

SHAKER 4522 LX

RP-CSL-CRYOV-04001
Version : 01
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Date : 7 May, 2004

UNIVERSITÉ DE LIÈGE

CENTRE SPATIAL DE LIÈGE

Vibration Test Report SPIRE QM

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1 Distribution list.

1.1 CSL.

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Cryovibrations data folder

1.2 Estec.

N. NIKOLAIZIG – Original

2 Document status sheet.

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3 Applicable documents.

[DA1]	ESA SCI-PT/RS-06194 Issue 4 Revision 0	Herschel Cold Vibration Specification for Test Facility
[DA2]	ESA SCI-PT-IIDB/SPIRE-02124	FIRST / Planck Instrument Interface Document Part B Instrument SPIRE
[DA3]	ESA PT-IID-A-04624 Issue 2 Revision 0	Instrument Interface Document Part A
[DA4]	ESA SCI-PT-RS-04683 Issue 2 Revision 0	Product Assurance Requirements for FIRST / Planck Satellite
[DA5]	m+p International VibCo NT	Vibration Control and Analysis System Operating Manual
[DA6]	m+p International SmartOffice	SmartOffice User Manual e-Reporter I and e-Reporter II
[DA7]	Brüel & Kjær NEXUS™	The NEXUS™ Range of Conditioning Amplifiers Type 2690,2691, <u>2692</u> and 2693 Vol. 1 : Operation Vol. 2 : Interface
[DA8]	Ling Electronics	Shaker 4522 LX Data Package
[DA9]	SPIRE-RAL-PRC-001956	SPIRE Cold Vibration Test Procedure CQM
[DA10]	SPIRE-RAL-DOC-001049	SPIRE Instrument Level Test Plan CQM
[DA11]	SPIRE-RAL-DOC-001955	SPIRE Cold Vibration Test Plan CQM
[DA12]	SCI-PT-25866	SPIRE CQM FPU / JFET's Cold Vibration TRR

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4 Reference documents.

[RD1]	CSL-OFF-ESA-010020	Herschel Instruments Cold Vibration Facility <i>A proposal to ESA Submitted by the Centre Spatial de Liège in reply to AO/1-3852/NL/NB</i>
[RD2]	PL-CSL-CRYOV-01001	Development Plan
[RD3]	PL-CSL-CRYOV-01003	AIV Plan
[RD4]	PL-CSL-CRYOV-01006	Cleanliness Plan
[RD5]	PL-CSL-CRYOV-01008	PA Plan
[RD6]	PL-CSL-CRYOV-01009	Configuration Management Plan
[RD7]	PL-CSL-CRYOV-01004	Validation Plan
[RD8]	PR-CSL-CRYOV-01001	Bellows Validation Test Procedure
[RD9]	PR-CSL-CRYOV-01002	Cold Vibration Test Procedure
[RD10]	PR-CSL-CRYOV-01003	Accelerometer Cold Calibration Test Procedure
[RD11]	PR-CSL-CRYOV-03004	Herschel Cold Vibration Facility Validation Procedure
[RD12]	RP-CSL-CRYOV-02001	Witzenmann Bellows Validation Test Report
[RD13]	RP-CSL-CRYOV-03001	Shrouds Baking Test Report
[RD14]	RP-CSL-CRYOV-03002	VTA Modal Analysis
[RD15]	RP-CSL-CRYOV-03003	Vessel Acceptance Test Report
[RD16]	RP-CSL-CRYOV-03004	Facility Acceptance Test report
[RD17]	RP-CSL-CRYOV-03005	Facility Validation Vibration Test Report
[RD18]	RP-CSL-CRYOV-04002	SPIRE QM Test Report

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[RD19]	TN-CSL-CRYOV-01001	Structural Analysis Report
[RD20]	TN-CSL-CRYOV-01002	Thermal Analysis Report
[RD21]	TN-CSL-CRYOV-01003	Design Description Document
[RD22]	LI-CSL-CRYOV-01001	Declared Material List
[RD23]	LI-CSL-CRYOV-01002	Deliverables and Spare Parts List
[RD24]	LI-CSL-CRYOV-04001	Bellows Status List
[RD25]	TN-CSL-SHK-00001	Caractéristiques Techniques des Pots à Vibrations
[RD26]	PR-CSL-SHK-97001	Procédure de montage et démontage d'un spécimen sur le shaker
[RD27]	PR-CSL-SHK-99001	Procédure de rotation du pot vibrant
[RD28]	LI-CSL-SHK-00001	Liste des capteurs
[RD29]	CSL/RFW/CRYOV/02001	Request for waiver on vibration test adapter frequency
[RD30]	CSL/RFW/CRYOV/02002	Request for waiver on sine tests levels specifications
[RD31]	CSL/RFW/CRYOV/02003	Request for waiver on analogue recording
[RD32]	CSL/RFW/CRYOV/02004	Request for waiver on visualisation capabilities
[RD33]	CSL/RFW/CRYOV/02005	Request for waiver on low frequency random spectrum
[RD34]	CSL/RFW/CRYOV/02006	Request for waiver on strain gages availability

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7 Introduction.

This document is the report of the vibration tests realised on the SPIRE QM. Those tests occurred on the 4522 LX shaker in cryovibration configuration.

8 Operating Mode.

Client : ESTEC

Tested Specimen : SPIRE QM (including JFET's)

Test Aim : Verification, characterisation and qualification of the SPIRE QM under cold vibration environment

Test Director : J-S. SERVAYE

8.1 Vibration Facility Description.

The vibration testing is performed by a closed control loop. This control is computed by a VXI-based workstation, sent to the shaker by mean of power amplifiers. The tested material acceleration is measured by piezo-electric accelerometers, and some of them are used for the control feedback.

Part	Model	Calibration - Verification - Version
Shaker :	Ling 4522 LX 200 kN	10/2003
Power amplifiers :	Ling DMA 4030 E	10/2003
Accelerometers :	Brüel & Kjaer 4326	10/2003
	Endevco 7724	10/2003
Charge amplifiers :	Brüel & Kjaer NEXUS™ 2692	10/2003
DAC-ADC :	VXI HP E1432A	10/2002
	BUSTEC ProDAQ 3042 cards	08/2002 (No calibration required)
Software :	Control and acquisition by m+p	2.7.2
	VibControl	

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8.2 Test Procedure.

Please refer to [DA11] for more details.

8.2.1 Test control.

8.2.1.1 Alarm and abort.

The usual alarm and abort levels are ± 3 dB and ± 6 dB (for sine), ± 6 dB and ± 12 dB (for random), in respect to the specifications. They could be adapted in accordance with the client to secure the test. In case of test abort, either hardware or software, this abort will be smooth to avoid any shock on the tested specimen. Each channel has an abort corresponding to the full scale of the amplifier.

8.2.1.2 Control strategy.

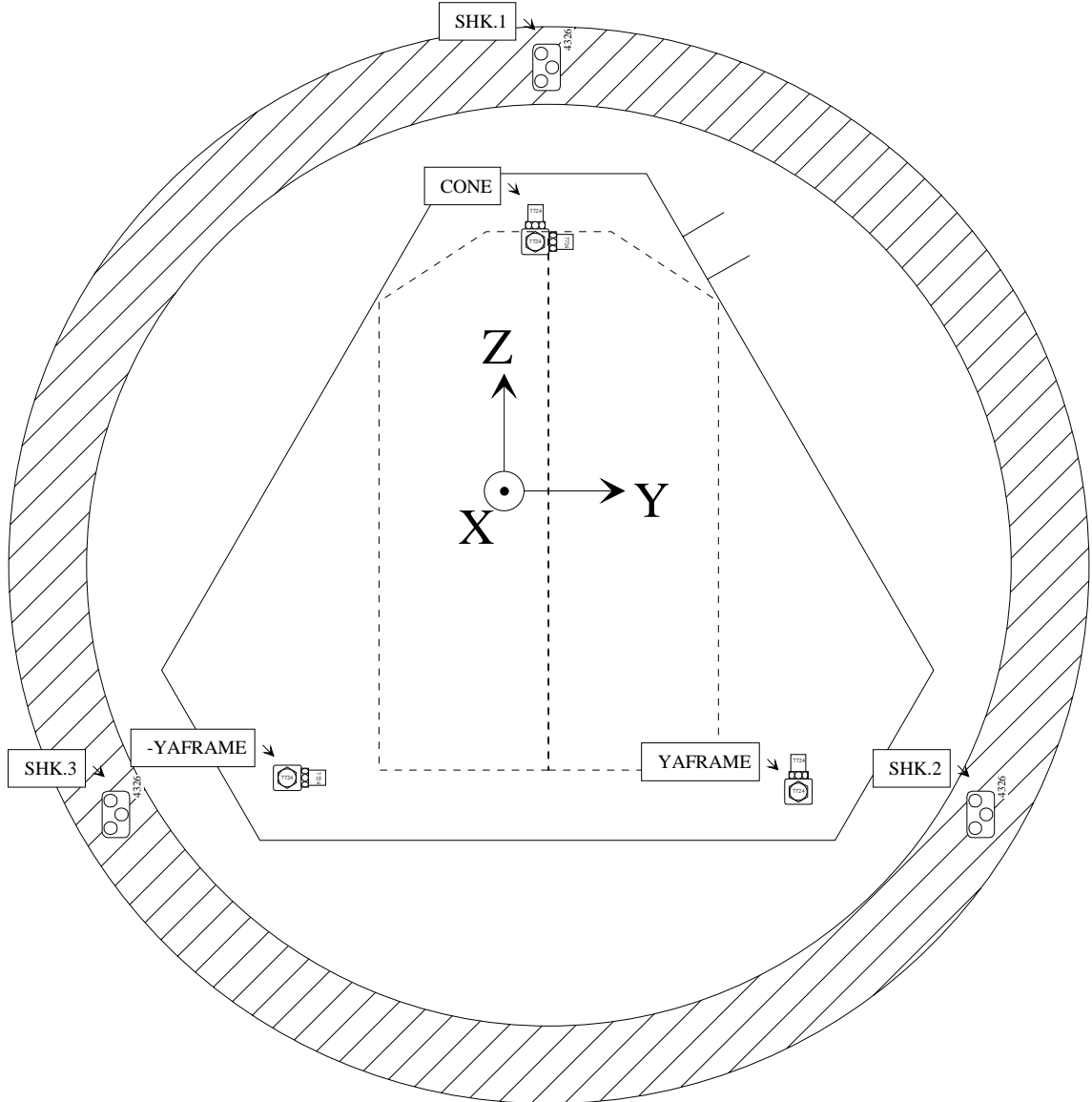
The control signal is the instantaneous maximum value or the average (client choice based on low level results) of the control accelerometers for sine and random tests.

For random tests, short duration at -6 dB and -3 dB from the specification are performed before the test for control optimisation purpose.

The pilot accelerometers are CONE, -Y.AFRAME and +Y.AFRAME.

8.3 Instrumentation.

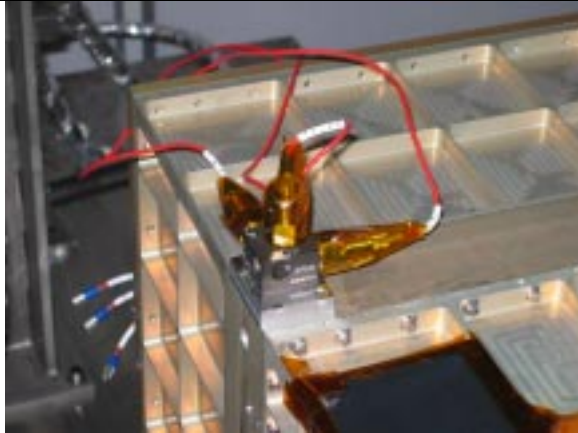
The ambient accelerometers are three BK 4326 tri-axes. The cold accelerometers are Endevco 7724 mono-axis. The position and the name of the control and measure points are outlined in Drawing 1. The customer has installed the accelerometers inside the instrument.



Drawing 1 - Instrumentation

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Picture 1 – Accelerometer on top of SPIRE



Picture 2 – CONE



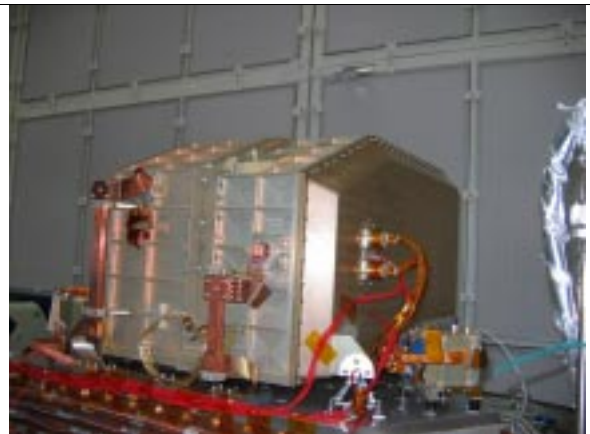
Picture 3 - -Y.AFRAME



Picture 4 - +Y.AFRAME



Picture 5 – Setting



Picture 6 - Setting

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9 Test chronology.

You find hereafter a copy of the shaker logbook.

<i>Datum</i>	<i>Hour</i>	<i>Operator</i>	<i>Results file</i>	<i>Observations</i>
29/03/04	18:40	JSS	BNS1Y.rsn	293 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Test OK.
05/04/04	10:50	JSS	BNS2Y.rsn	-YAFRAME.Y is not functioning anymore, we remove it from the control. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -9.57707 dB at 706.653 Hz, we restart from there. Contr. chan. abort: Error -14.0627 dB at 783.471 Hz. COOL.X is not functioning anymore, we will check it between horizontal and vertical configurations.
05/04/04	14:30	JSS	BNS3Y.rsn	We enlarge the abort limit after 650 Hz to 20 dB. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Test OK.
05/04/04	15:35	JSS	NIS4Y.rsn	15 K. 20-200 Hz ; 2 g ; 4 Oct./min. Notching OB.Y activated. Misunderstanding between SPIRE and CSL teams, the frequency range of the test should be 20-100 Hz. Test OK. No more test is allowed without the run sheet signed.
05/04/04	17:50	JSS	BNS5Y.rsn	Same as BNS3Y. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Test OK.
06/04/04	11:50	JSS	HNS6Y.rsn	15 K. 20-100 Hz ; 8 g ; 4 Oct./min. Notching OB.Y activated. Test OK.
06/04/04	12:10	JSS	BNS7Y.rsn	Same as BNS5Y. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -20.6288 dB at 1601.27 Hz. Test OK.
06/04/04	12:40	JSS	BNA8Y.rsn	15 K. 20-2000 Hz ; 0.44 g _{rms} ; 15 s. Test OK.
06/04/04	15:30	JSS	BNA9Y.rsn	15 K. 20-2000 Hz ; 0.64 g _{rms} ; 15 s. PHE.XY electrical overload during all test (not physically possible). Test OK.
06/04/04	16:20	JSS	BNA10Y.rsn	15 K. 20-2000 Hz ; 0.64 g _{rms} ; 15 s. Notching OB.Y activated. Test OK.
06/04/04	17:40	JSS	NIA11Y.rsn	15 K. 20-2000 Hz ; 1.27 g _{rms} ; 15 s. Notchings SPEC.X and OB.Y activated. Test OK.
06/04/04	18:20	JSS	HNA12Y.rsn	15 K. 20-2000 Hz ; 2.54 g _{rms} ; 120 s. Notchings SPEC.X and OB.Y activated. Test OK.
06/04/04	18:35	JSS	BNS13Y.rsn	Same as BNS5Y. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -20.2935 dB at 1617.57 Hz. Test OK.
07/04/04	14:30	JSS	BNS1Z.rsn	15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -10.2915 dB at 845.911 Hz. Test OK.
07/04/04	15:55	JSS	NIS2Z.rsn	15 K. 20-100 Hz ; 4 g ; 4 Oct./min. Notching PHS.Z activated. Test OK.
07/04/04	16:00	JSS	HNS3Z.rsn	15 K. 20-100 Hz ; 8 g ; 4 Oct./min. Notching PHS.Z activated. Test OK.
07/04/04	16:10	JSS	BNS4Z.rsn	Same as BNS1Z. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -9.28513 dB at 476.305 Hz ; we restart from there ; Contr. chan. abort: Error 9.67183 dB at 840.685 Hz. Test OK.

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<i>Datum</i>	<i>Hour</i>	<i>Operator</i>	<i>Results file</i>	<i>Observations</i>
07/04/04	16:25	JSS	BNA5Z.rrn	15 K. 20-2000 Hz ; 0.44 g _{rms} ; 20 s. Test OK.
07/04/04	17:35	JSS	BNA6Z.rrn	15 K. 20-2000 Hz ; 0.56 g _{rms} ; 20 s. Notchings PHS.Z and PHS.XY activated. Test OK.
07/04/04	17:40	JSS		There is probably a inversion between SPEC.X and SPEC.Z. This inversion is inside the chamber, so we have to check it at the change of configuration.
07/04/04	18:00	JSS	NIA7Z.rrn	15 K. 20-2000 Hz ; 1.27 g _{rms} ; 20 s. Notchings PHS.Z and PHS.XY activated. Test OK.
07/04/04	18:30	JSS	HNA8Z.rrn	15 K. 20-2000 Hz ; 2.5 g _{rms} ; 120 s. Notchings PHS.Z and PHS.XY activated. Test OK.
07/04/04	18:40	JSS	BNS9Z.rsn	Same as BNS1Z. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -10.5845 dB at 724.746 Hz ; we restart from there ; Contr. chan. abort: Error 9.87286 dB at 838.604 Hz. Test OK.
14/04/04	08:00	JSS	Change configuration from horizontal to vertical	Head Expander connection
14/04/04	14:00	JSS	Sensors to check	-YAFRAME.Z, PHE.XY (inside instrument, not accessible), COOL.X (inside instrument, not accessible), SPEC.Z (inside instrument, not accessible). Nothing strange with respect to capacitance and resistance measures. No inversion noticed on cable for accelerometers SPEC.X and SPEC.Z, left as it is, to be checked by SPIRE team on accelerometers removal. Try to check it at ambient with a selfcheck.
21/04/04	15:00	RAL	Removal of the instrument	Problem with bellows see Cryovibration facility logbook and [RD18] for more details
22/04/04	14:30	JSS	BNS1X.rsn	IF plate alone. 293 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Control on the inside of the chamber. Test OK.
22/04/04	14:50	JSS	HNS2X.rsn	IF plate alone. 293 K. 20-100 Hz ; 18 g ; 4 Oct./min. Control on the inside of the chamber. Test OK.
22/04/04	15:00	JSS	HNA3X.rrn	IF plate alone. 293 K. 20-2000 Hz ; 3.7 g _{rms} ; 20 s. Control on the inside of the chamber. Test OK.
30/04/04	18:35	JSS	BNA4X.rrn	Tmax SPIRE 63.9 K. 20-2000 Hz ; 0.44 g _{rms} ; 20 s. Test OK.
01/05/04	09:00	JSS	BNS5X.rsn	15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -12.2251 dB at 458.123 Hz ; we restart from there ; Contr. chan. abort: Error -9.8967 dB at 1752.68 Hz. Test OK.
01/05/04	10:10	JSS	NIS6X.rsn	15 K. 20-100 Hz ; 9 g ; 2 Oct./min. Notching FPU.X activated. FPU.X 7.325e g ; up. abort lim.(notch) : 6 g ; we restart from there. Test OK.
01/05/04	10:55	JSS	HNS7X.rsn	15 K. 20-100 Hz ; 18 g ; 2 Oct./min. Notchings FPU.X and SMECU.X activated. Test OK.
01/05/04	11:00	JSS	BNS8X.rsn	We enlarge the lower abort limit to -20 dB in the frequency bandwidth 400 to 500 Hz. 15 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Contr. chan. abort: Error -12.3355 dB at 1674.88 Hz. Test OK.
01/05/04	11:20	JSS	BNA9X.rrn	15 K. 20-2000 Hz ; 0.8 g _{rms} ; 30 s. Test OK.

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<i>Datum</i>	<i>Hour</i>	<i>Operator</i>	<i>Results file</i>	<i>Observations</i>
01/05/04	14:45	JSS	NIA10X.rrn	15 K. 20-2000 Hz ; 1.74 g _{rms} ; 30 s. Notchings on SMLECU.X, SPEC.X and PHS.Z activated. Test OK.
01/05/04	15:35	JSS/BW		Mistake in the test file definition, inversion of notching specification between SMECU.X and SPEC.X.
01/05/04	15:35	JSS	NIA11X.rrn	15 K. 20-2000 Hz ; 1.74 g _{rms} ; 30 s. Notchings on SMLECU.X, SPEC.X and PHS.Z activated. Test OK.
01/05/04	15:45	JSS	HNA12X.rrn	15 K. 20-2000 Hz ; 3.47 g _{rms} ; 120 s. Notchings on SMLECU.X, SPEC.X and PHS.Z activated. COOL.X overload on the end of the run, measurement finished before it happens. Test OK.
01/05/04	16:00	JSS	BNS13X.rsn	Same as BNS8X. 5 K. 20-2000 Hz ; 0.2 g ; 2 Oct./min. Input overload, channel 13 at 157.62 Hz ; COOL.X not functioning anymore, change the amplifier gain to 1 mV/g and restart from there. Contr. chan. abort: Error -9.45211 dB at 951.941 Hz ; we restart from there. Contr. chan. abort: Error -12.4232 dB at 1684.13 Hz. Test OK.

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10 Results.

You will find hereafter the specifications used in control and notching for the high levels random and sine, as the representatives of ESTEC, RAL and MSSL requested them.

10.1 Tests characteristics.

10.1.1 HNS_Y.

10.1.1.1 Pilot.

Frequency	Level
20 Hz – 31.5 Hz	2 mm
31.5 Hz – 45 Hz	8 g
45 Hz – 60 Hz	-6.02 dB/Oct
60 Hz – 100 Hz	6 g

Table 1 – Reference high level sine y

10.1.1.2 Notching-control.

Sensor	Frequency	Level
OB.Y	20 Hz – 100 Hz	8 g
FPU.Y	20 Hz – 100 Hz	10 g

Table 2 – Notching high level sine y

10.1.2 HNA_Y.

10.1.2.1 Pilot.

Frequency	Level	Acceleration rms
20 Hz – 100 Hz	3 dB/Oct	2.54 grms
100 Hz – 150 Hz	0.02 g ² /Hz	
150 Hz – 300 Hz	0.0125 g ² /Hz	
300 Hz – 2000 Hz	-7 dB/Oct	

Table 3 – Reference high level random y

10.1.2.2 Notching-control.

Sensor	Frequency	Level
SPEC.X	190 Hz – 250 Hz	0.16 g ² /Hz
OB.Y	90 Hz – 150 Hz	0.001 g ² /Hz
	270 Hz – 350 Hz	0.02 g ² /Hz

Table 4 – Notching high level random y

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10.1.3 HNS_Z.

10.1.3.1 Pilot.

Frequency	Level
20 Hz – 31.5 Hz	2 mm
31.5 Hz – 45 Hz	8 g
45 Hz – 60 Hz	-6.02 dB/Oct
60 Hz – 100 Hz	6 g

Table 5 – Reference high level sine z

10.1.3.2 Notching-control.

Sensor	Frequency	Level
PHS.Z	20 Hz – 52.5 Hz	8 g
	52.5 Hz – 100 Hz	6 g
FPU.Z	20 Hz – 52.5 Hz	8.8 g
	52.5 Hz – 100 Hz	6.6 g

Table 6 – Notching high level sine z

10.1.4 HNA_Z.

10.1.4.1 Pilot.

Frequency	Level	Acceleration rms
20 Hz – 100 Hz	3 dB/Oct	2.54 g _{rms}
100 Hz – 150 Hz	0.02 g ² /Hz	
150 Hz – 300 Hz	0.0125 g ² /Hz	
300 Hz – 2000 Hz	-7 dB/Oct	

Table 7 – Reference high level random z

10.1.4.2 Notching-control.

Sensor	Frequency	Level
PHS.XY	190 Hz – 300 Hz	0.0125 g ² /Hz
PSH.Z	120 Hz – 170 Hz	0.005 g ² /Hz
	190 Hz – 300 Hz	0.0125 g ² /Hz

Table 8 – Notching high level random z

10.1.5 HNS_X.

10.1.5.1 Pilot.

Frequency	Level
20 Hz – 50 Hz	2 mm
50 Hz – 75 Hz	18 g
75 Hz – 80 Hz	-75.6 dB/Oct
80 Hz – 100 Hz	8 g

Table 9 – Reference high level sine x

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10.1.5.2 Notching-control.

Sensor	Frequency	Level
FPU.X	20 Hz – 75 Hz	18 g
	75 Hz – 80 Hz	-75.6 dB/Oct
	80 Hz – 100 Hz	8 g
SMECU.X	50 Hz – 100 Hz	11.4 g

Table 10 – Notching high level sine x

10.1.6 HNA_X.

10.1.6.1 Pilot.

Frequency	Level	Acceleration rms
20 Hz – 100 Hz	3 dB/Oct	3.47 g _{rms}
100 Hz – 150 Hz	0.05 g ² /Hz	
150 Hz – 300 Hz	0.02 g ² /Hz	
300 Hz – 2000 Hz	-7 dB/Oct	

Table 11 – Reference high level random x

10.1.6.2 Notching-control.

Sensor	Frequency	Level
PHS.Z	200 Hz – 300 Hz	0.2 g ² /Hz
SPEC.X	150 Hz – 230 Hz	0.2 g ² /Hz
SMECU.X	100 Hz – 170 Hz	0.3 g ² /Hz

Table 12 – Notching high level random x

10.2 Other results.

All the realised measurements are given in the annexes. Nevertheless, they are still available on numerical format (back up cartridge or hard disk of the shakers control PC).

Data files in UFF format have been given to customer.

11 Conclusions.

The required levels were passed on the control signal.

The comparison of the dynamic signatures between the pre and post low level shows the structural integrity of the specimen.

Therefore, the campaign is considered successful.

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12 Annexes.

Hereafter you will find all the measurements done during the campaign.

For sine tests, the scales are logarithmic. You always have two estimates in sine tests. They are defined as follow.

- Peak : The "Peak" mode searches the data for absolute peak values.
- RMS : The "RMS" mode adds the square of each input data point, divides the result by the number of data point and takes the root of this result. This RMS value is multiplied by a factor of $\sqrt{2}$, which represents the Peak-to-RMS ratio of a pure sine.
- Filtered : The "Filter" mode uses the principle of single-frequency FFT. The filter accepts only the fundamental frequency, harmonics waves will be rejected.

For random tests, the scales are logarithmic. The value is an averaged of the peak measurements (25 averages).

The RMS value is computed on the 20-2000 Hz bandwidth.

The transfer functions (i.e. measurement divided by control) comparisons have logarithmic scales.

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12.1 BNS1Y.

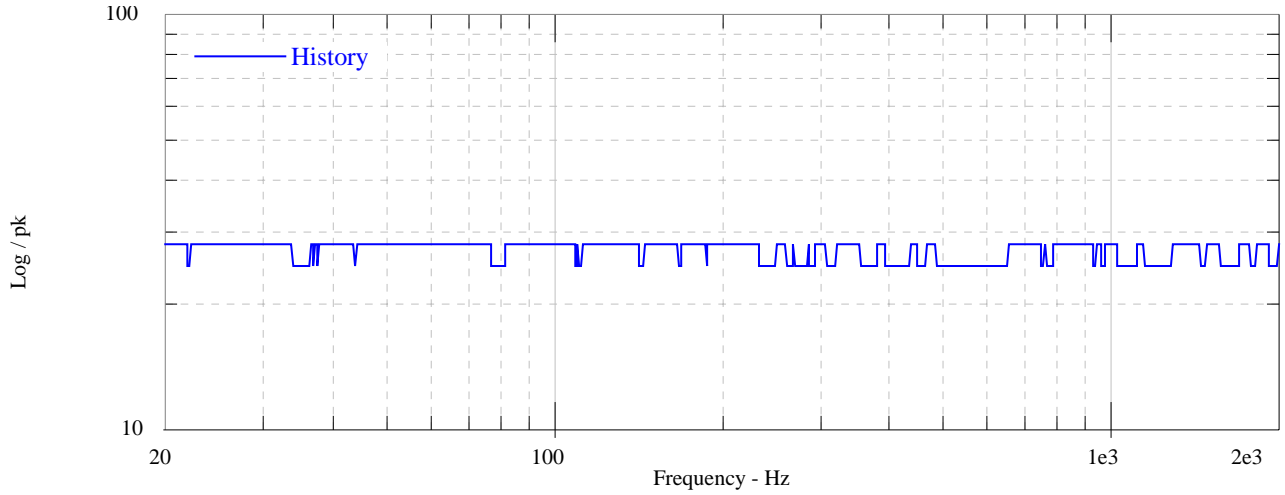
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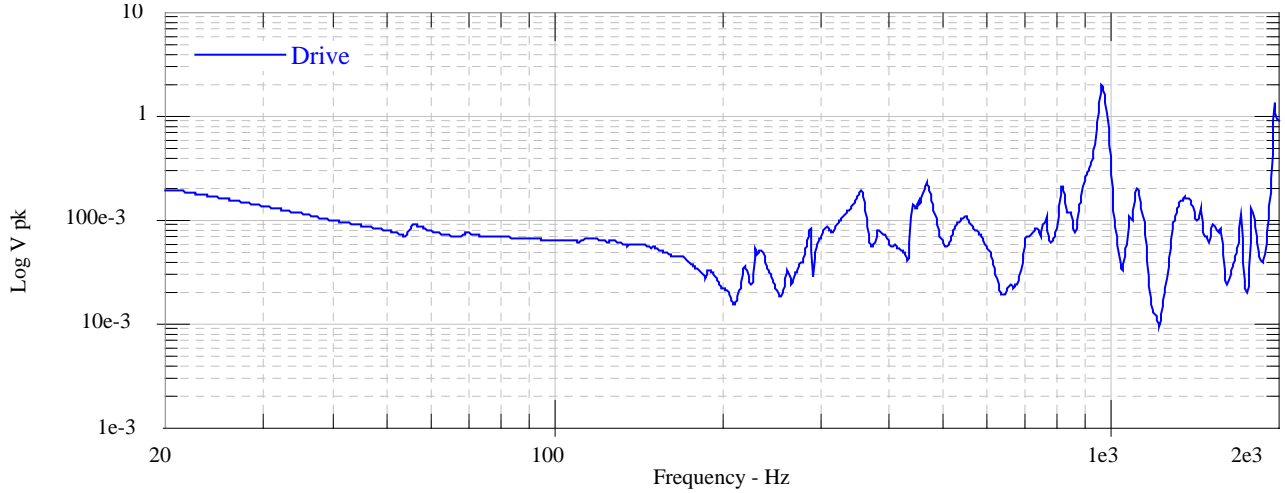
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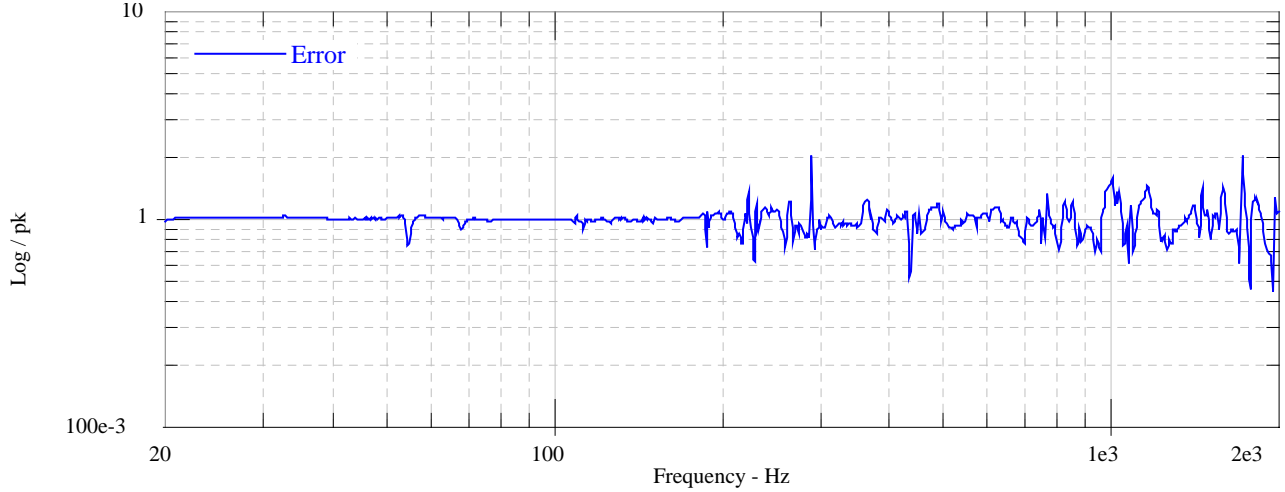
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Drive Channel n° -2



Error Channel n° -1

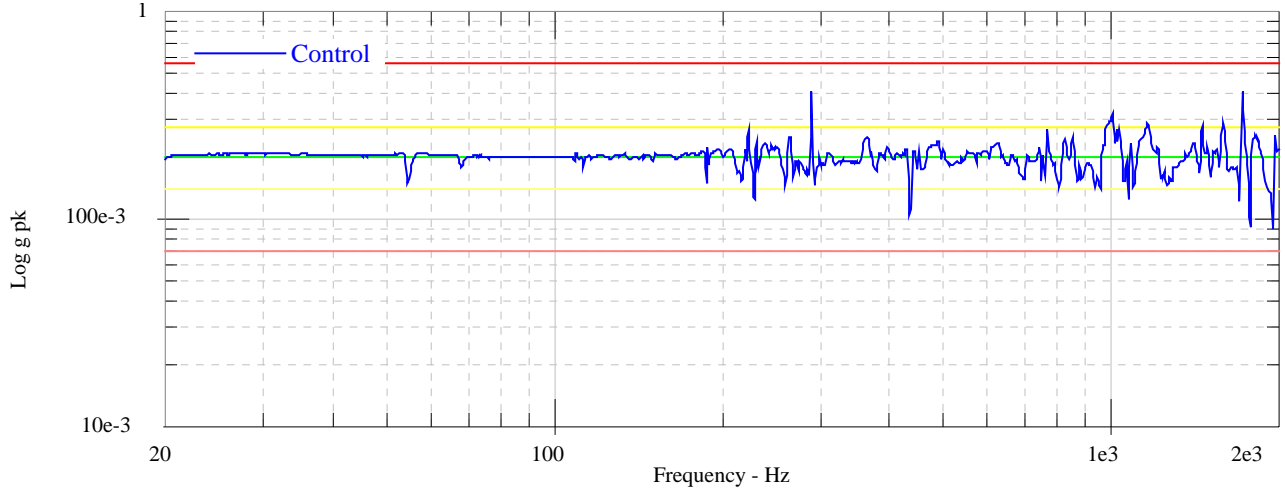


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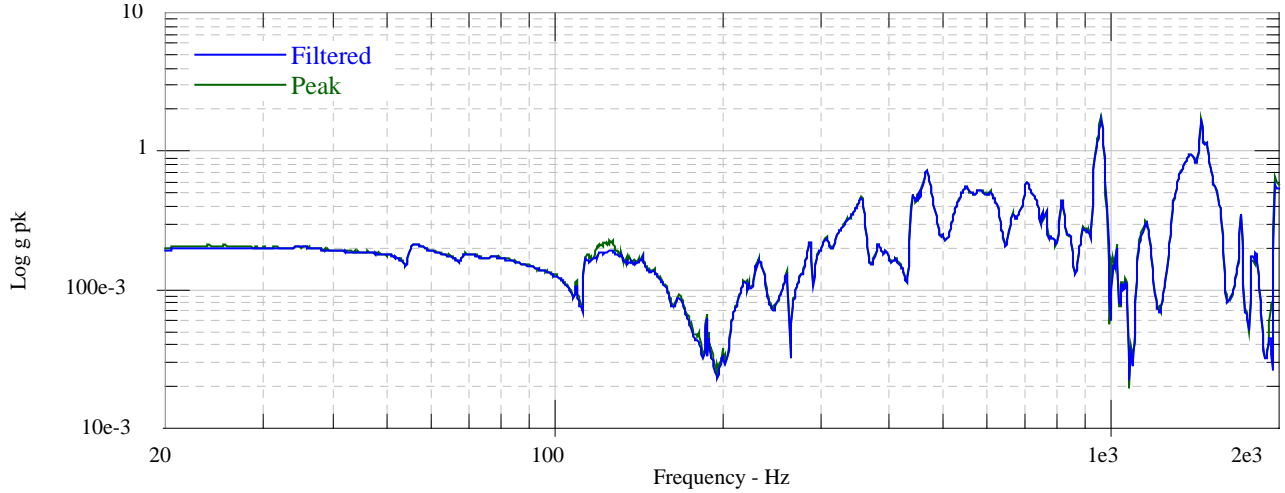
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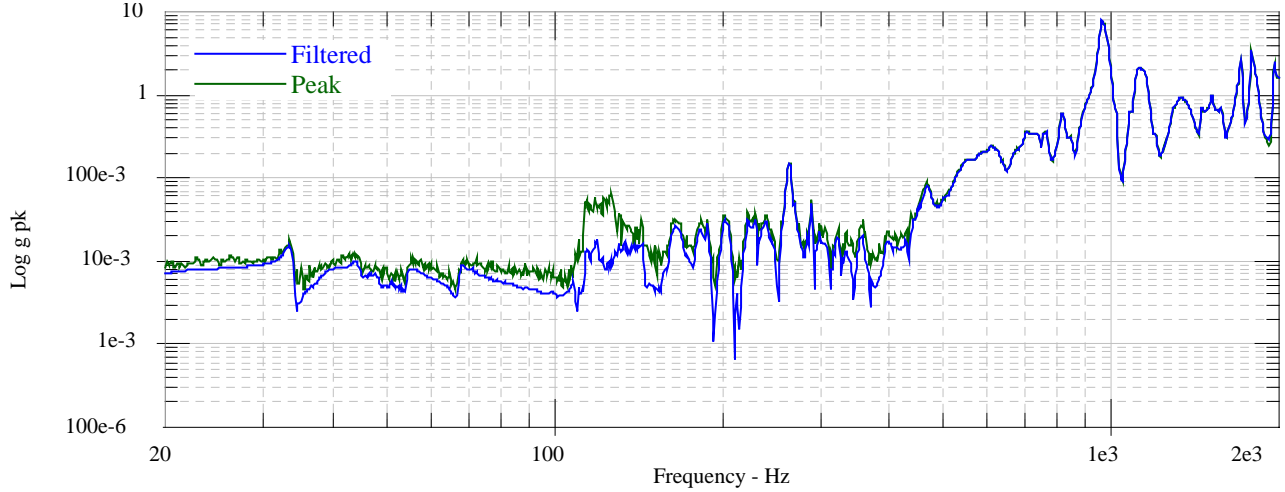
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SHK.1.Z Channel n° 2

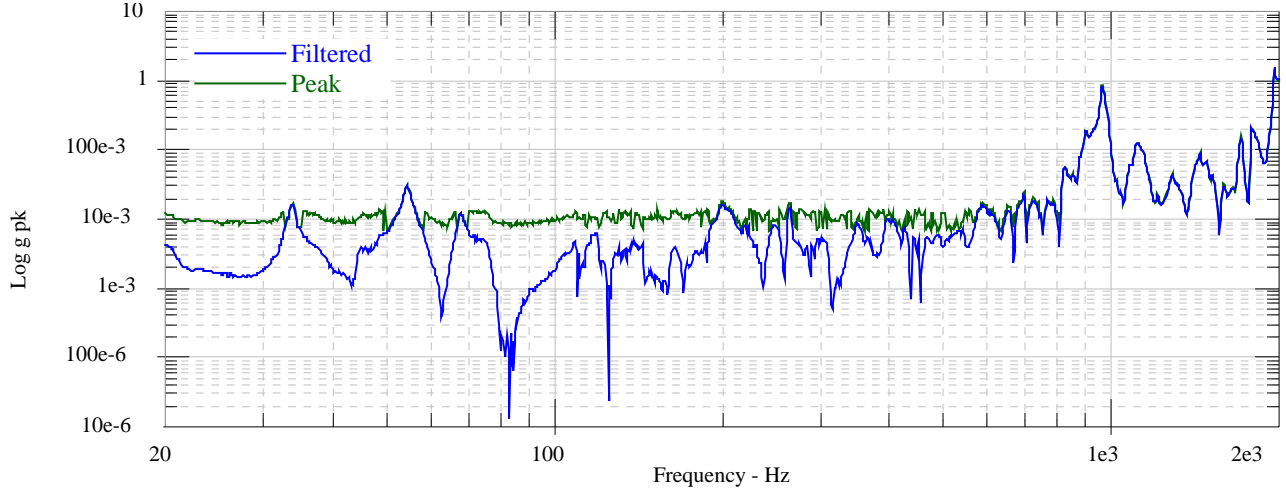


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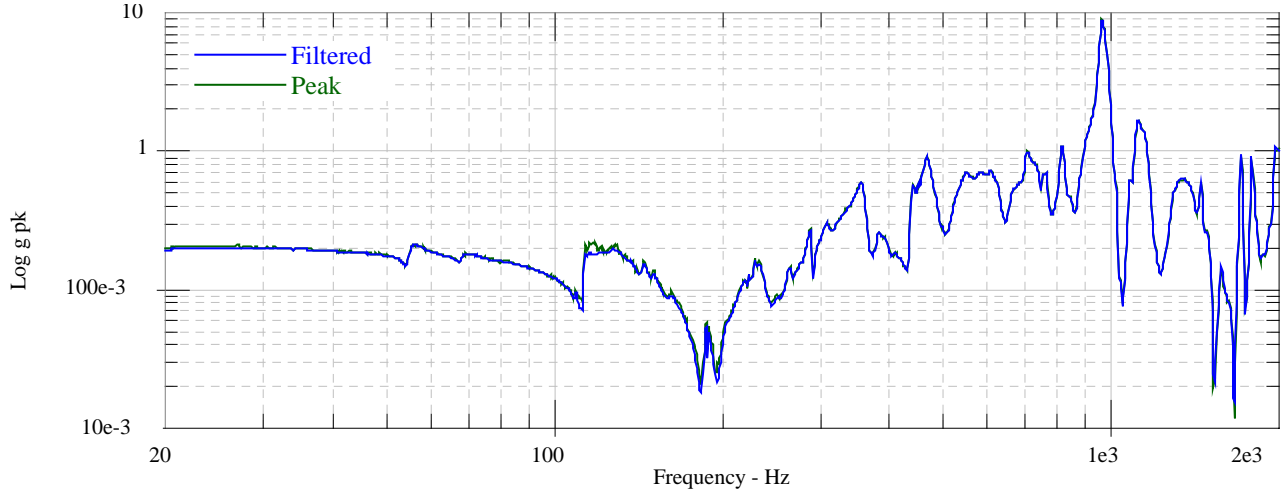
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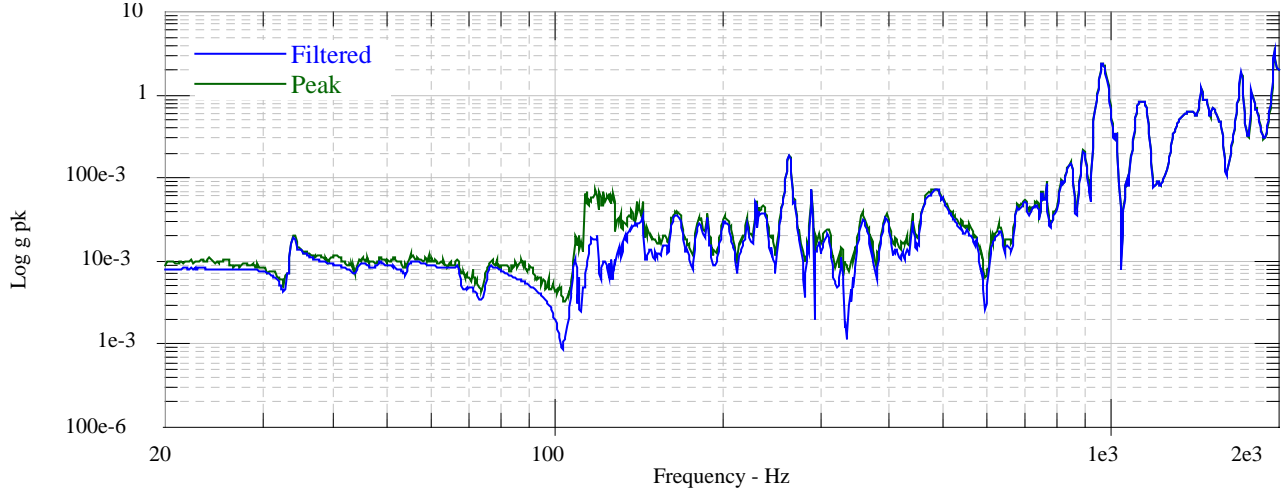
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

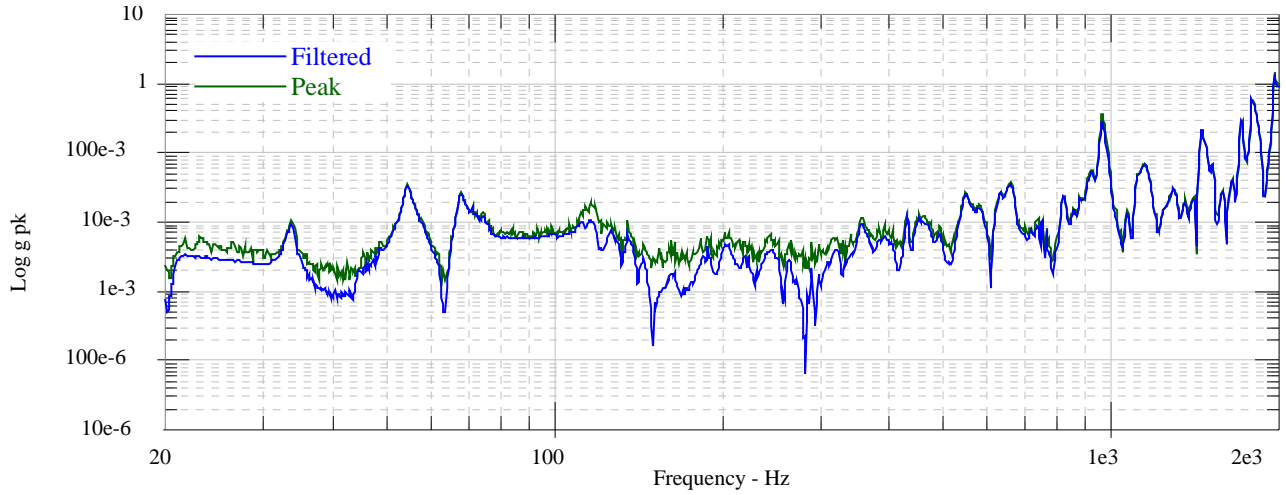


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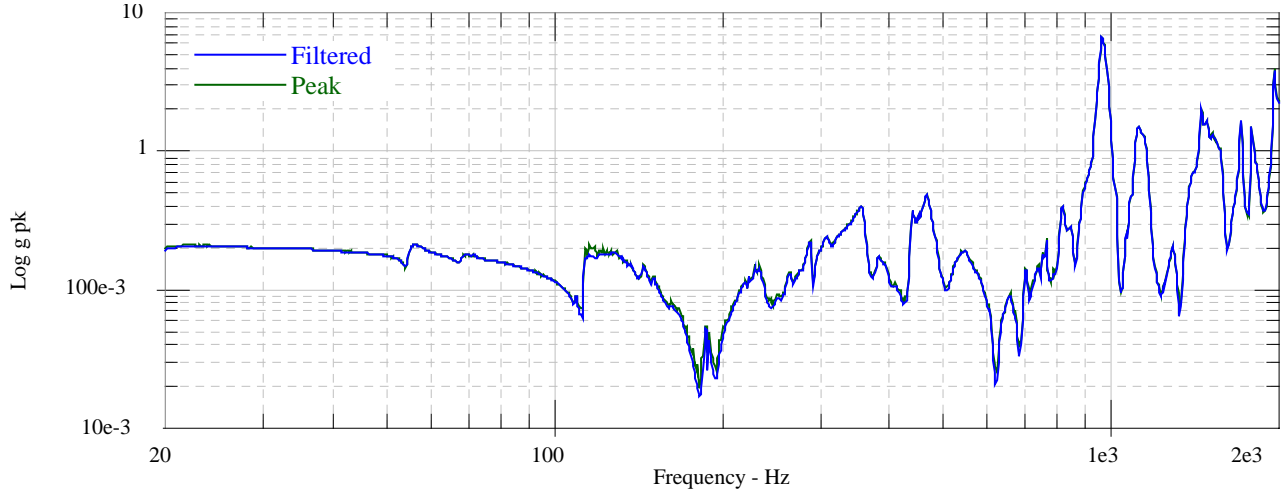
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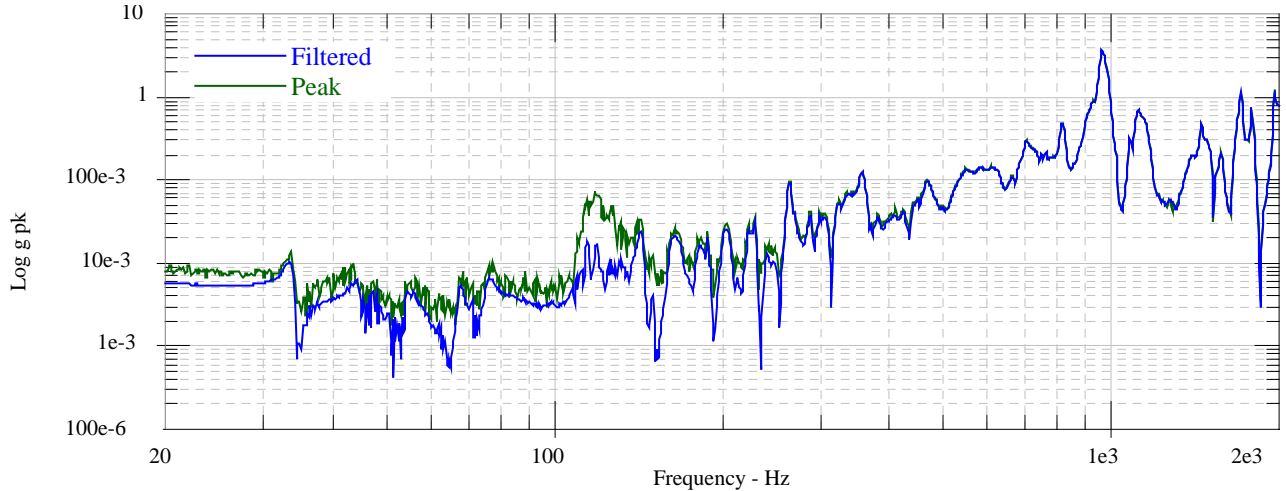
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

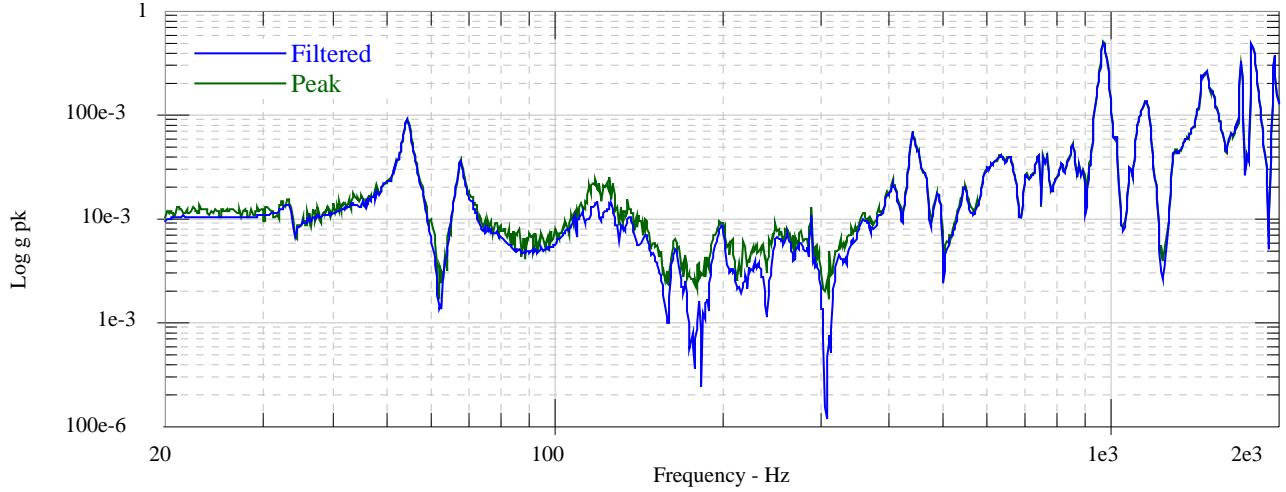


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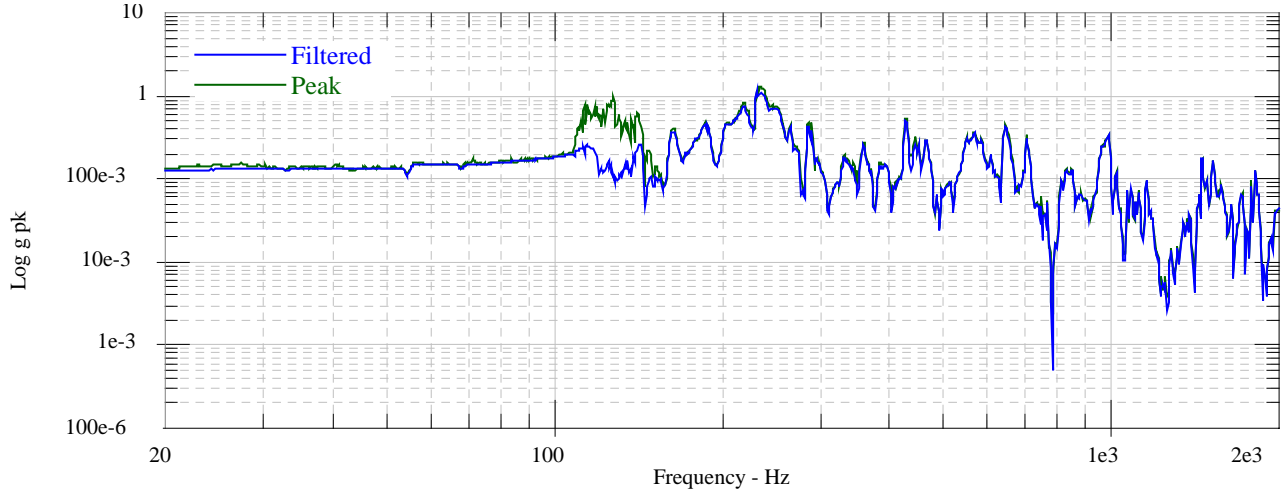
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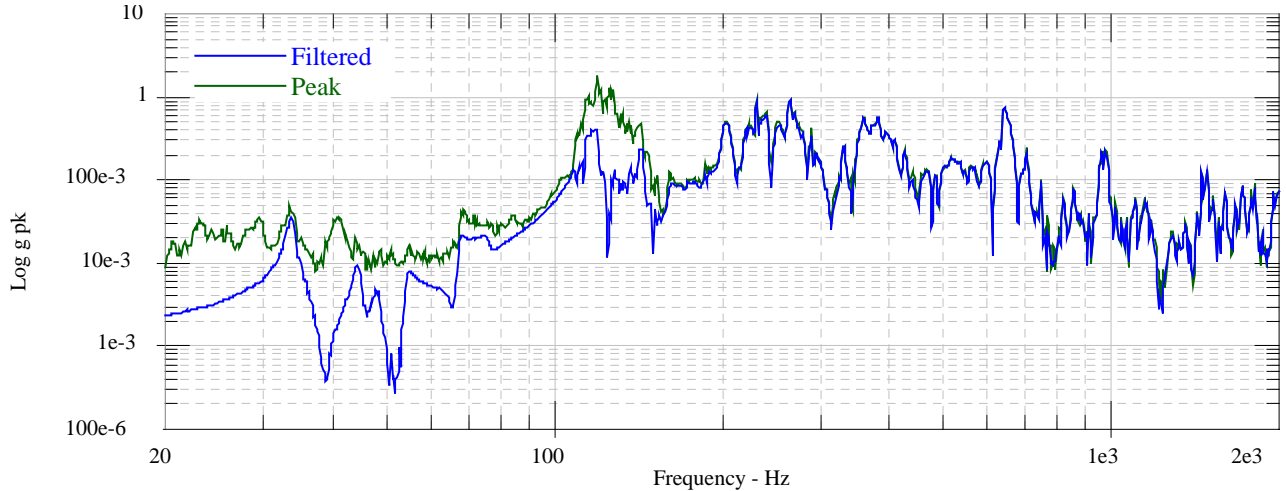
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

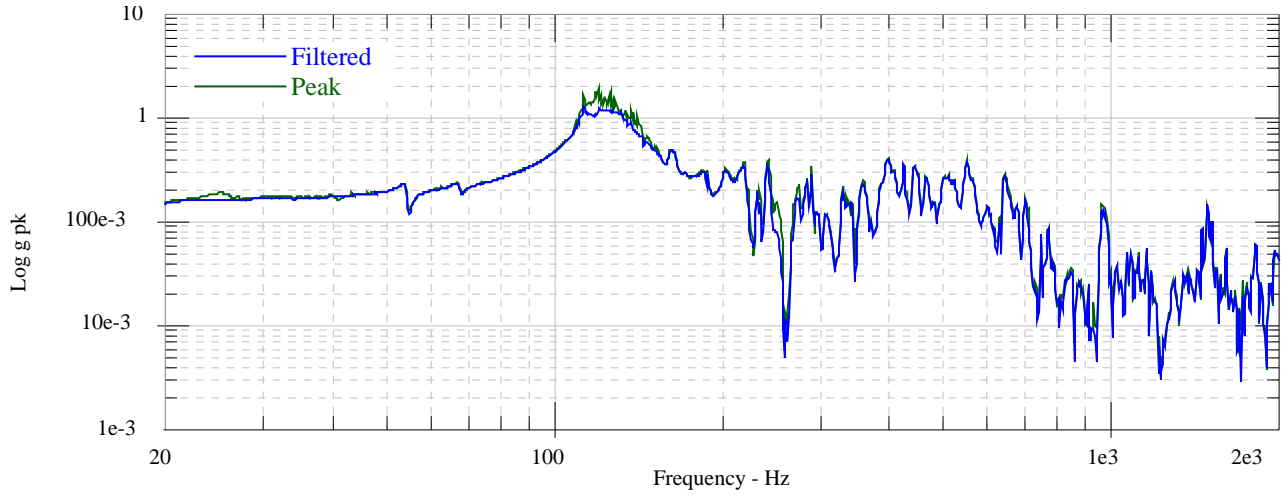


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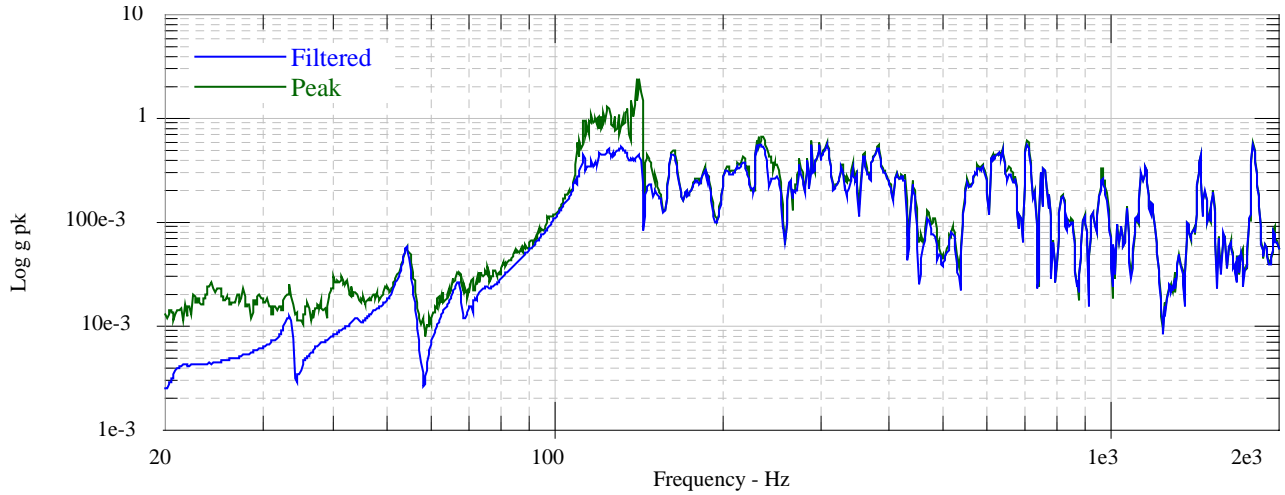
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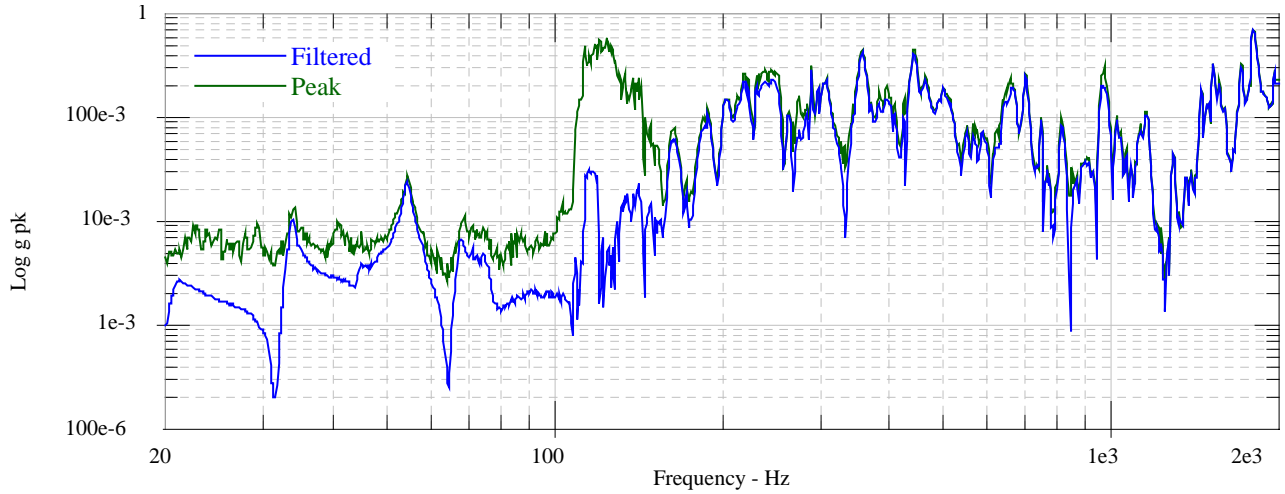
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COOL.X Channel n° 13



FPU.X Channel n° 14

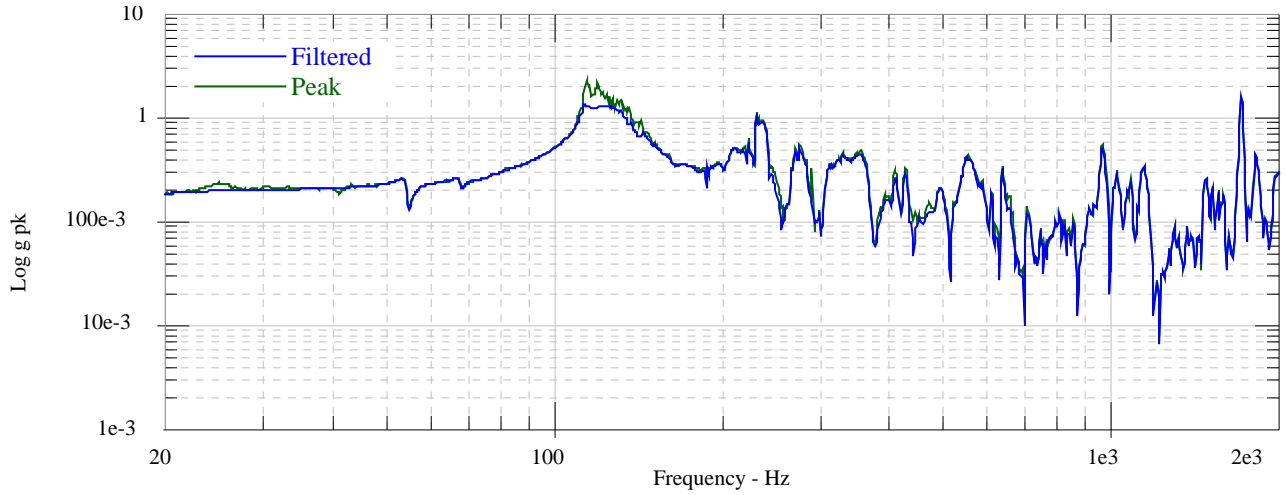


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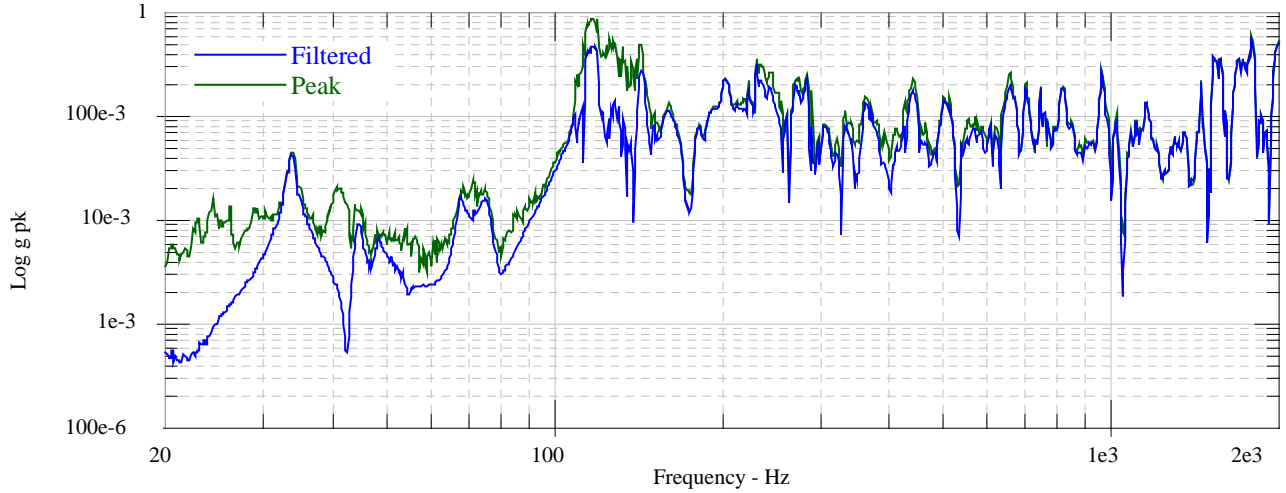
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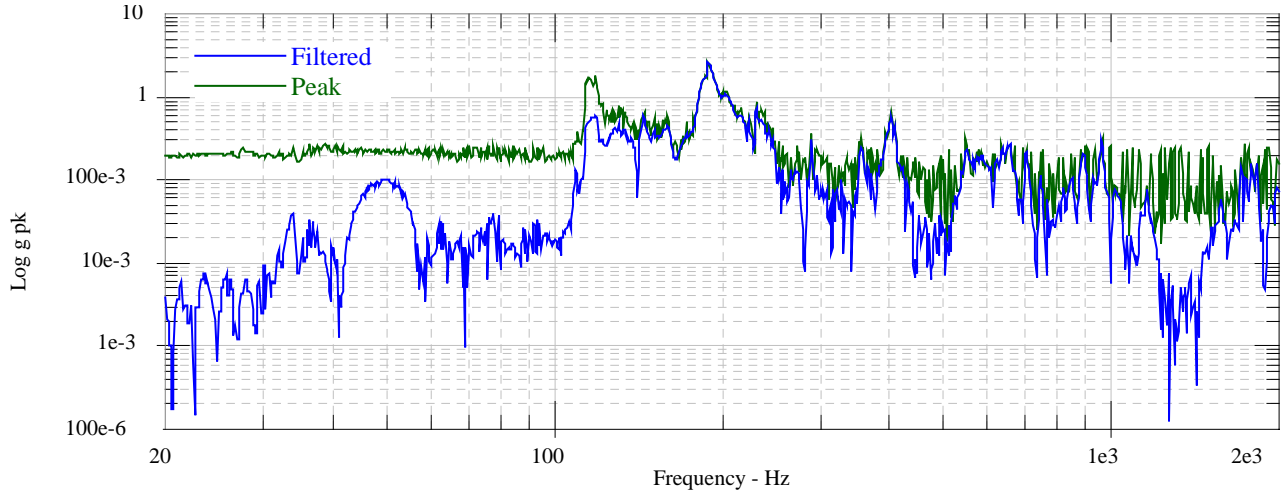
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FPU.Z Channel n° 16



SPEC.X Channel n° 17

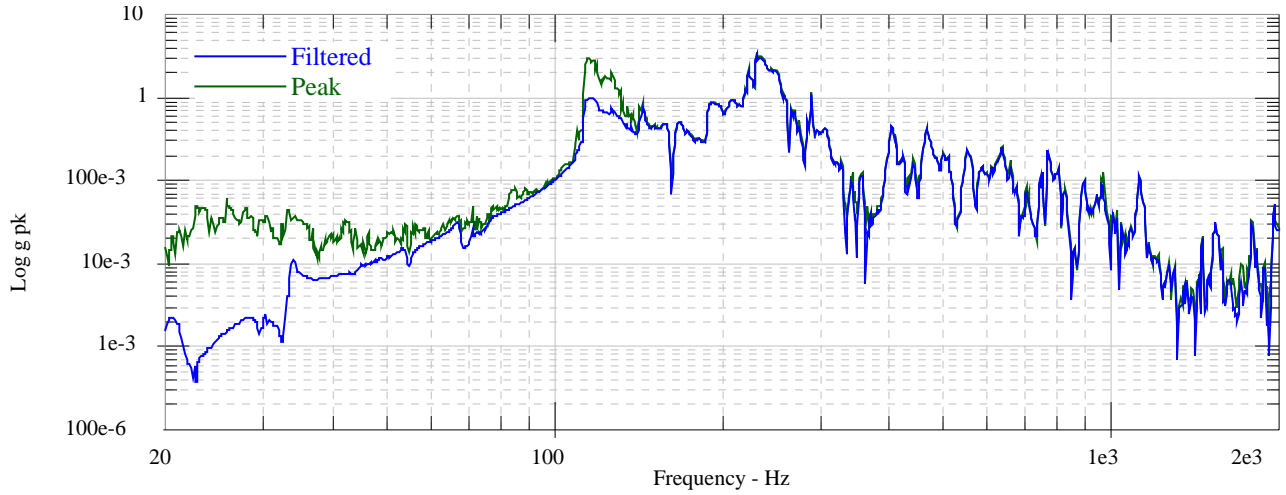


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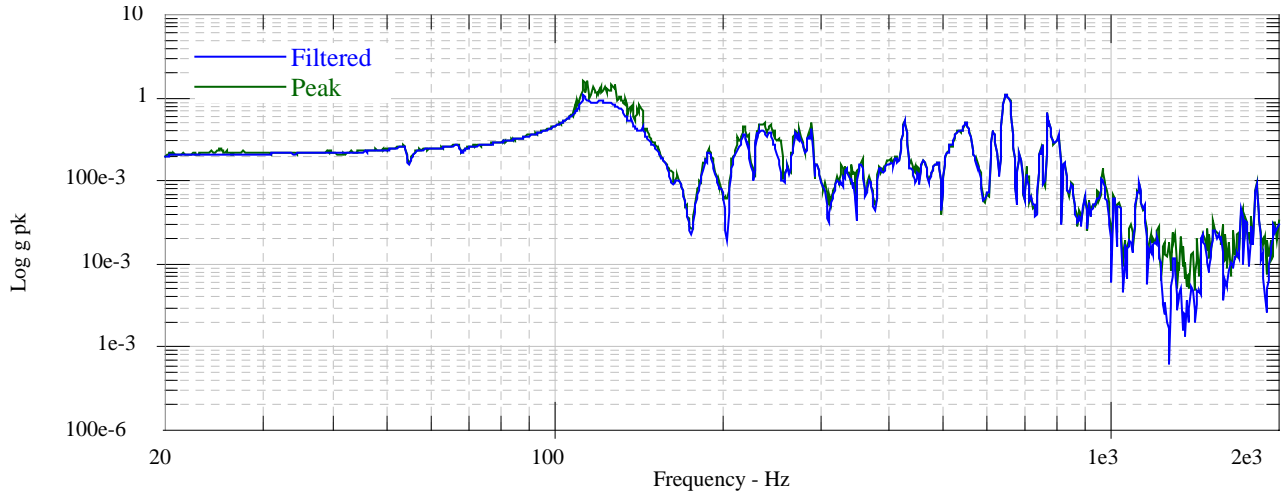
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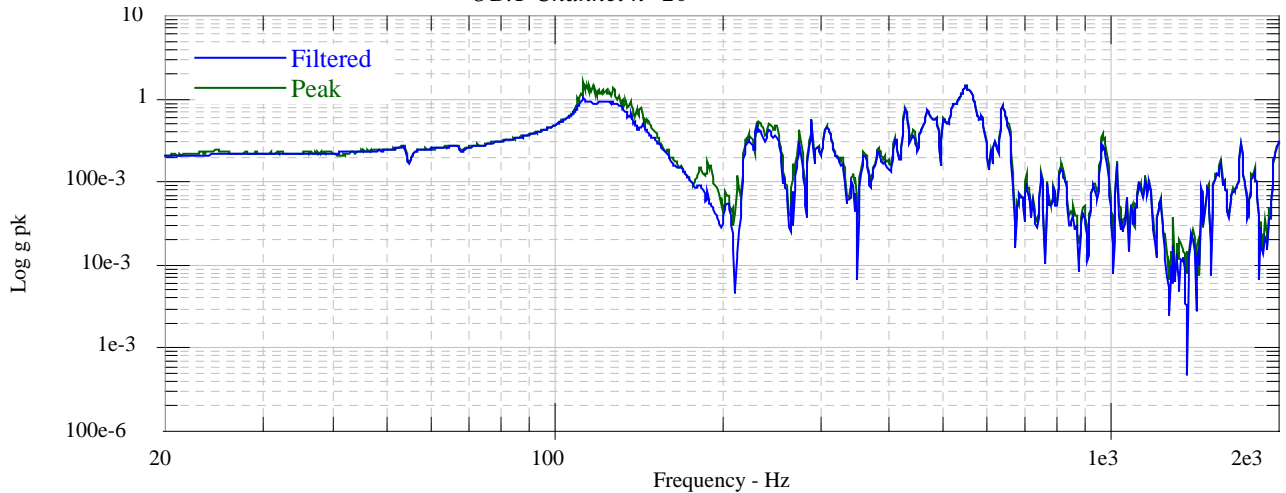
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SPEC.Y Channel n° 19



OB.Y Channel n° 20

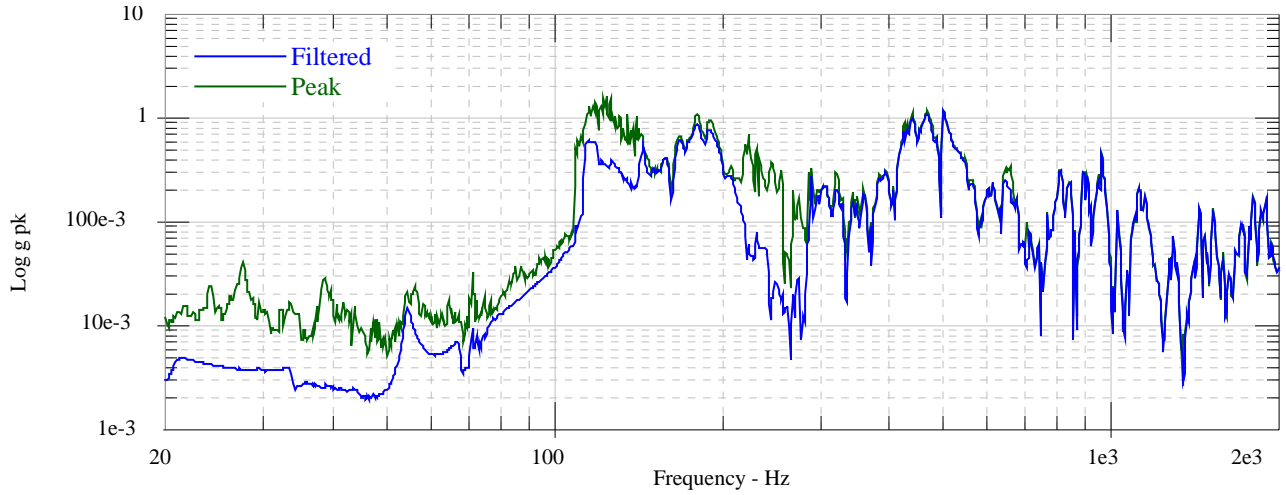


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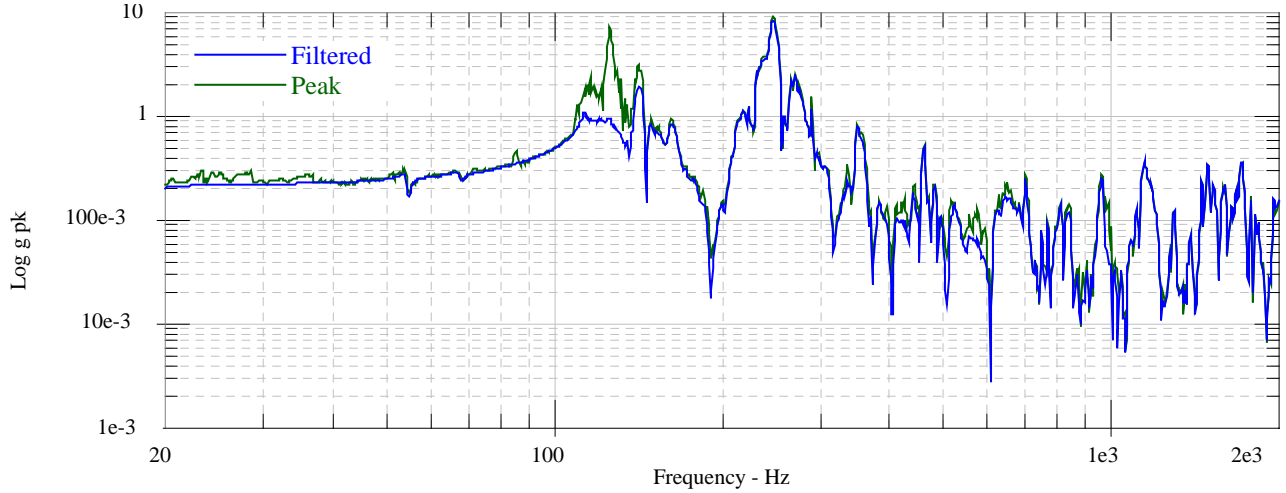
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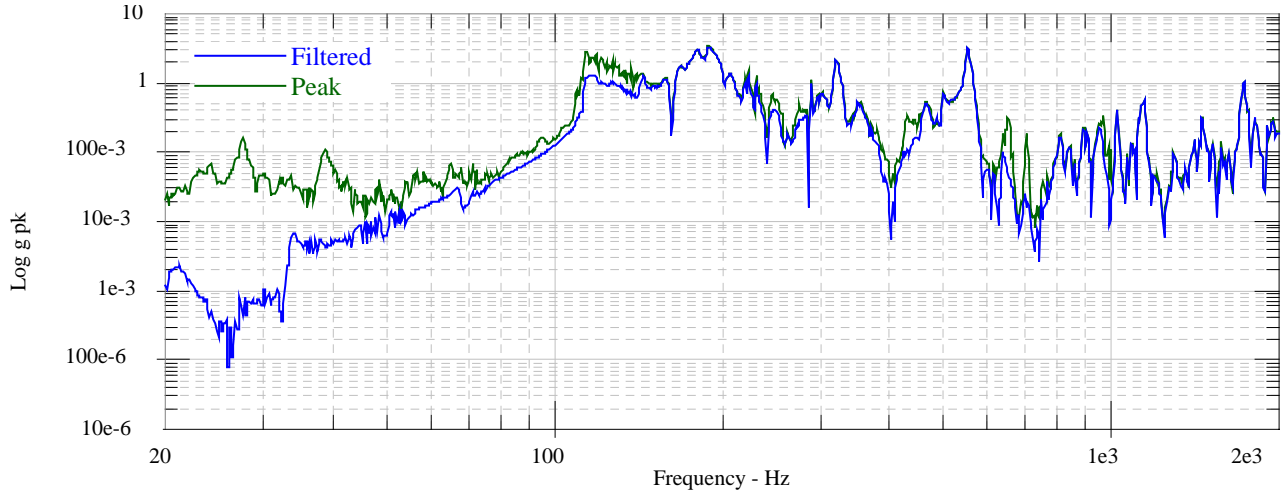
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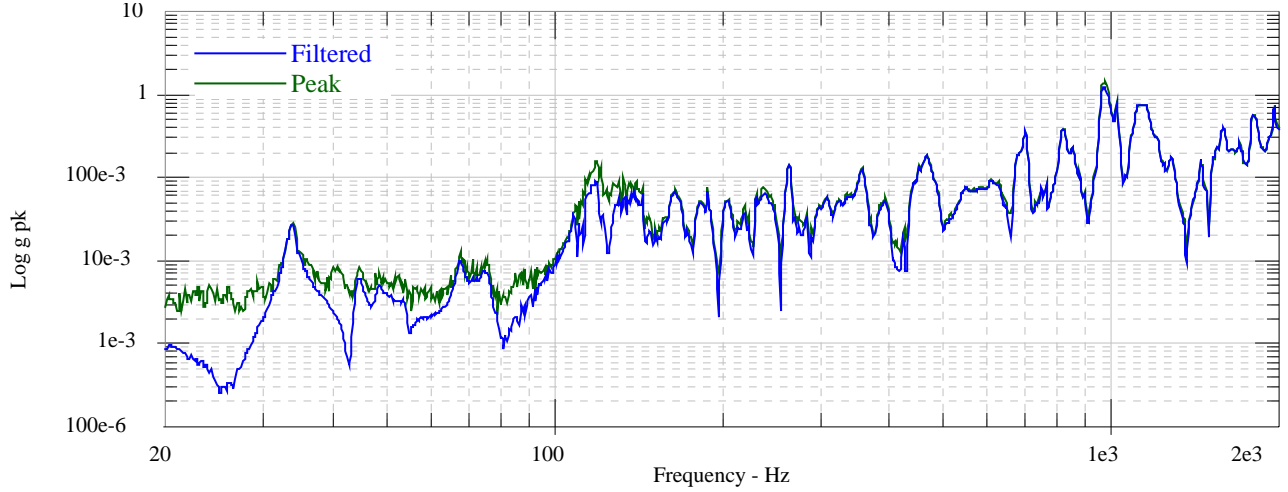


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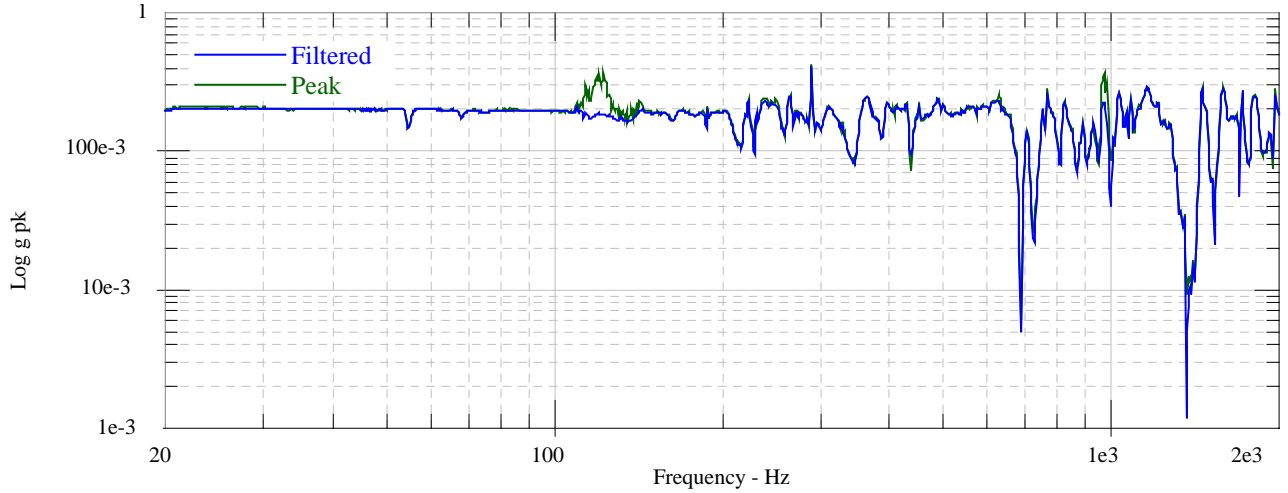
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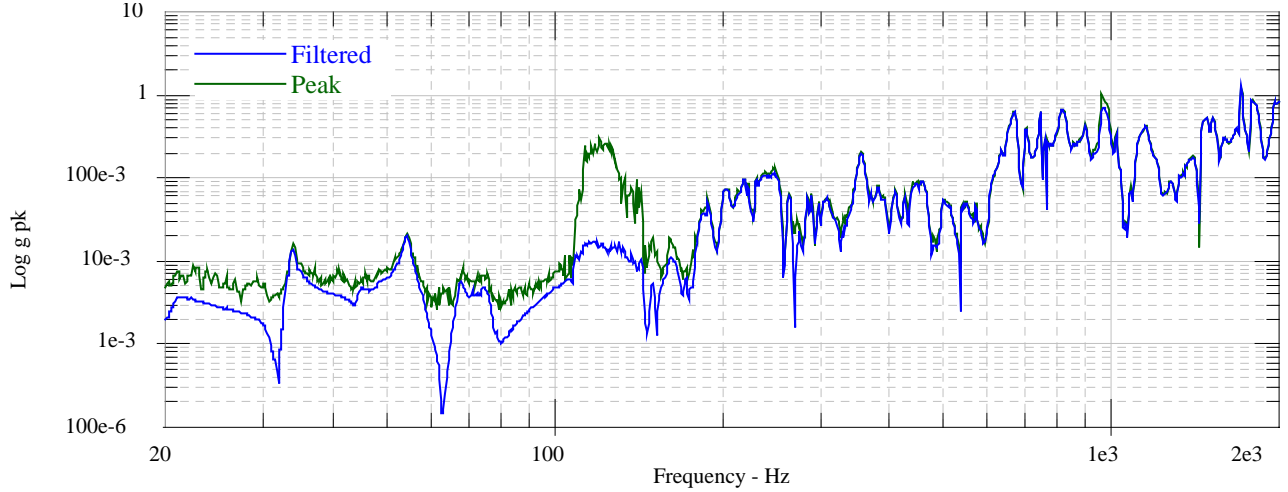
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CONE.Y Channel n° 25



CONE.X Channel n° 26

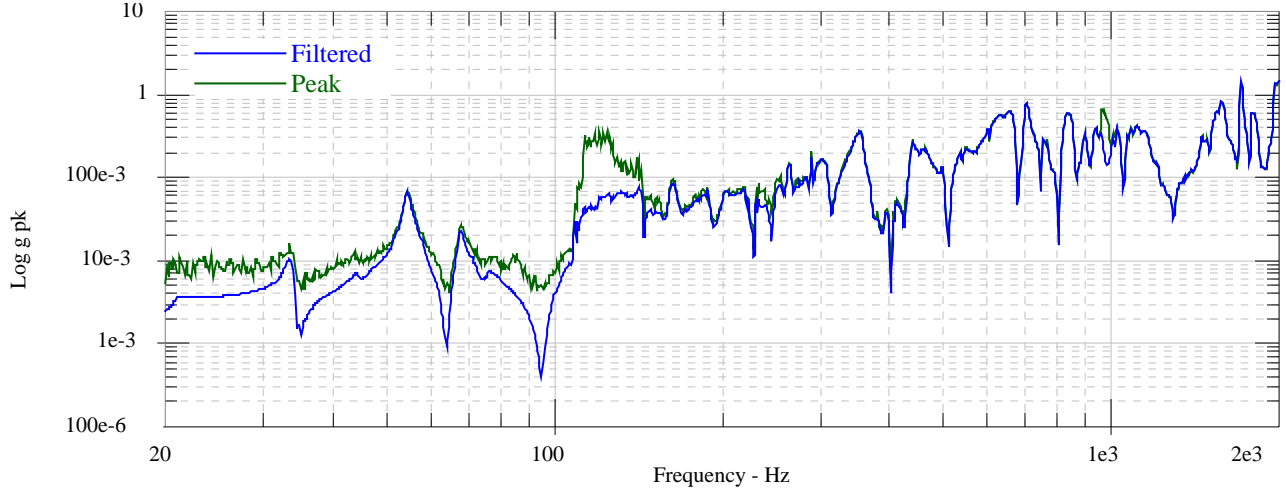


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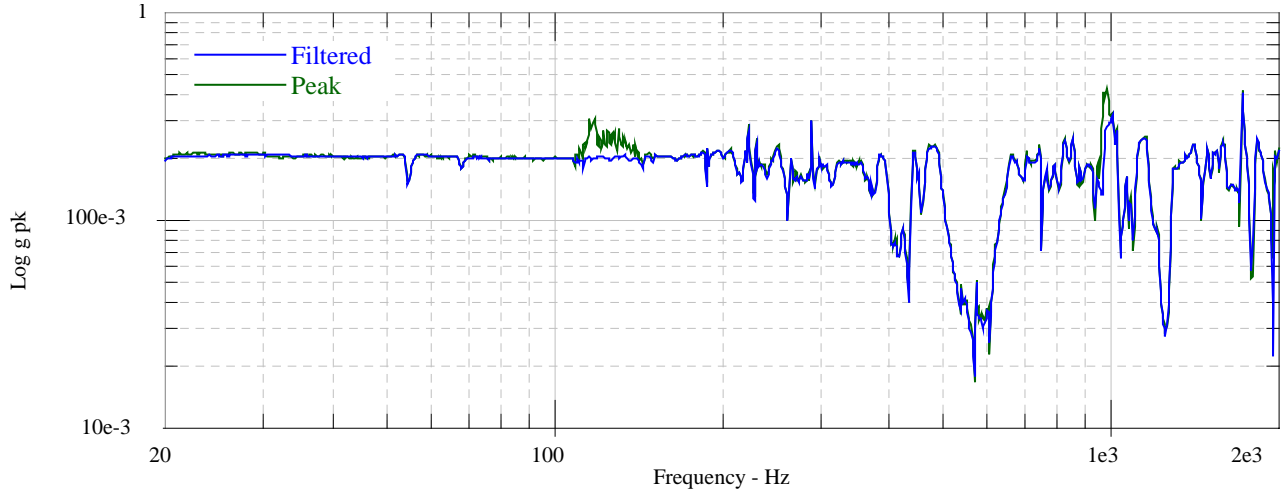
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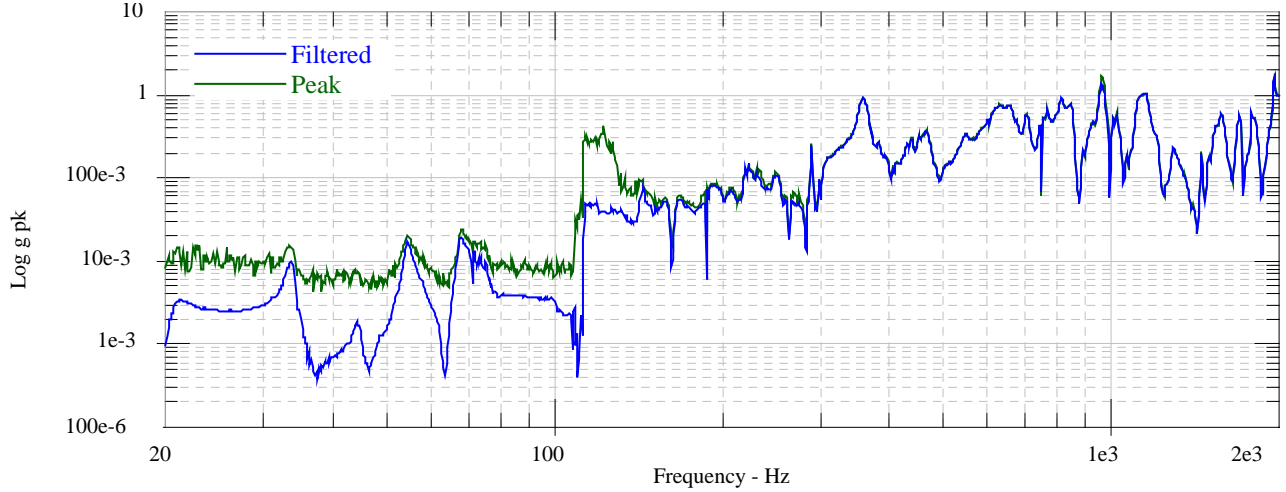
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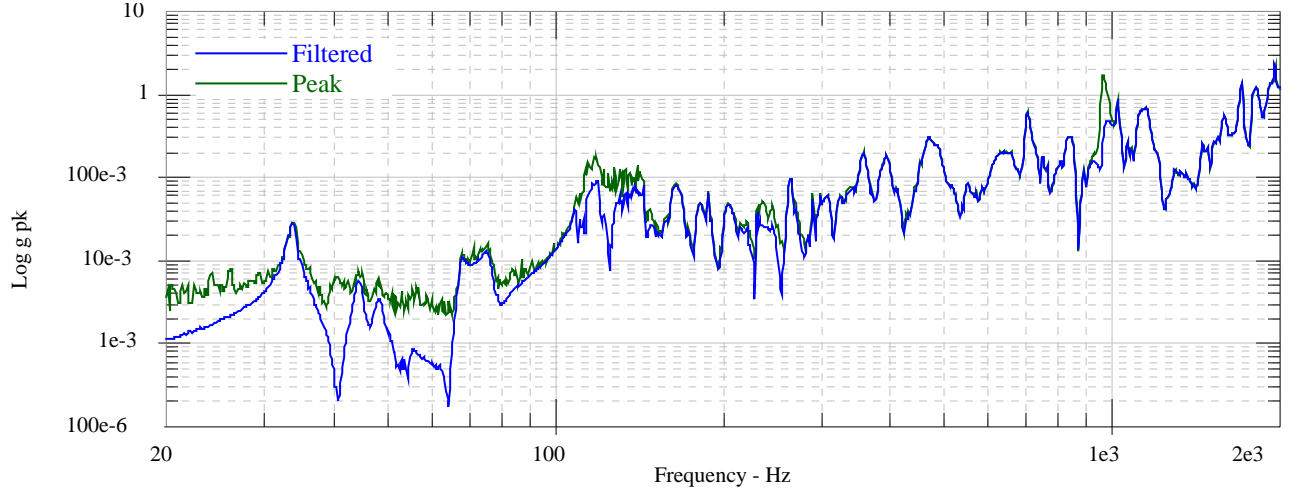


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12.2 BNS2Y.

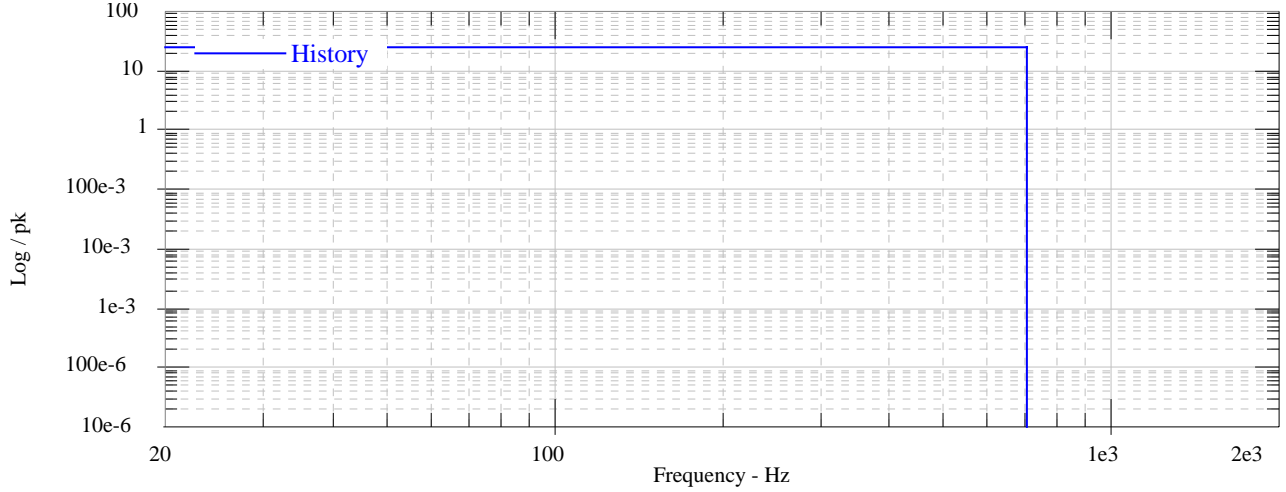
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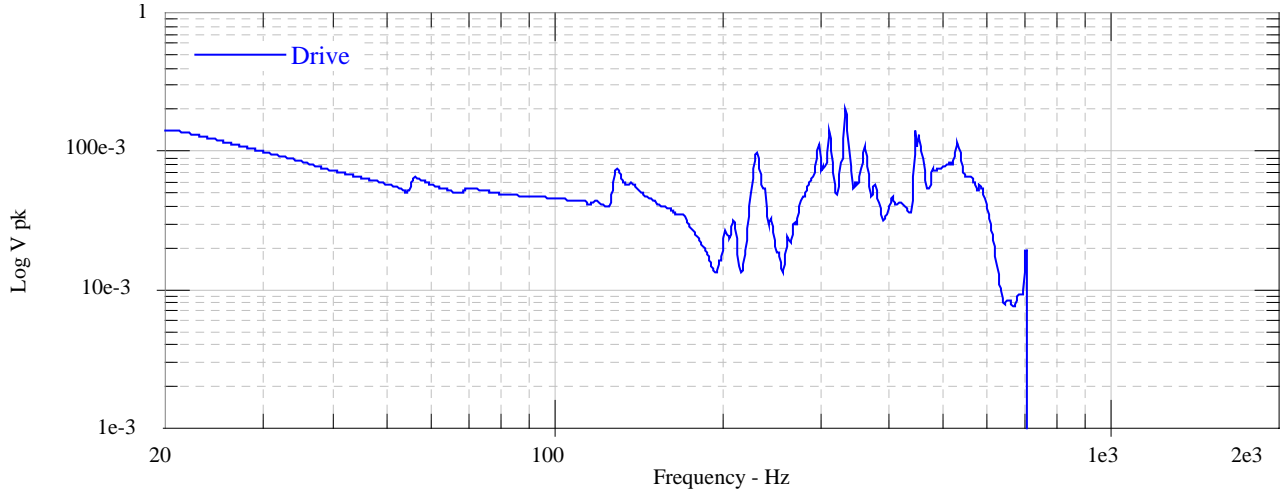
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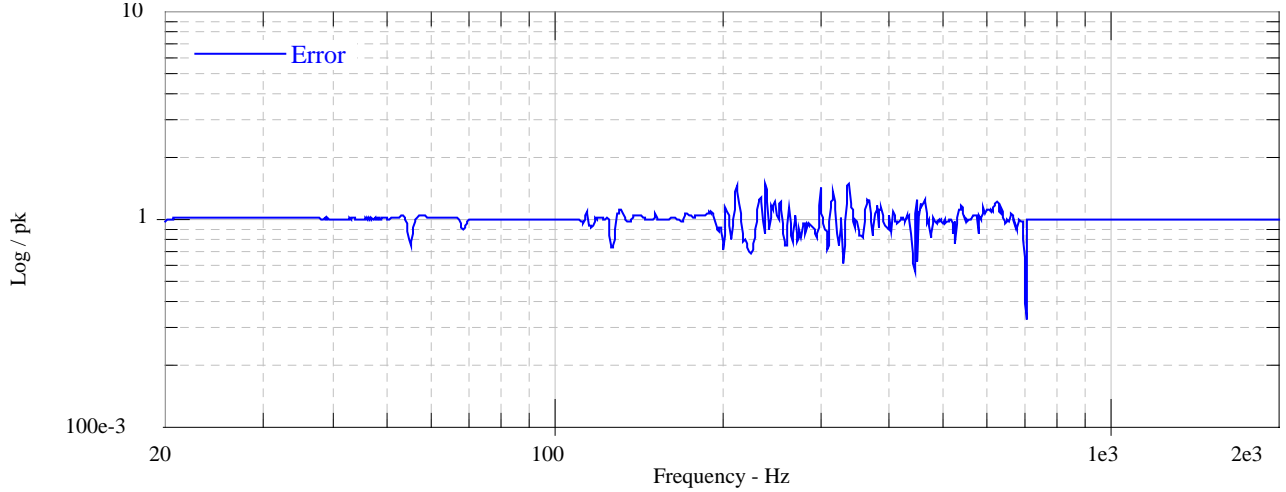
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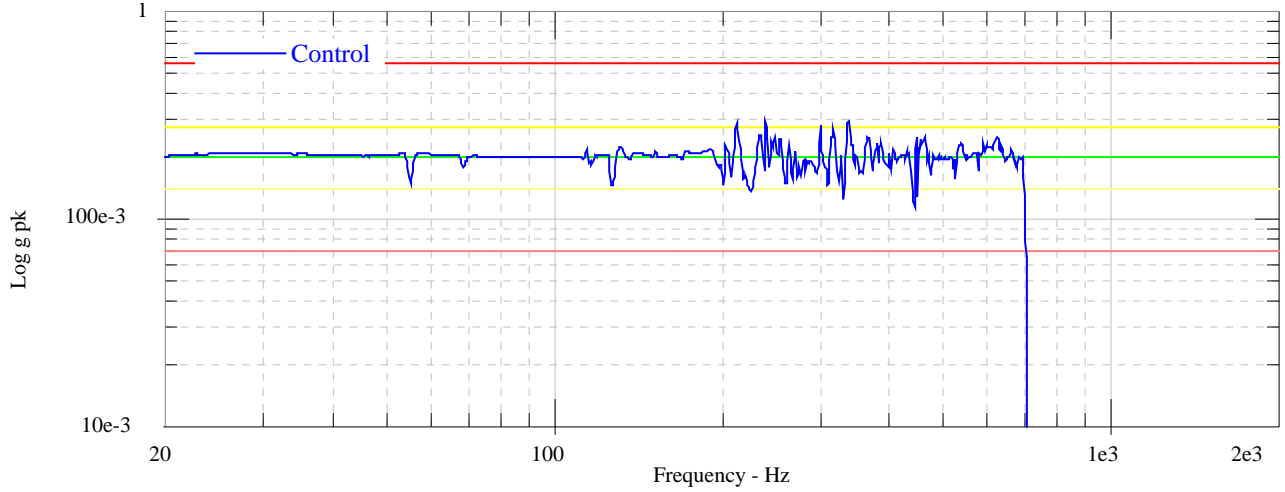


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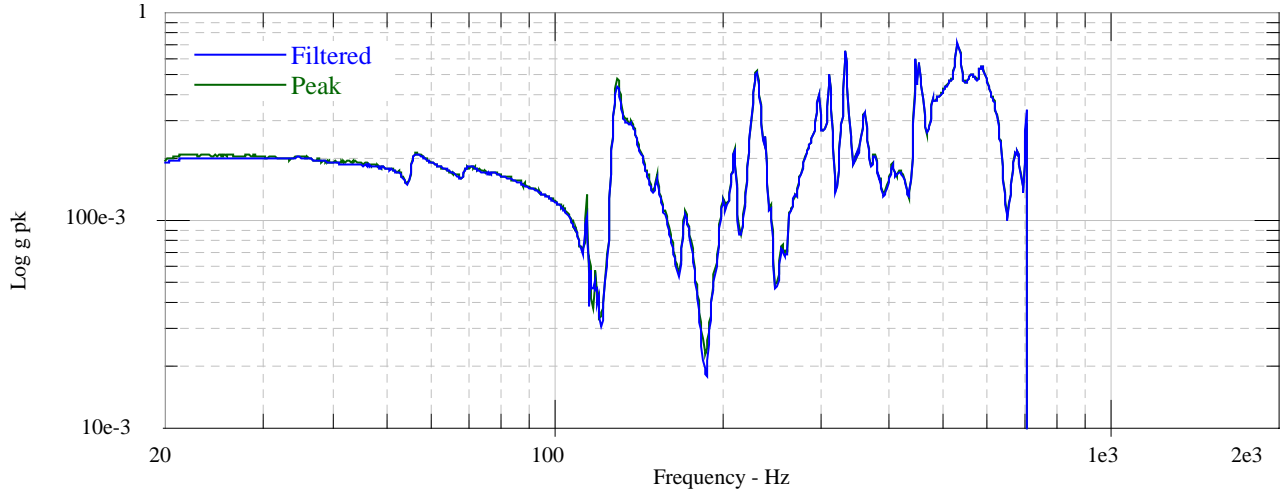
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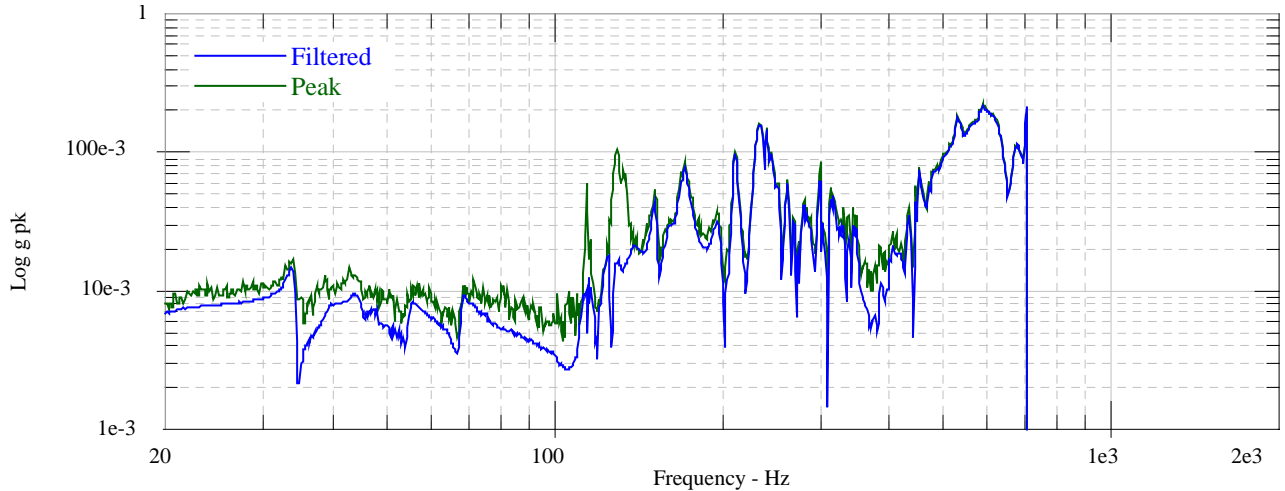
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SHK.1.Z Channel n° 2

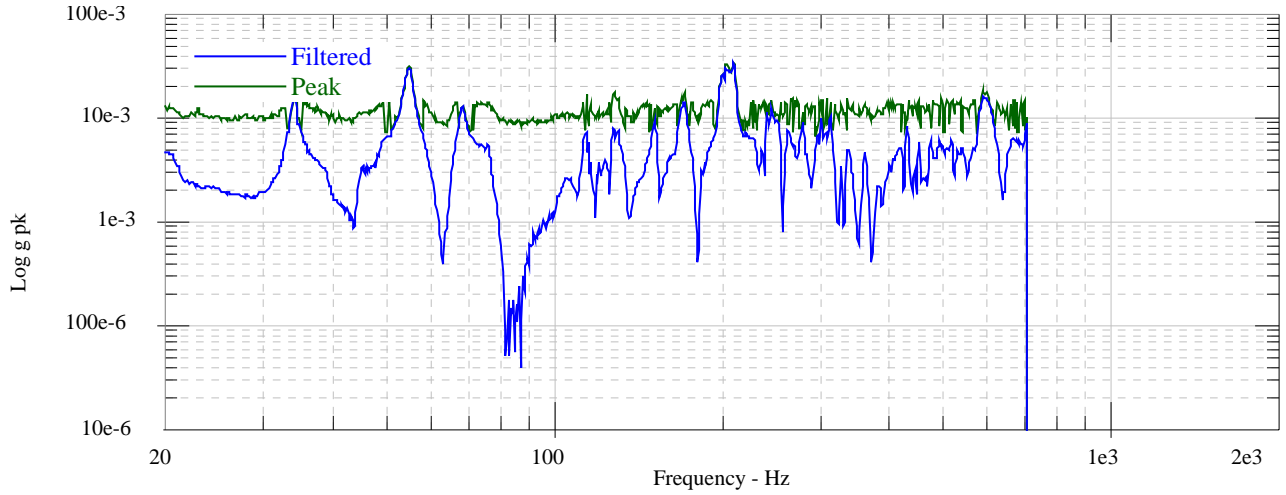


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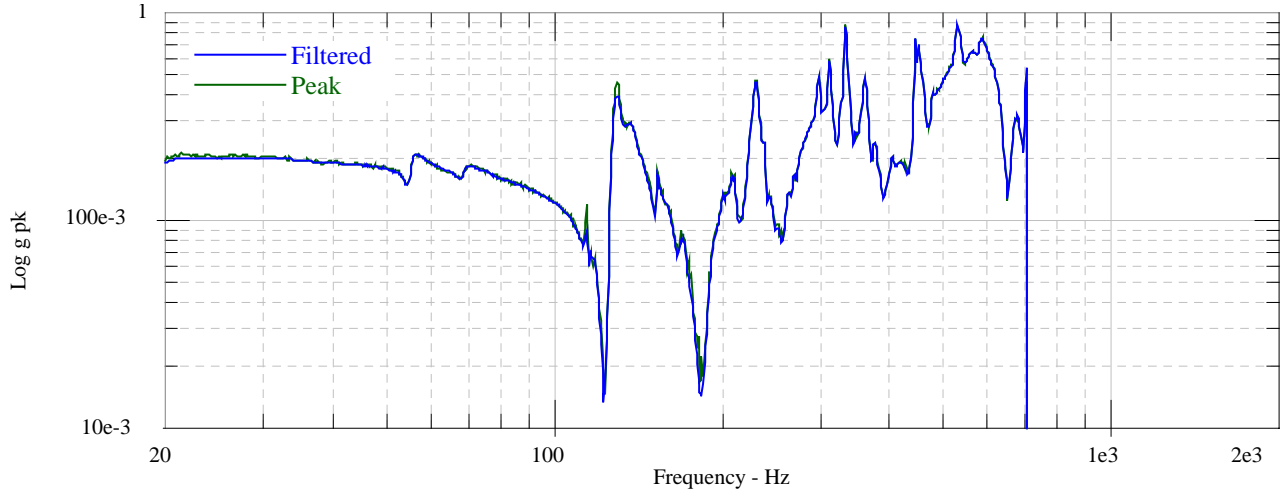
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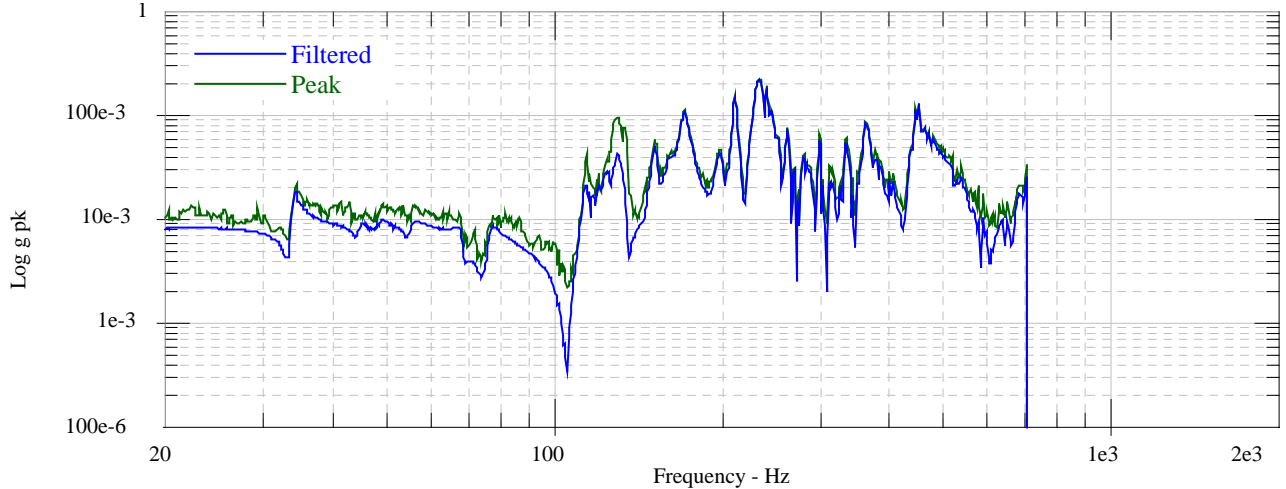
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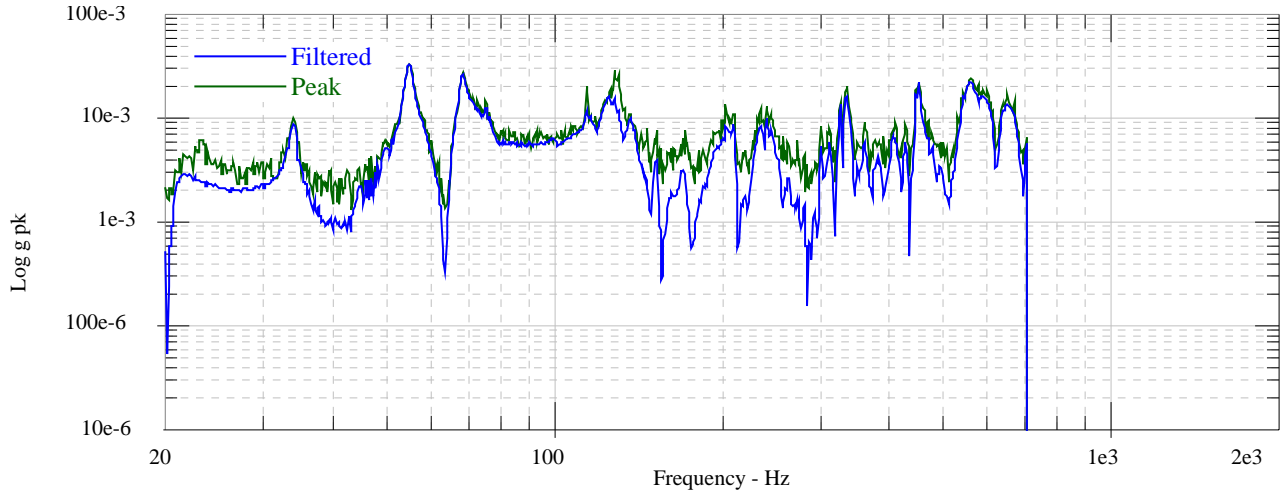


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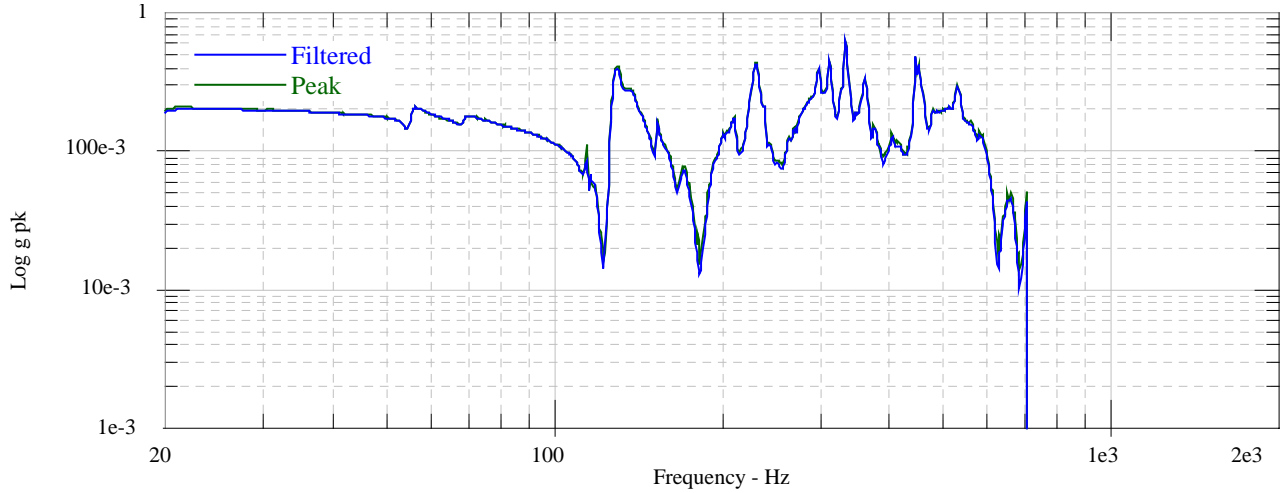
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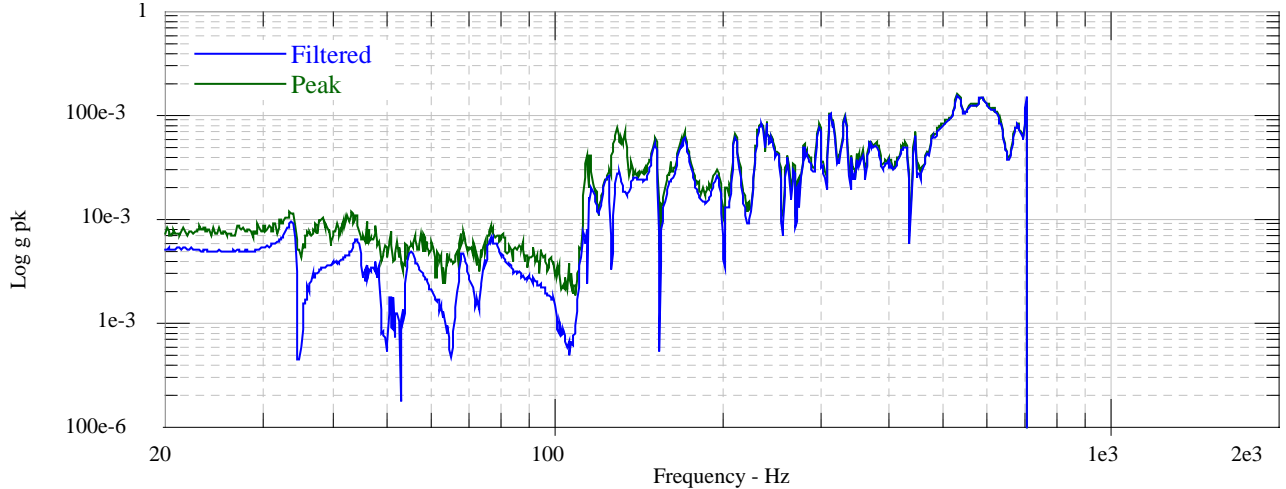
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

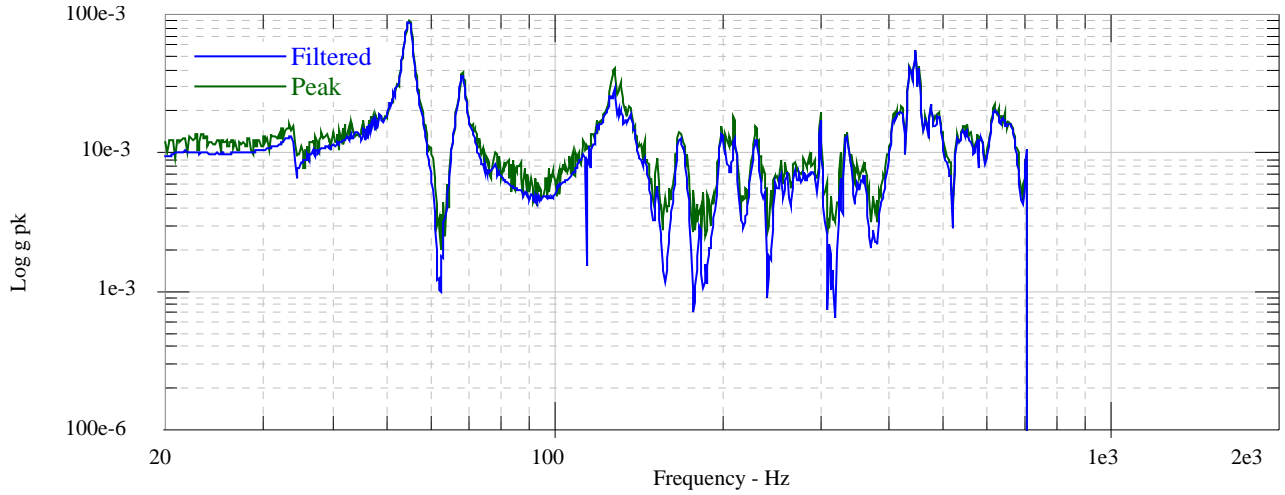


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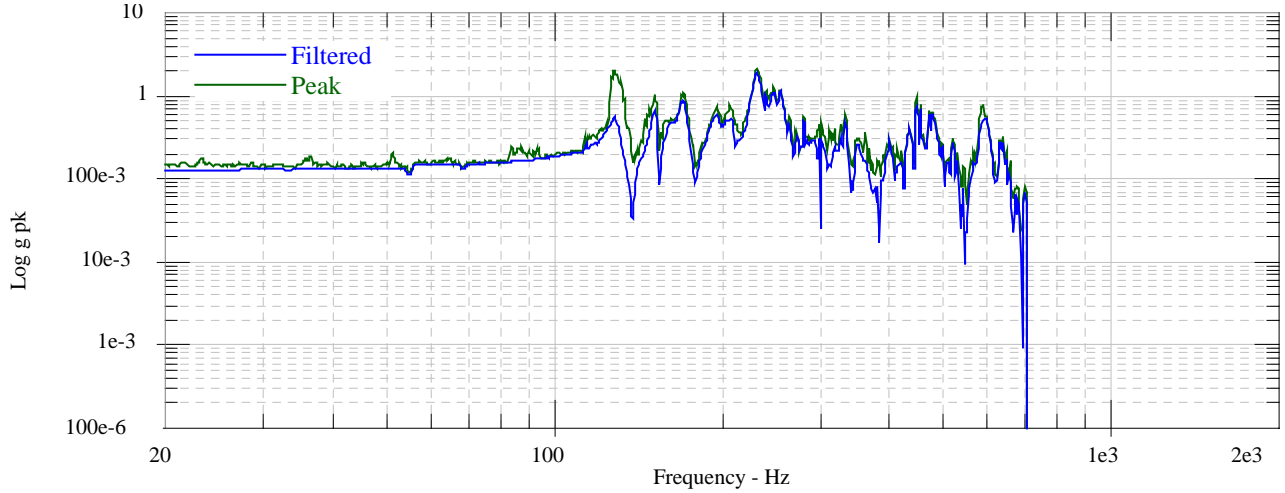
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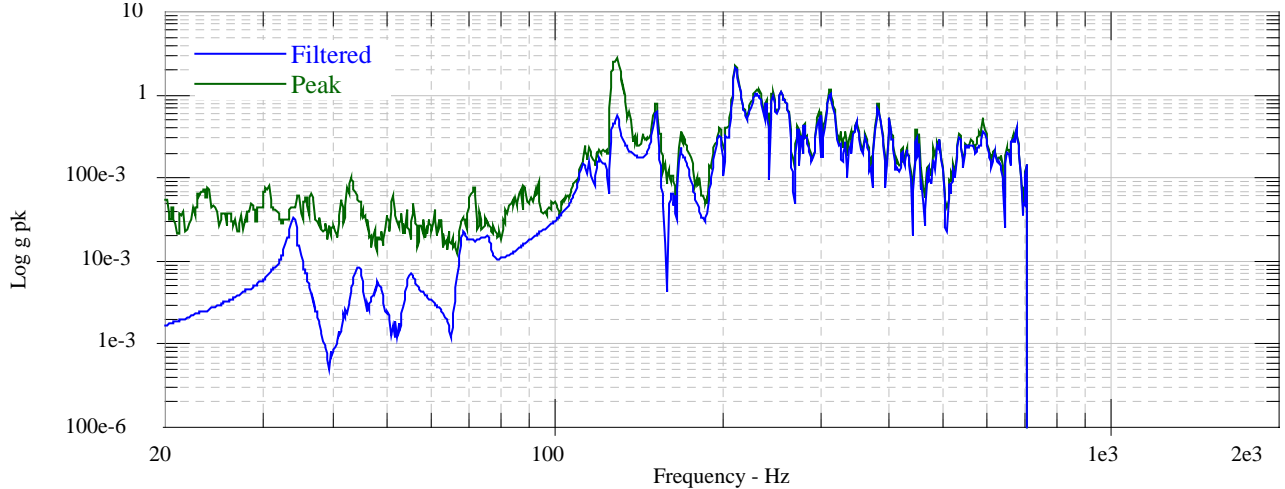
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

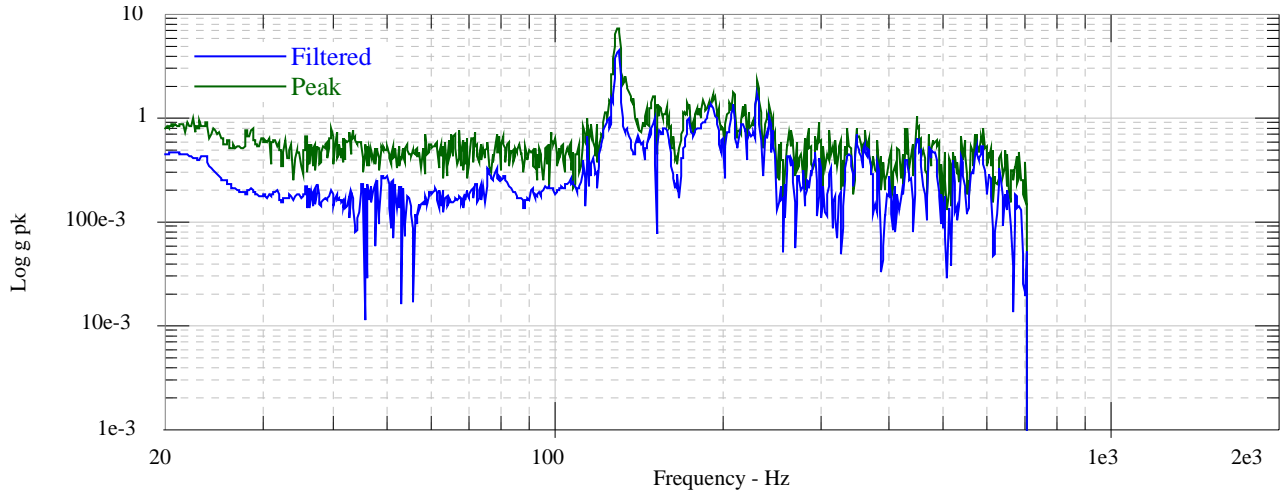


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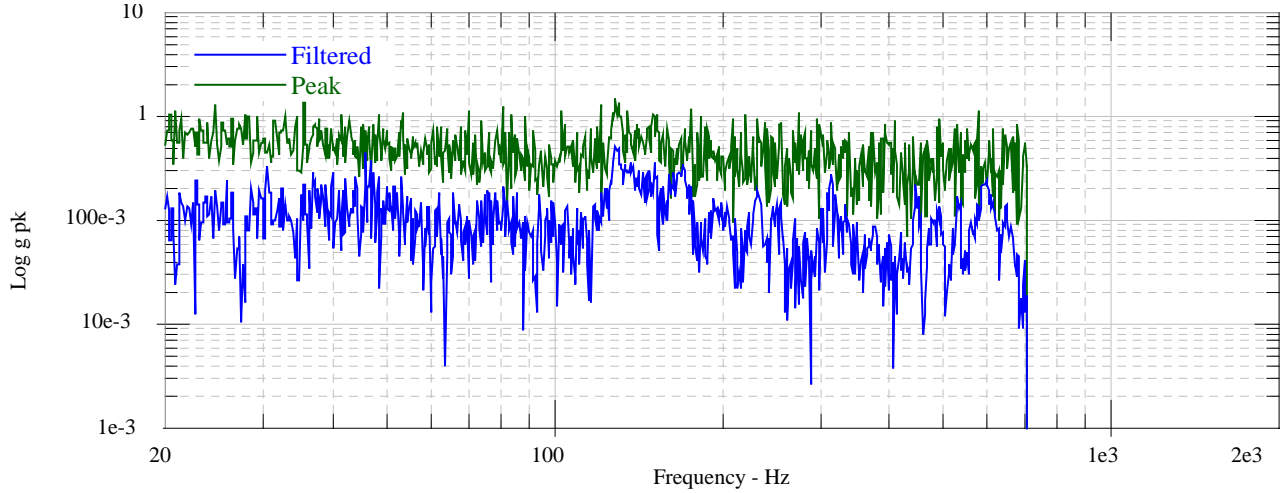
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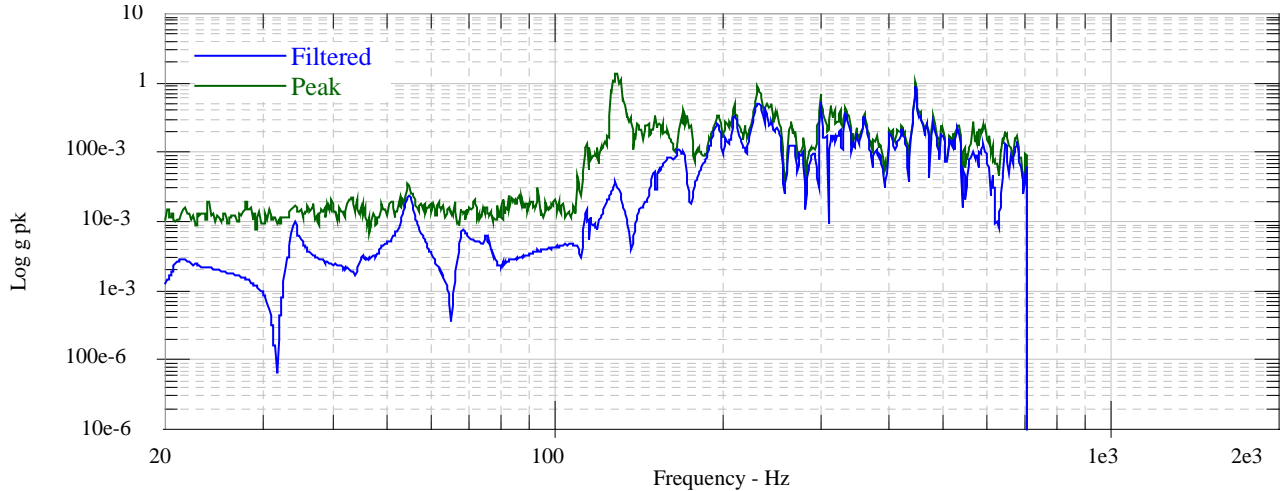
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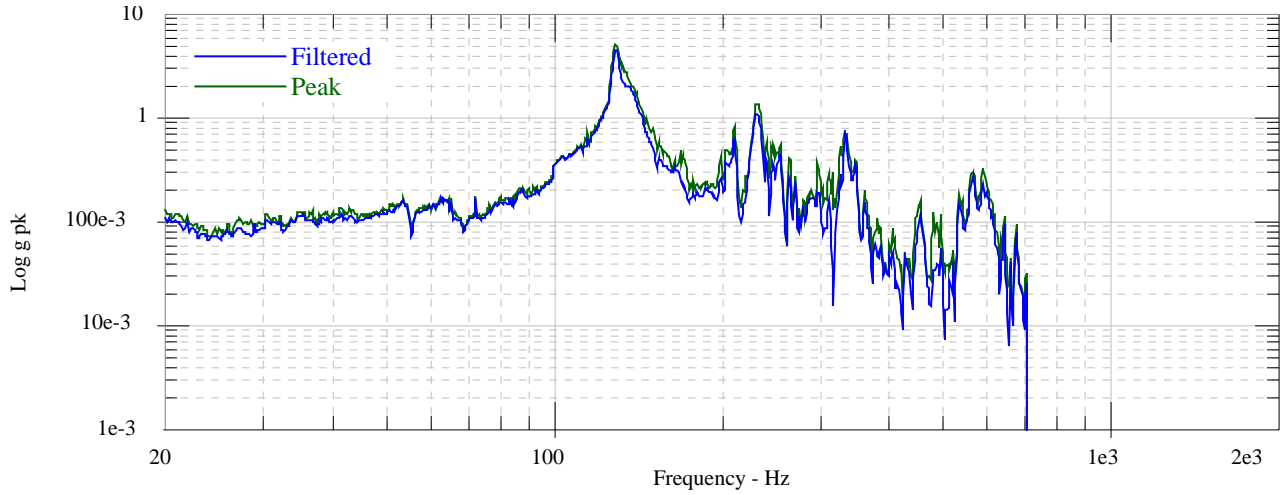


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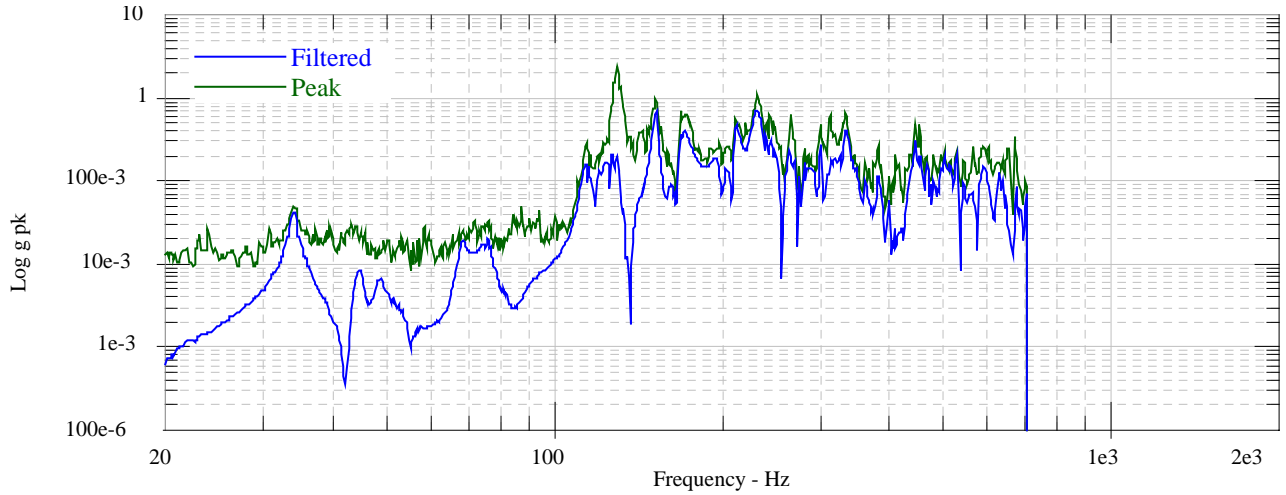
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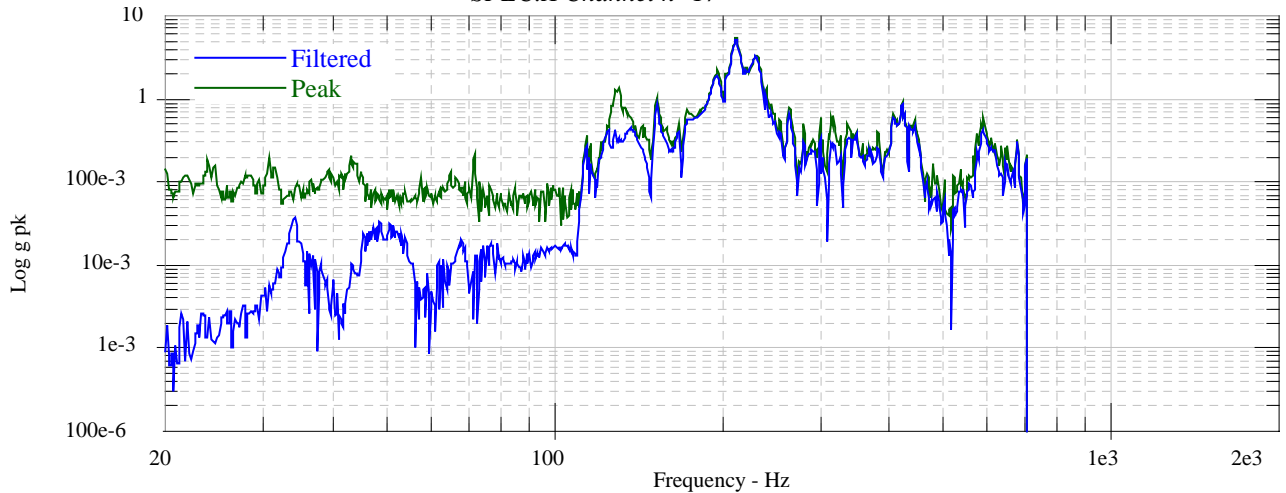
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FPU.Z Channel n° 16



SPEC.X Channel n° 17

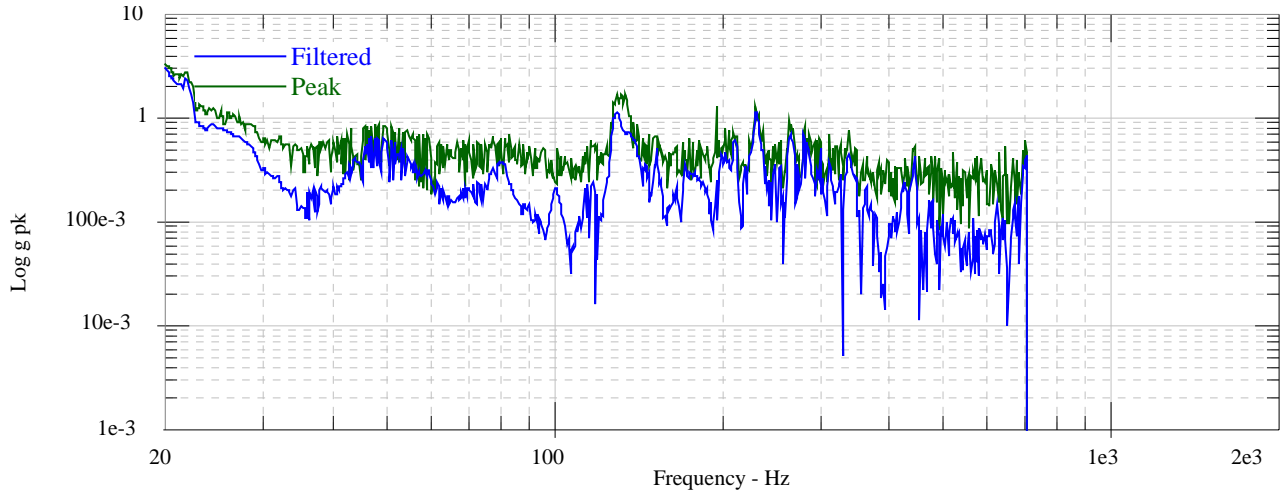


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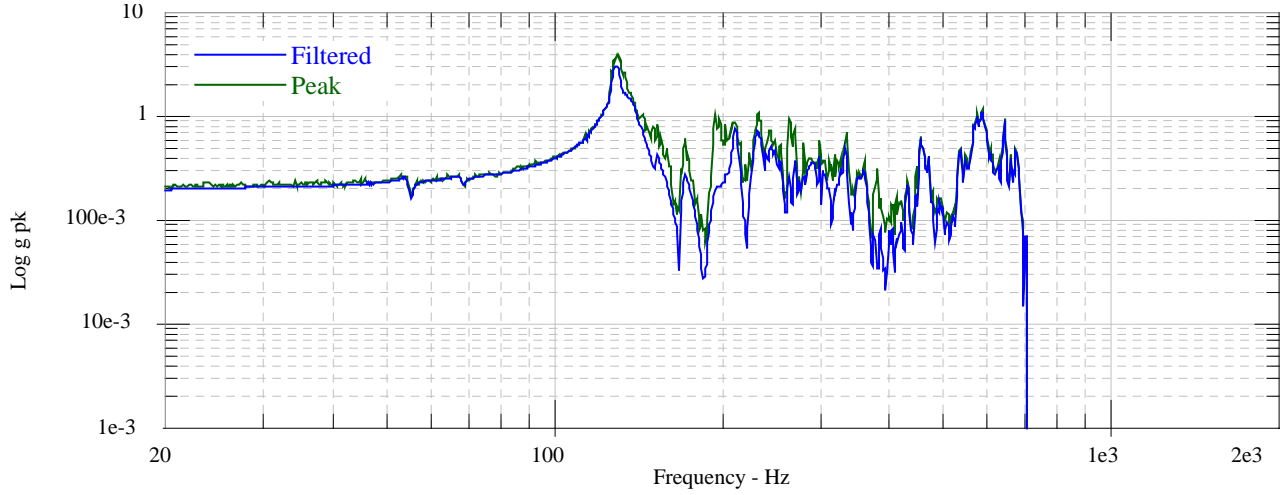
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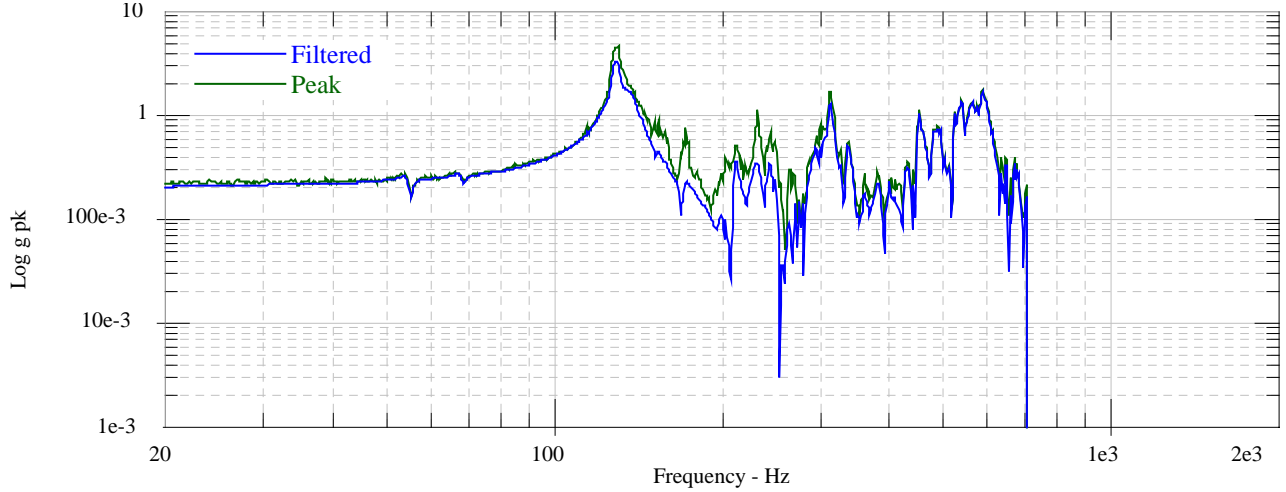
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

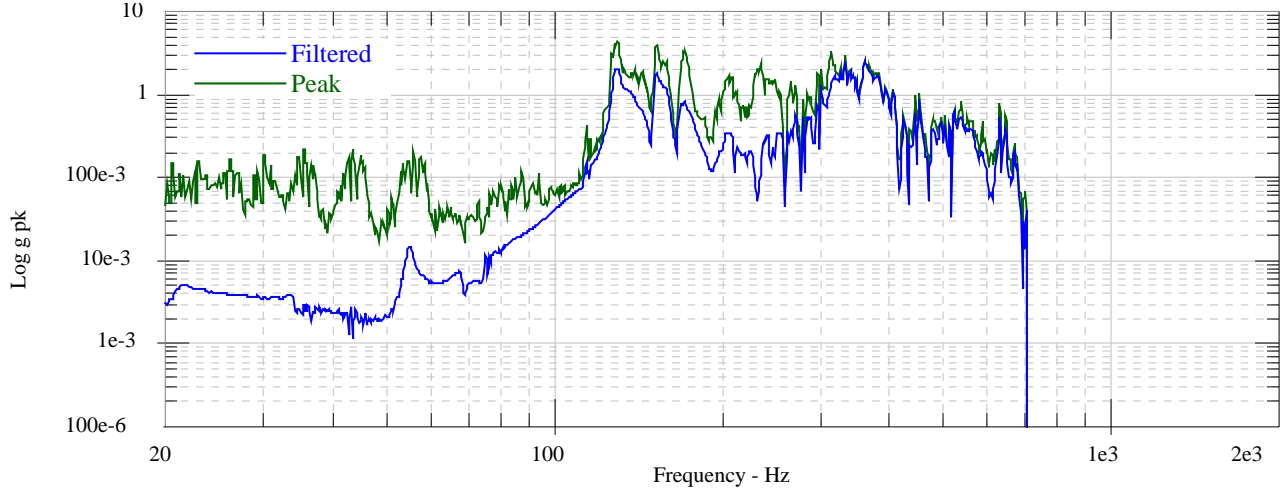


VIBRATION TEST REPORT
SPIRE QM

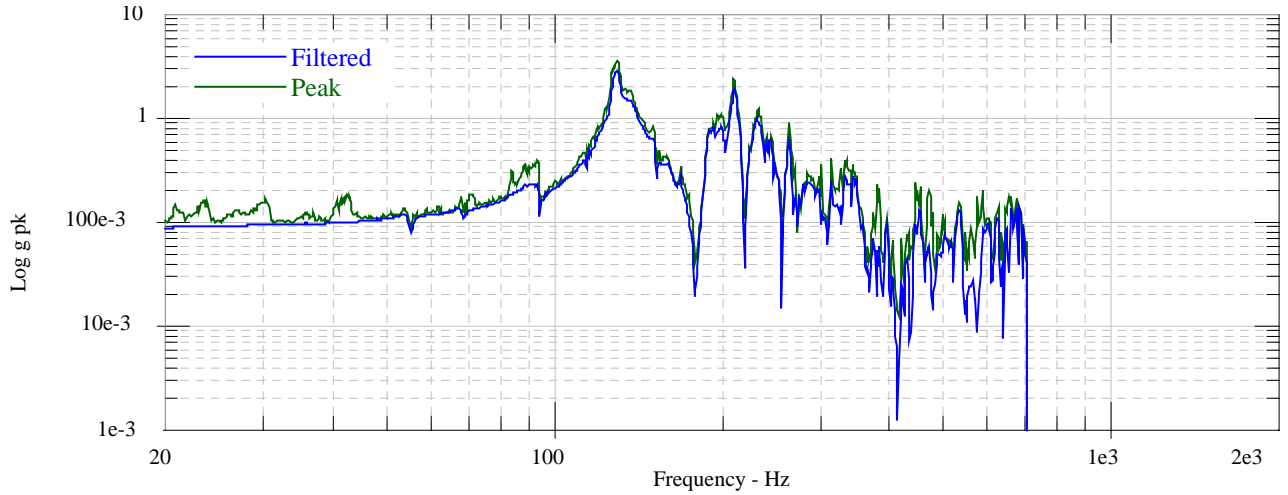
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
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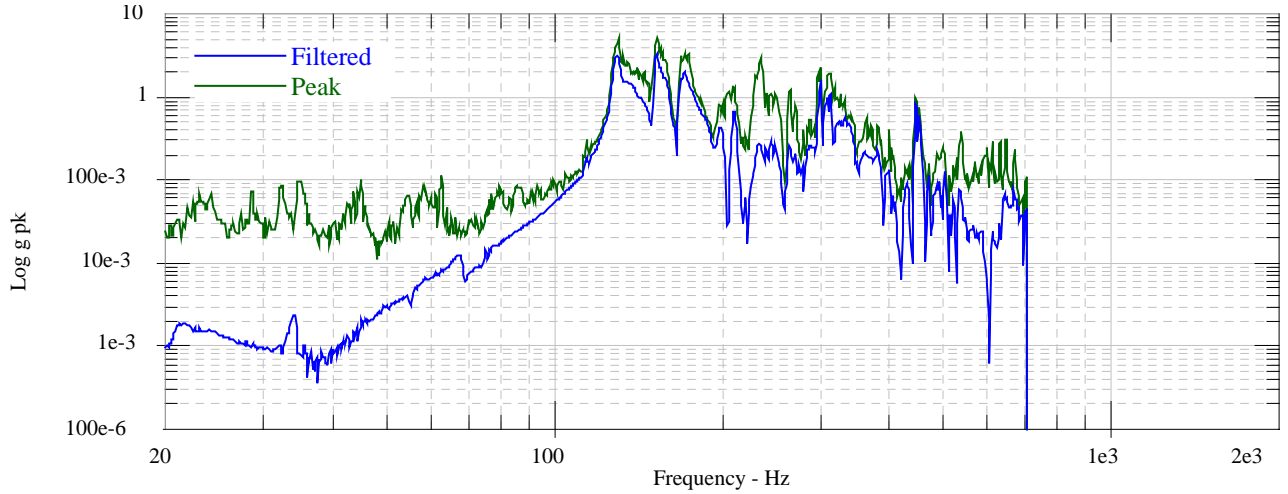
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

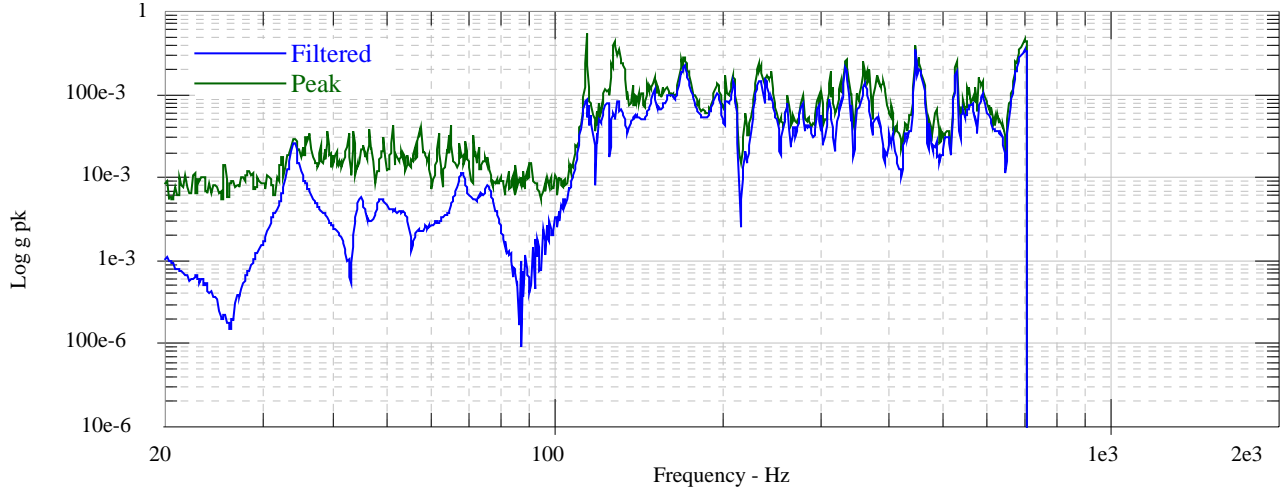


VIBRATION TEST REPORT
SPIRE QM

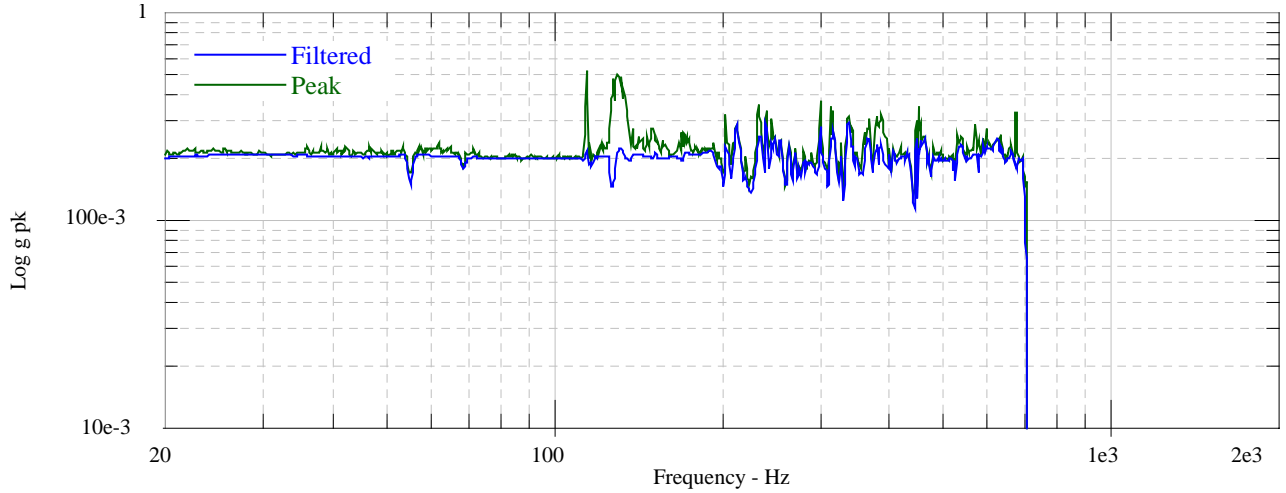
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Révision : 00
Date : 5-Apr-04
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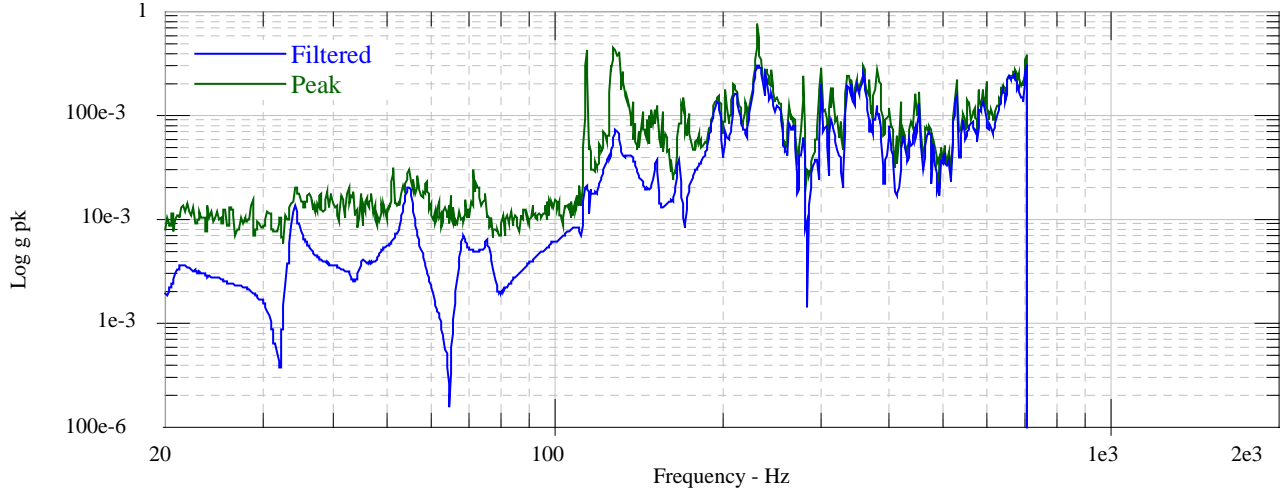
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26



VIBRATION TEST REPORT
SPIRE QM

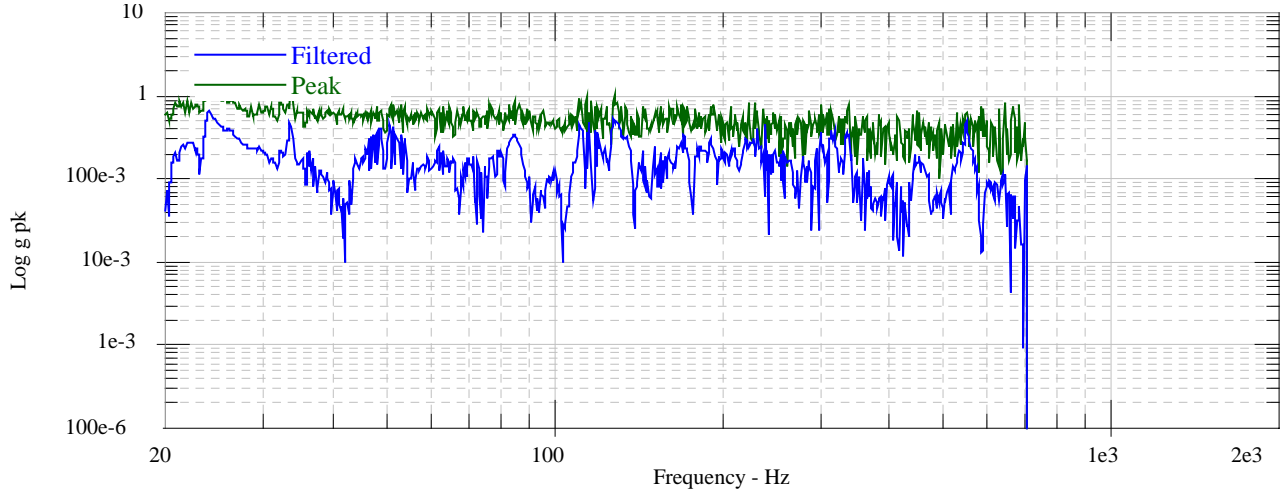
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Révision : 00
Date : 5-Apr-04
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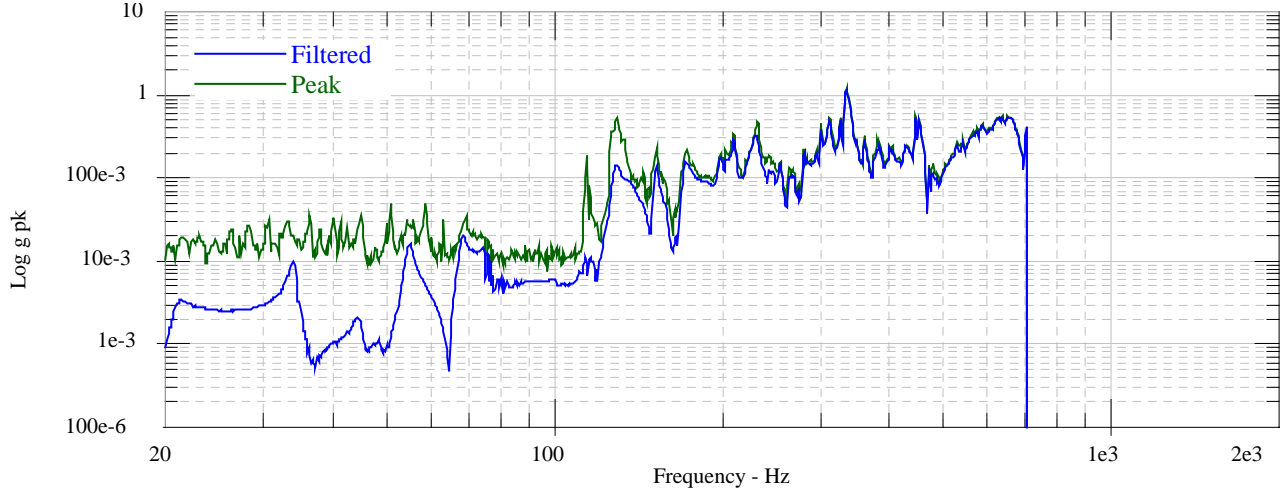
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

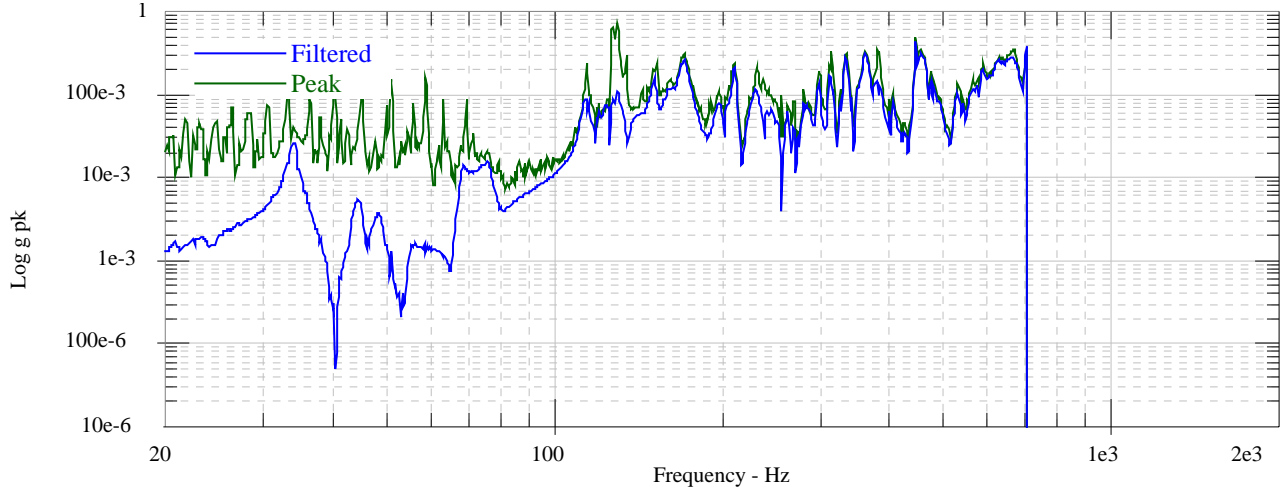


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SPIRE QM

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Date : 5-Apr-04
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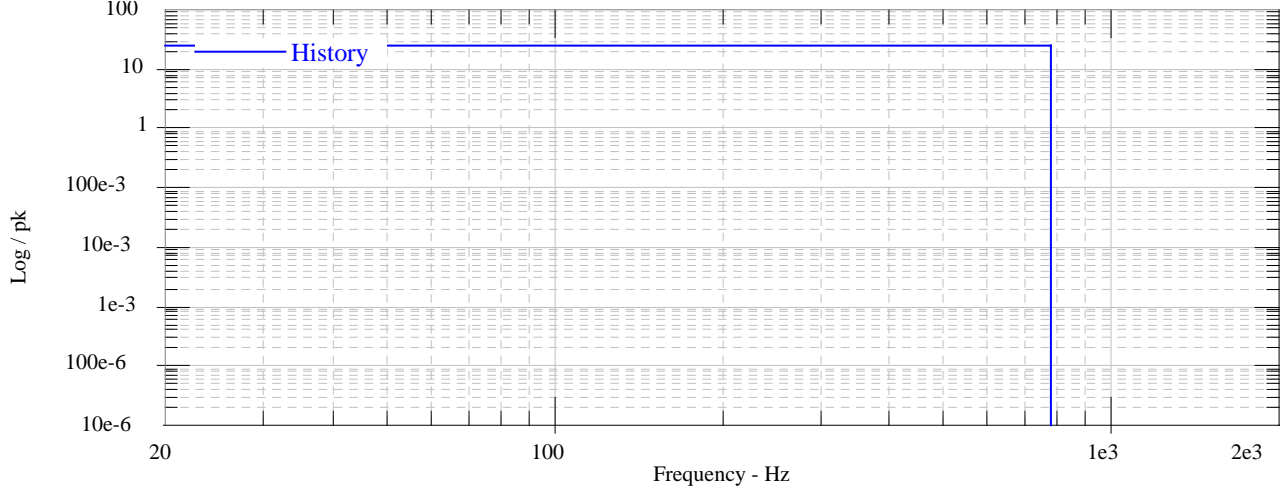
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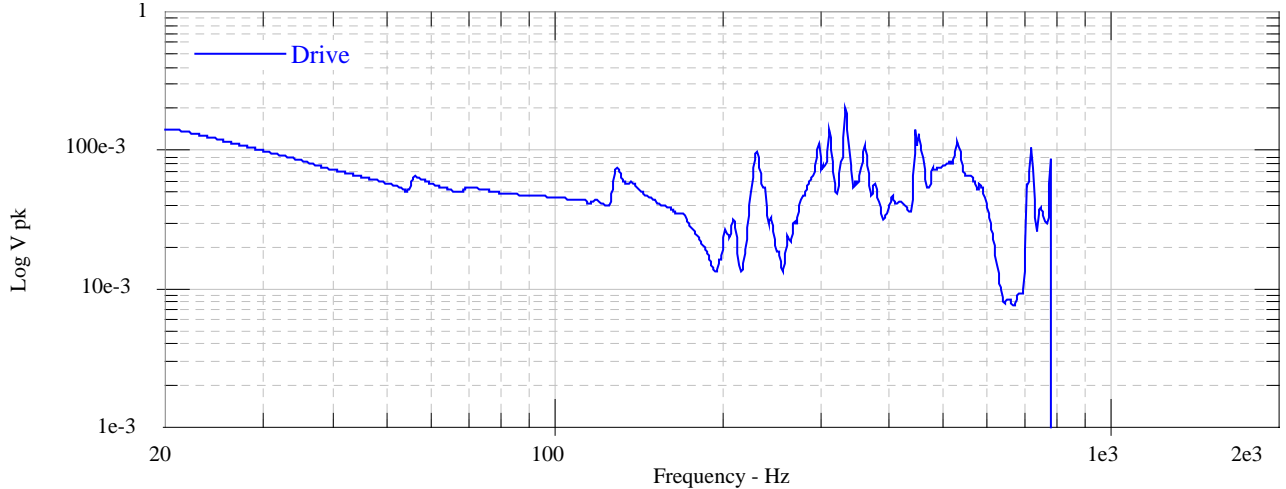


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History Channel n° -3



Drive Channel n° -2

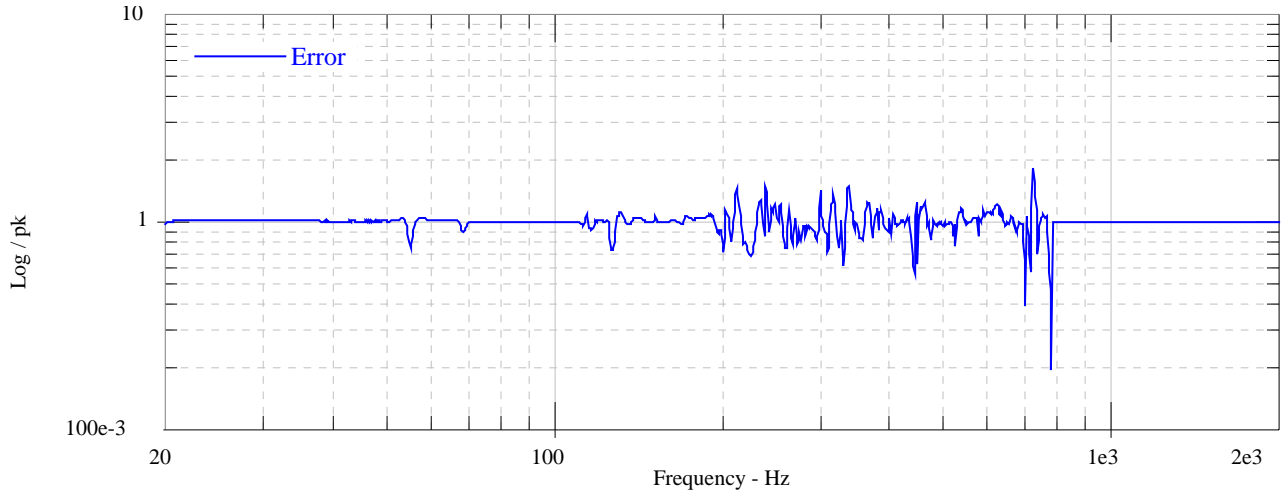


VIBRATION TEST REPORT
SPIRE QM

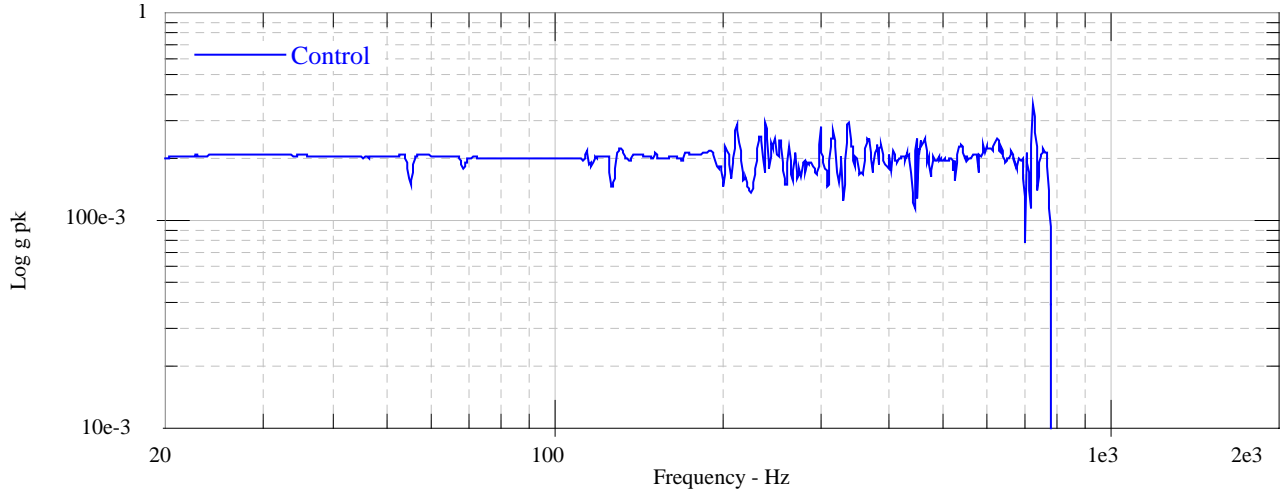
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Version : 01
Révision : 00
Date : 5-Apr-04
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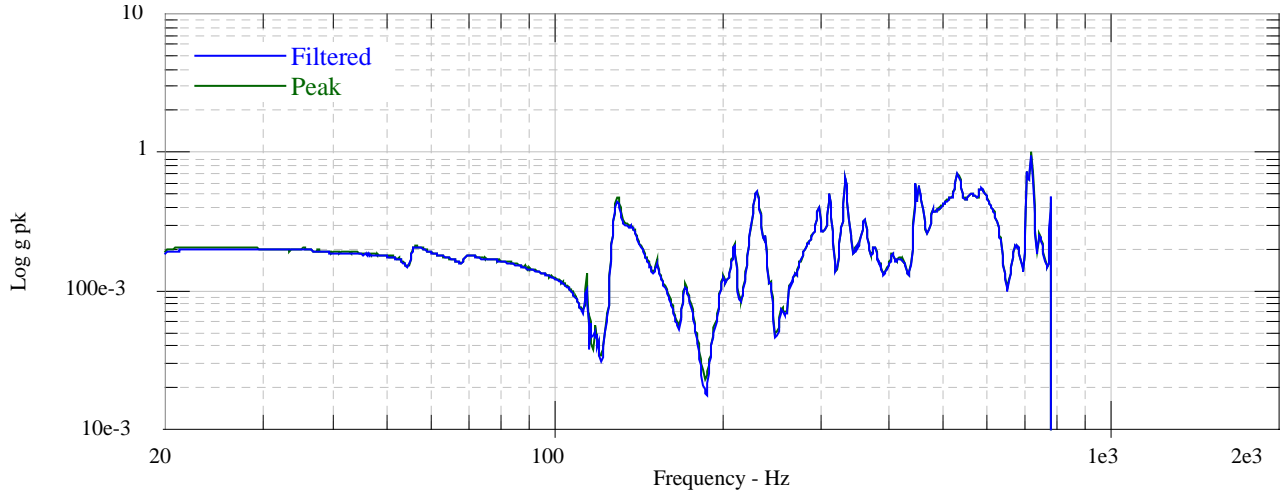
Error Channel n° -1



Control Channel n° 0



SHK.1.Y Channel n° 1

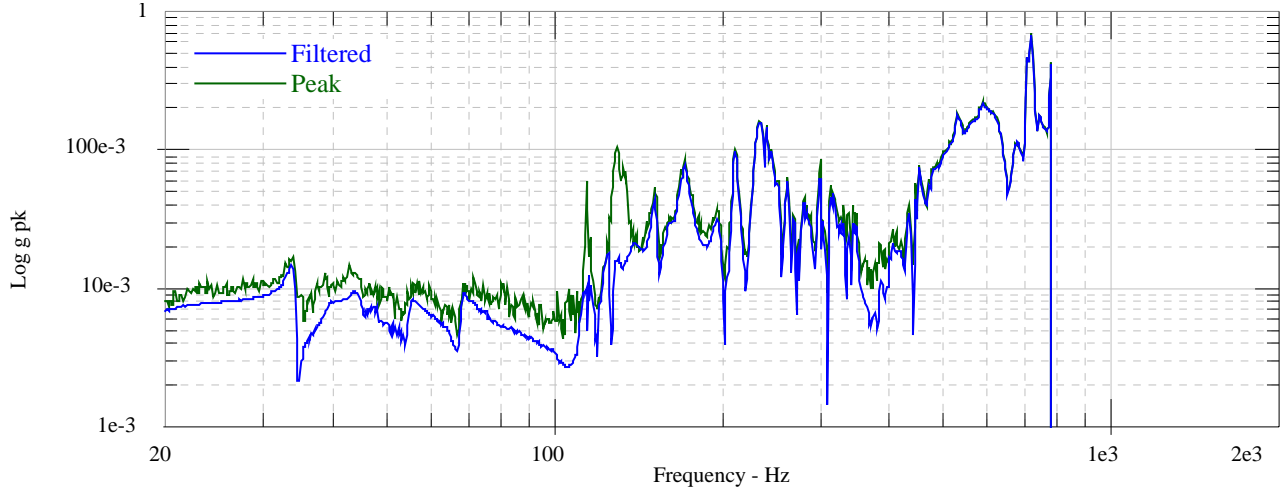


VIBRATION TEST REPORT
SPIRE QM

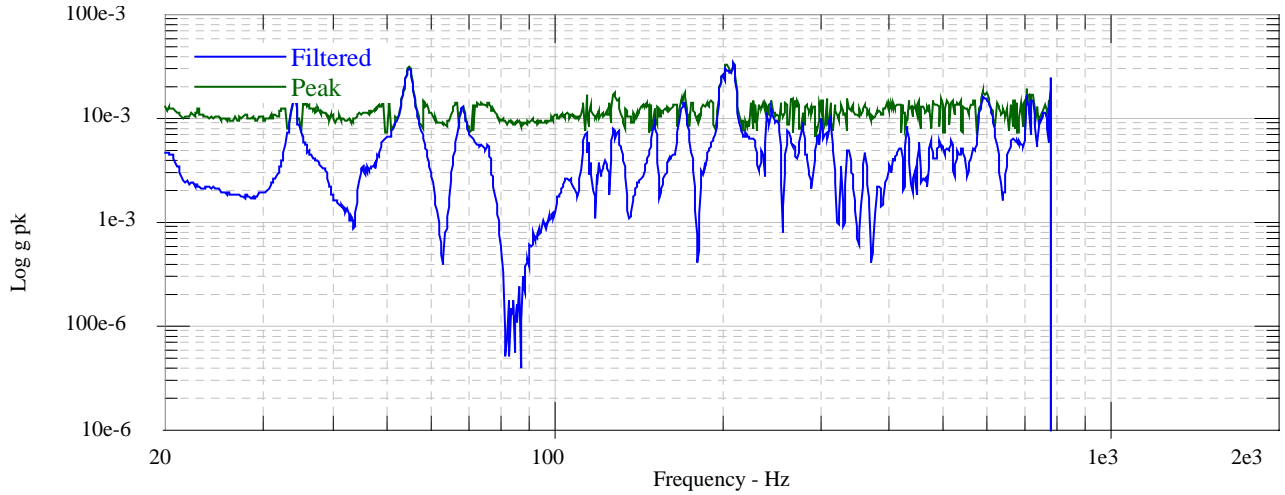
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Version : 01
Révision : 00
Date : 5-Apr-04
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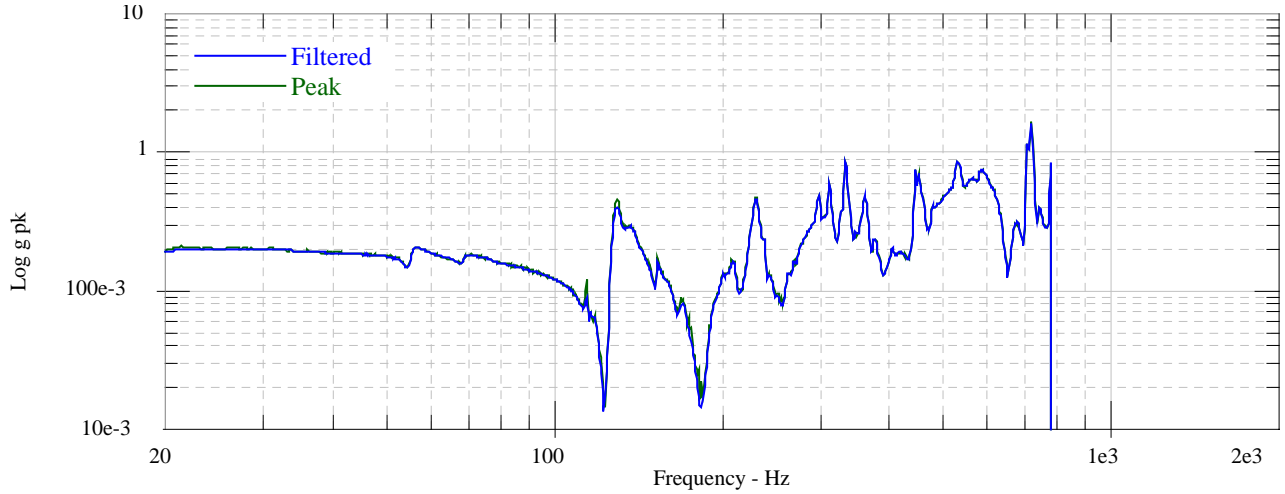
SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4

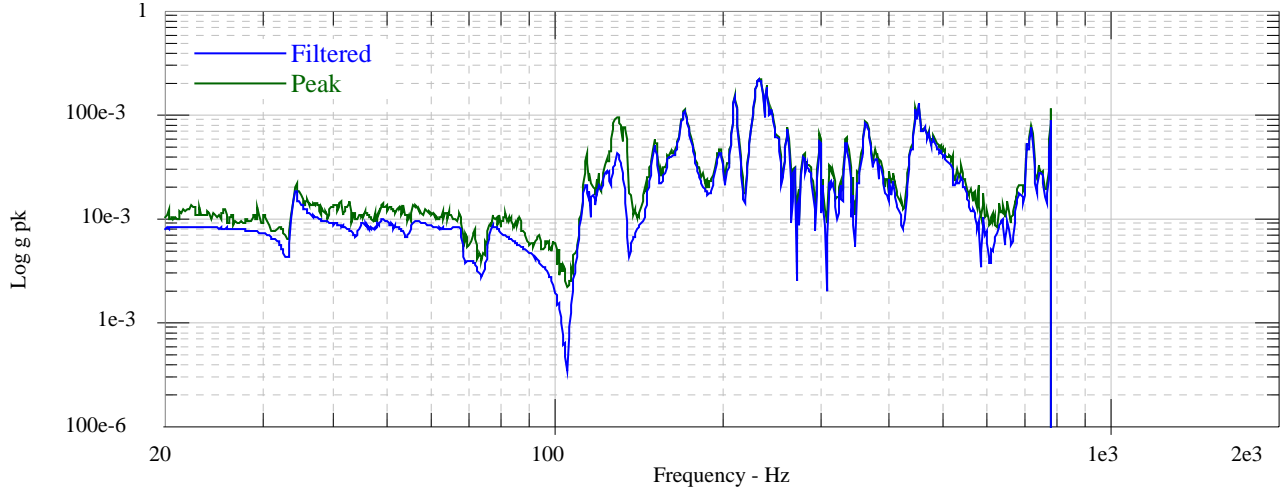


VIBRATION TEST REPORT
SPIRE QM

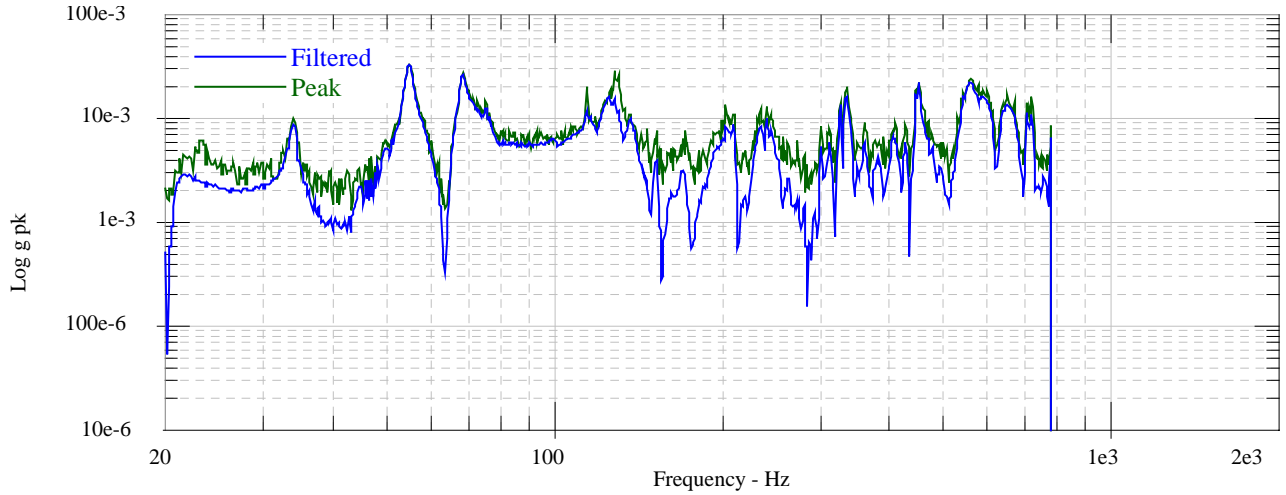
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Version : 01
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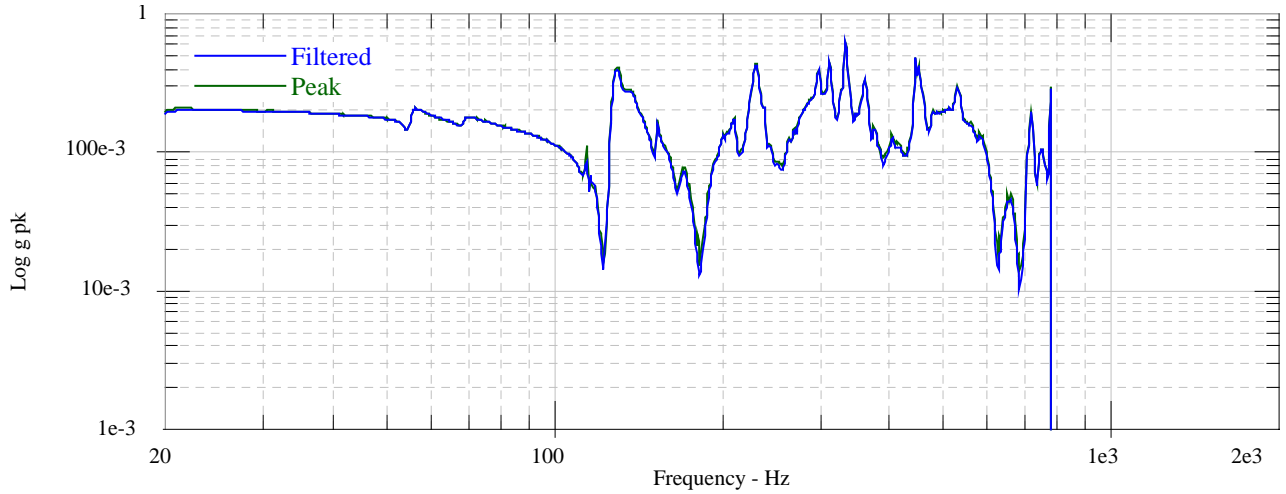
SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6



SHK.3.Y Channel n° 7

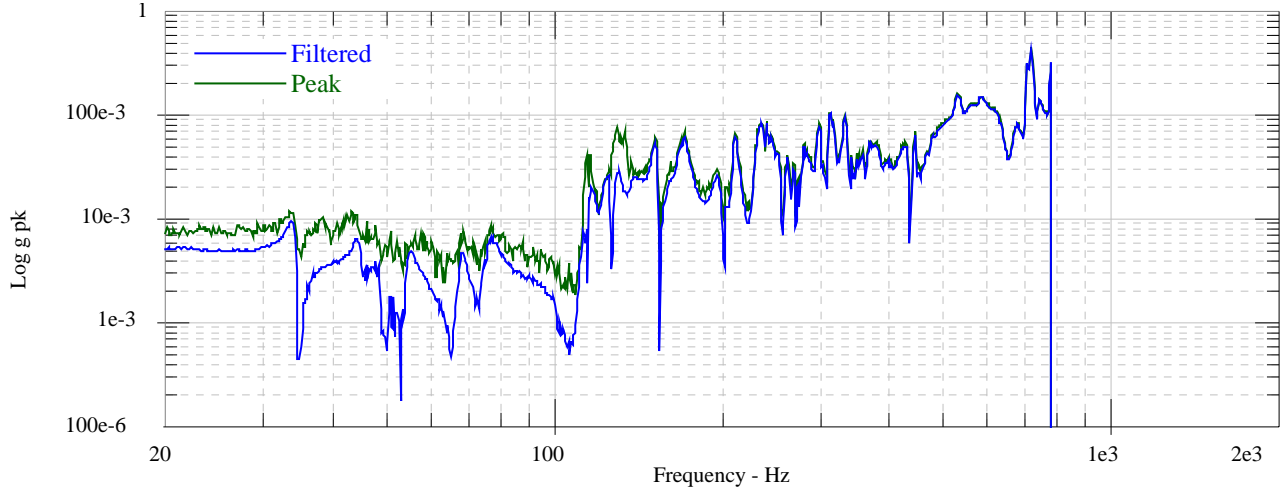


VIBRATION TEST REPORT
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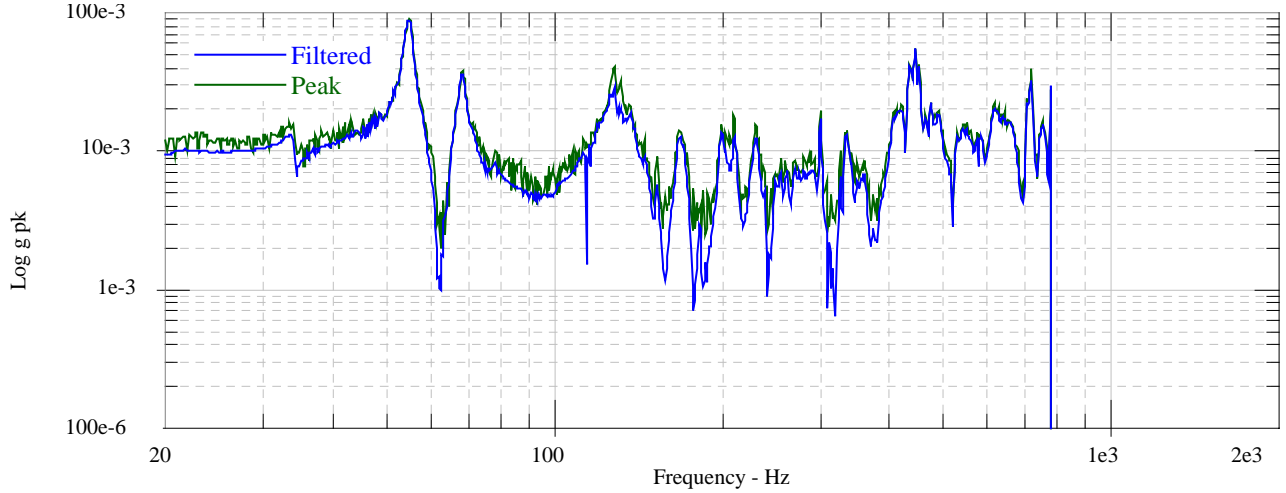
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Date : 5-Apr-04
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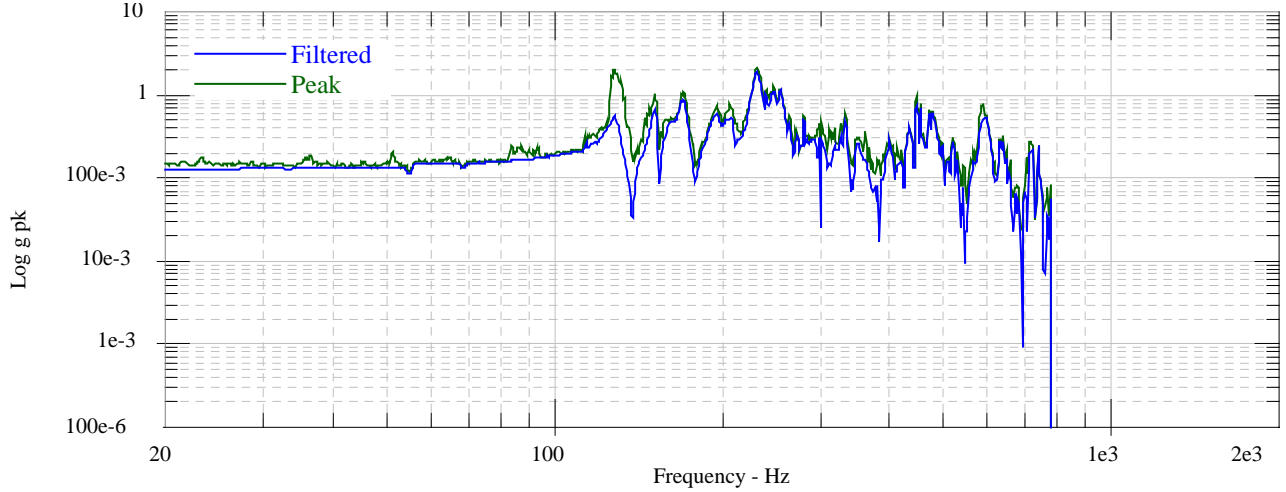
SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9



PHS.XY Channel n° 10

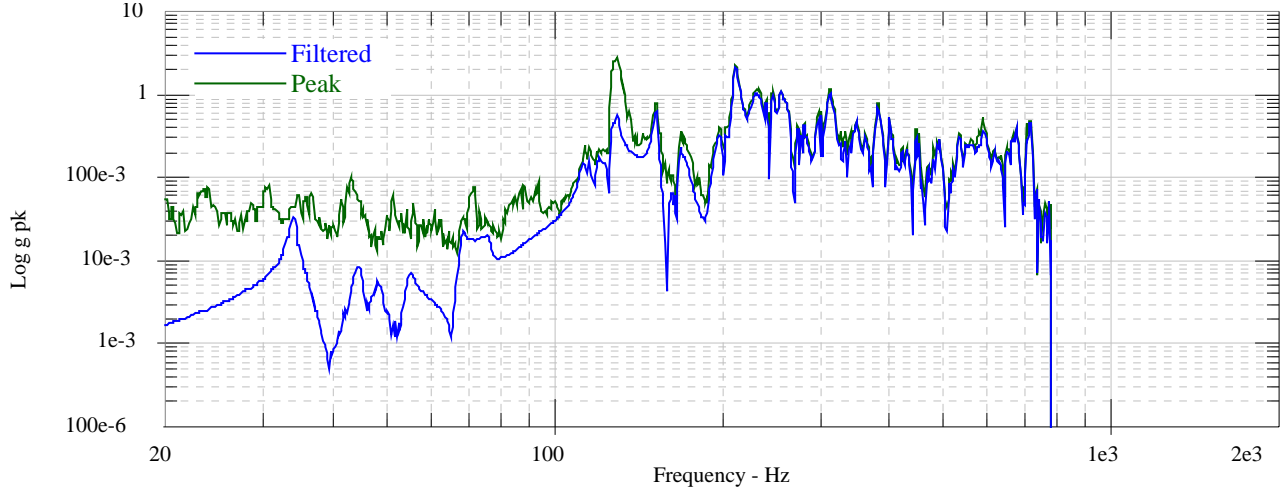


VIBRATION TEST REPORT
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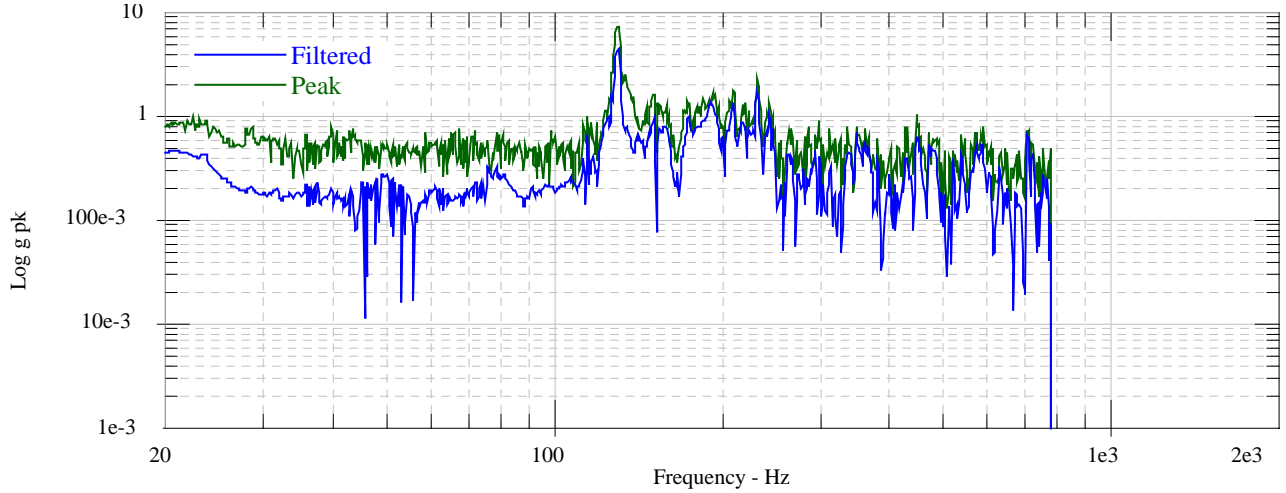
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Révision : 00
Date : 5-Apr-04
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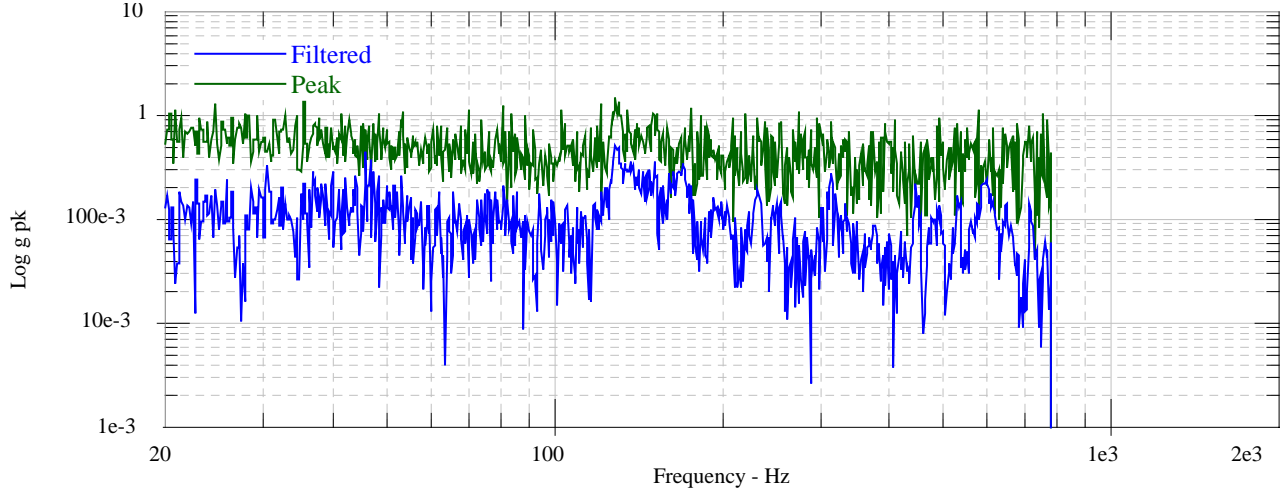
PHS.Z Channel n° 11



PHE.XY Channel n° 12



COOLX Channel n° 13

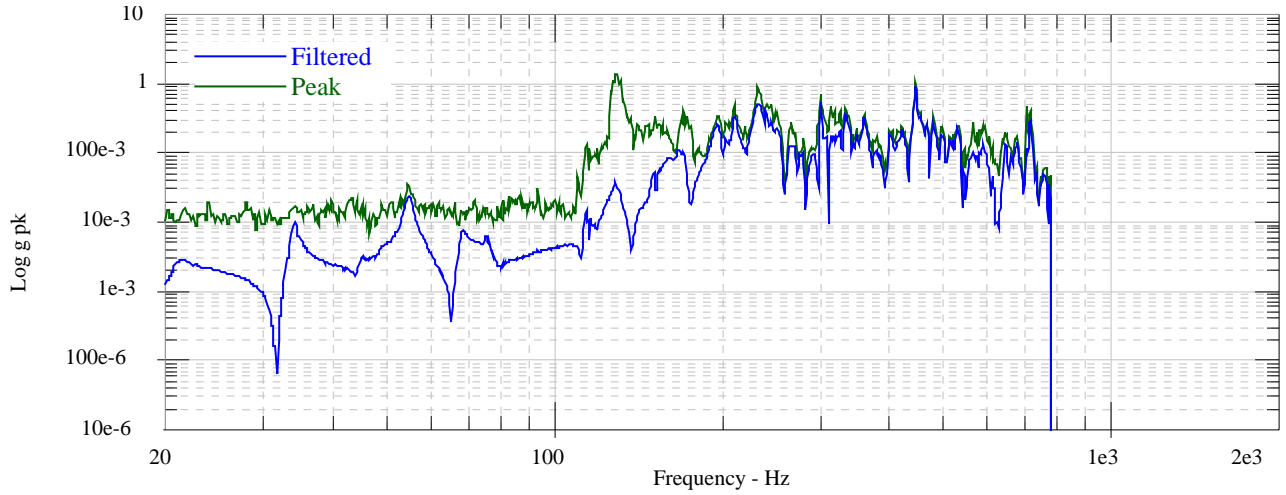


VIBRATION TEST REPORT
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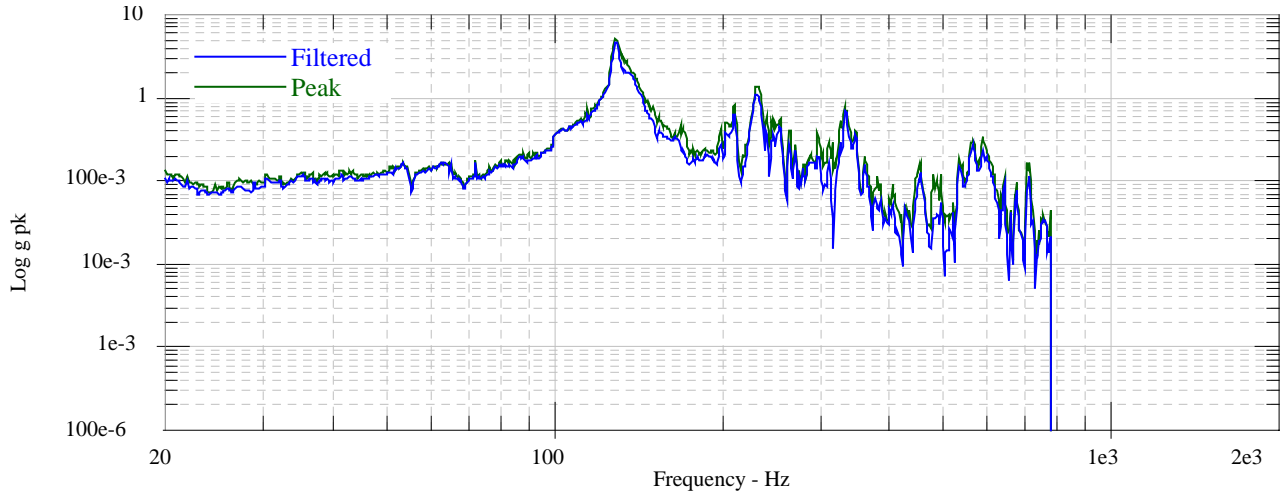
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Date : 5-Apr-04
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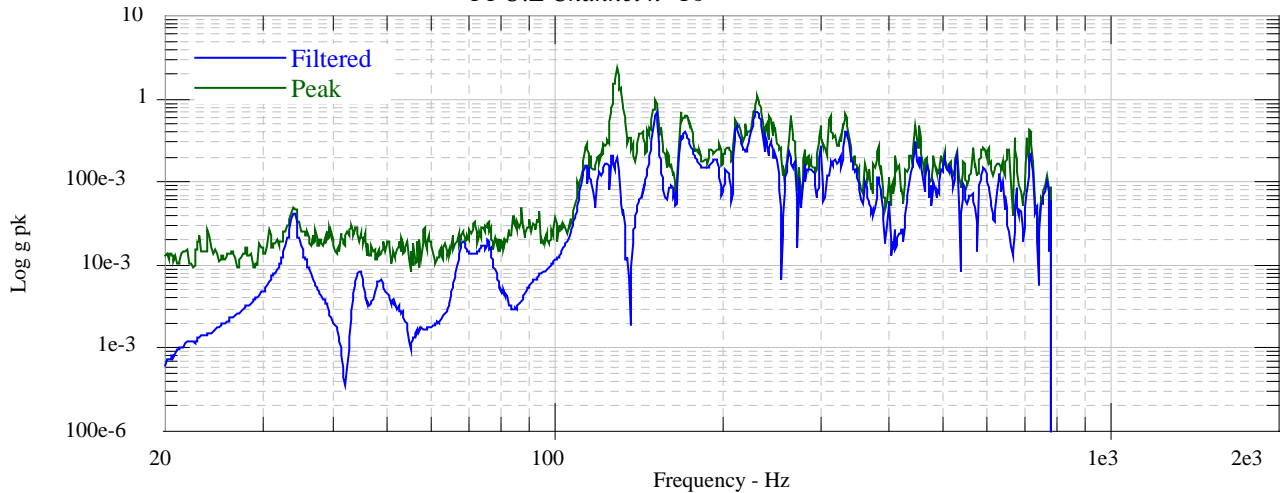
FPU.X Channel n° 14



FPU.Y Channel n° 15



FPU.Z Channel n° 16

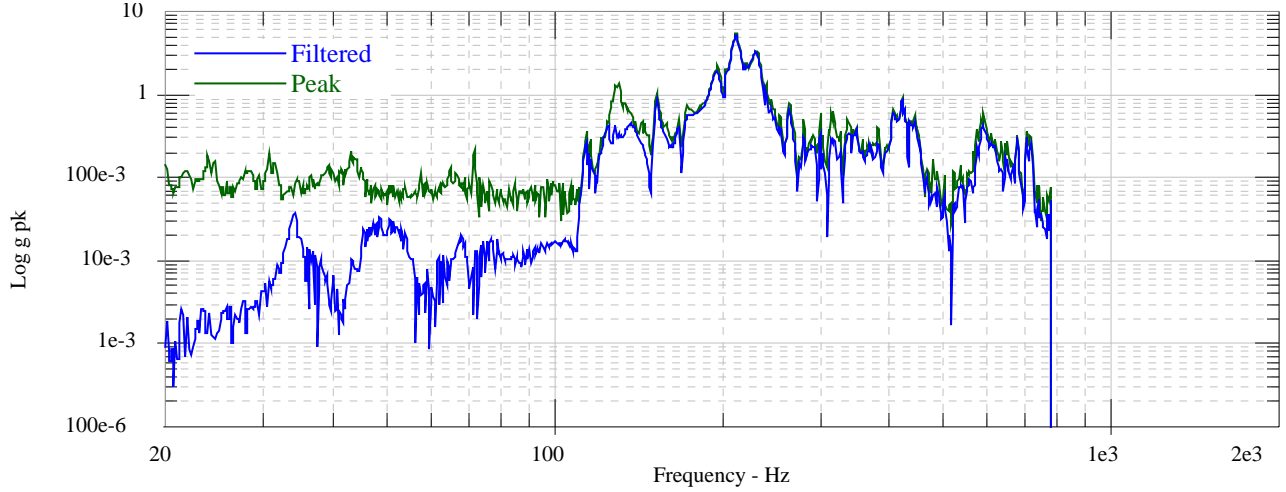


VIBRATION TEST REPORT
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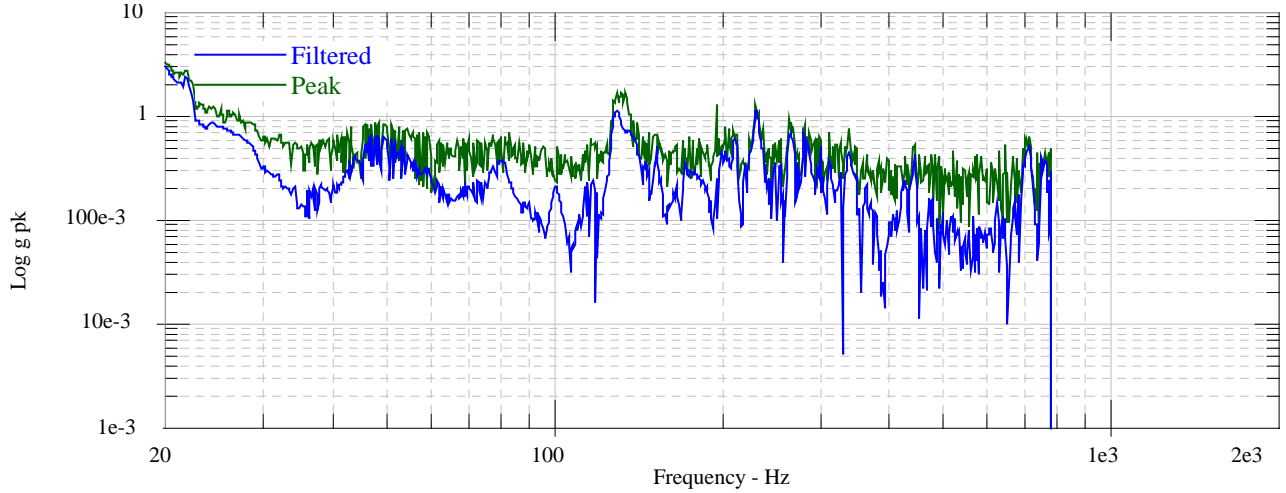
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Version : 01
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Date : 5-Apr-04
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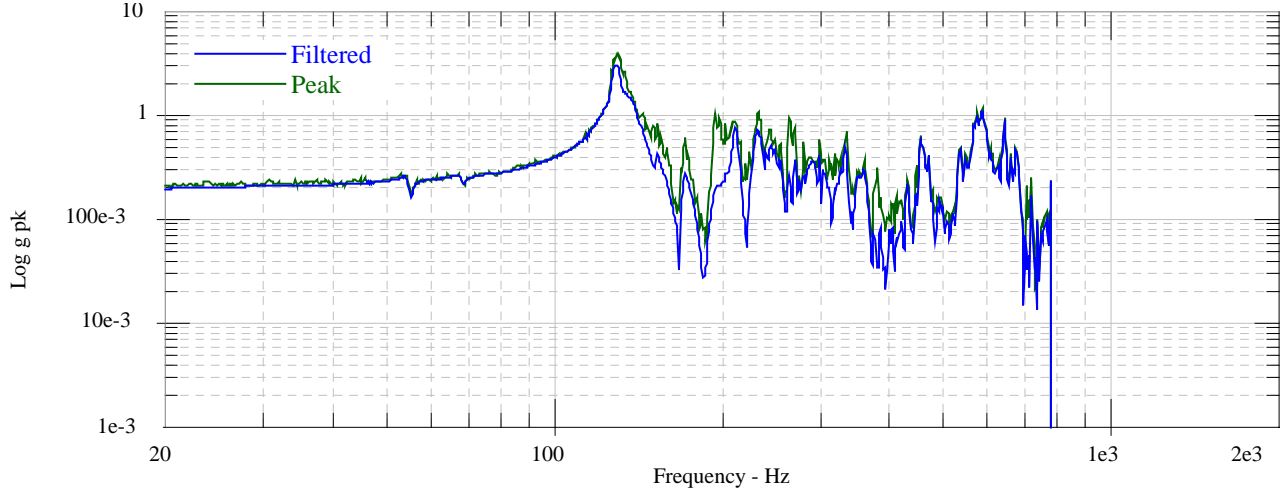
SPEC.X Channel n° 17



SPEC.Z Channel n° 18



SPEC.Y Channel n° 19

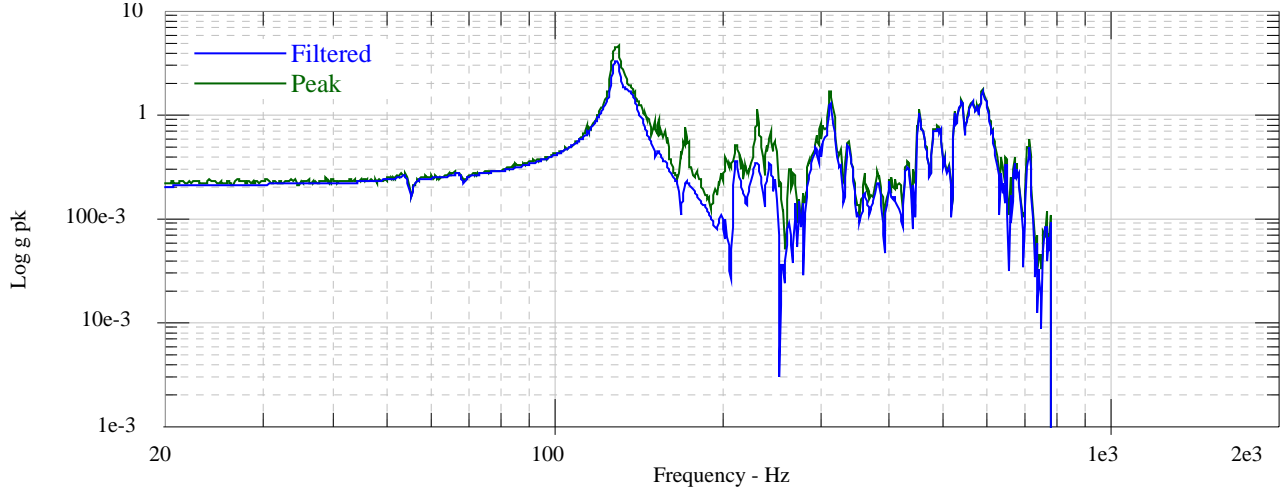


VIBRATION TEST REPORT
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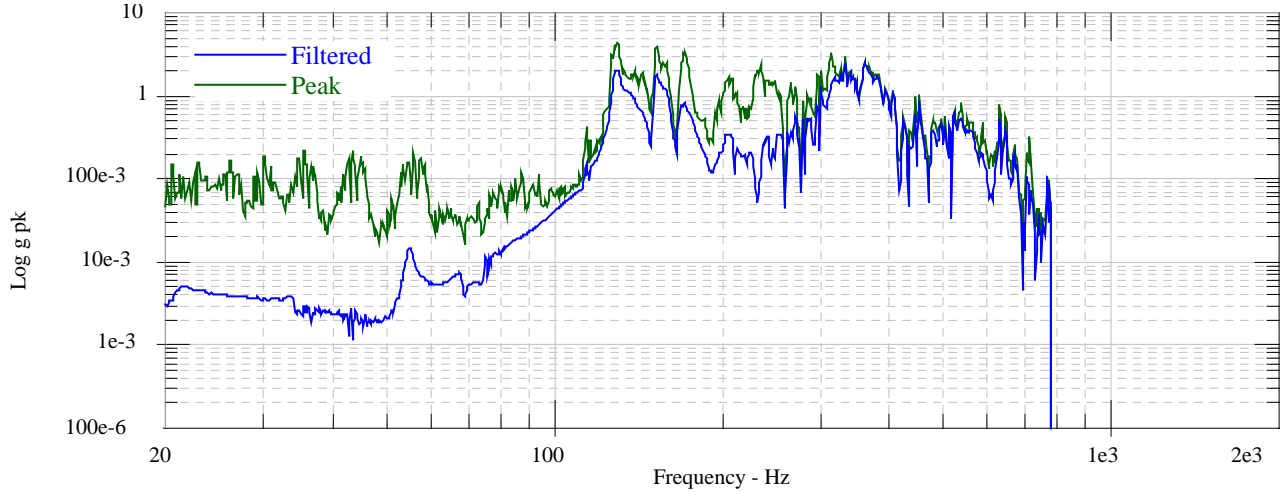
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Date : 5-Apr-04
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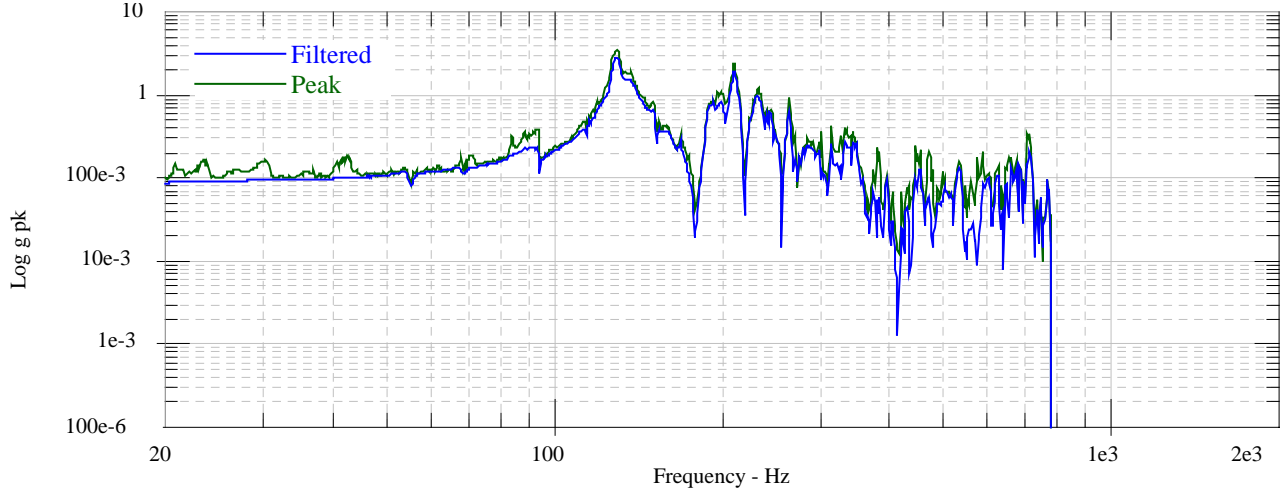
OB.Y Channel n° 20



SMECL.X Channel n° 21



CTIP.Y Channel n° 22

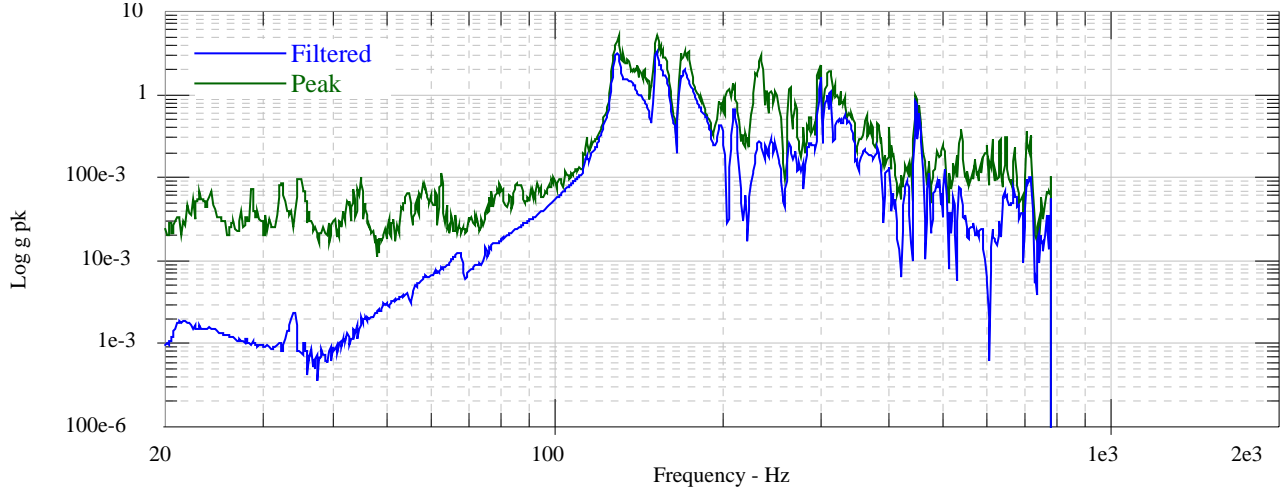


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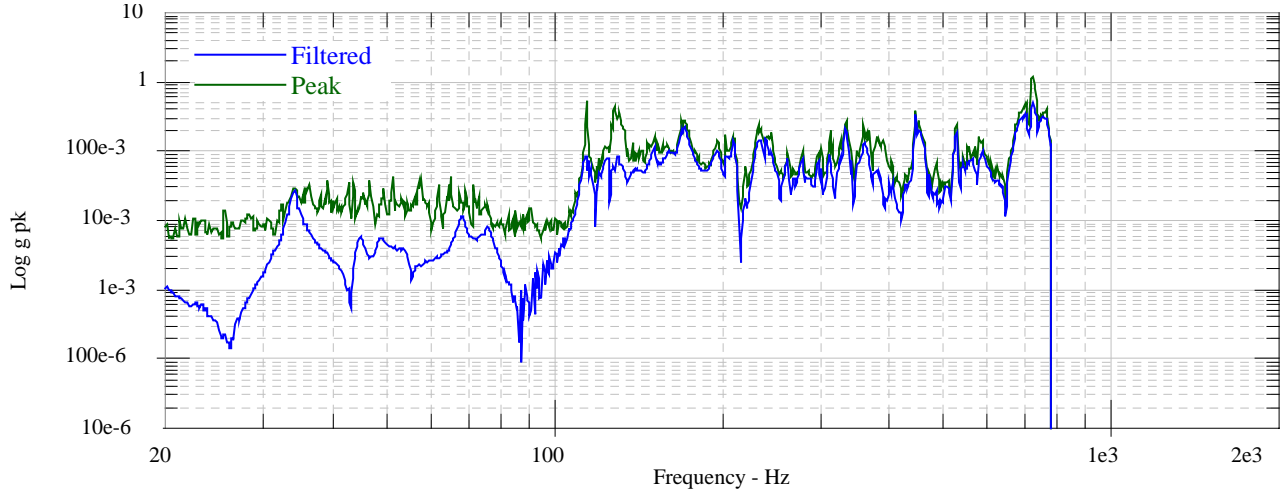
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Date : 5-Apr-04
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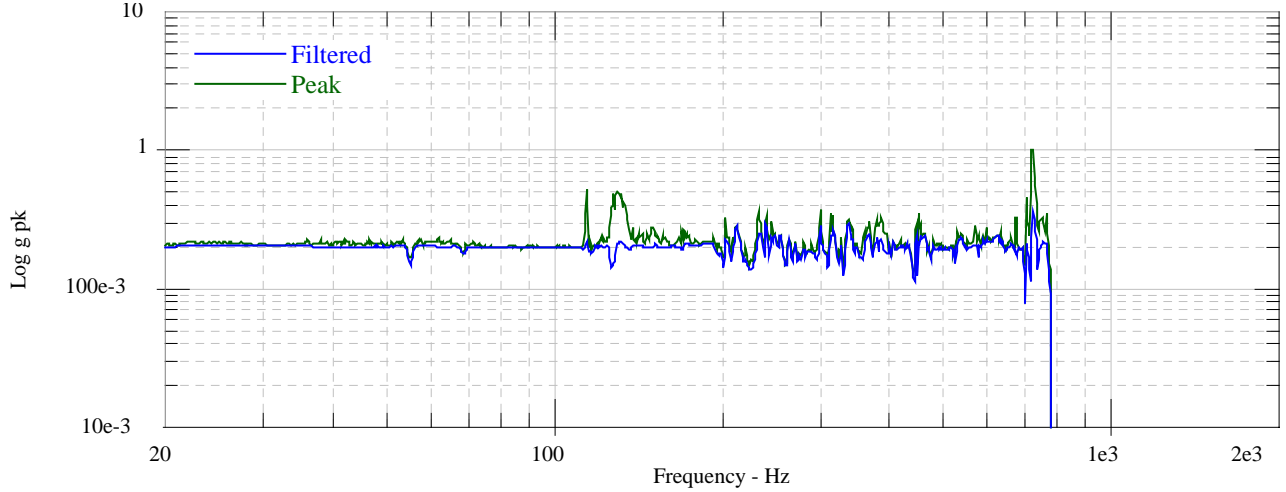
SMECU.X Channel n° 23



CONE.Z Channel n° 24



CONE.Y Channel n° 25

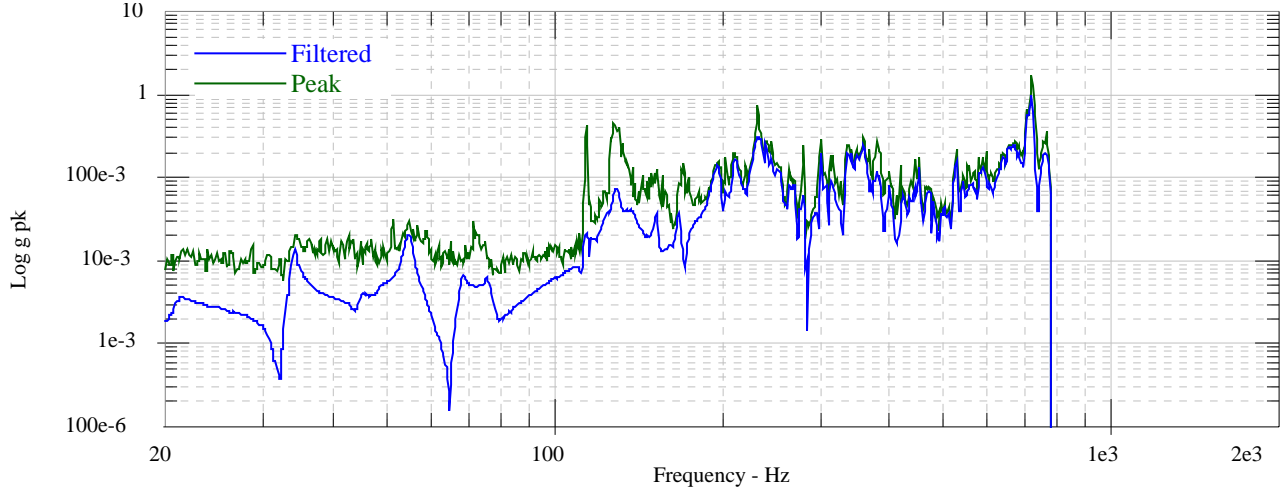


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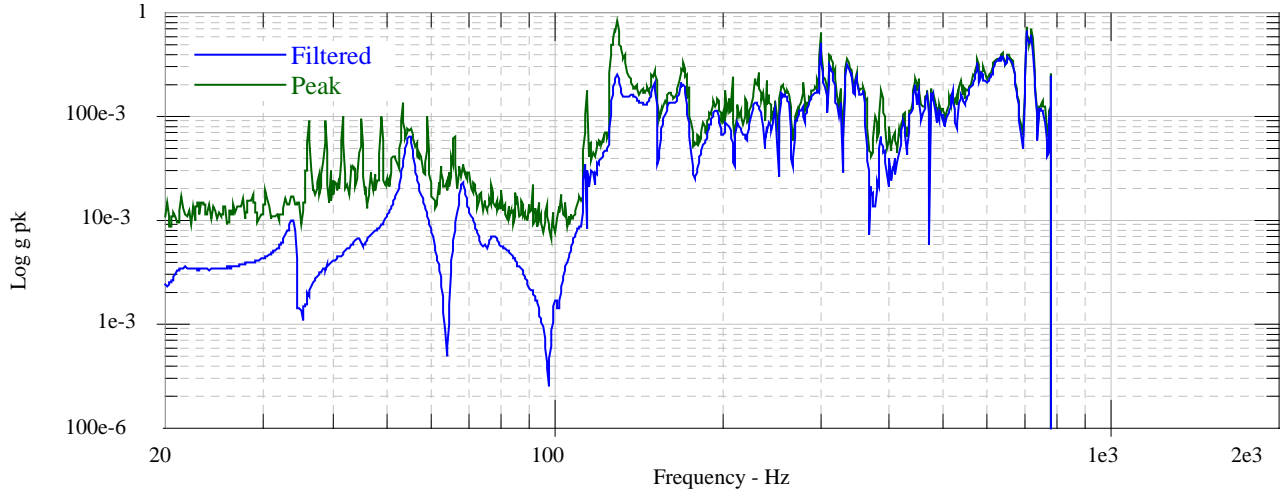
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Date : 5-Apr-04
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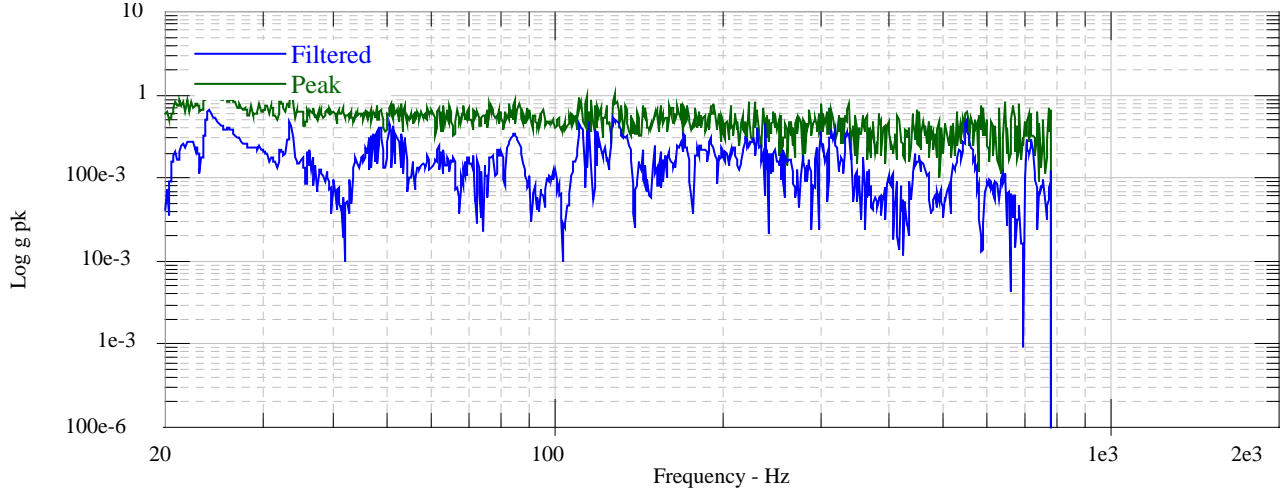
CONE.X Channel n° 26



-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28

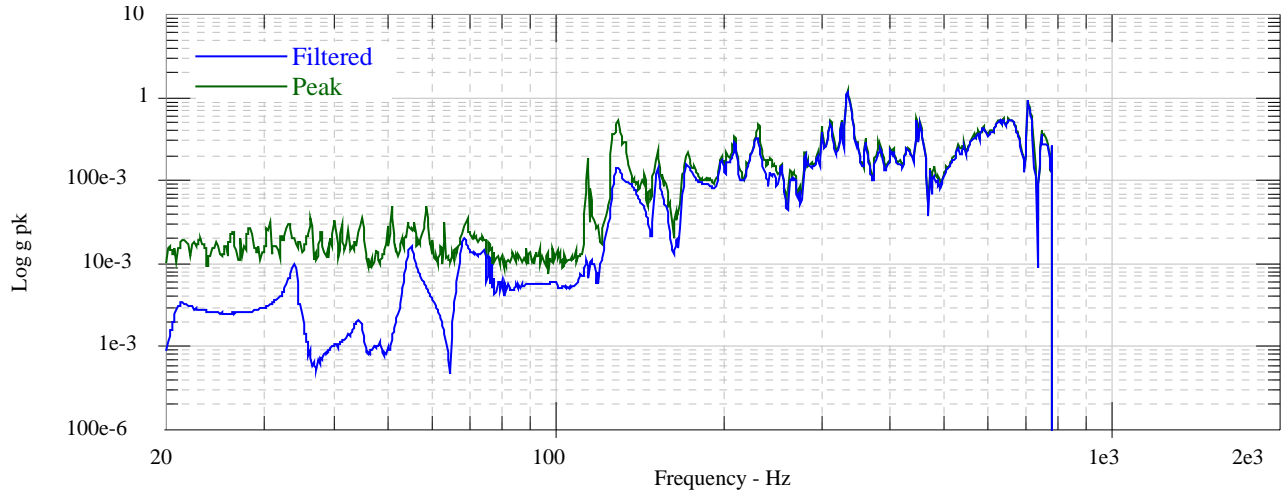


VIBRATION TEST REPORT
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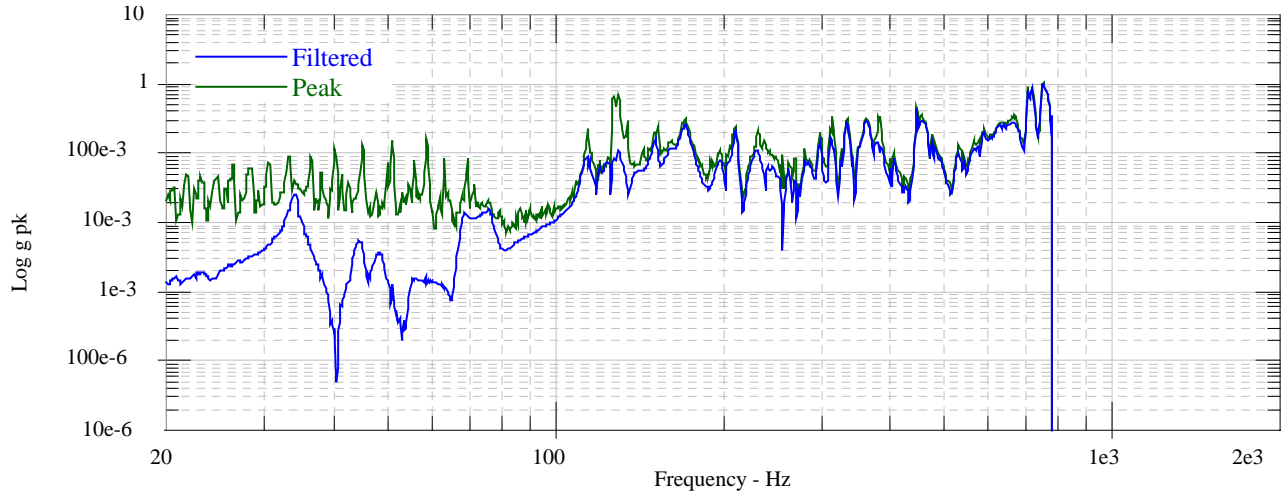
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Date : 5-Apr-04
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
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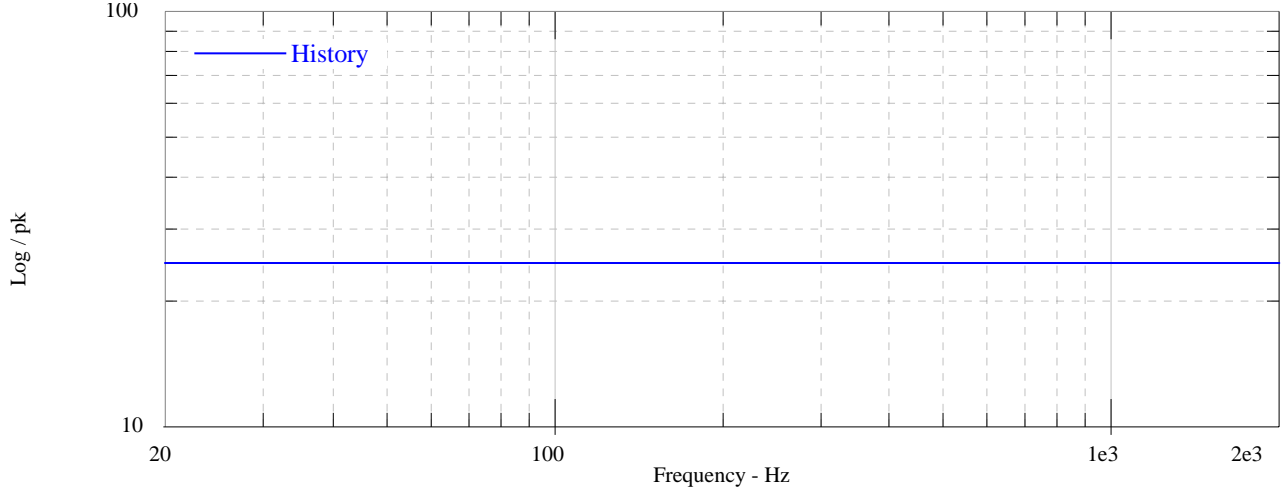
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VIBRATION TEST REPORT
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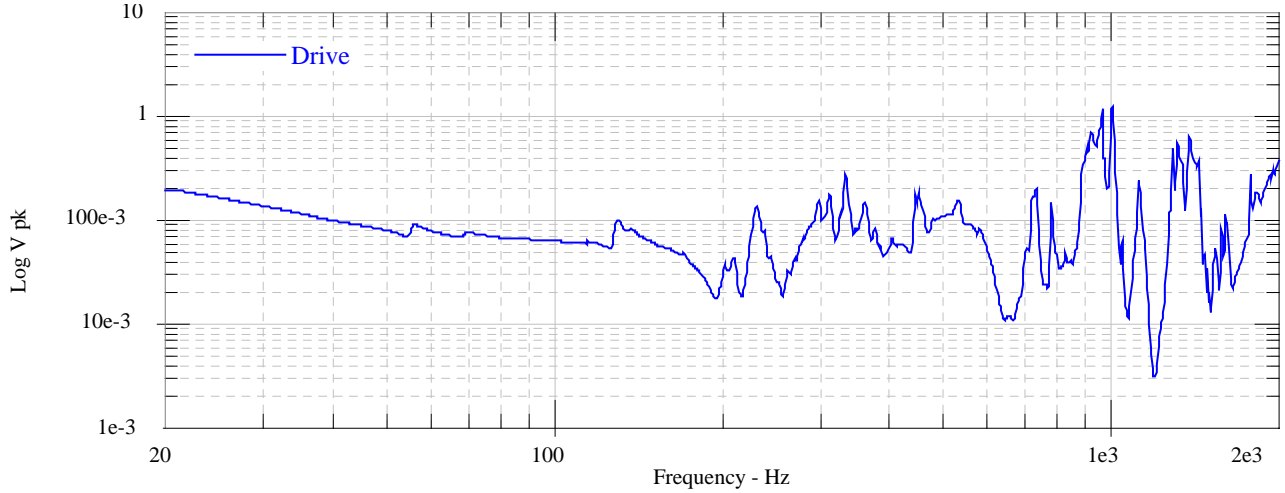
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Date : 5-Apr-04
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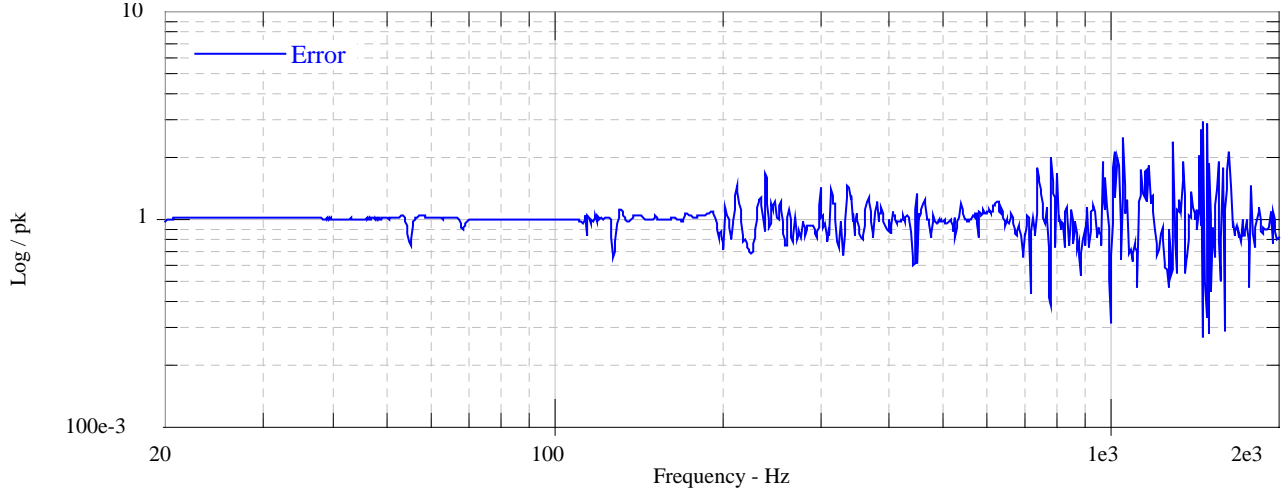
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

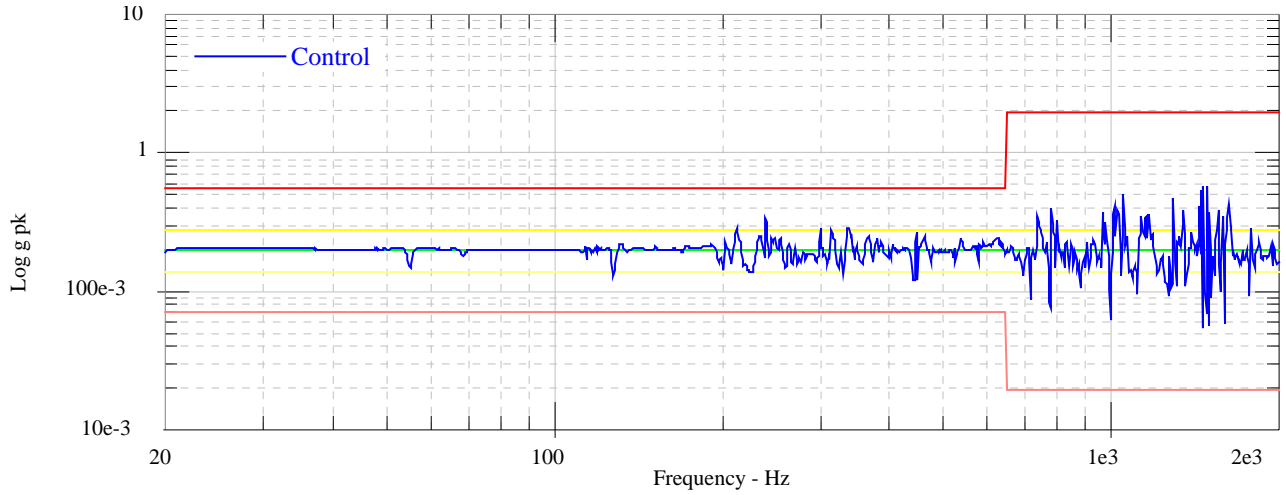


VIBRATION TEST REPORT
SPIRE QM

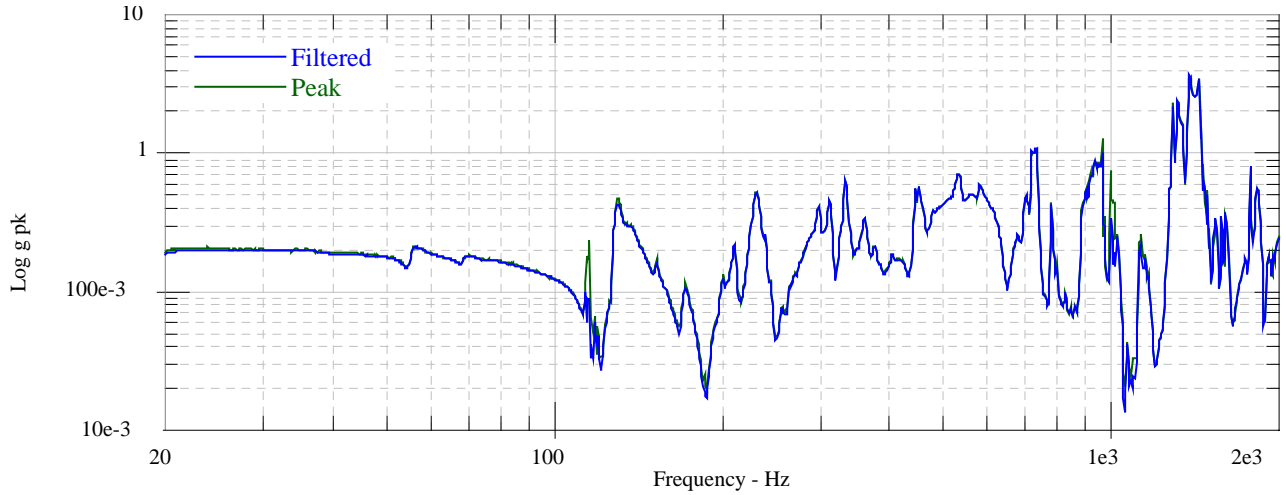
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Date : 5-Apr-04
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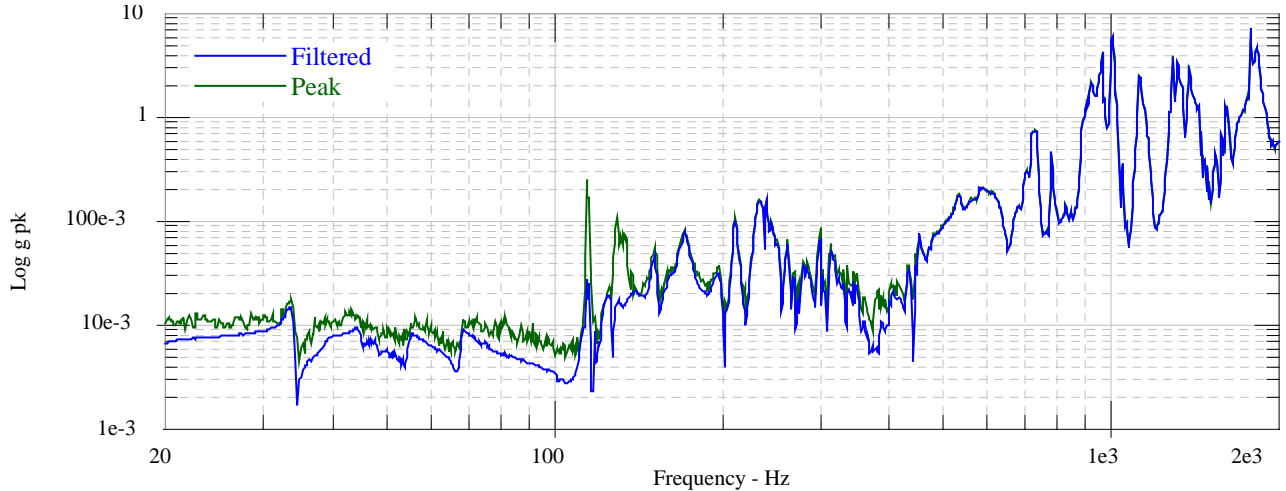
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

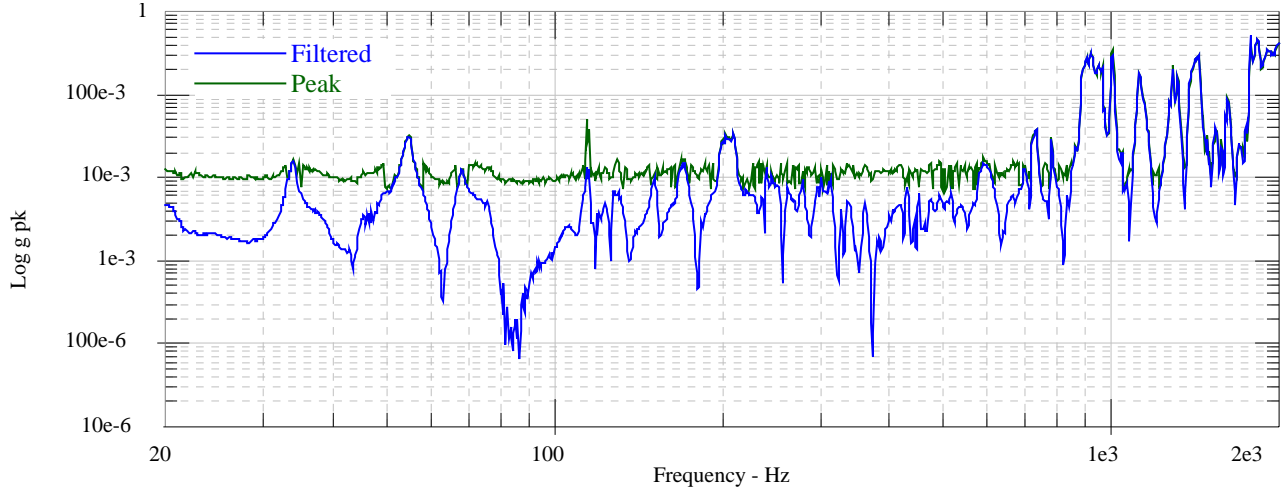


VIBRATION TEST REPORT
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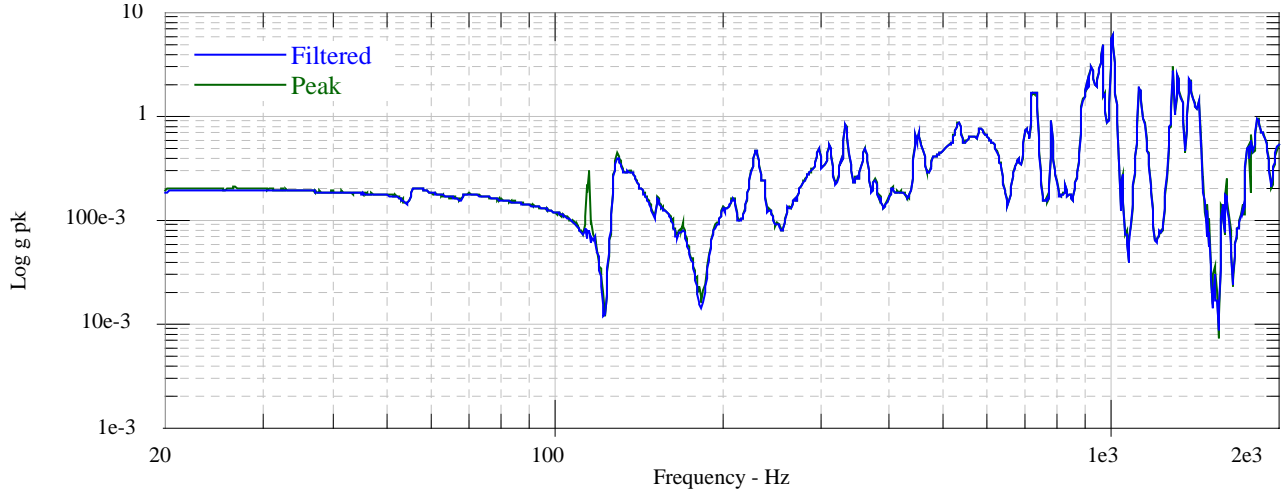
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Date : 5-Apr-04
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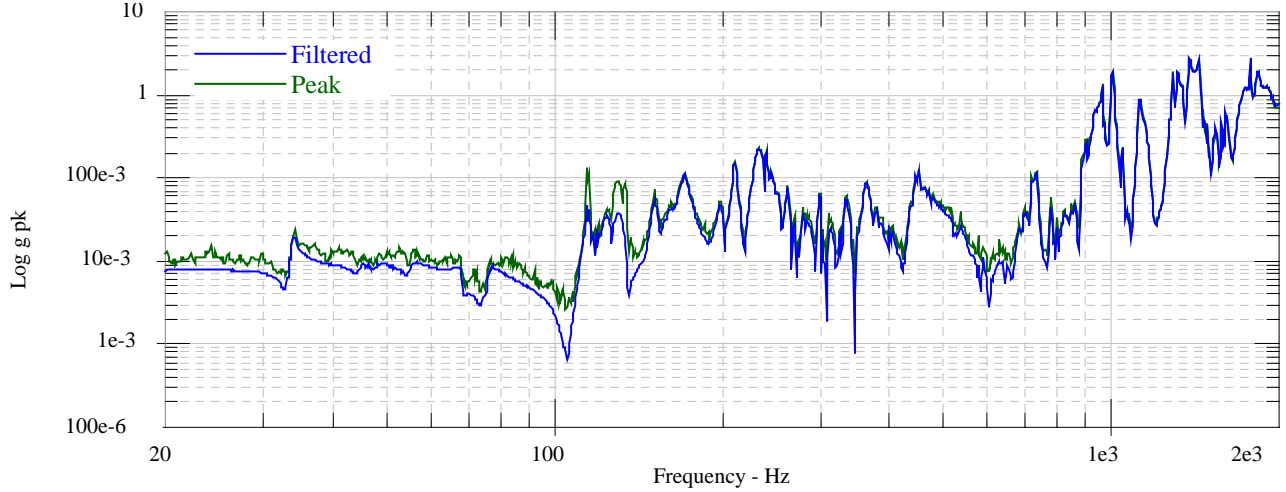
SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

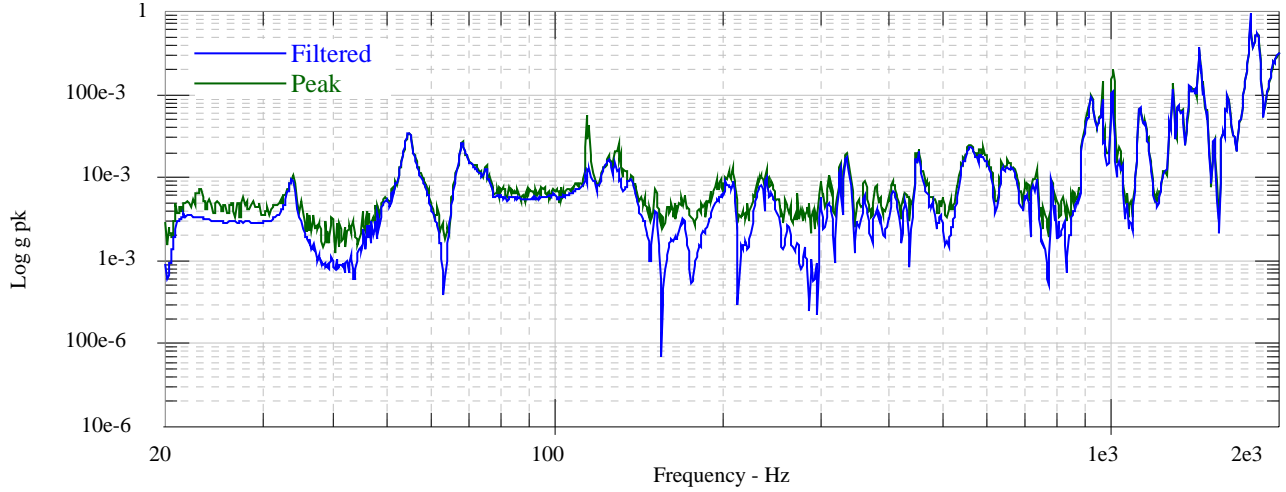


VIBRATION TEST REPORT
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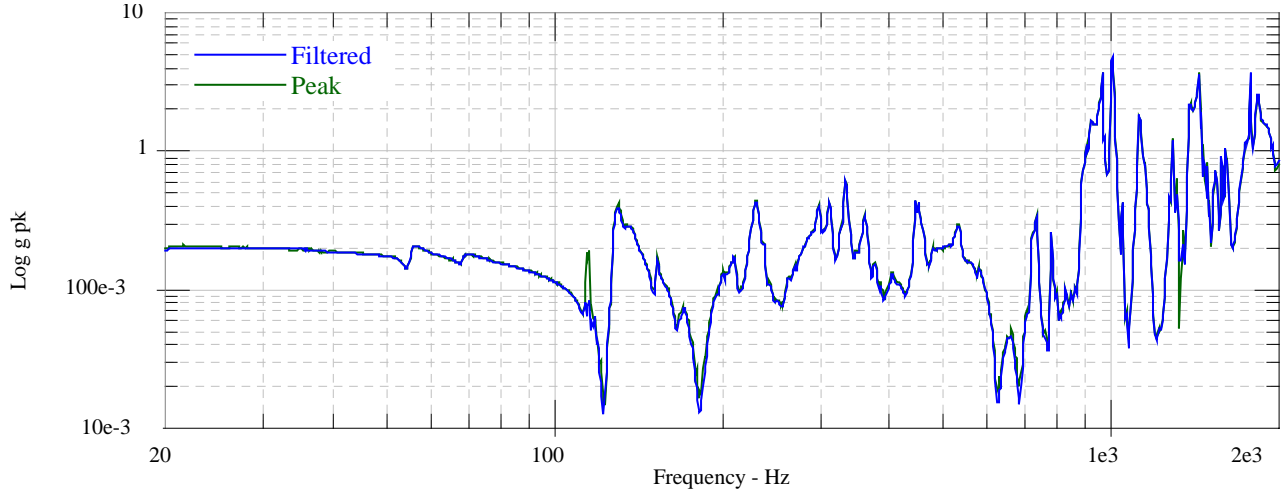
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Date : 5-Apr-04
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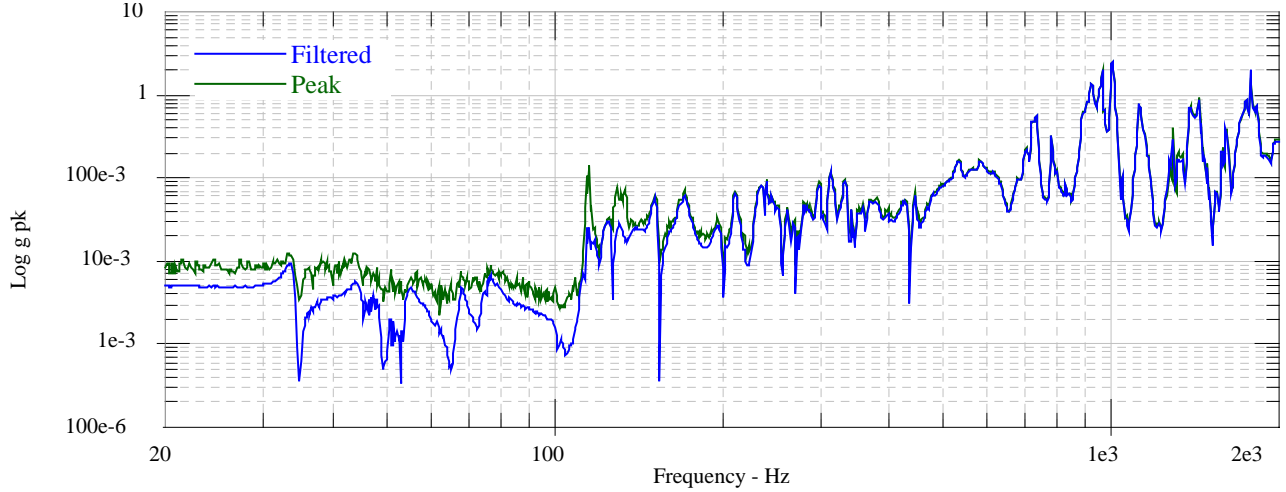
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

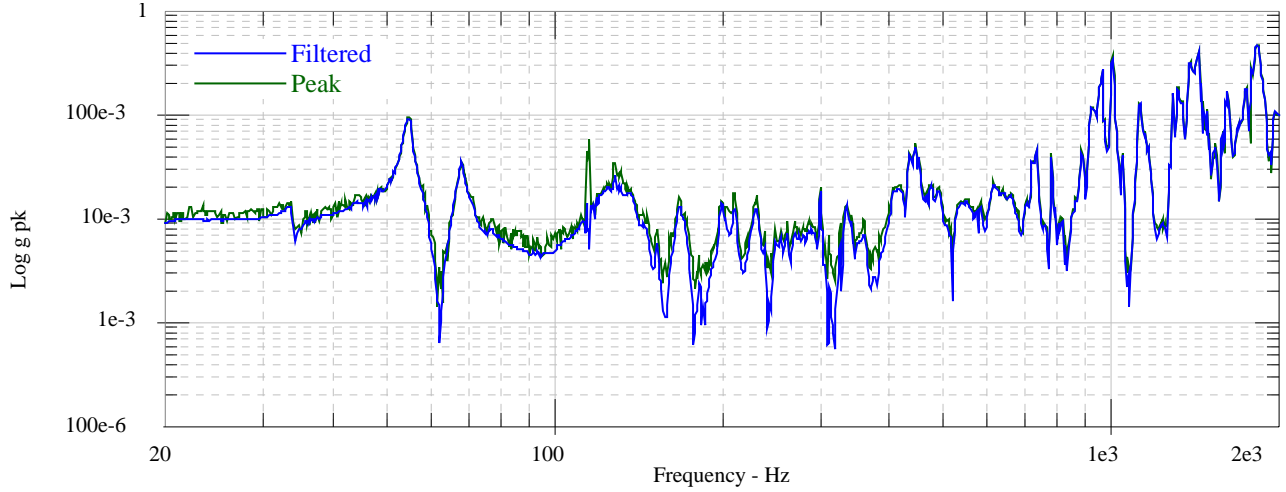


VIBRATION TEST REPORT
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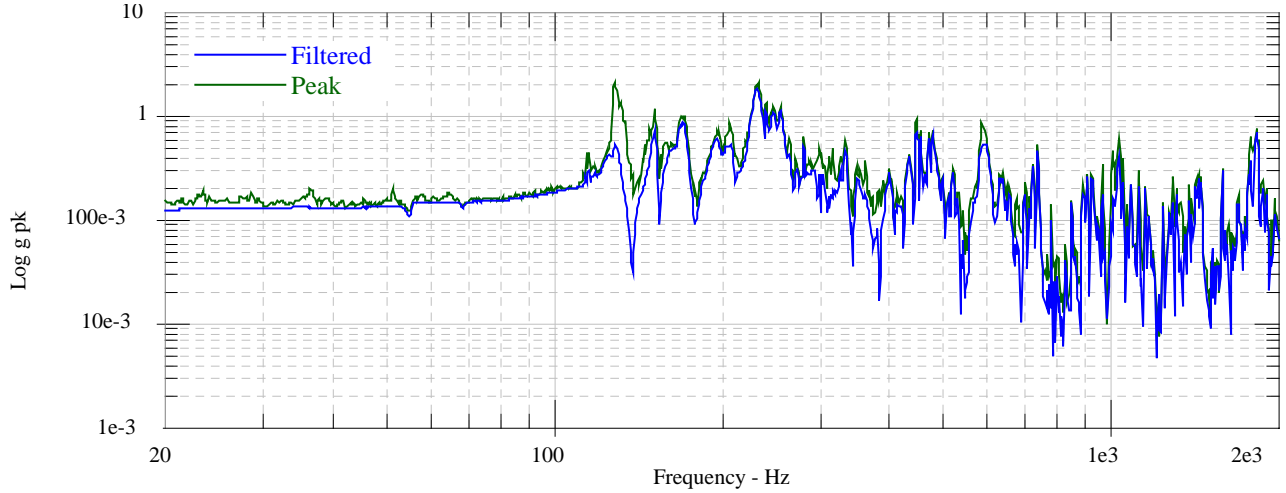
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Version : 01
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Date : 5-Apr-04
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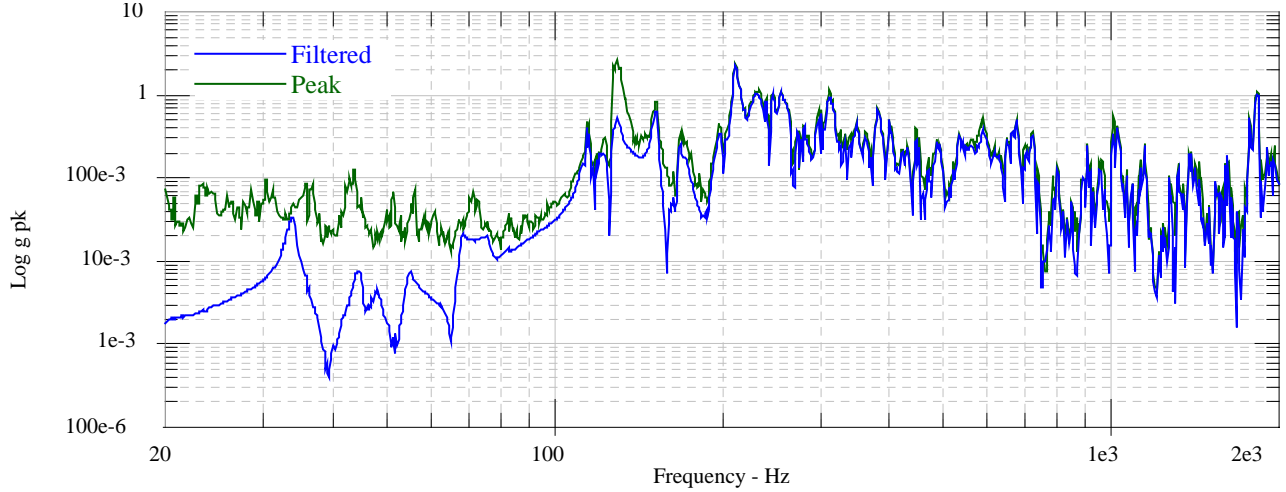
SHK.3.X Channel n° 9



PHS.XY Channel n° 10



PHS.Z Channel n° 11

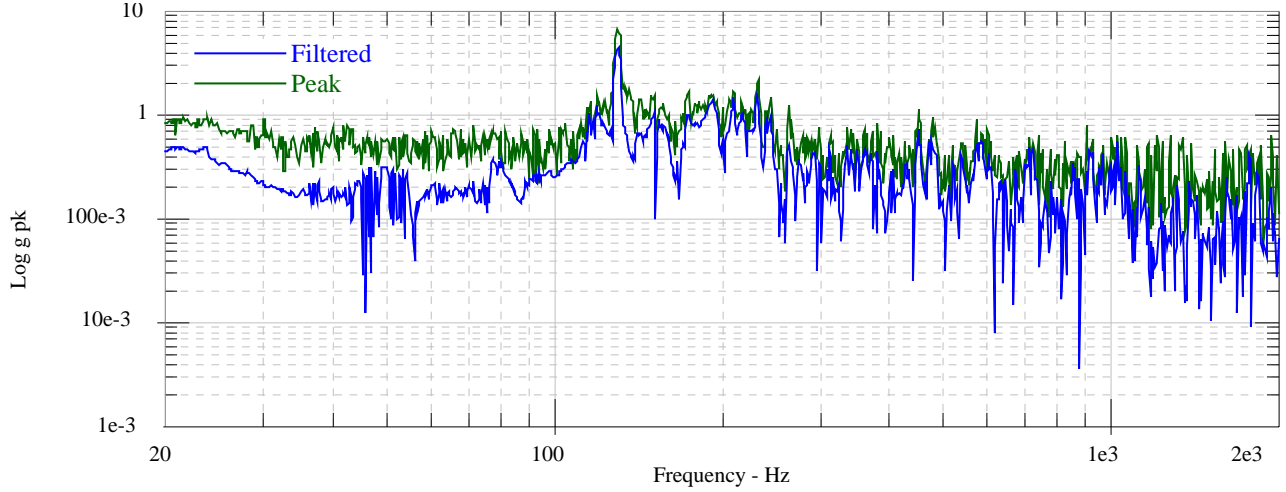


VIBRATION TEST REPORT
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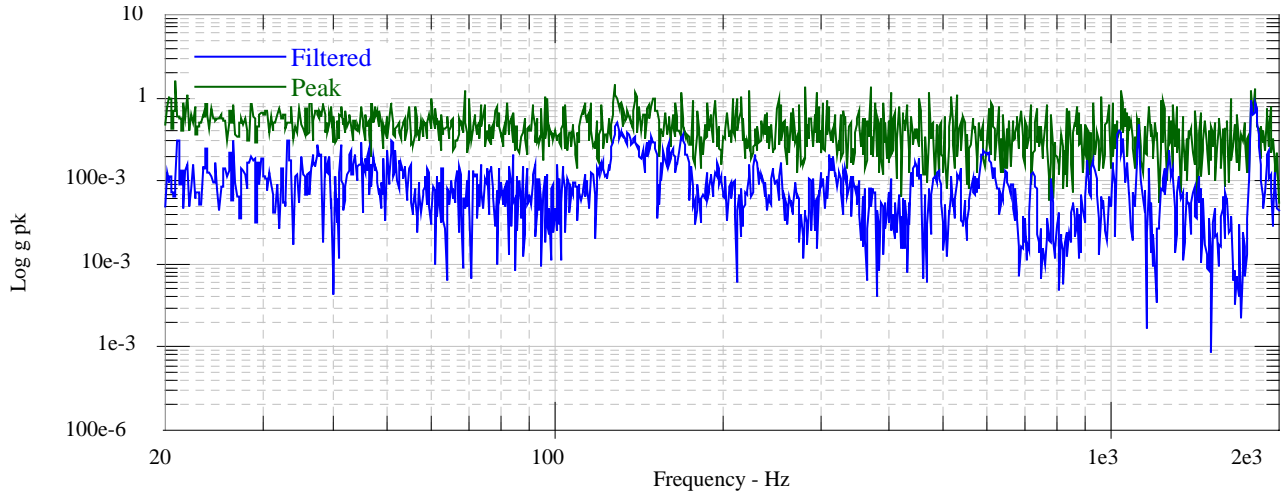
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Version : 01
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Date : 5-Apr-04
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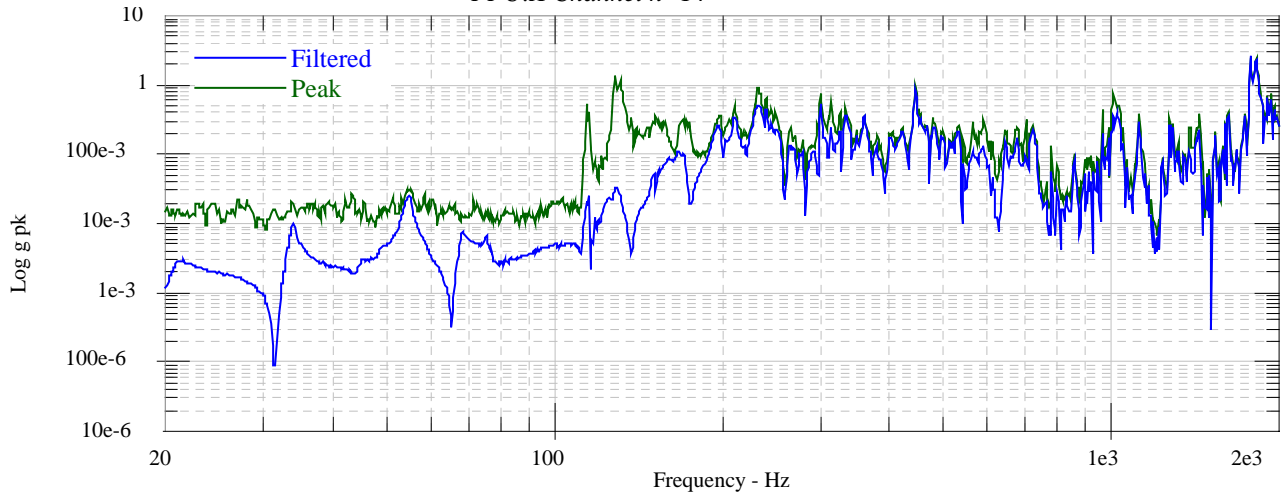
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

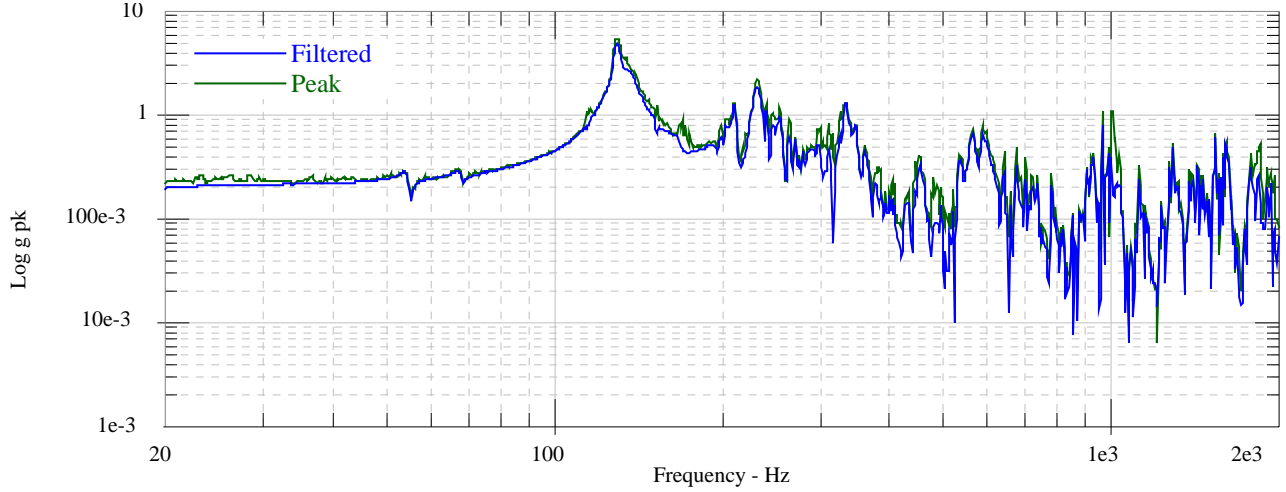


VIBRATION TEST REPORT
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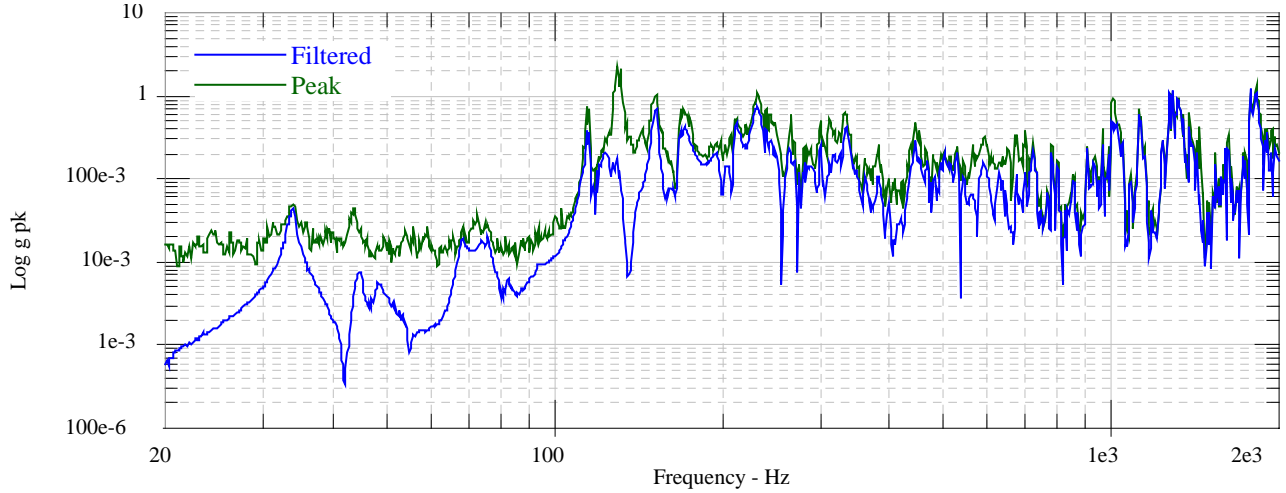
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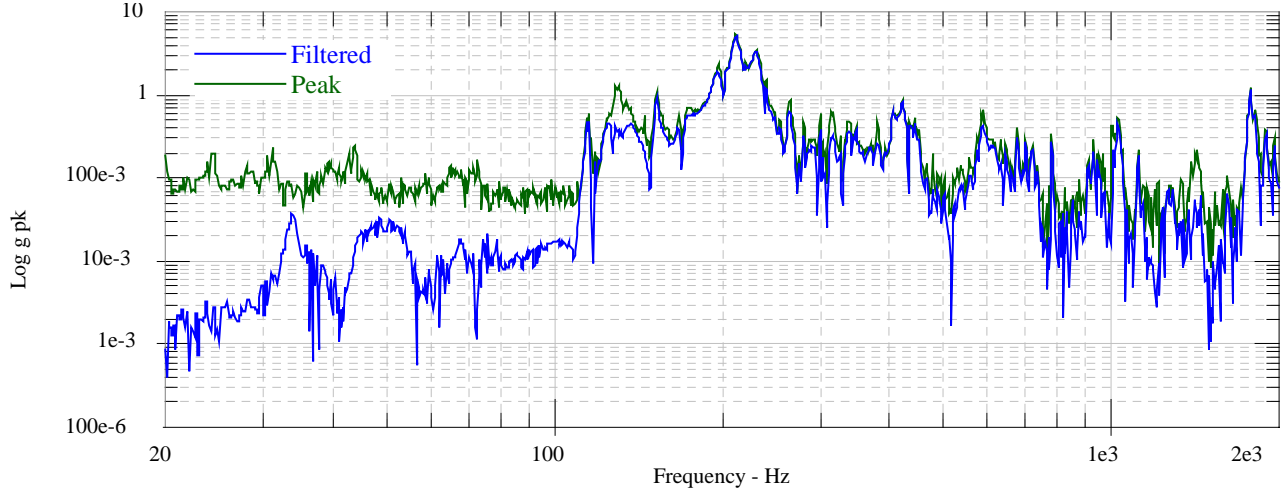
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

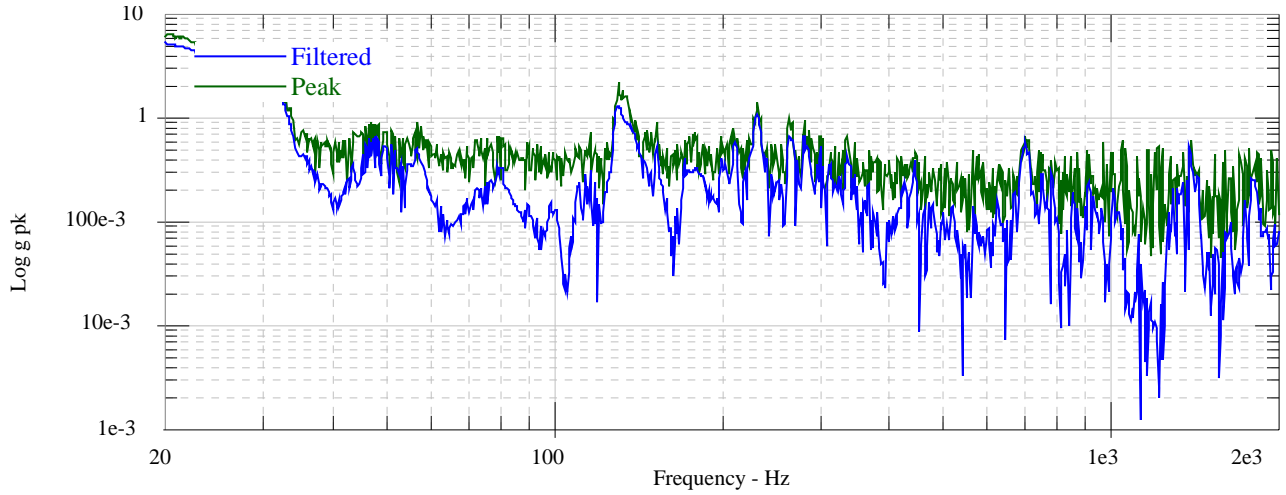


VIBRATION TEST REPORT
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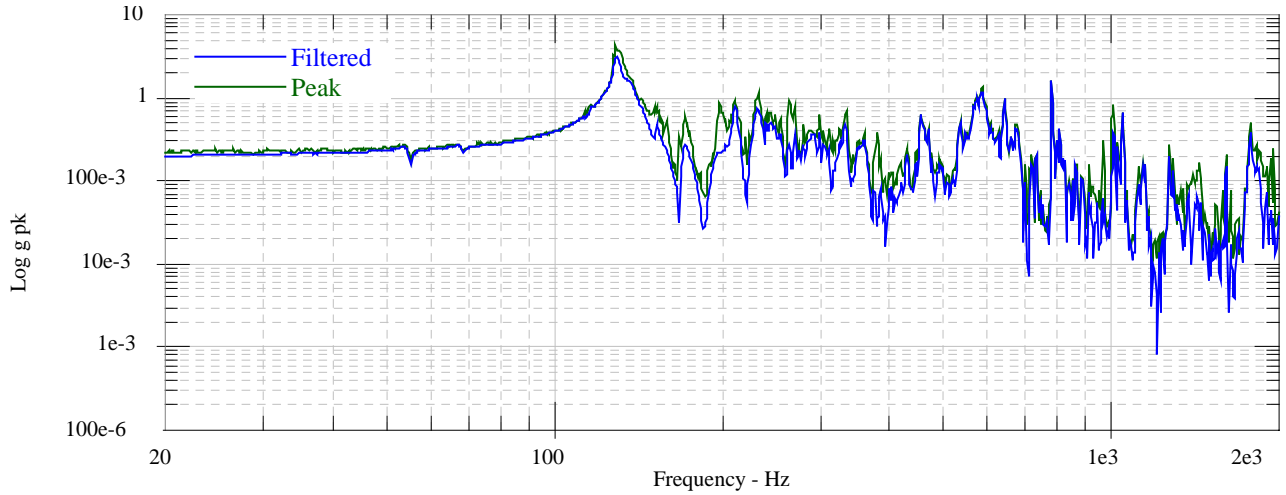
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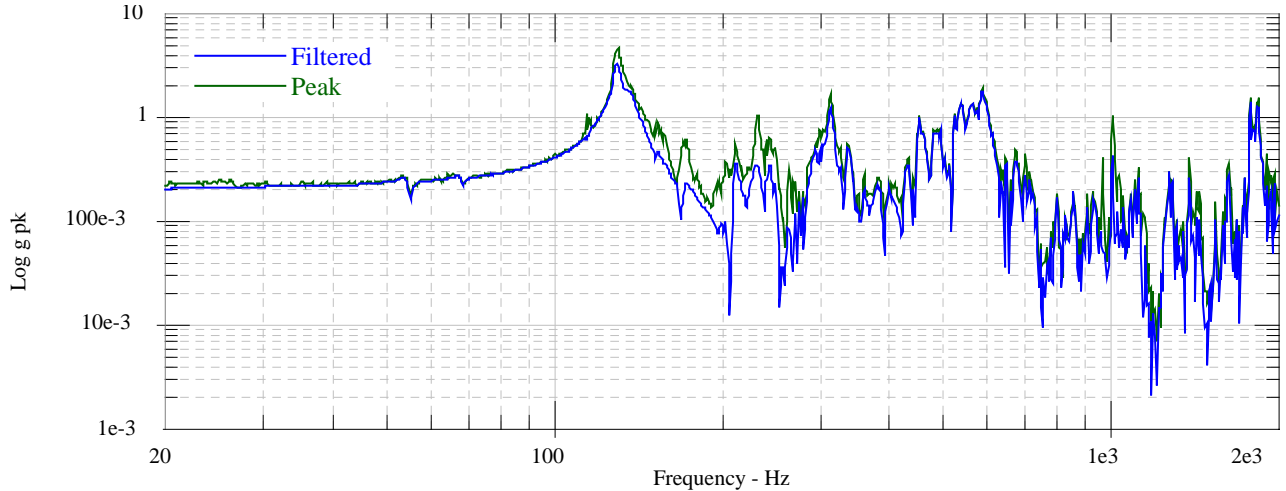
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

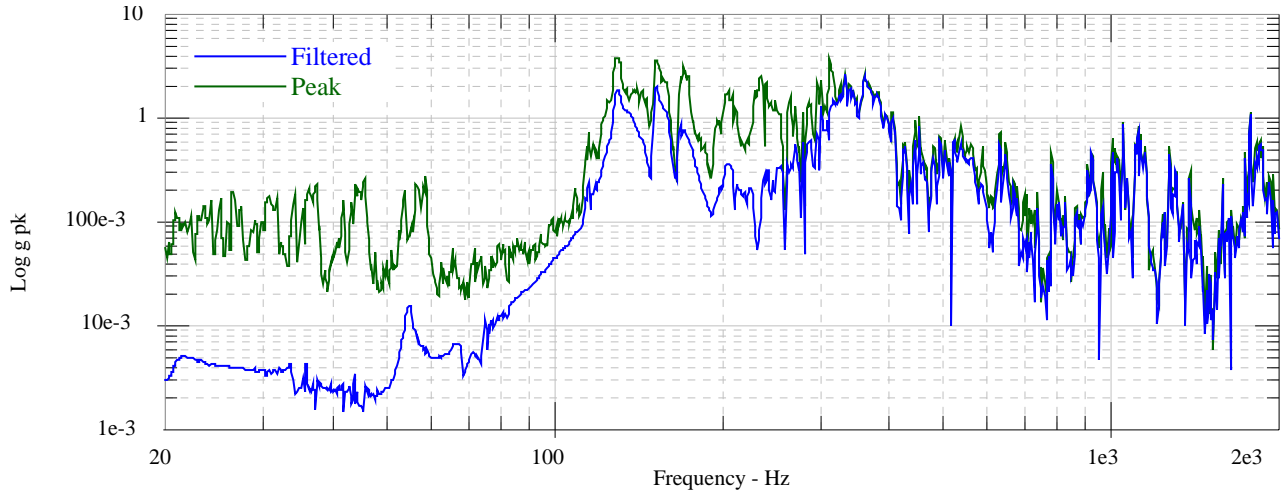


VIBRATION TEST REPORT
SPIRE QM

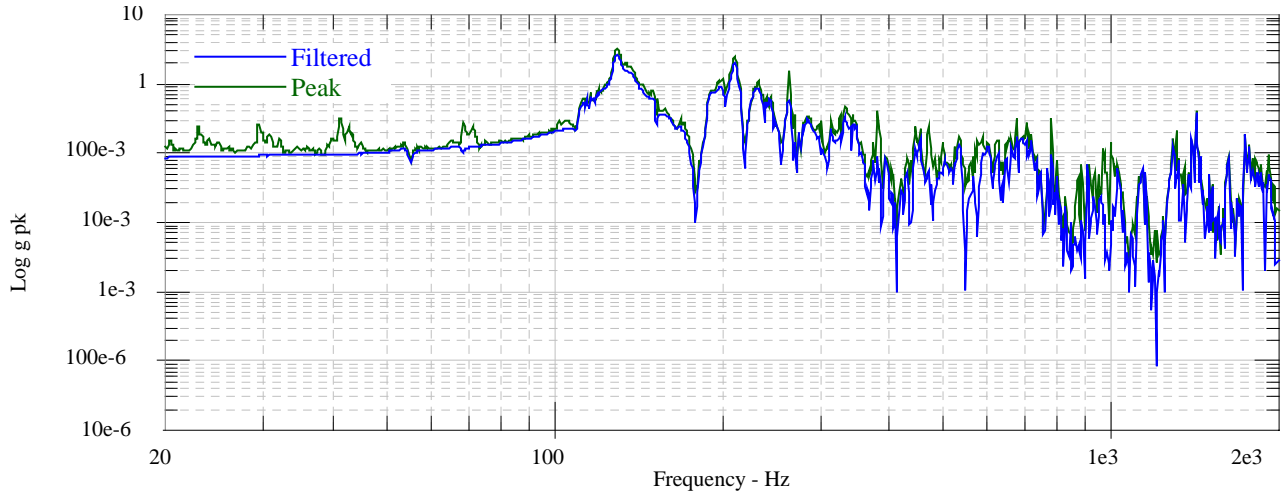
RP-CSL-CRYOV-04001
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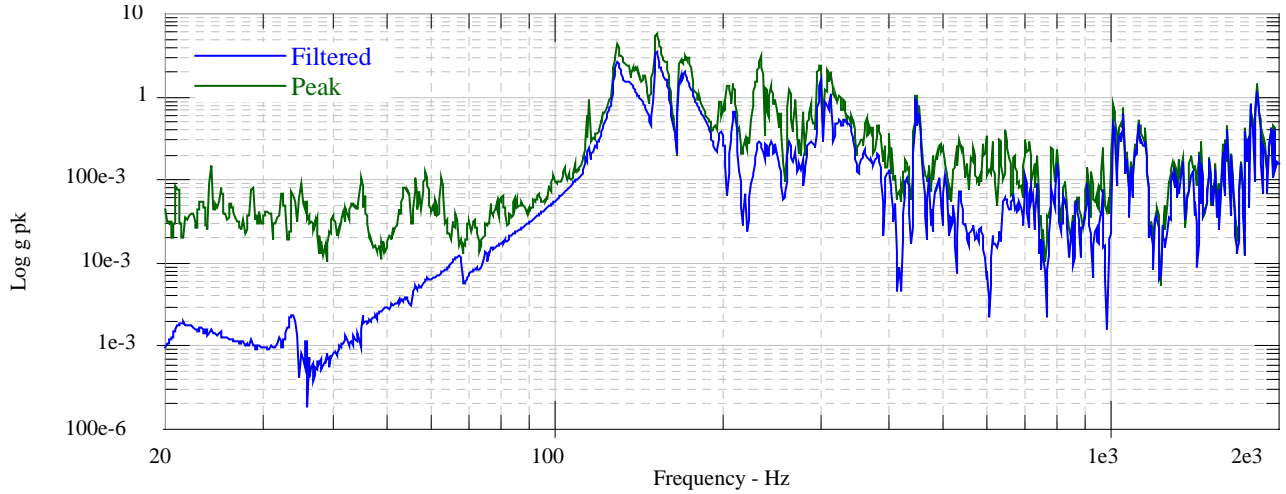
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

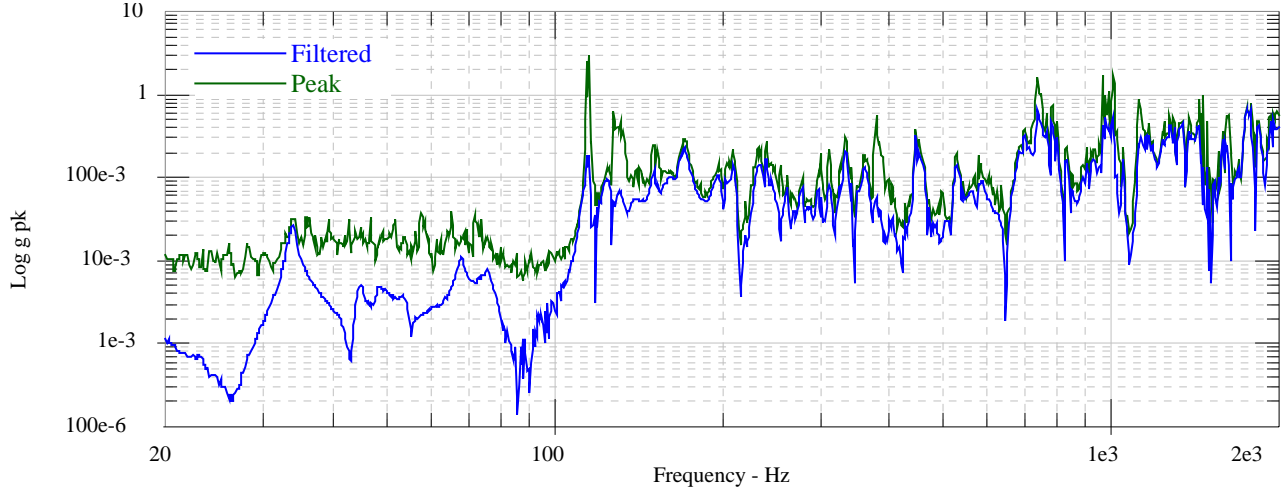


VIBRATION TEST REPORT
SPIRE QM

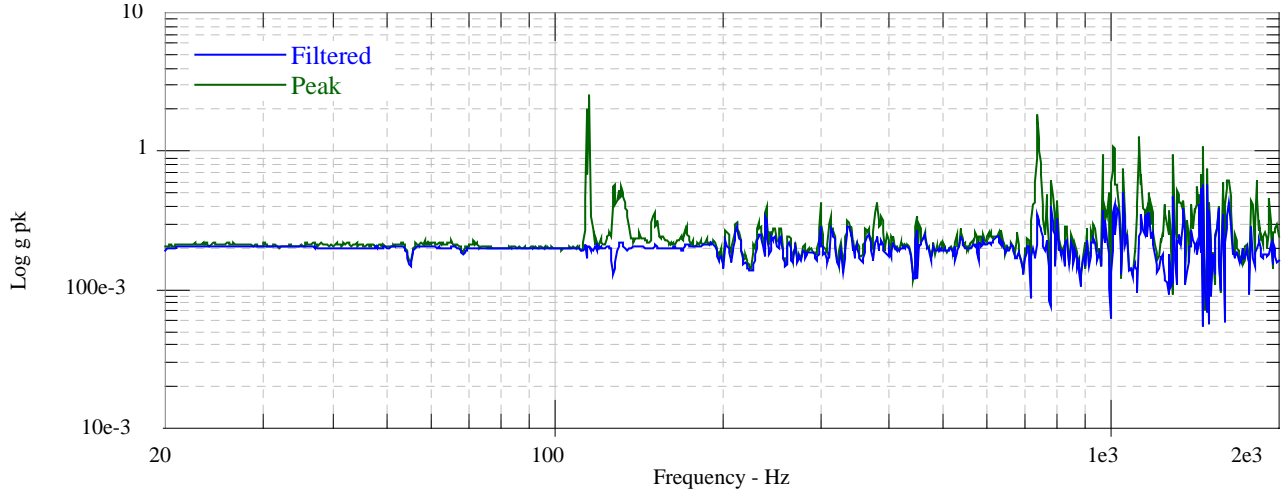
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Version : 01
Révision : 00
Date : 5-Apr-04
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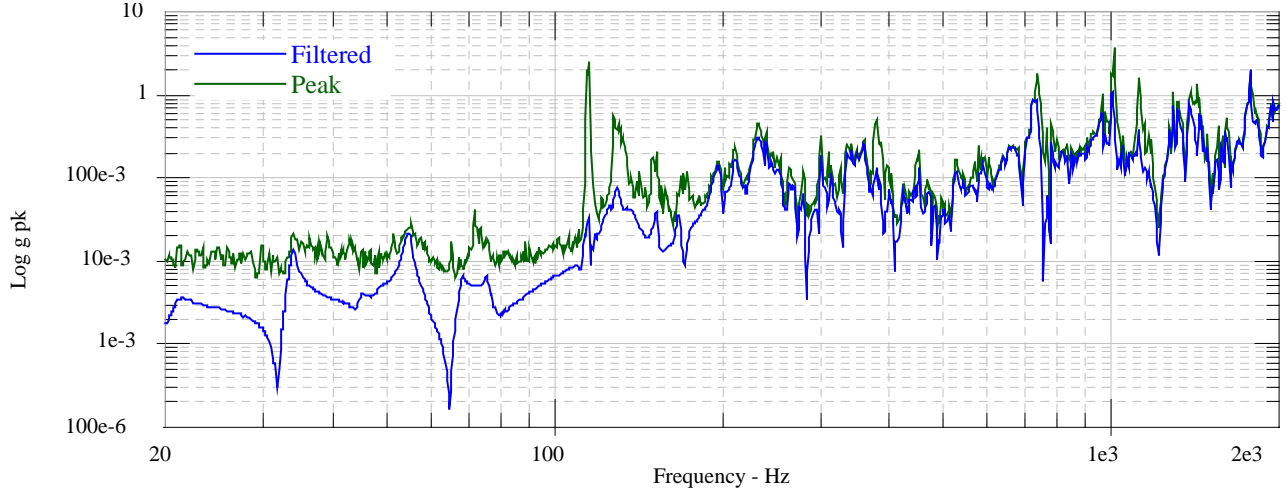
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

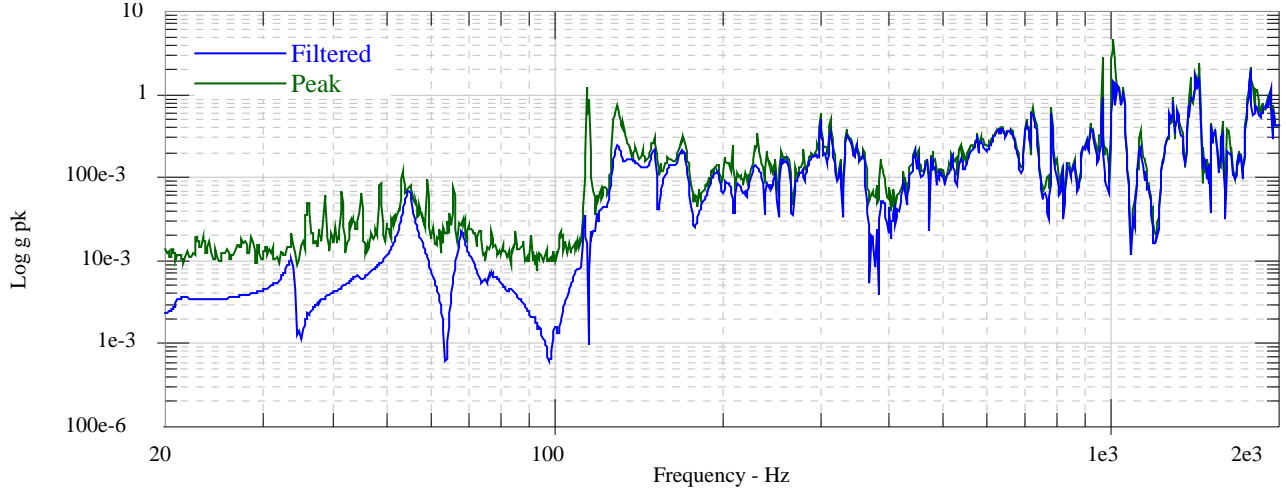


VIBRATION TEST REPORT
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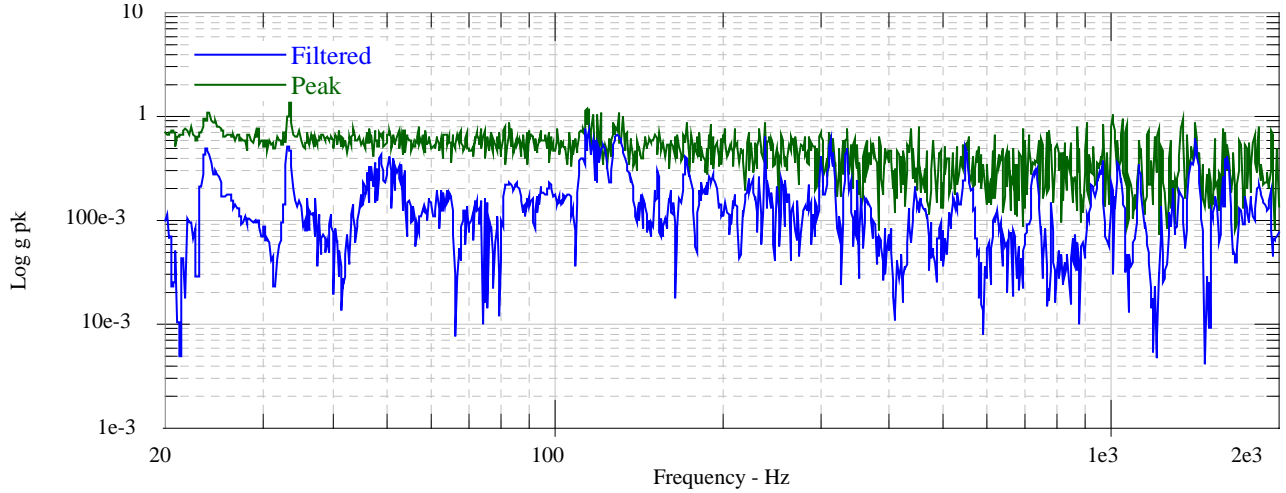
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Version : 01
Révision : 00
Date : 5-Apr-04
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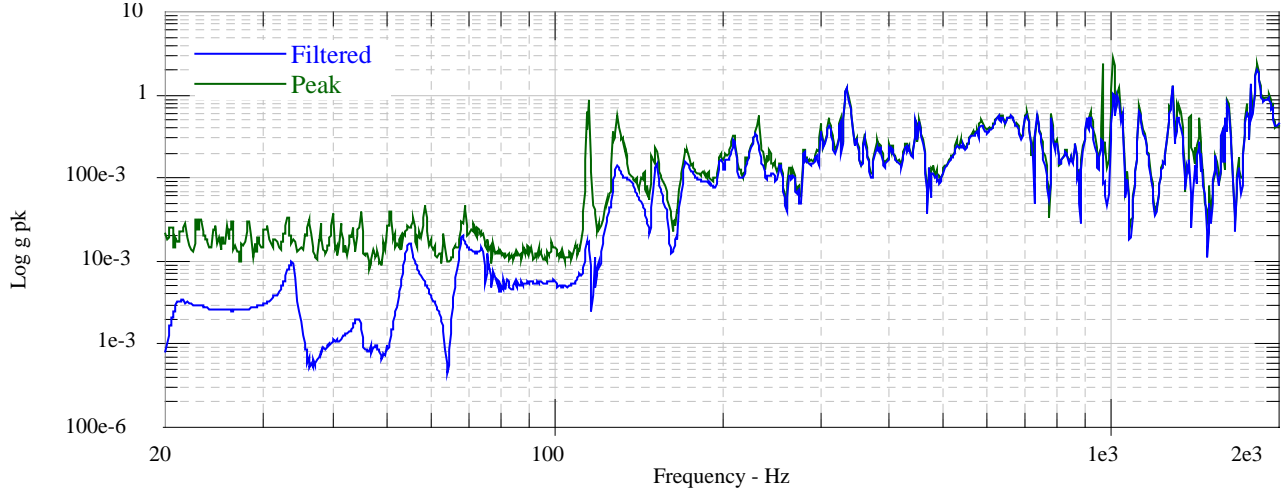
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

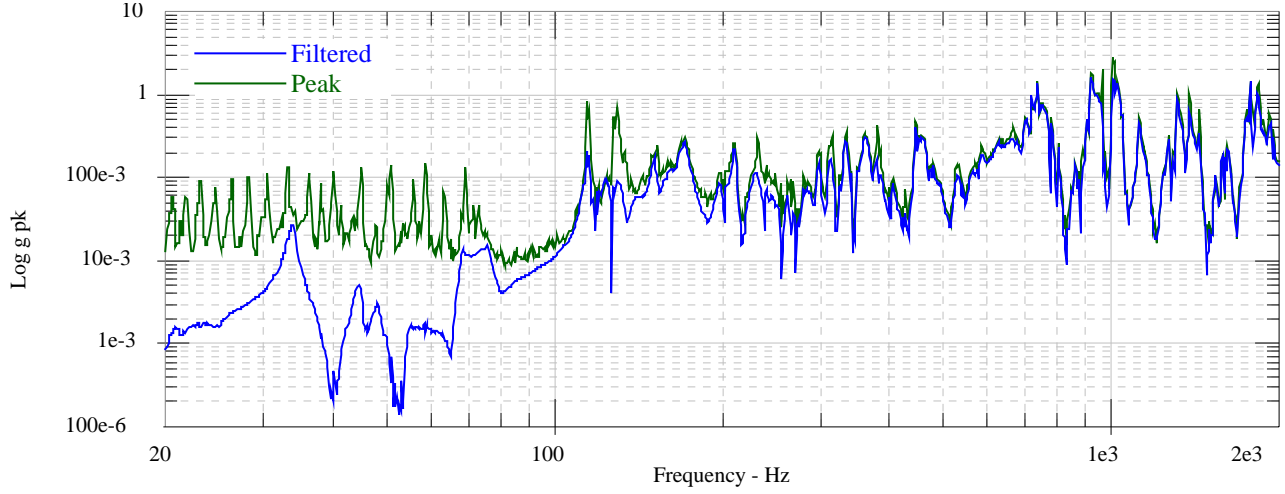


VIBRATION TEST REPORT
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+YAFRAME.Z Channel n° 30



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Version : **01**
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12.4 NIS4Y.

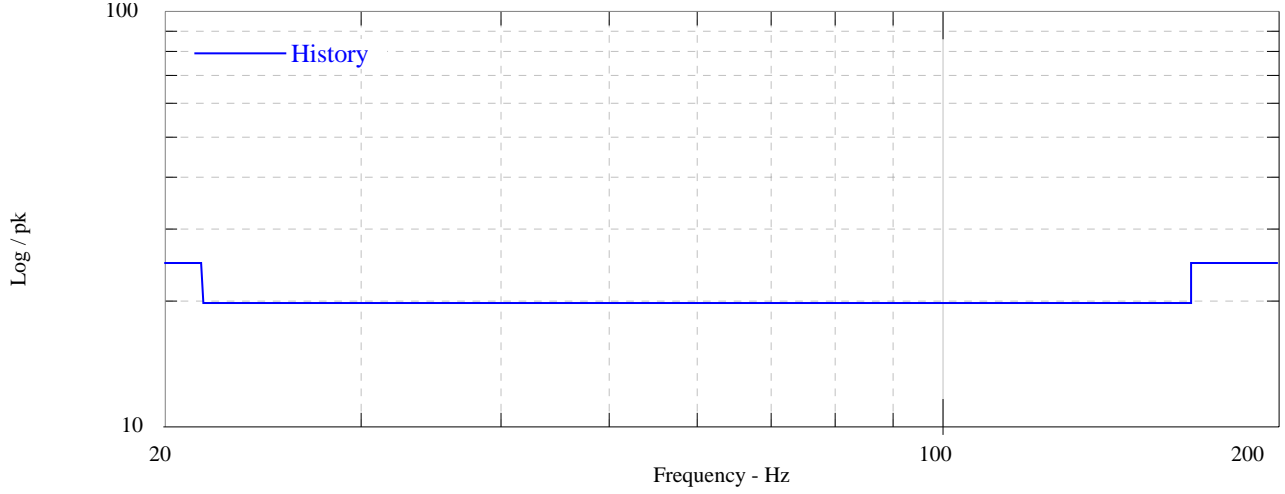
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SPIRE QM

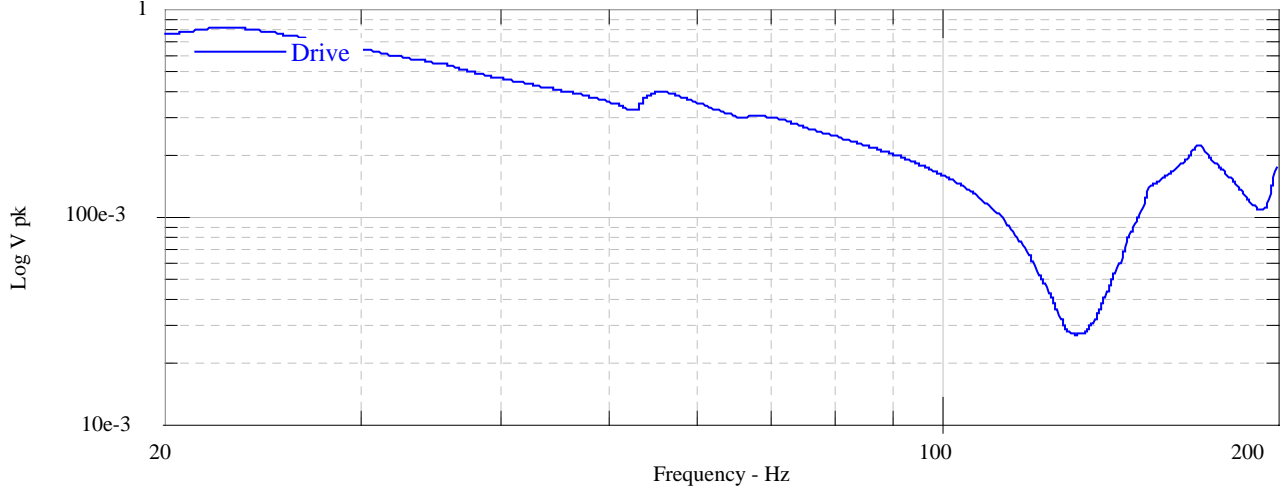
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Révision : 00
Date : 5-Apr-04
Page : NIS4Y - 1 / 12

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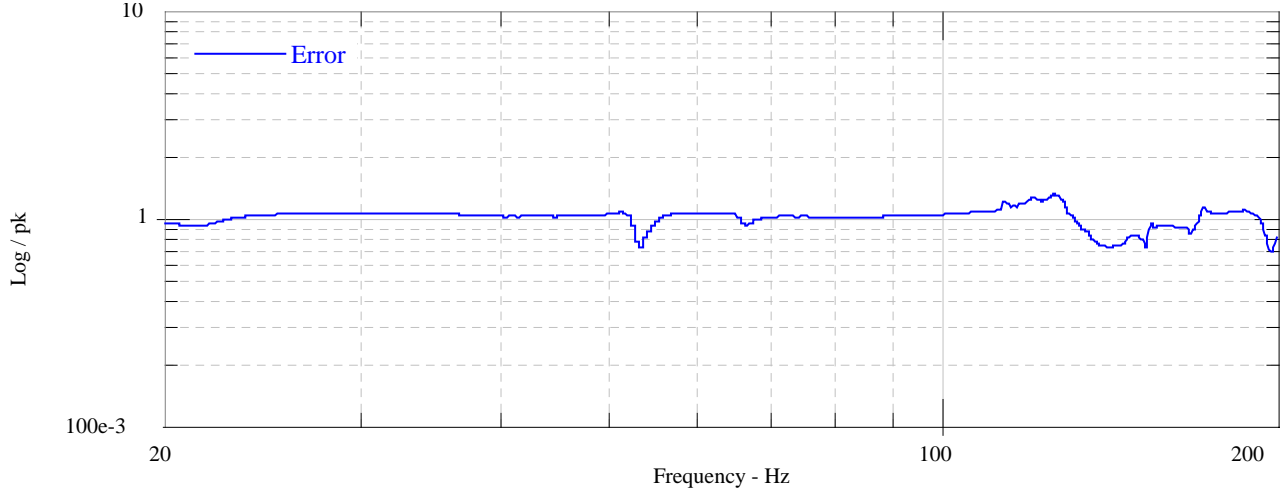
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

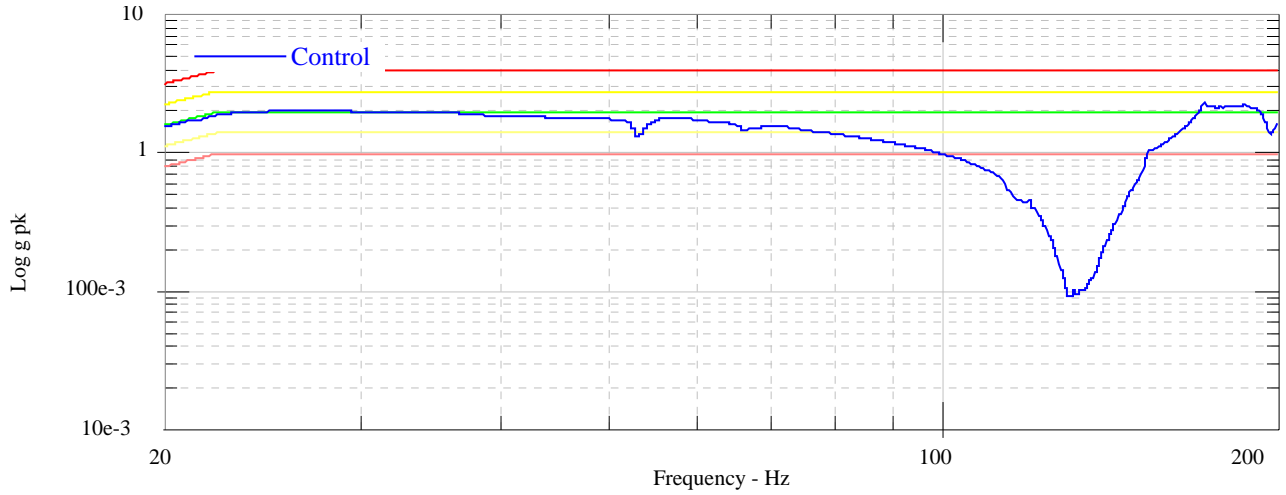


VIBRATION TEST REPORT
SPIRE QM

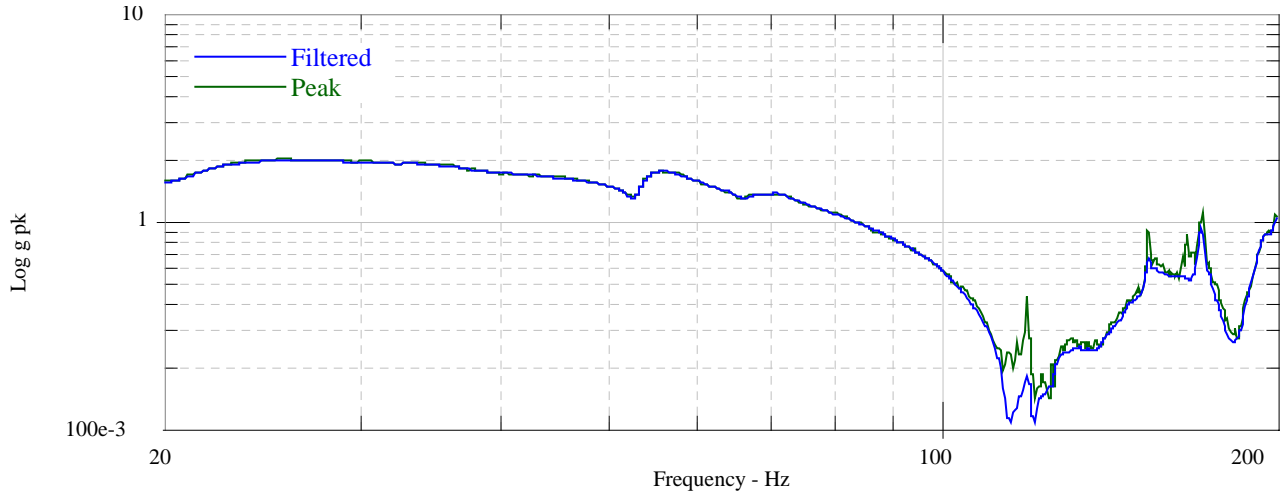
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Date : 5-Apr-04
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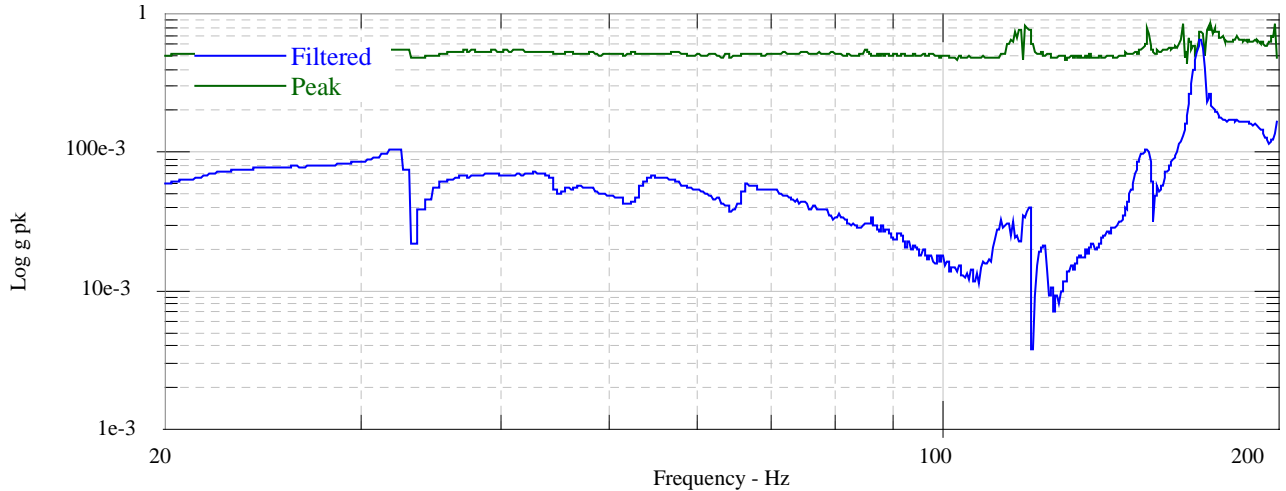
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

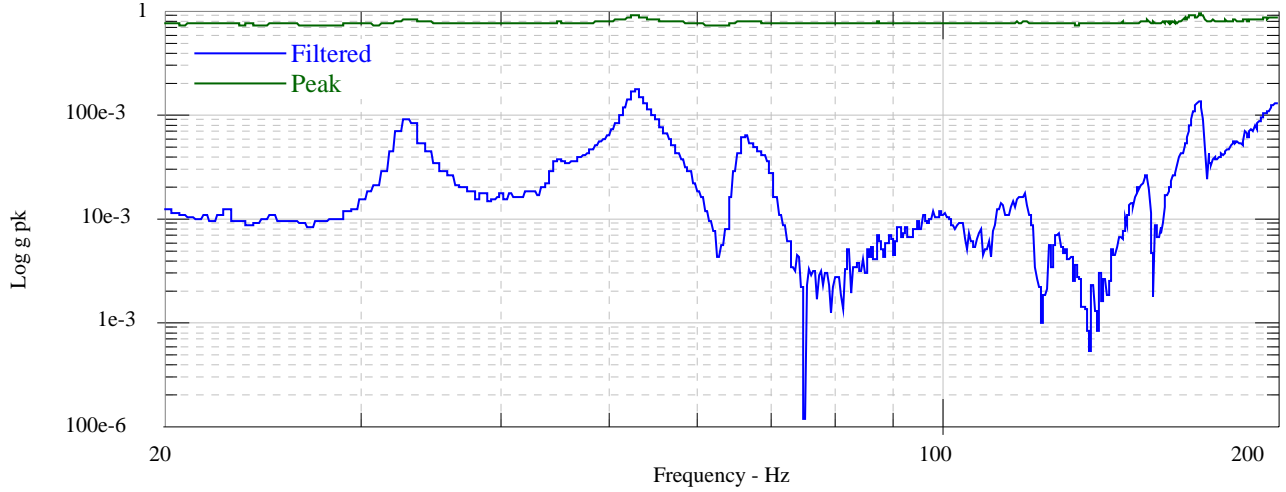


VIBRATION TEST REPORT
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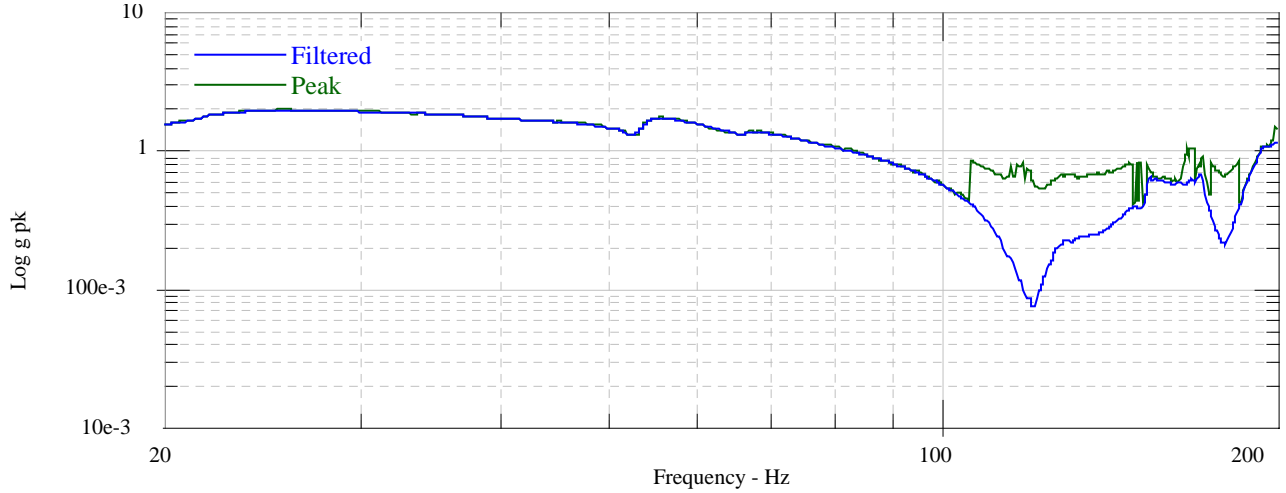
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Révision : 00
Date : 5-Apr-04
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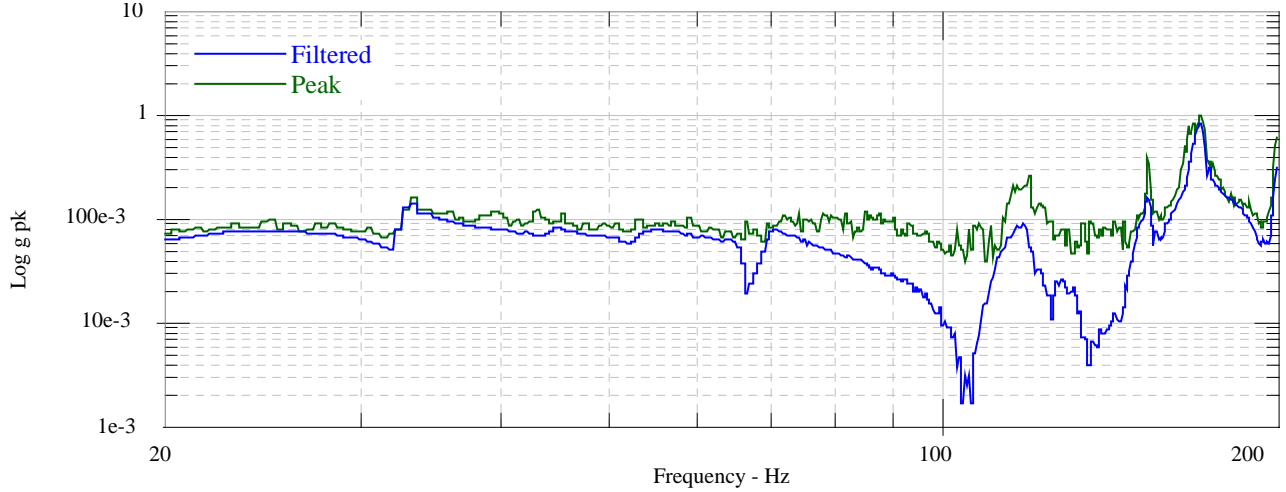
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

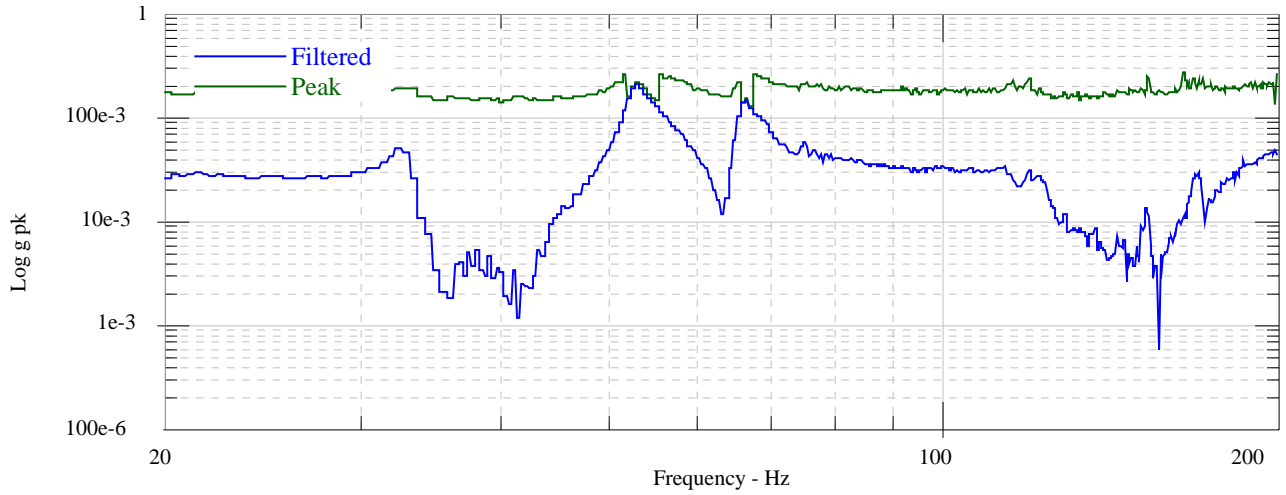


VIBRATION TEST REPORT
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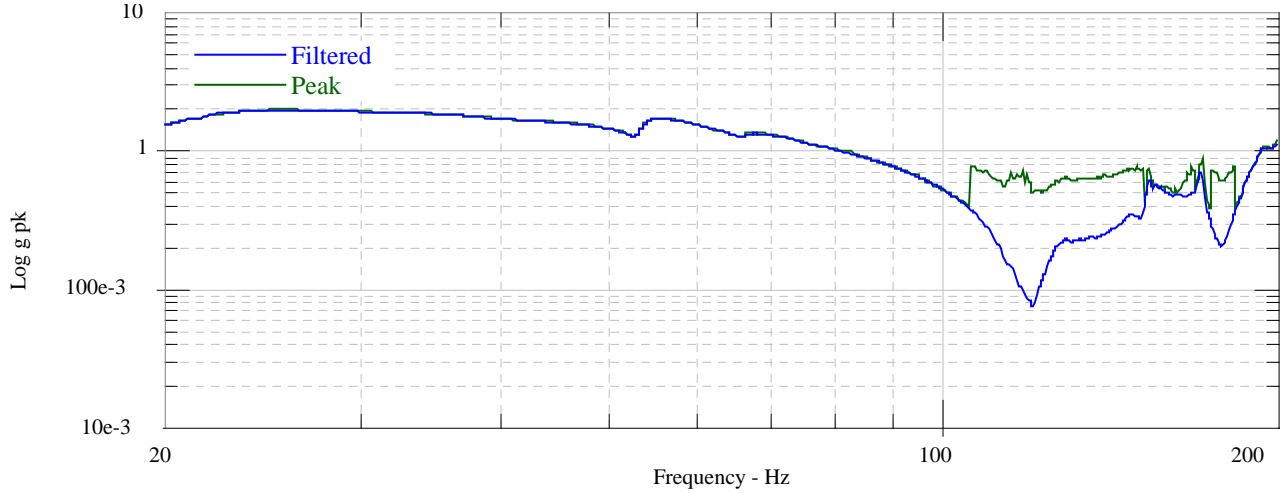
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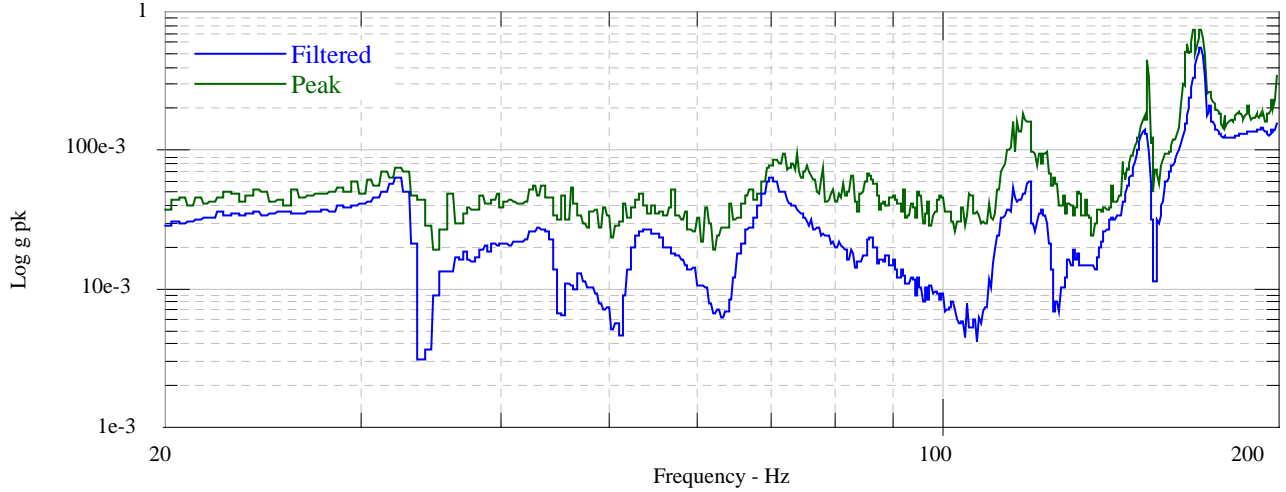
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

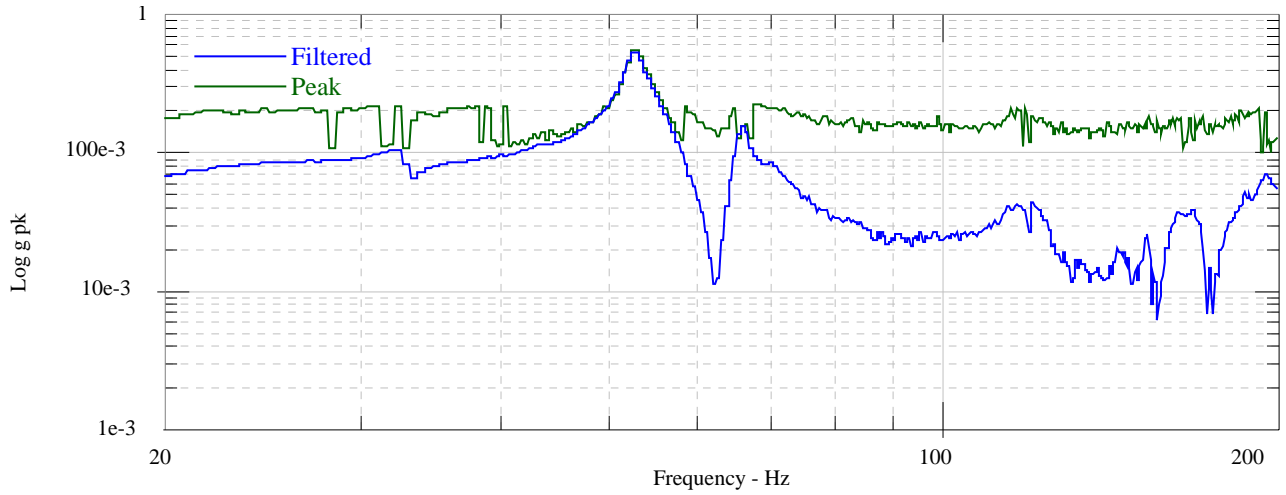


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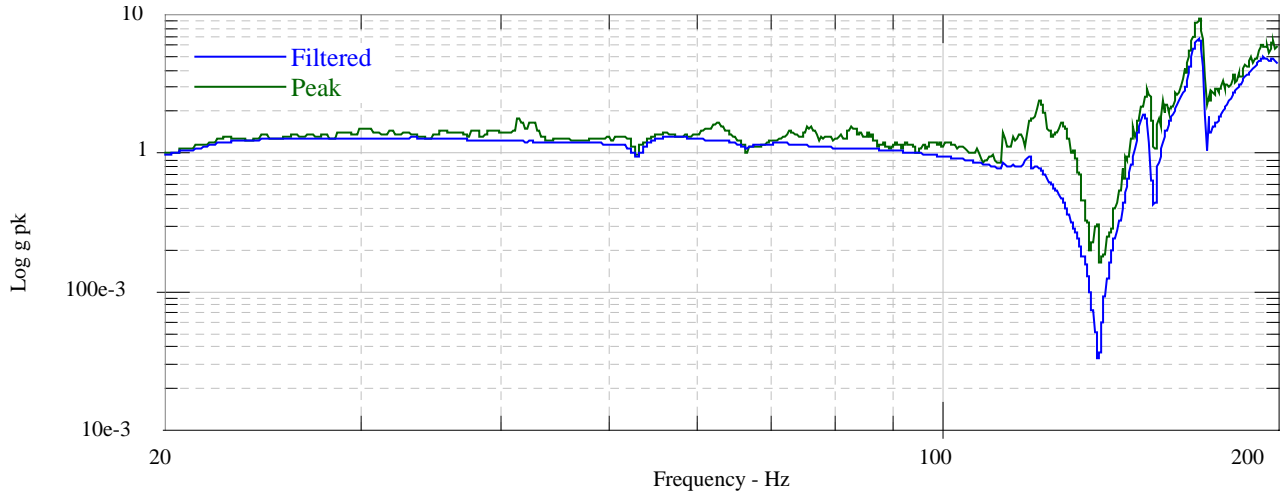
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Révision : 00
Date : 5-Apr-04
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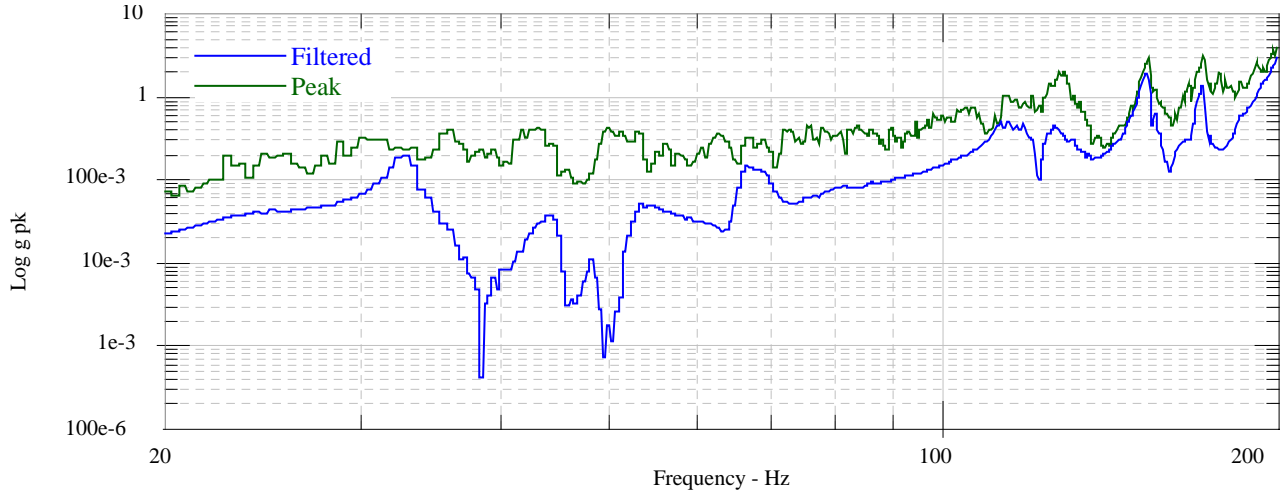
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

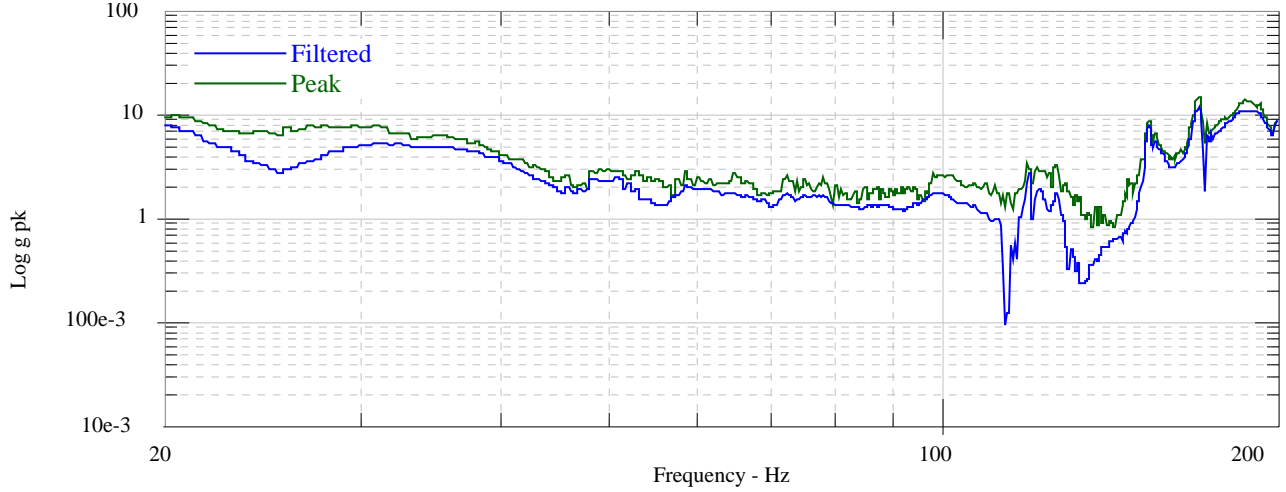


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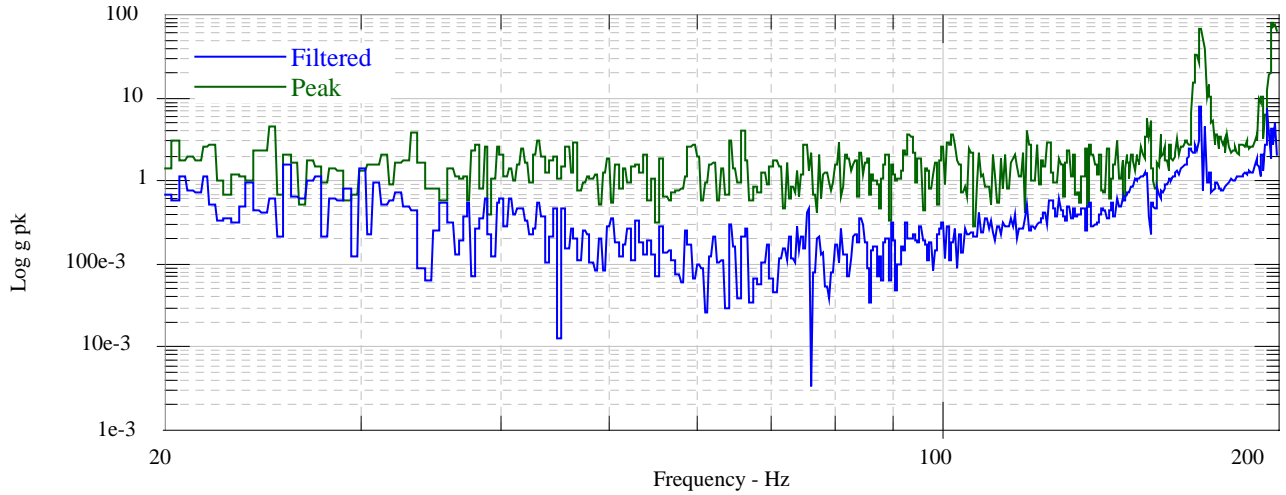
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Date : 5-Apr-04
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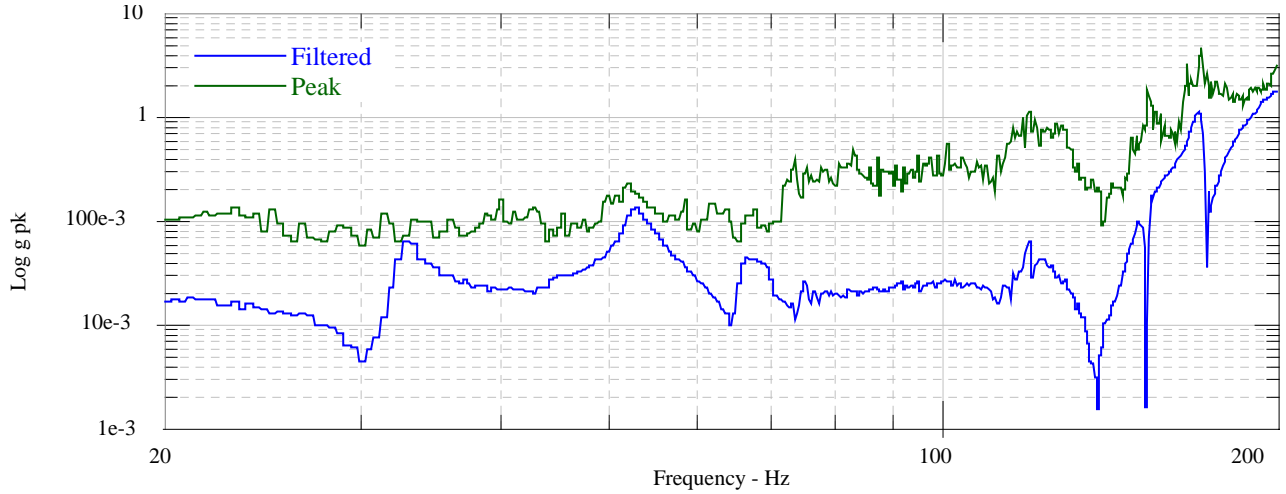
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

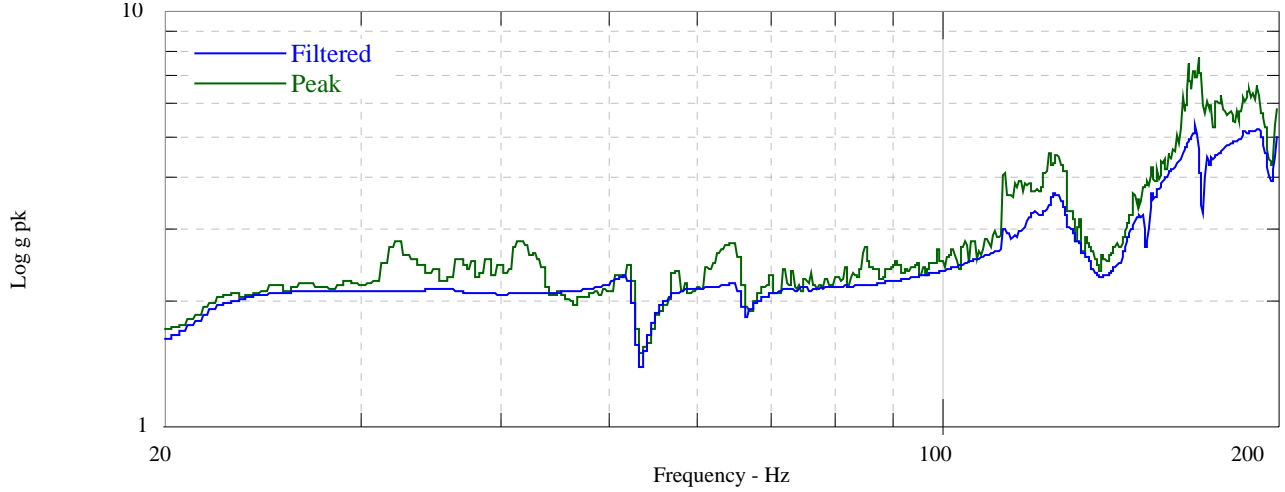


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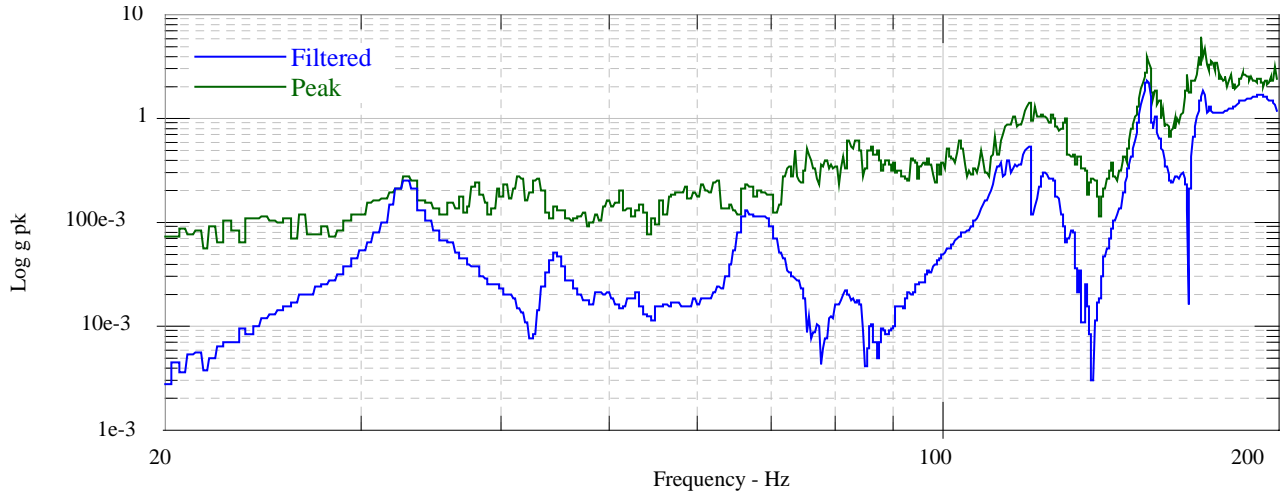
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Date : 5-Apr-04
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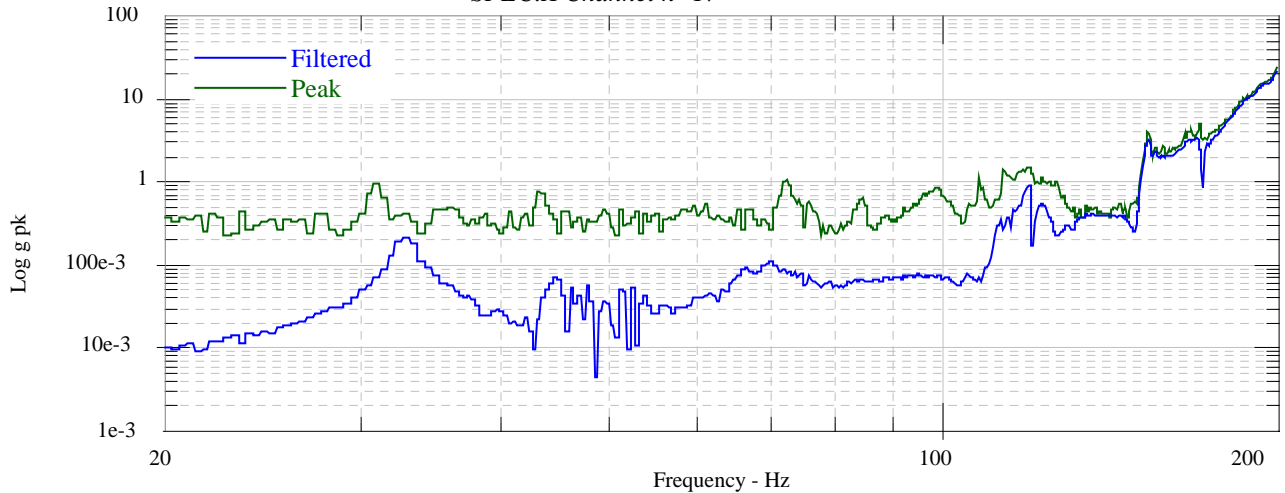
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FPU.Z Channel n° 16



SPEC.X Channel n° 17

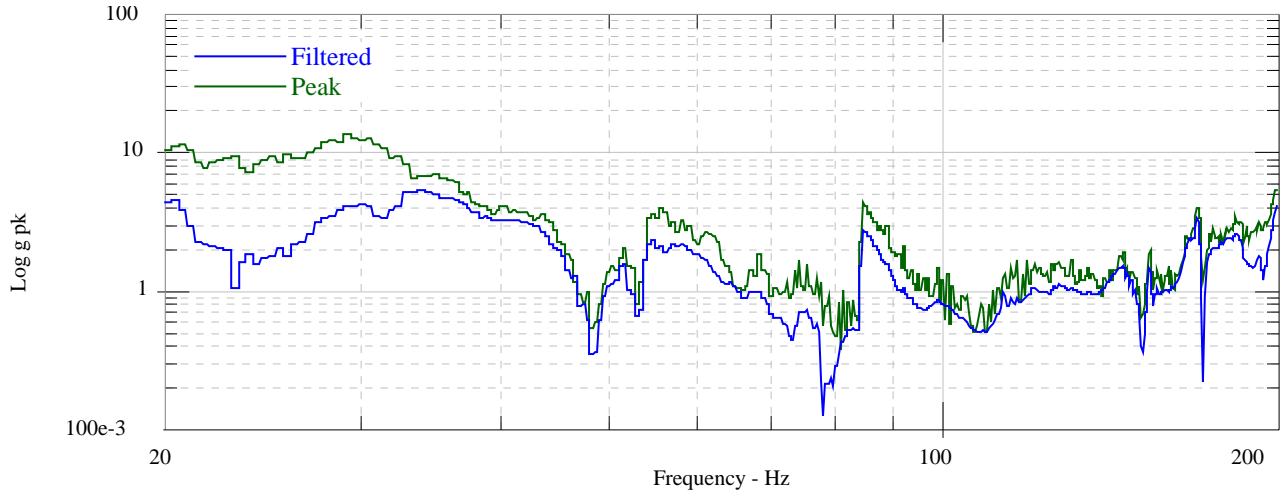


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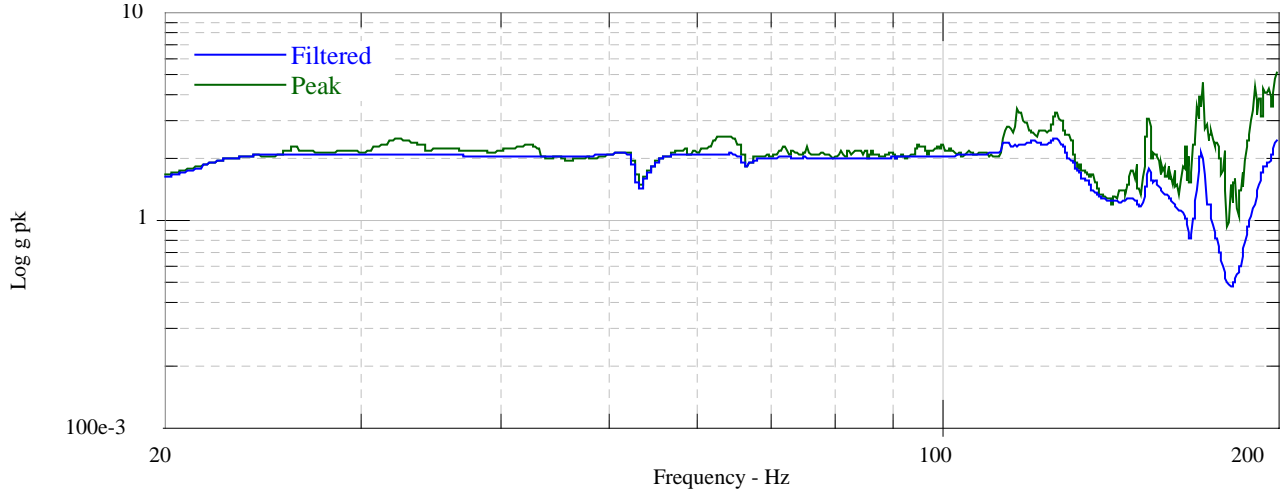
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Révision : 00
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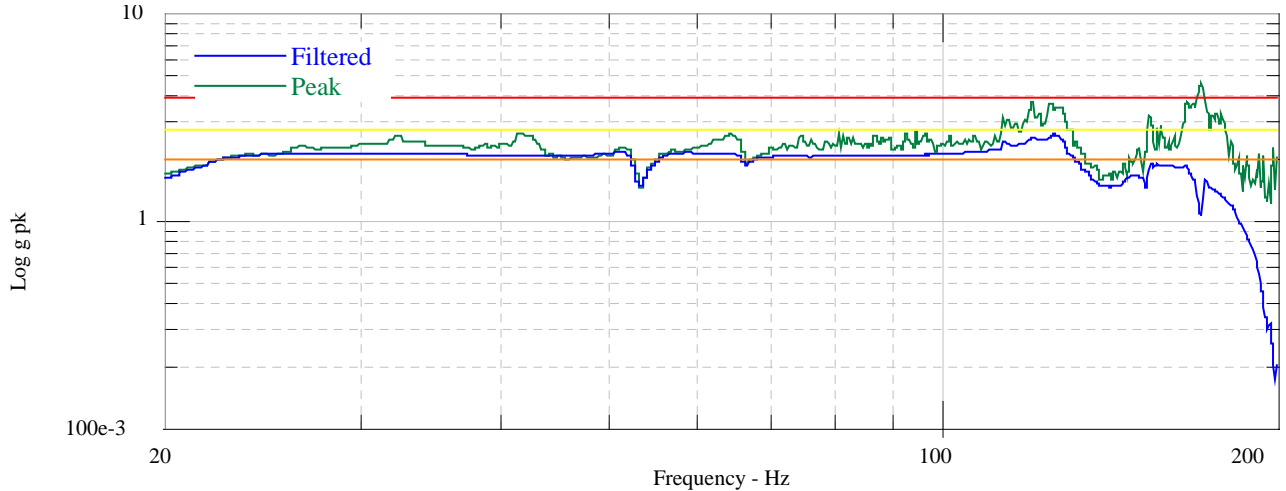
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

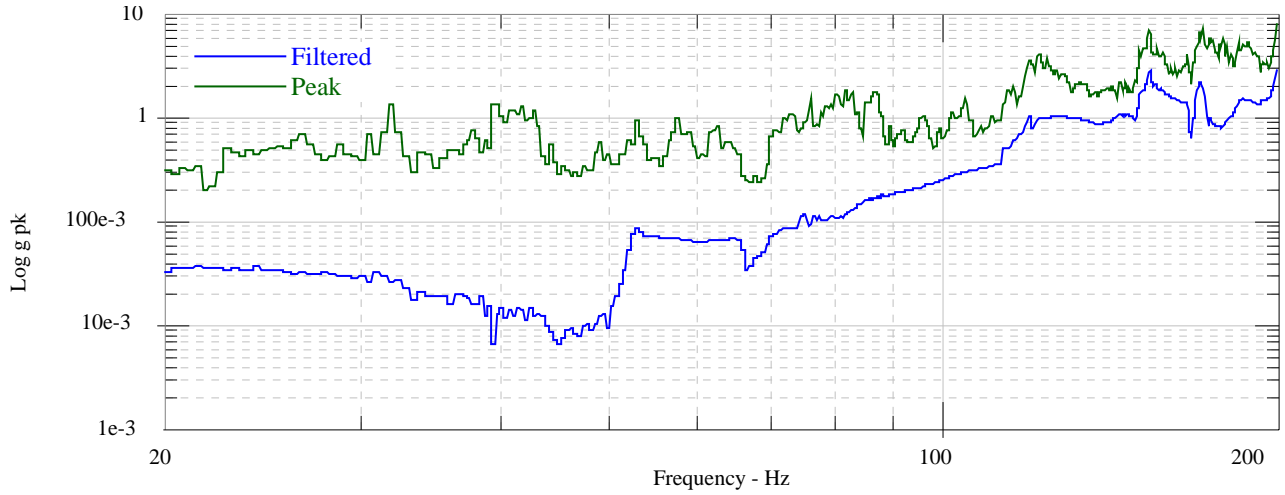


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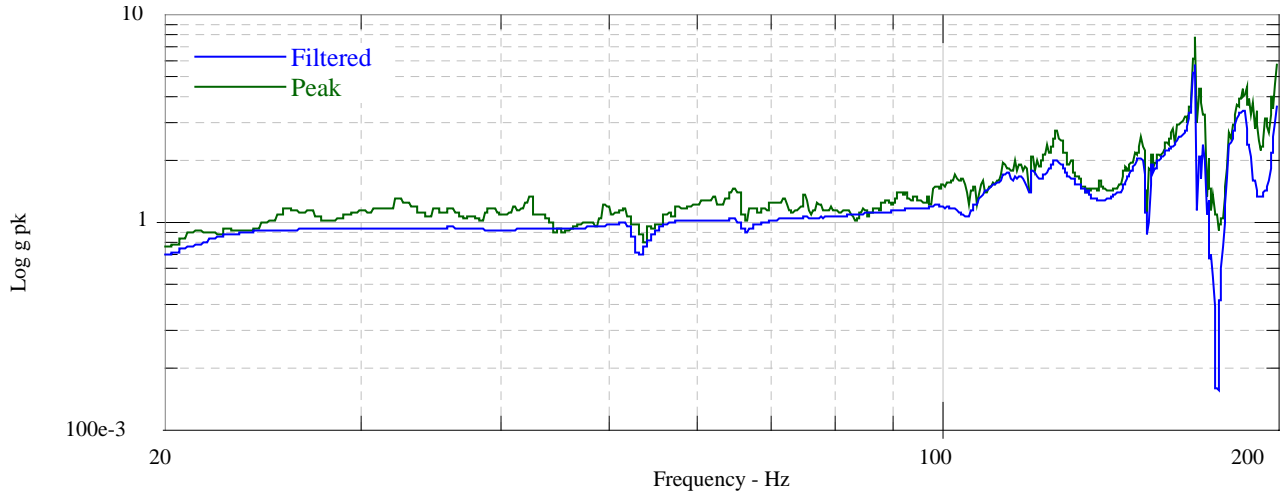
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Révision : 00
Date : 5-Apr-04
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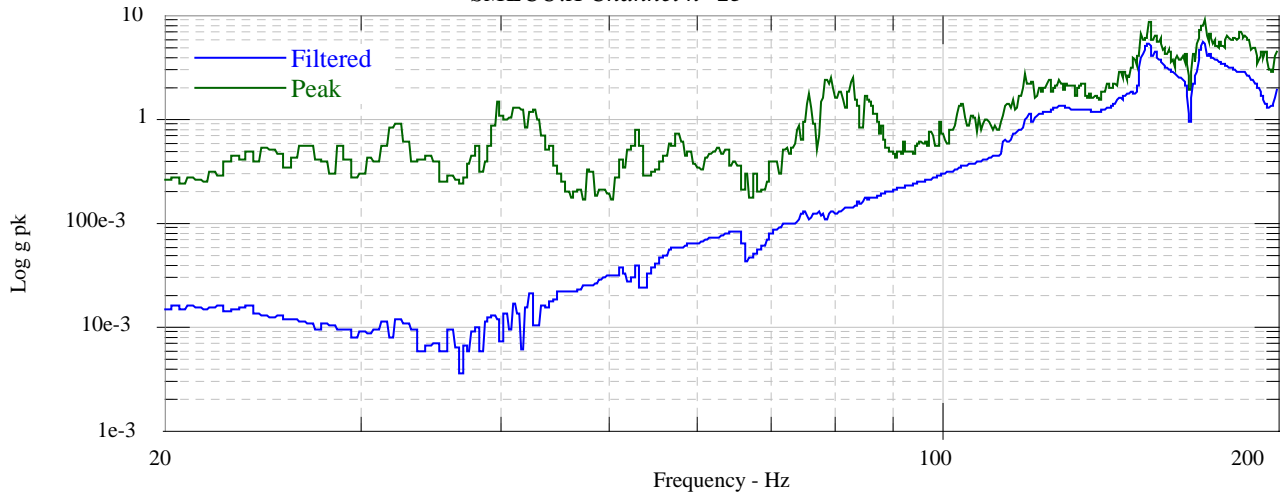
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

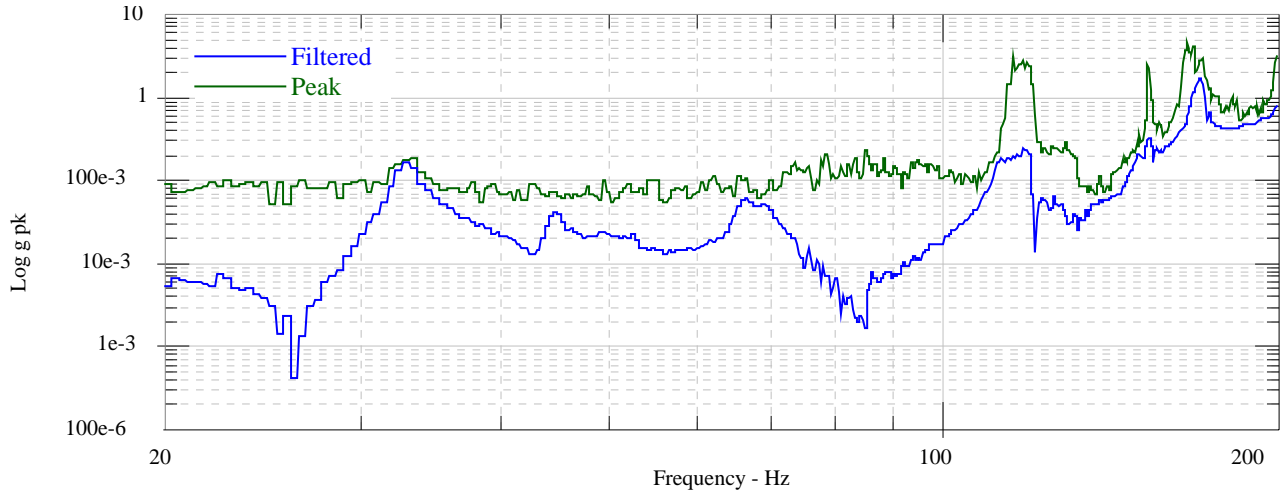


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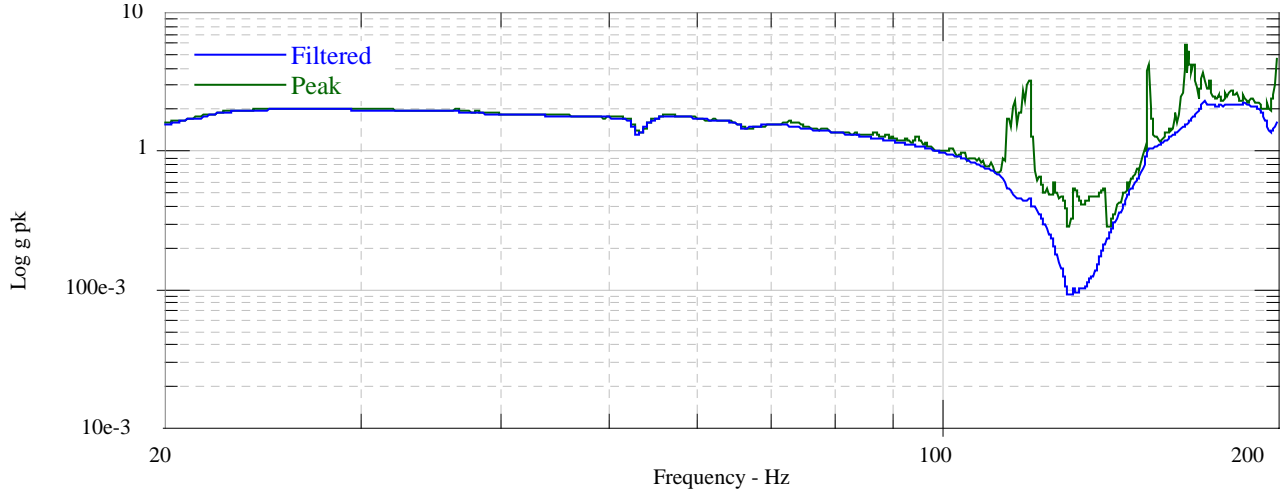
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Date : 5-Apr-04
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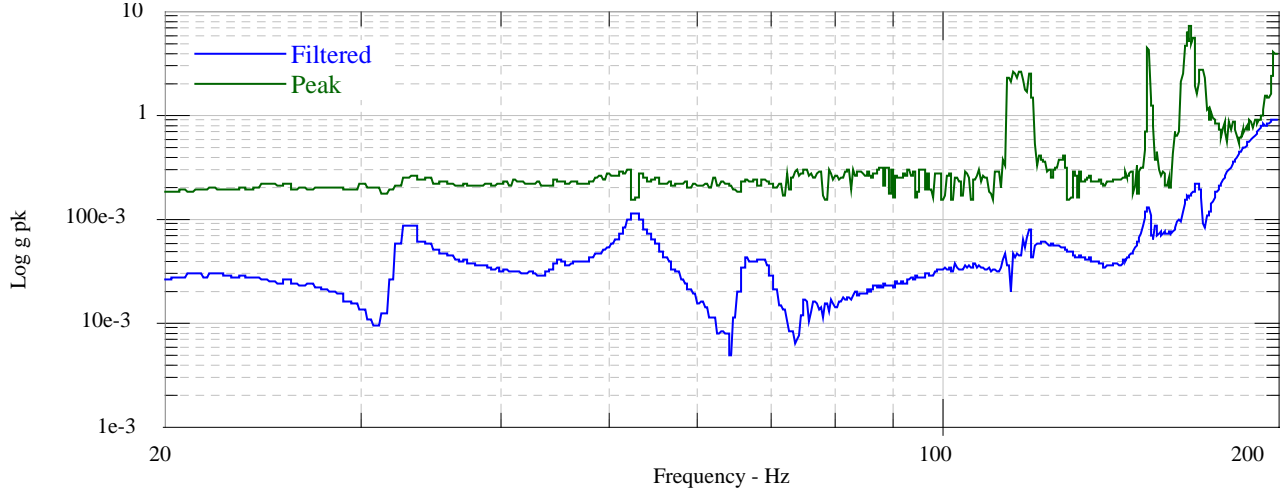
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

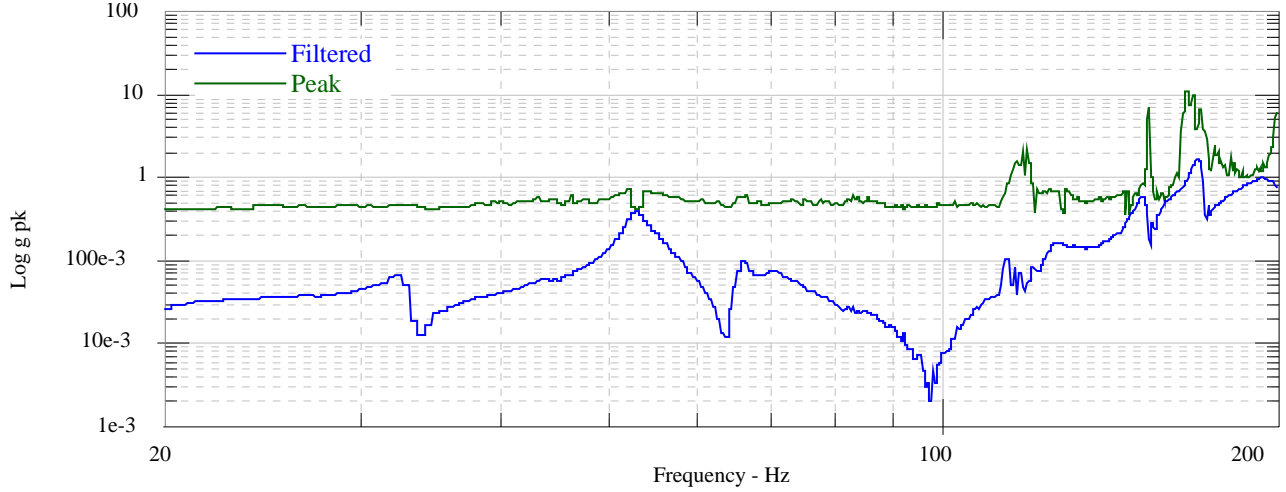


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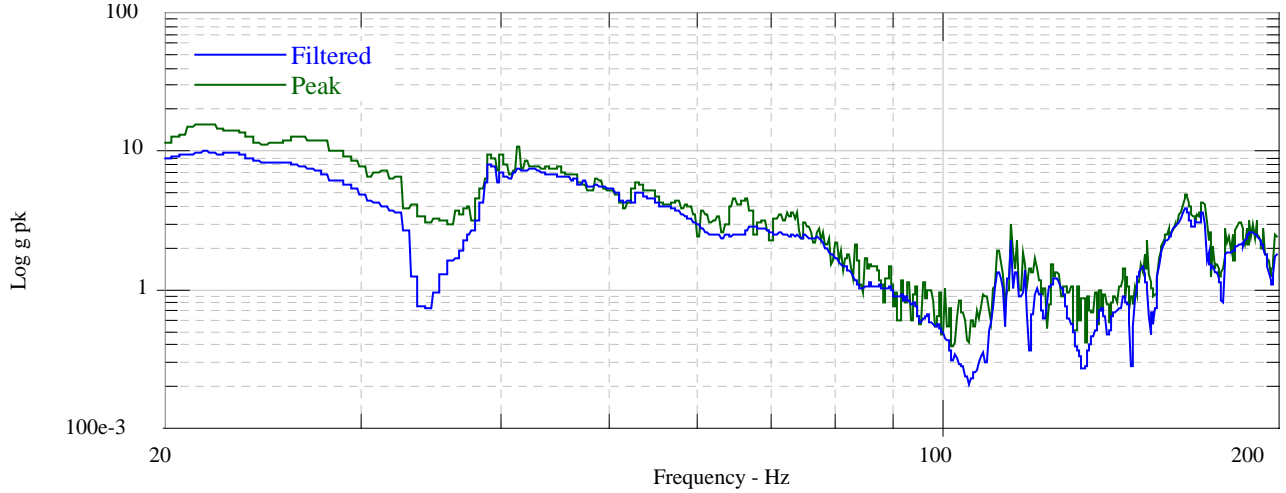
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Date : 5-Apr-04
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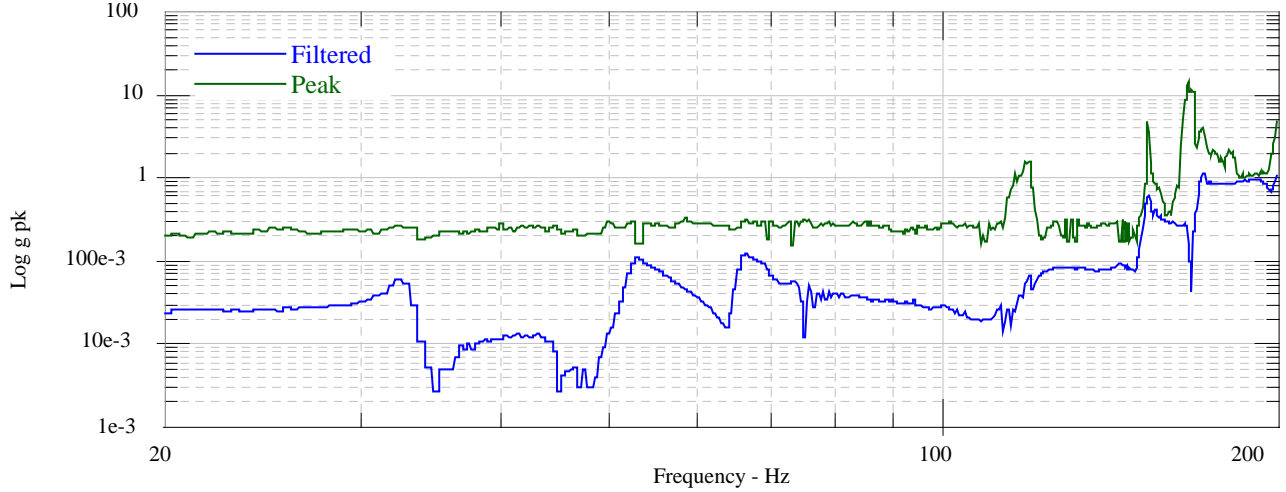
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

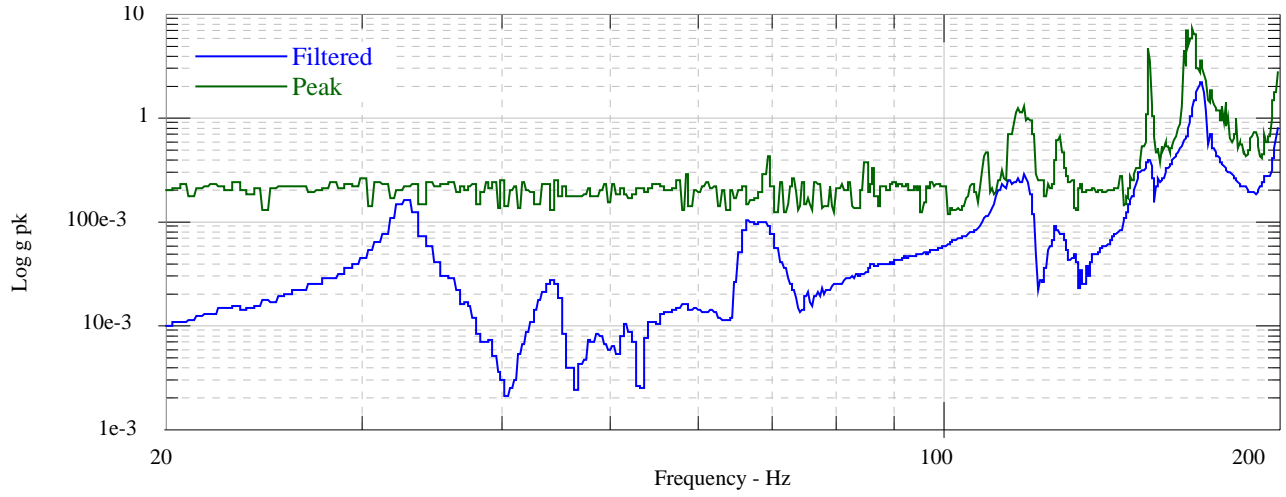


VIBRATION TEST REPORT
SPIRE QM

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+YAFRAME.Z Channel n° 30



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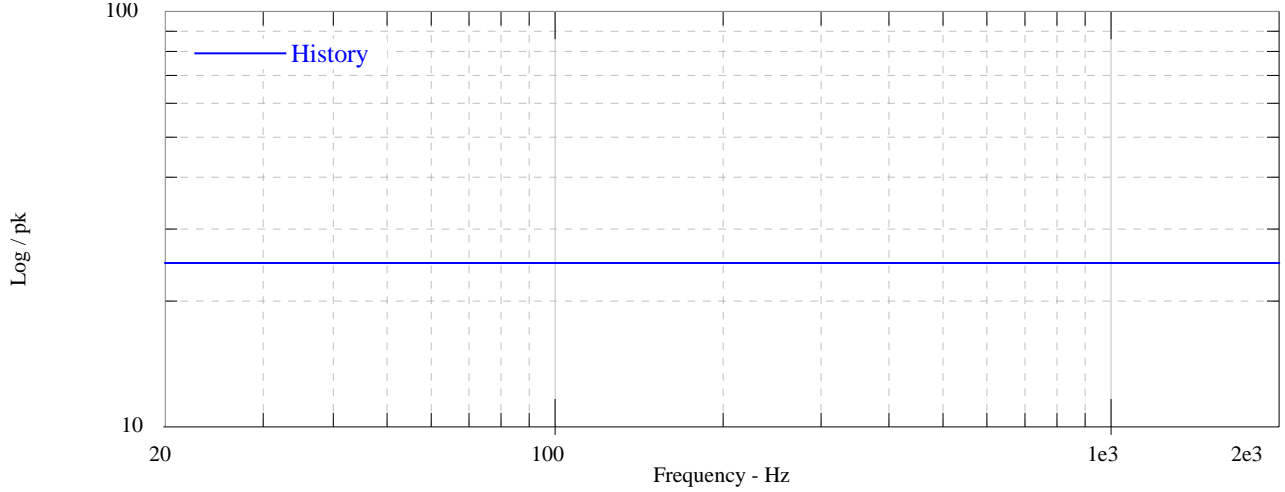
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SPIRE QM

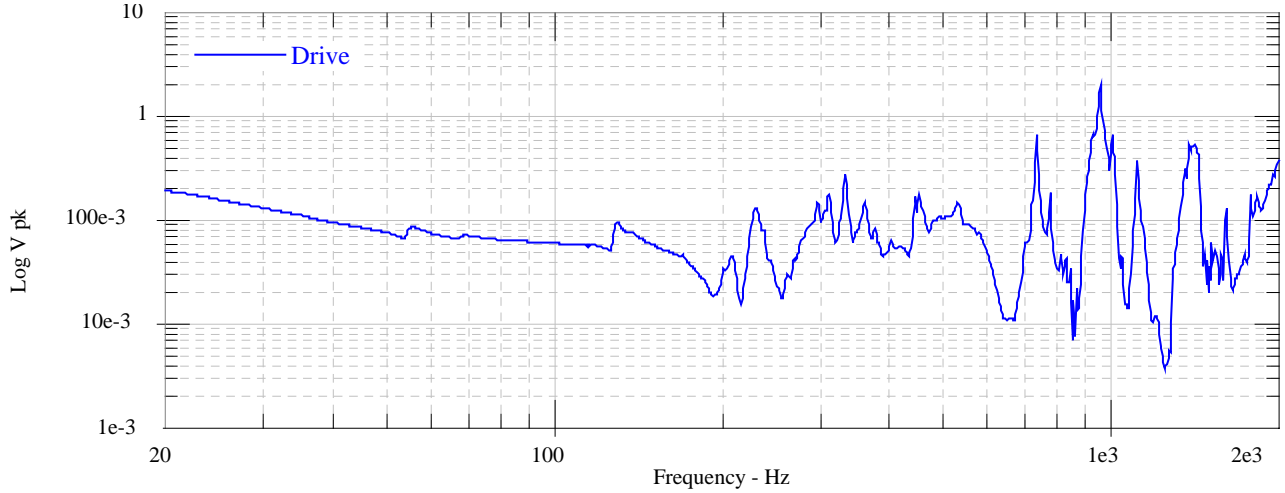
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Révision : 00
Date : 5-Apr-04
Page : BNS5Y - 1 / 12

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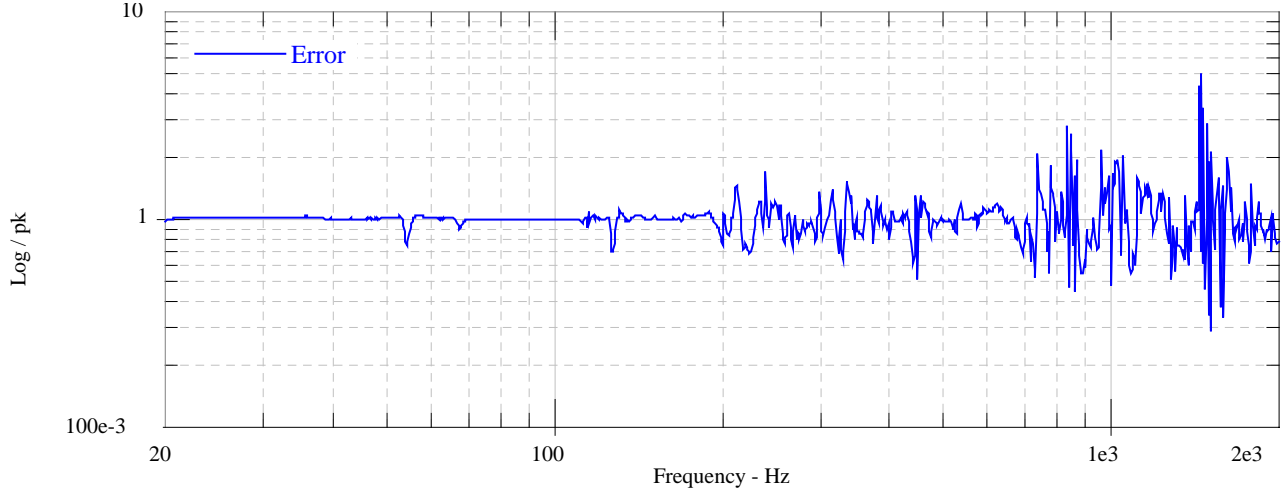
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

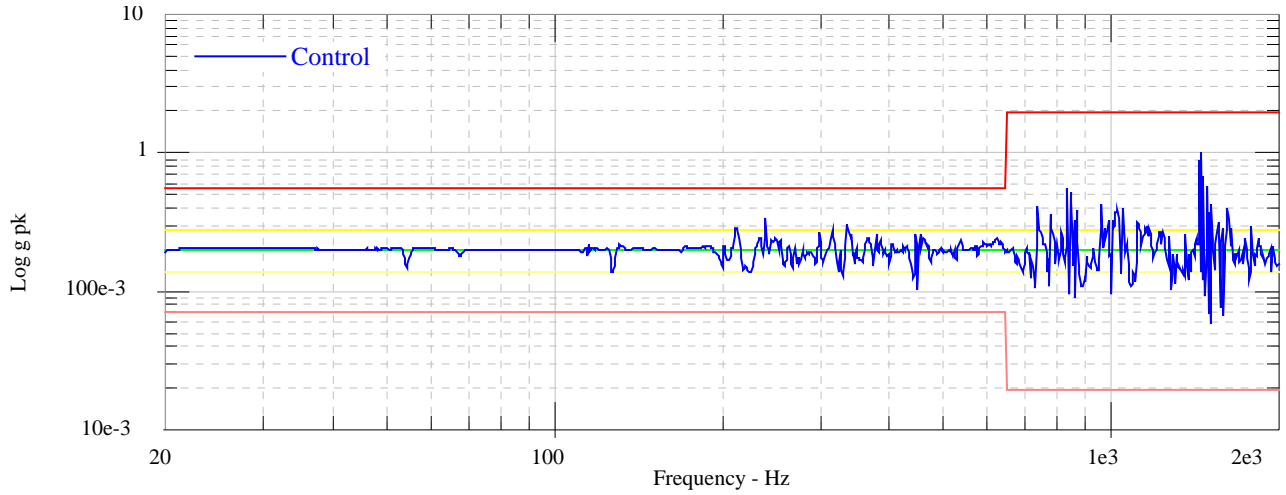


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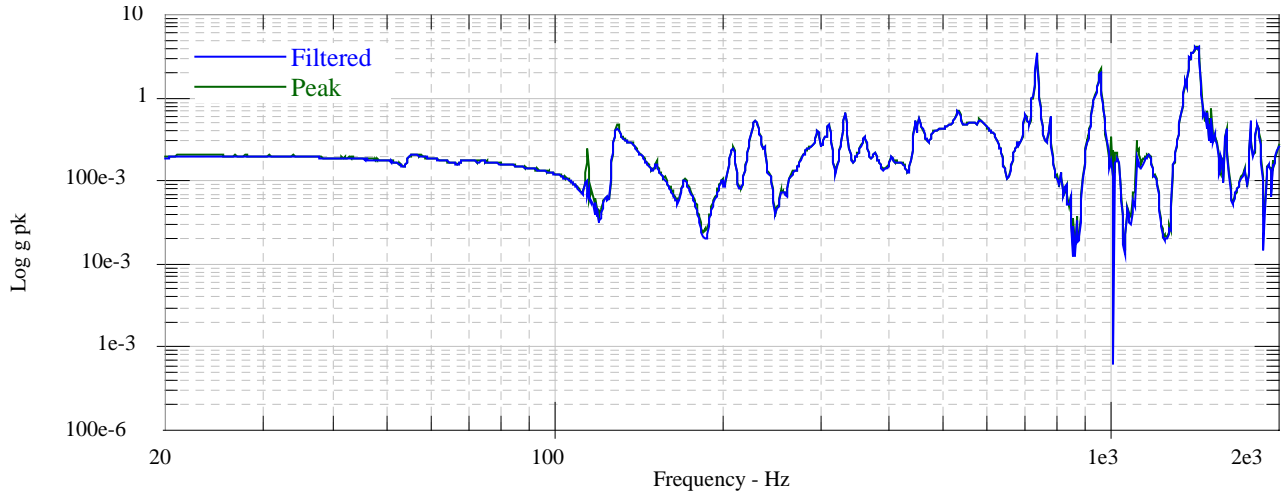
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Date : 5-Apr-04
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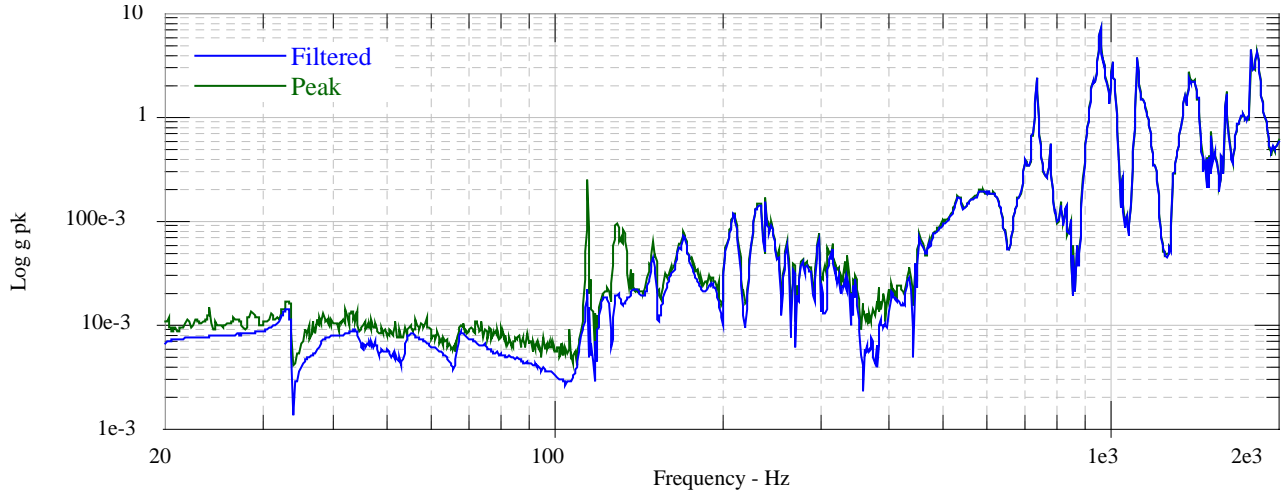
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

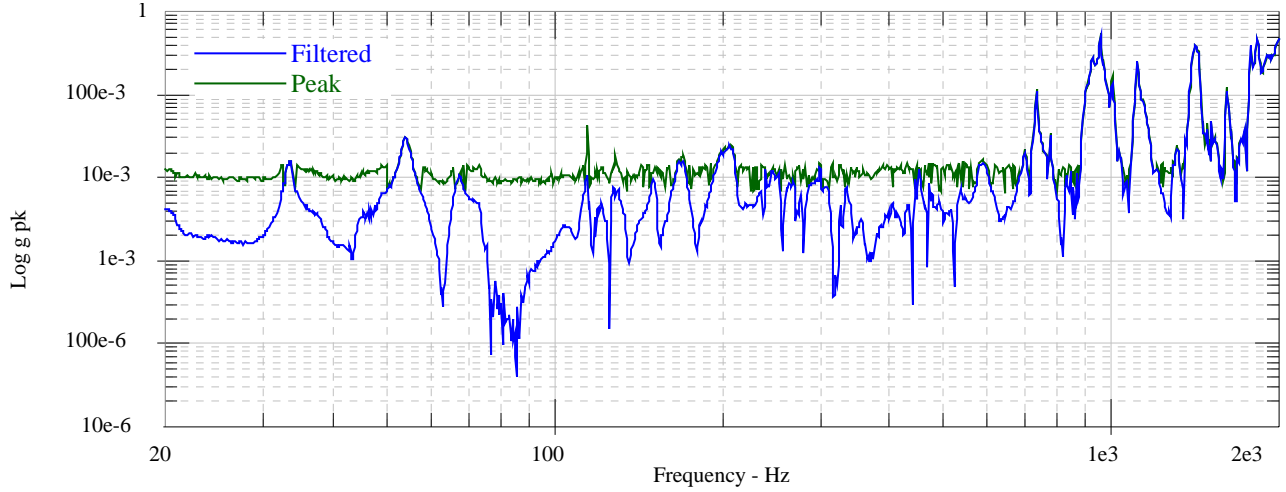


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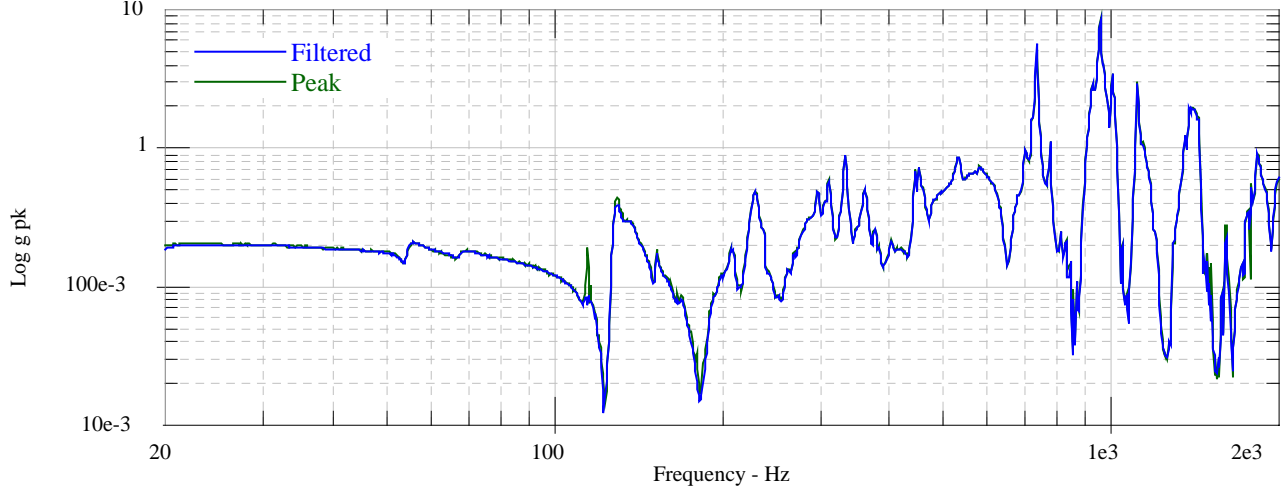
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Révision : 00
Date : 5-Apr-04
Page : BNS5Y - 3 / 12

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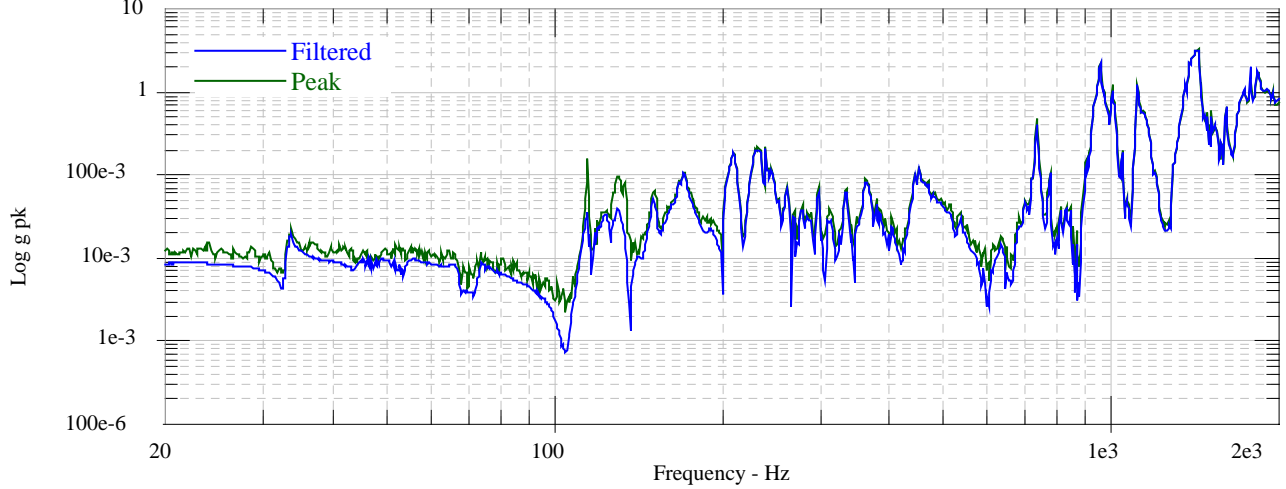
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

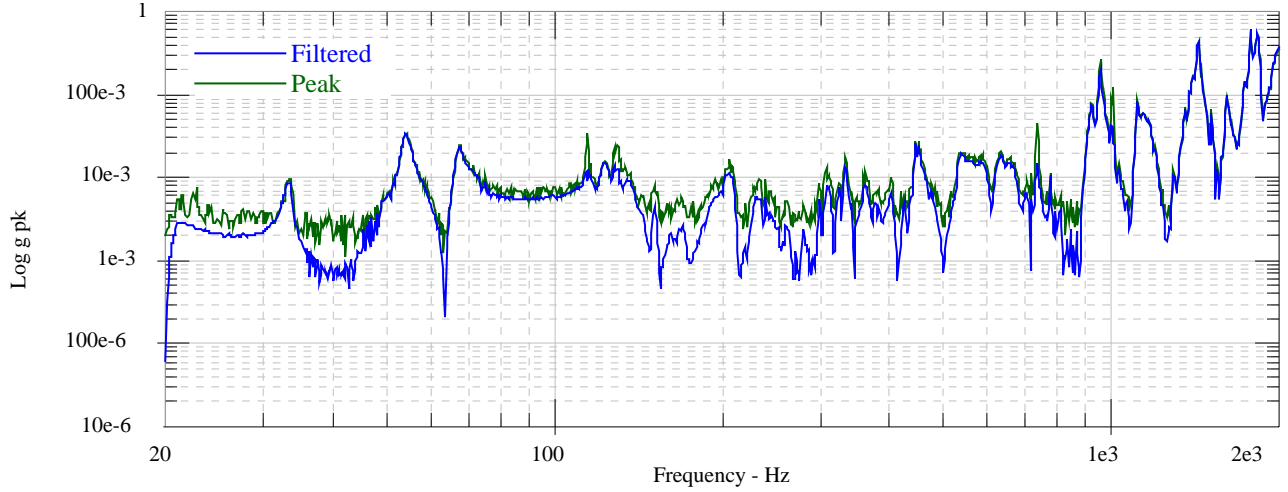


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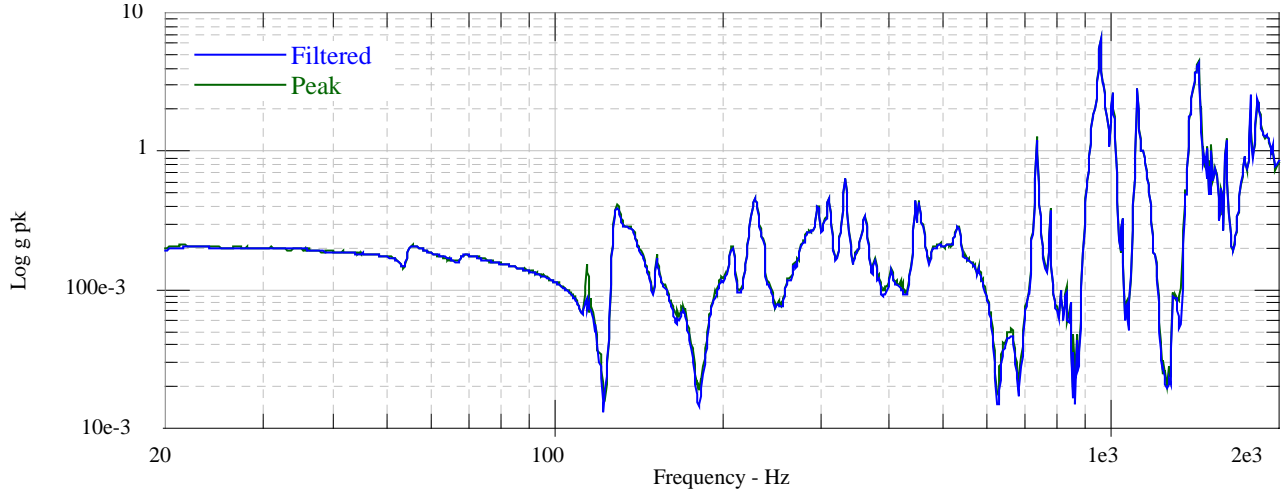
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Version : 01
Révision : 00
Date : 5-Apr-04
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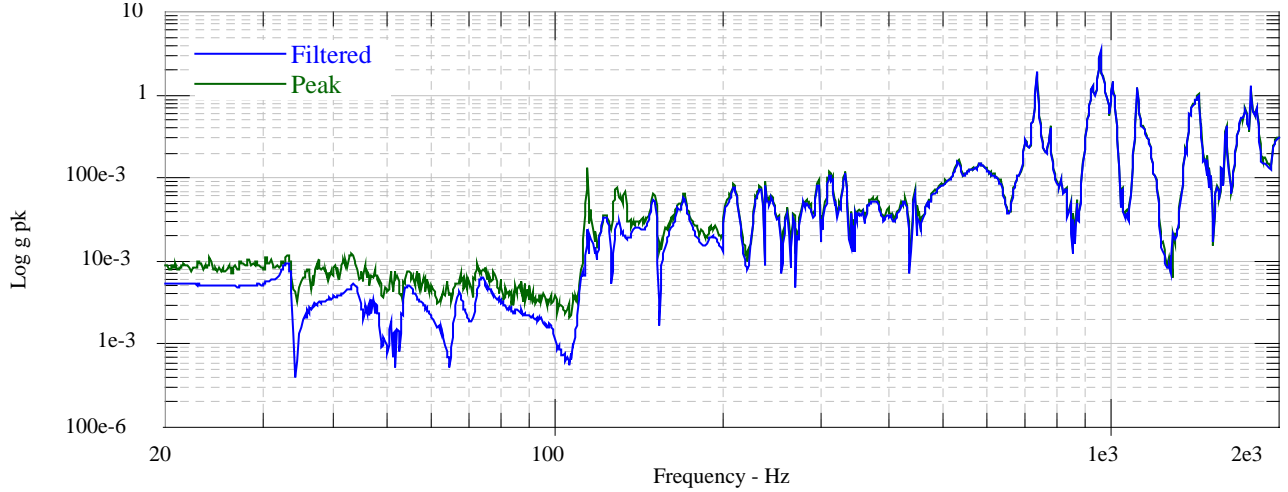
SHK.2.X Channel n° 6



SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

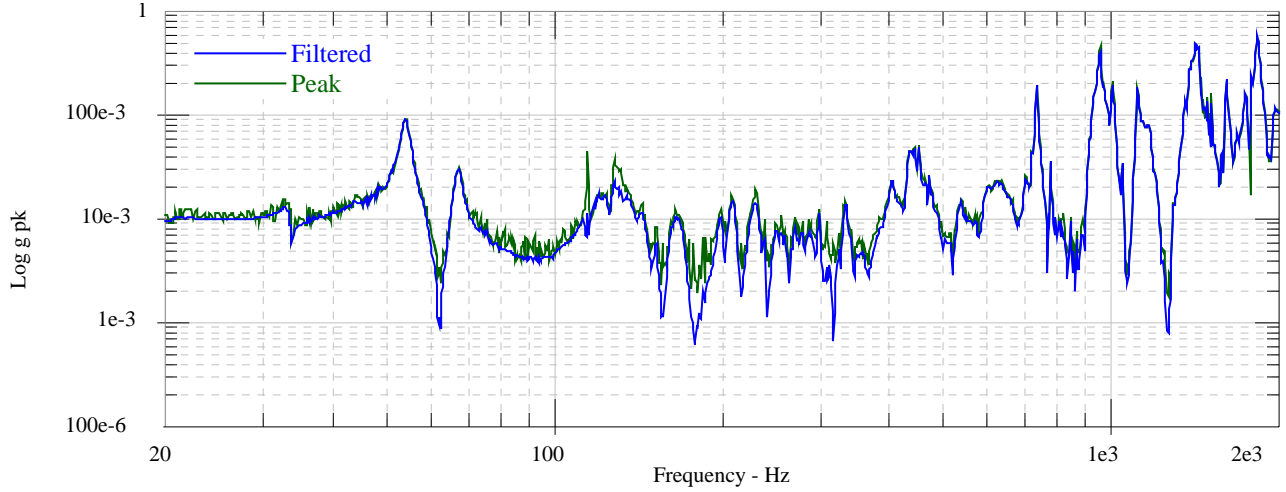


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SPIRE QM

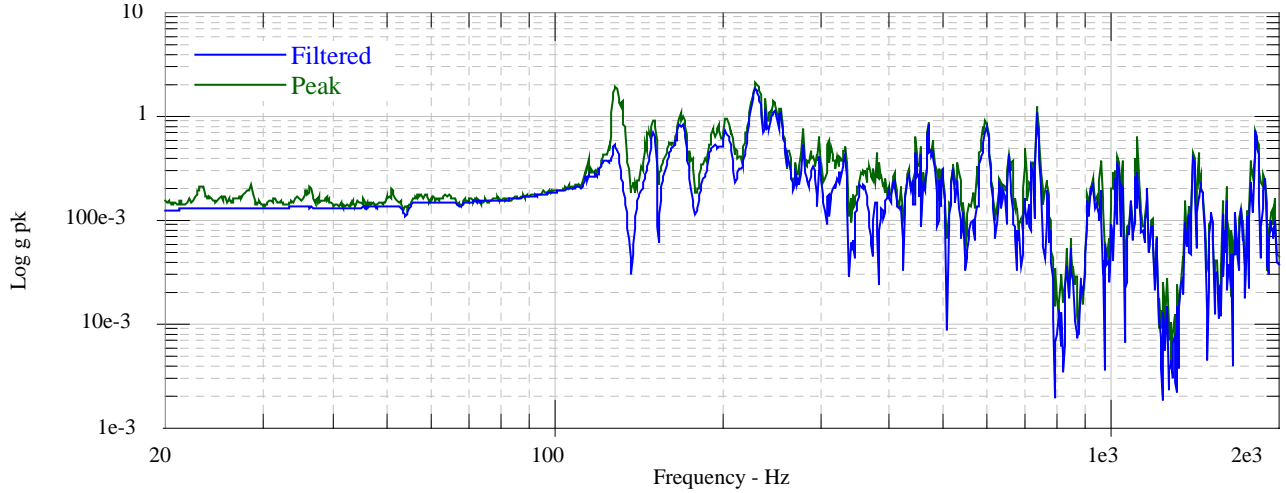
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Date : 5-Apr-04
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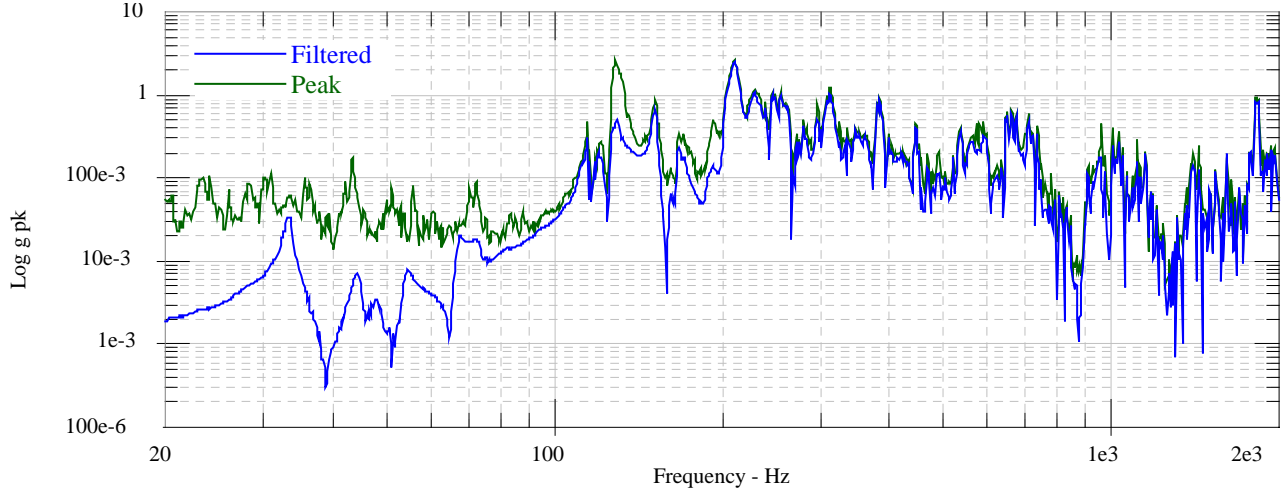
SHK.3.X Channel n° 9



PHS.XY Channel n° 10



PHS.Z Channel n° 11

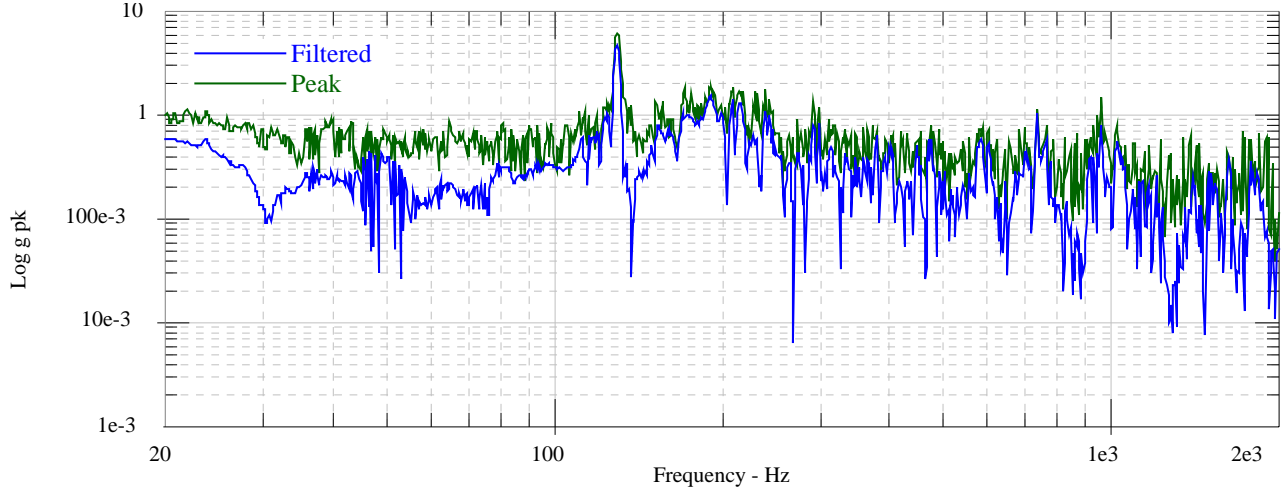


VIBRATION TEST REPORT
SPIRE QM

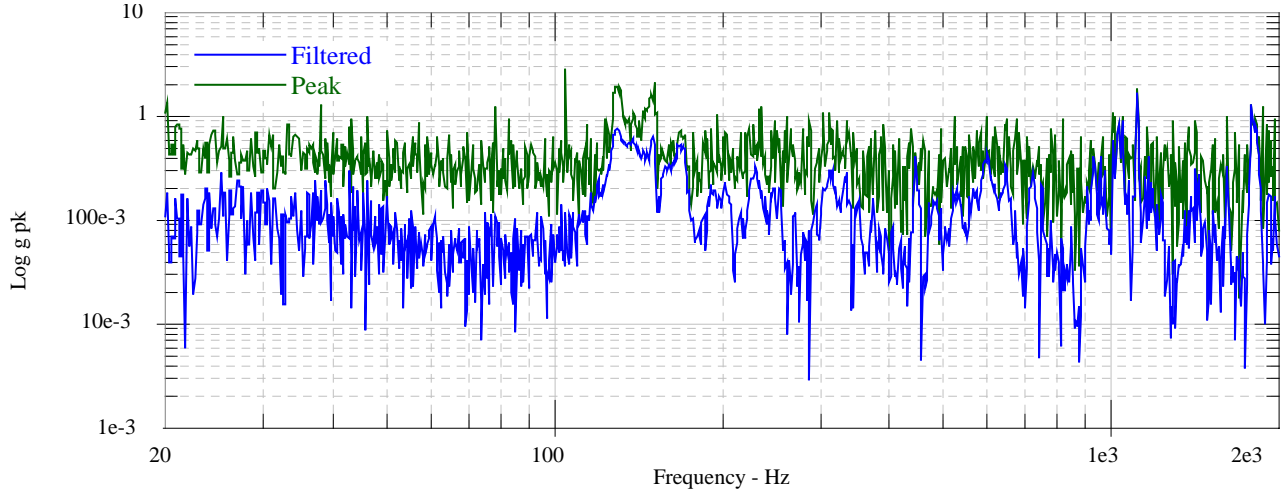
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Révision : 00
Date : 5-Apr-04
Page : BNS5Y - 6 / 12

05/04/04 17:53:41

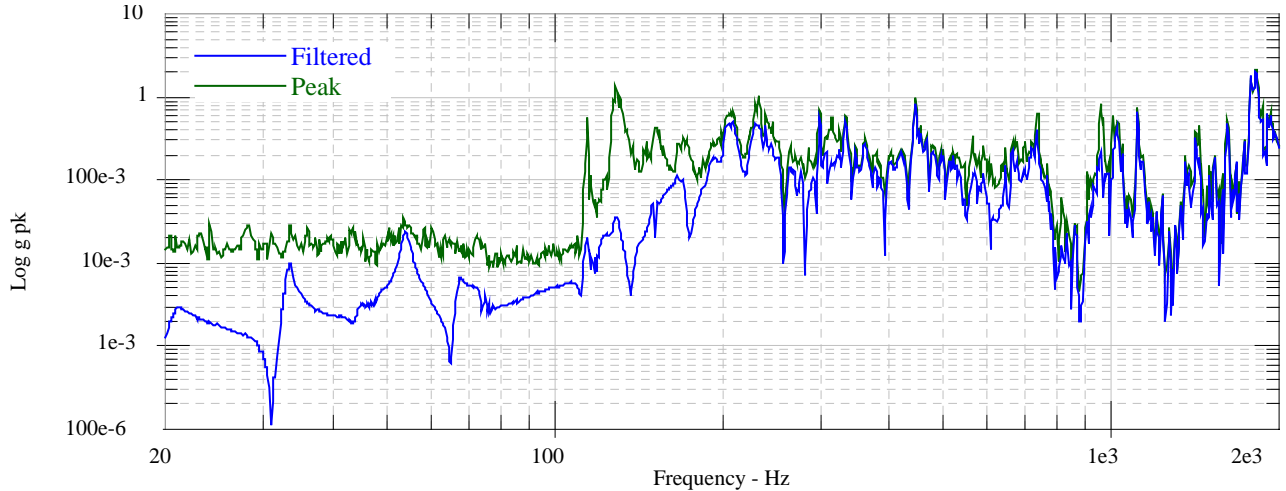
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COOL.X Channel n° 13



FPU.X Channel n° 14

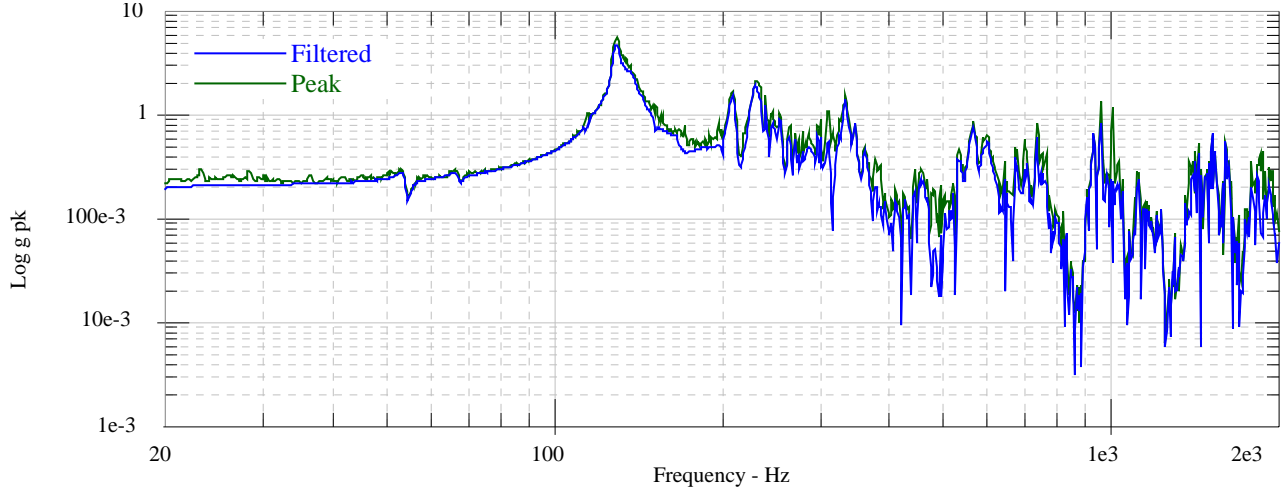


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SPIRE QM

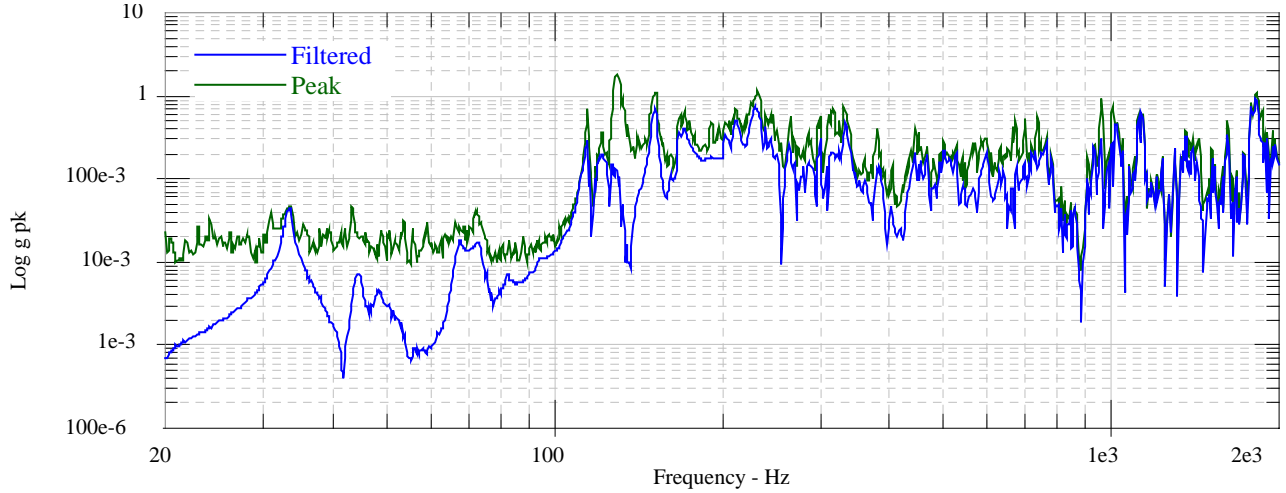
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Date : 5-Apr-04
Page : BNS5Y - 7 / 12

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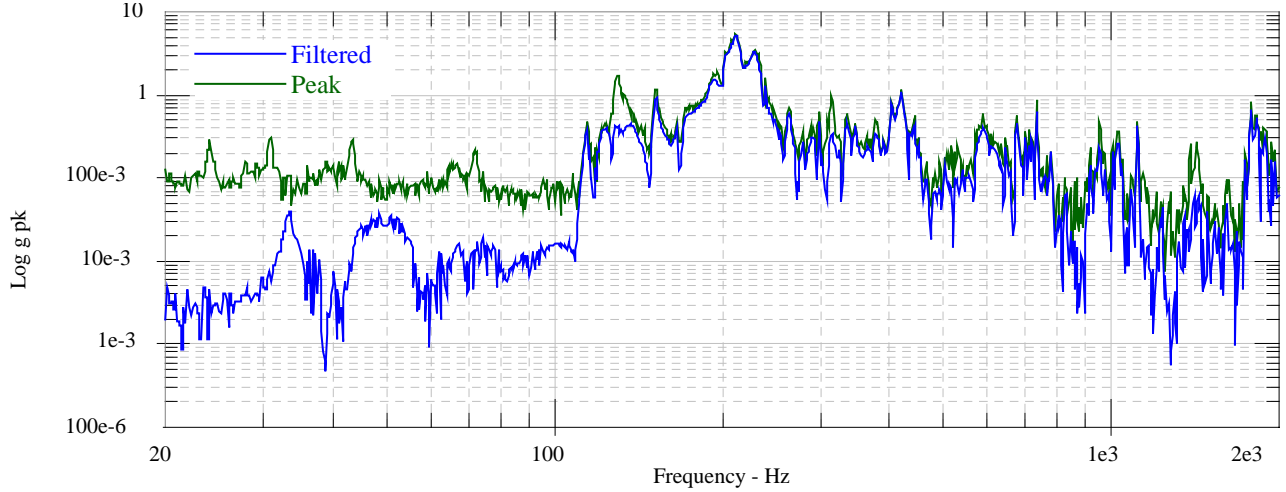
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

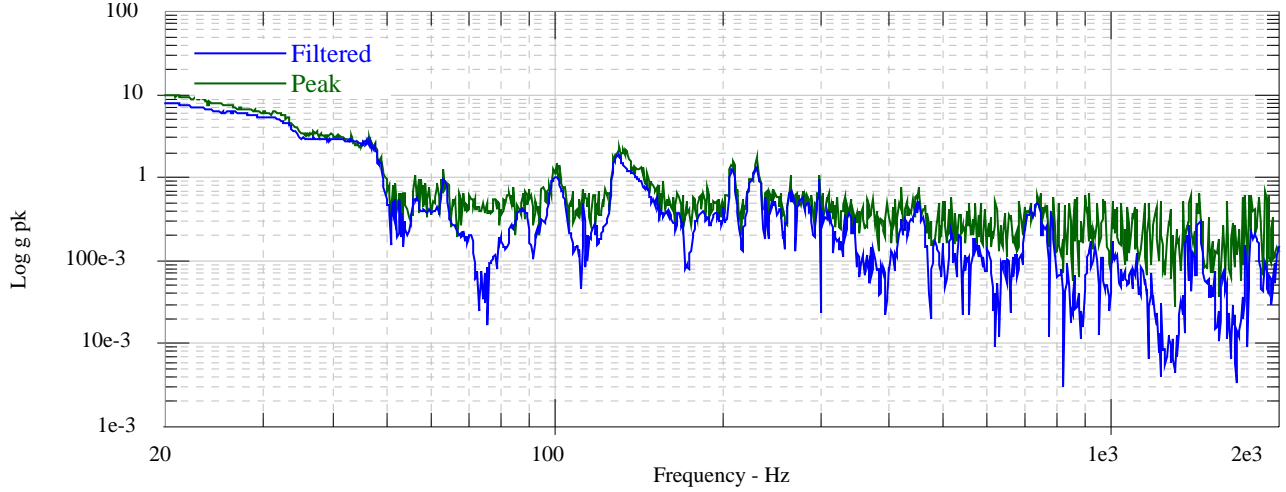


VIBRATION TEST REPORT
SPIRE QM

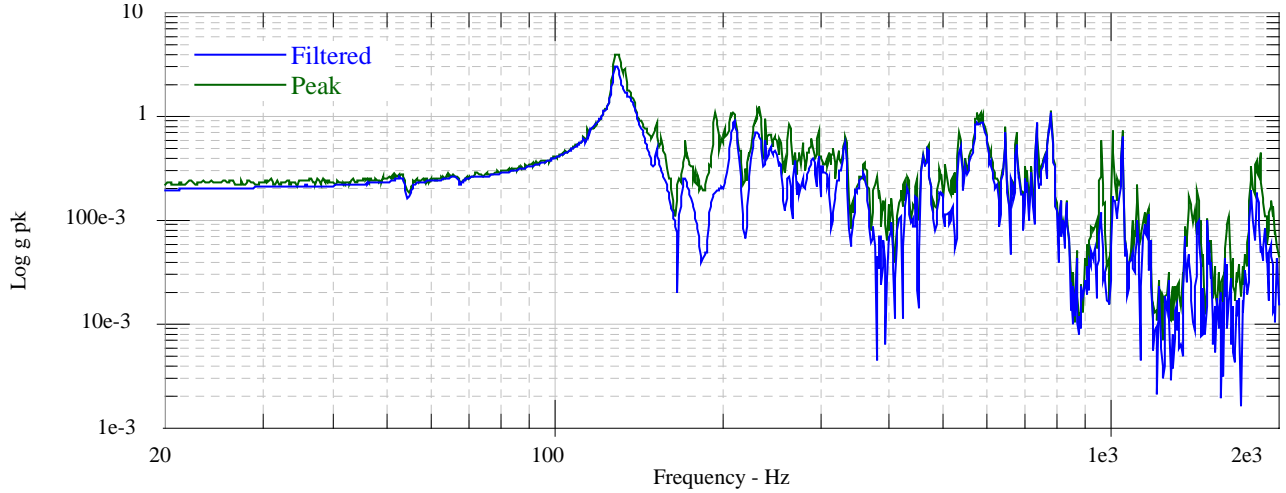
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 5-Apr-04
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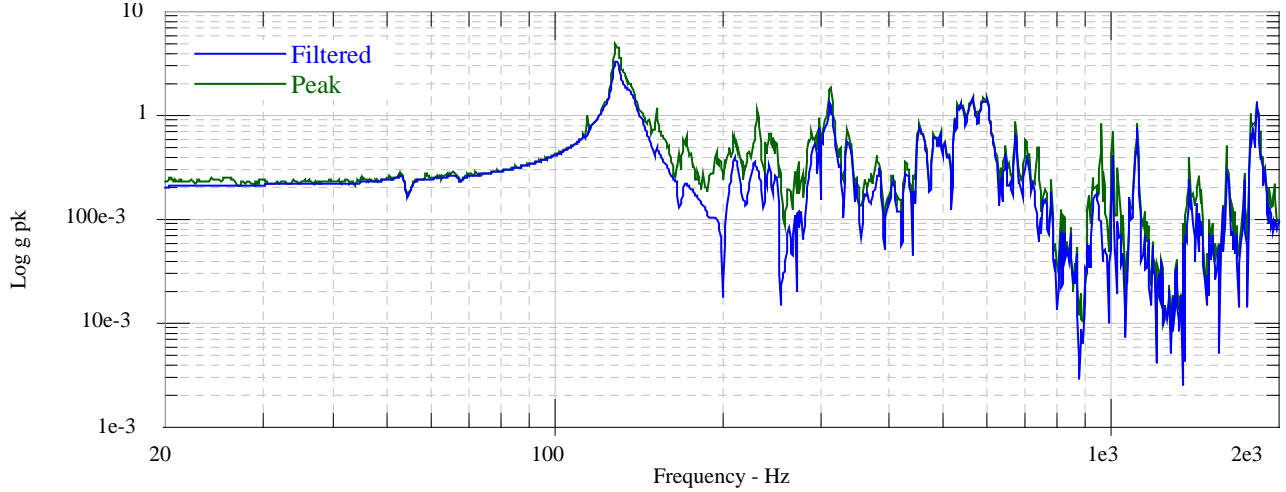
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

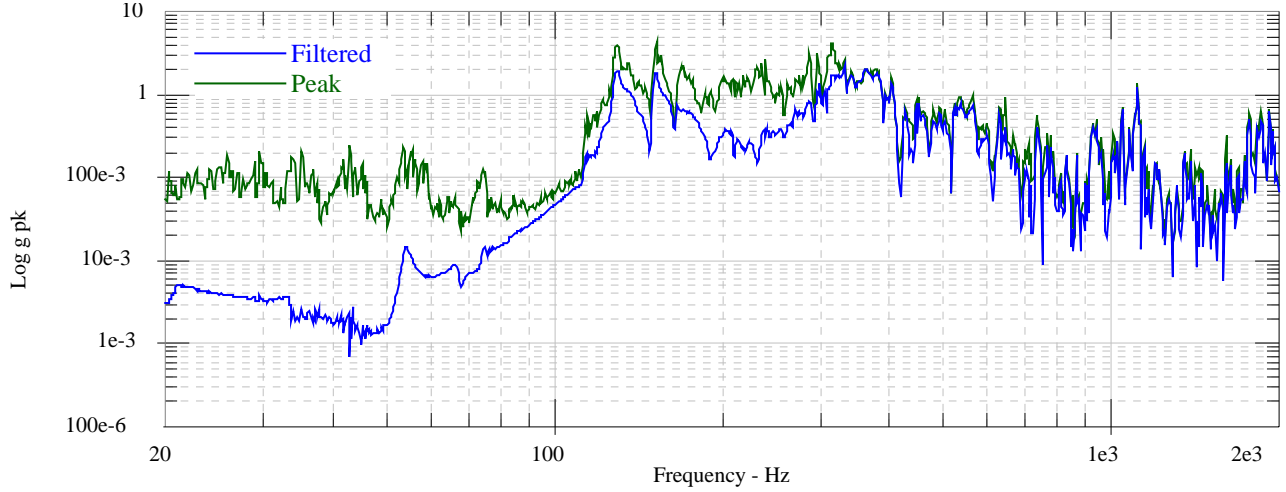


VIBRATION TEST REPORT
SPIRE QM

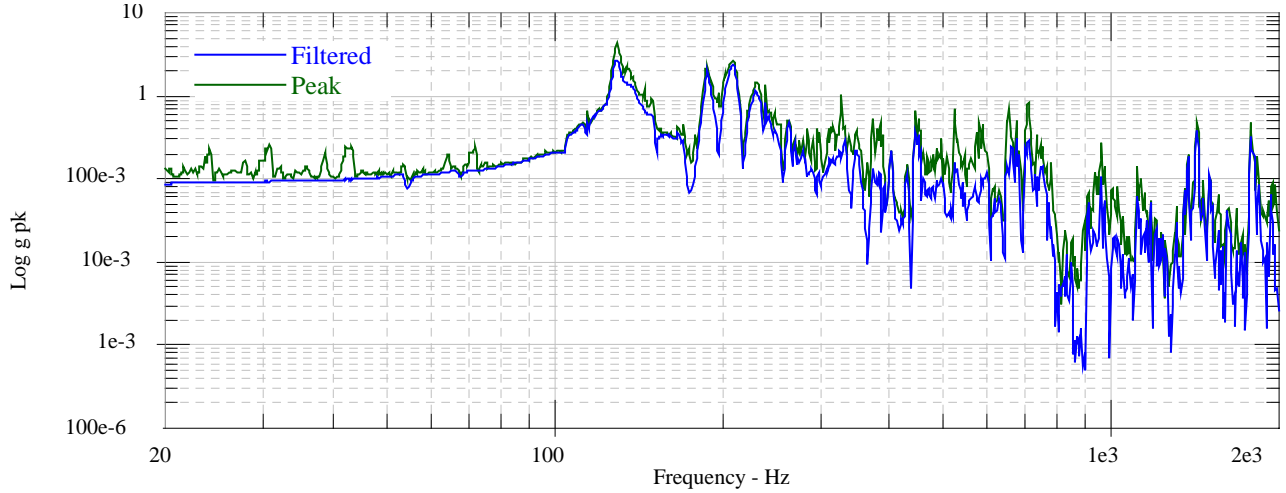
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 5-Apr-04
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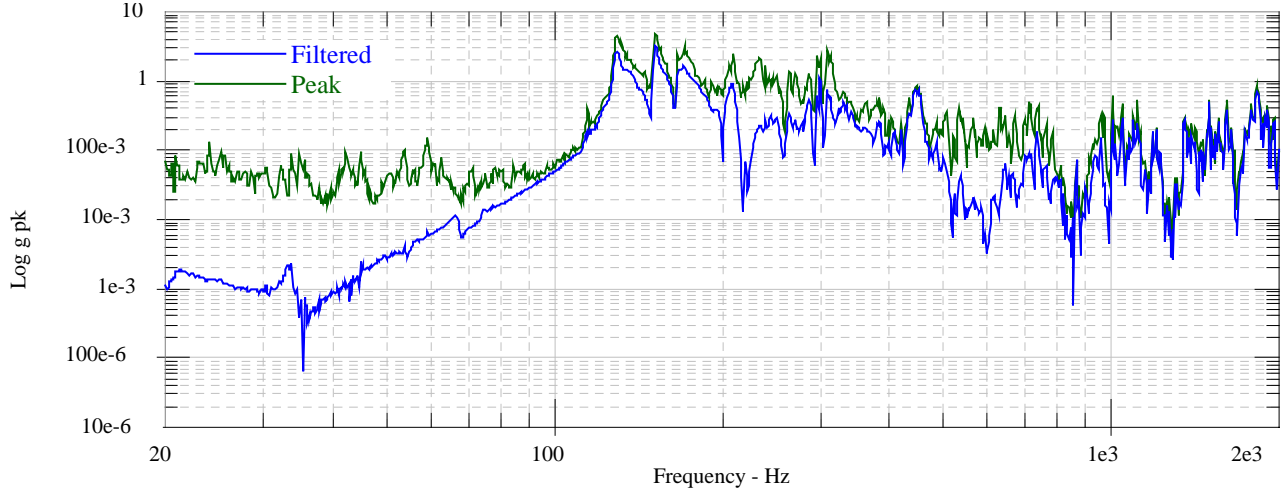
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

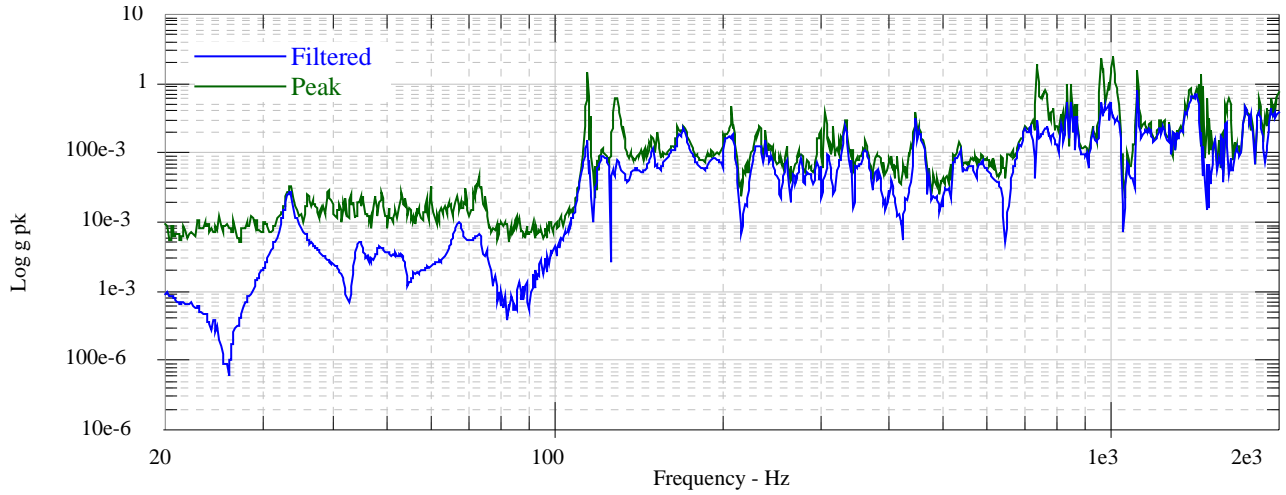


VIBRATION TEST REPORT
SPIRE QM

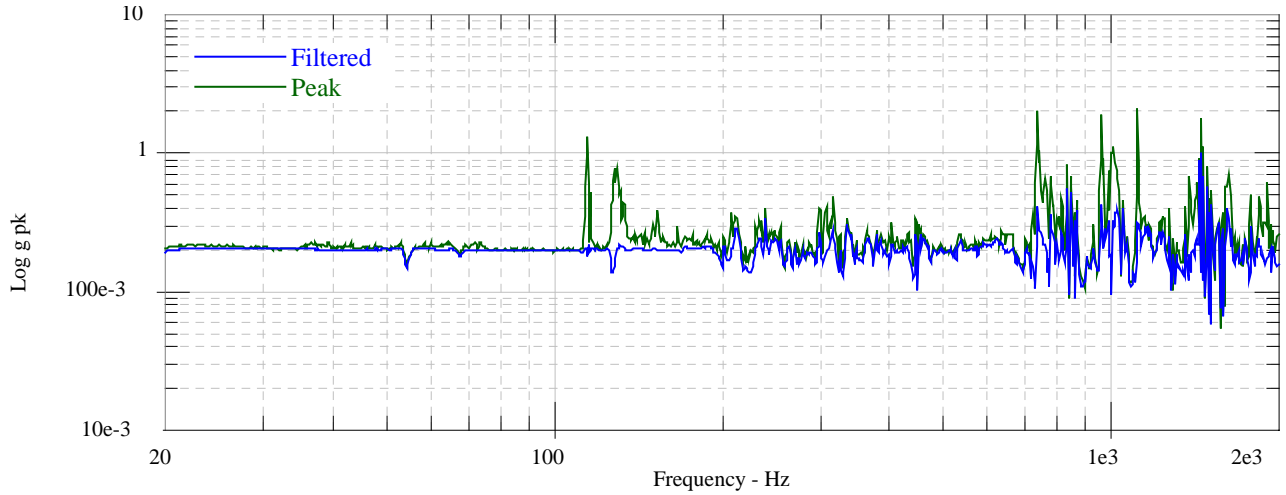
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 5-Apr-04
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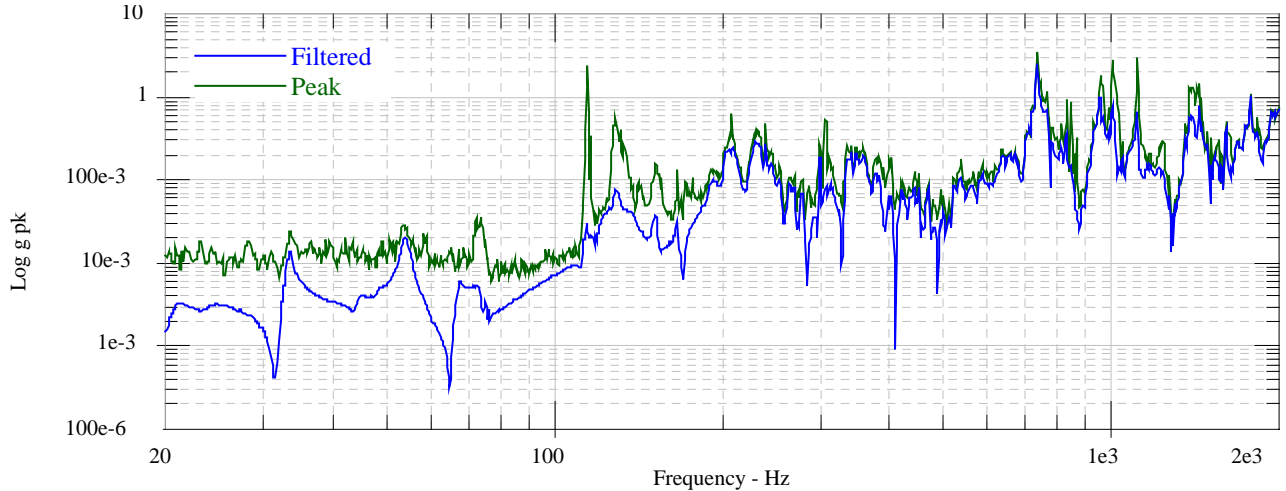
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

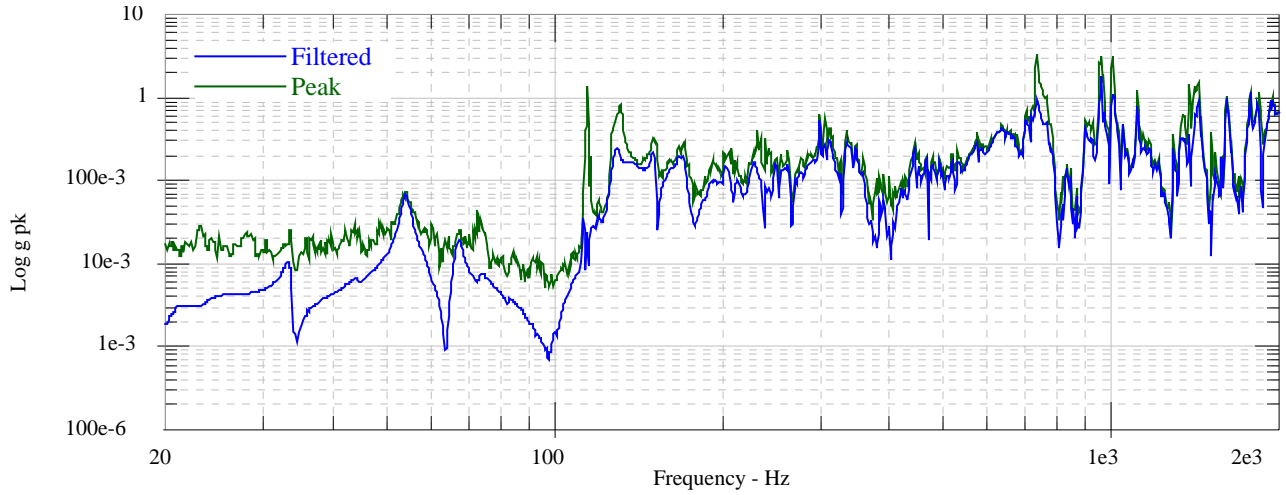


VIBRATION TEST REPORT
SPIRE QM

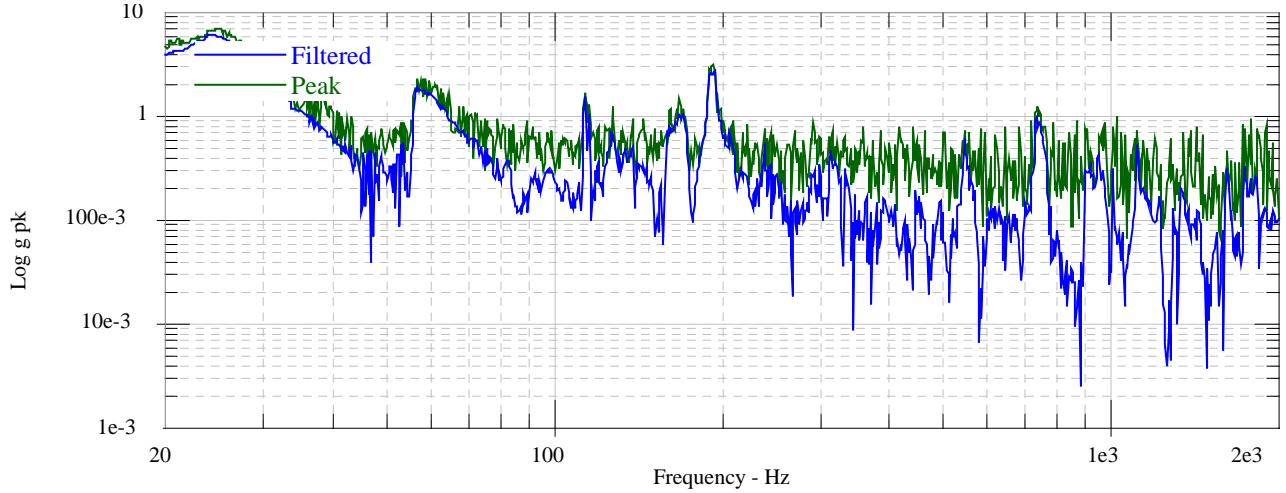
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 5-Apr-04
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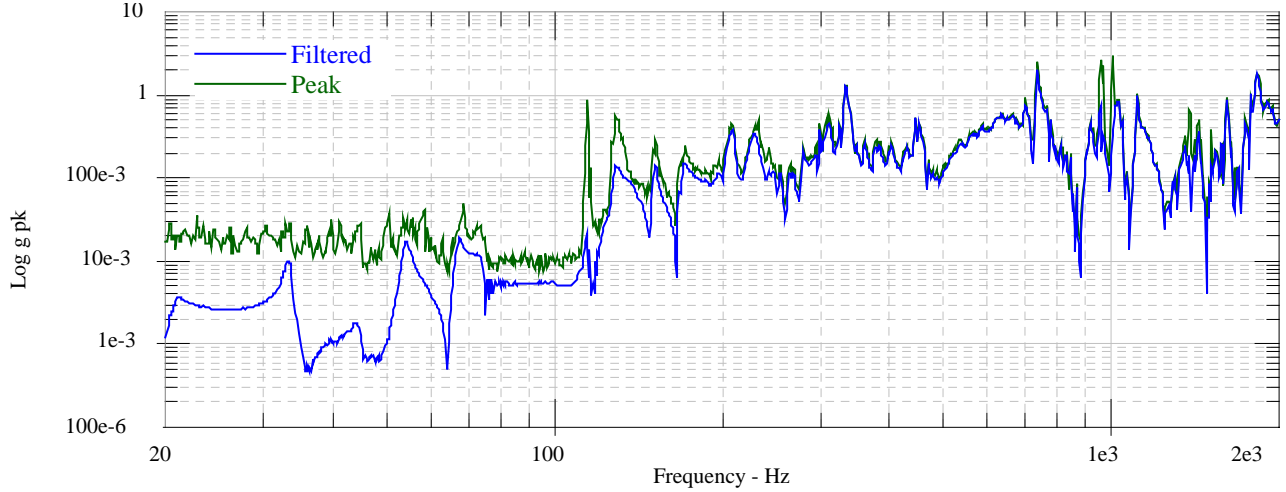
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

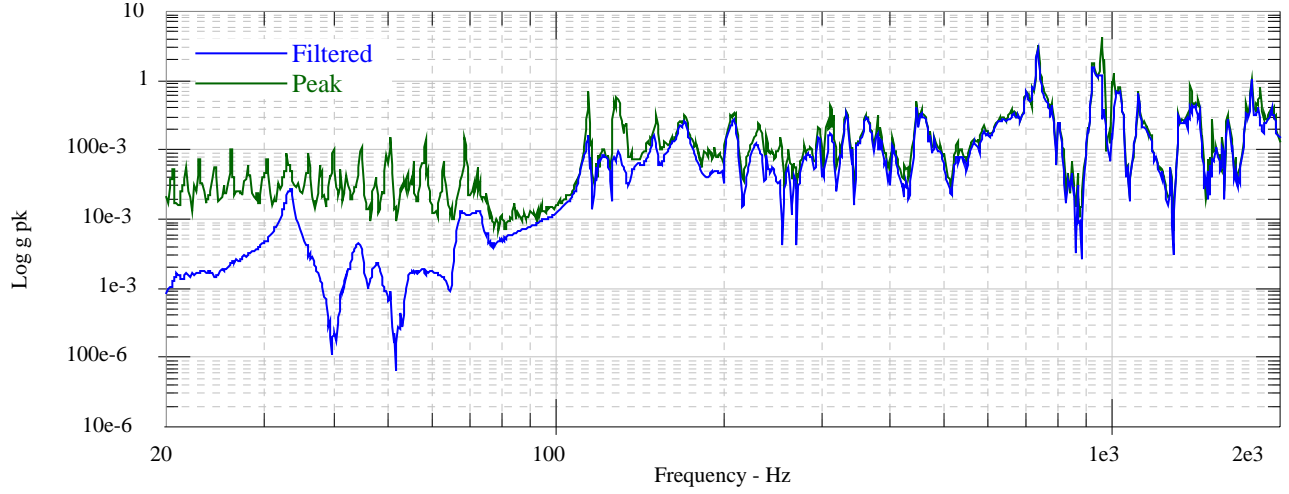


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RP-CSL-CRYOV-04001
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+YAFRAME.Z Channel n° 30



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12.6 HNS6Y.

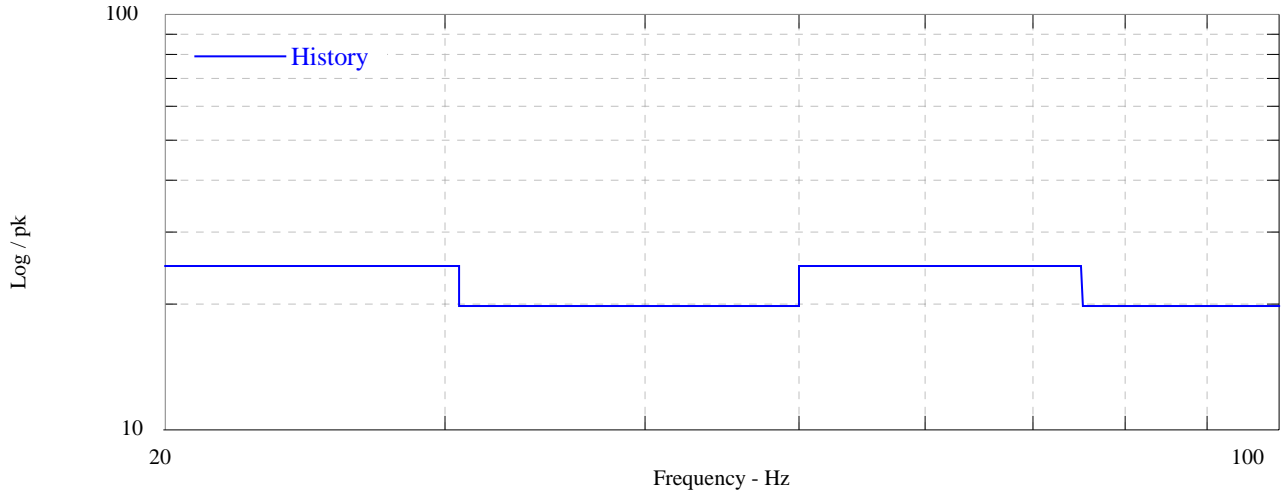
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VIBRATION TEST REPORT
SPIRE QM

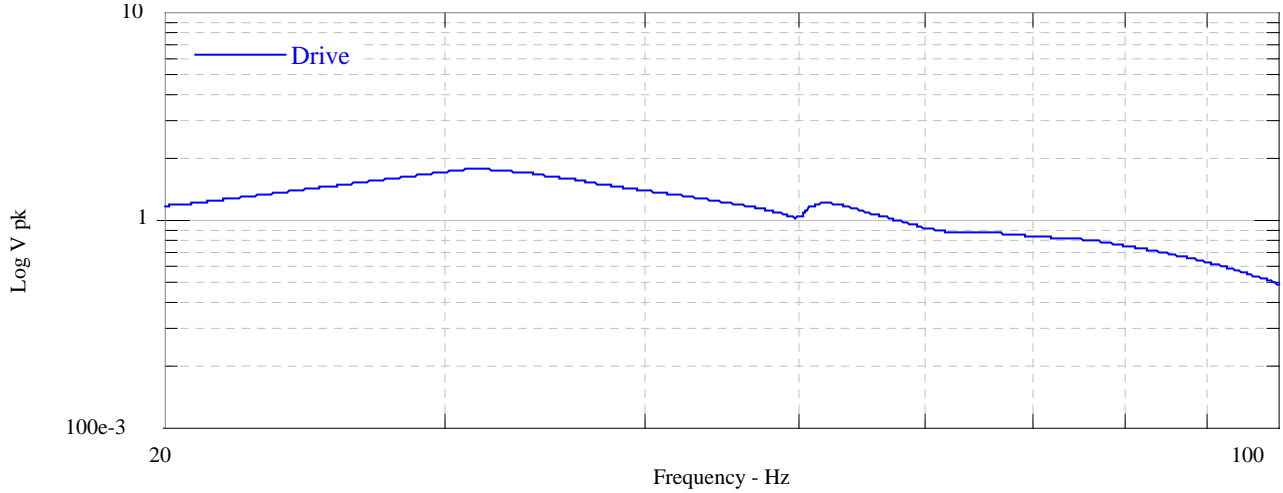
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Révision : 00
Date : 6-Apr-04
Page : HNS6Y - 1 / 12

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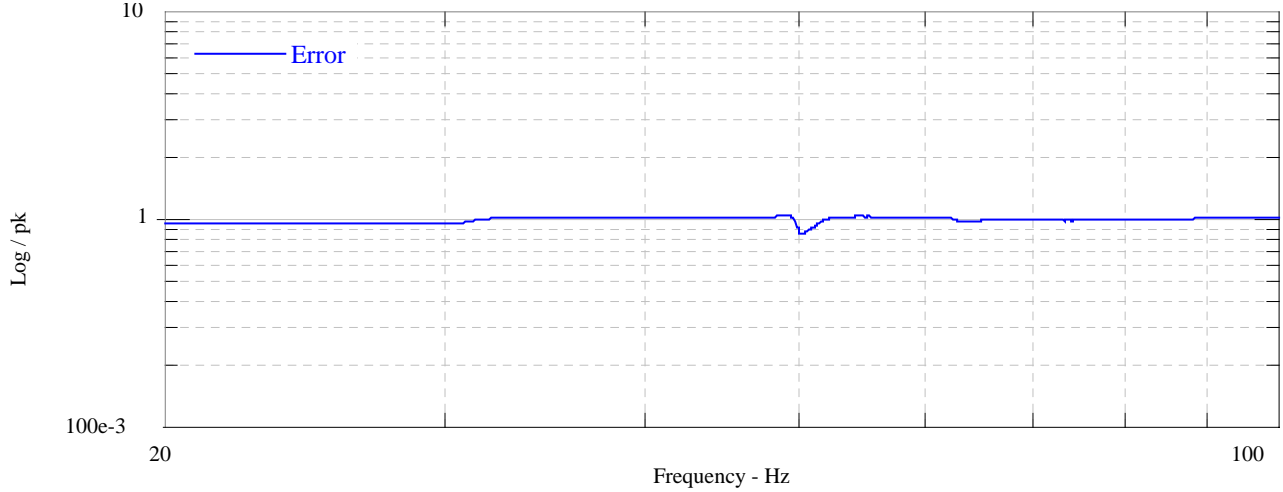
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

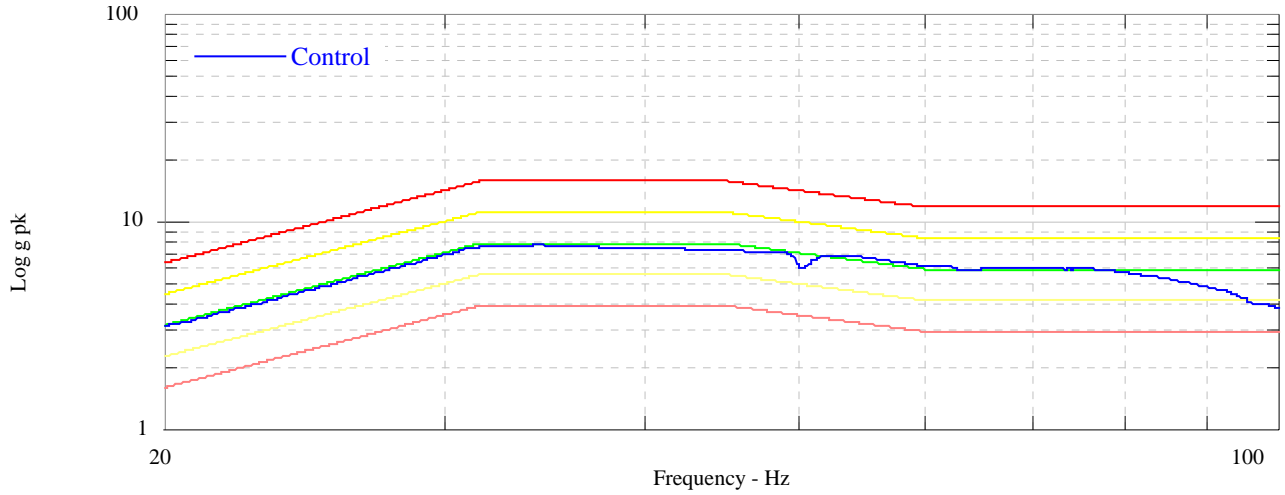


VIBRATION TEST REPORT
SPIRE QM

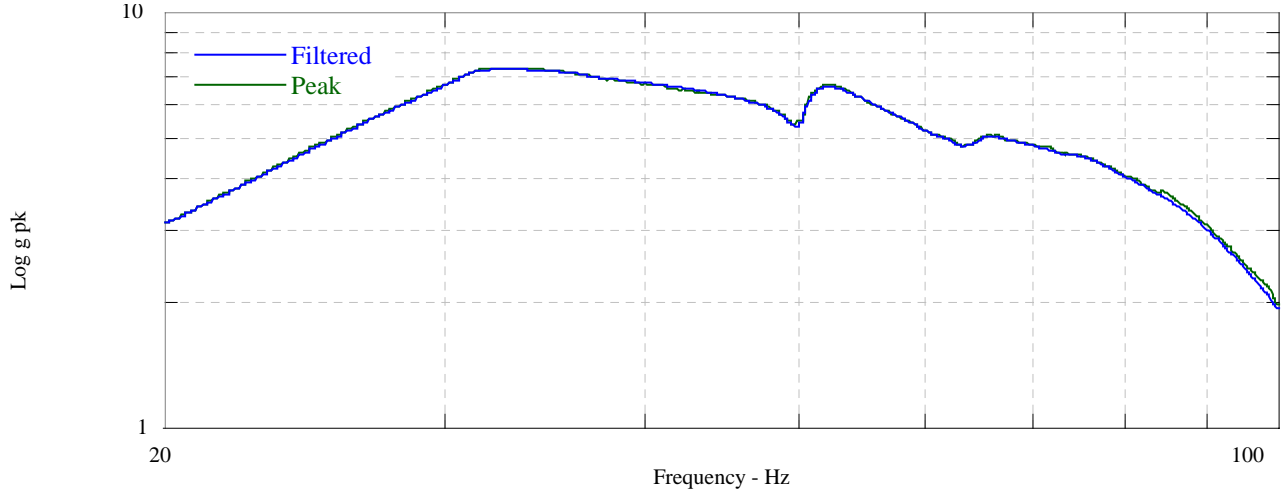
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Révision : 00
Date : 6-Apr-04
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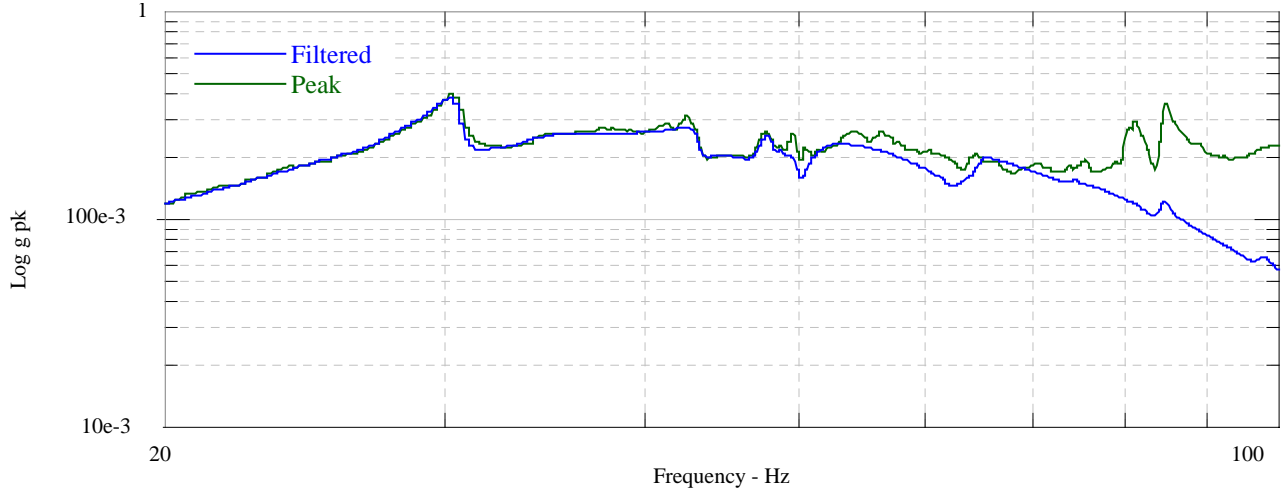
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

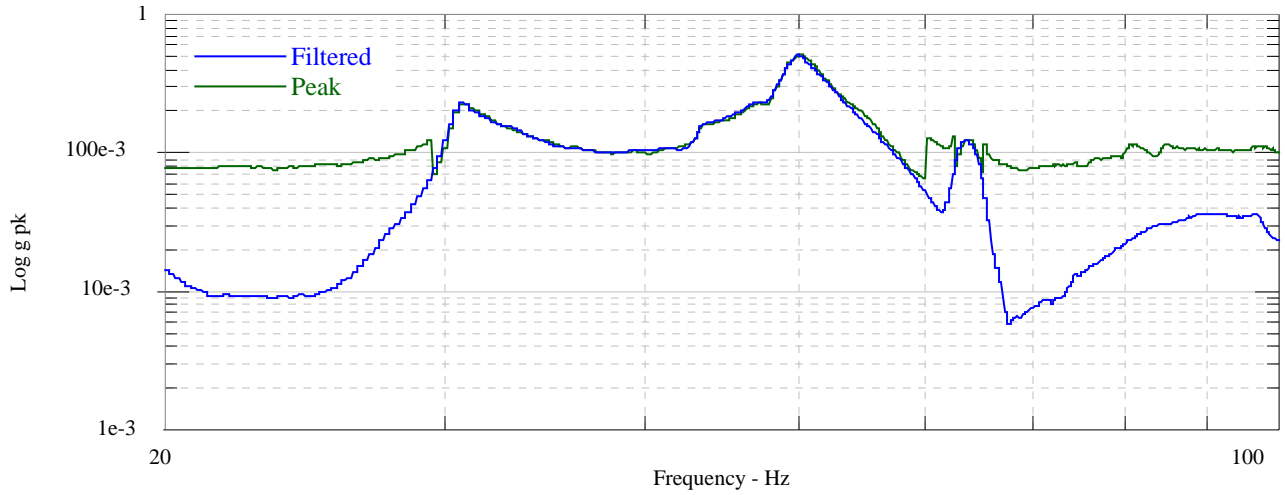


VIBRATION TEST REPORT
SPIRE QM

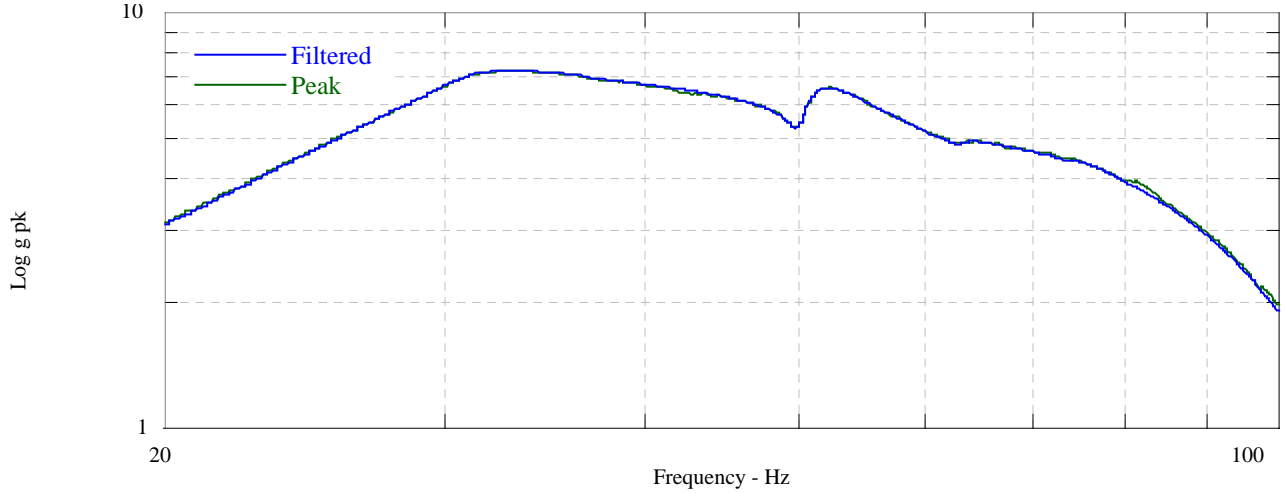
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Version : 01
Révision : 00
Date : 6-Apr-04
Page : HNS6Y - 3 / 12

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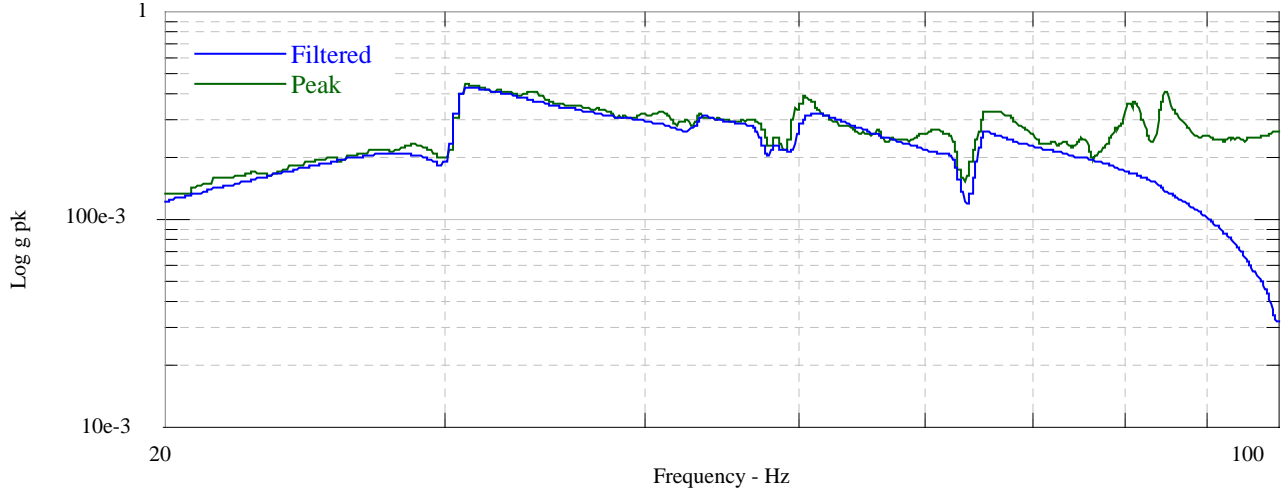
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

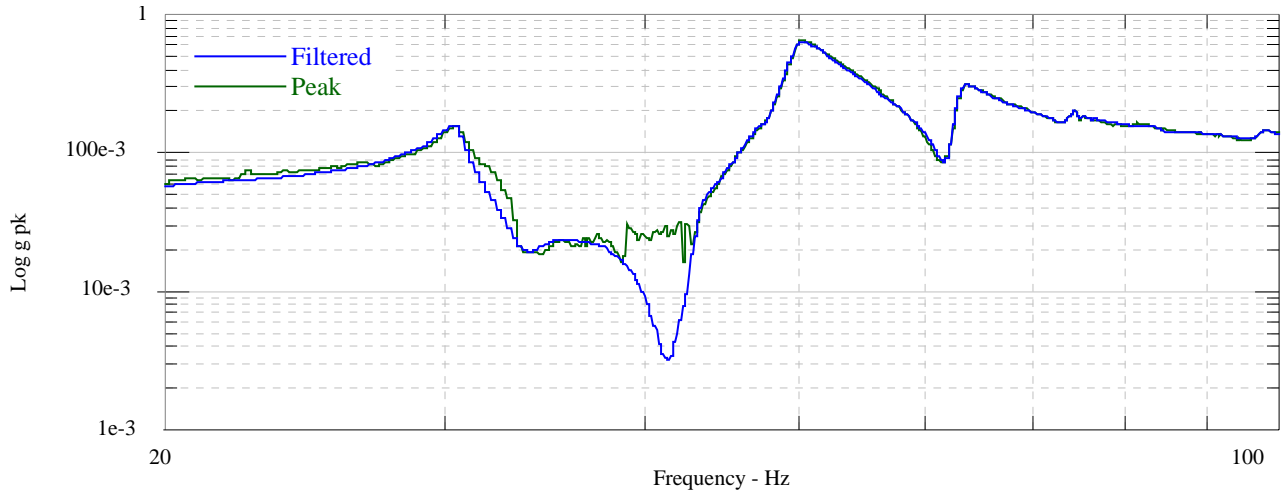


VIBRATION TEST REPORT
SPIRE QM

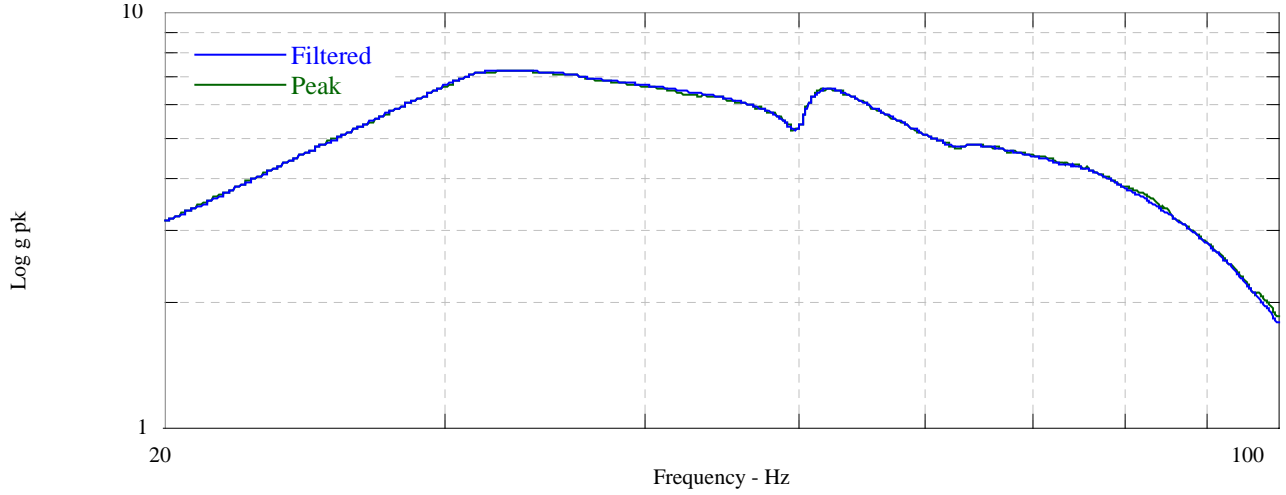
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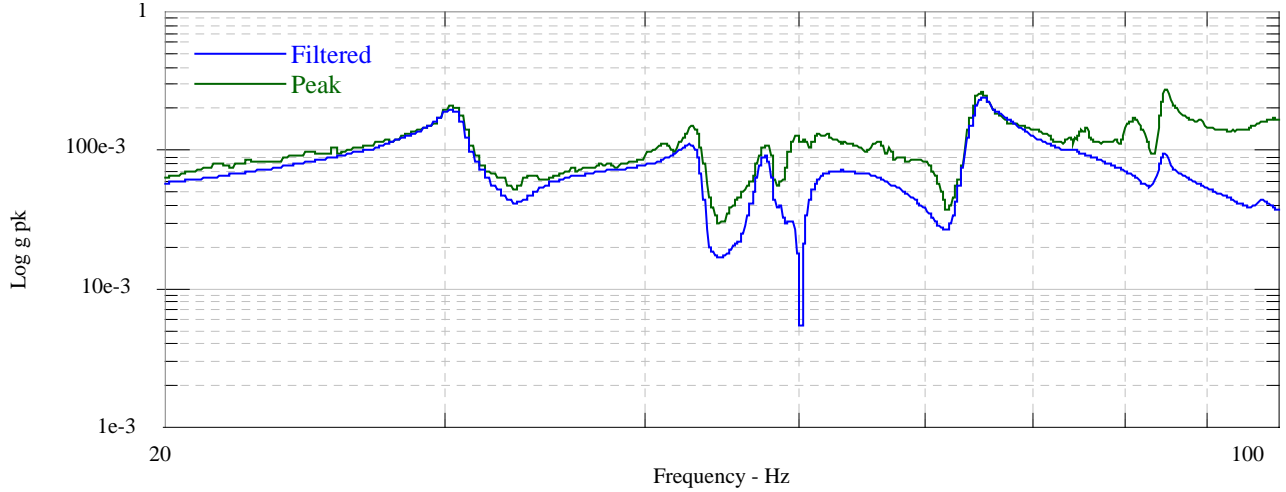
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

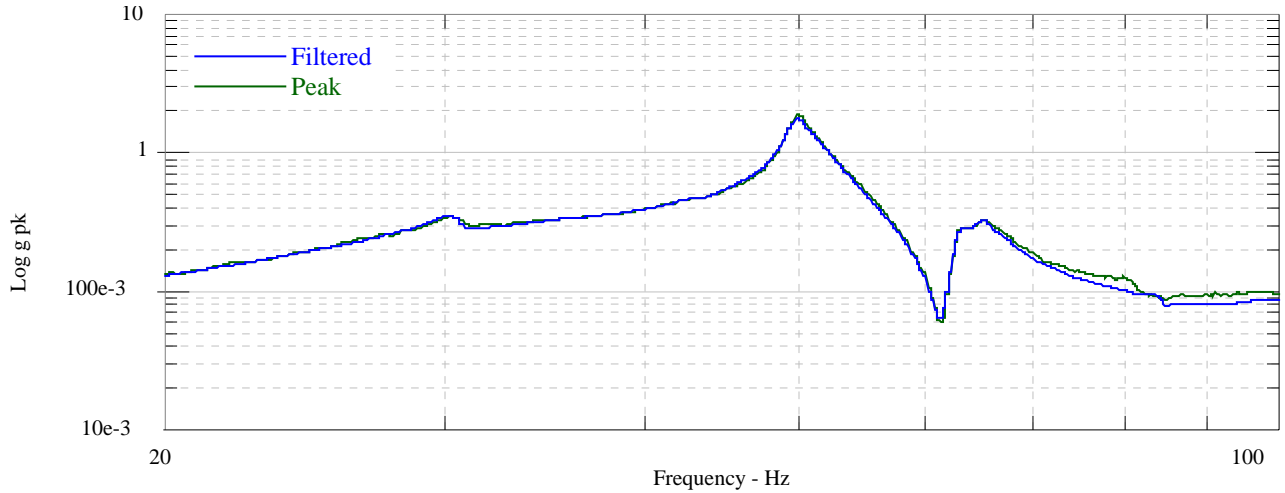


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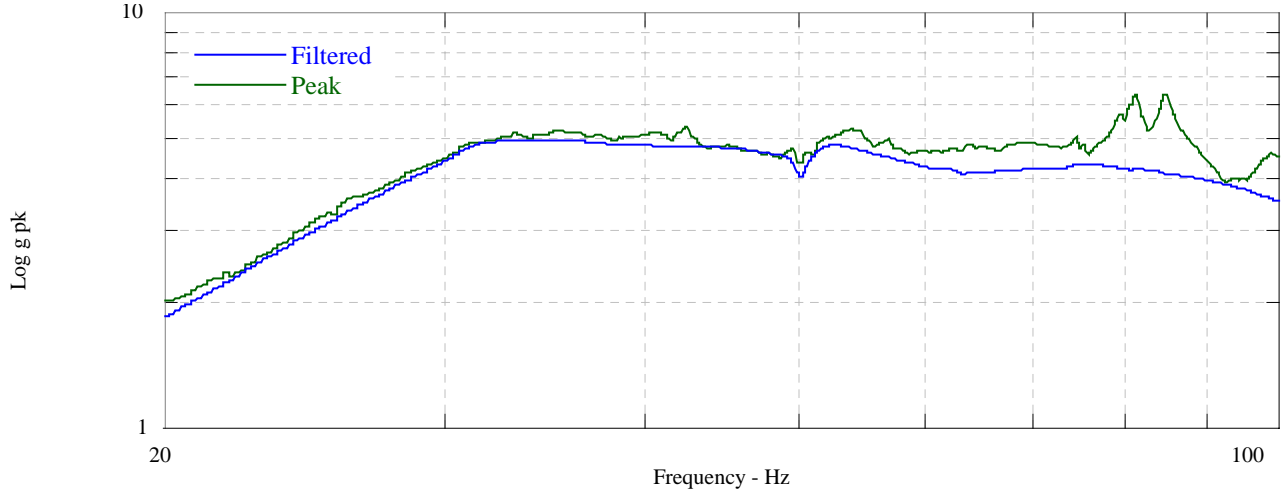
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Date : 6-Apr-04
Page : HNS6Y - 5 / 12

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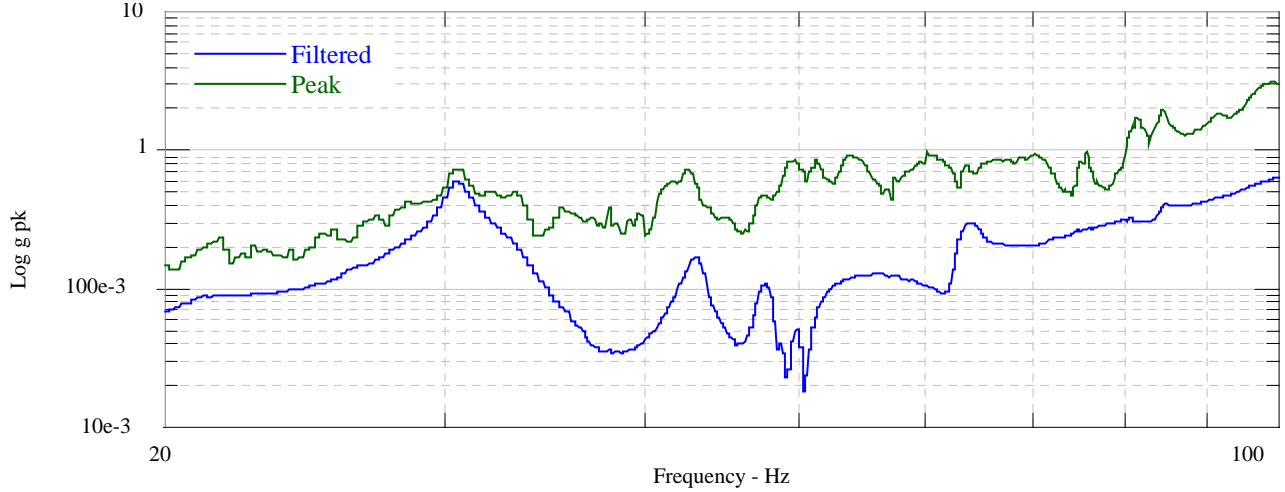
SHK.3.X Channel n° 9



PHS.XY Channel n° 10



PHS.Z Channel n° 11

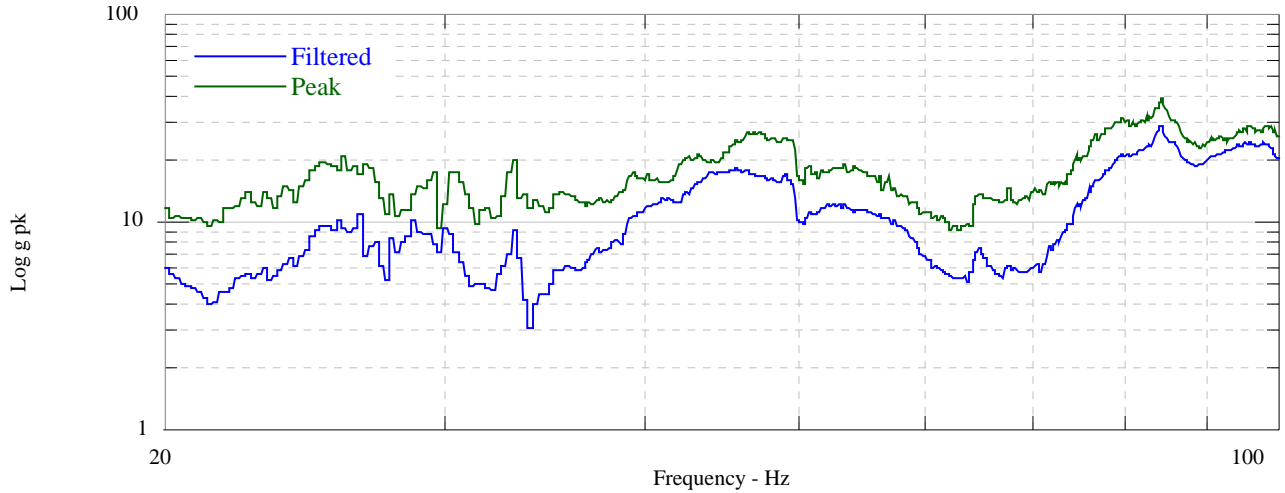


VIBRATION TEST REPORT
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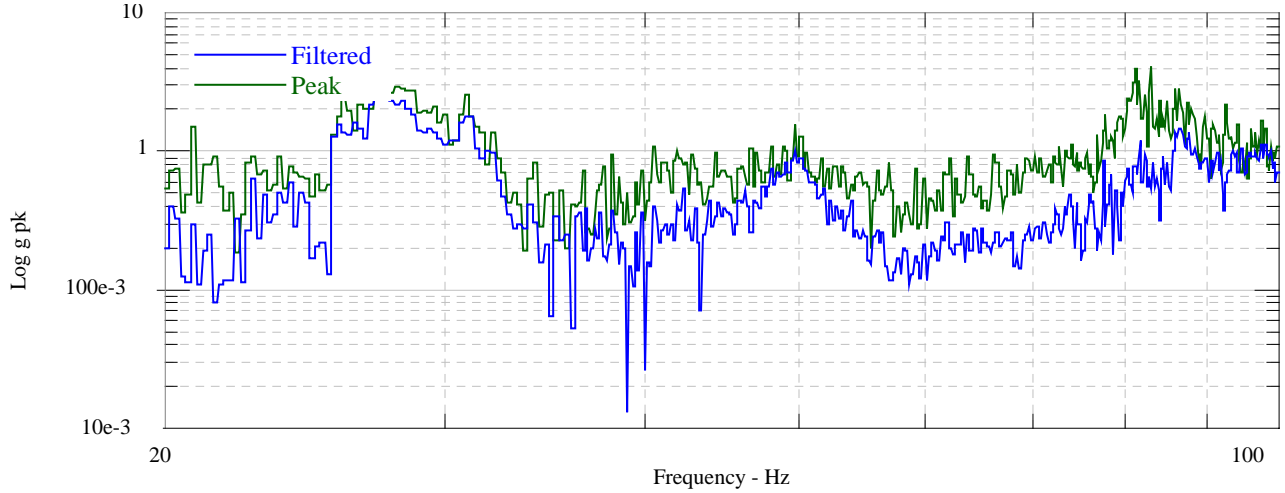
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Date : 6-Apr-04
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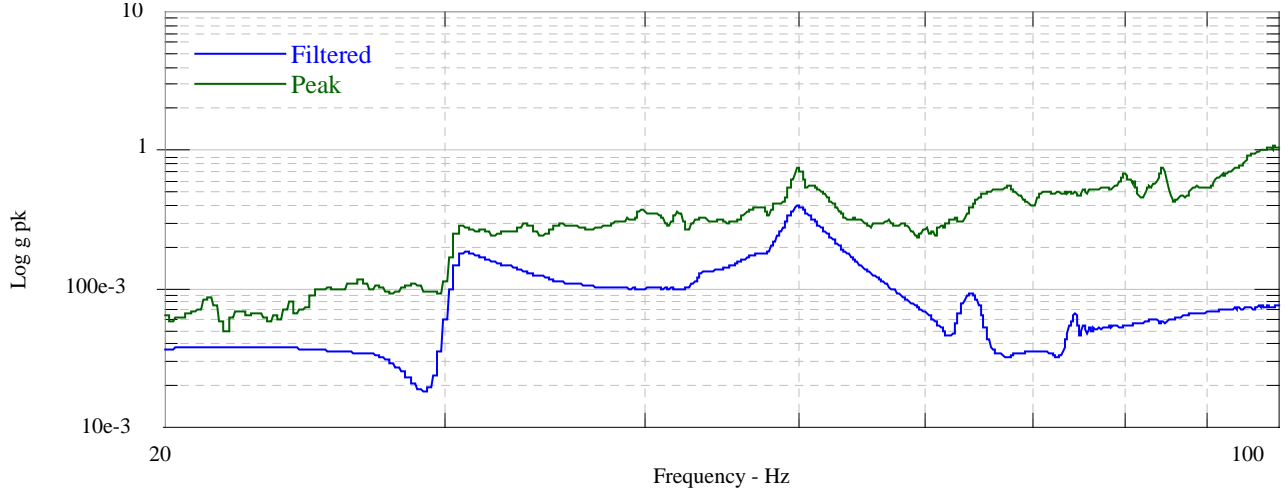
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

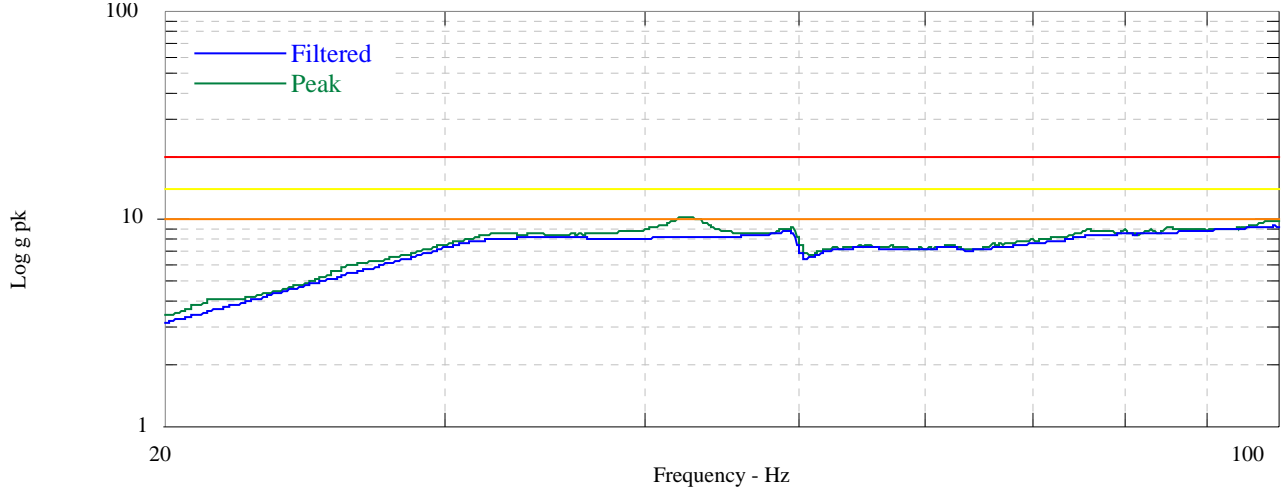


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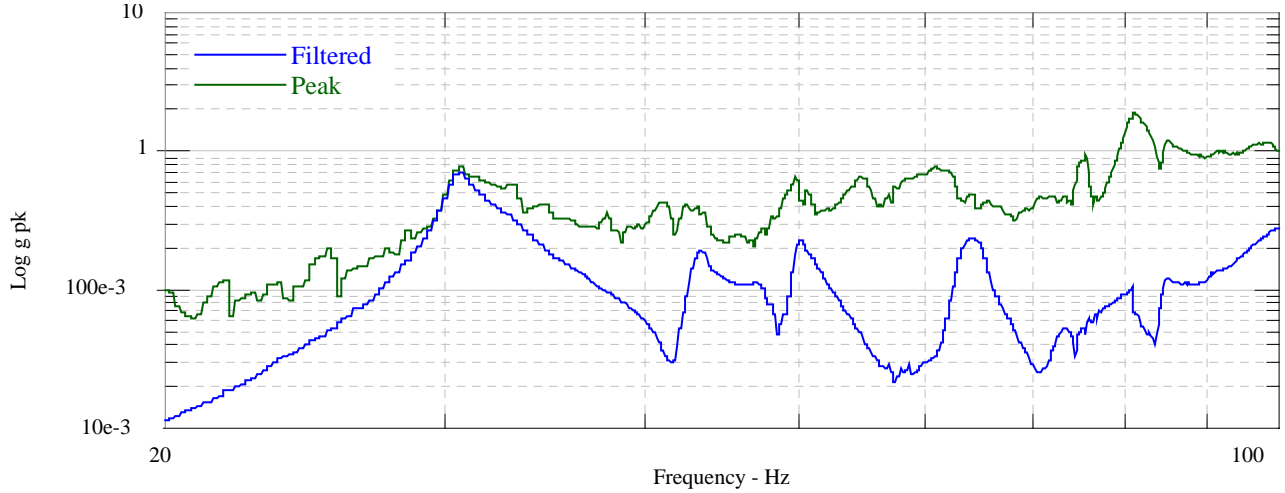
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Date : 6-Apr-04
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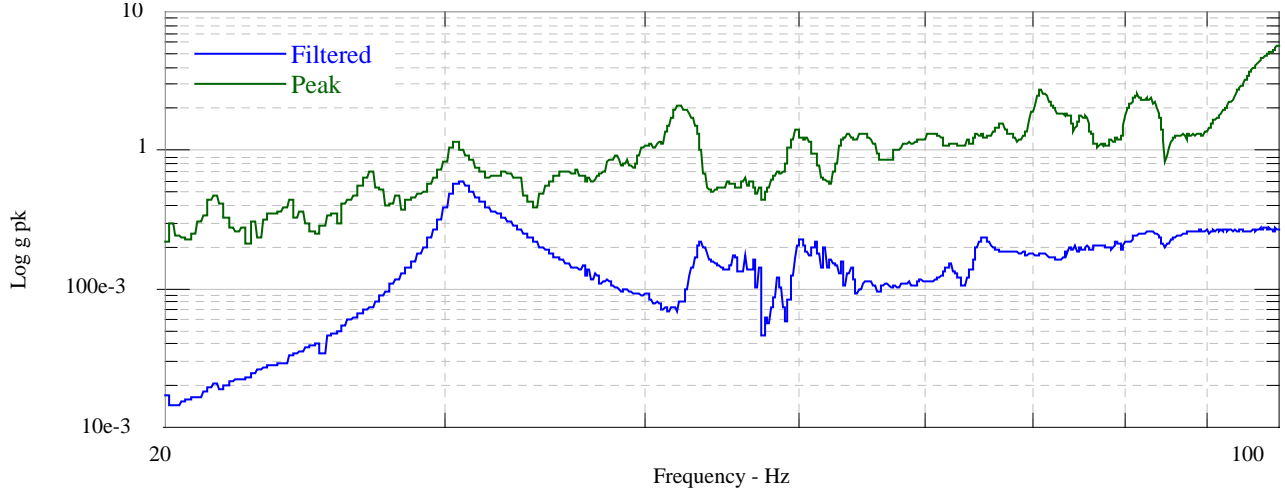
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

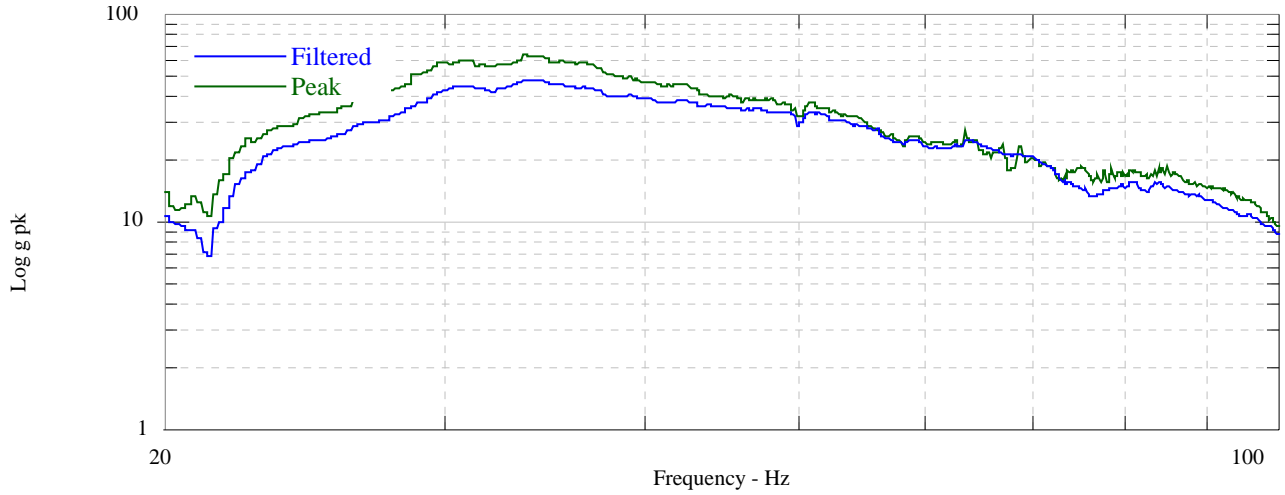


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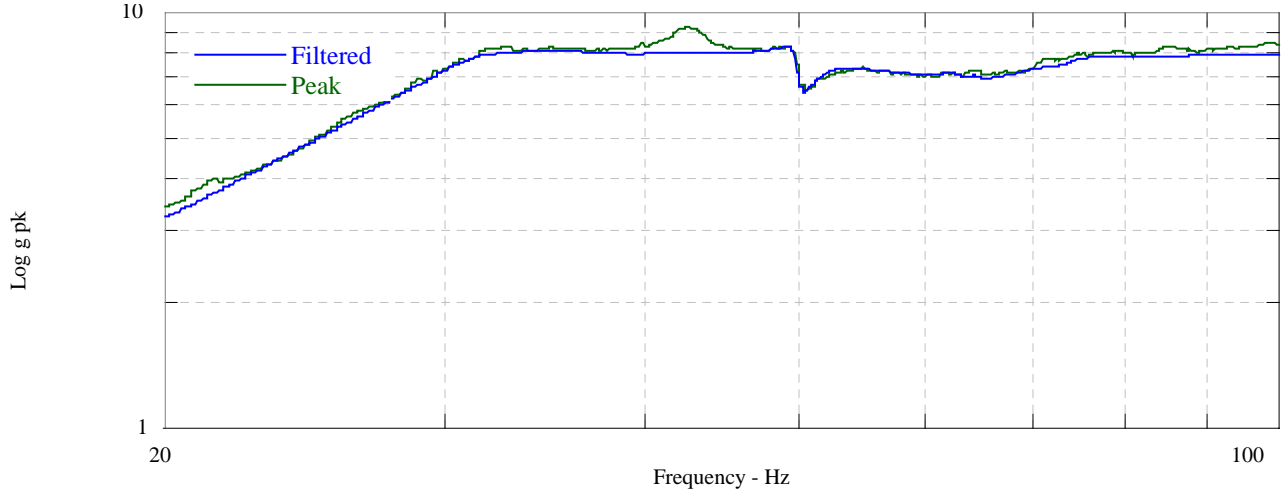
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Date : 6-Apr-04
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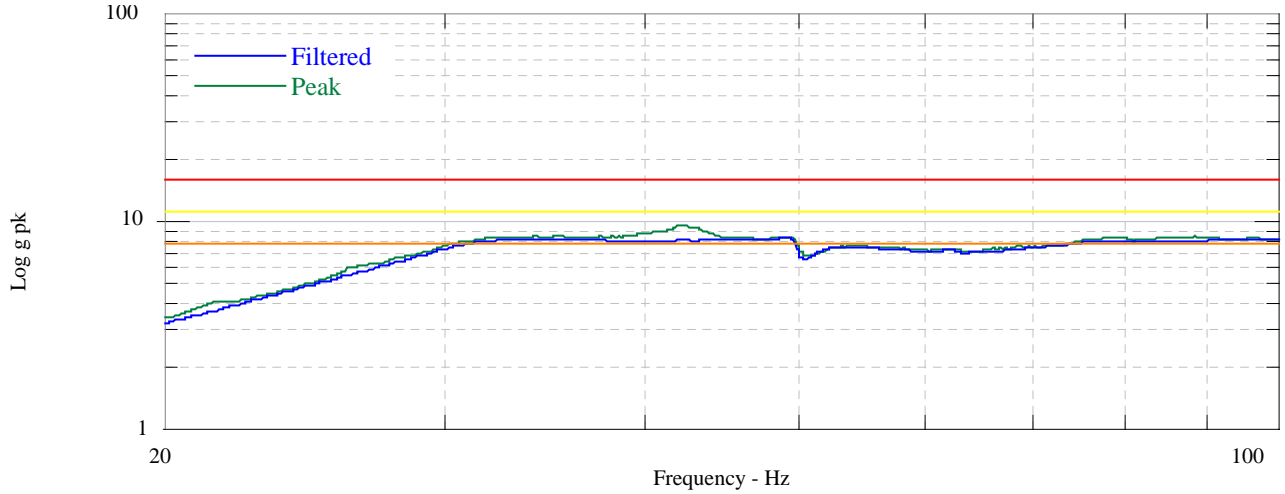
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

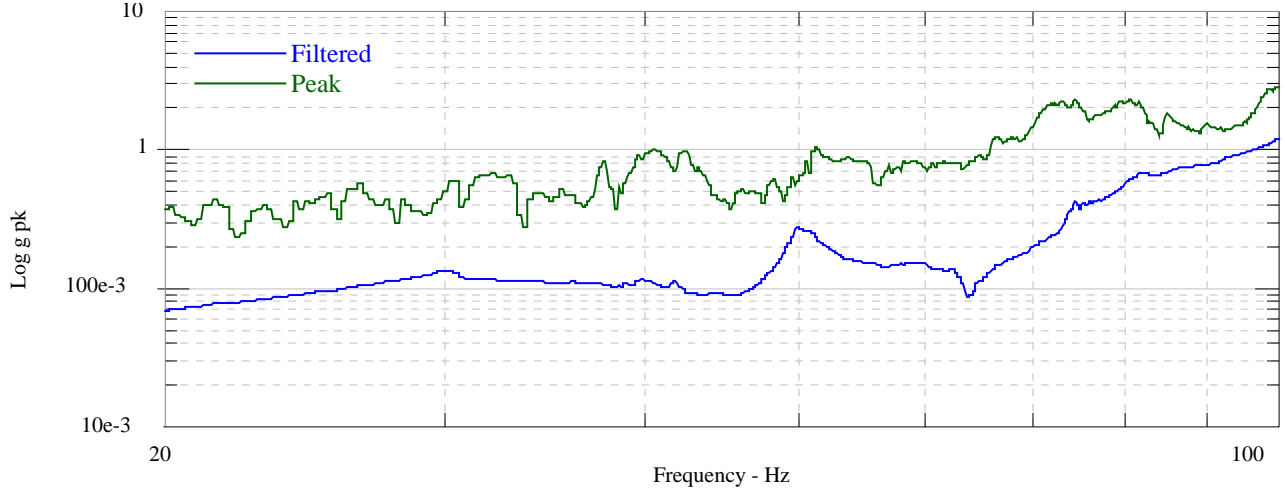


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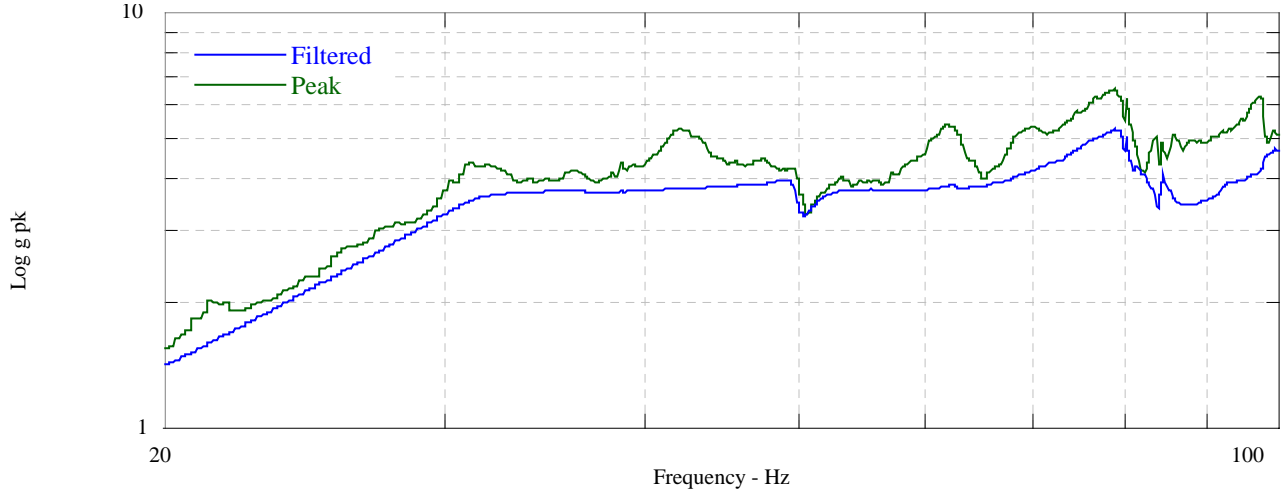
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Date : 6-Apr-04
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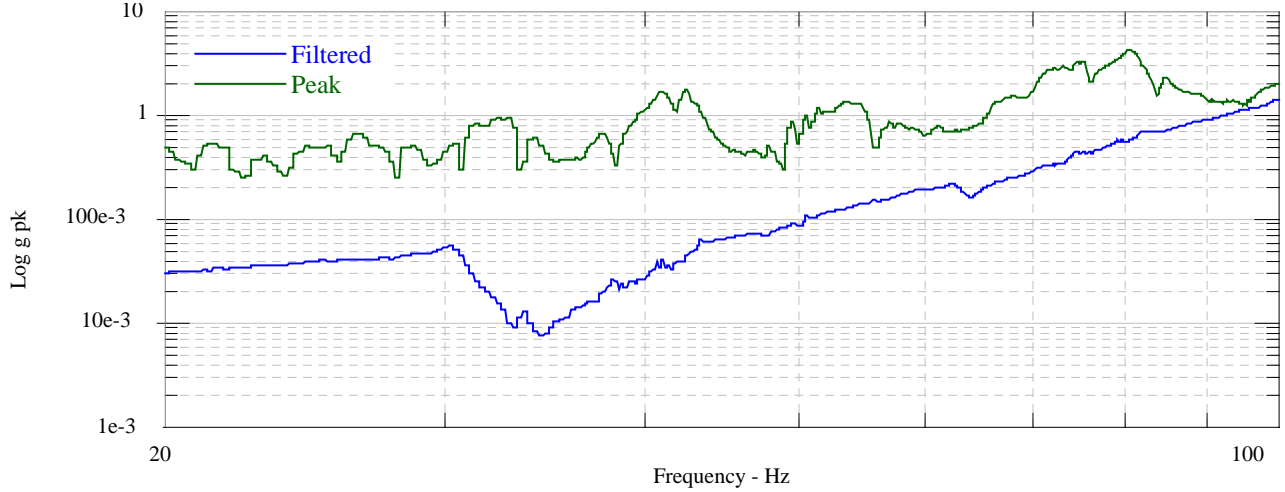
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CTIP.Y Channel n° 22



SMECU.X Channel n° 23

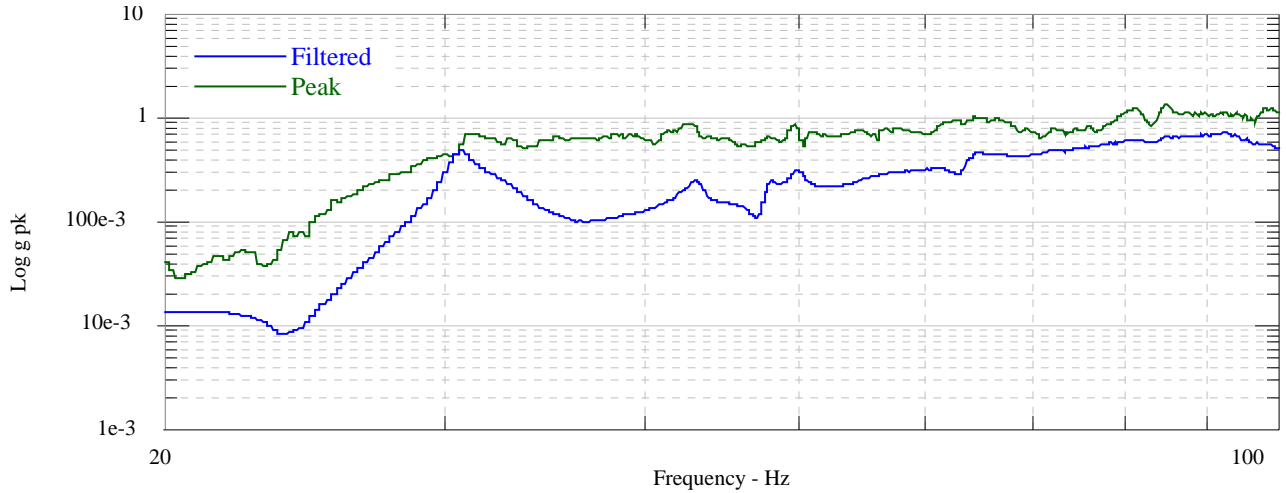


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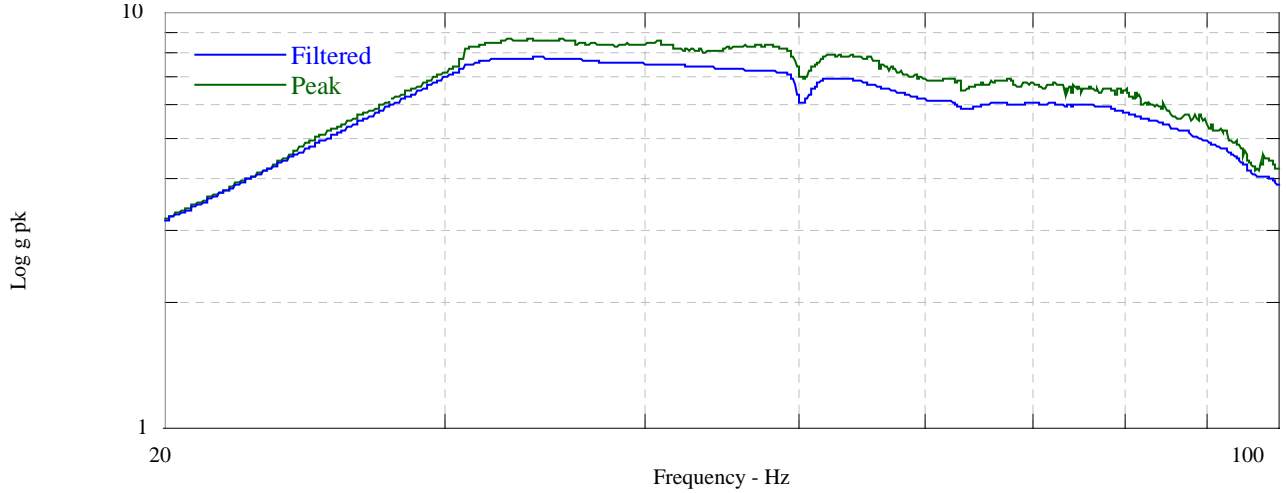
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Révision : 00
Date : 6-Apr-04
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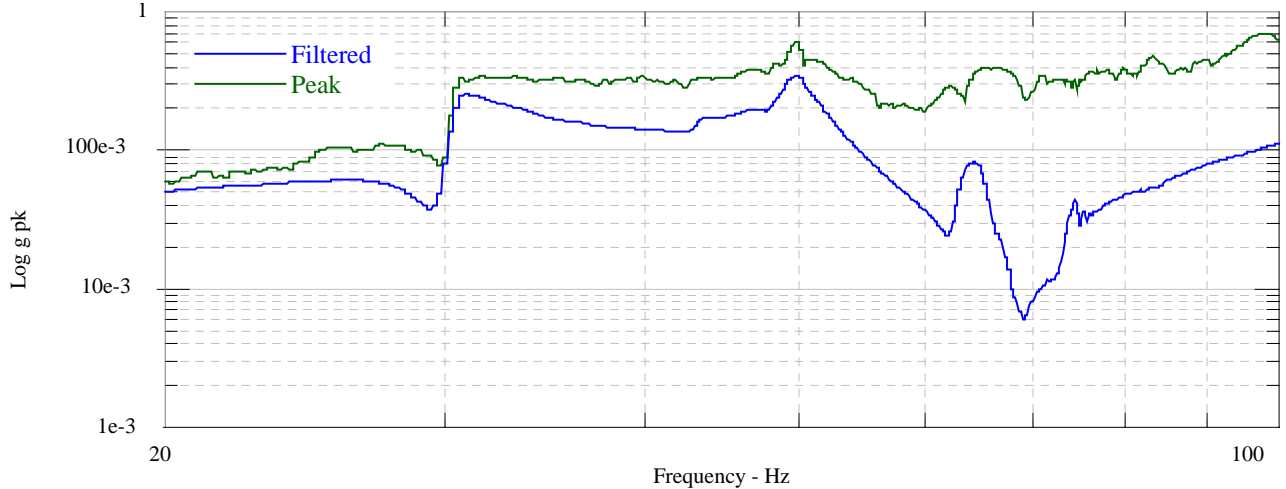
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

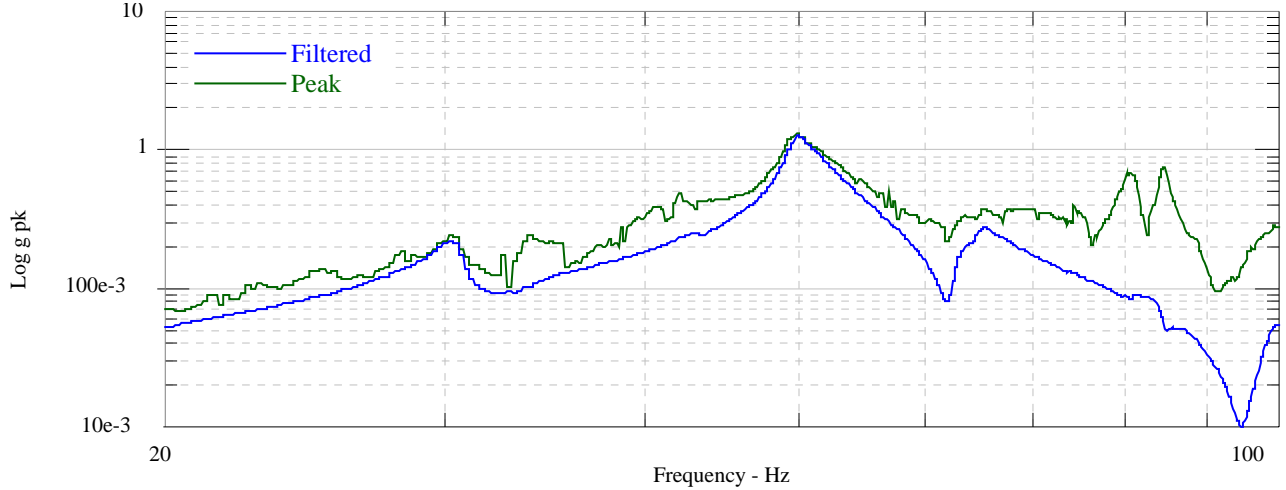


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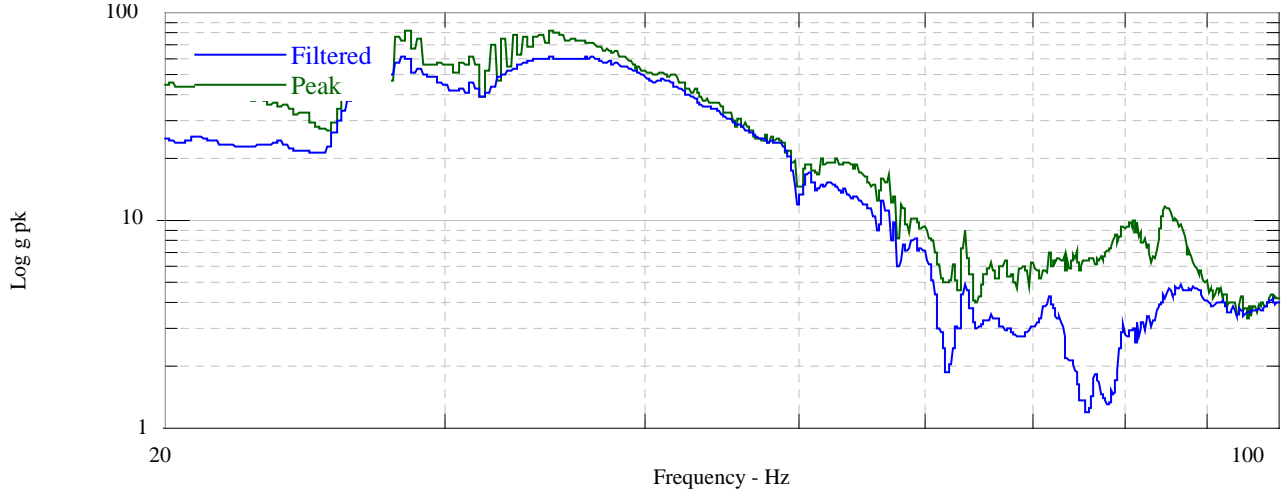
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Date : 6-Apr-04
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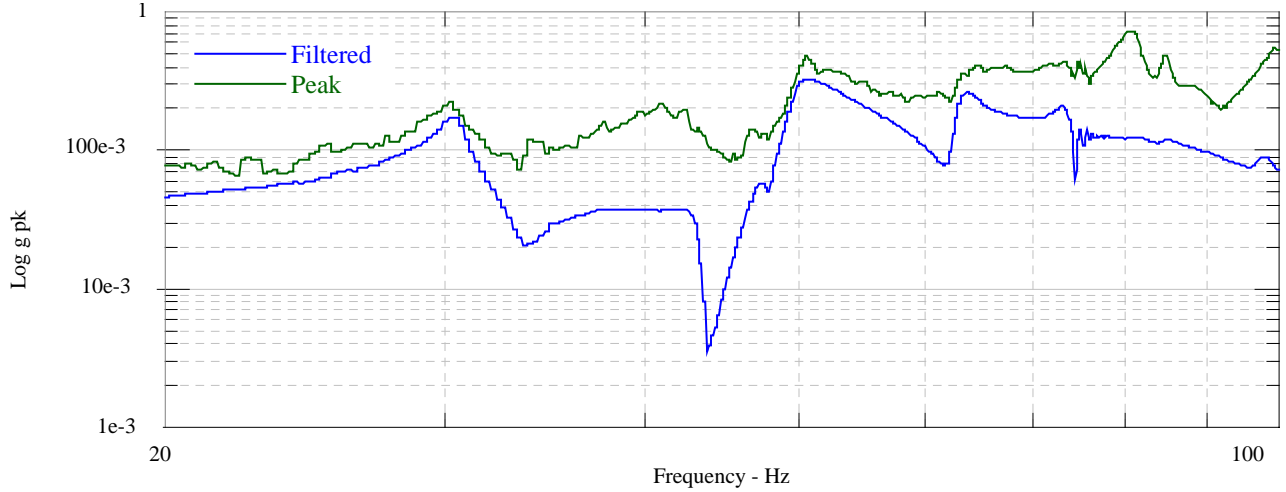
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

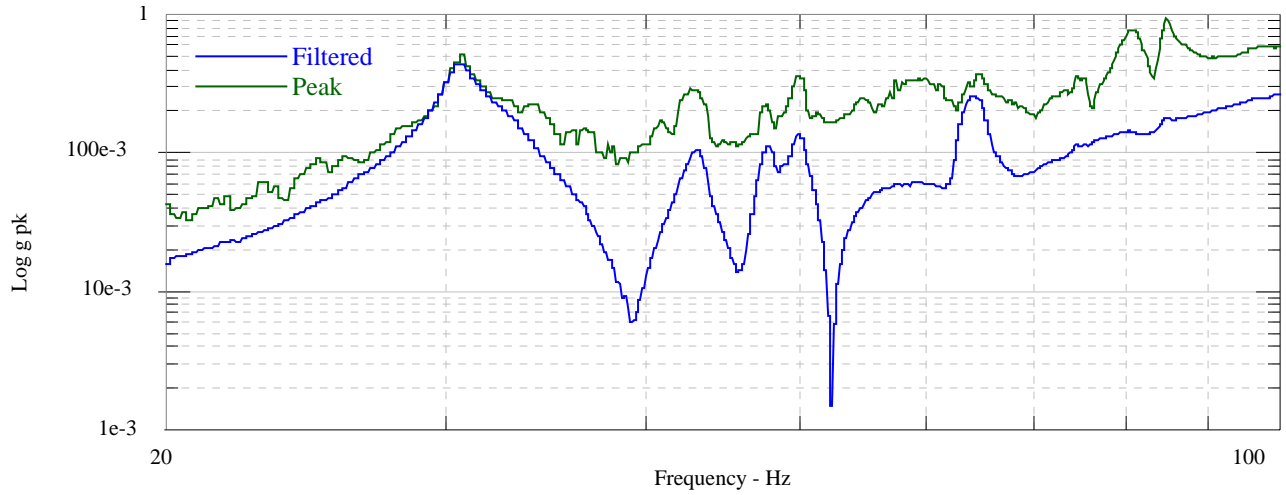


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SPIRE QM

RP-CSL-CRYOV-04001
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+YAFRAME.Z Channel n° 30



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SPIRE QM

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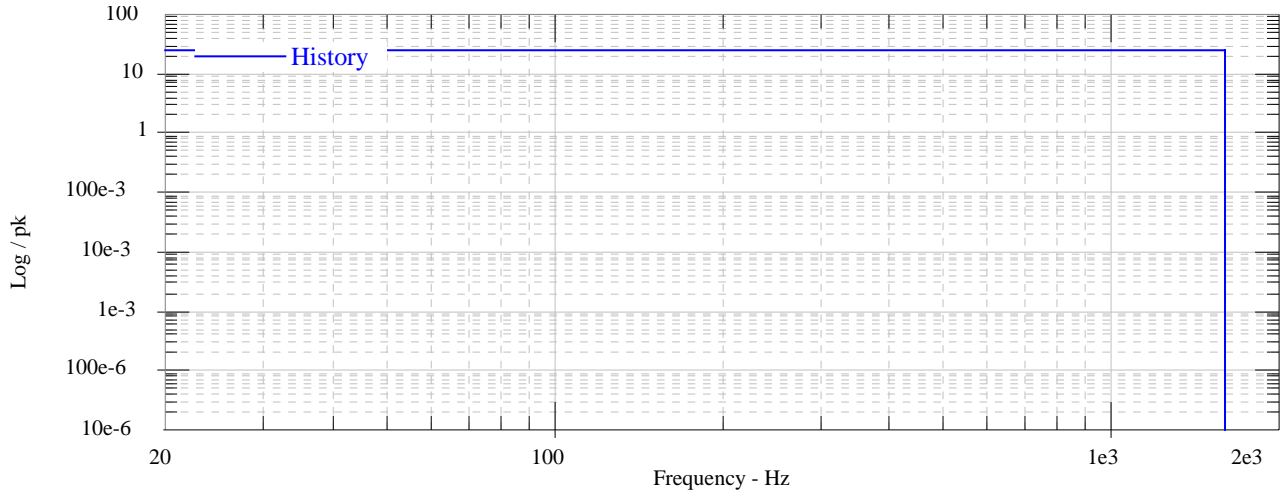
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SPIRE QM

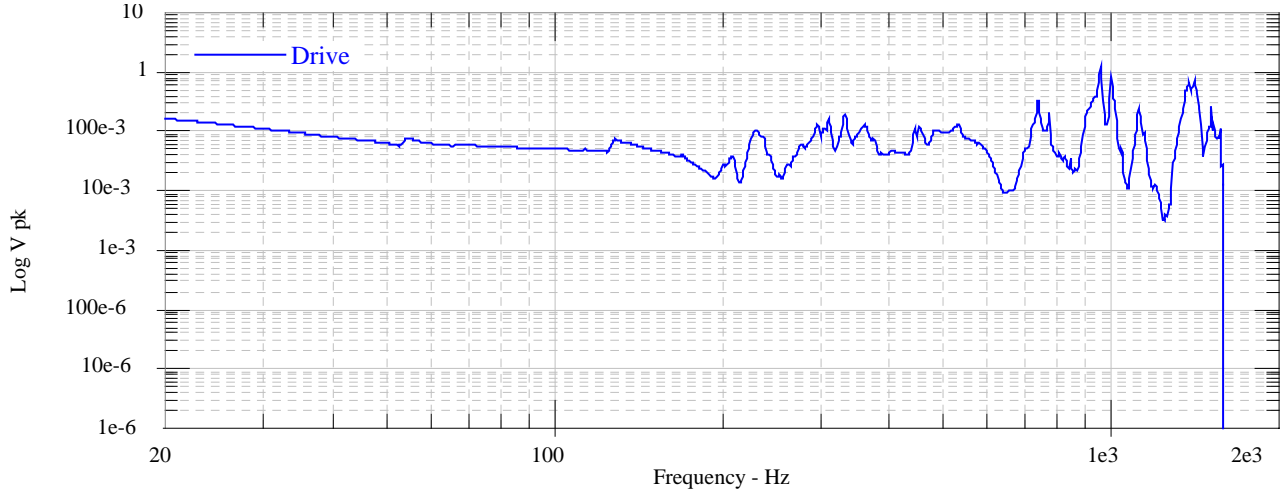
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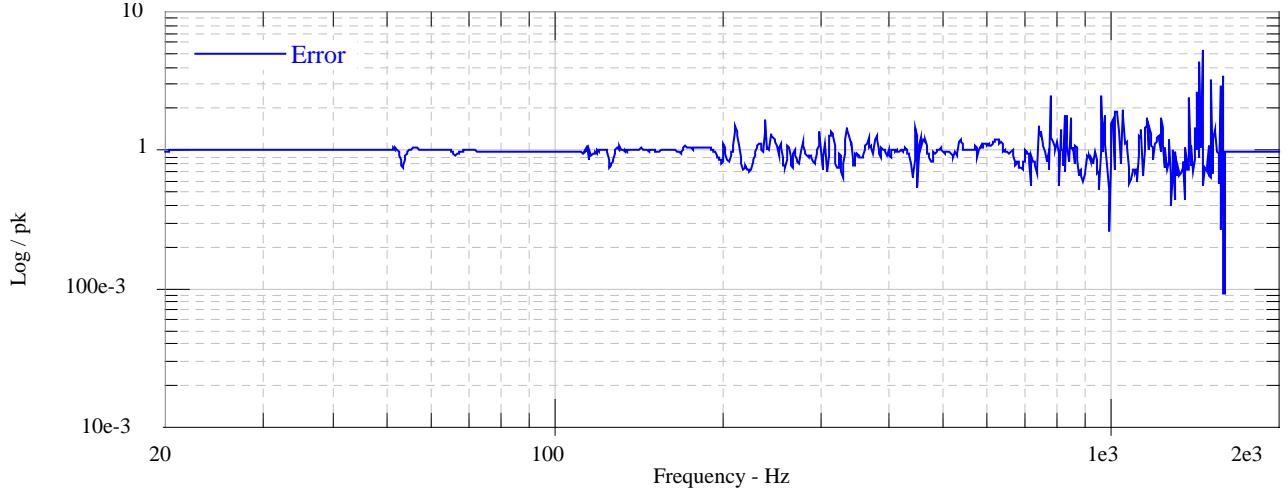
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

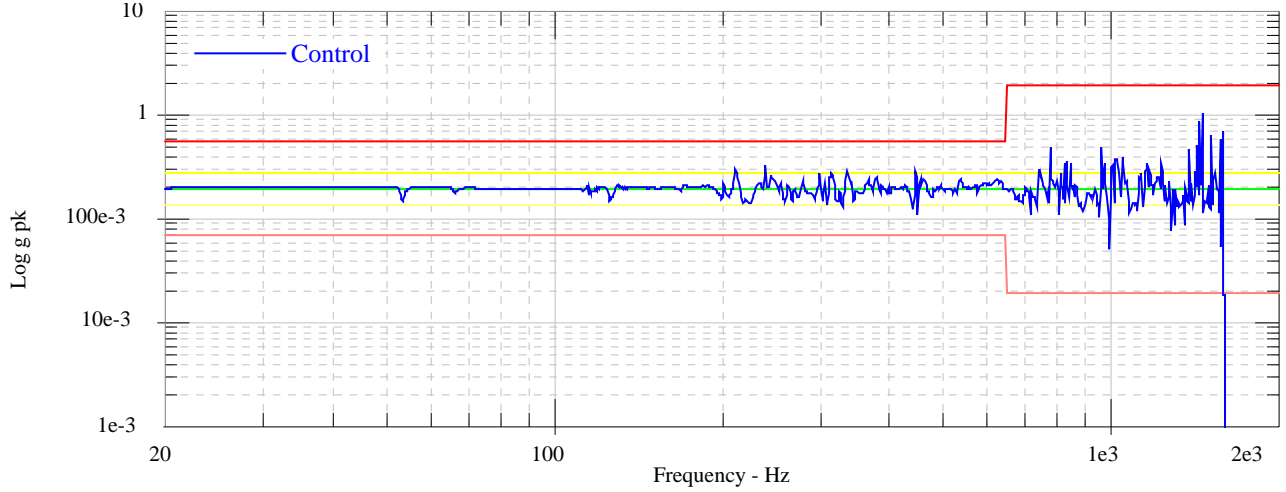


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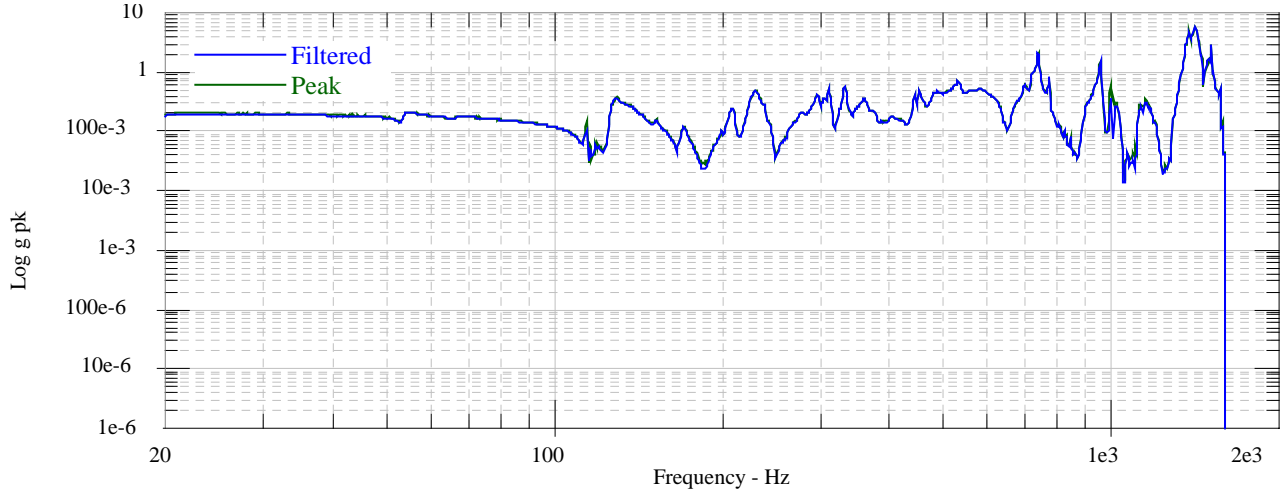
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Date : 6-Apr-04
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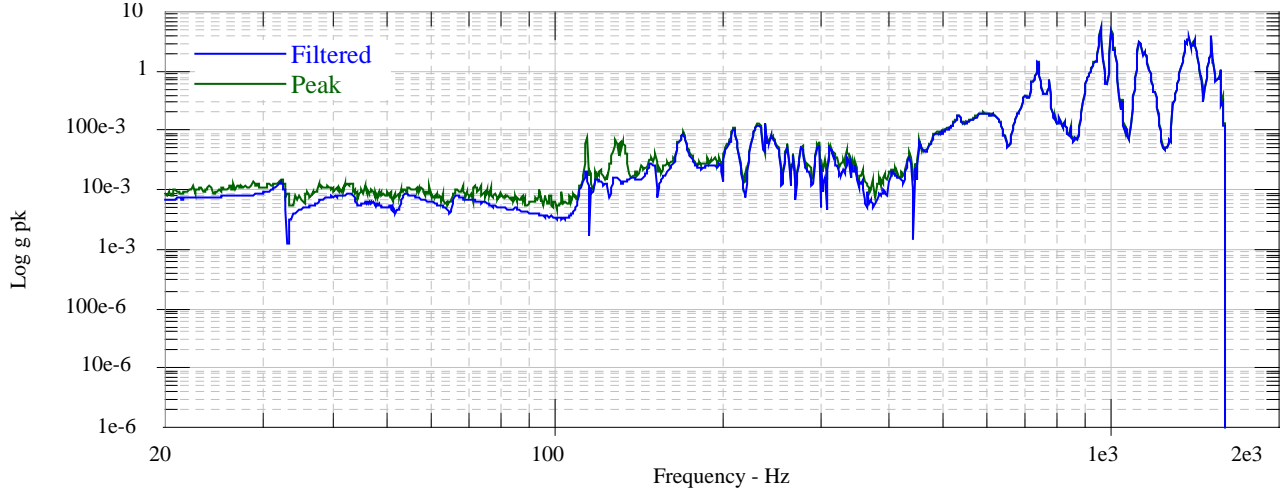
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

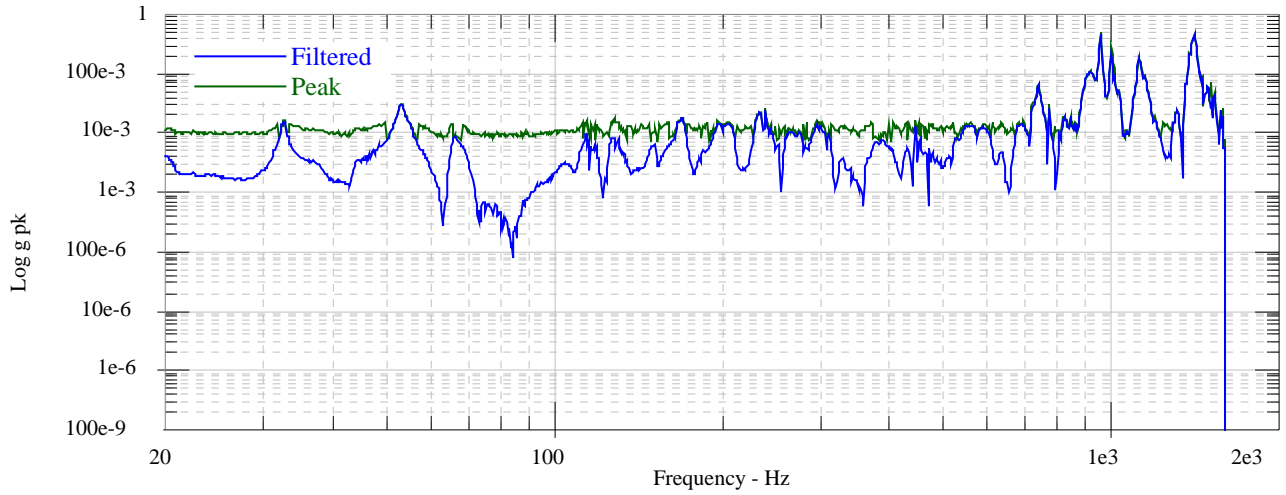


VIBRATION TEST REPORT
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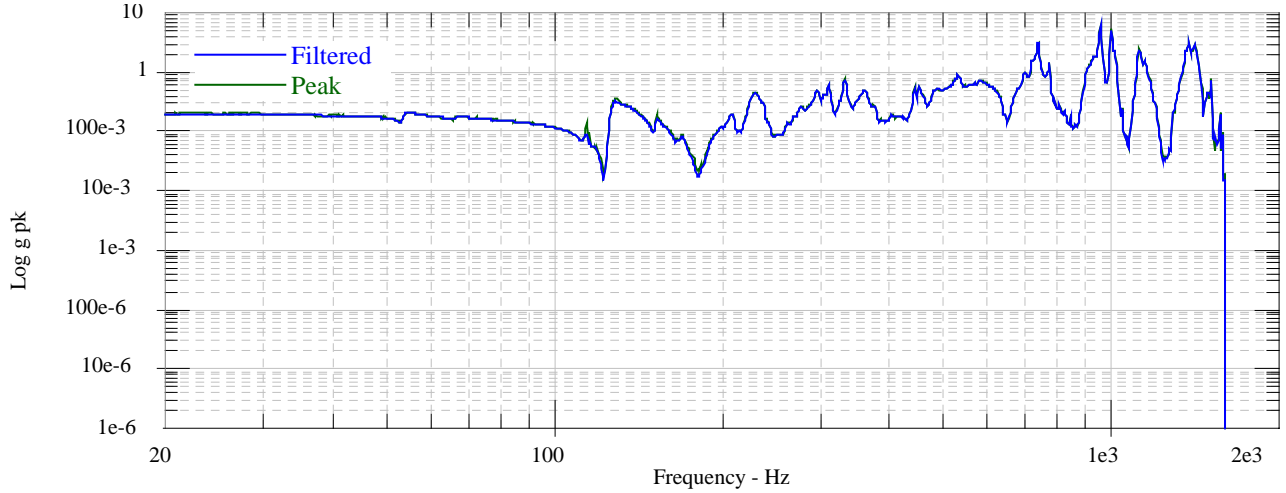
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Date : 6-Apr-04
Page : BNS7Y - 3 / 12

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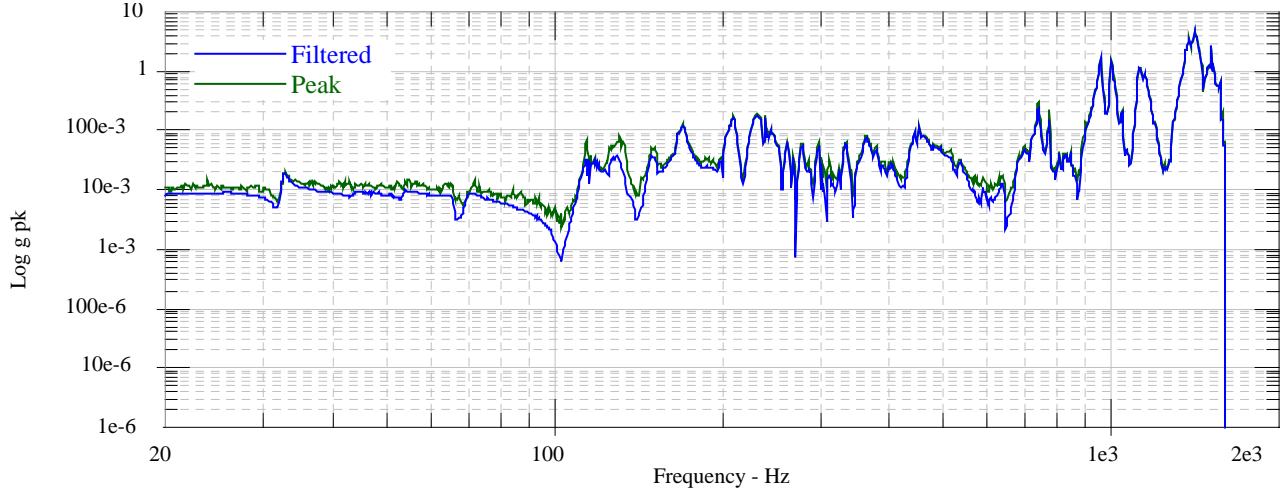
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

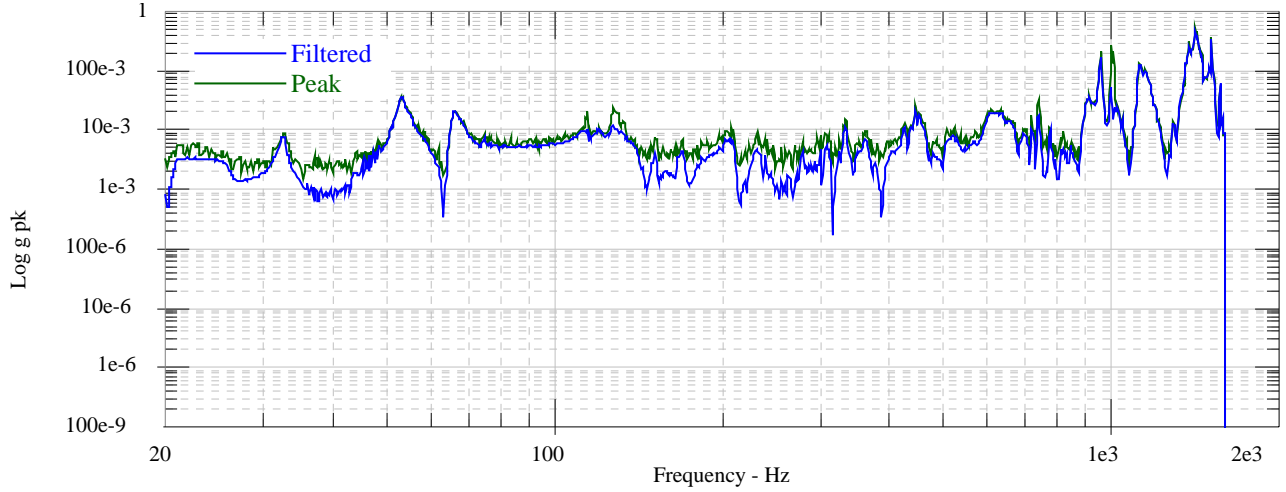


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SPIRE QM

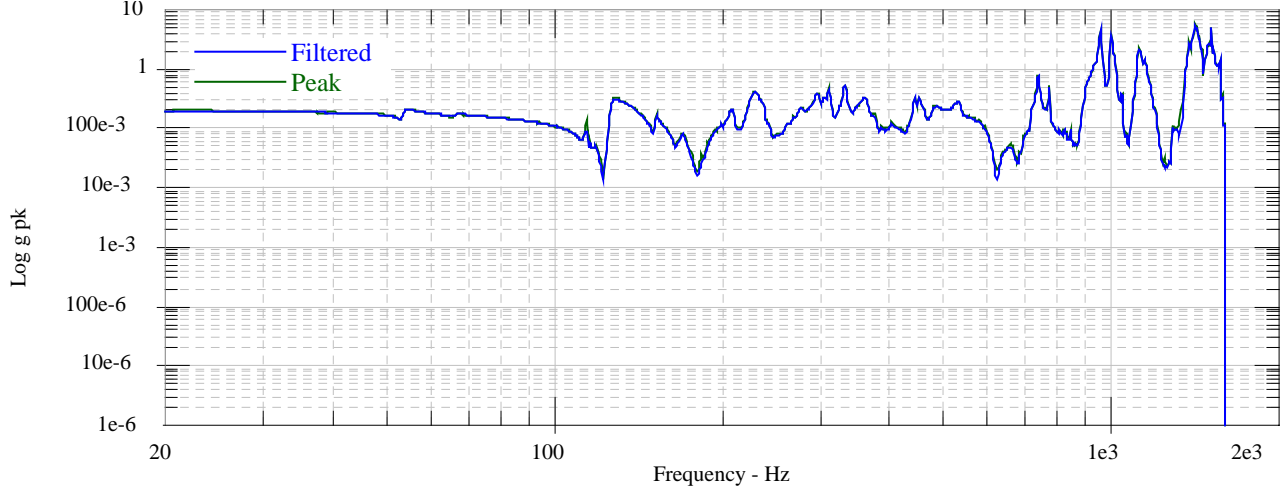
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Date : 6-Apr-04
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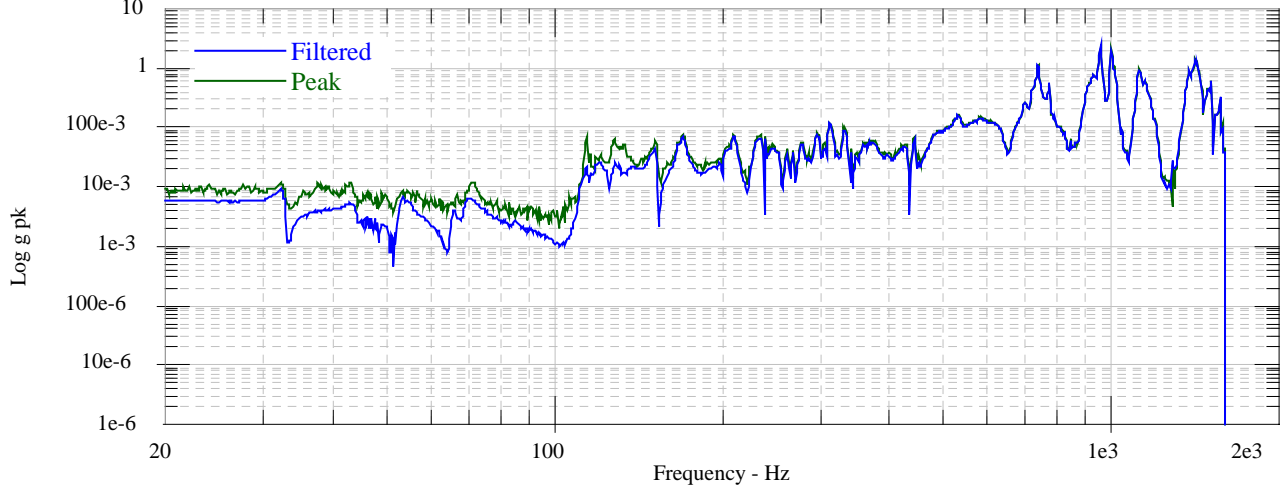
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

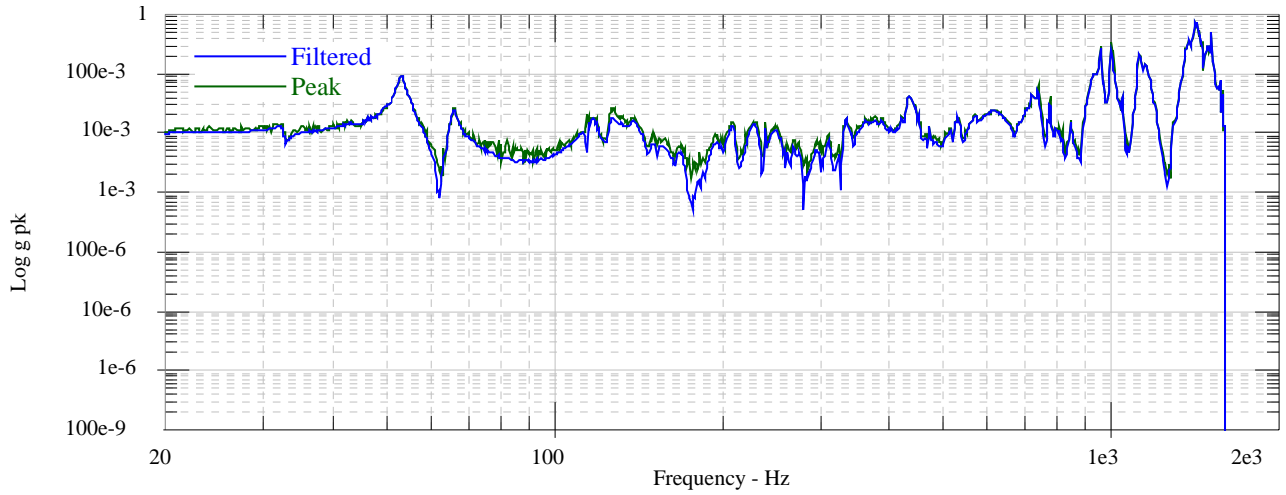


VIBRATION TEST REPORT
SPIRE QM

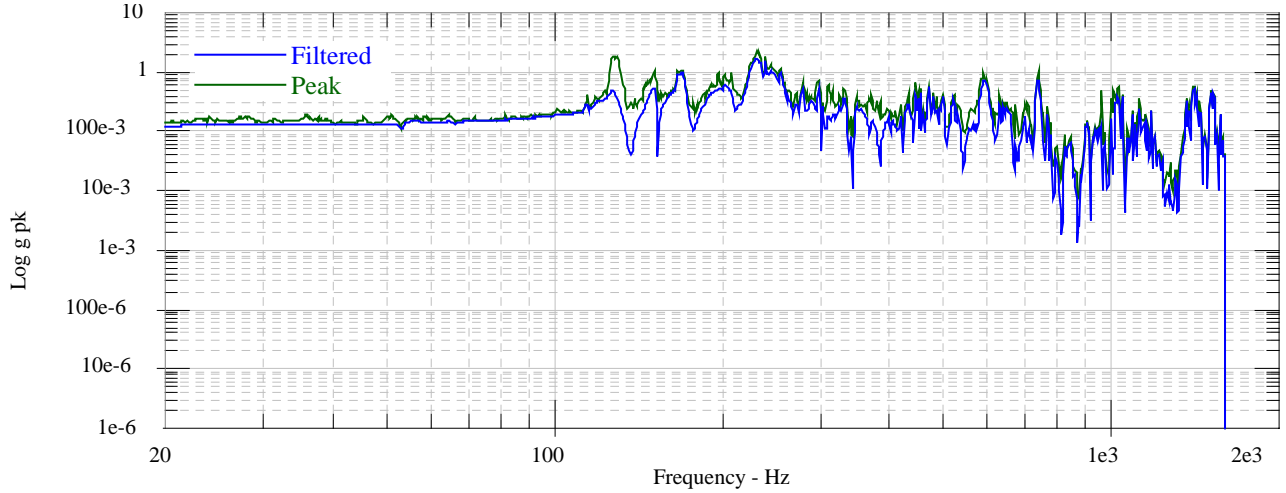
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Page : BNS7Y - 5 / 12

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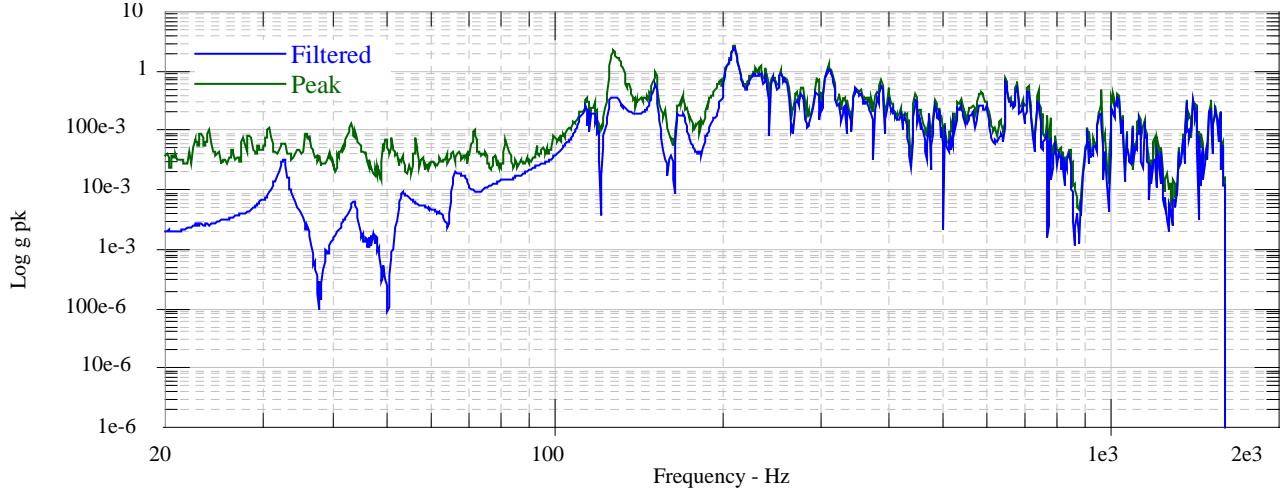
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

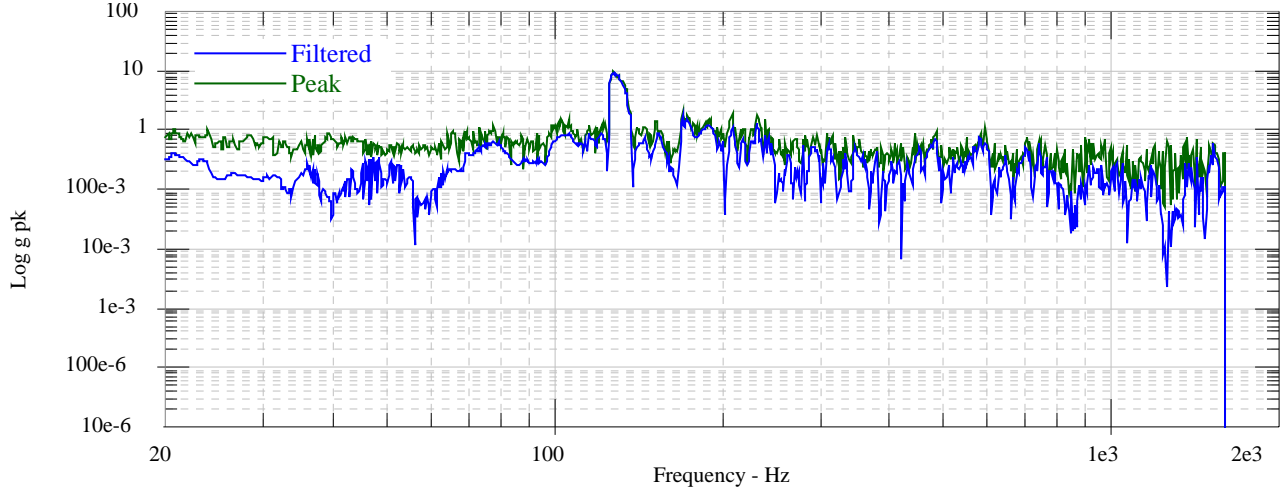


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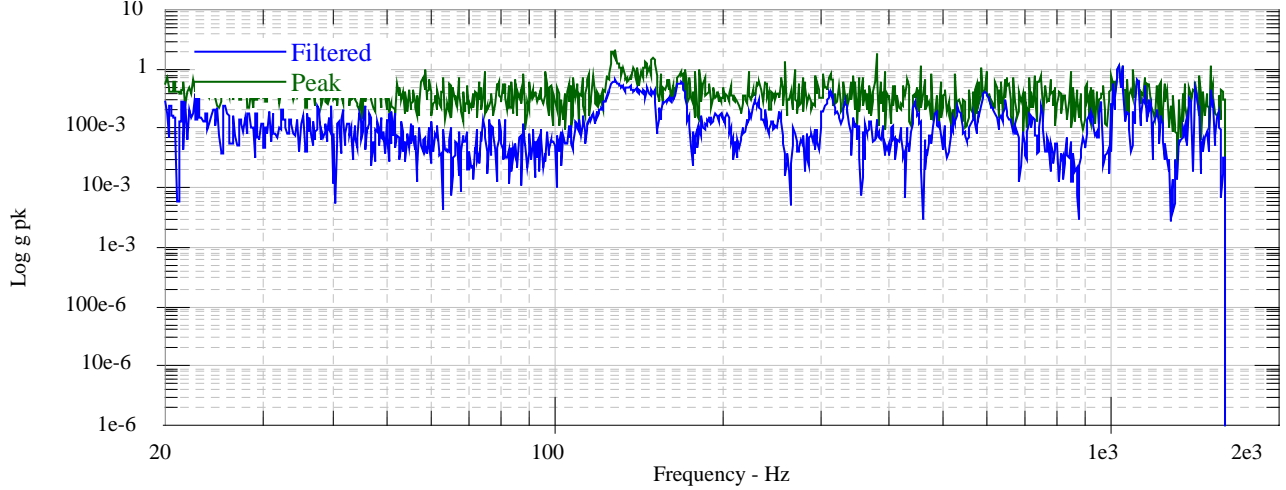
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Version : 01
Révision : 00
Date : 6-Apr-04
Page : BNS7Y - 6 / 12

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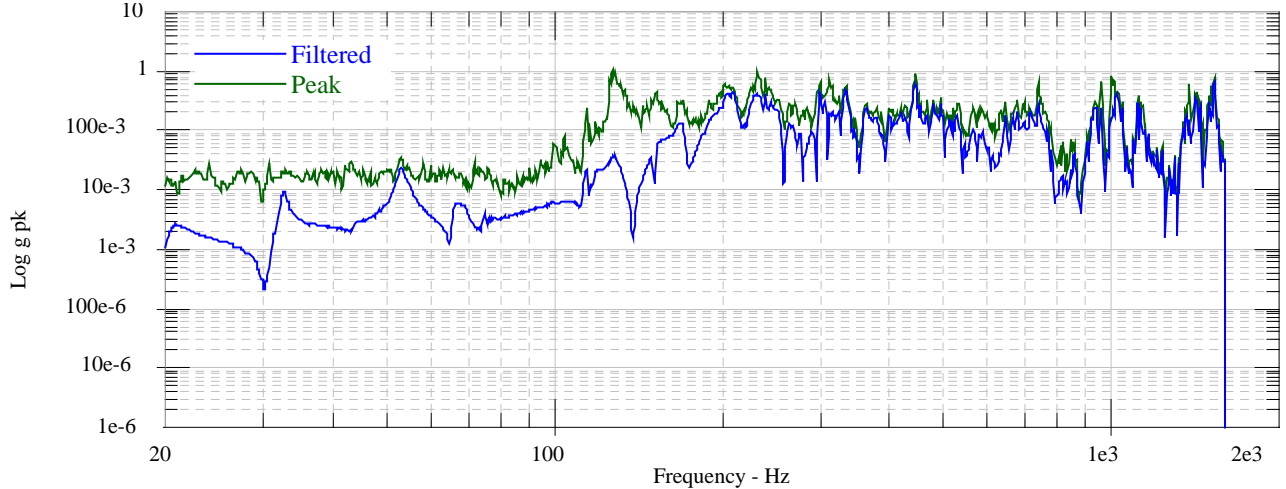
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COOL.X Channel n° 13



FPU.X Channel n° 14

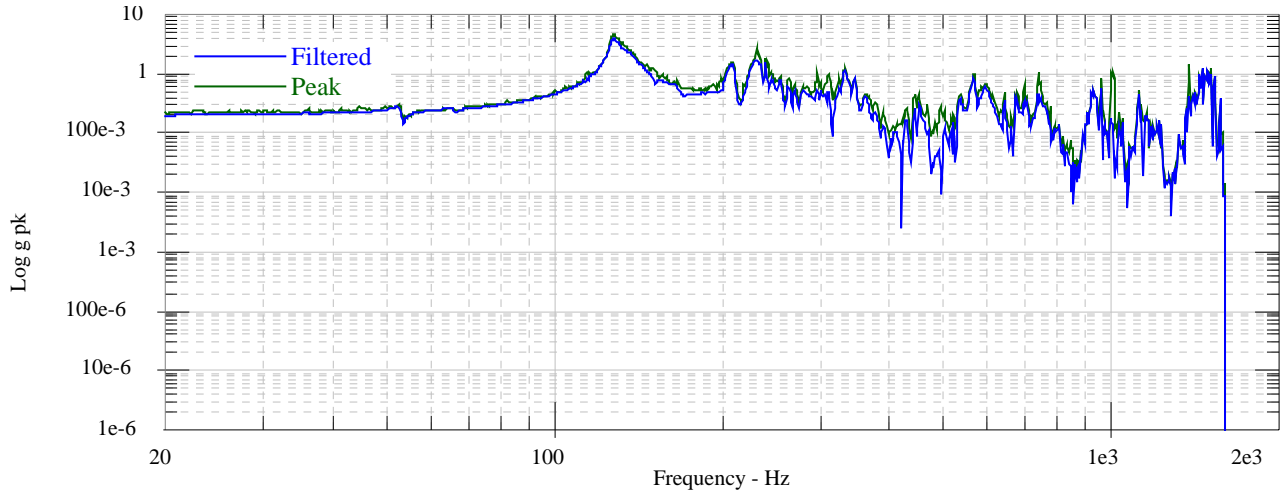


VIBRATION TEST REPORT
SPIRE QM

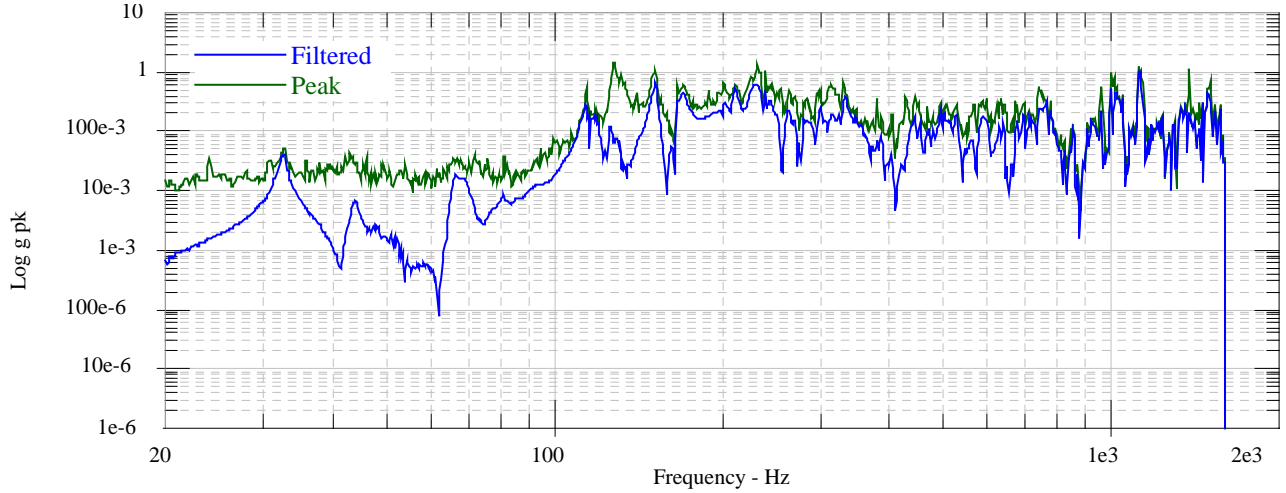
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Version : 01
Révision : 00
Date : 6-Apr-04
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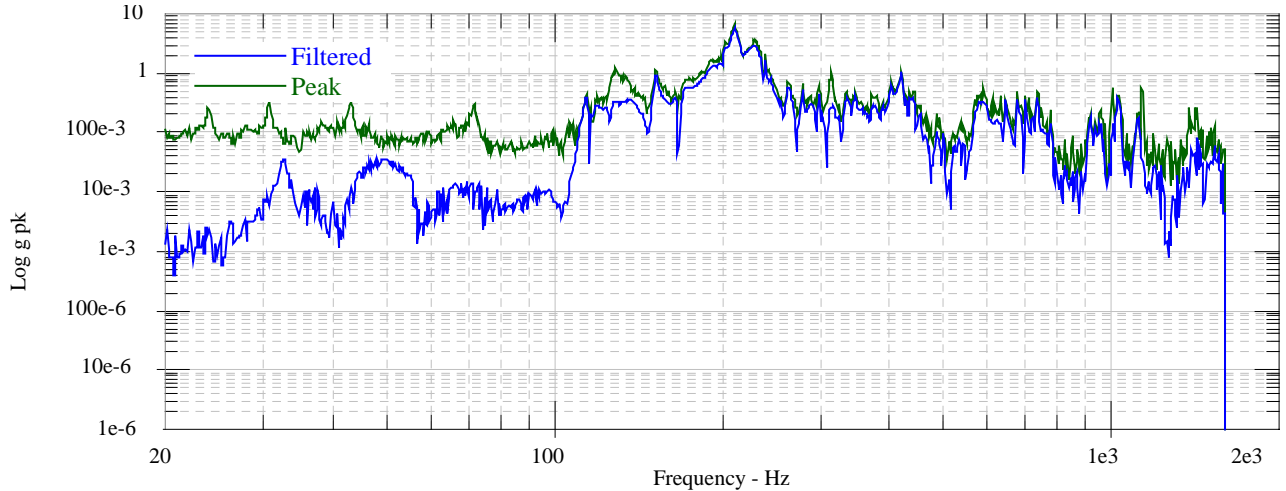
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

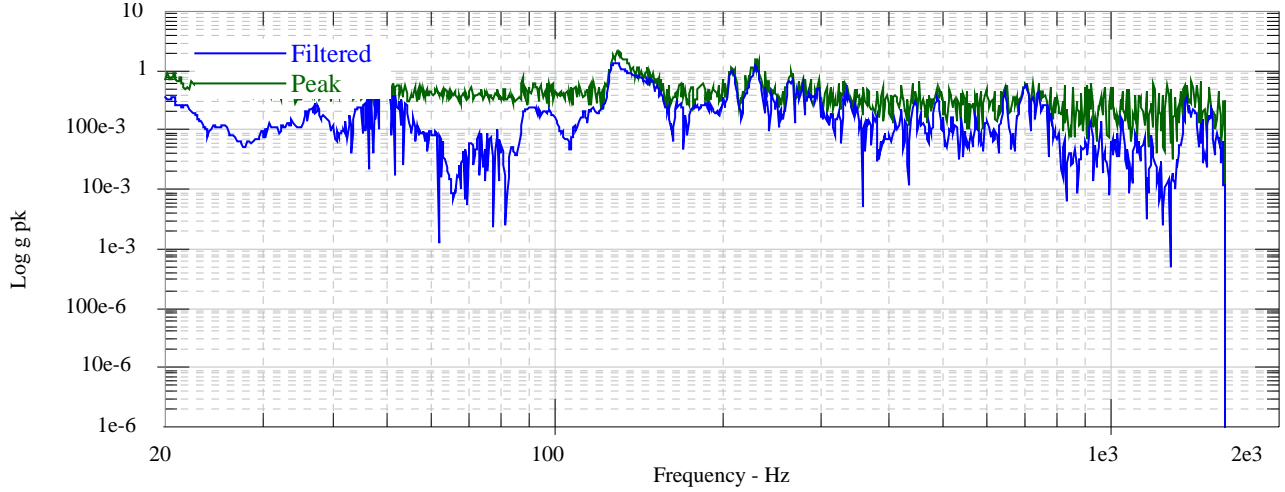


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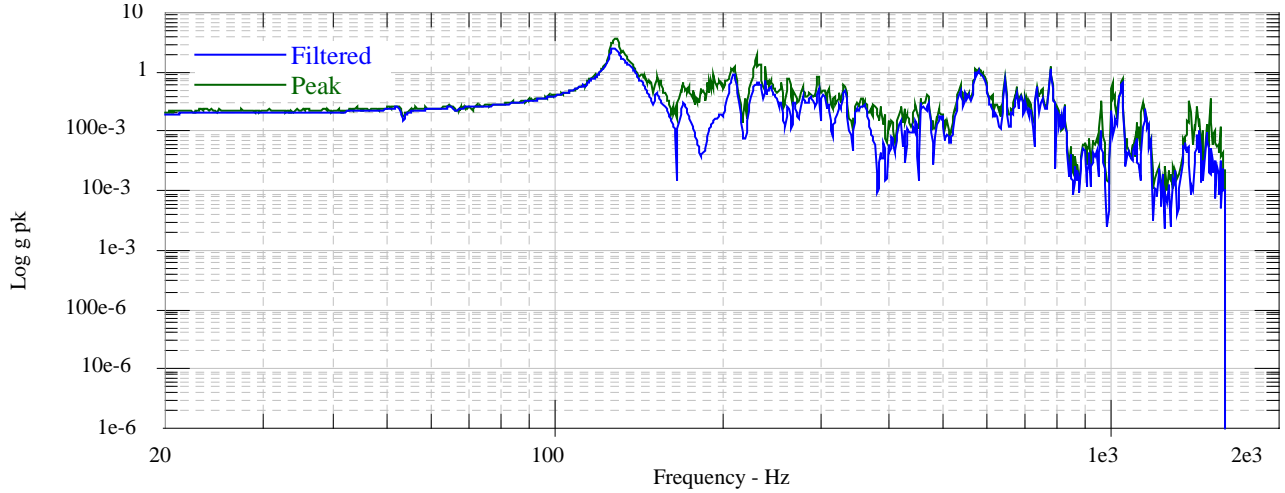
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Date : 6-Apr-04
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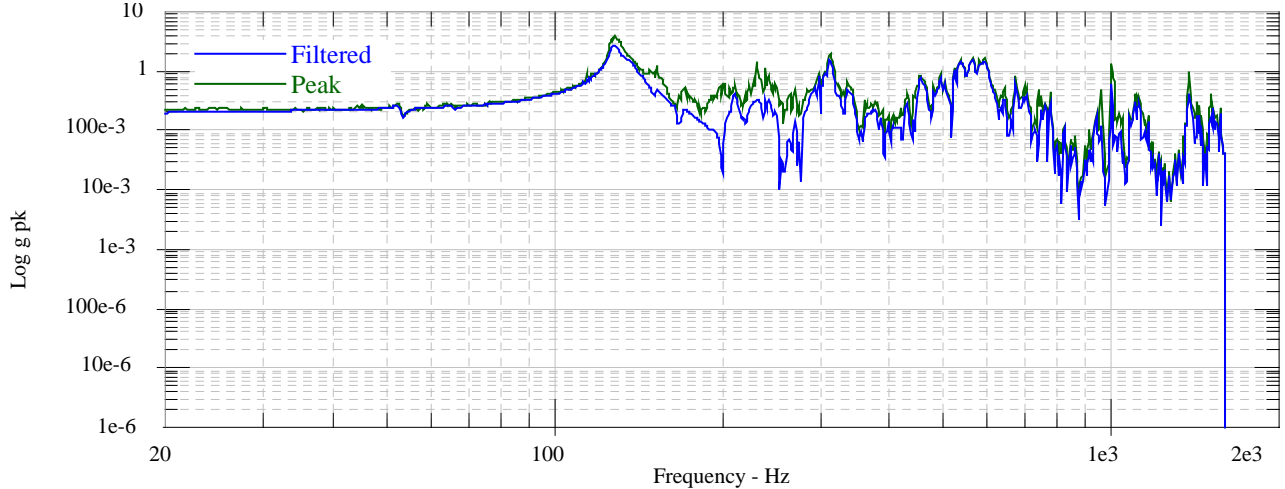
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

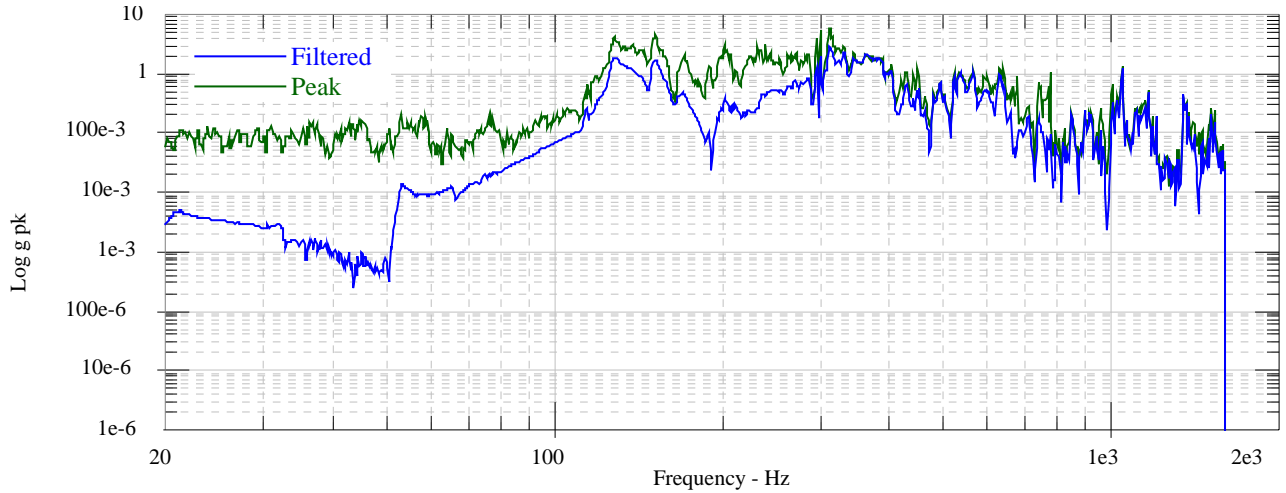


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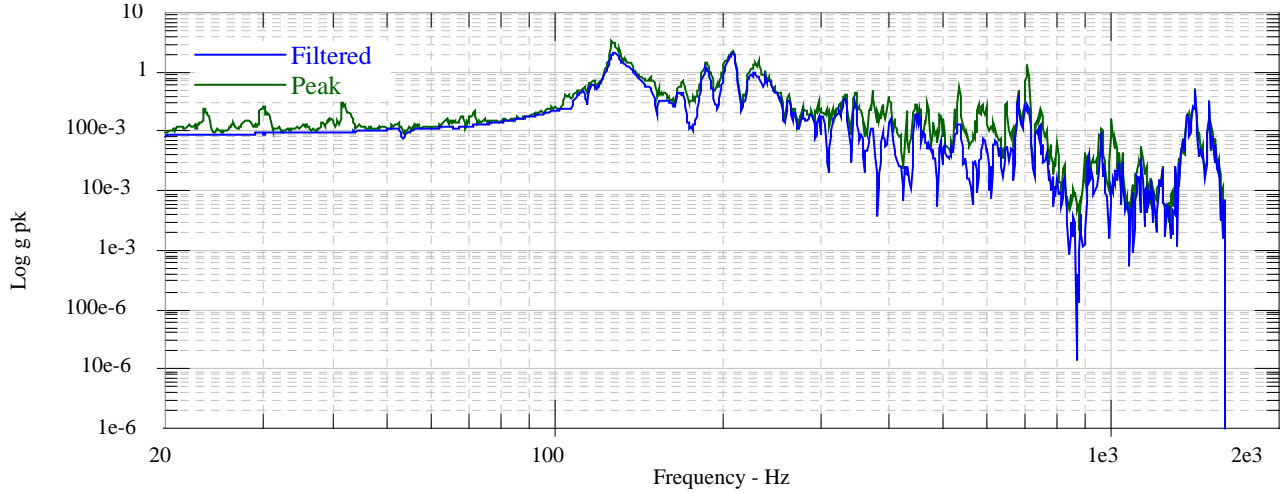
RP-CSL-CRYOV-04001
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SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

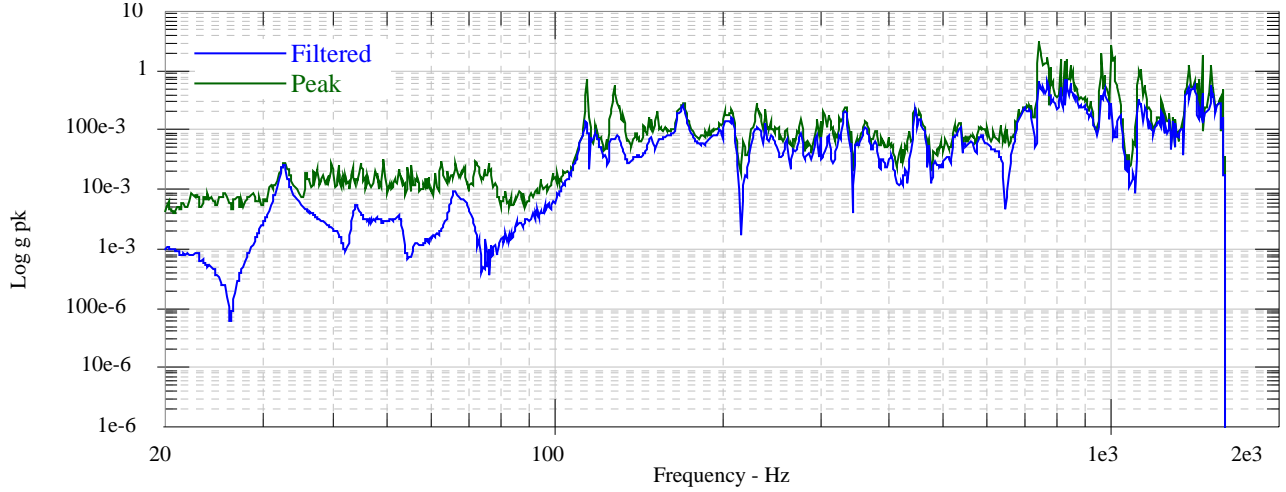


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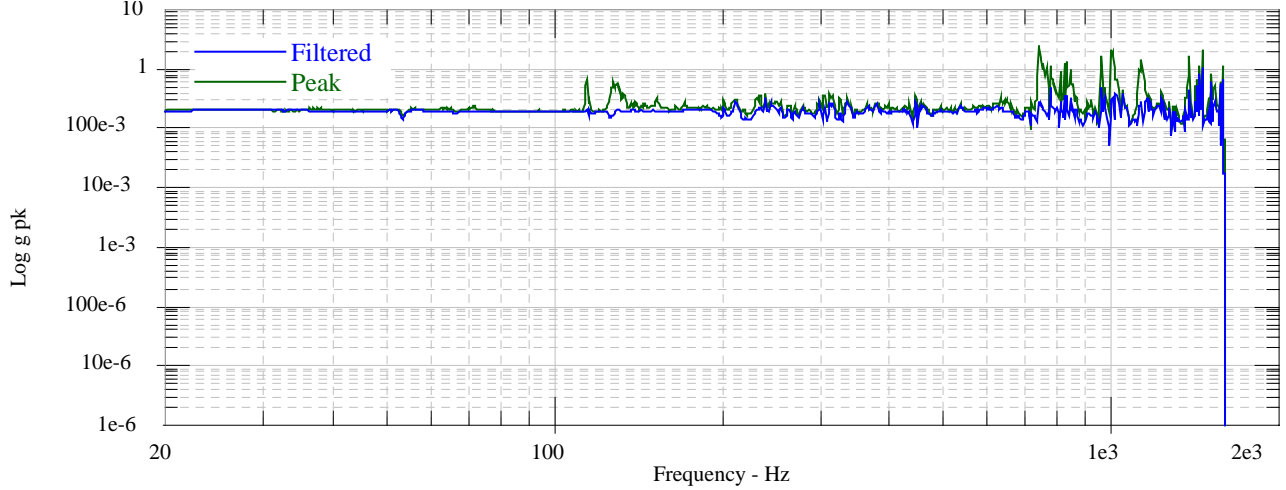
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Date : 6-Apr-04
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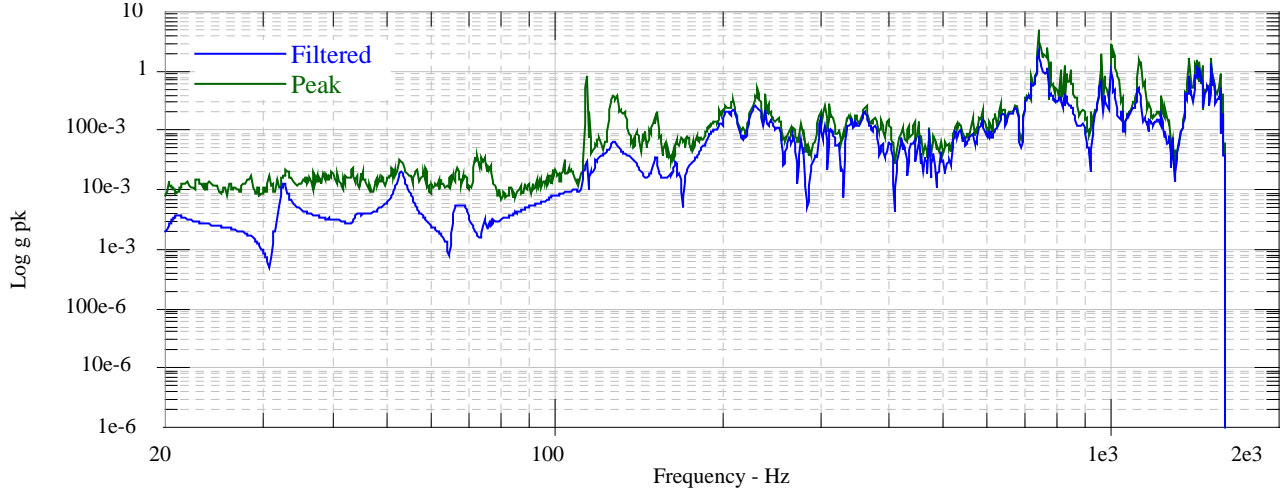
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

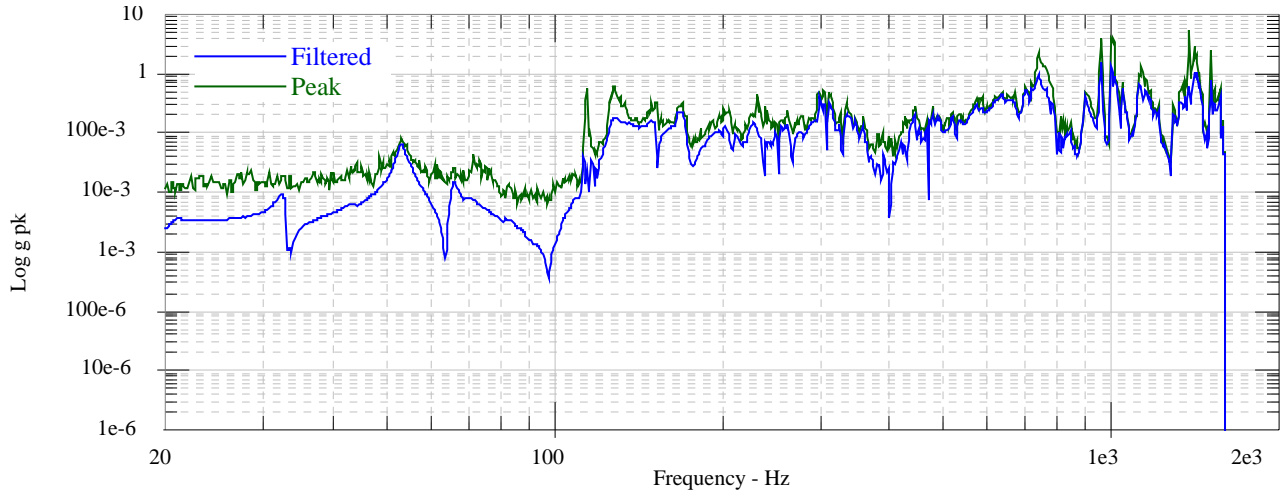


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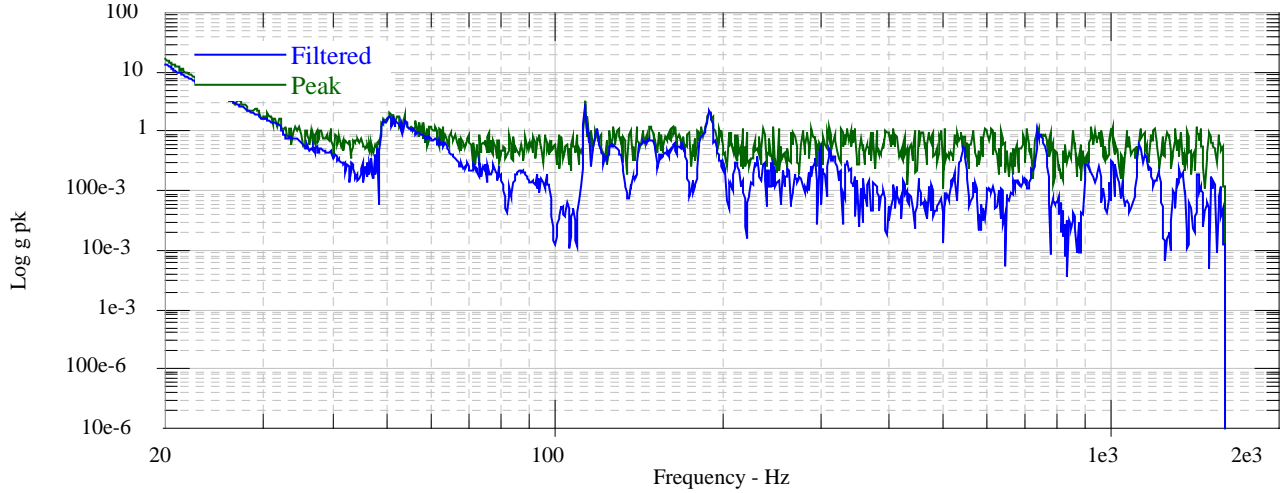
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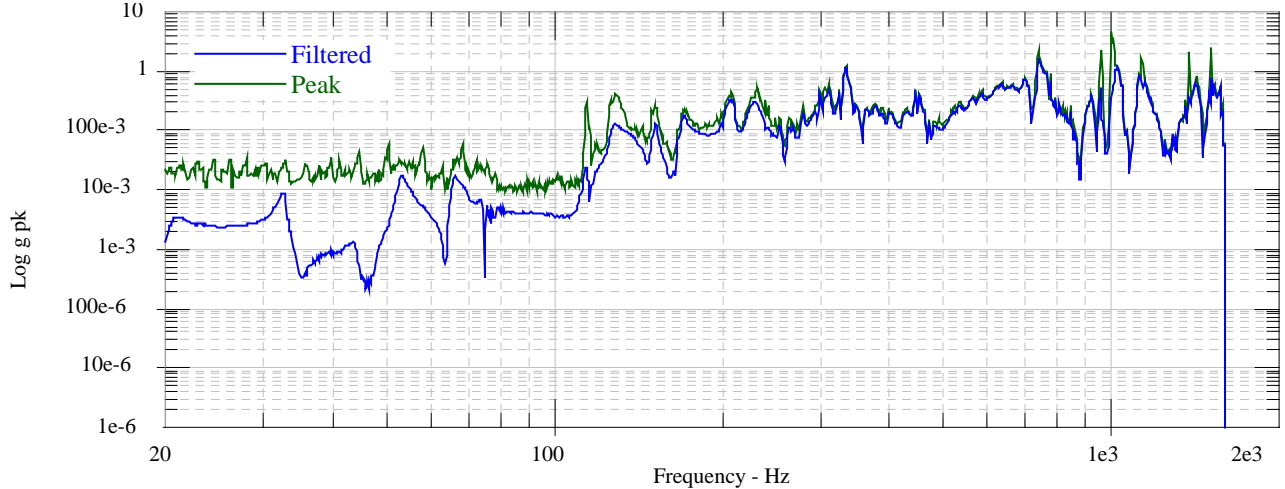
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

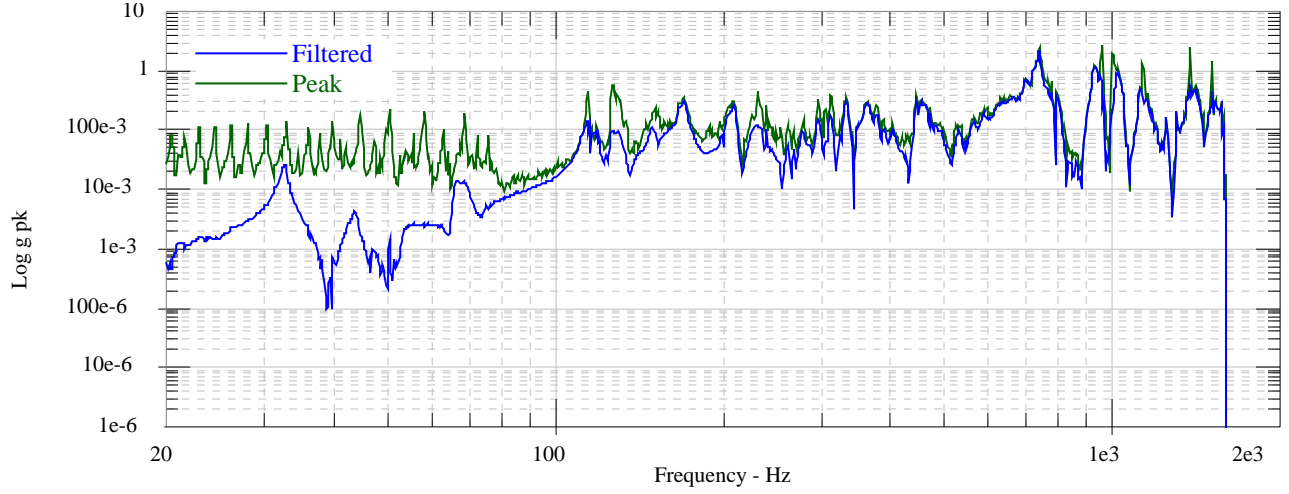


VIBRATION TEST REPORT
SPIRE QM

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+YAFRAME.Z Channel n° 30



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SPIRE QM

RP-CSL-CRYOV-04001
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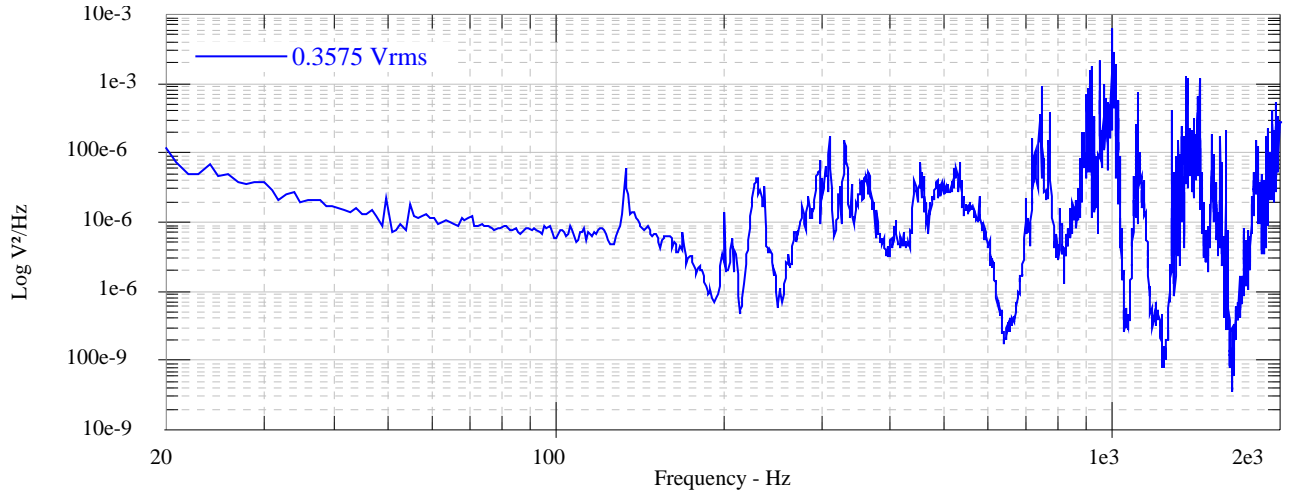
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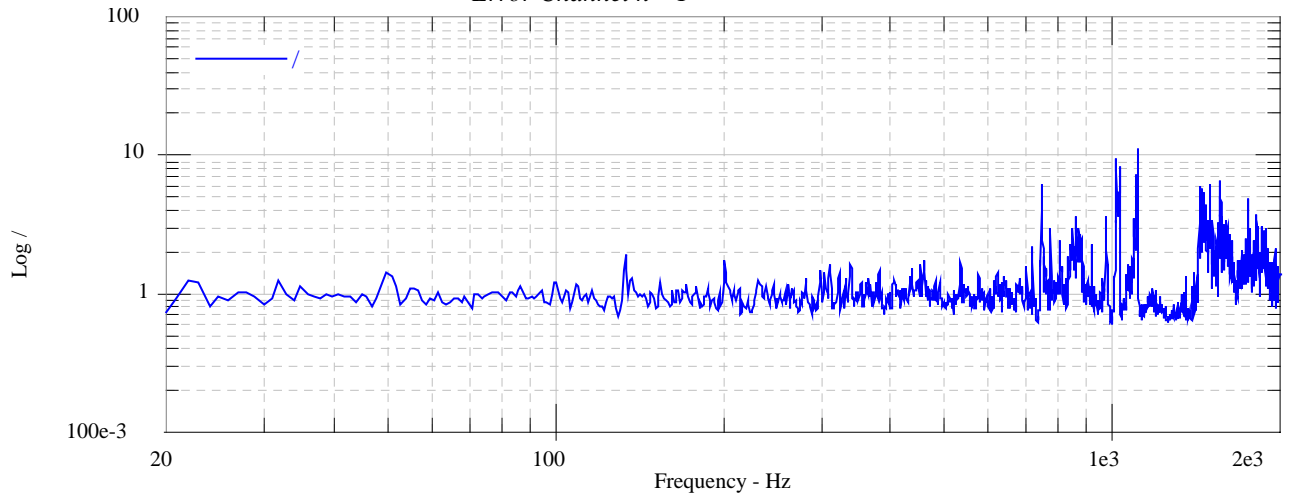
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Page : BNA8Y - 1 / 11

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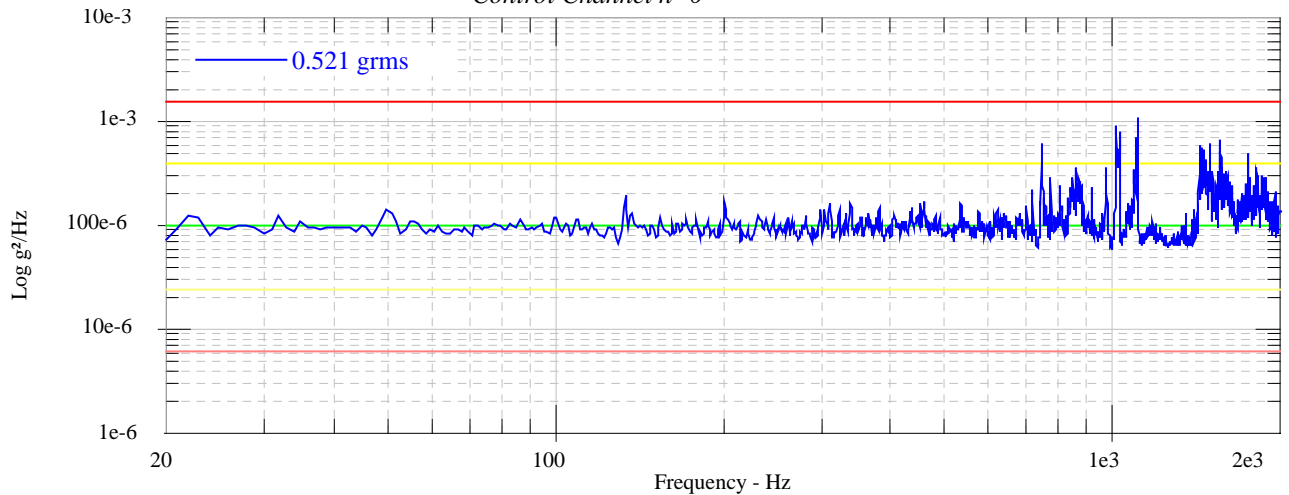
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

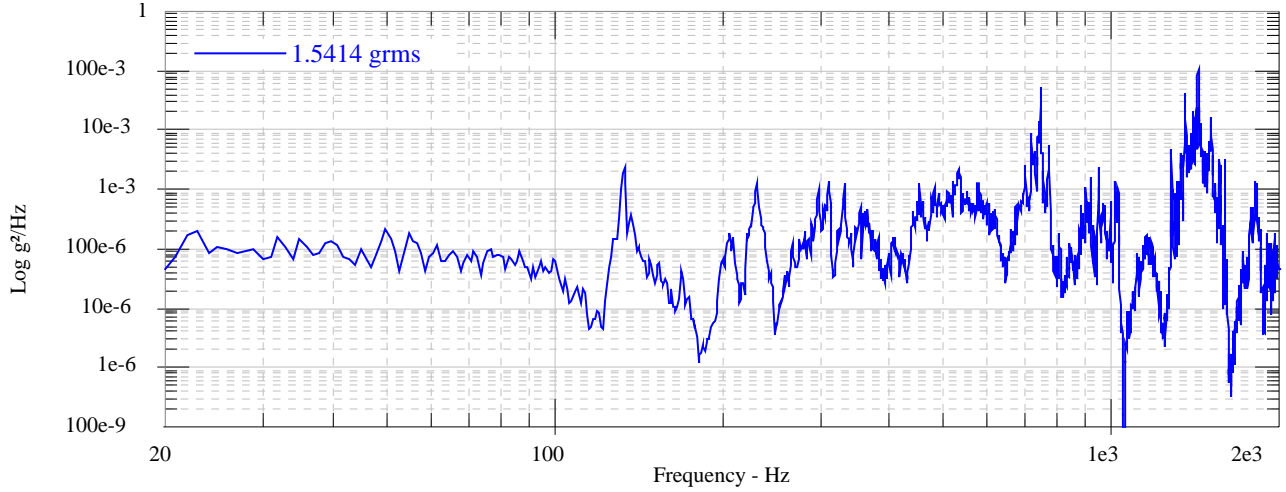


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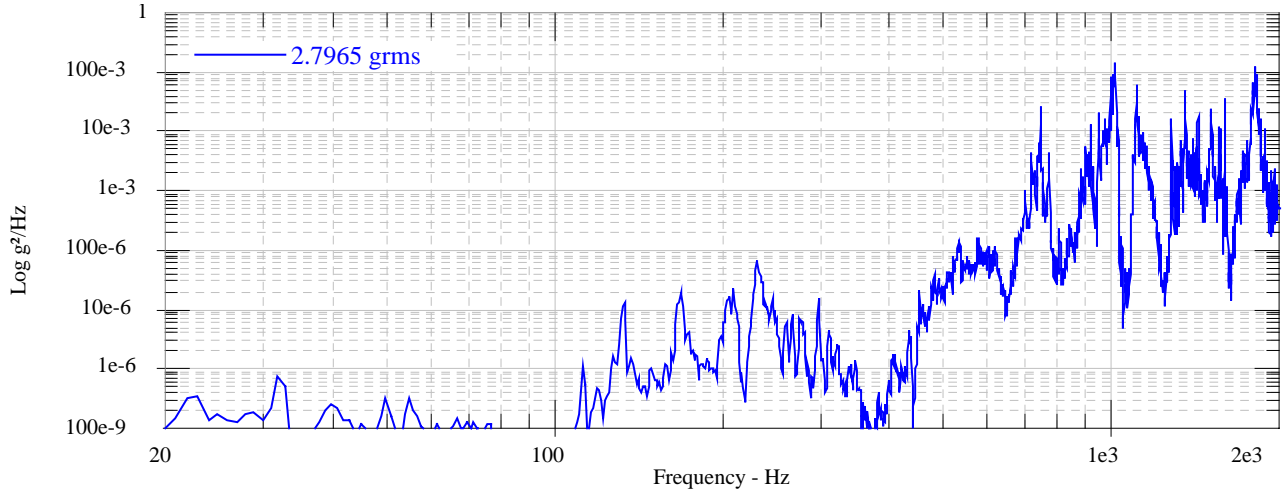
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Page : BNA8Y - 2 / 11

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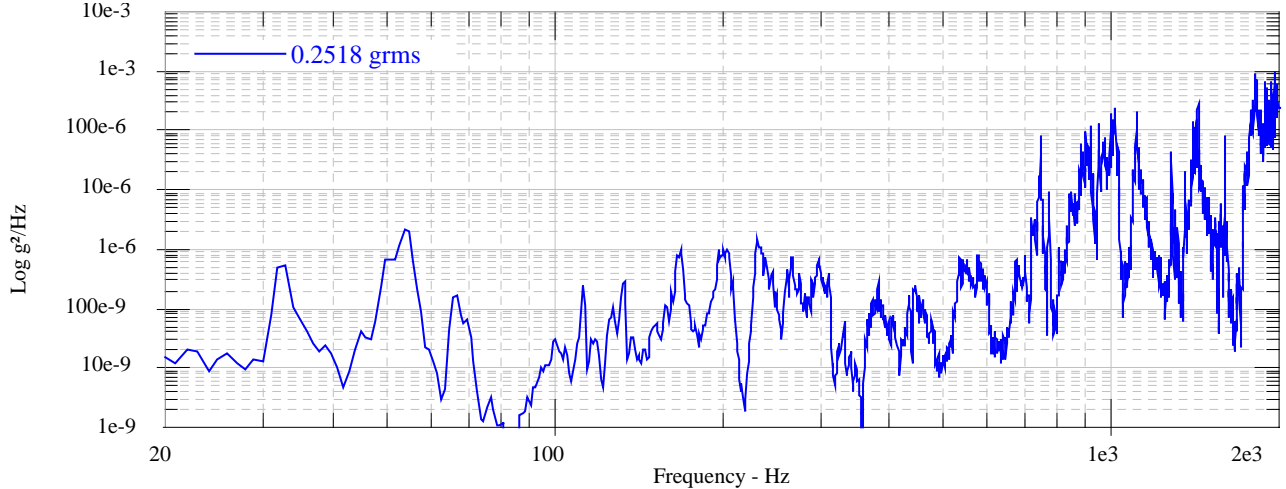
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

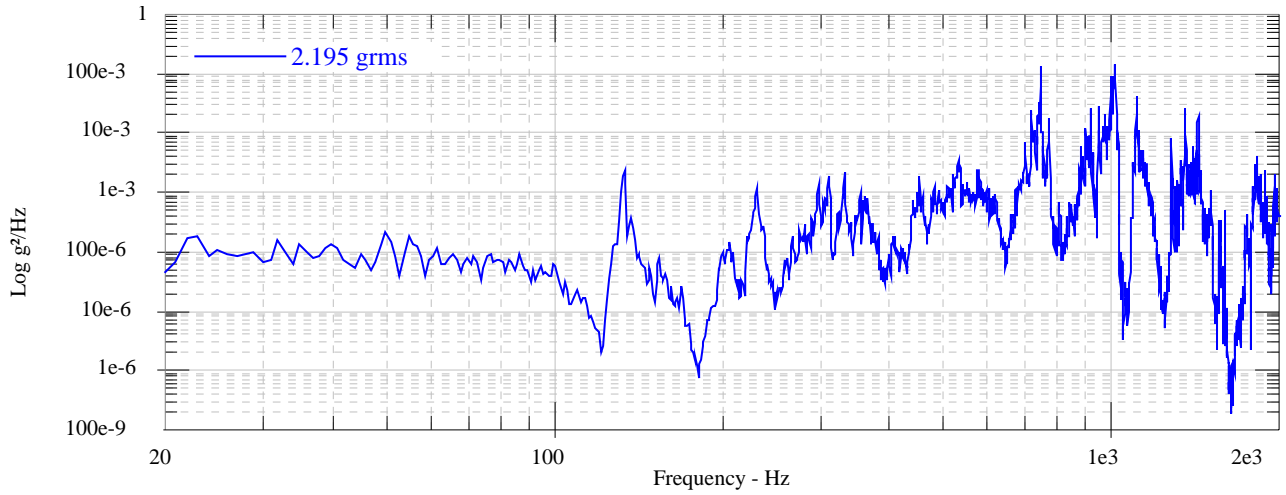


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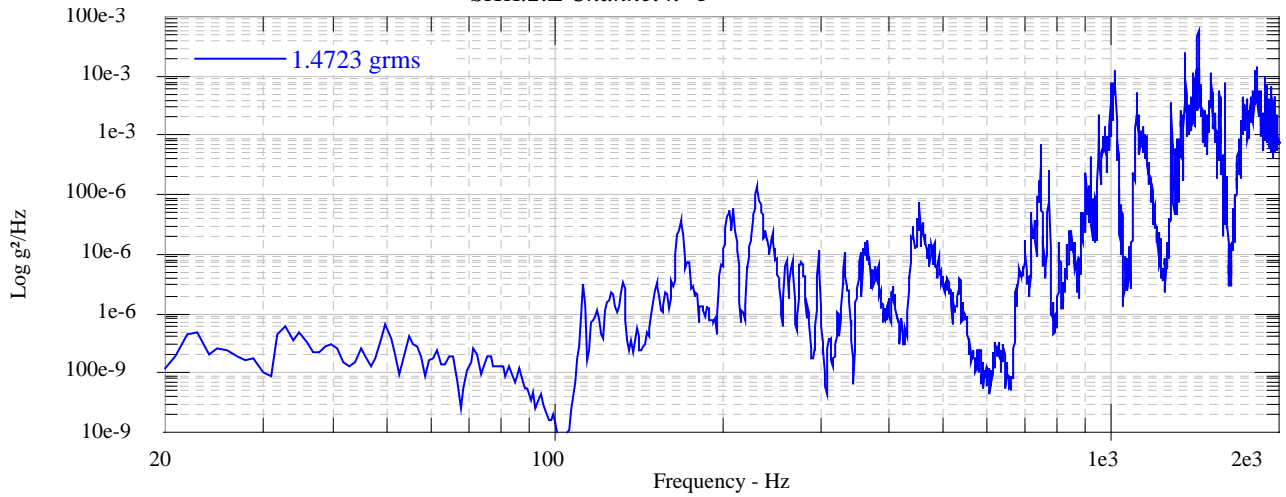
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Date : 6-Apr-04
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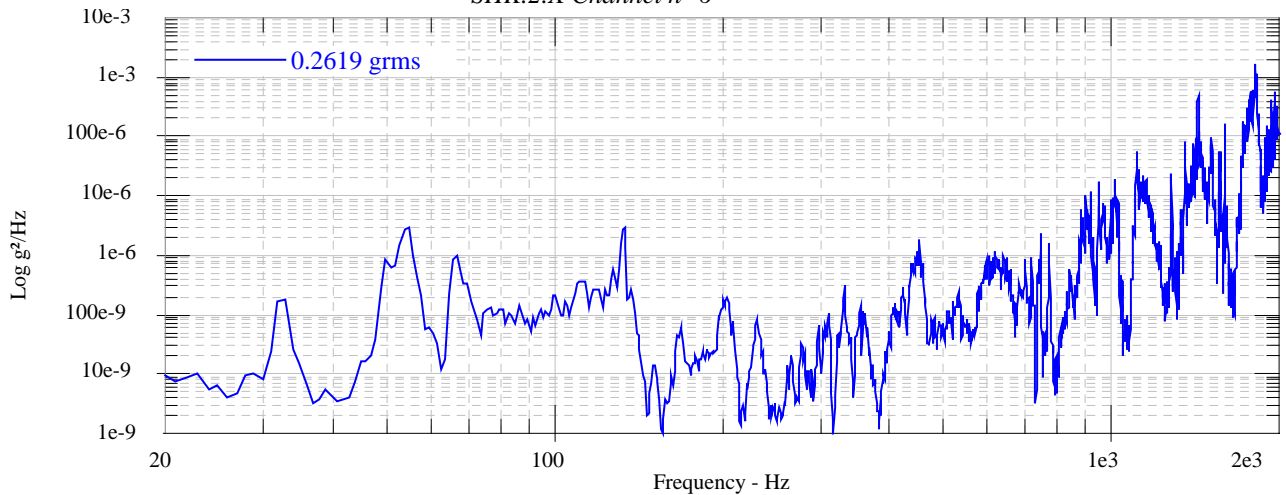
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

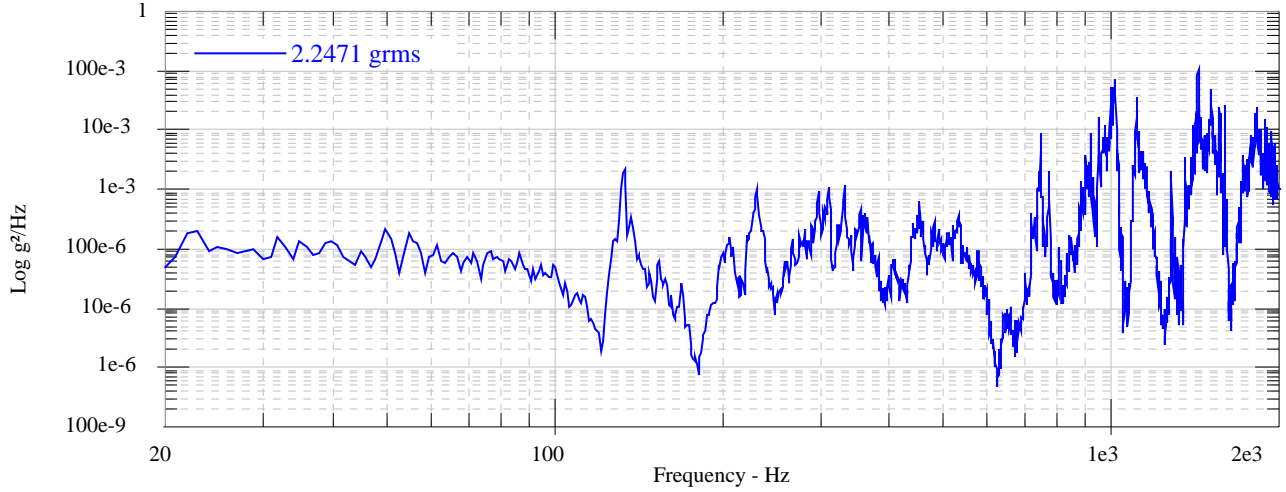


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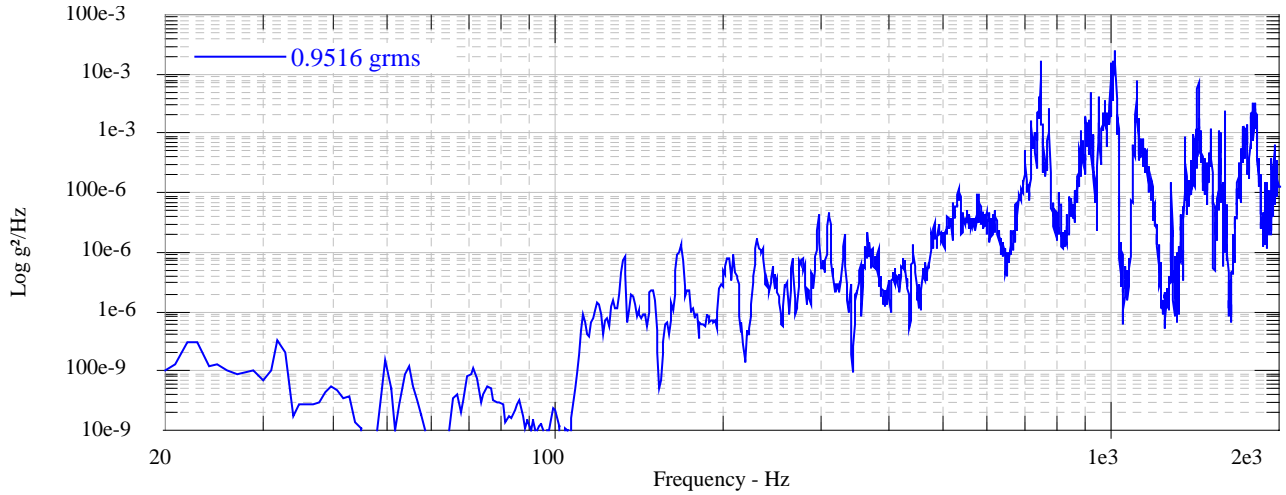
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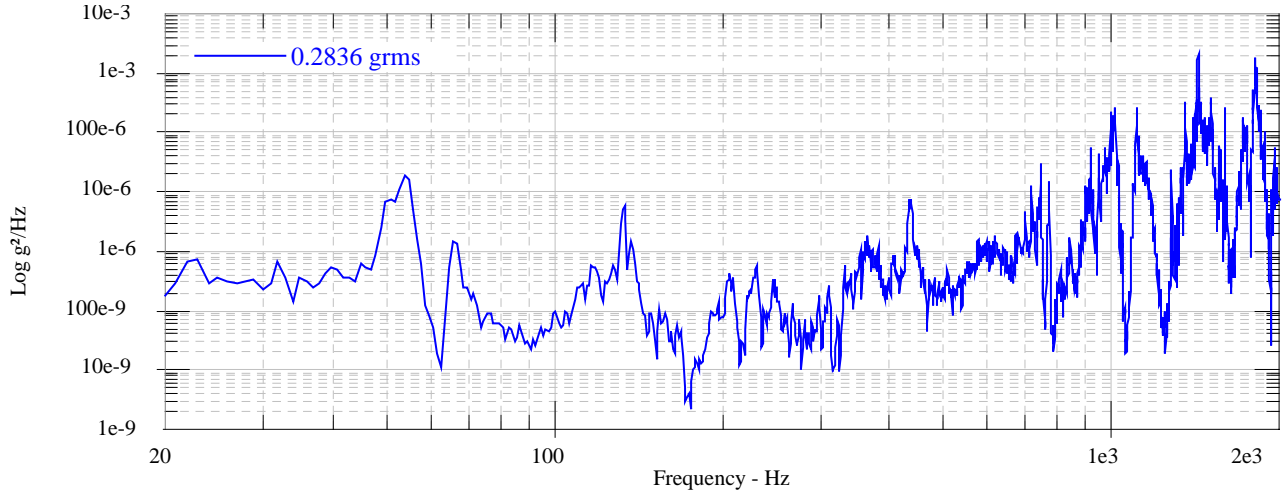
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

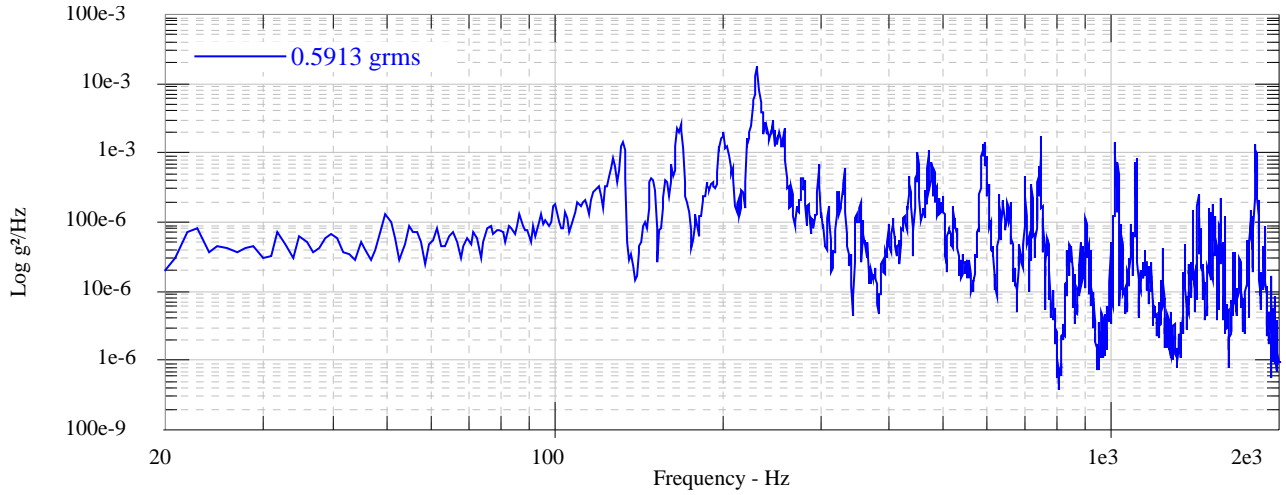


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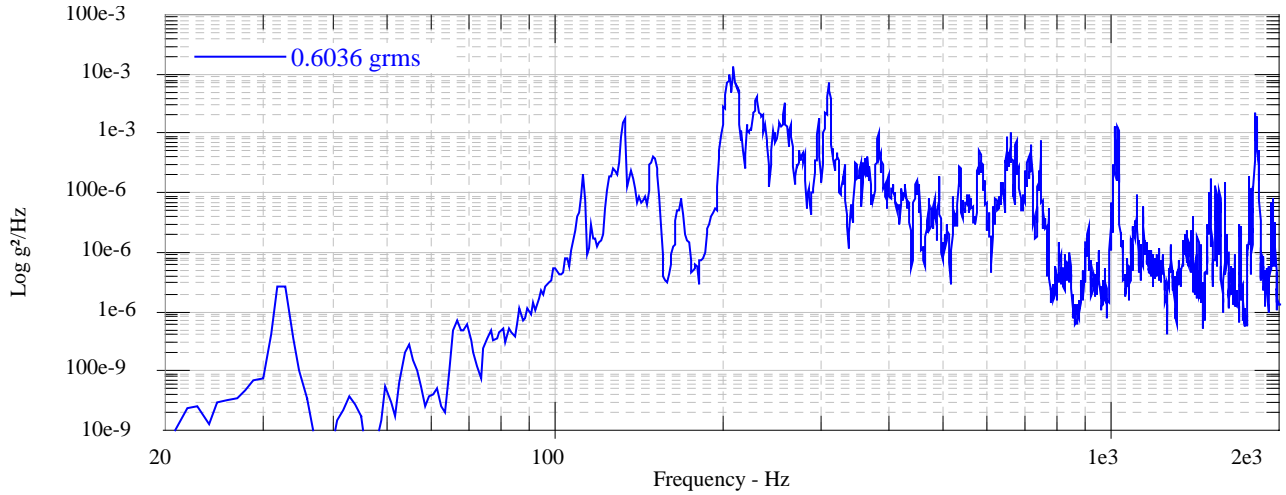
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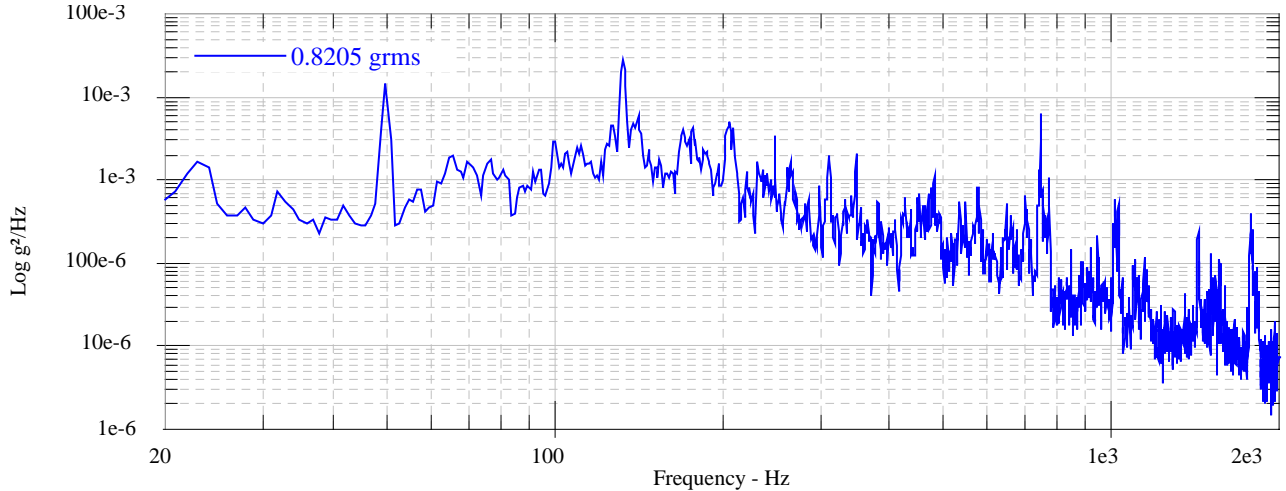
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

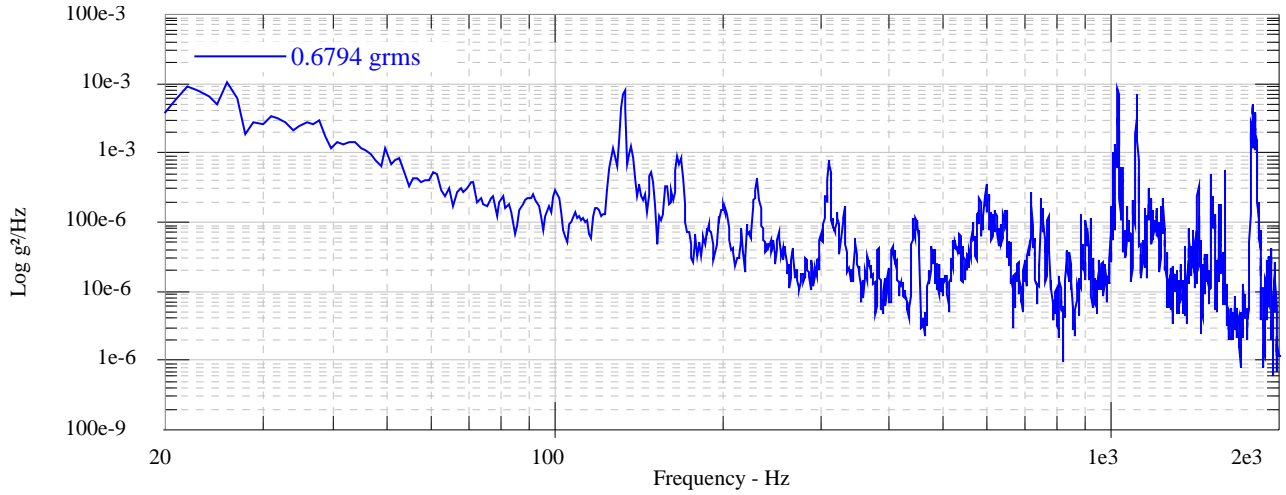


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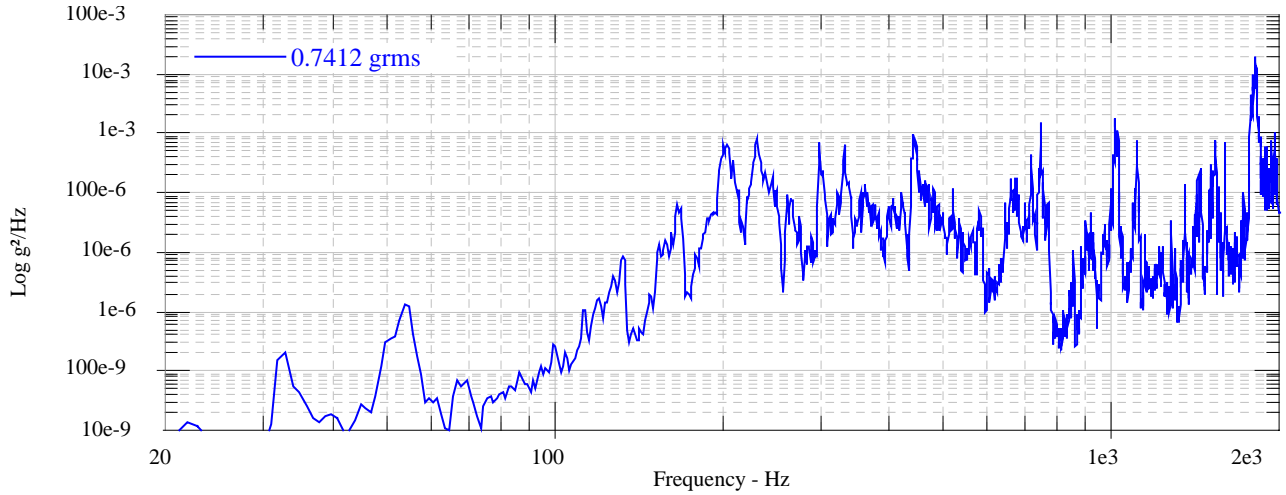
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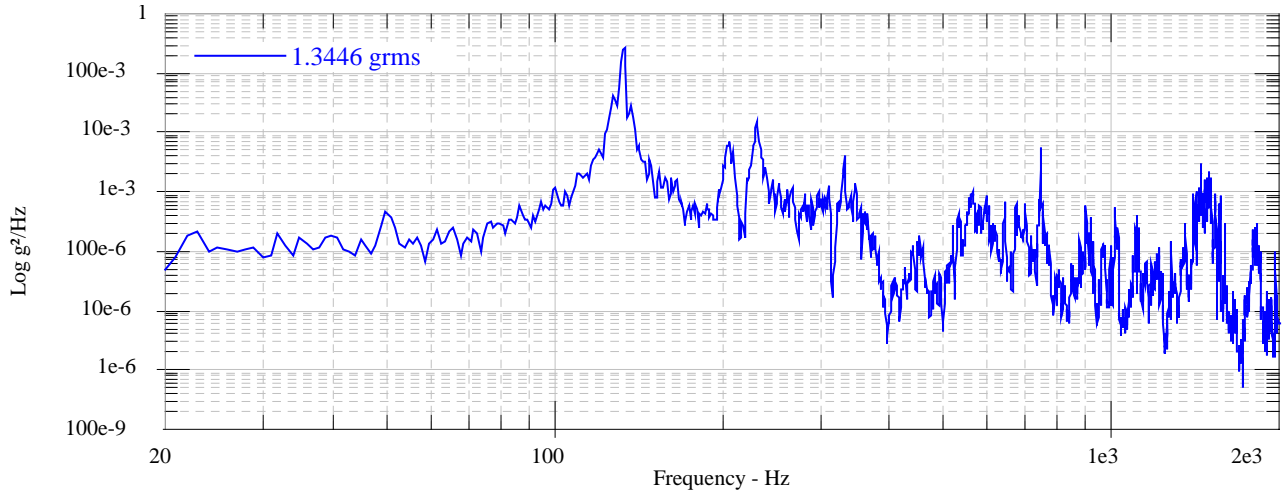
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

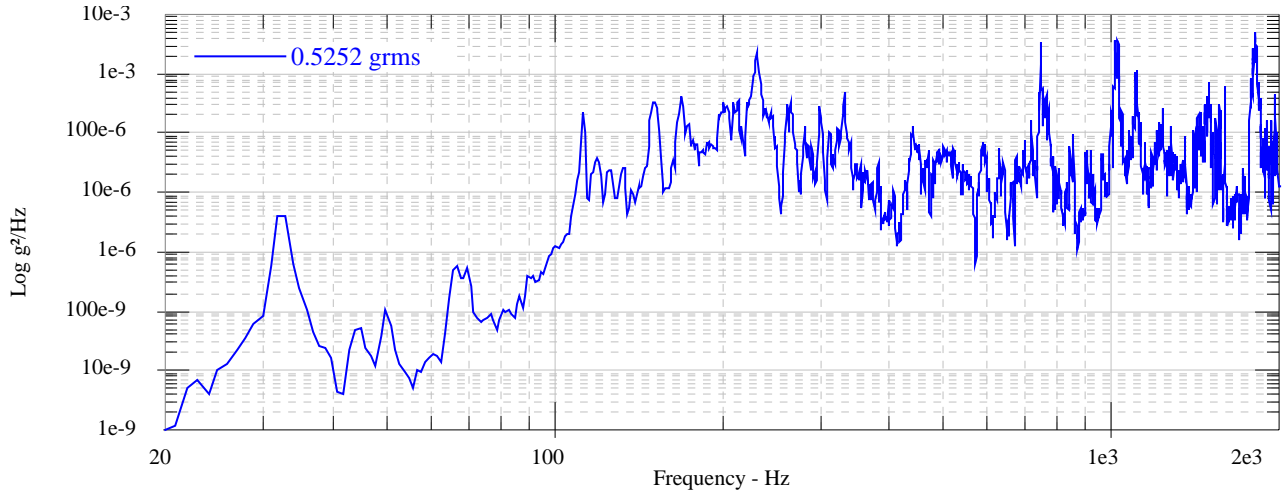


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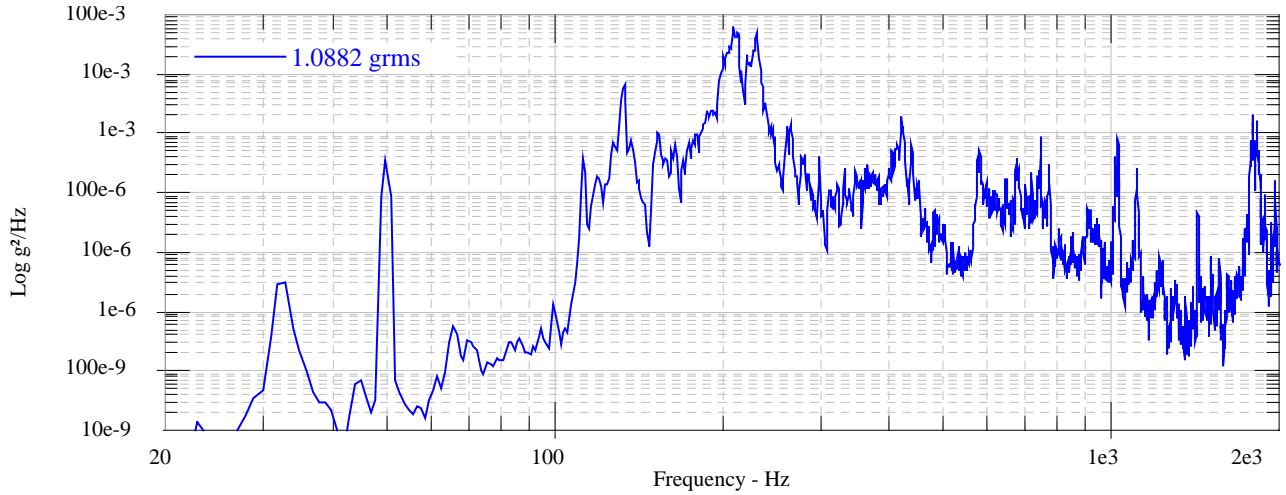
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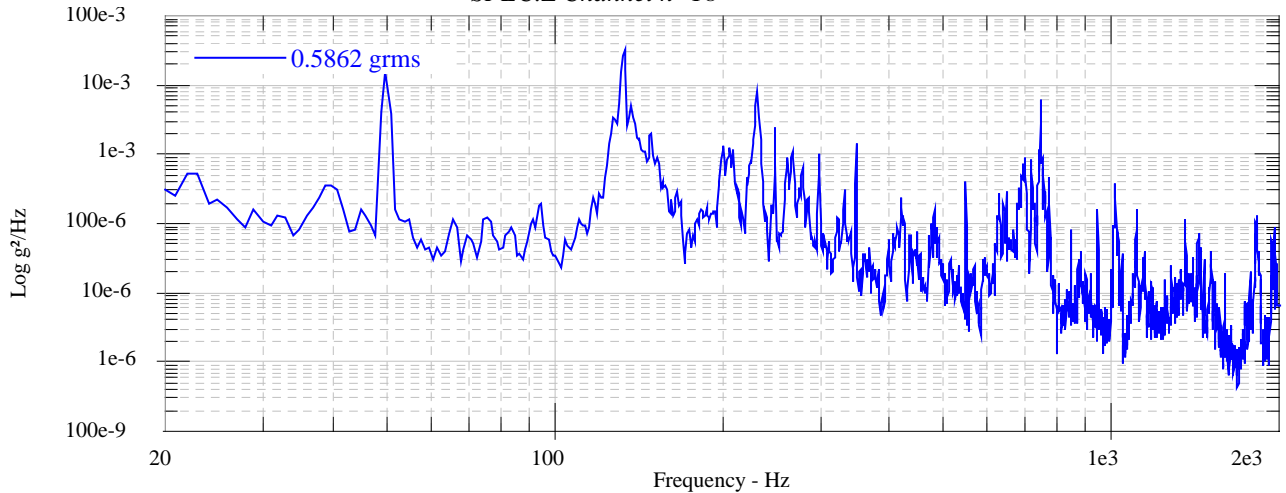
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

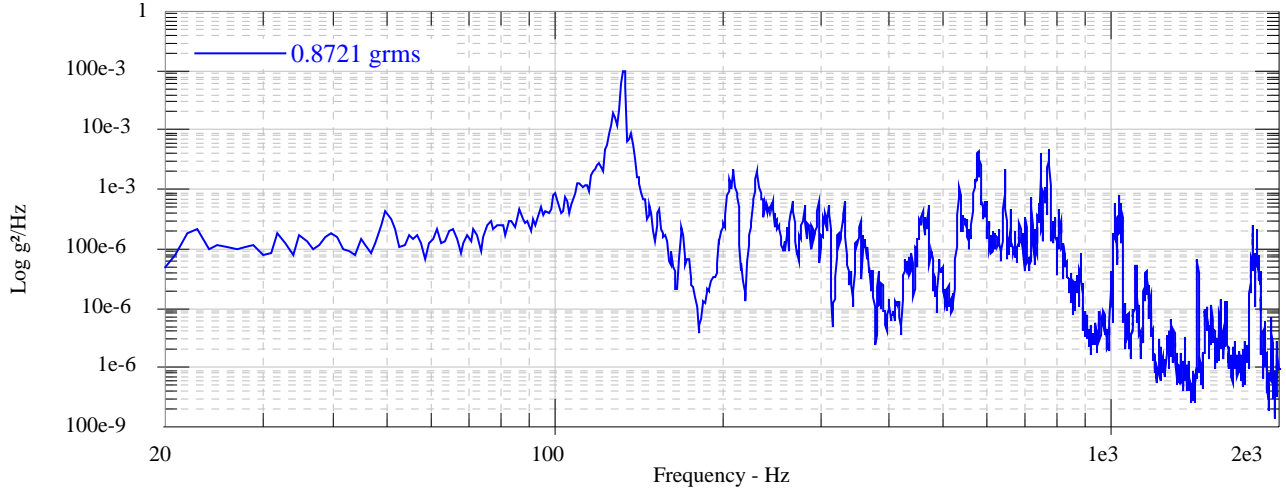


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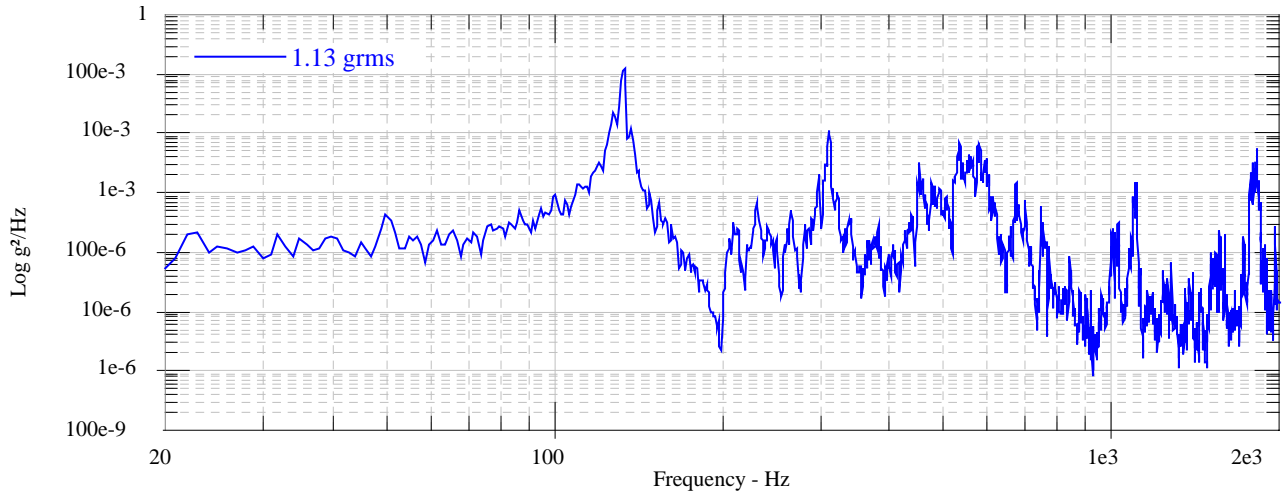
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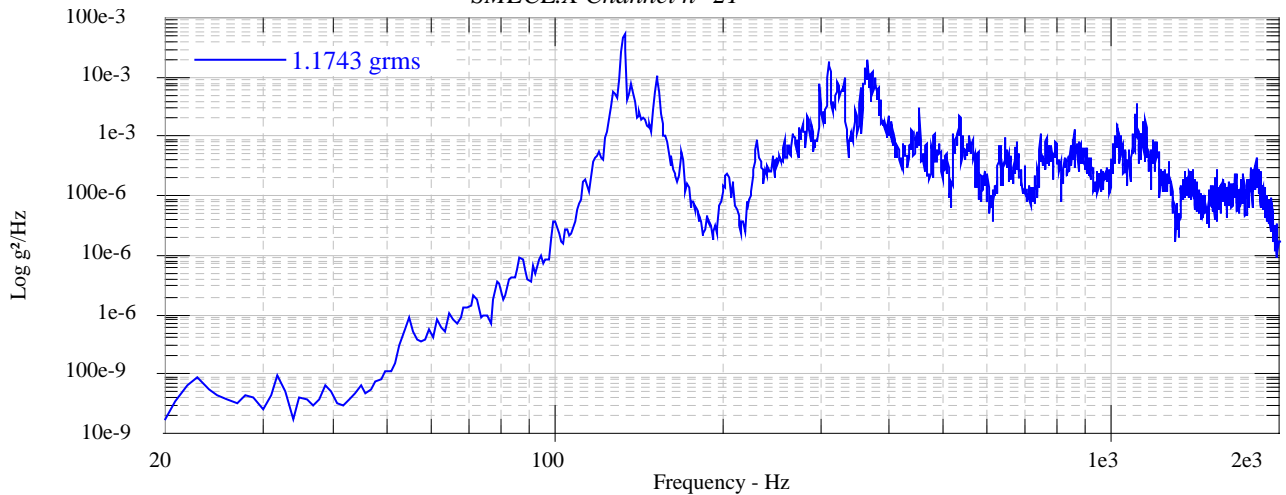
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OB.Y Channel n° 20



SMECL.X Channel n° 21

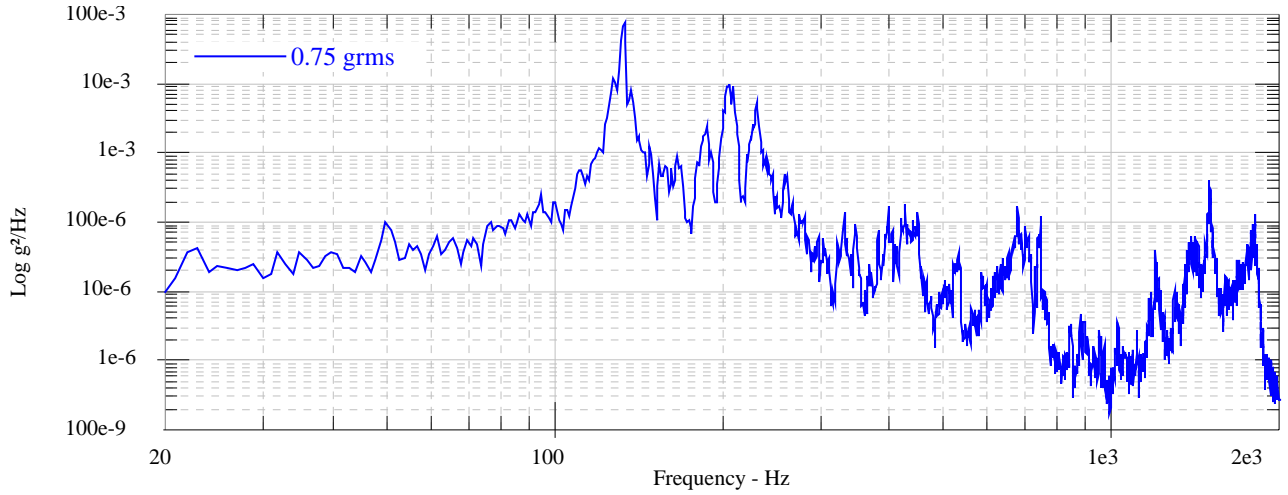


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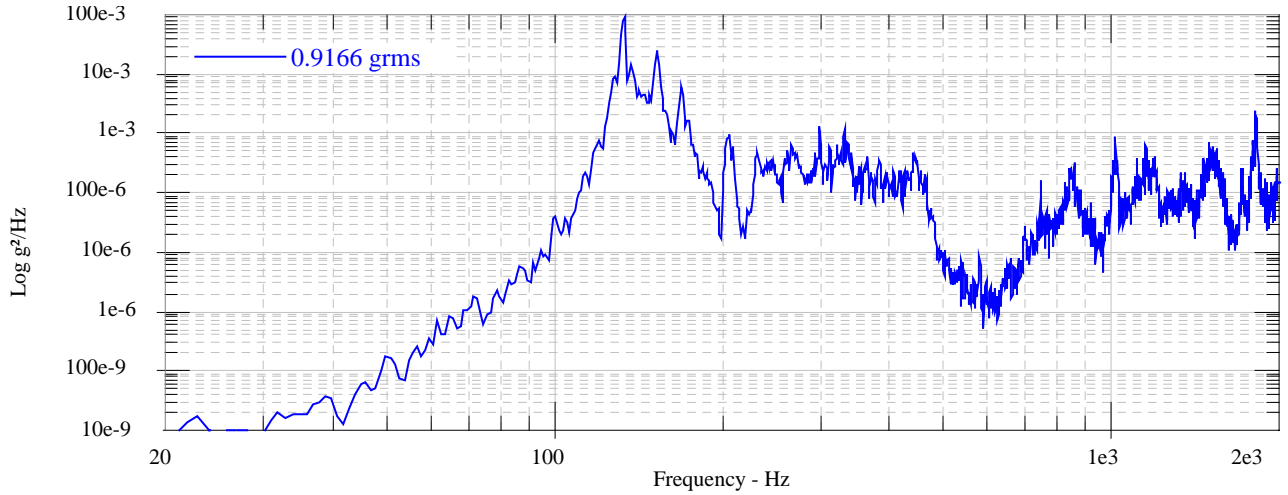
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Date : 6-Apr-04
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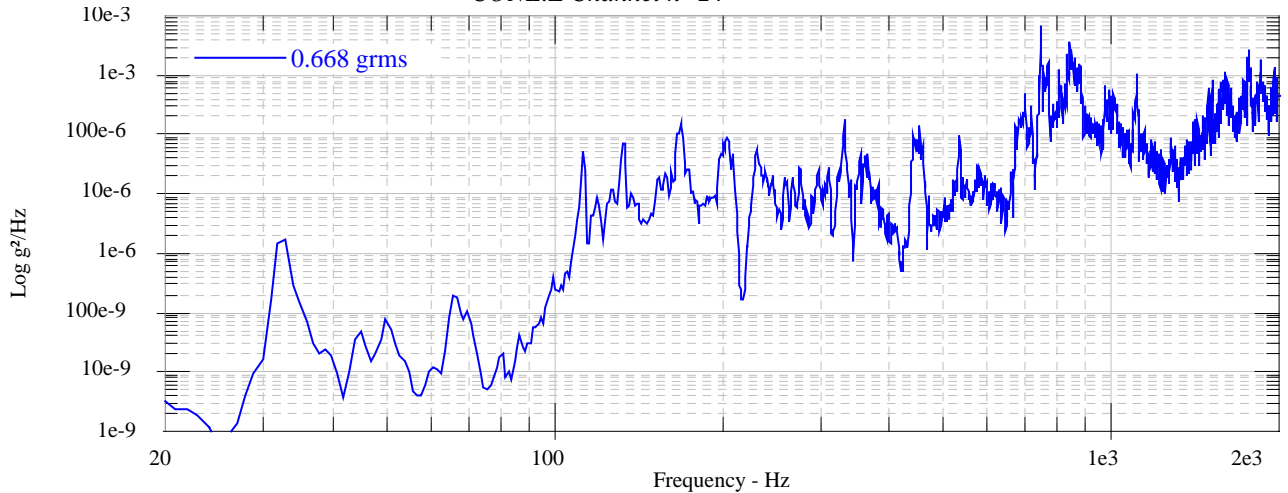
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

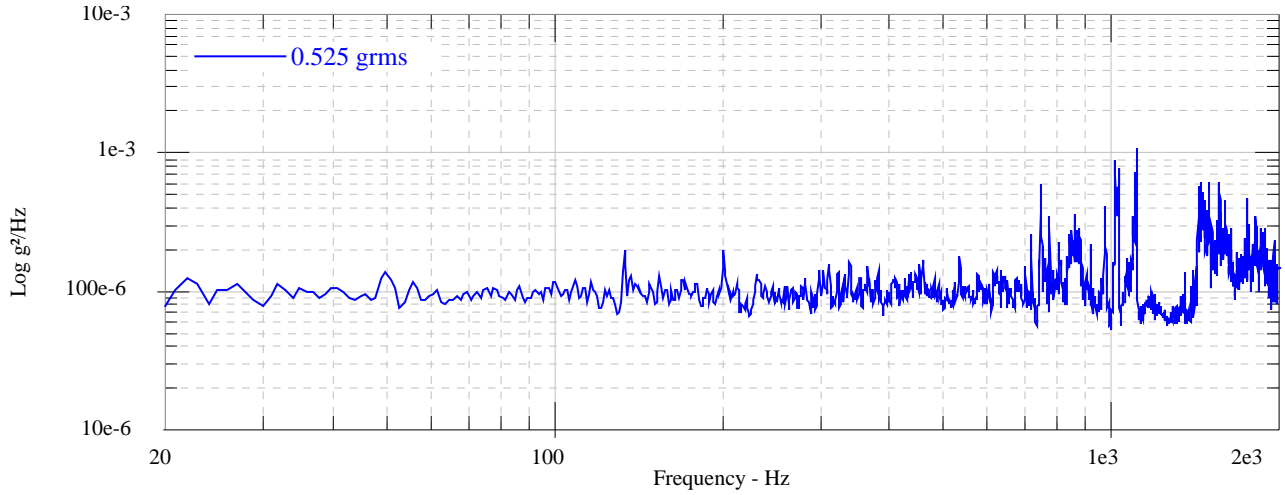


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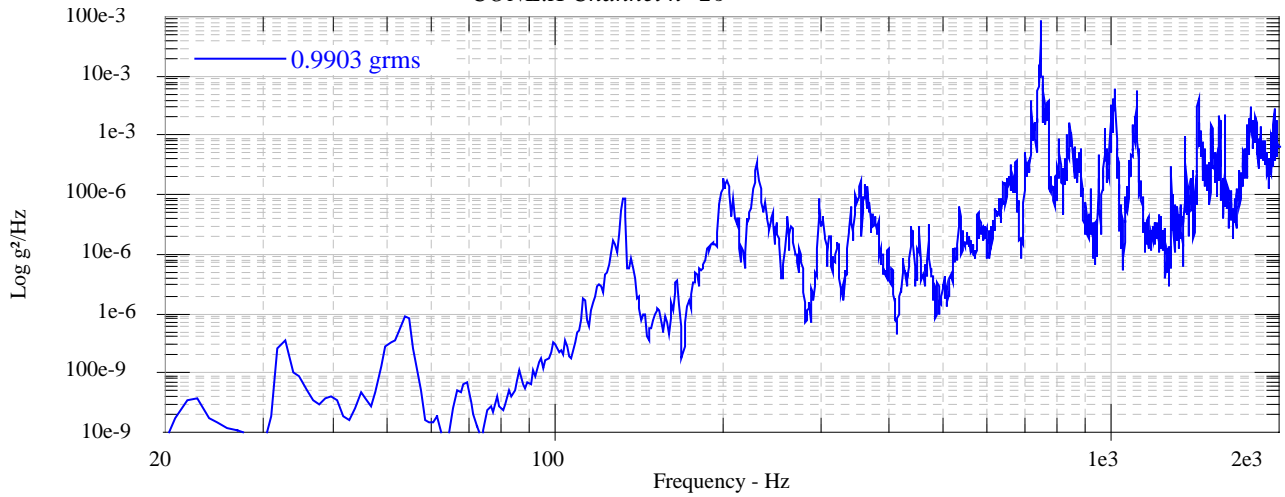
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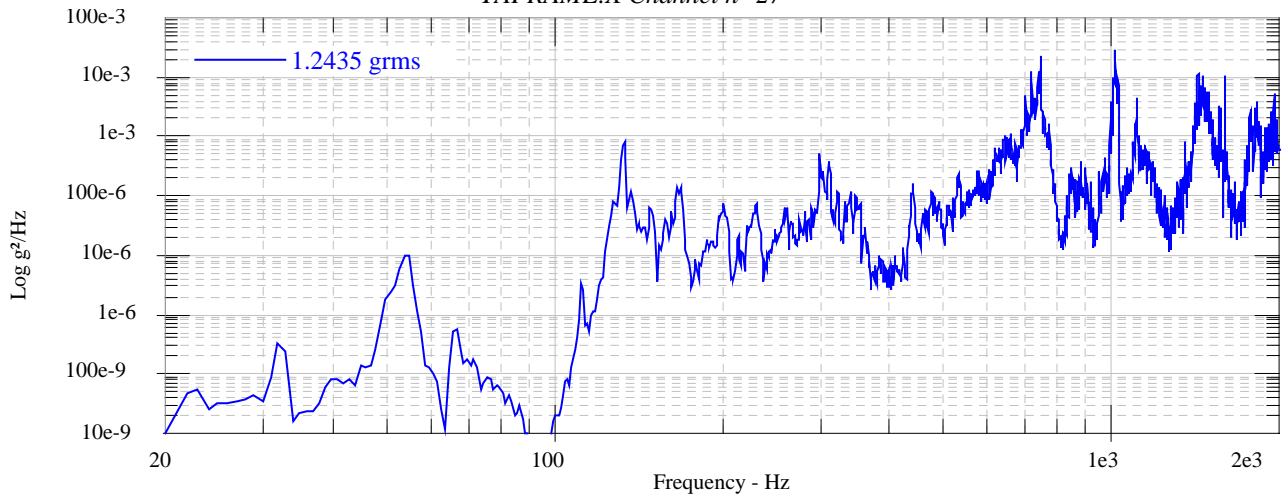
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CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

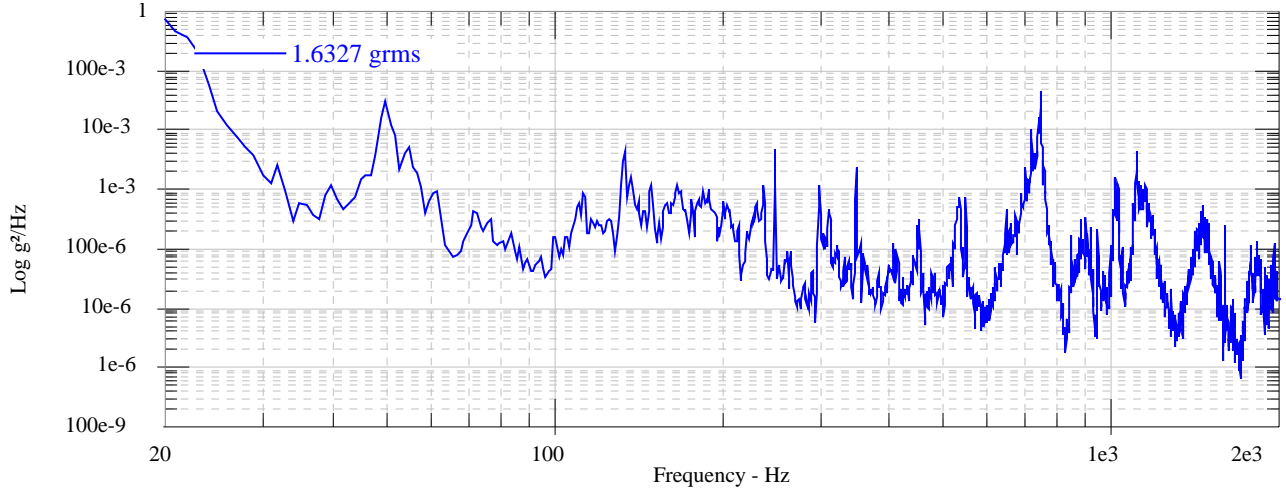


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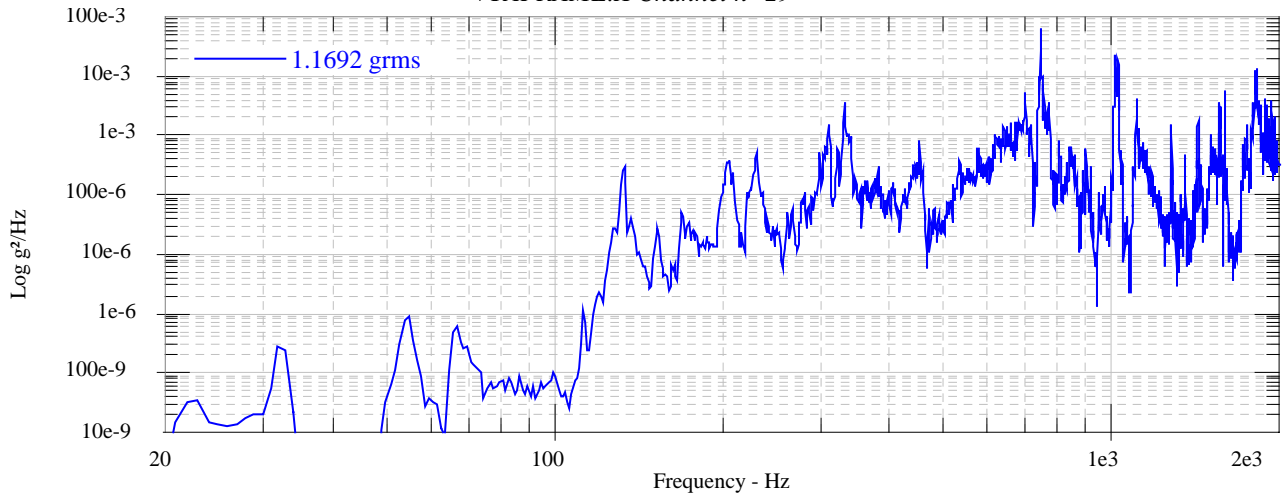
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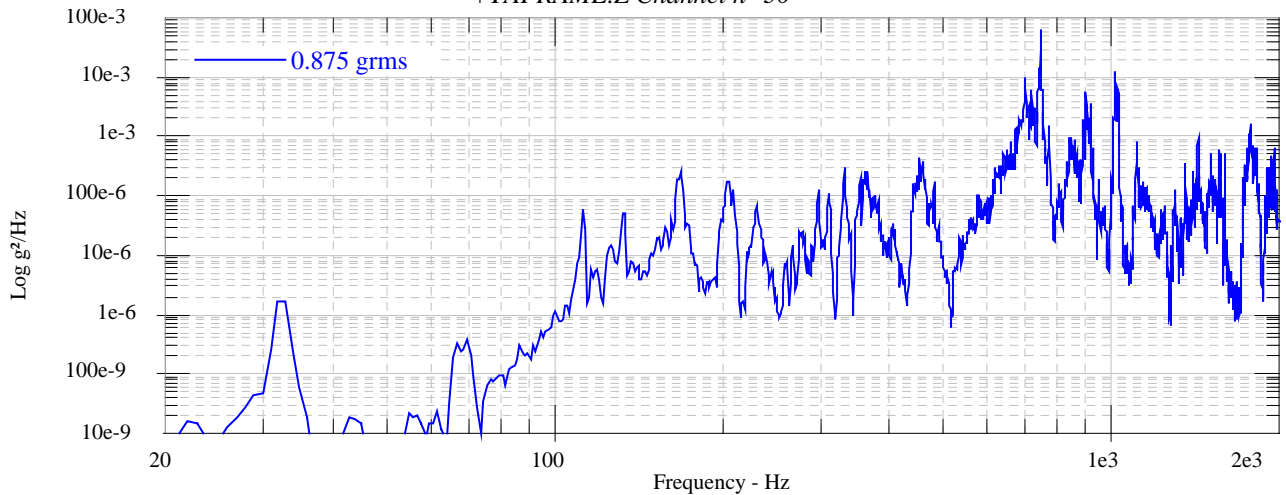
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



VIBRATION TEST REPORT
SPIRE QM

RP-CSL-CRYOV-04001
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Révision : **00**
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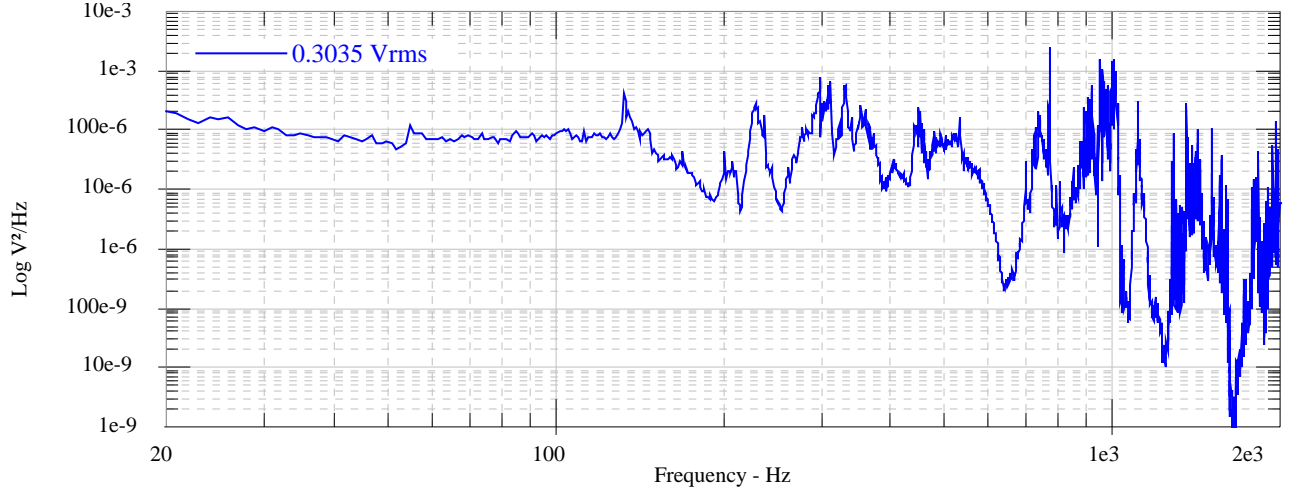
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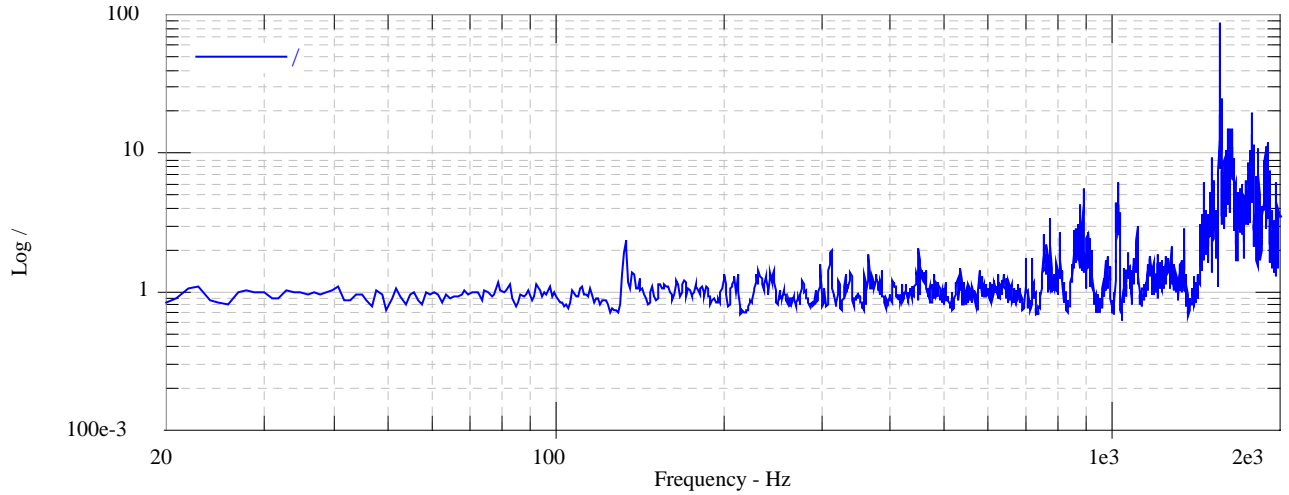
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Page : BNA9Y - 1 / 11

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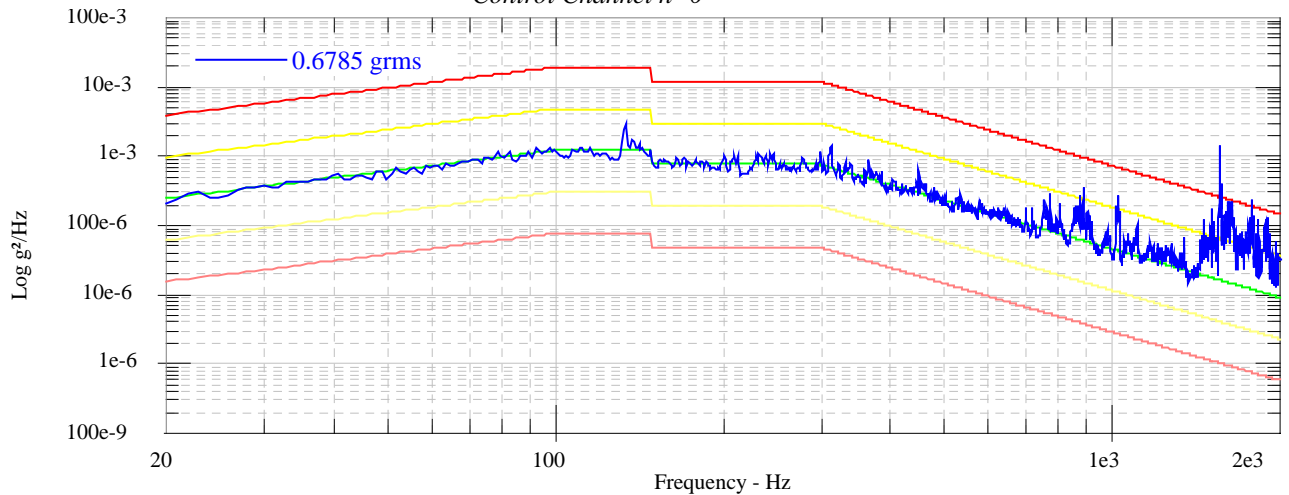
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Error Channel n° -1



Control Channel n° 0

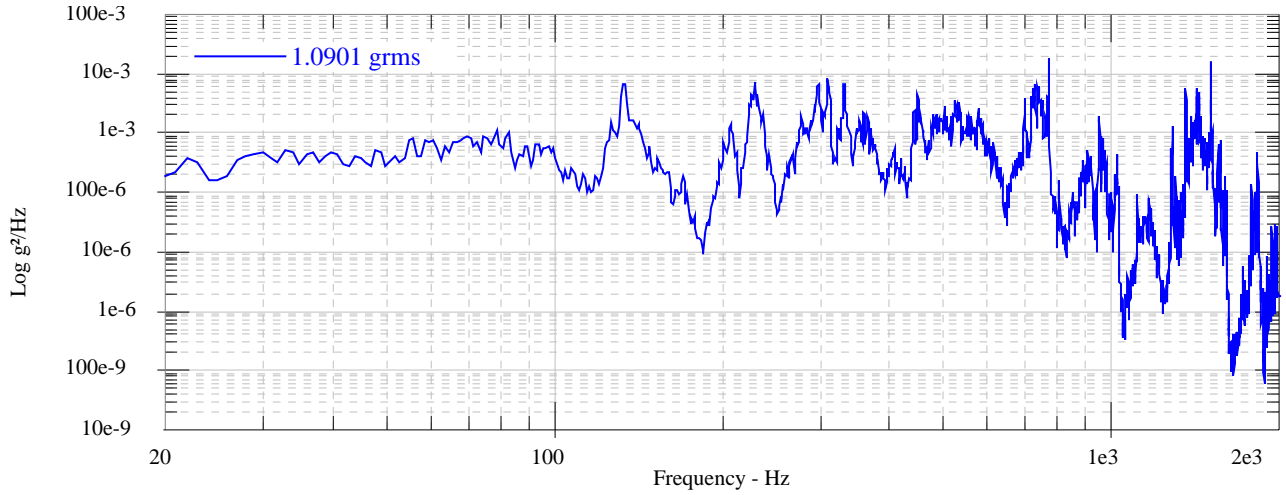


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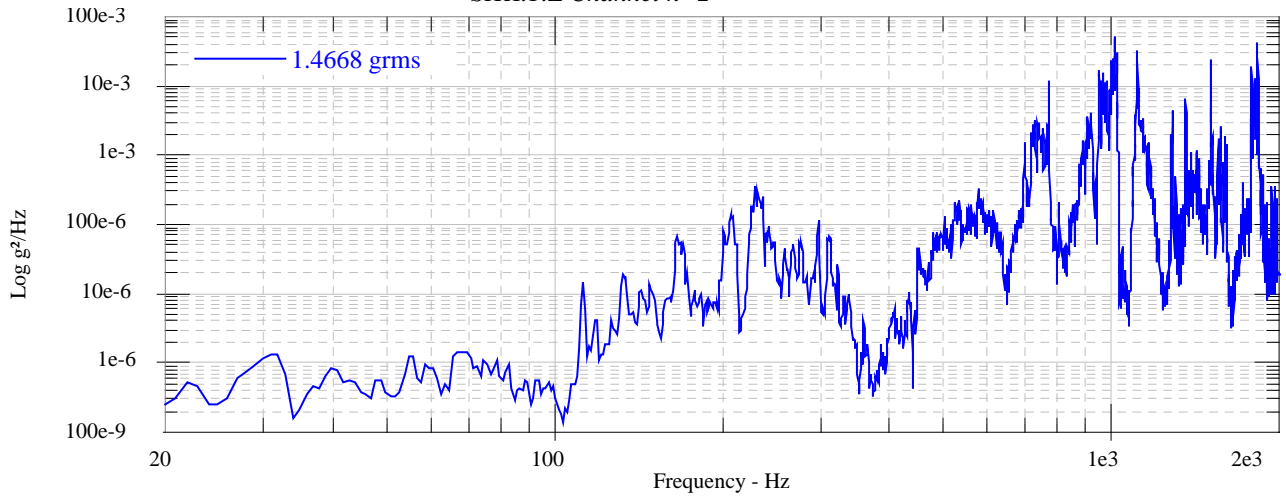
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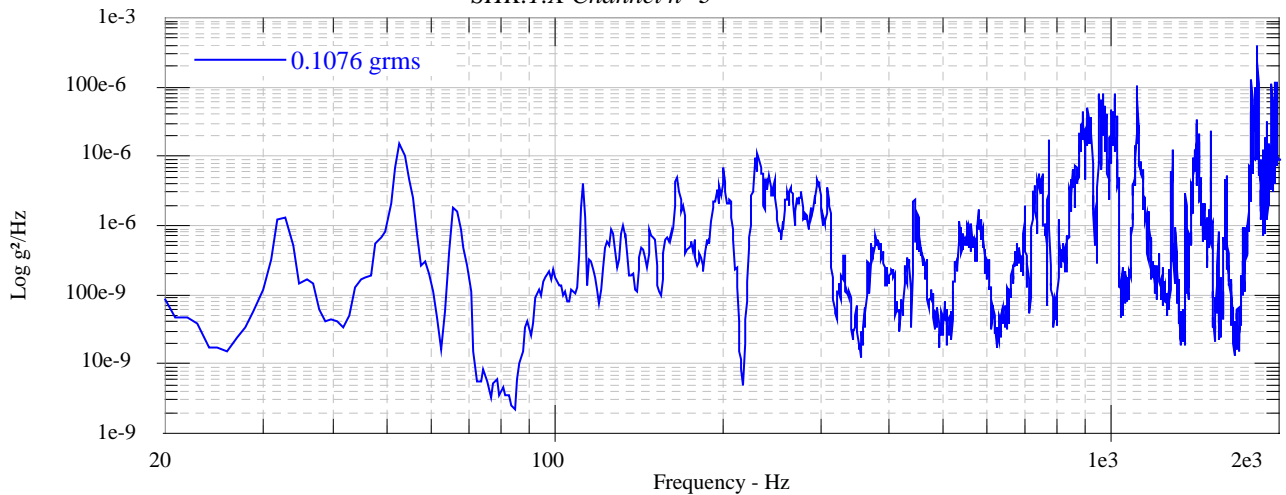
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

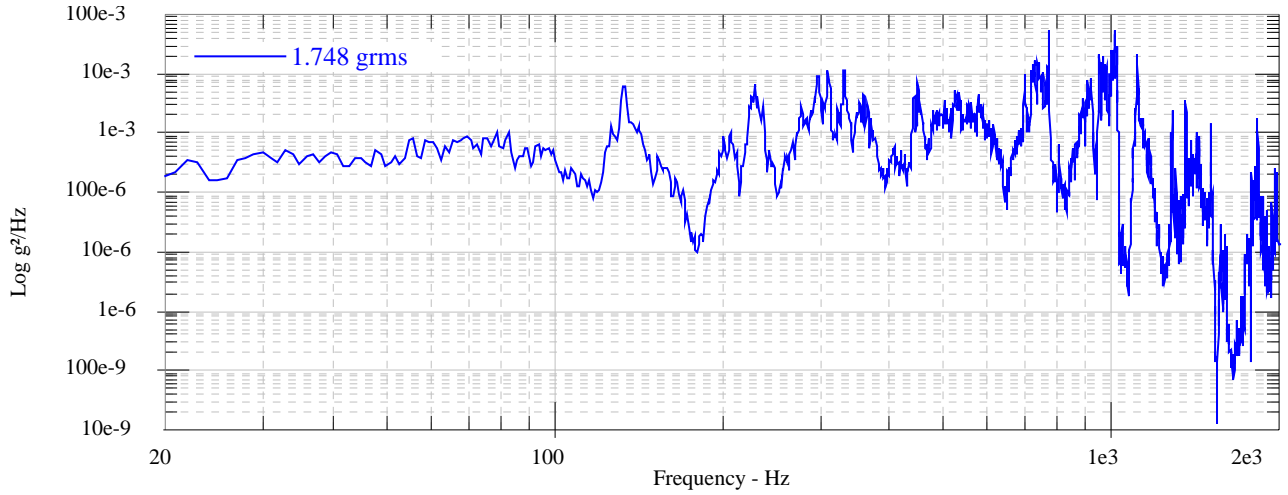


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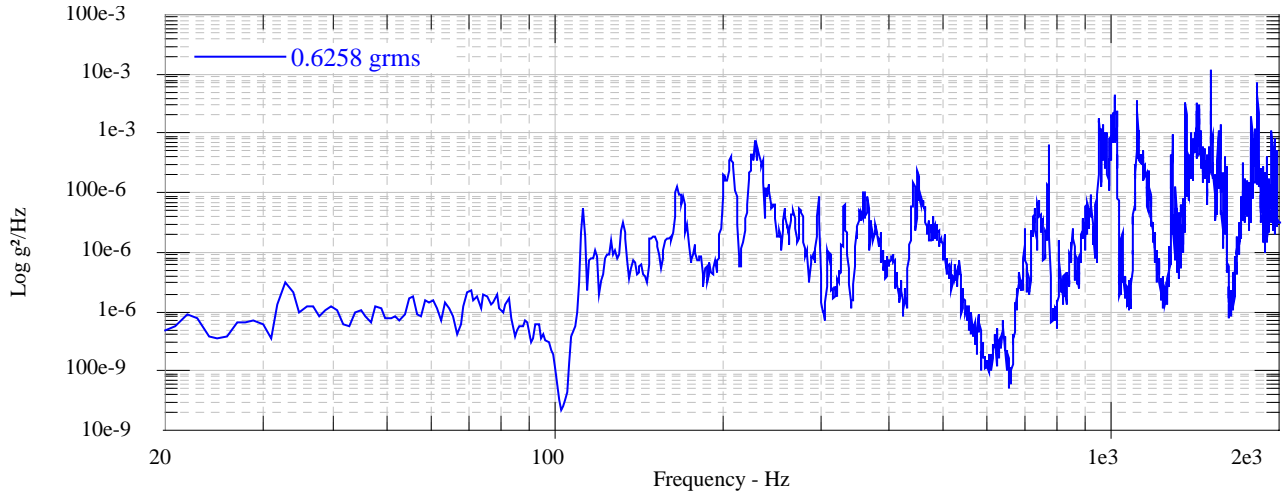
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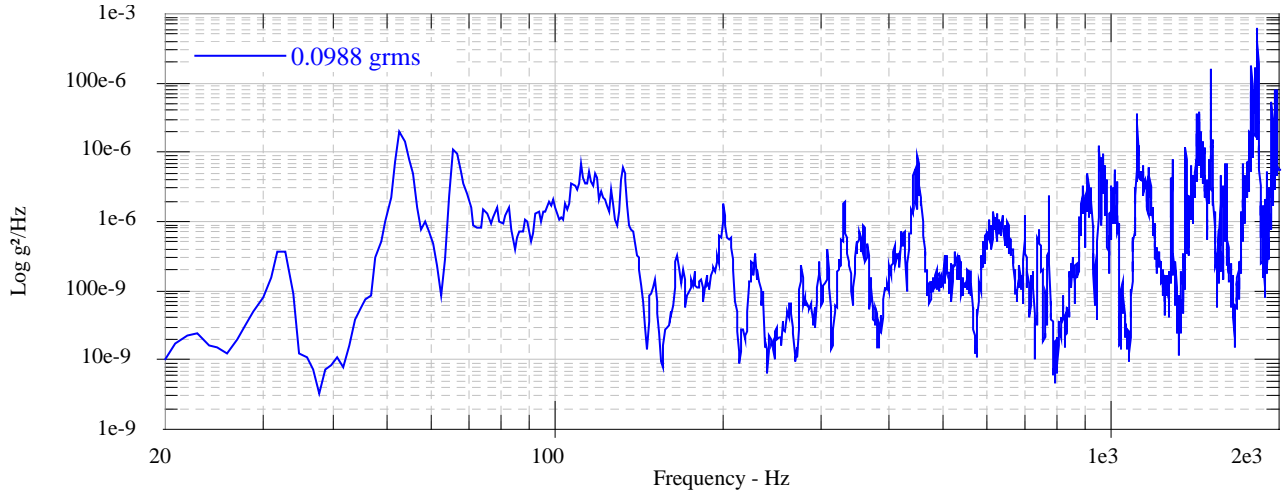
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SHK.2.X Channel n° 6

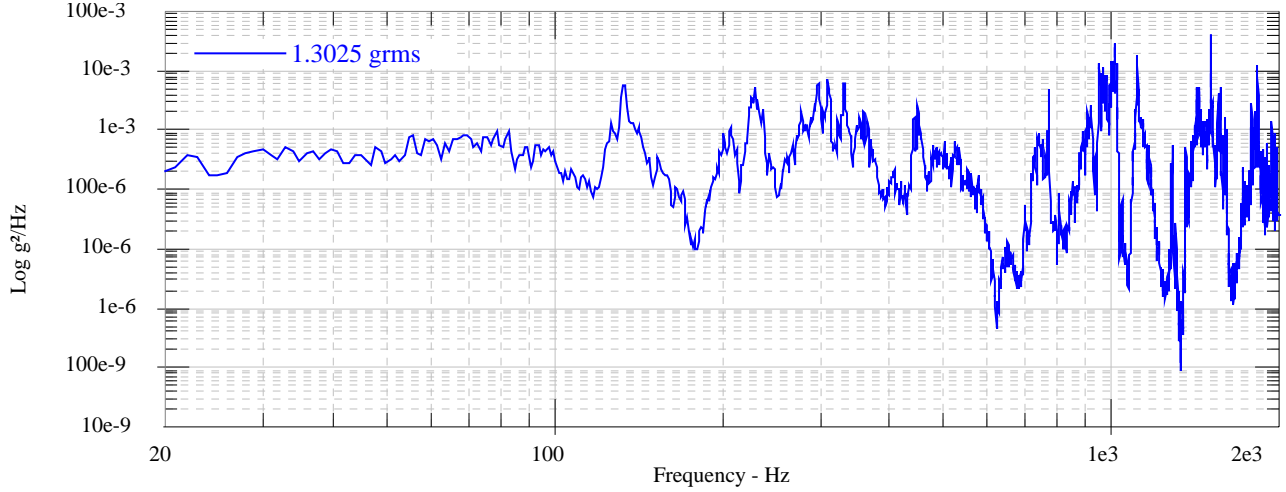


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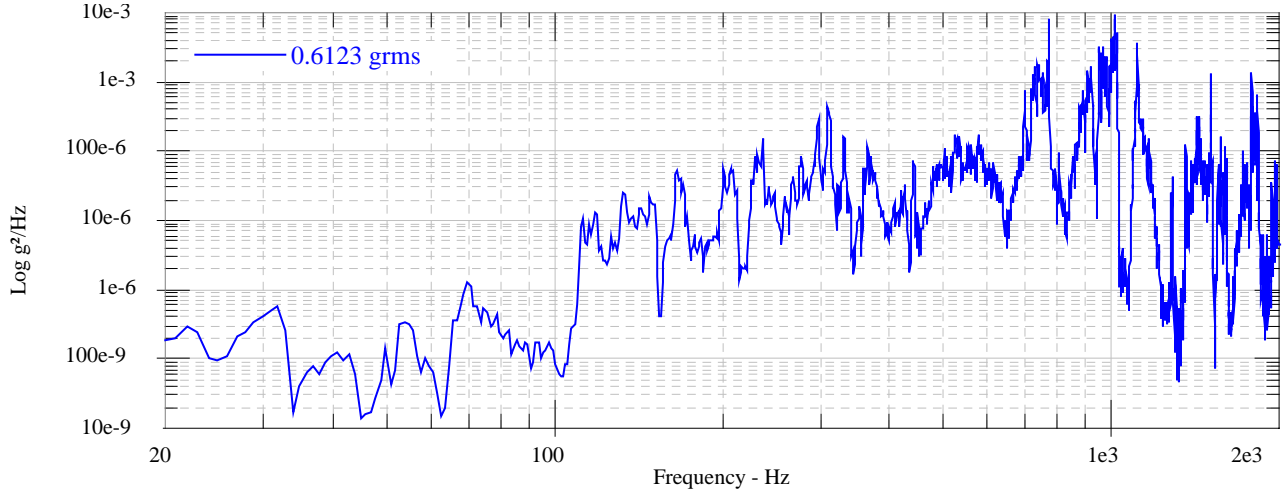
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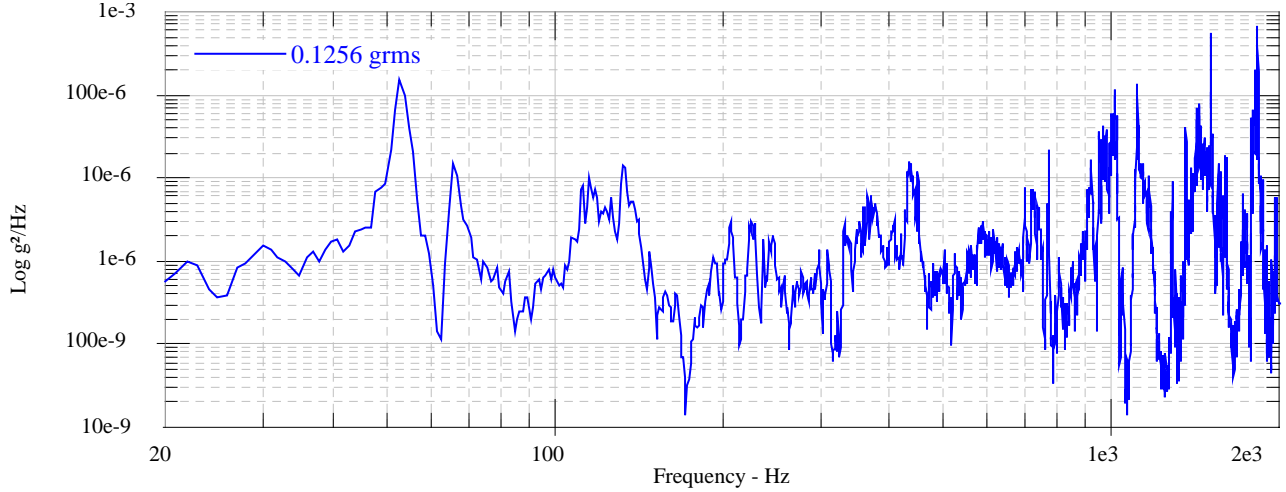
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SHK.3.Z Channel n° 8



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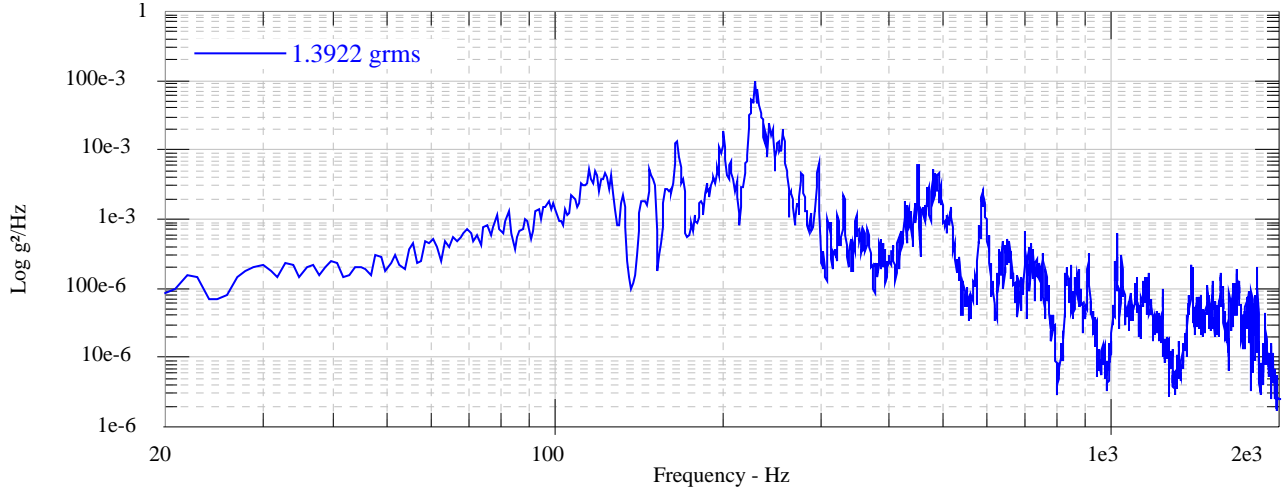


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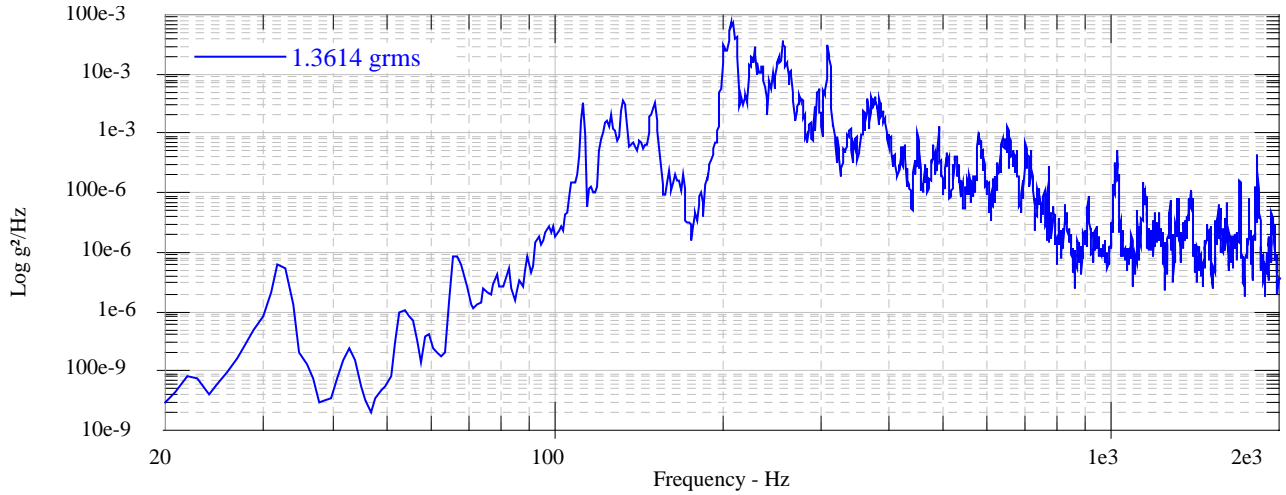
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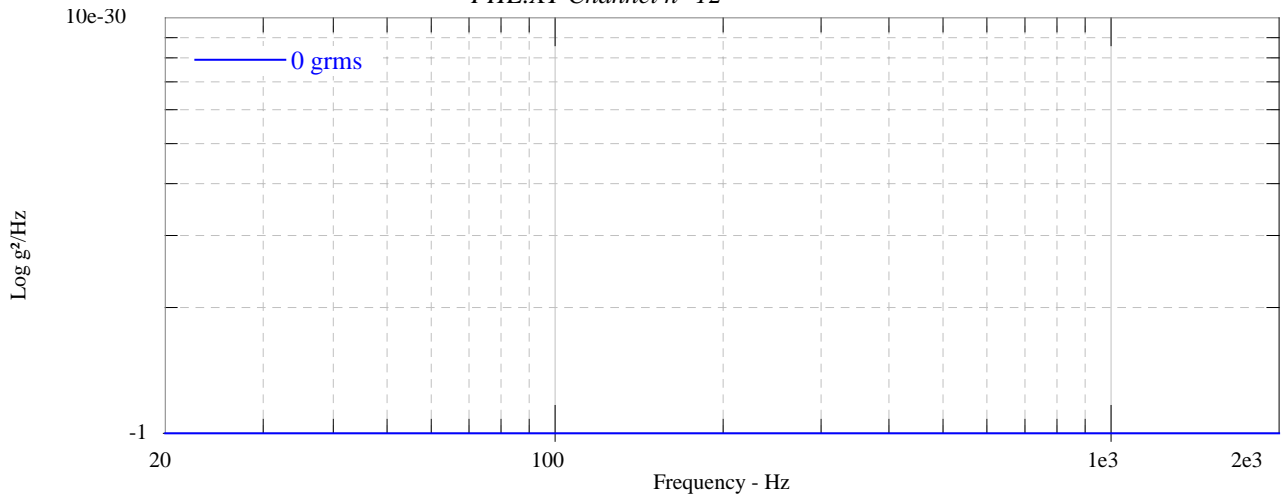
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PHS.Z Channel n° 11



PHE.XY Channel n° 12

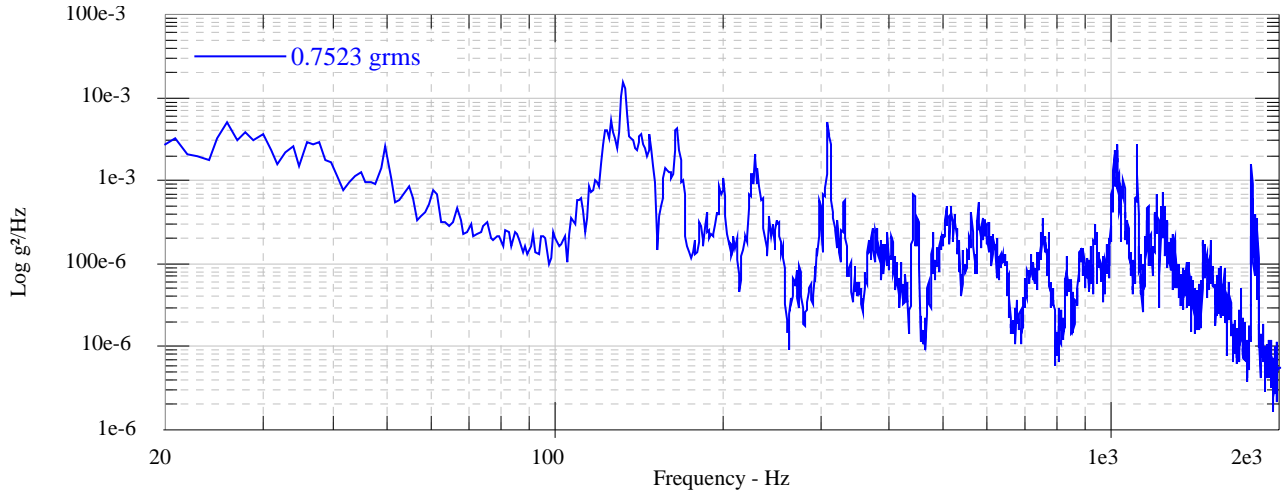


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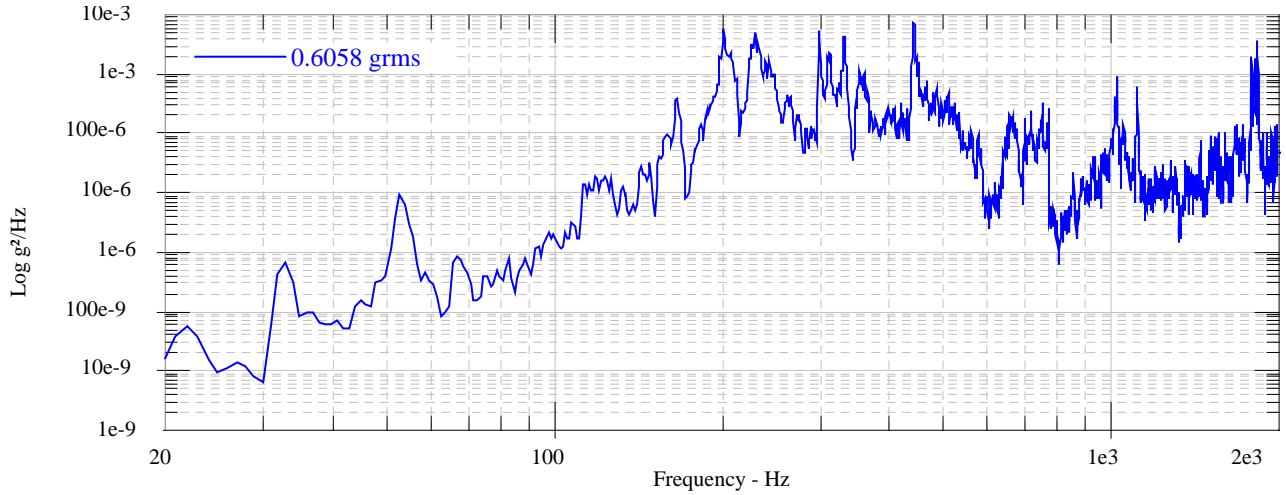
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Date : 6-Apr-04
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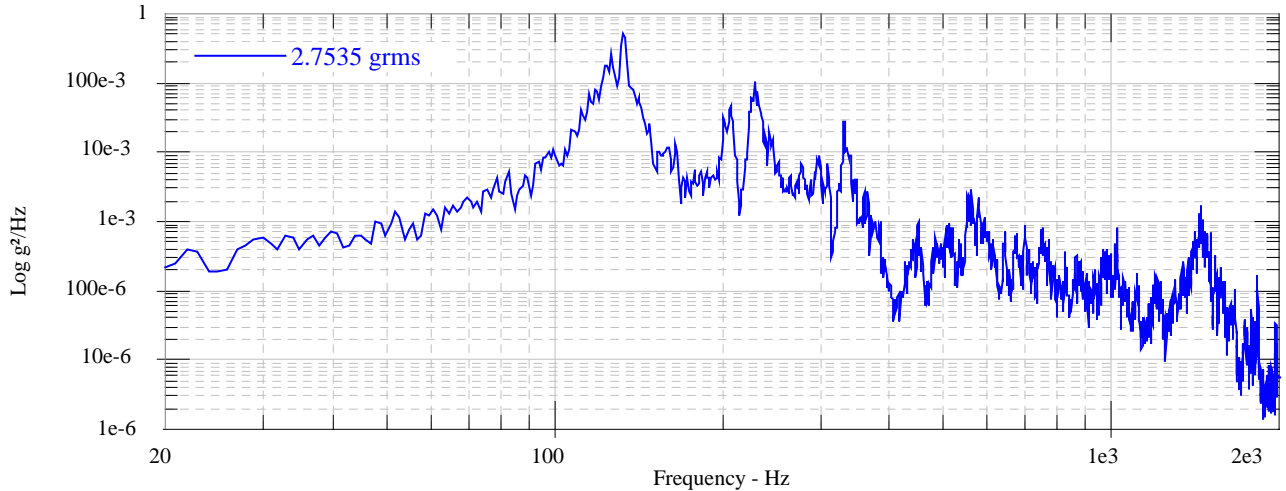
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

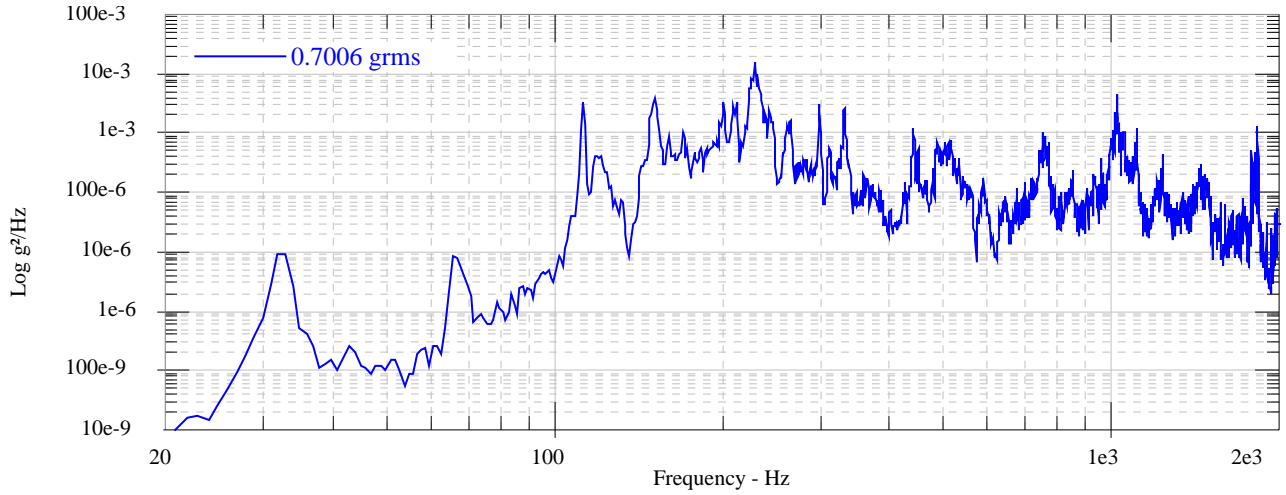


VIBRATION TEST REPORT
SPIRE QM

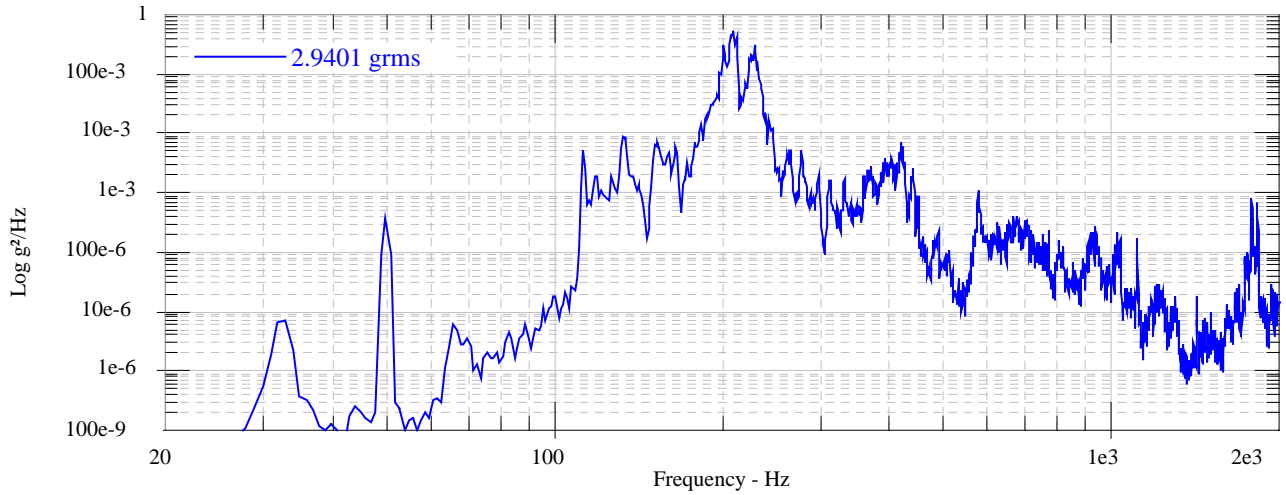
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 6-Apr-04
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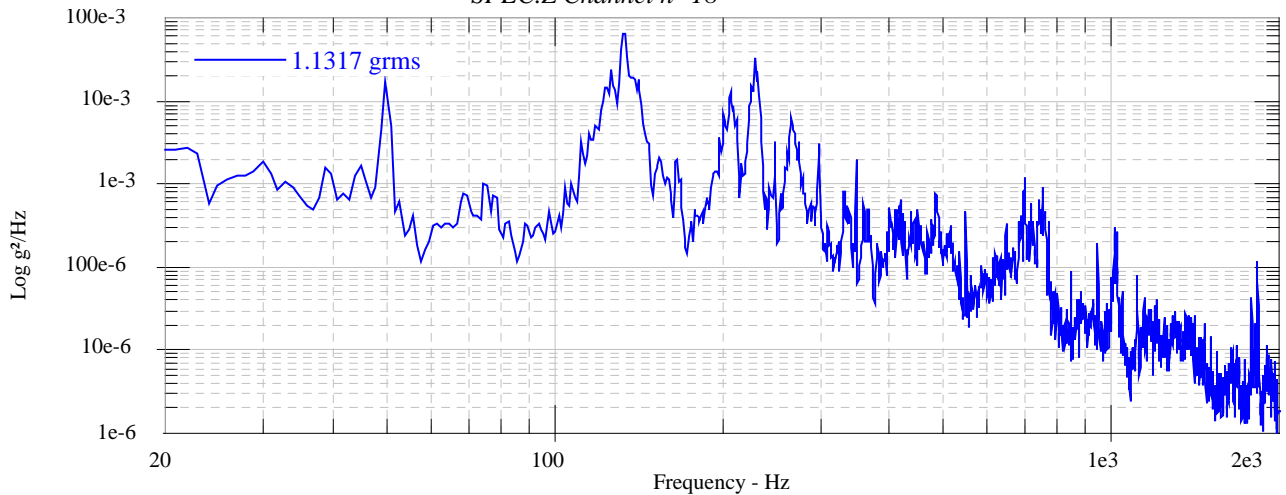
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

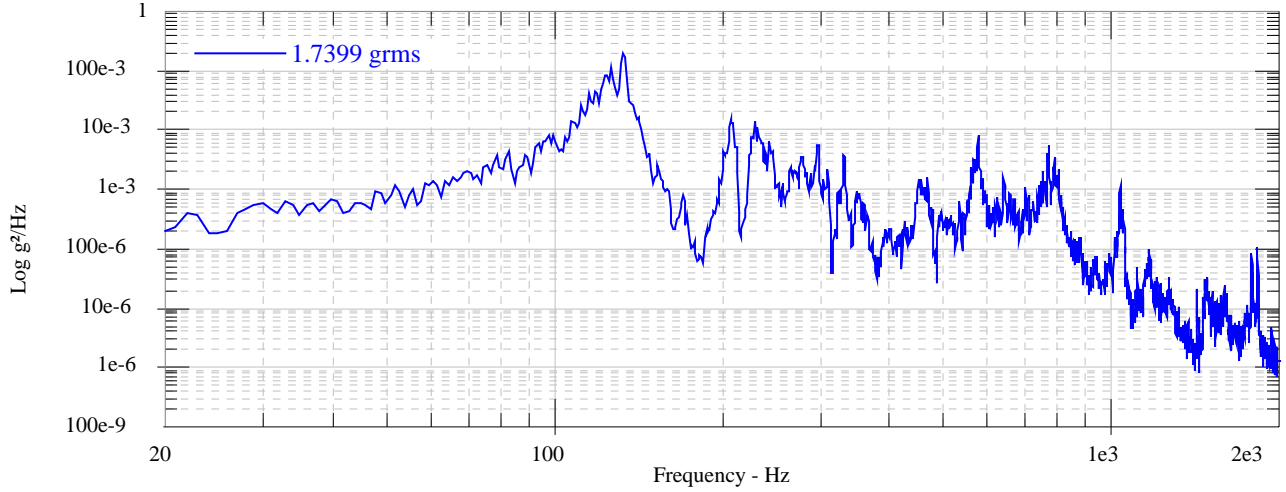


VIBRATION TEST REPORT
SPIRE QM

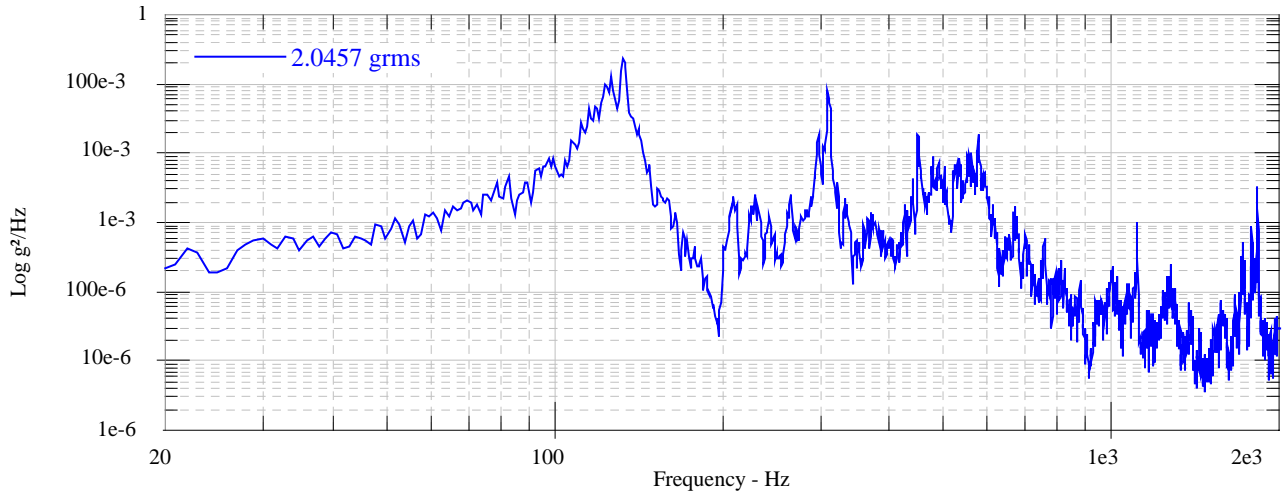
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 6-Apr-04
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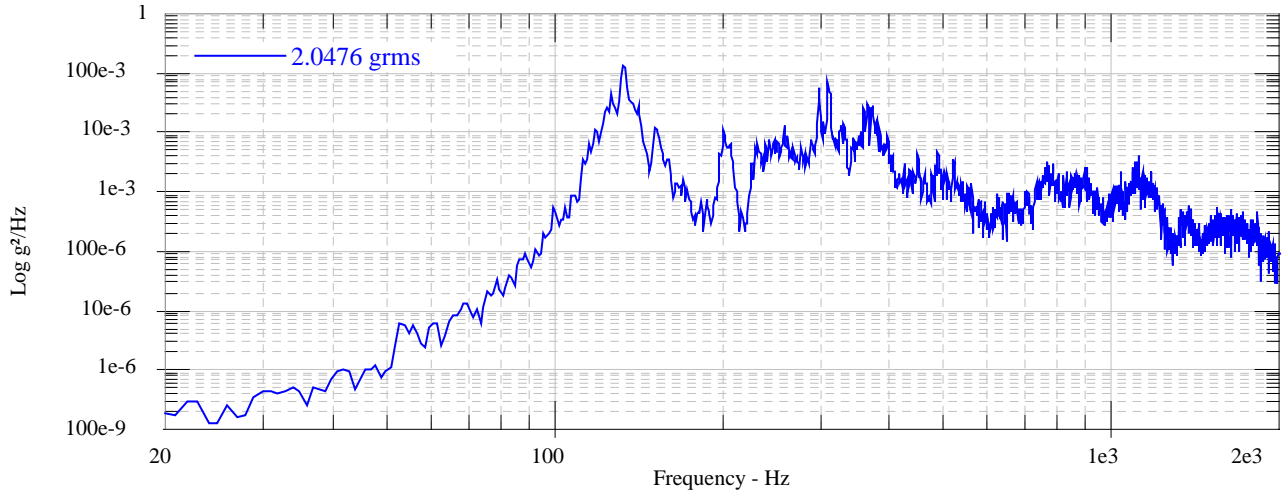
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

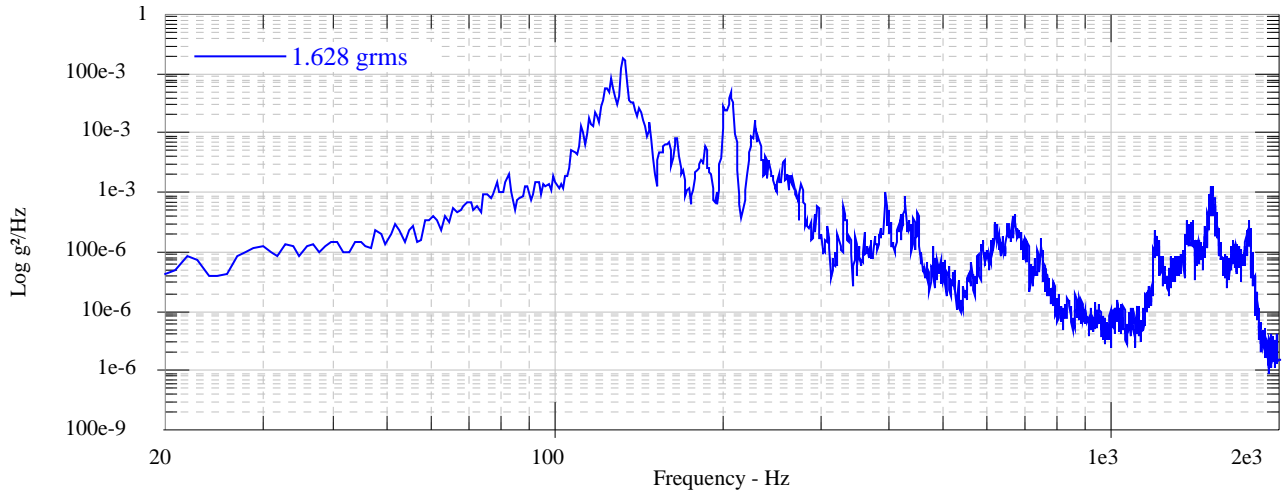


VIBRATION TEST REPORT
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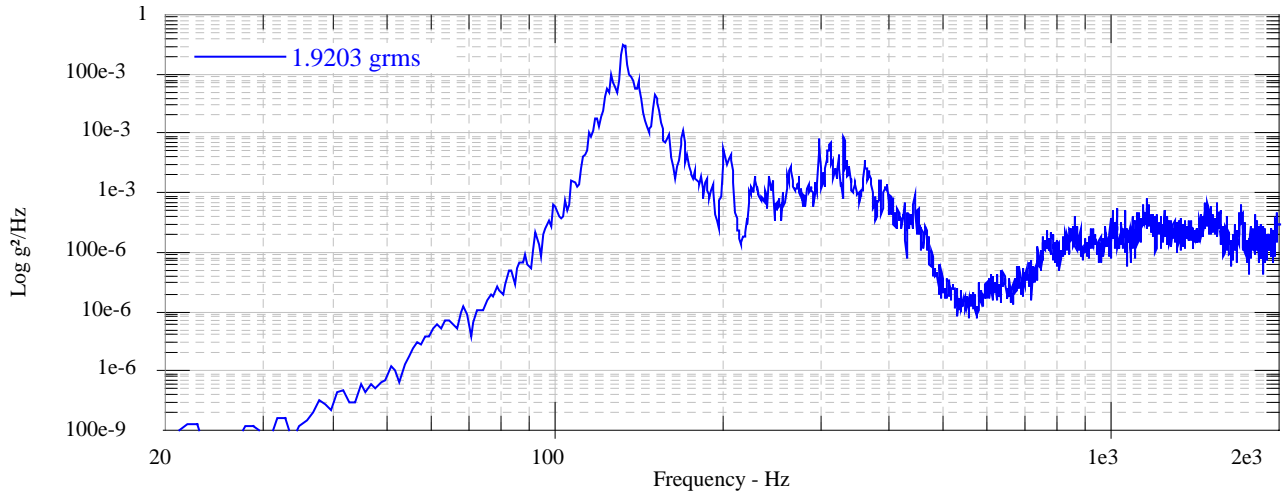
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Version : 01
Révision : 00
Date : 6-Apr-04
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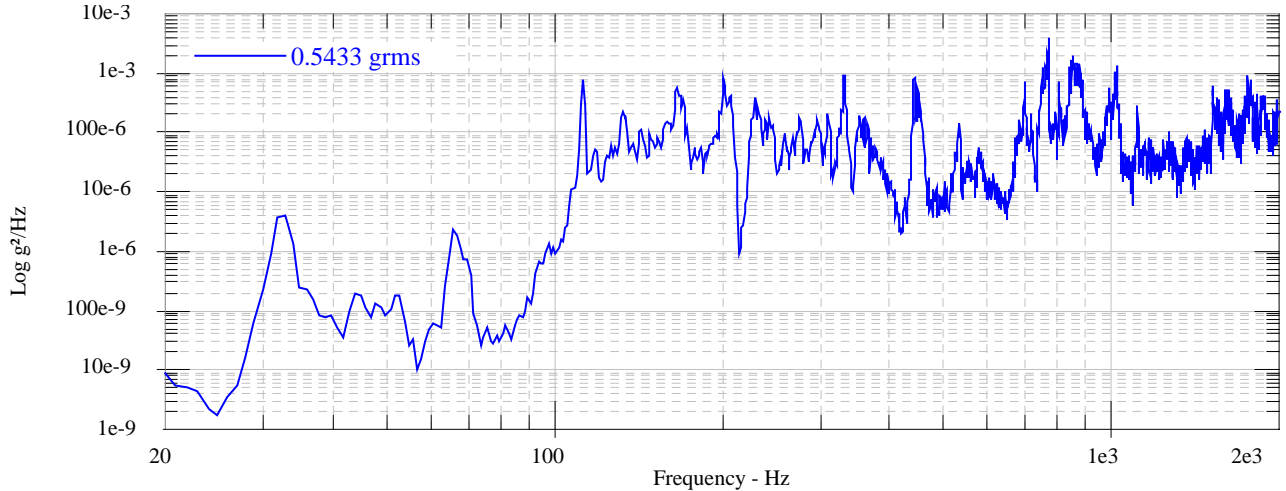
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

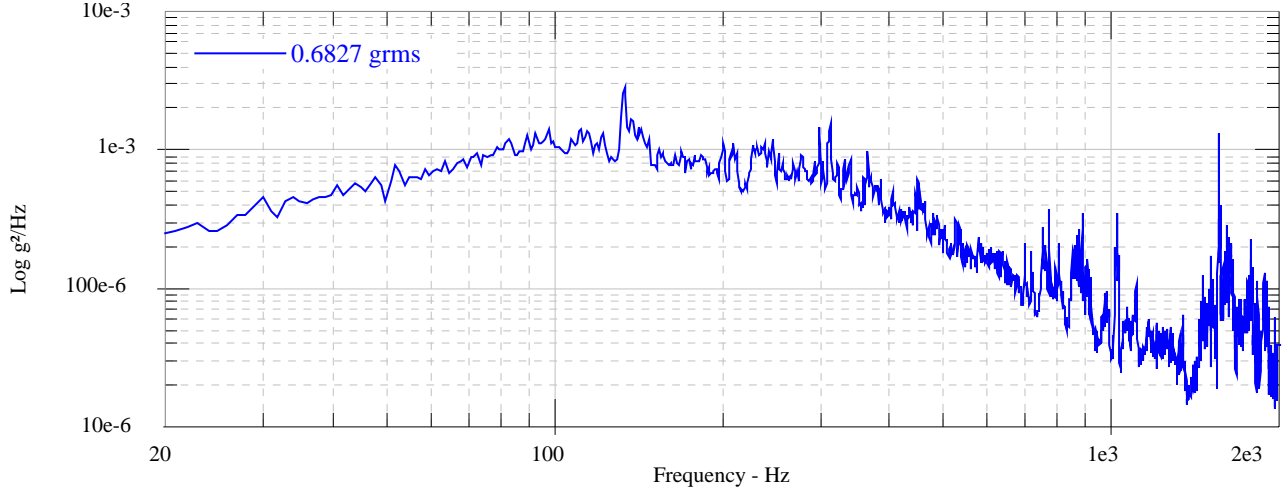


VIBRATION TEST REPORT
SPIRE QM

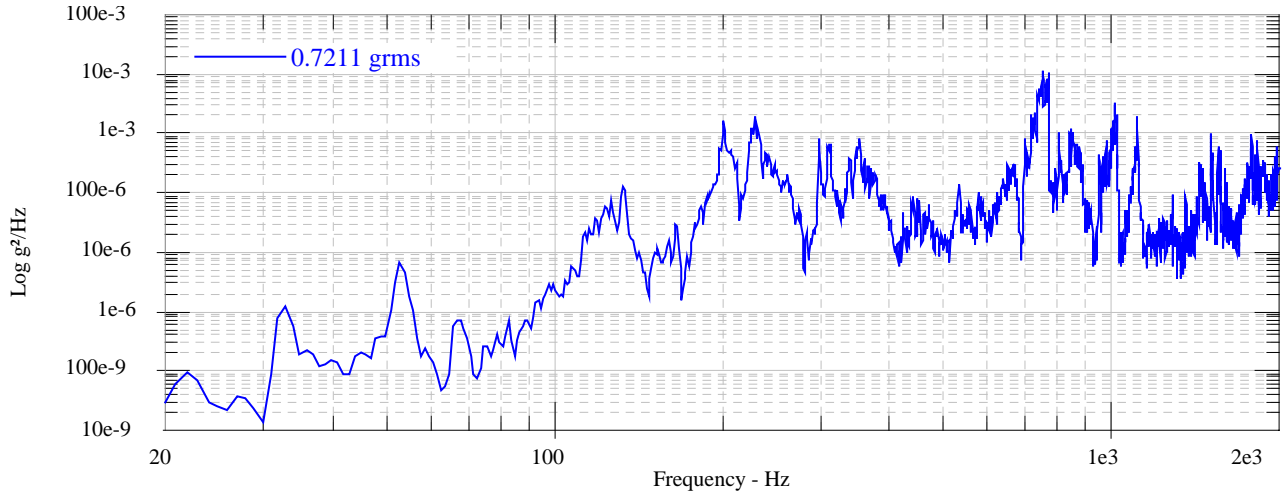
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Version : 01
Révision : 00
Date : 6-Apr-04
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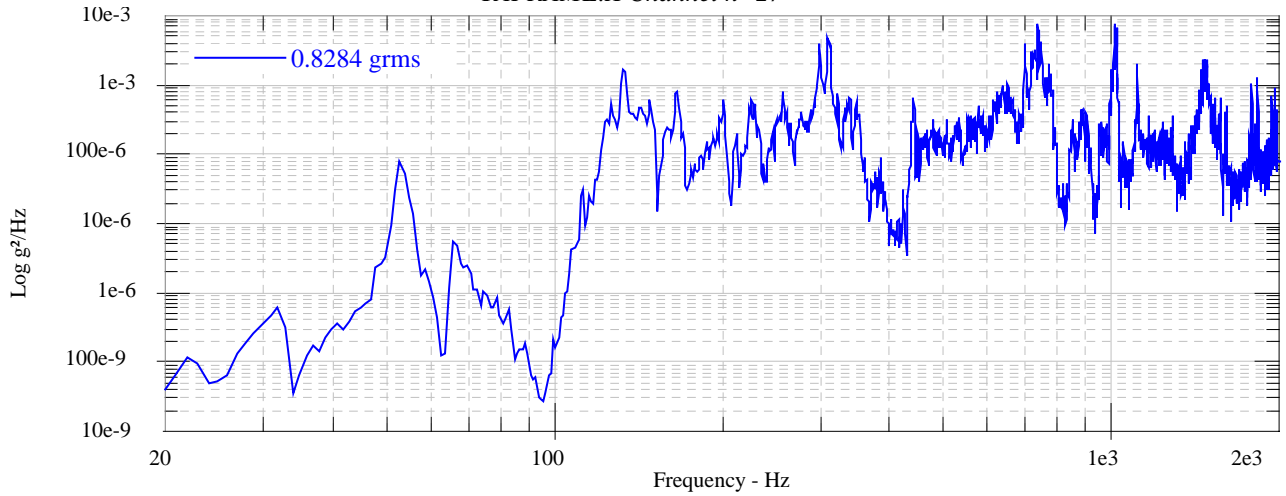
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

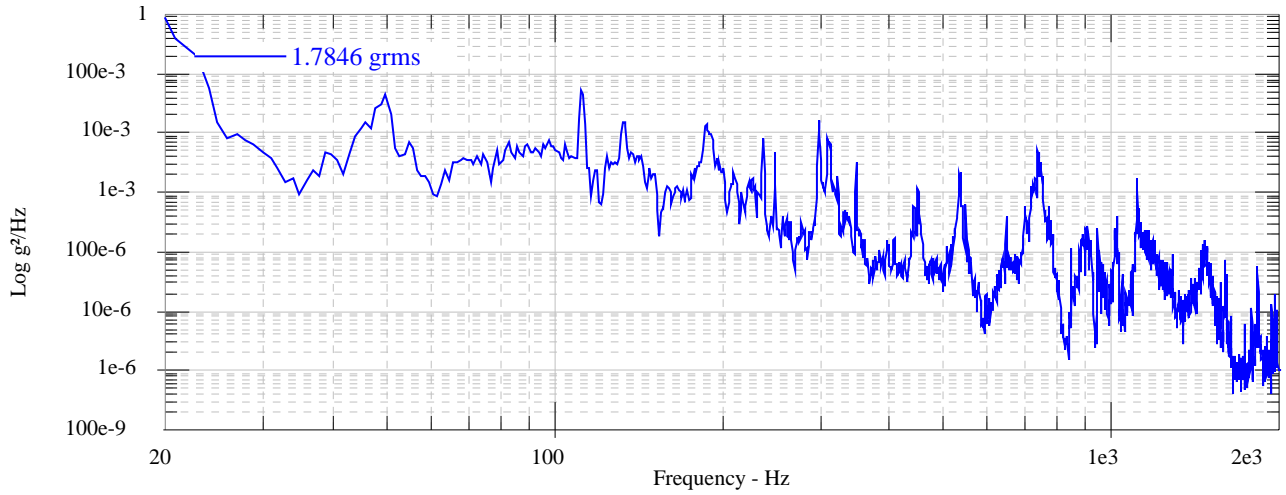


VIBRATION TEST REPORT
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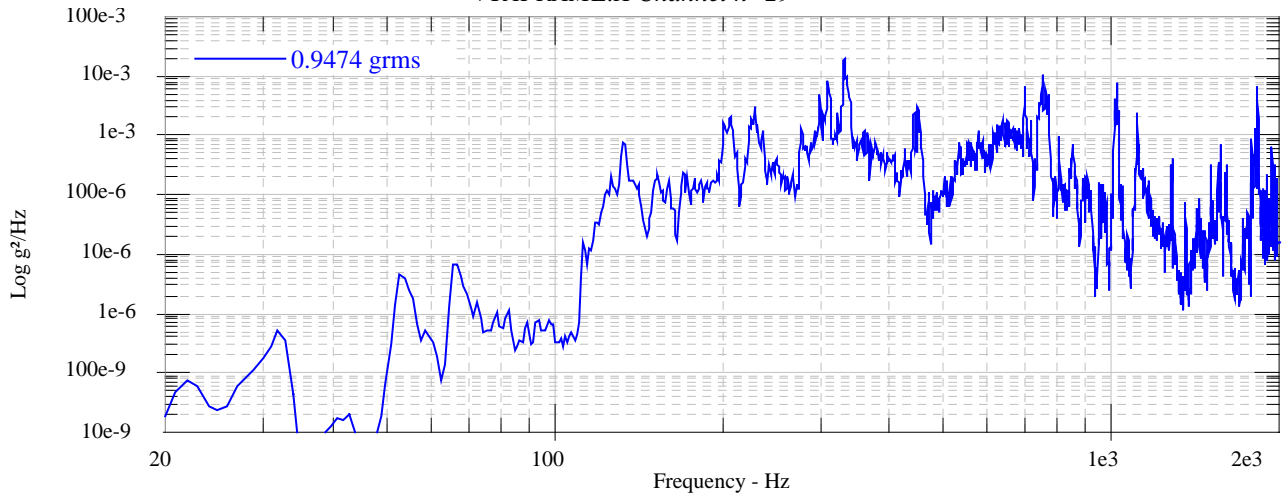
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Version : 01
Révision : 00
Date : 6-Apr-04
Page : BNA9Y - 11 / 11

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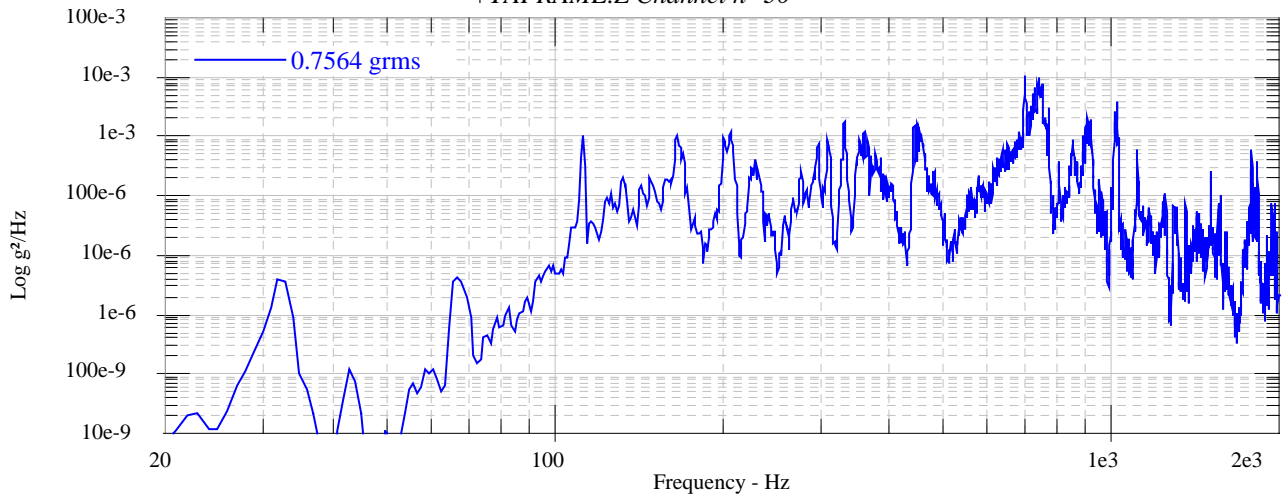
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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SPIRE QM

RP-CSL-CRYOV-04001
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12.10 BNA10Y.

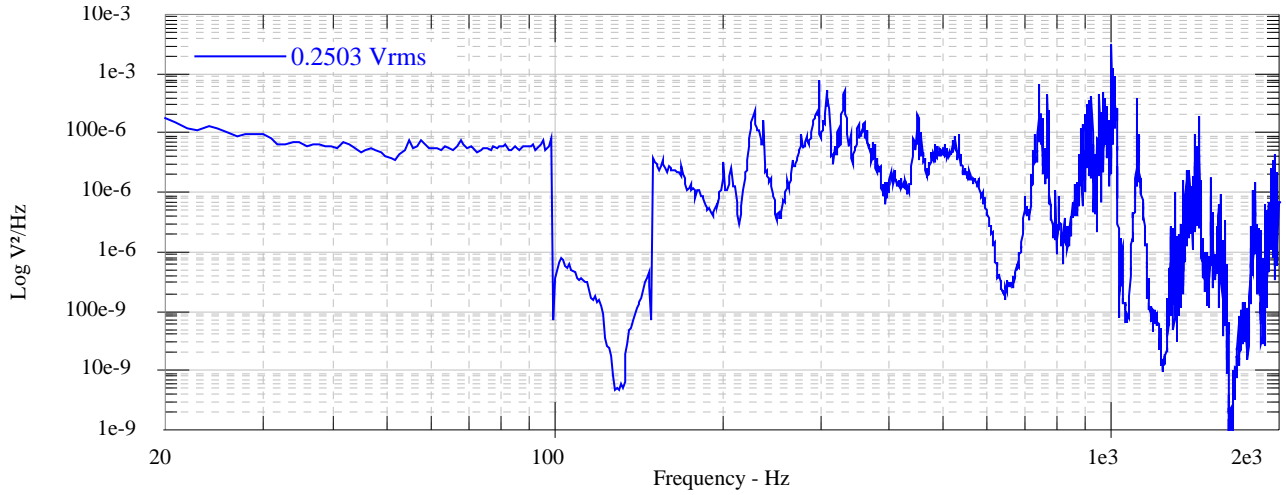
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VIBRATION TEST REPORT
SPIRE QM

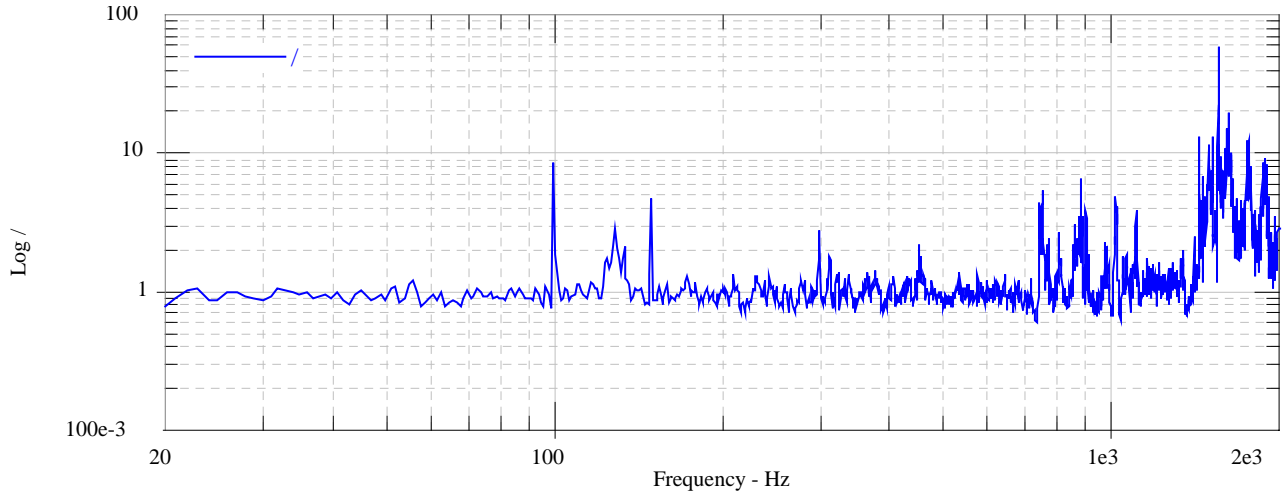
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Version : 01
Révision : 00
Date : 6-Apr-04
Page : BNA10Y - 1 / 11

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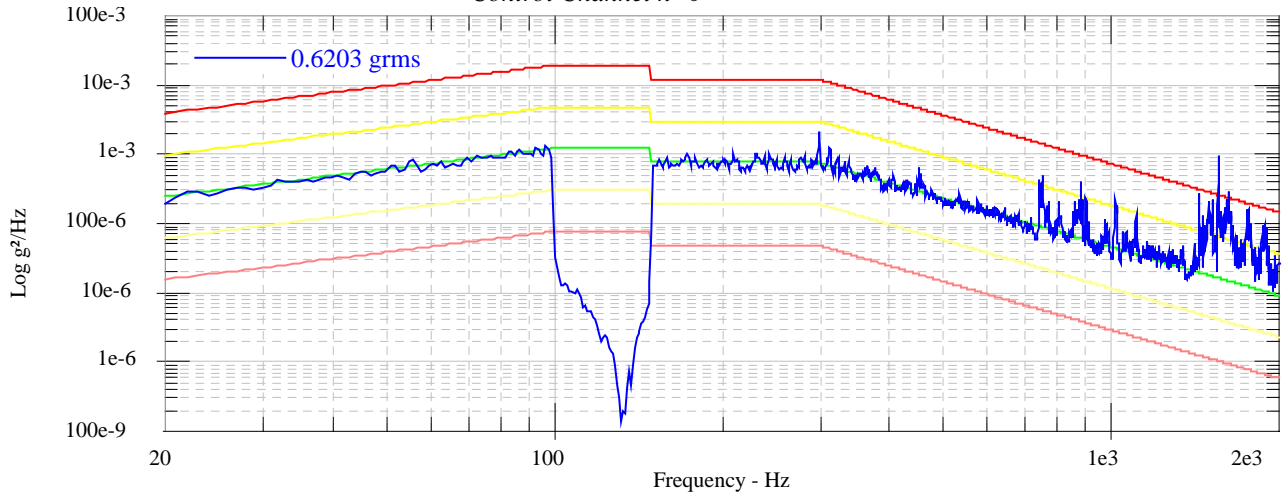
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

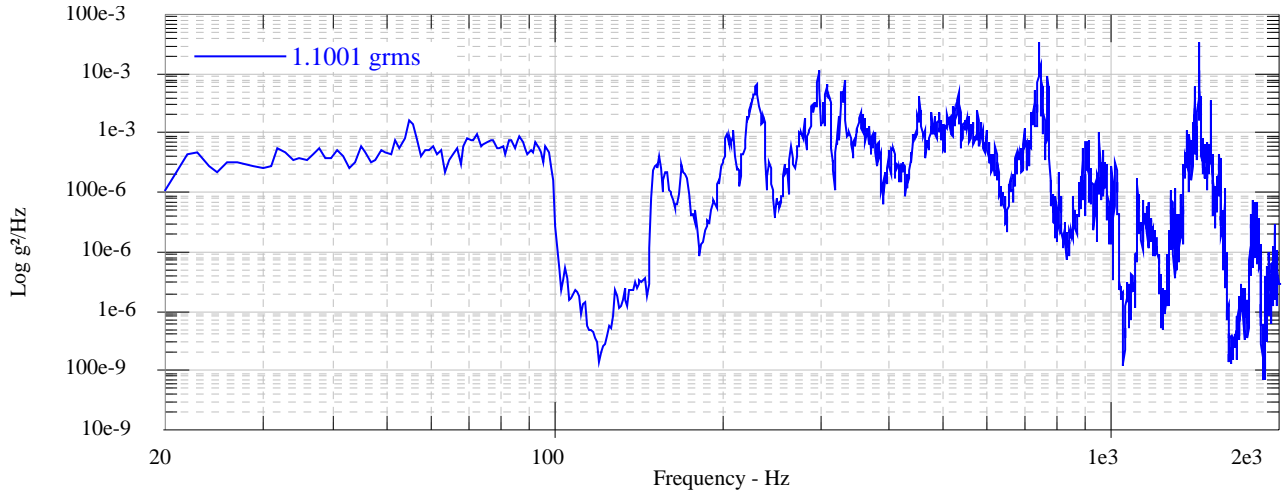


VIBRATION TEST REPORT
SPIRE QM

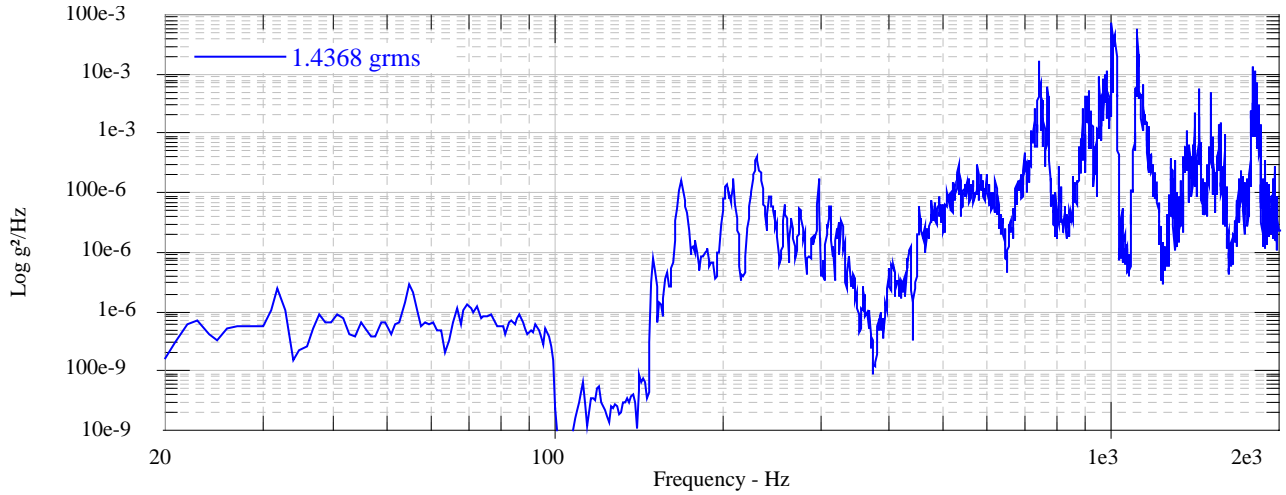
RP-CSL-CRYOV-04001
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Révision : 00
Date : 6-Apr-04
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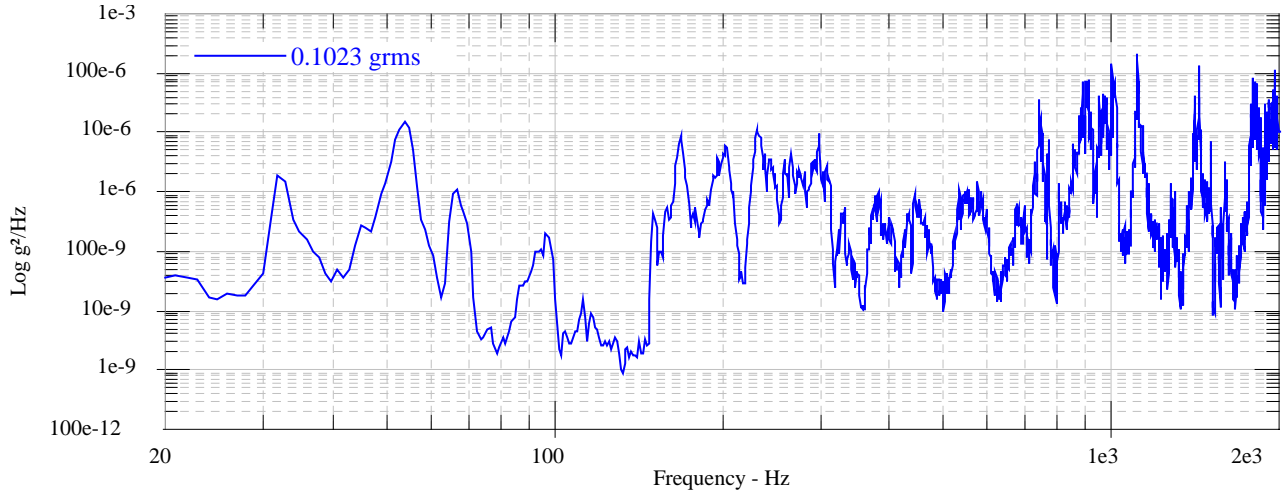
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

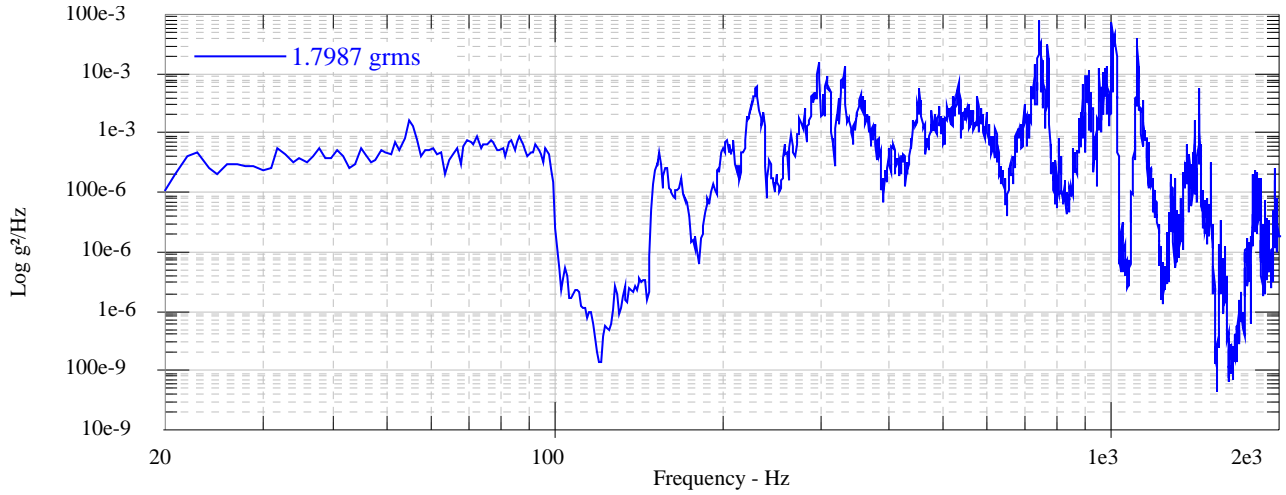


VIBRATION TEST REPORT
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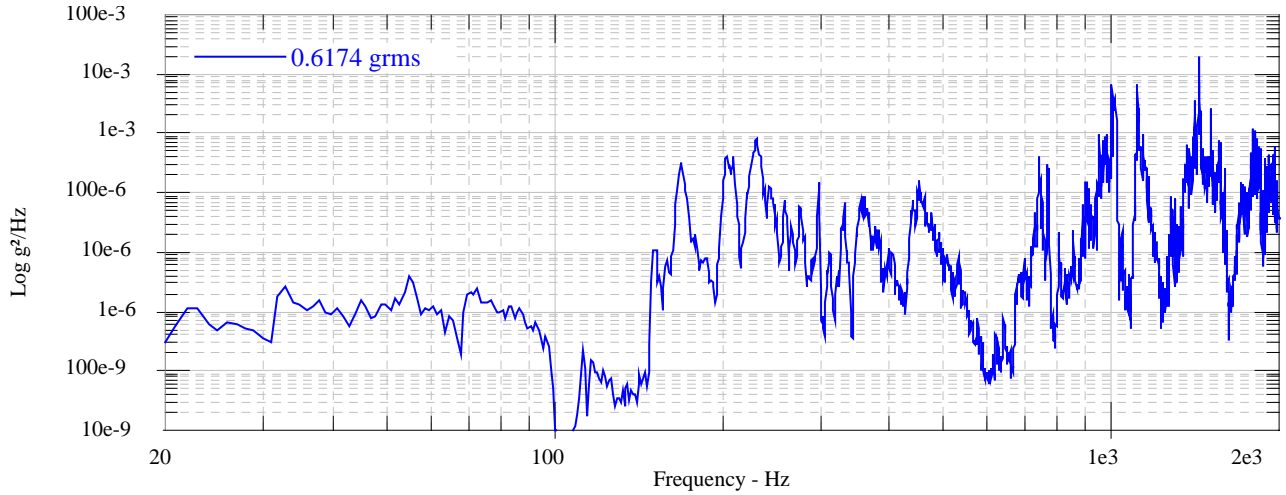
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Date : 6-Apr-04
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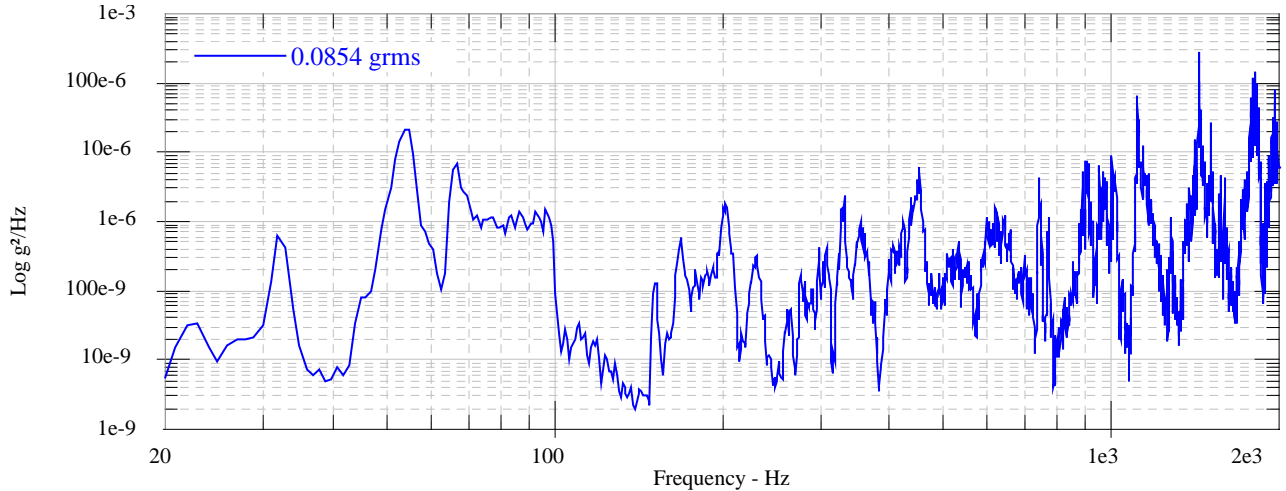
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

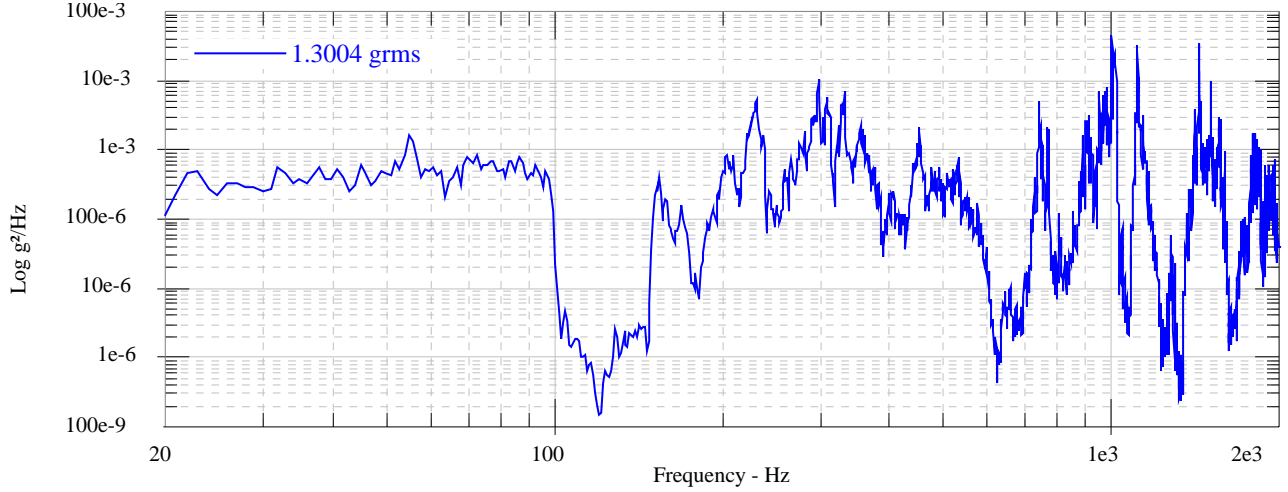


VIBRATION TEST REPORT
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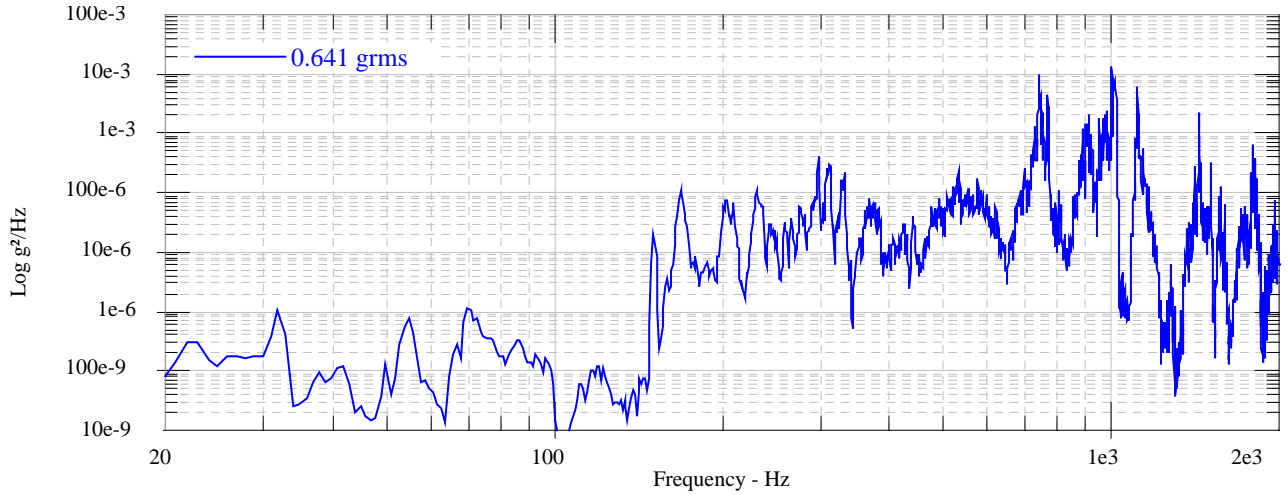
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Révision : 00
Date : 6-Apr-04
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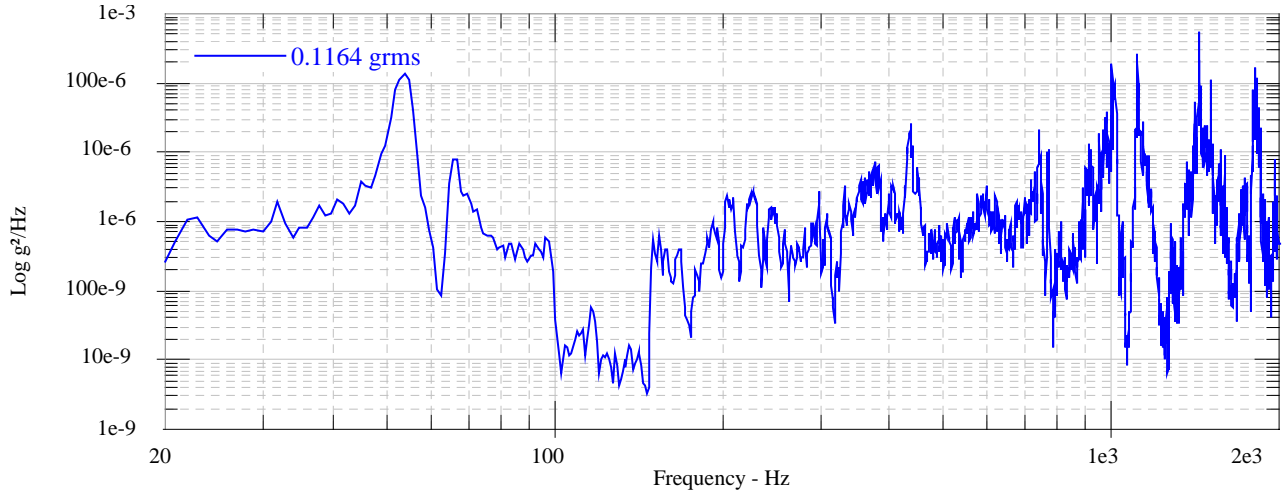
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

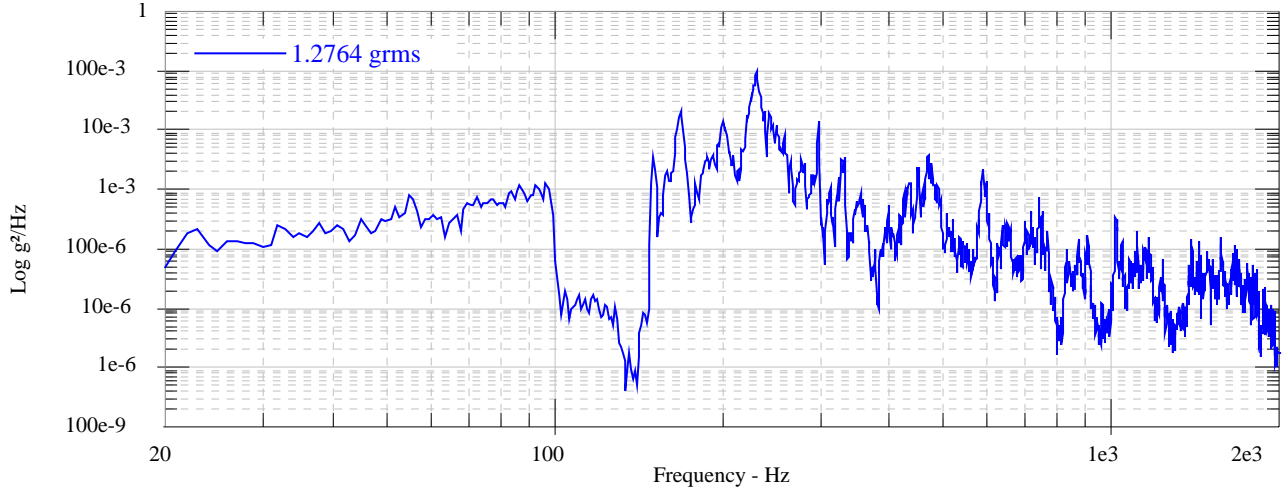


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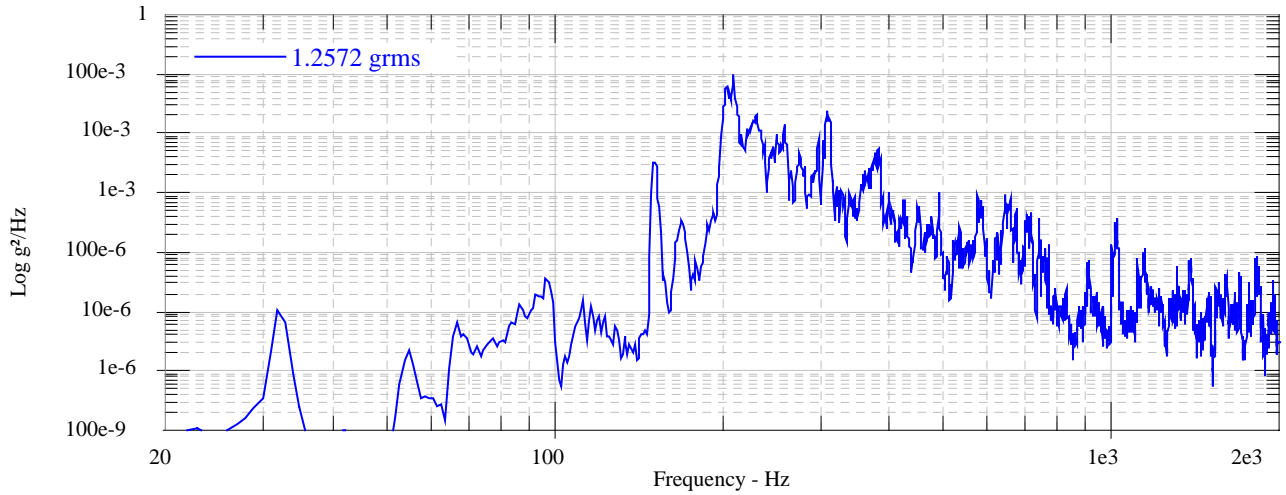
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Révision : 00
Date : 6-Apr-04
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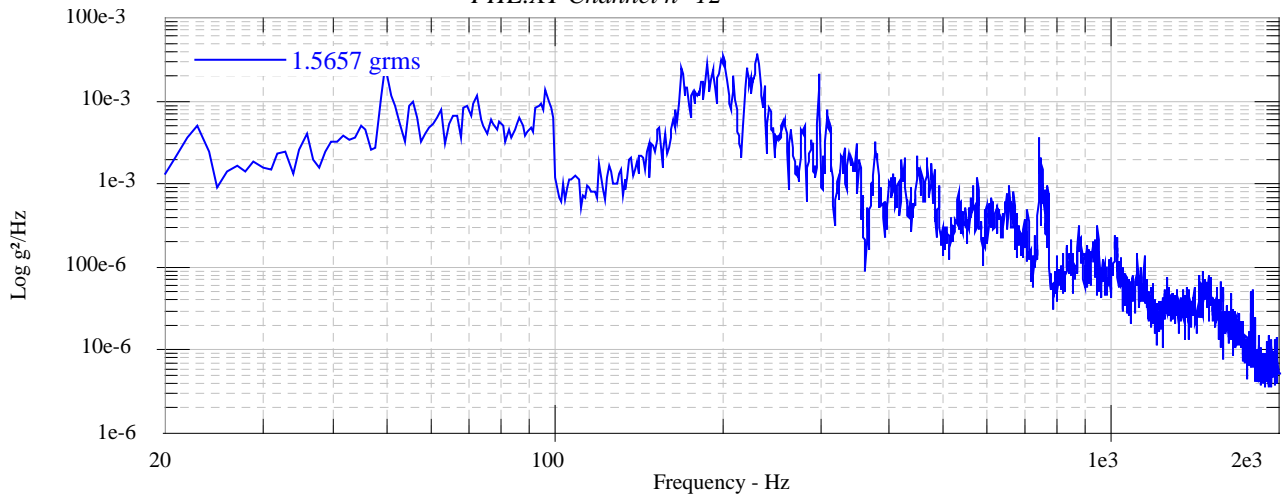
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

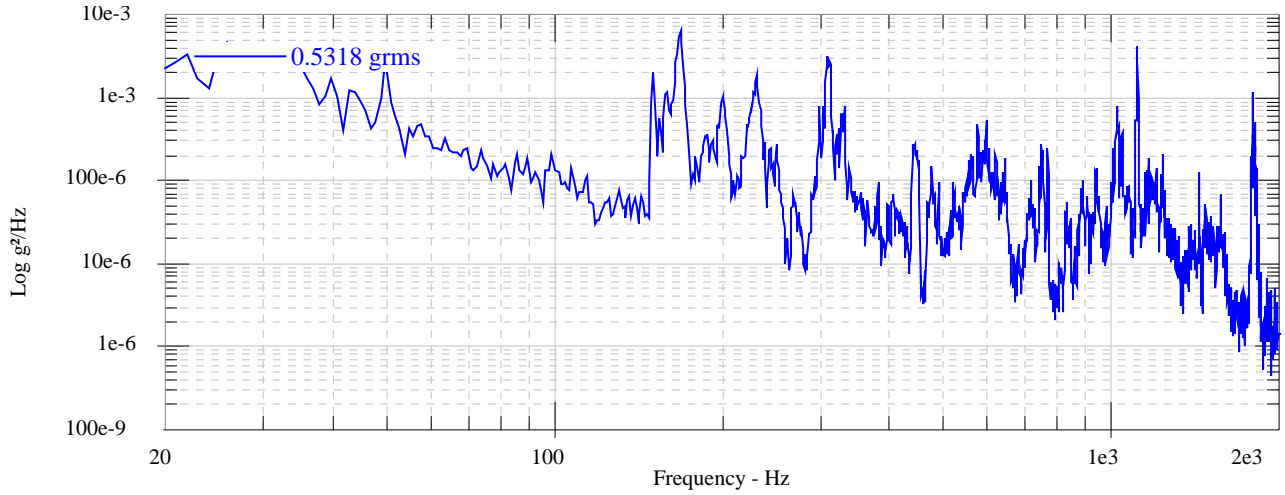


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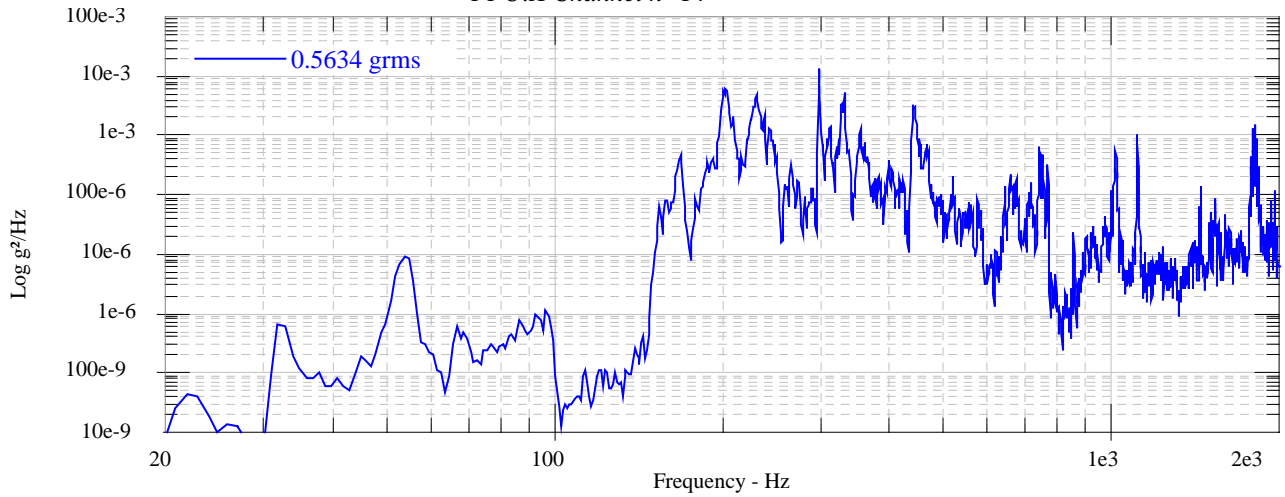
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Date : 6-Apr-04
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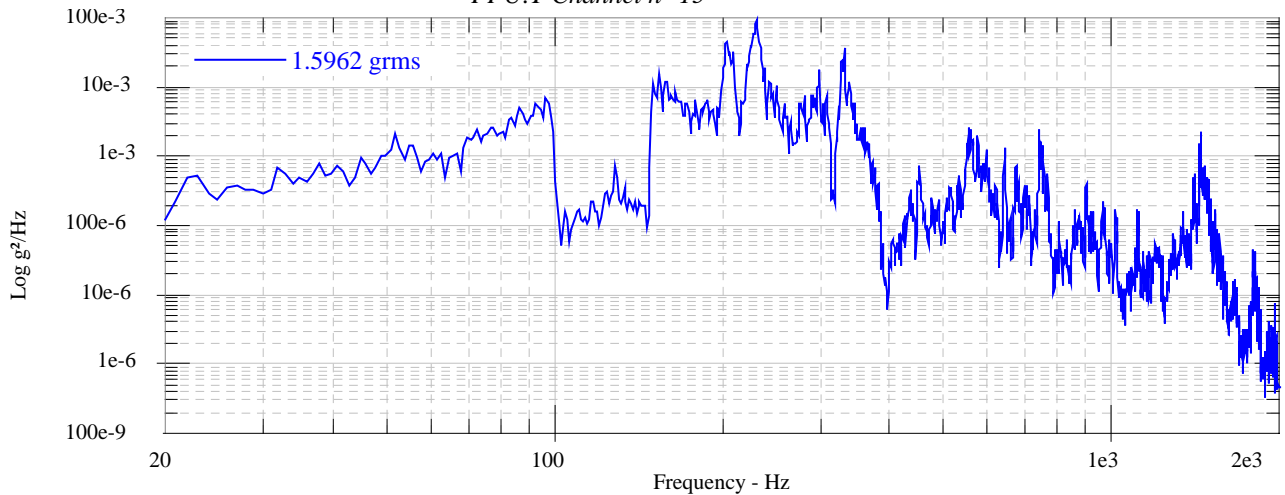
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

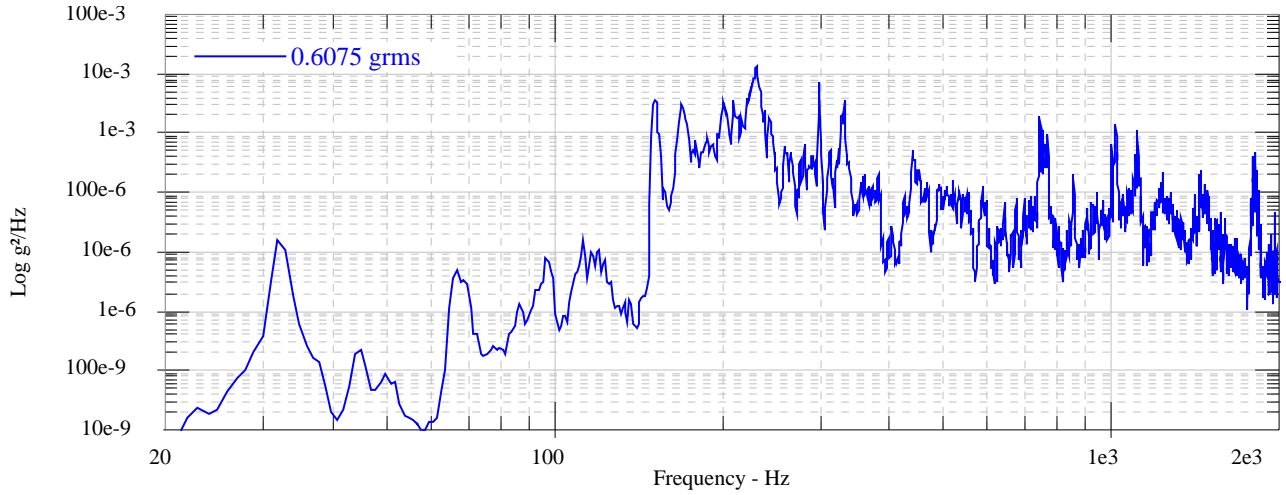


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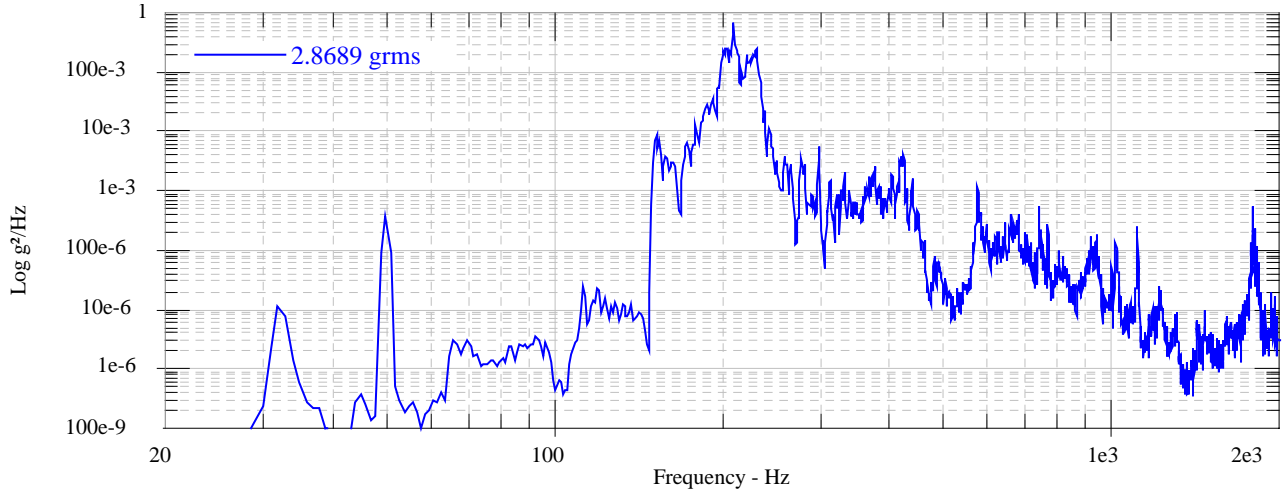
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Date : 6-Apr-04
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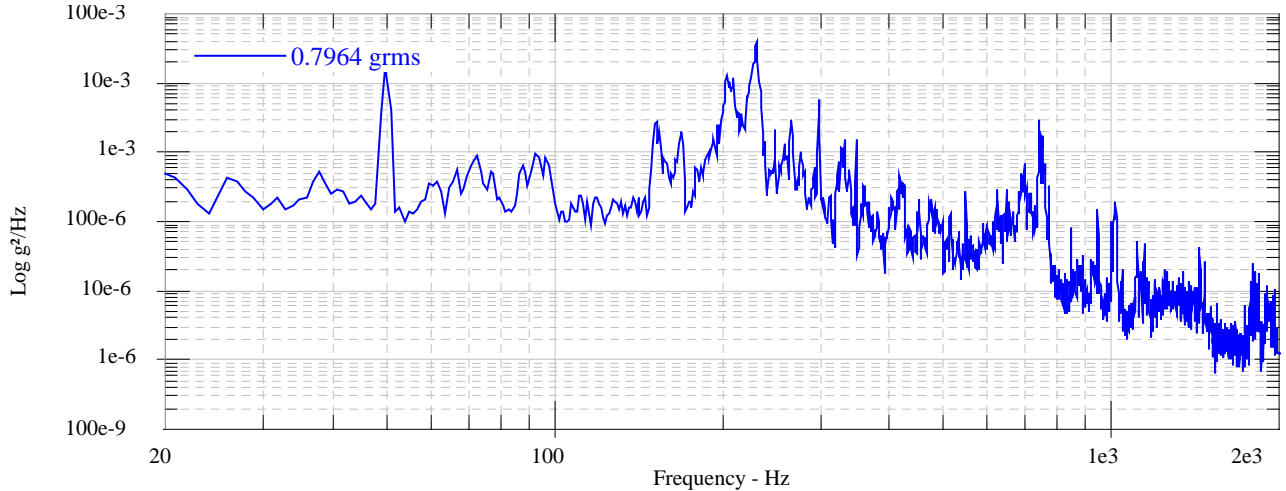
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

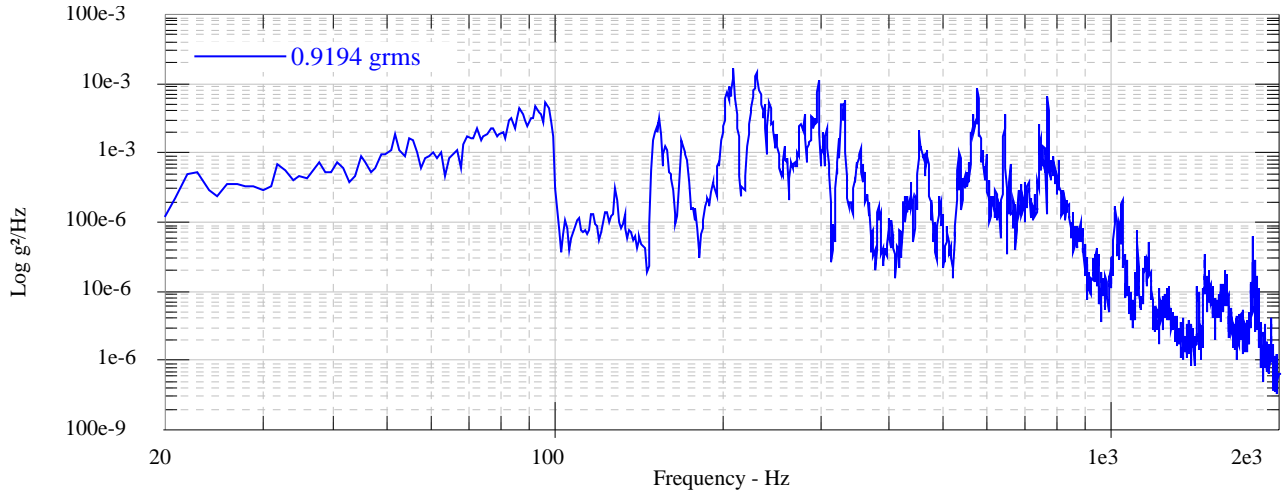


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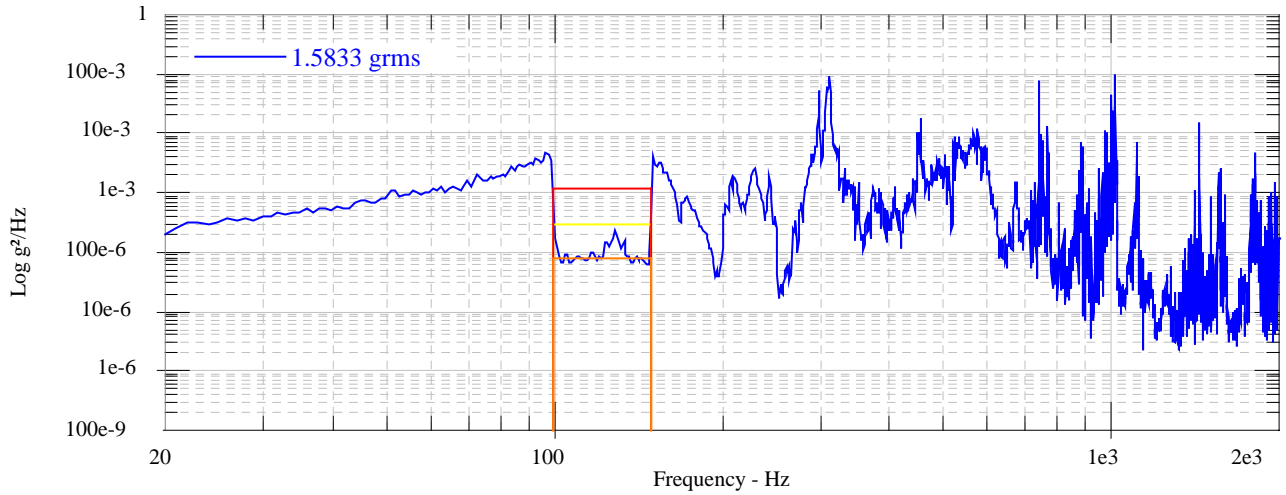
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Révision : 00
Date : 6-Apr-04
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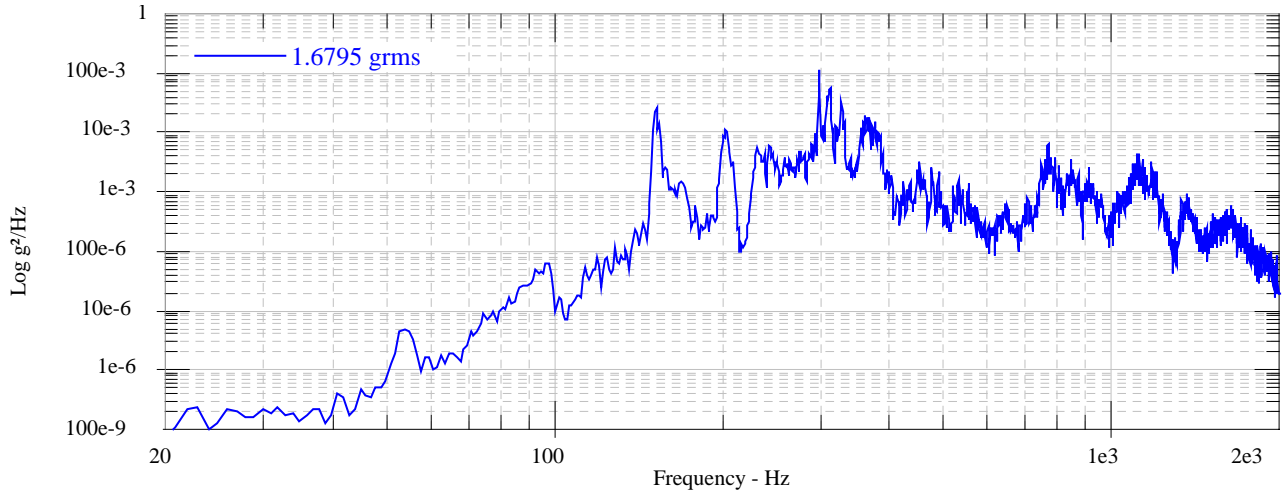
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

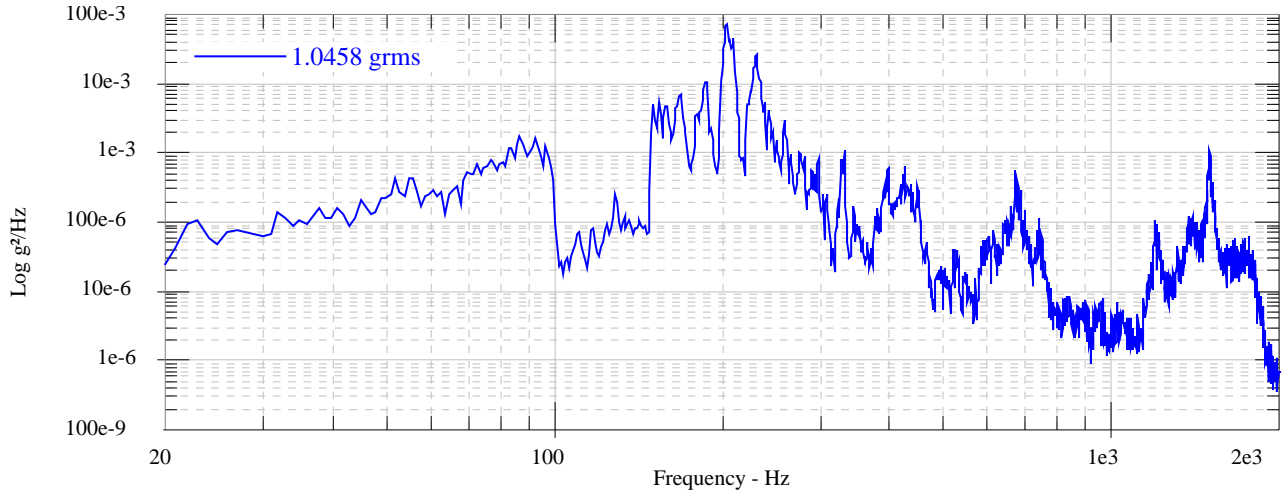


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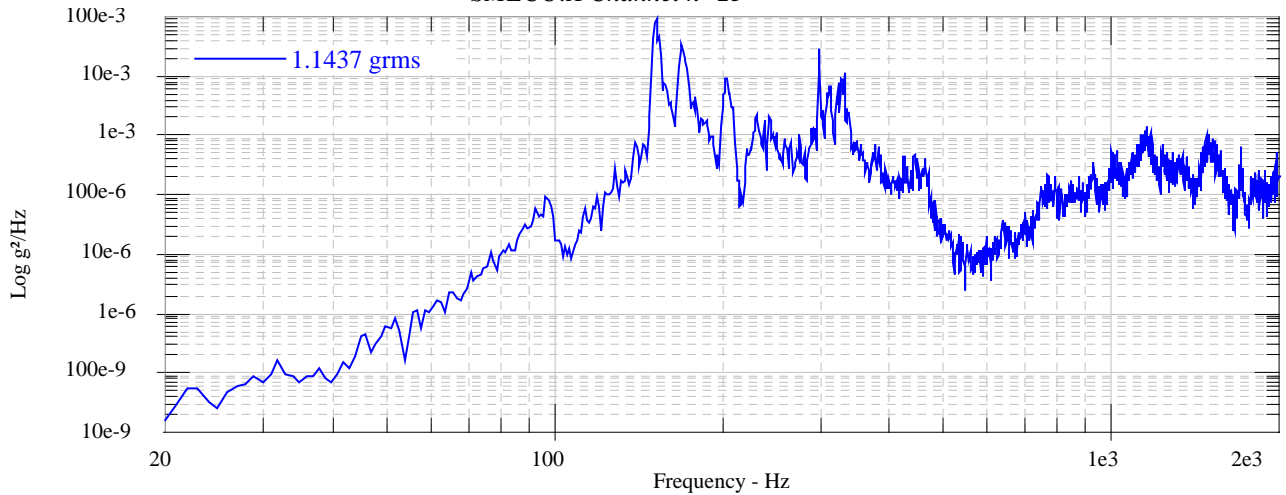
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Révision : 00
Date : 6-Apr-04
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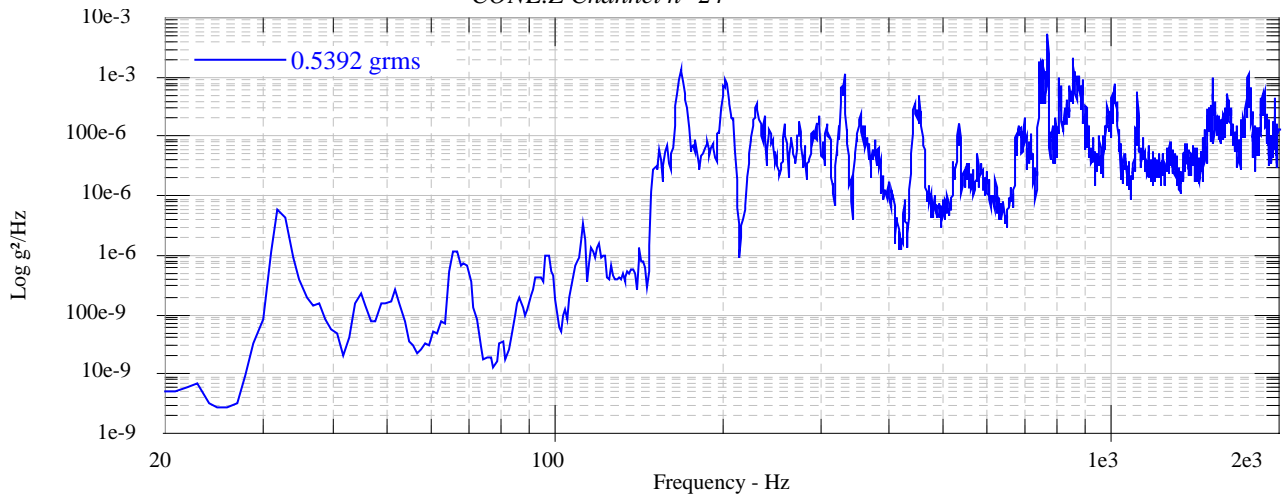
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

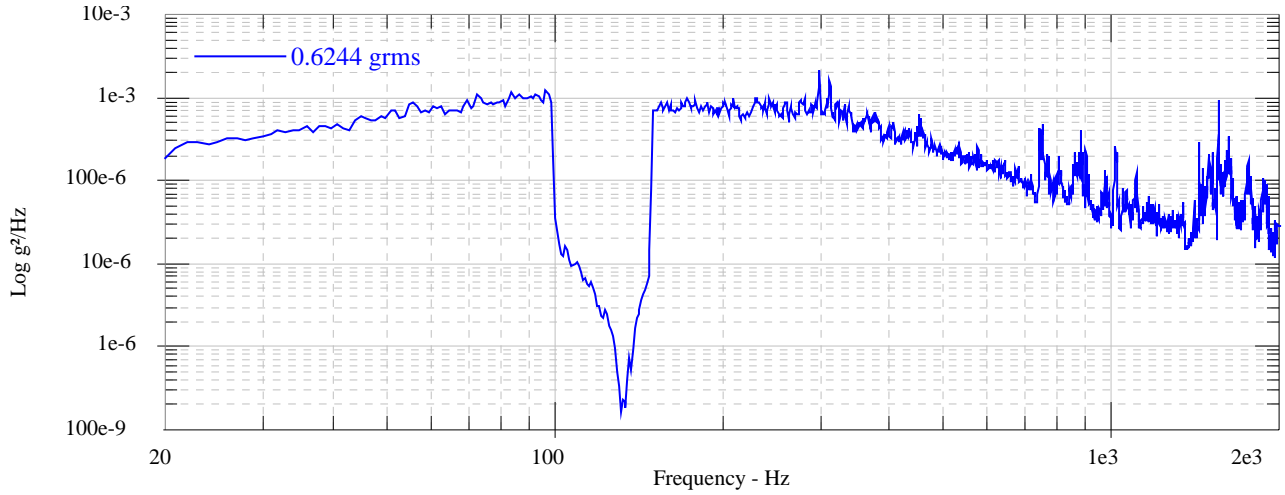


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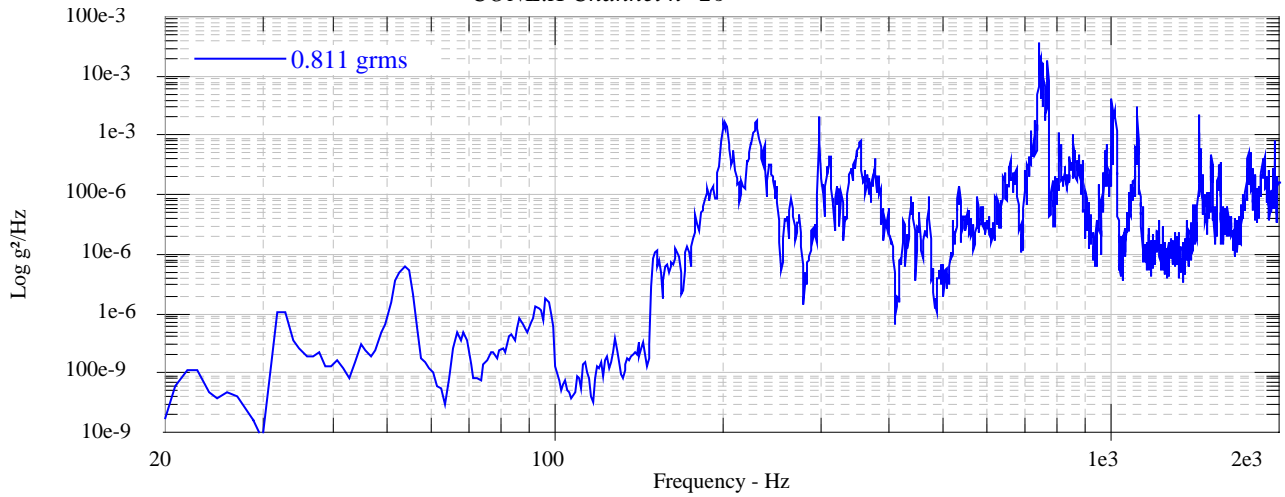
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Date : 6-Apr-04
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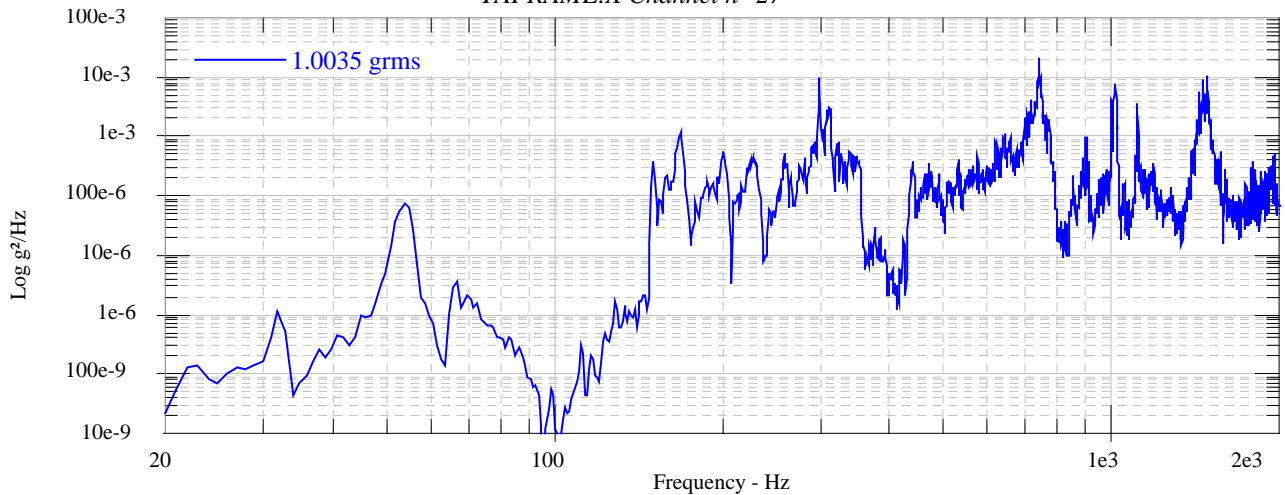
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

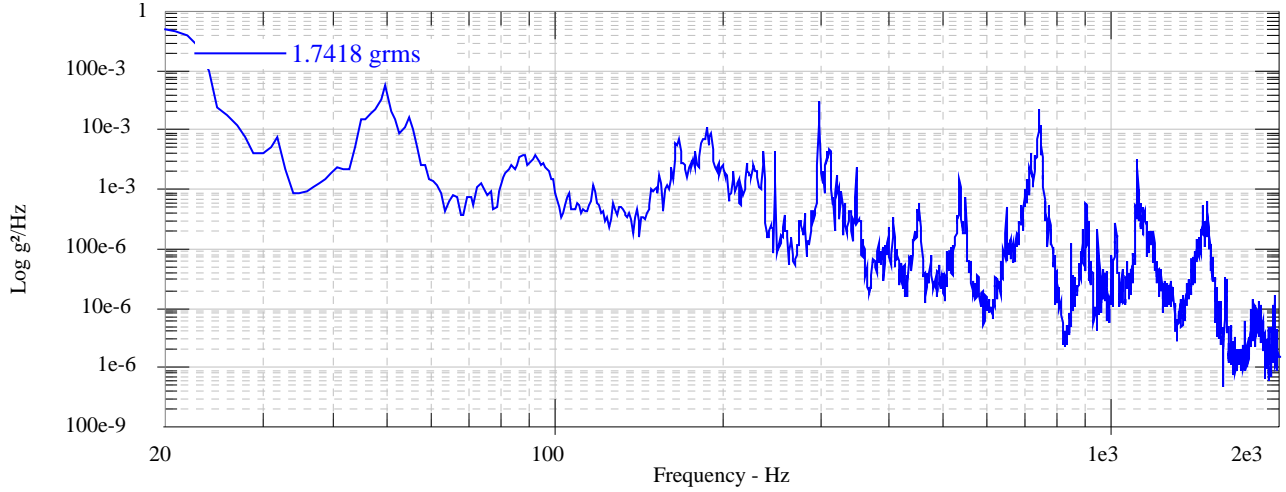


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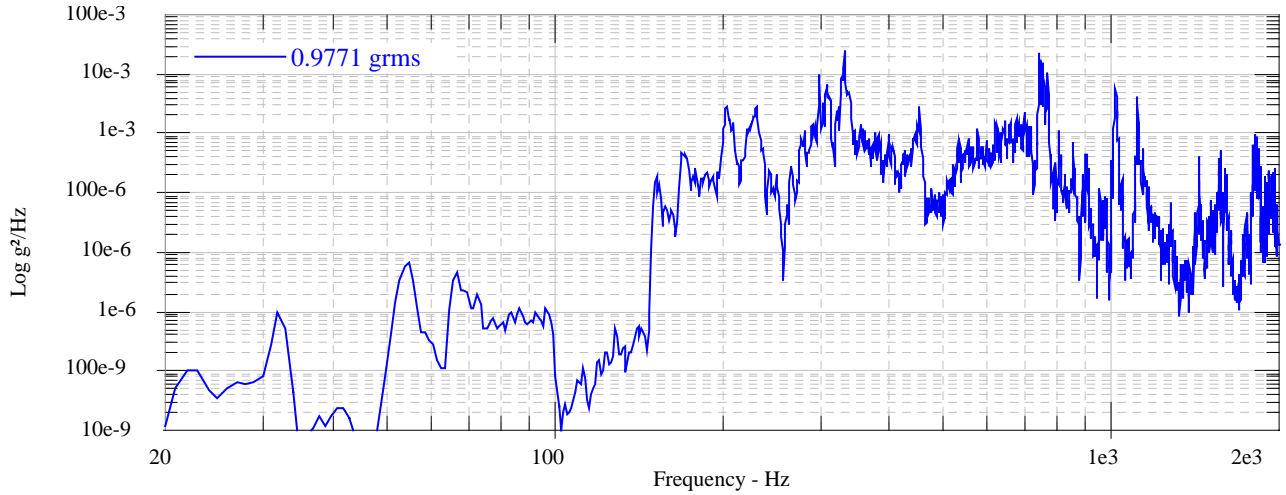
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Révision : 00
Date : 6-Apr-04
Page : BNA10Y - 11 / 11

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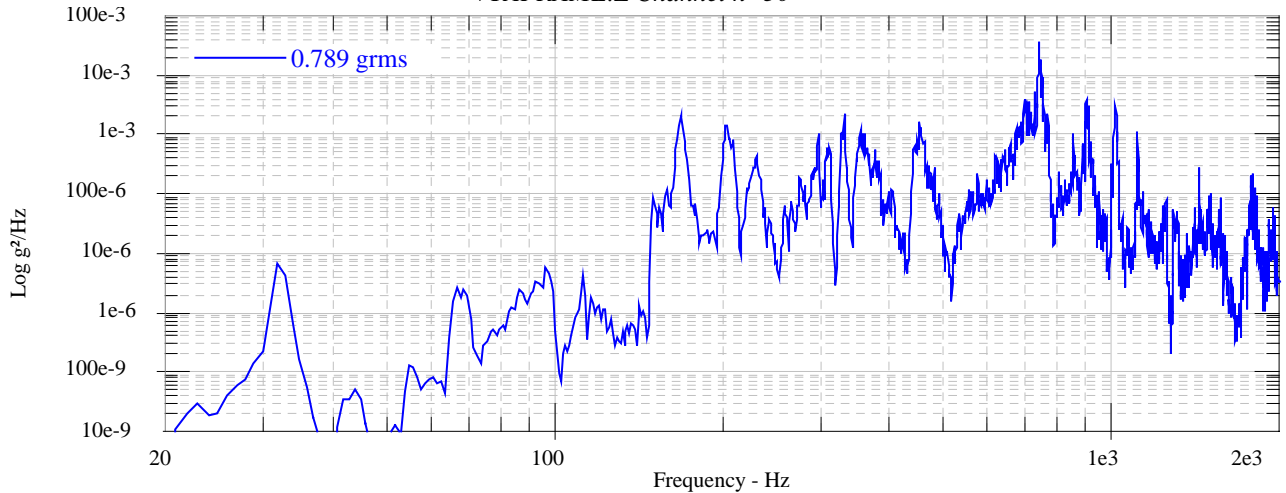
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



VIBRATION TEST REPORT
SPIRE QM

RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
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12.11 NIA11Y.

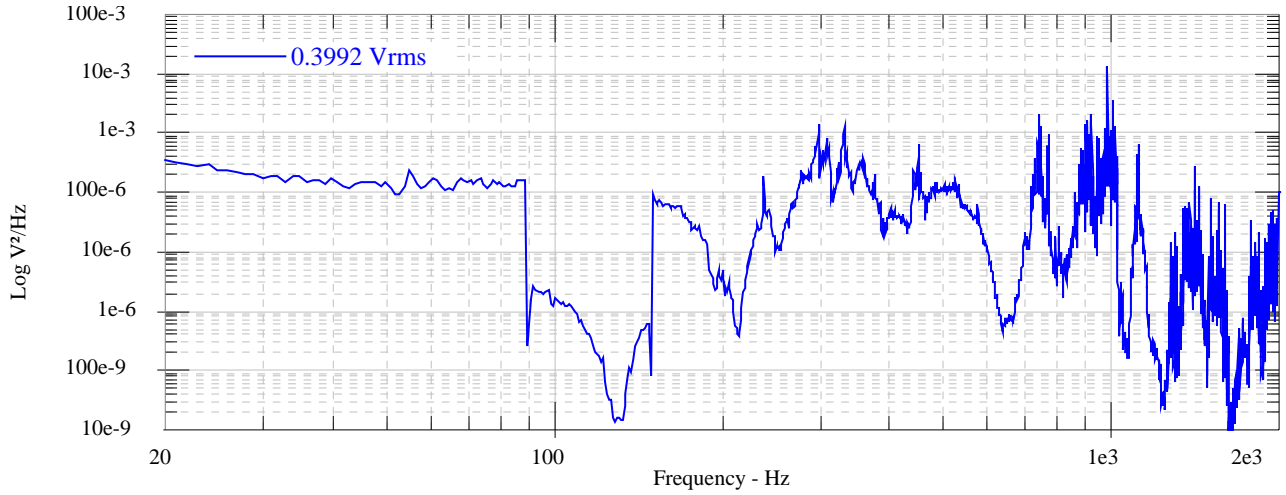
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VIBRATION TEST REPORT
SPIRE QM

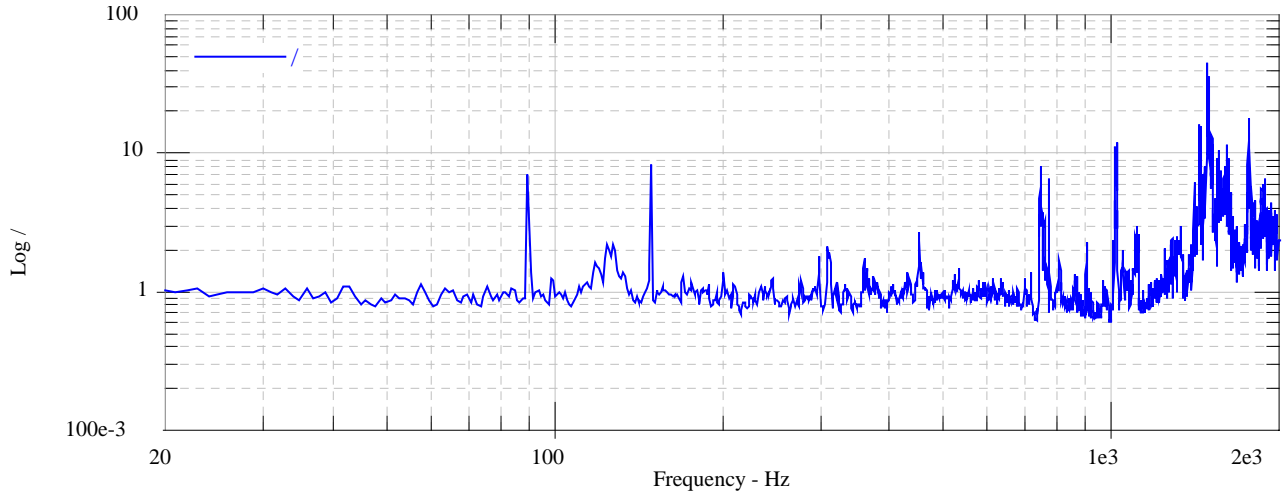
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Révision : 00
Date : 7-Apr-04
Page : NIA11Y - 1 / 11

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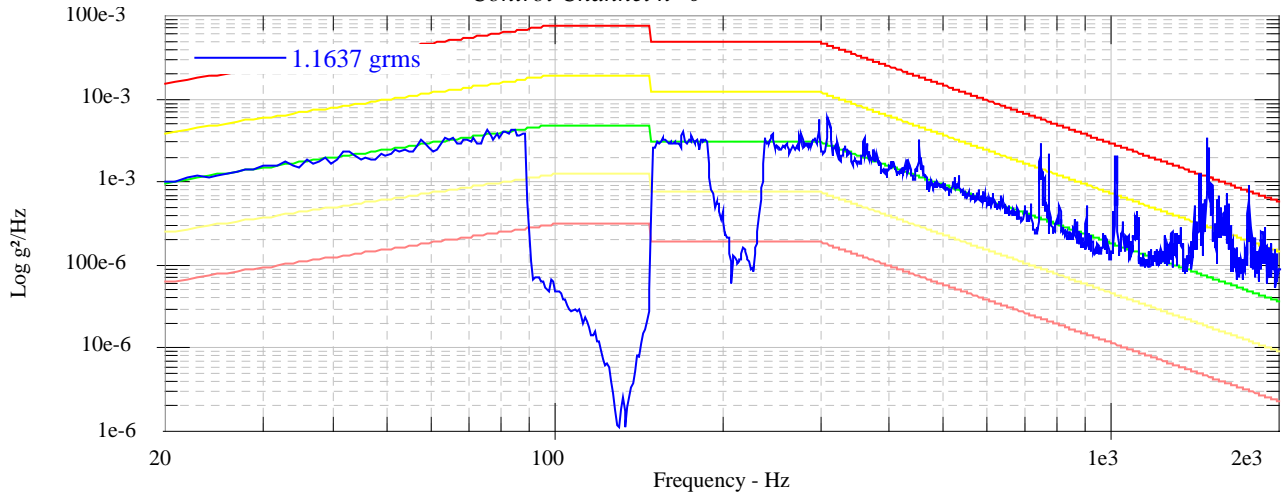
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

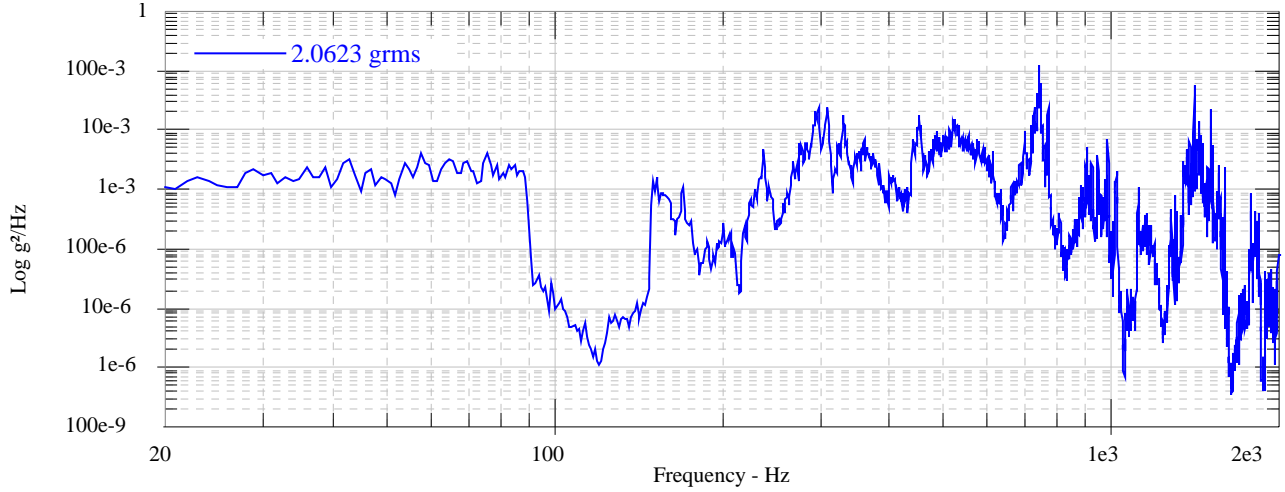


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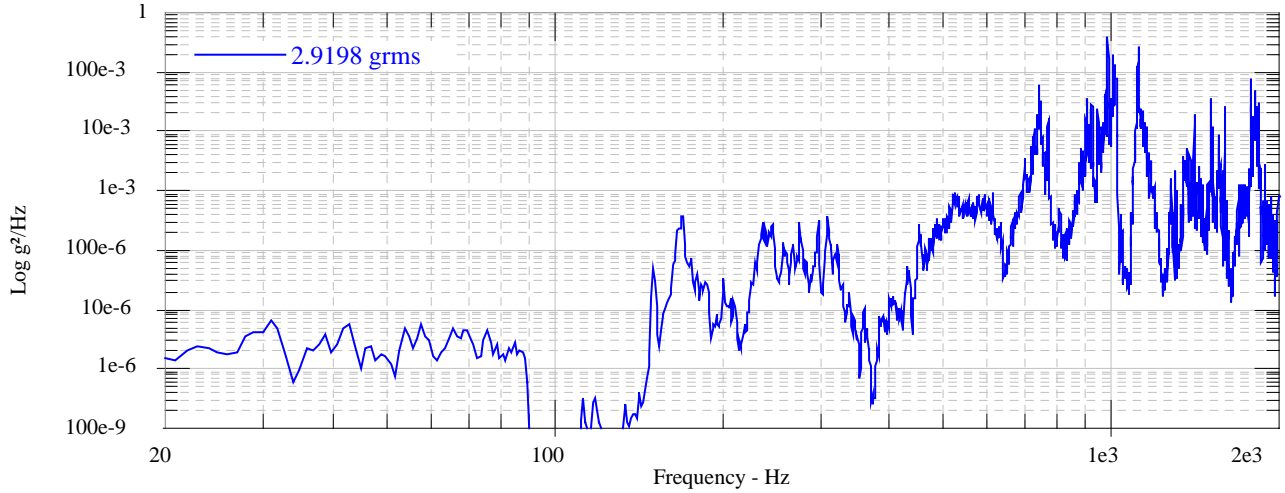
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Révision : 00
Date : 7-Apr-04
Page : NIA11Y - 2 / 11

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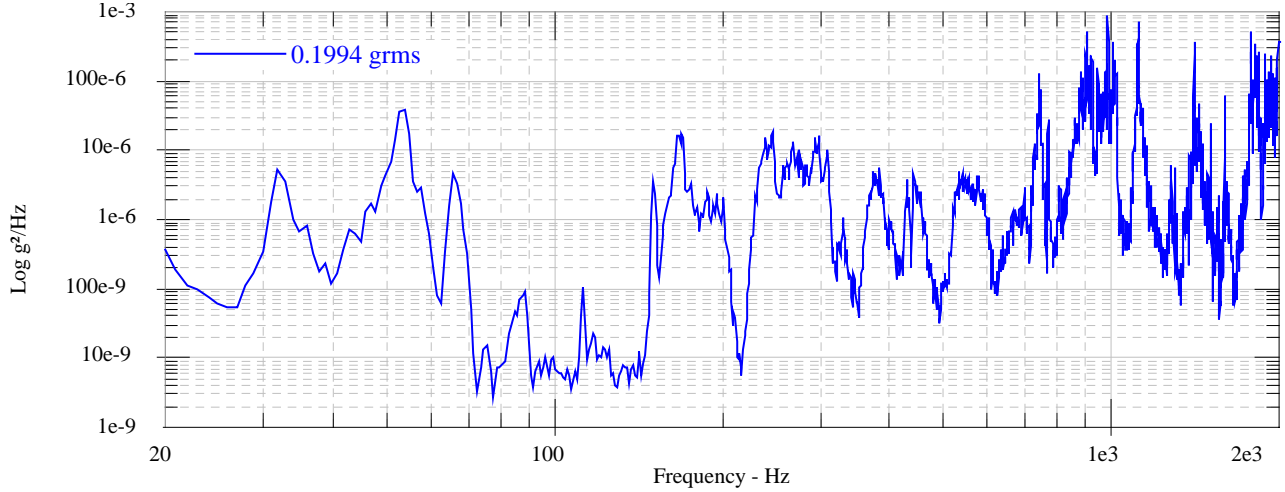
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

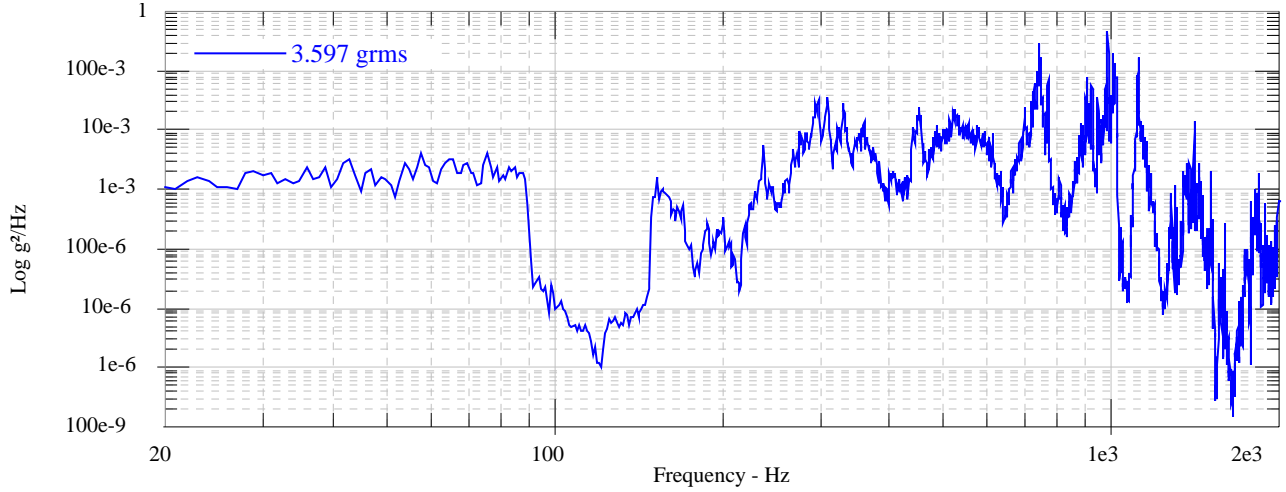


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SPIRE QM

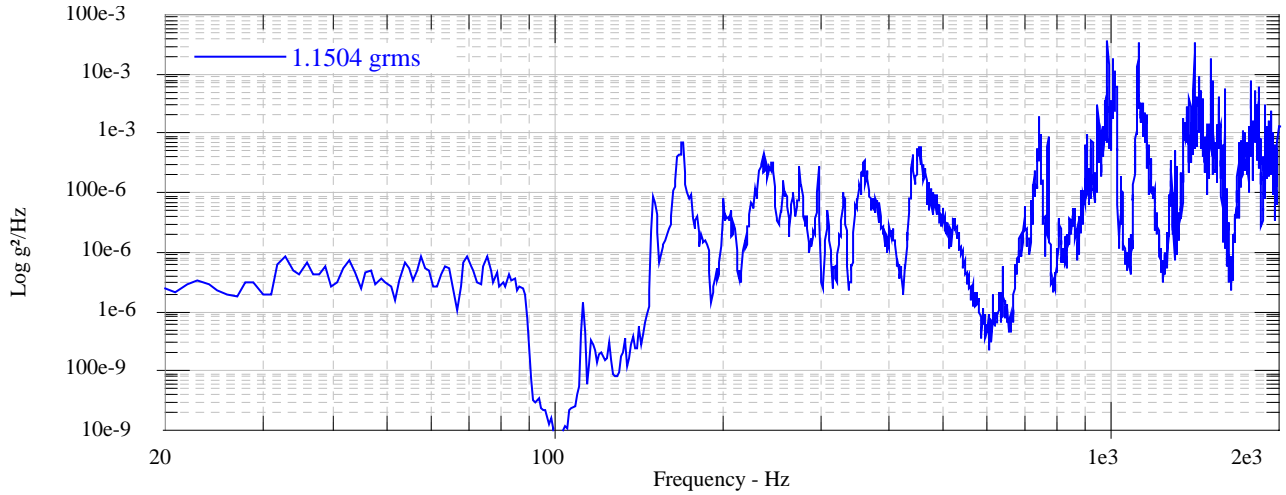
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Date : 7-Apr-04
Page : NIA11Y - 3 / 11

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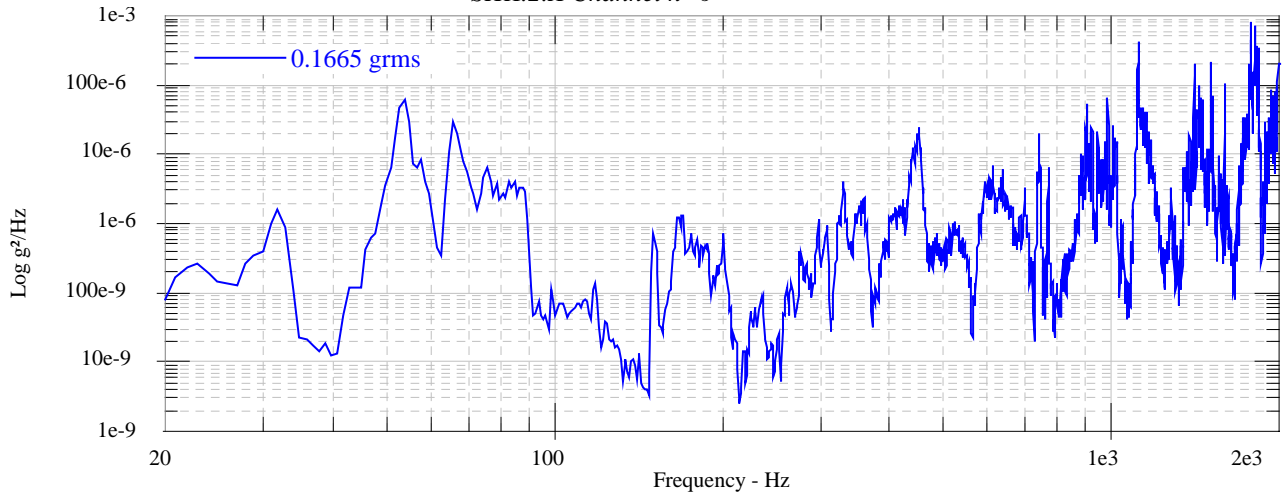
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

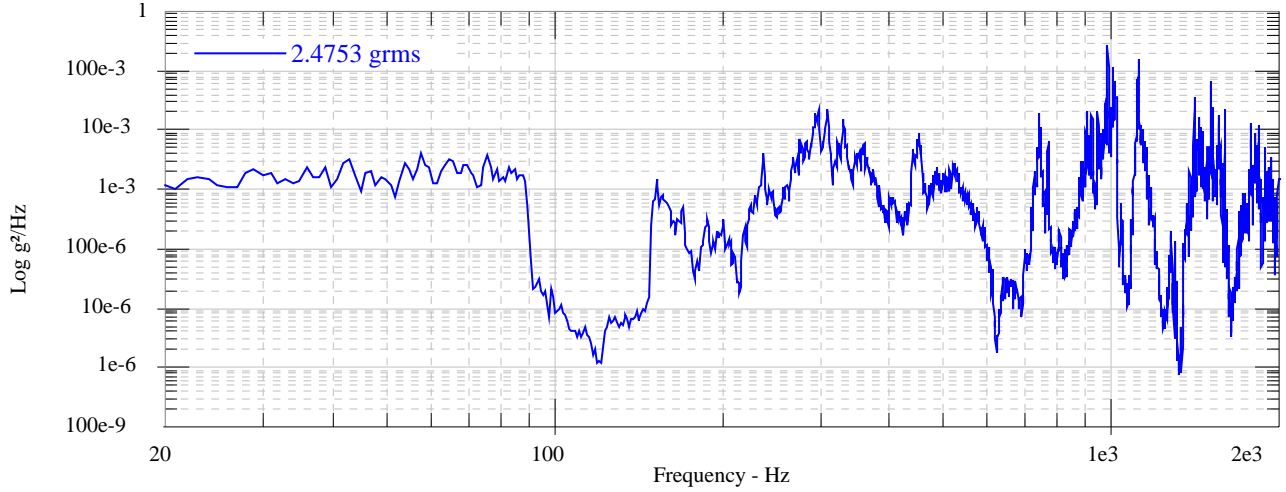


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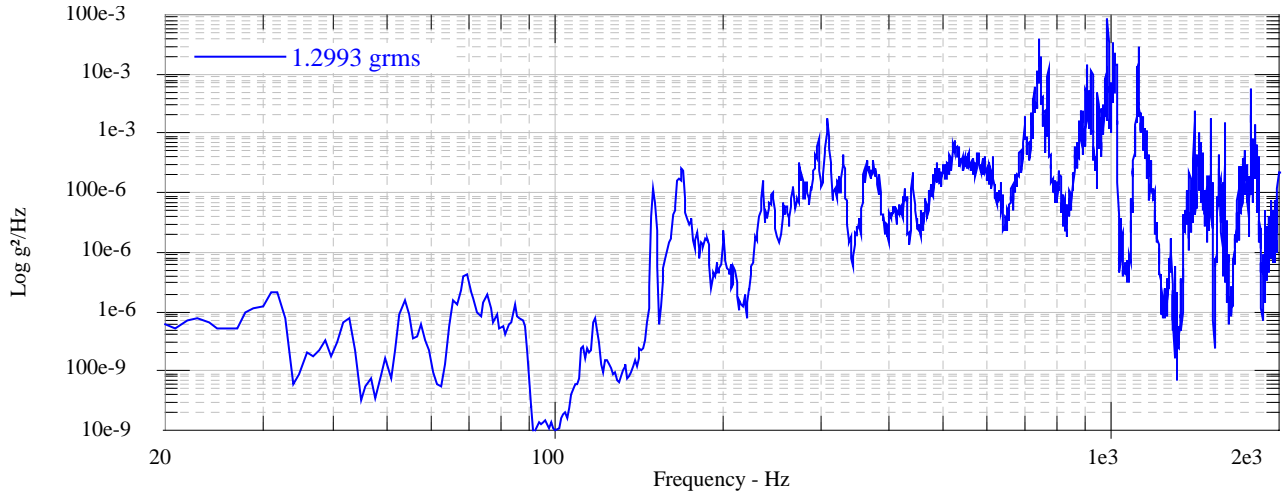
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Version : 01
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Date : 7-Apr-04
Page : NIA11Y - 4 / 11

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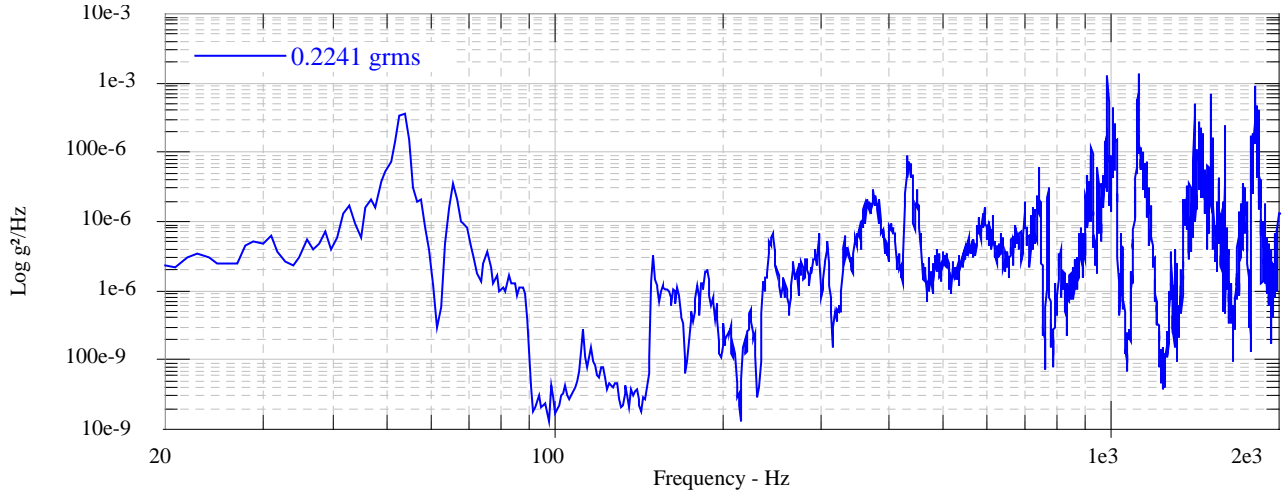
SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

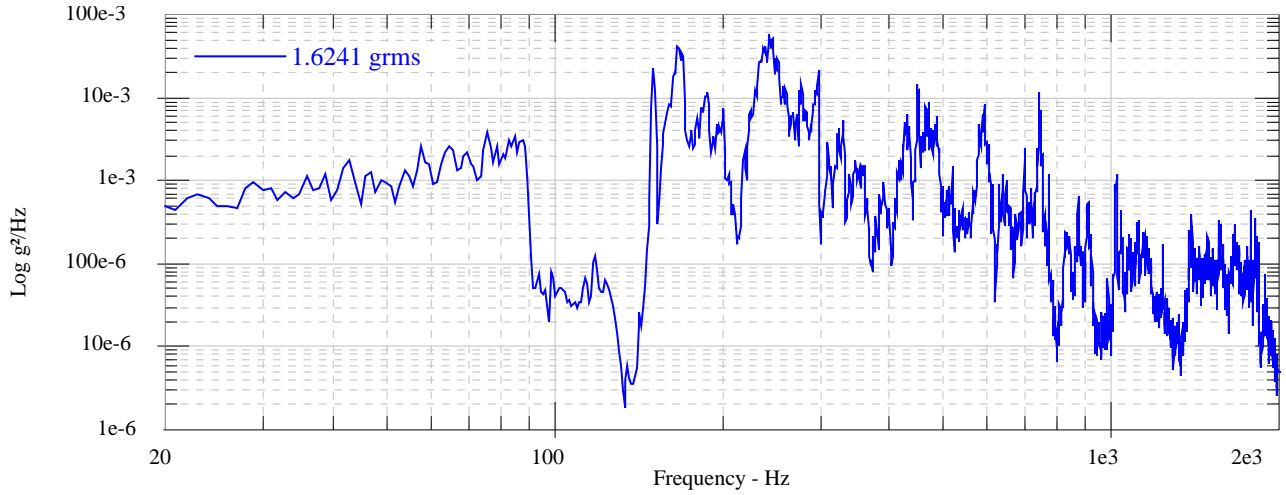


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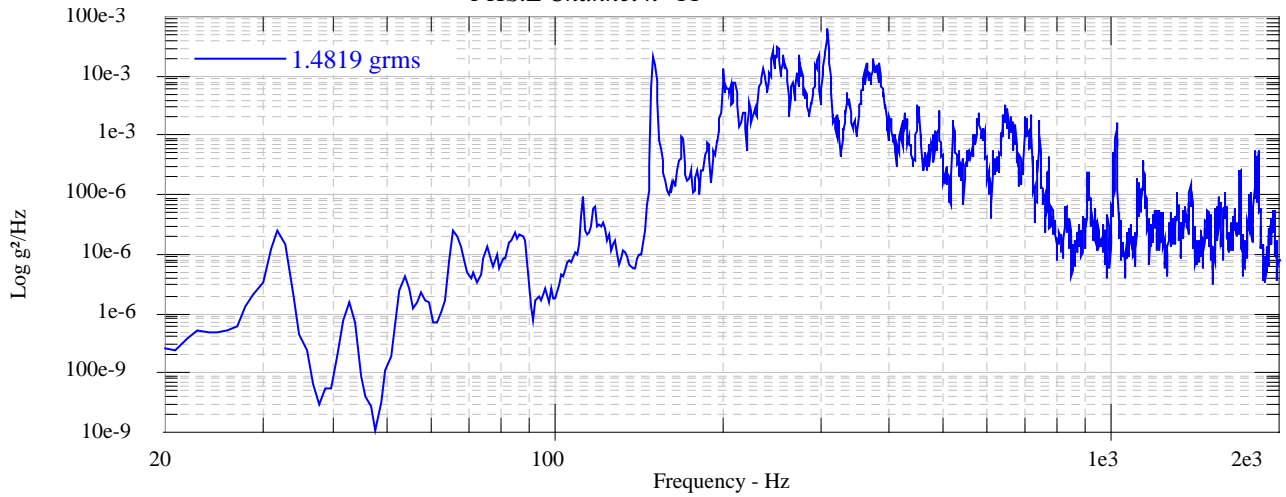
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Version : 01
Révision : 00
Date : 7-Apr-04
Page : NIA11Y - 5 / 11

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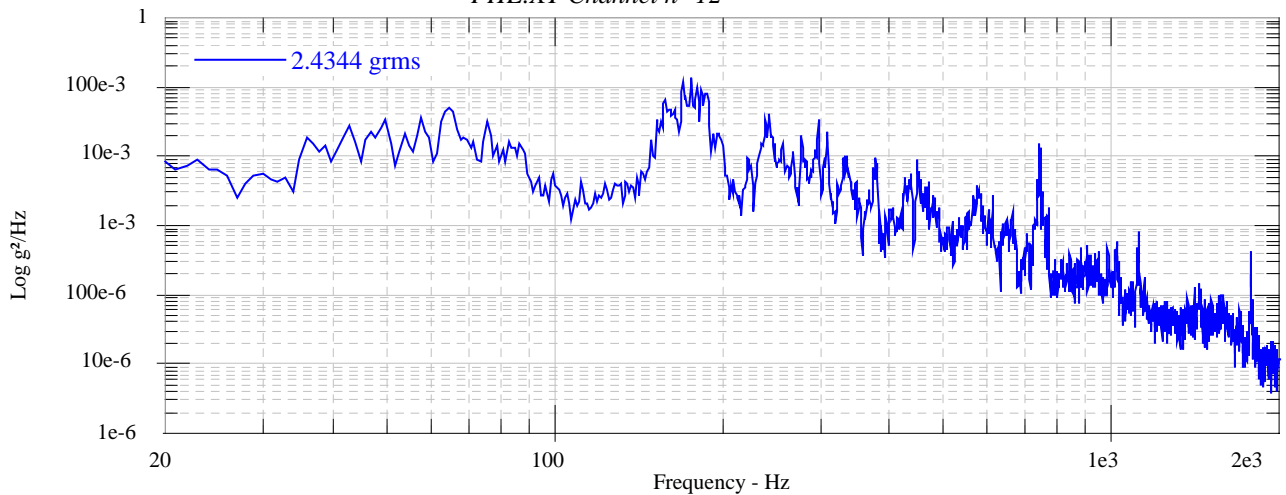
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

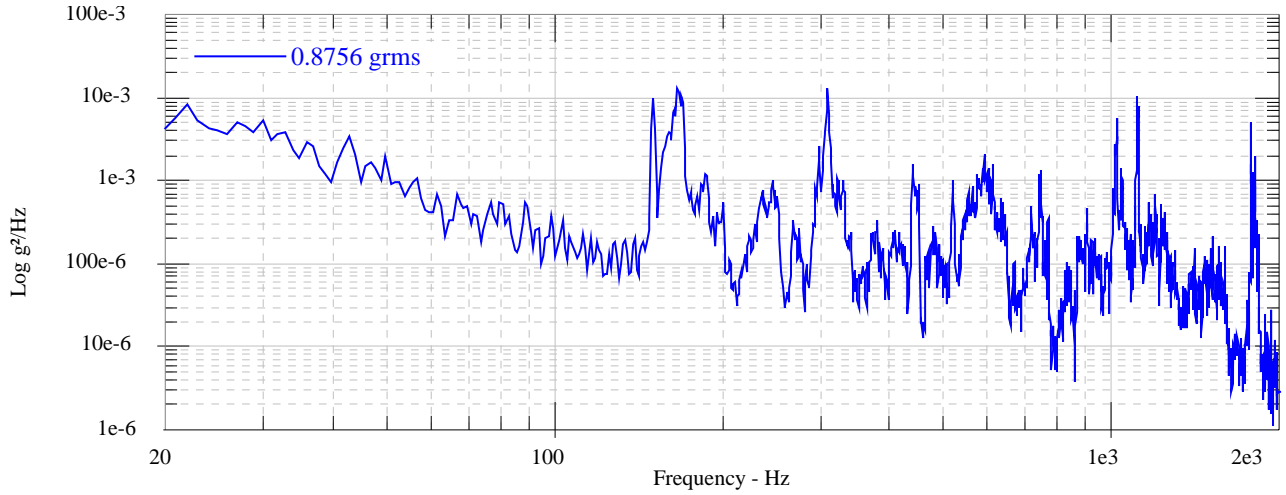


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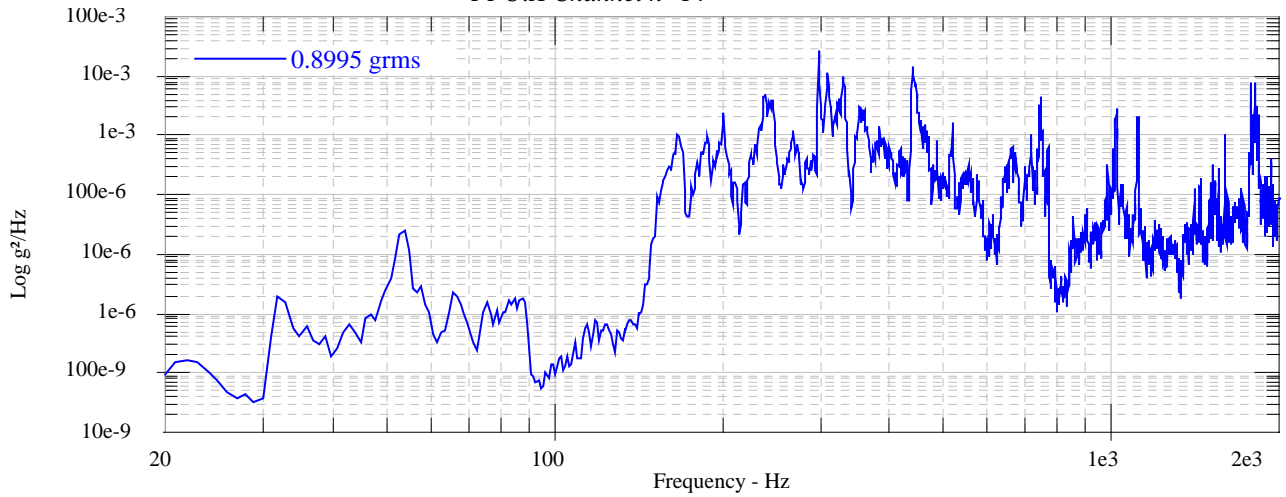
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Version : 01
Révision : 00
Date : 7-Apr-04
Page : NIA11Y - 6 / 11

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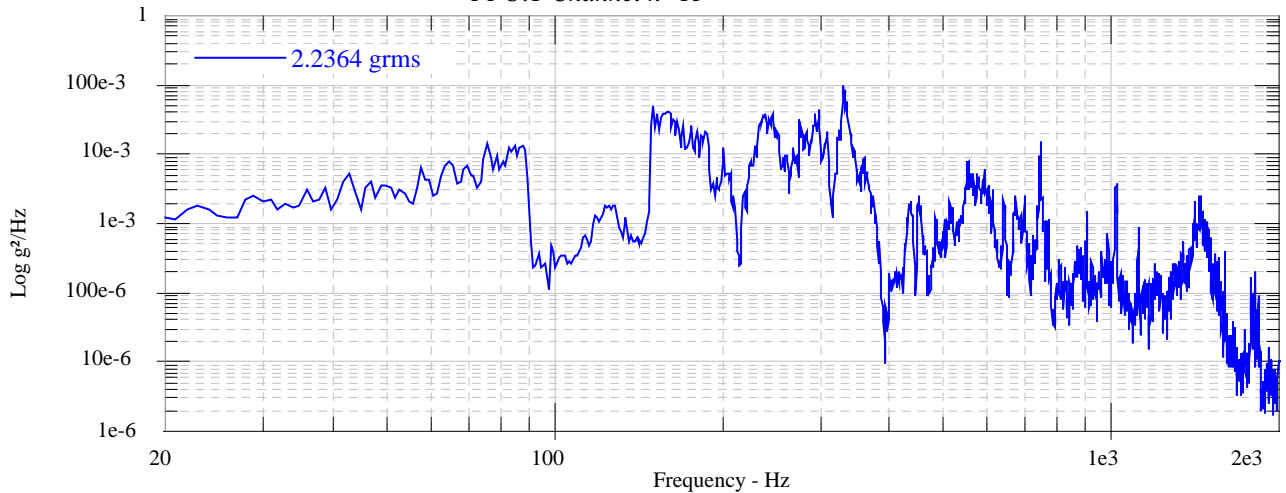
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

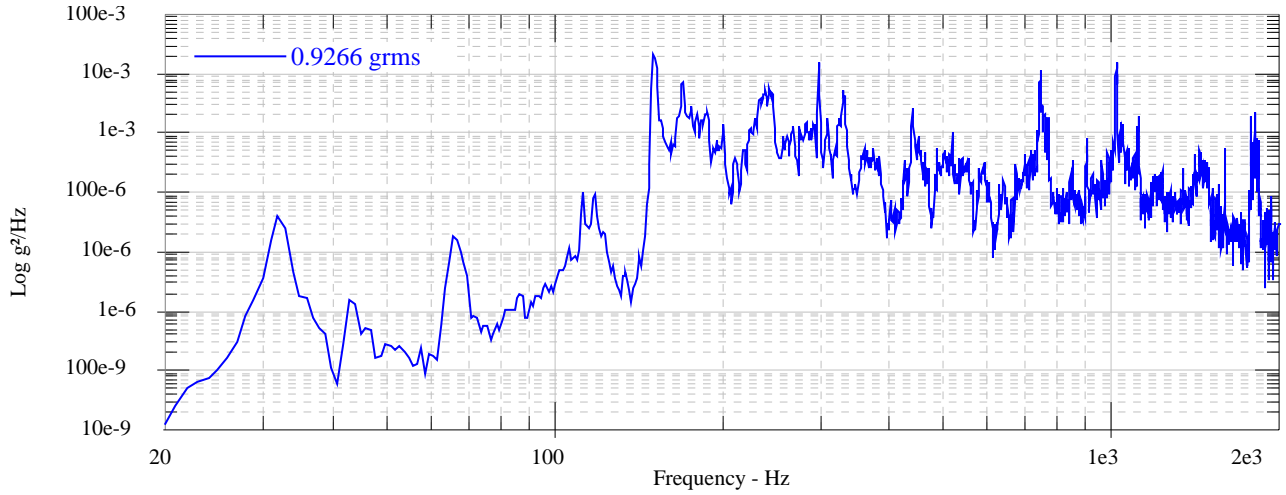


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SPIRE QM

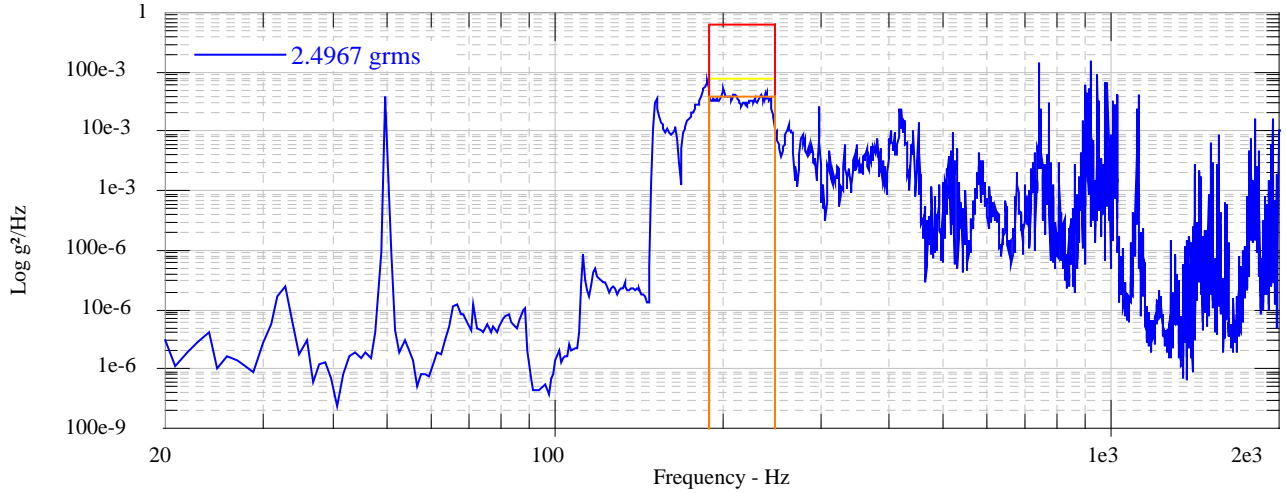
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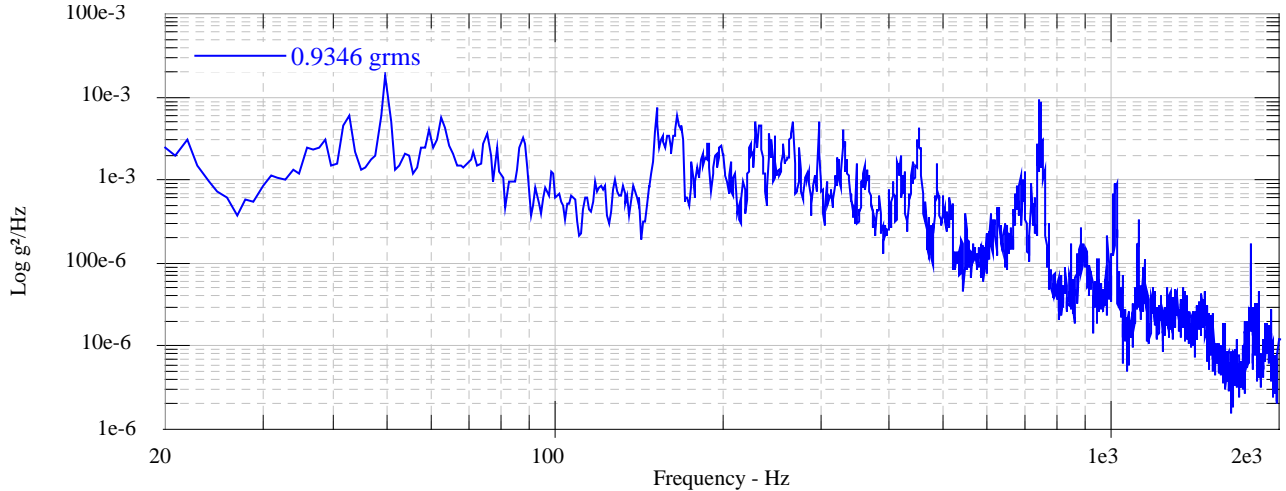
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

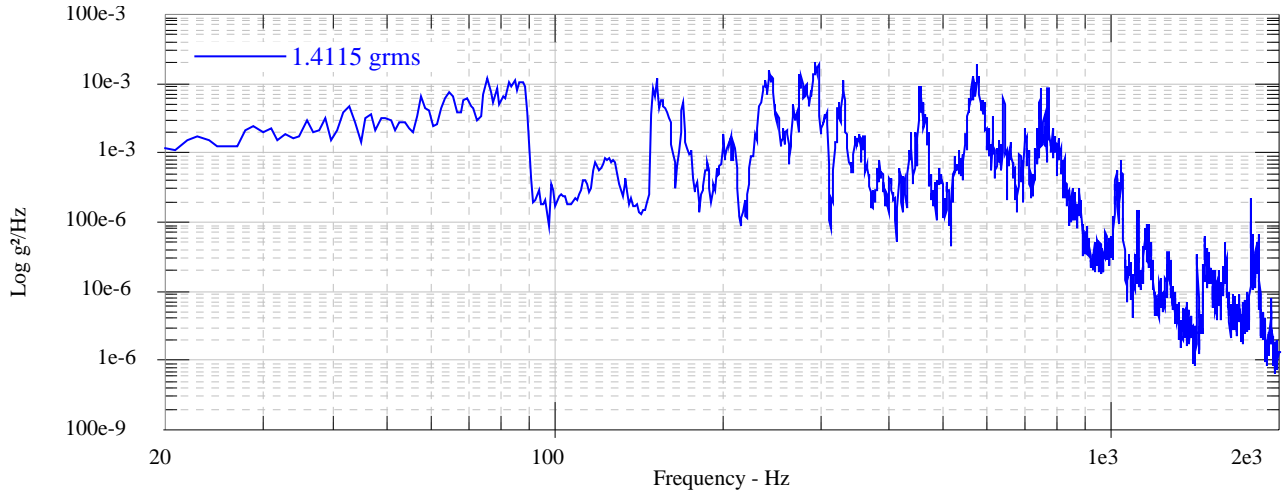


VIBRATION TEST REPORT
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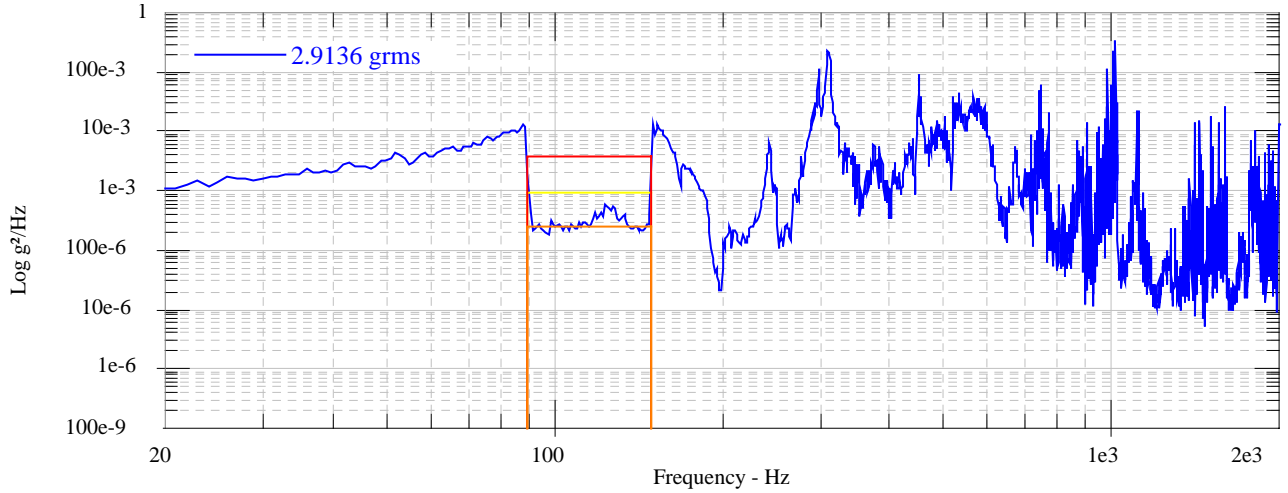
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Date : 7-Apr-04
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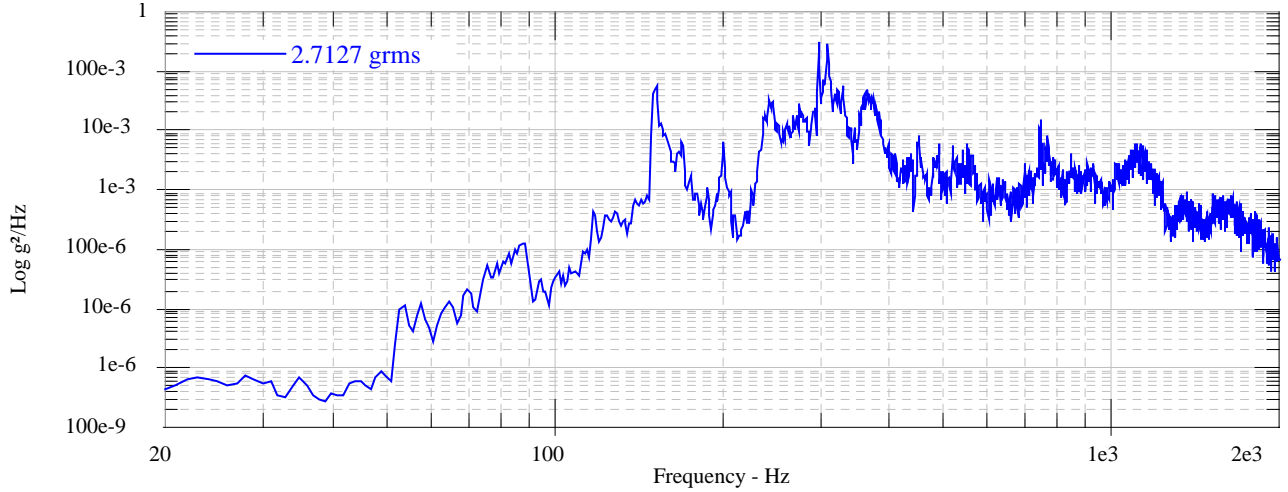
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

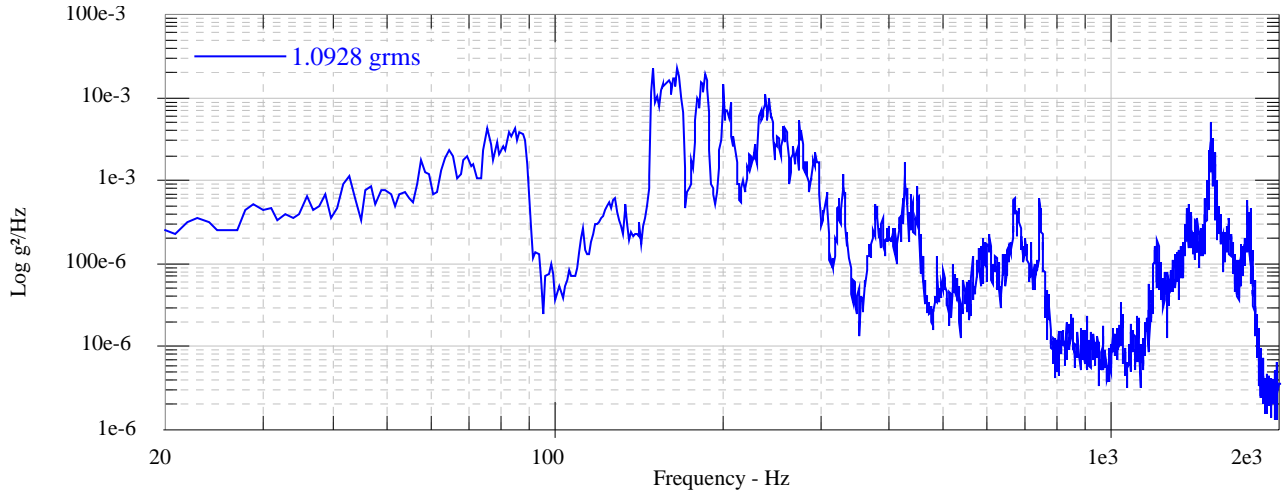


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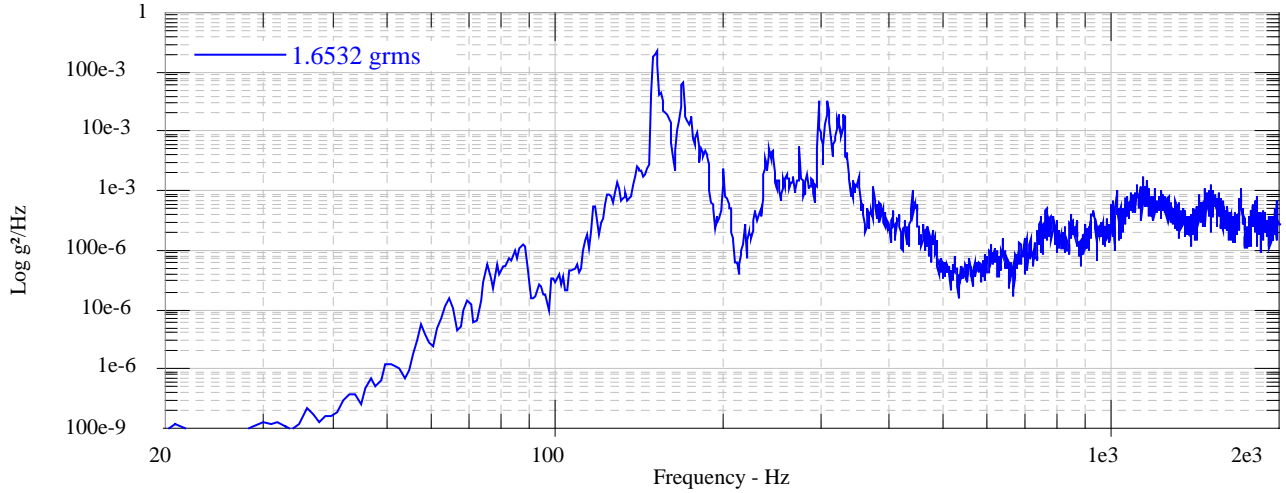
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Révision : 00
Date : 7-Apr-04
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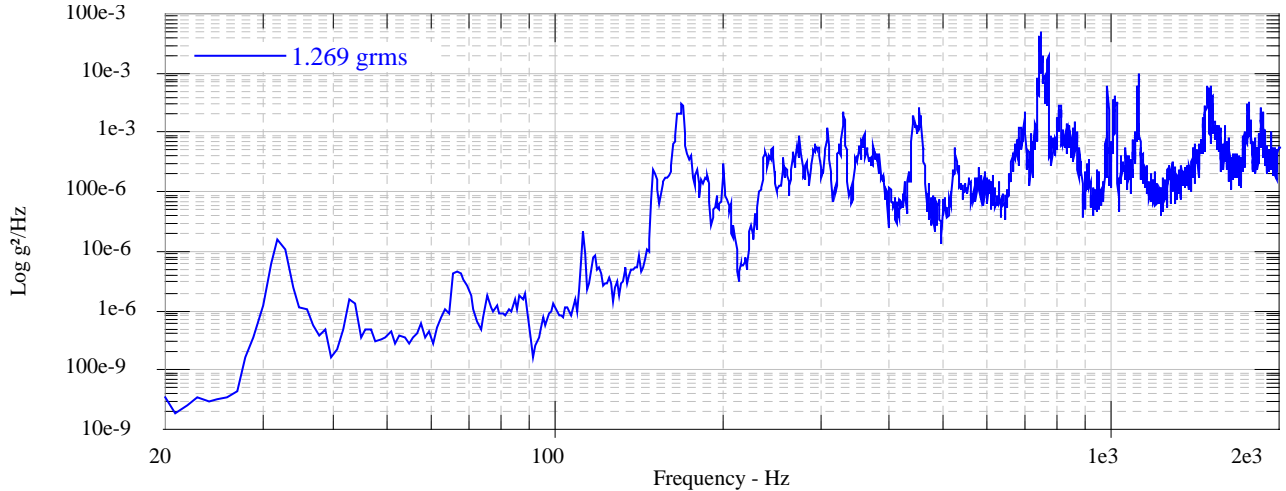
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

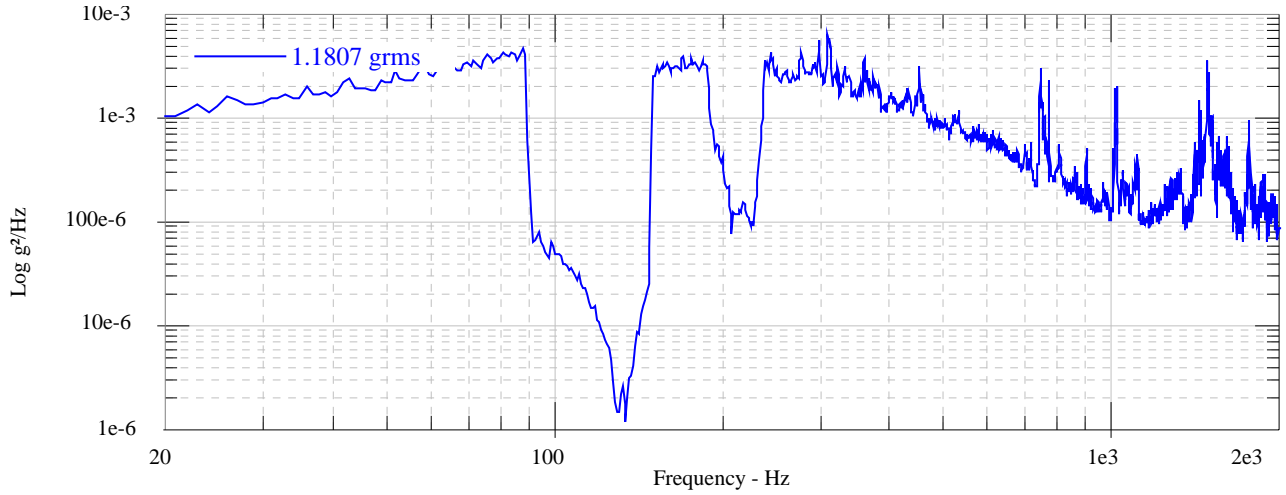


VIBRATION TEST REPORT
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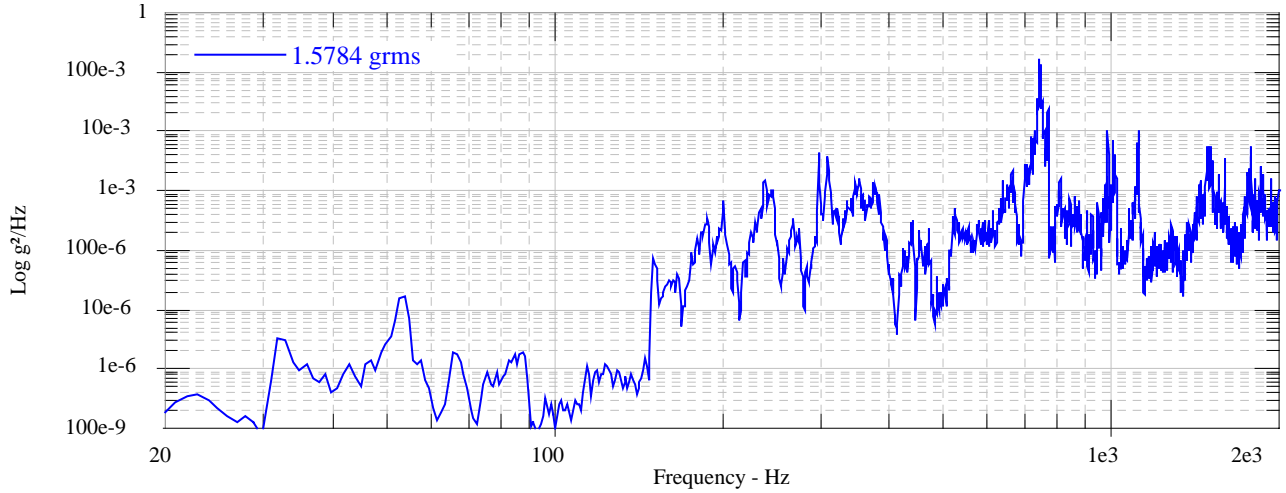
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Date : 7-Apr-04
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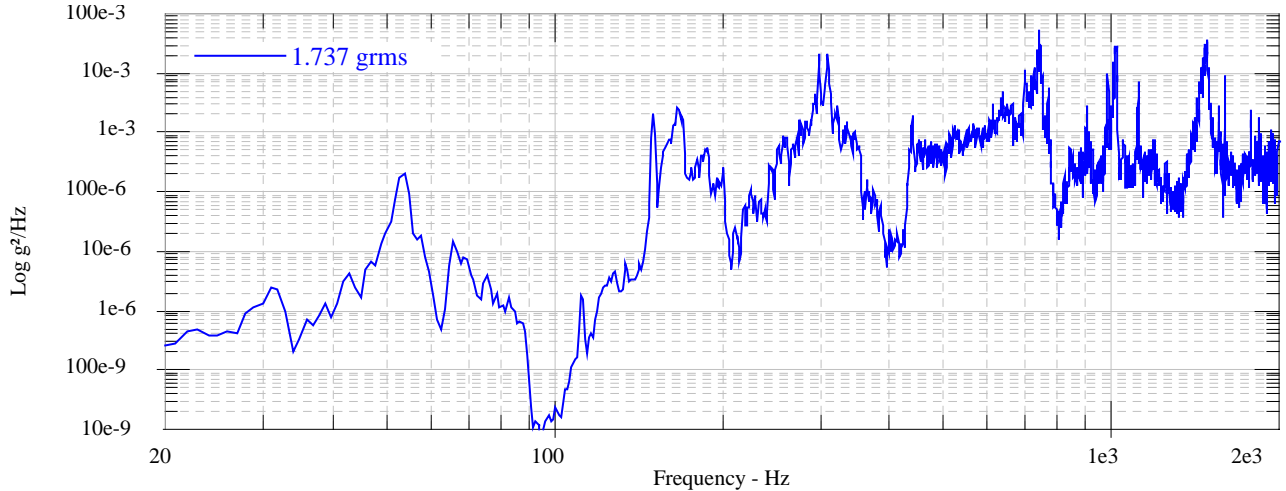
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

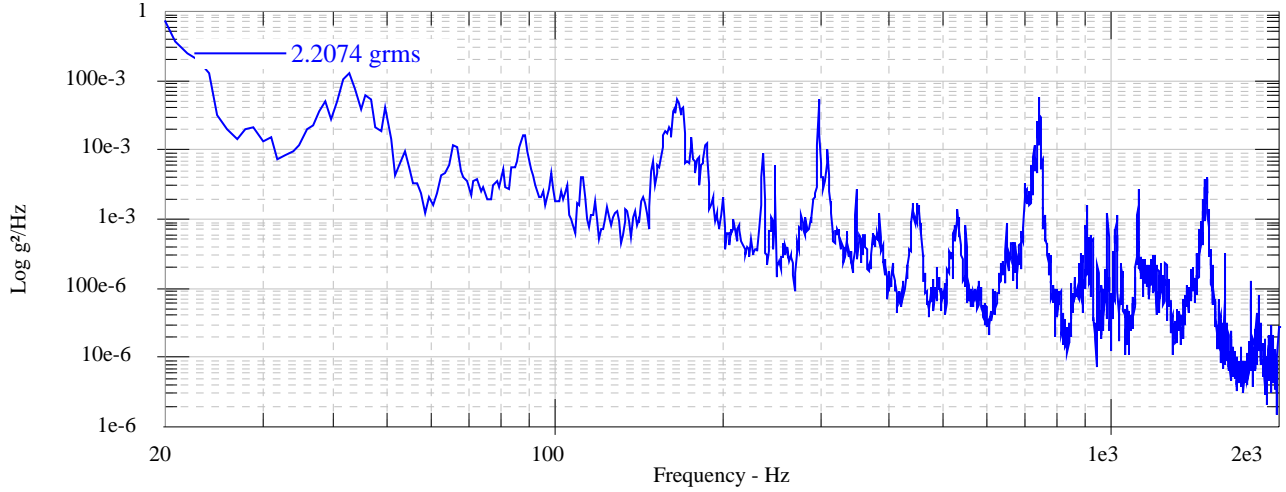


VIBRATION TEST REPORT
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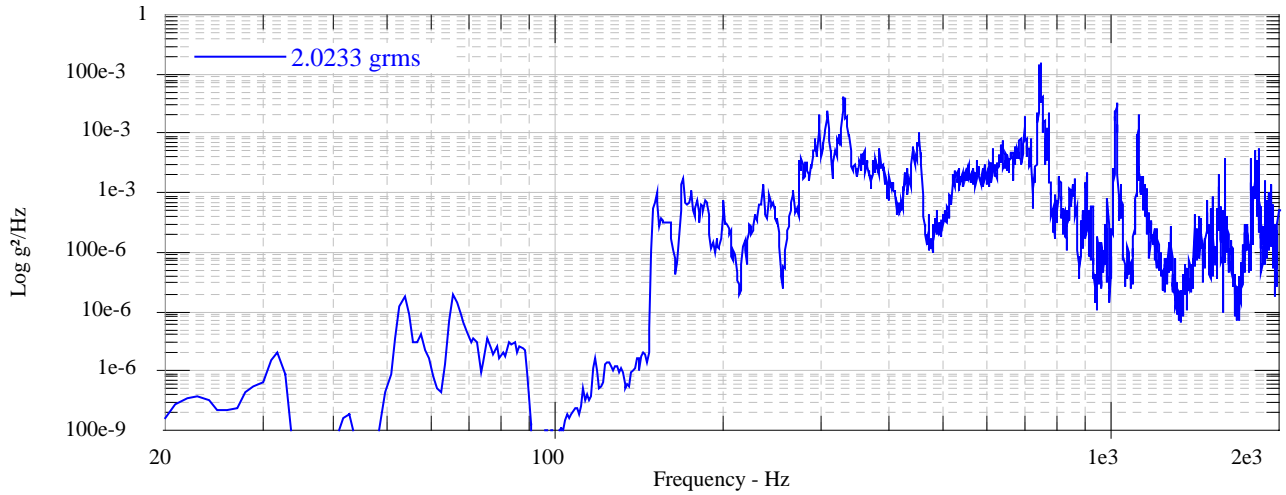
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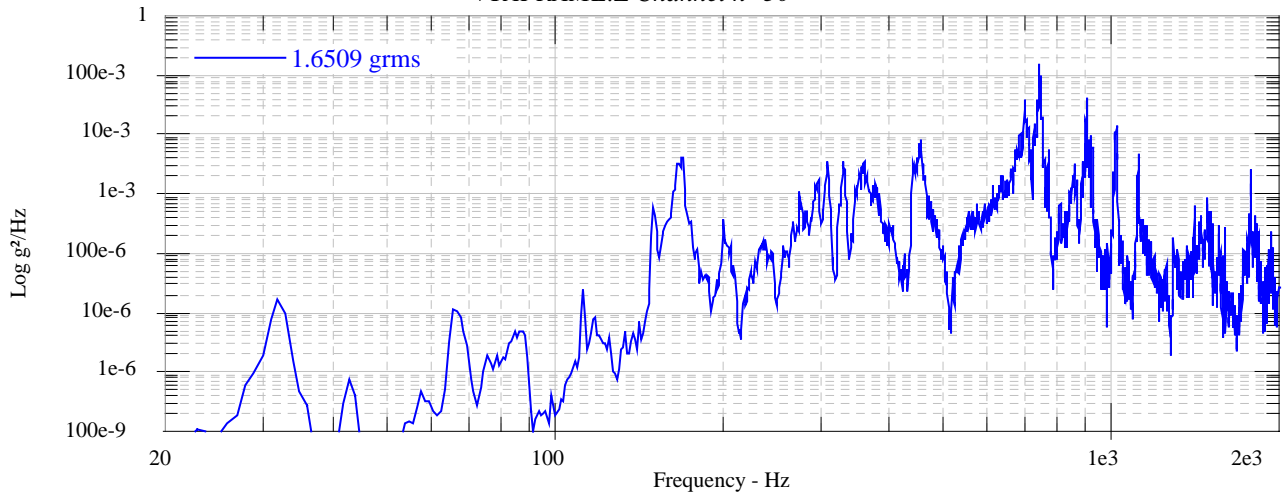
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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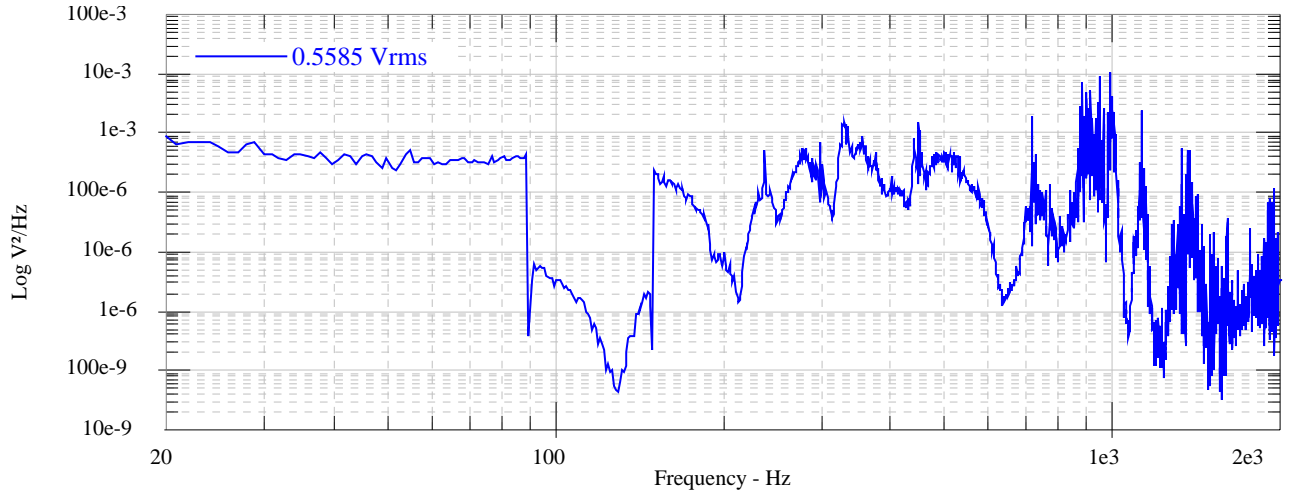
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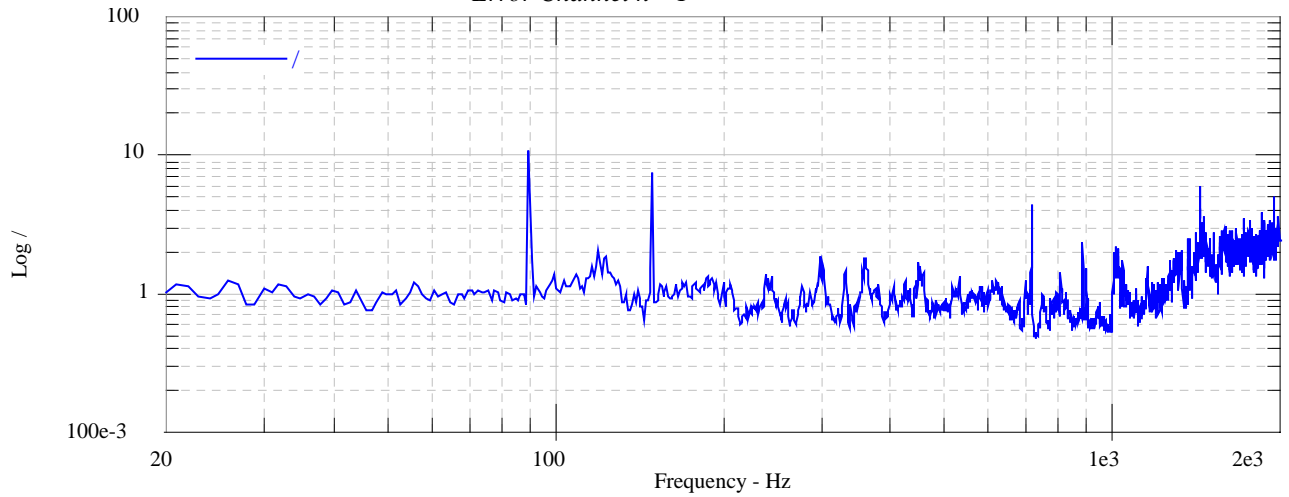
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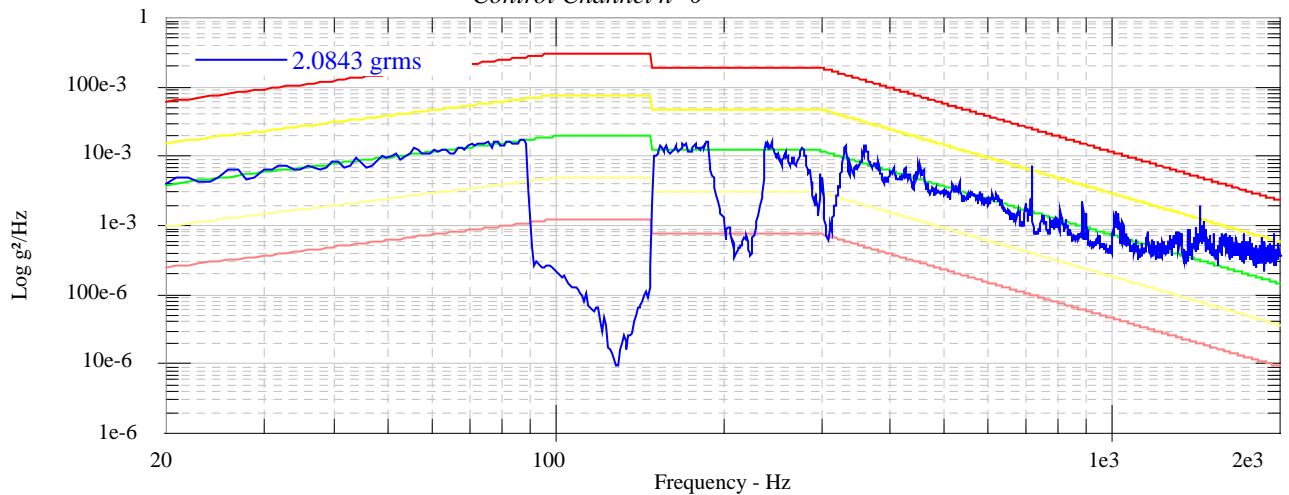
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

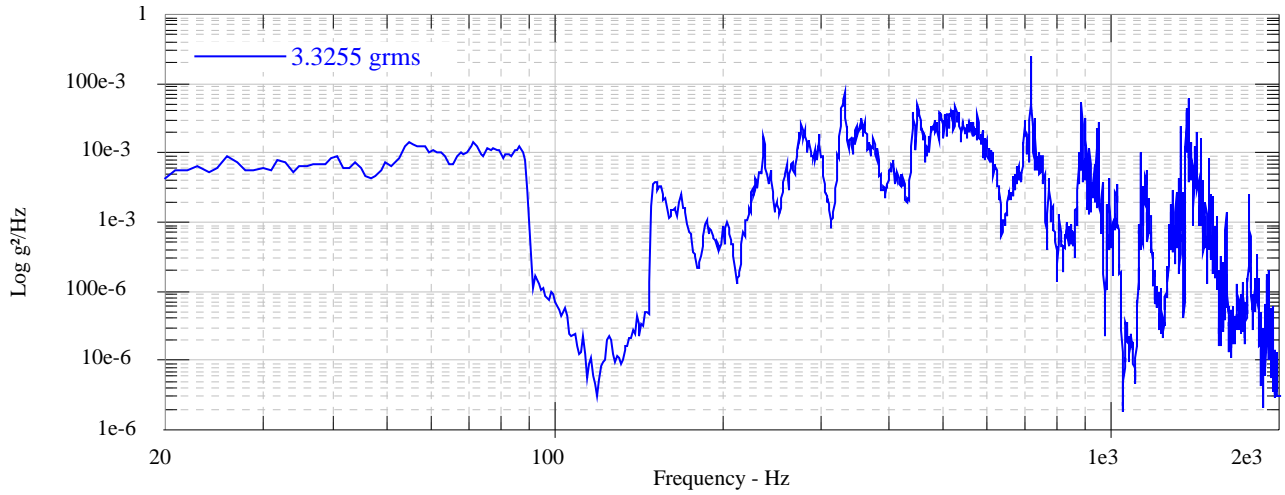


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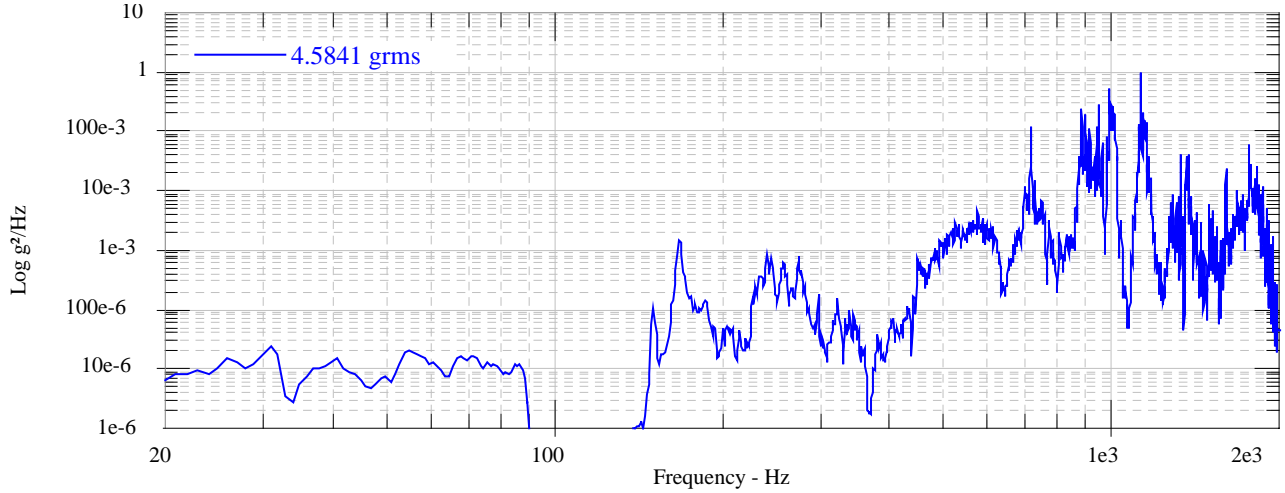
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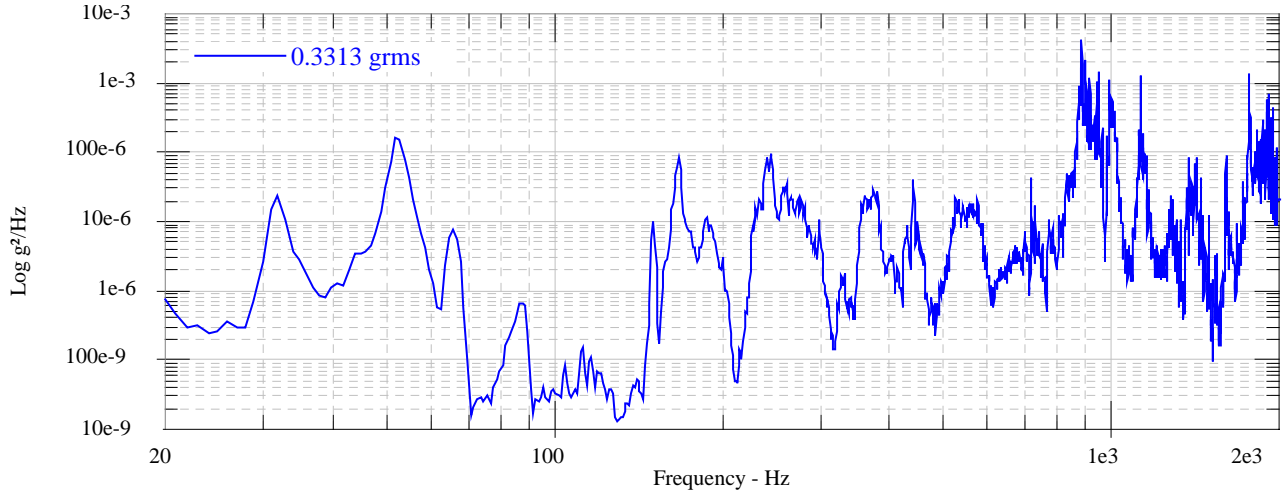
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

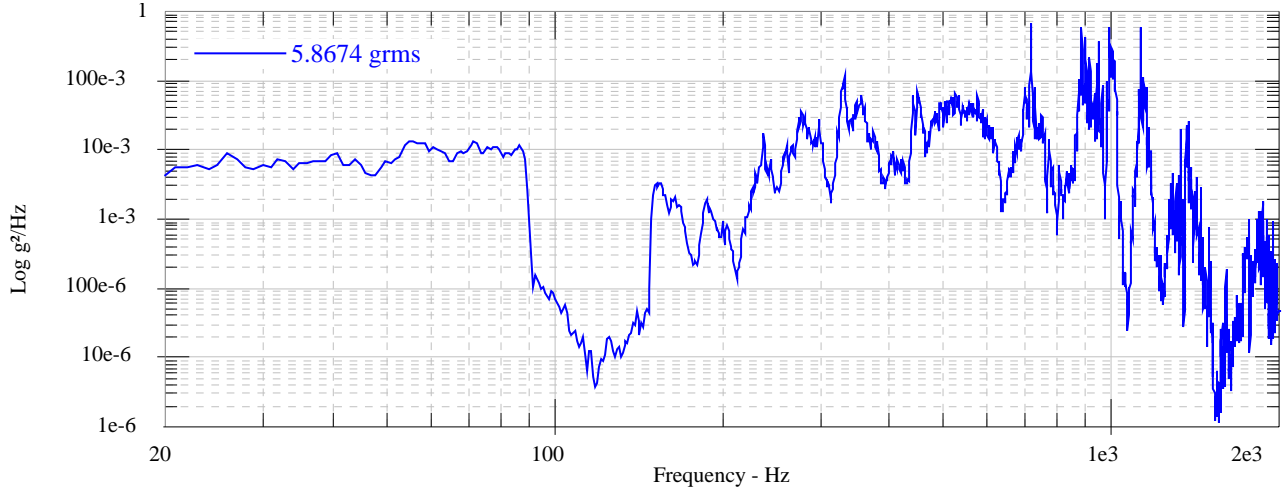


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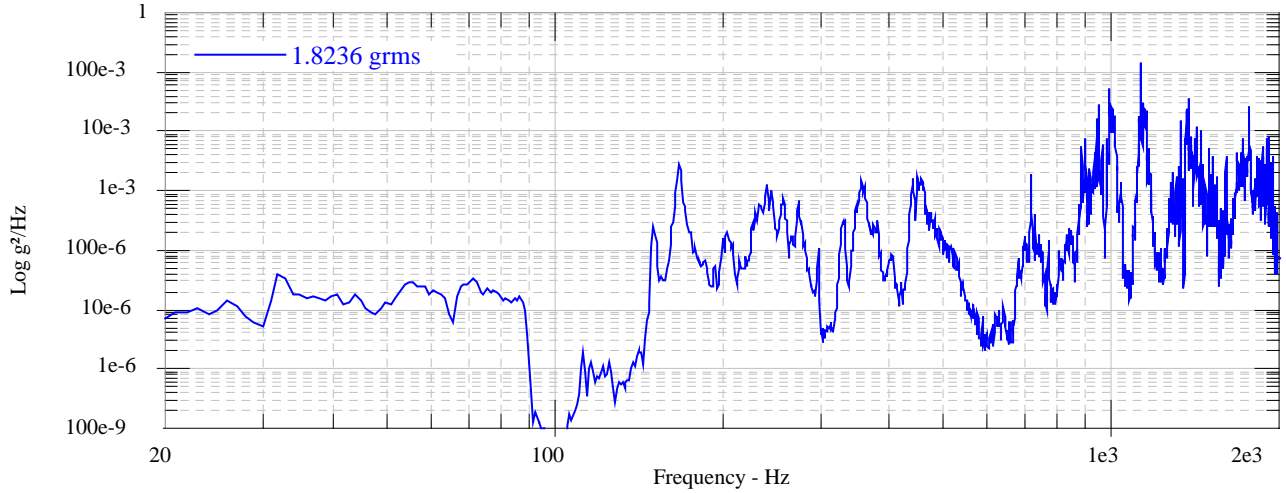
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Date : 7-Apr-04
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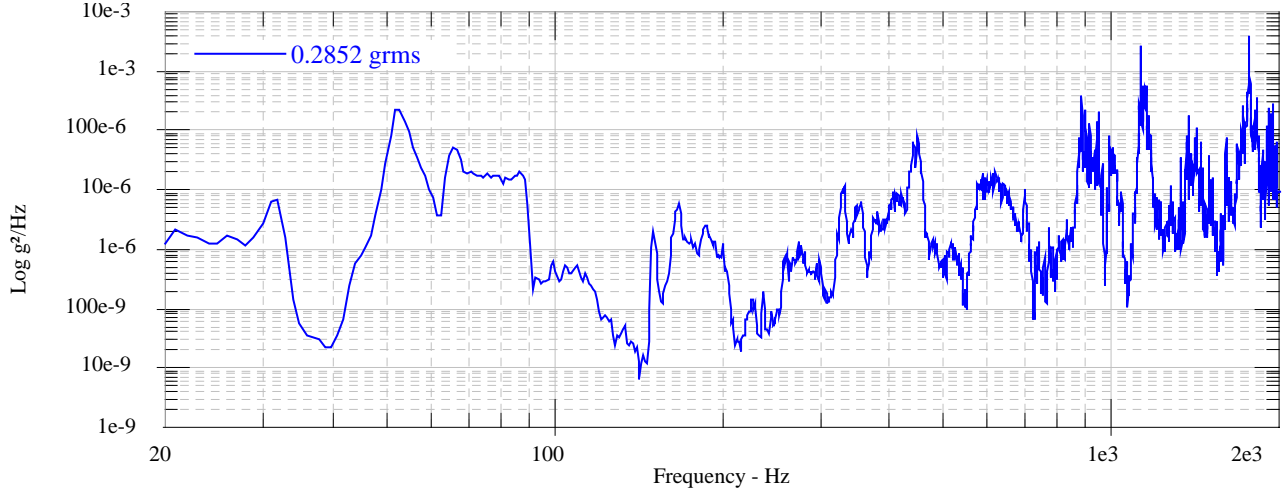
SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

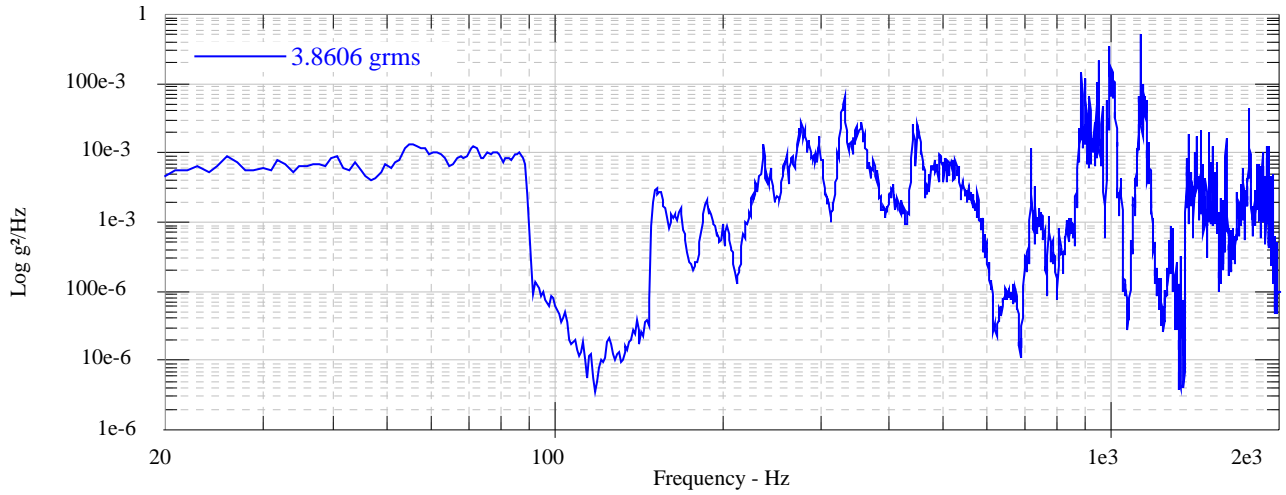


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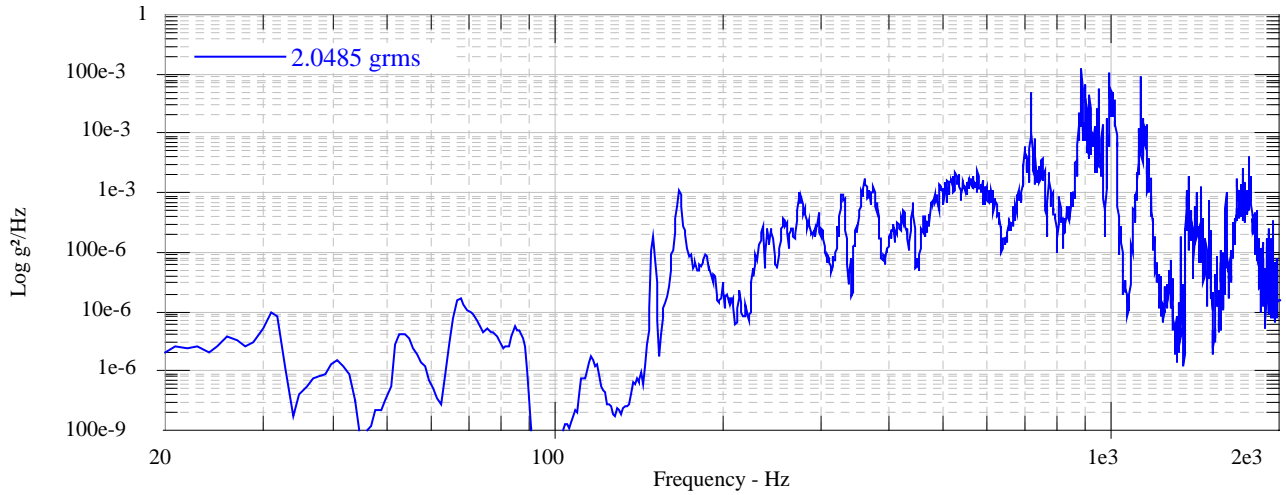
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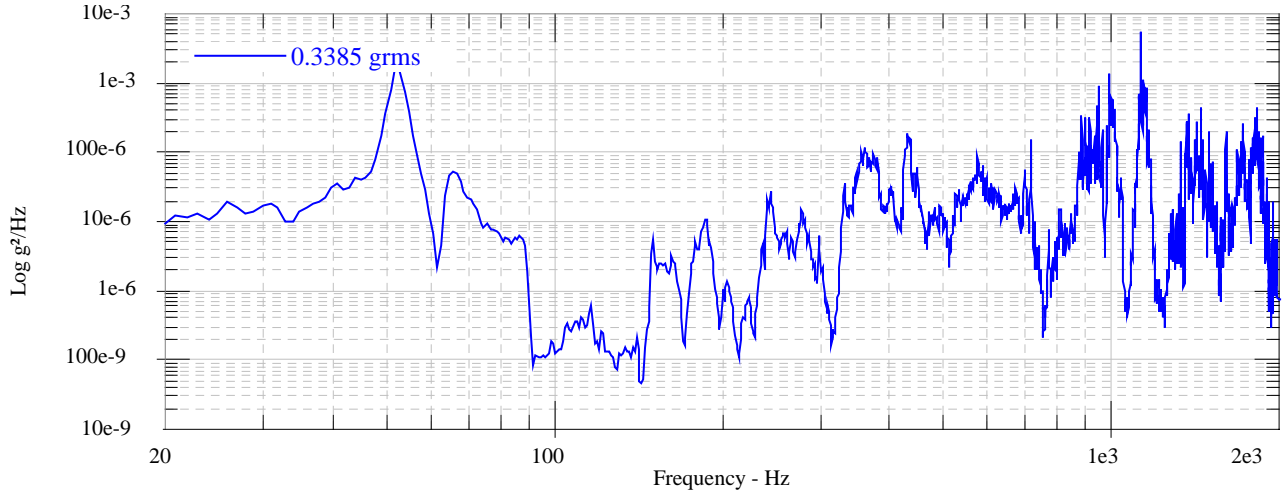
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

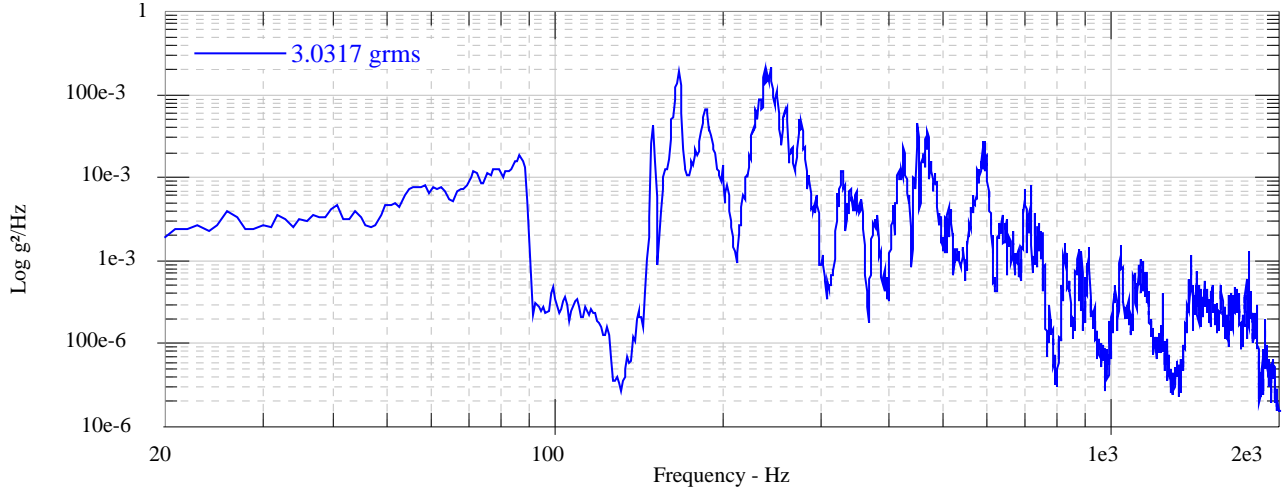


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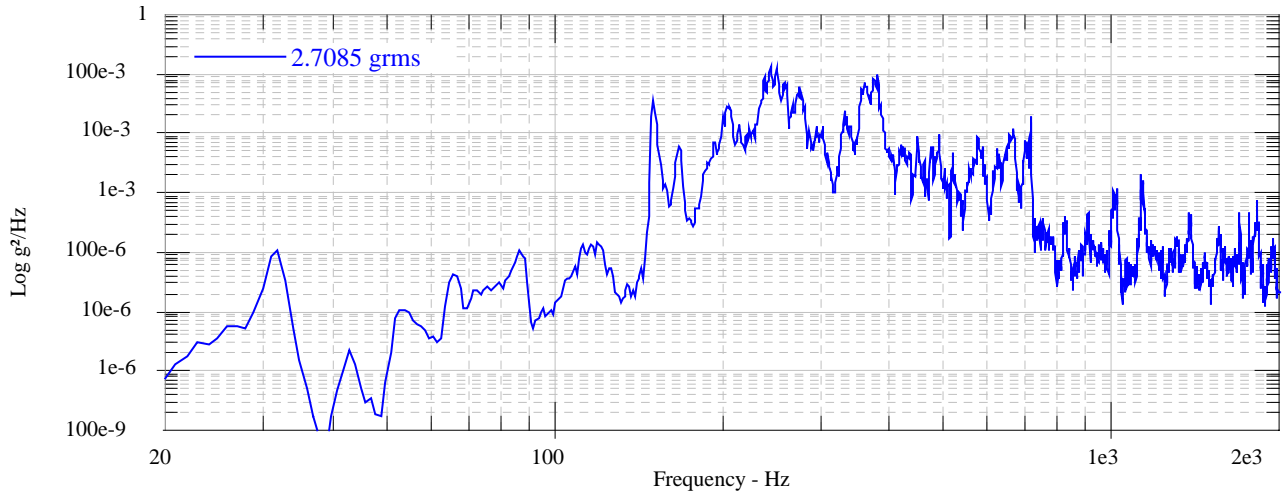
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Date : 7-Apr-04
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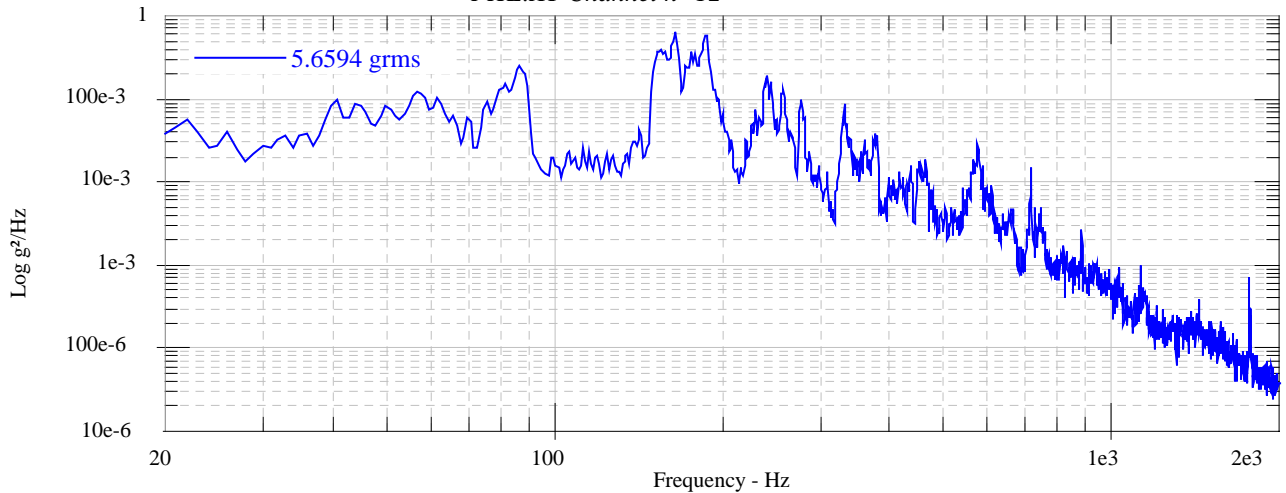
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PHS.Z Channel n° 11



PHE.XY Channel n° 12

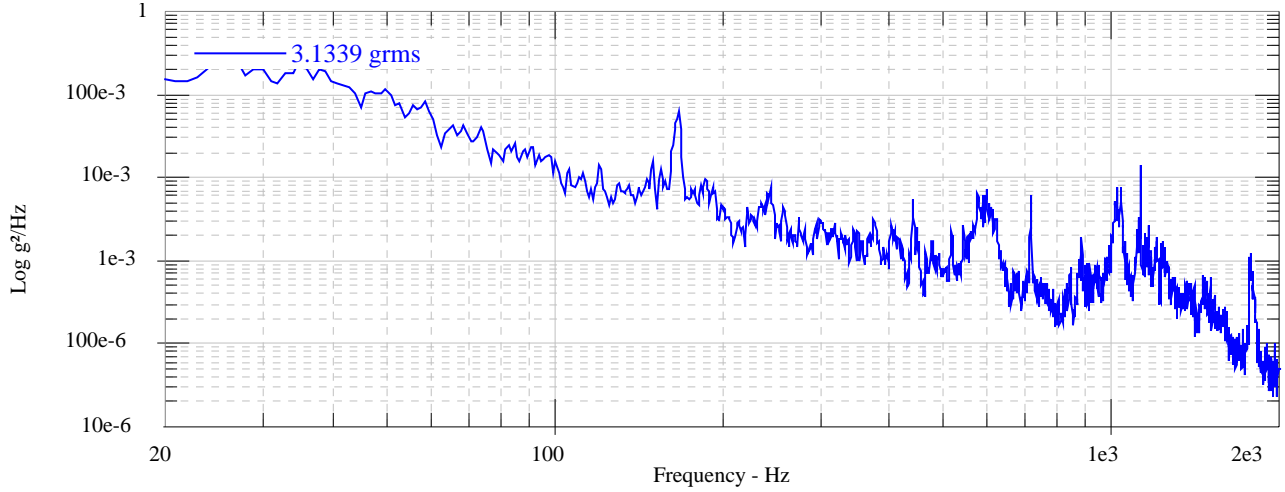


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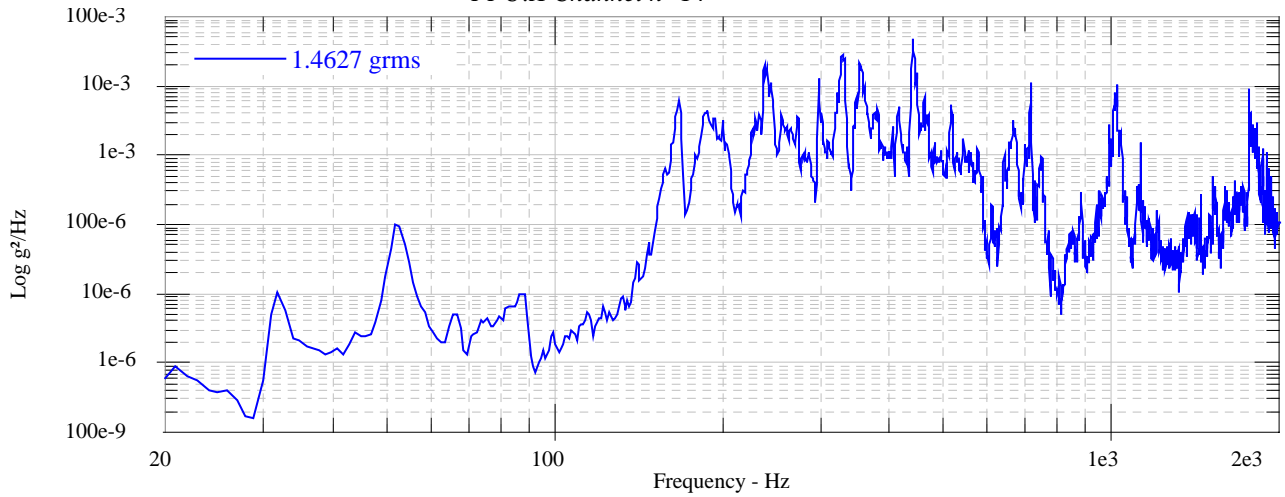
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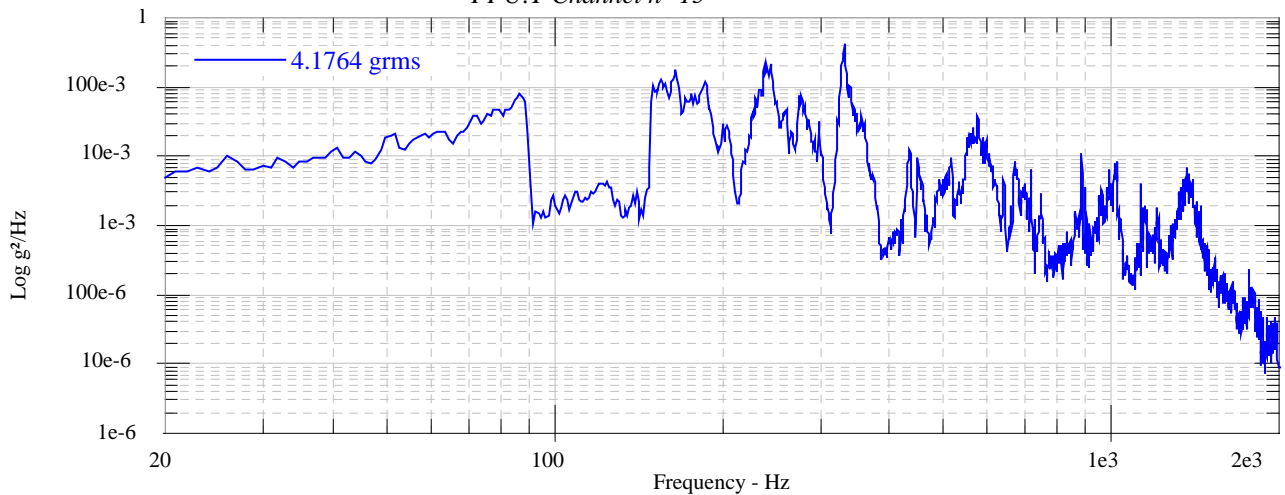
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

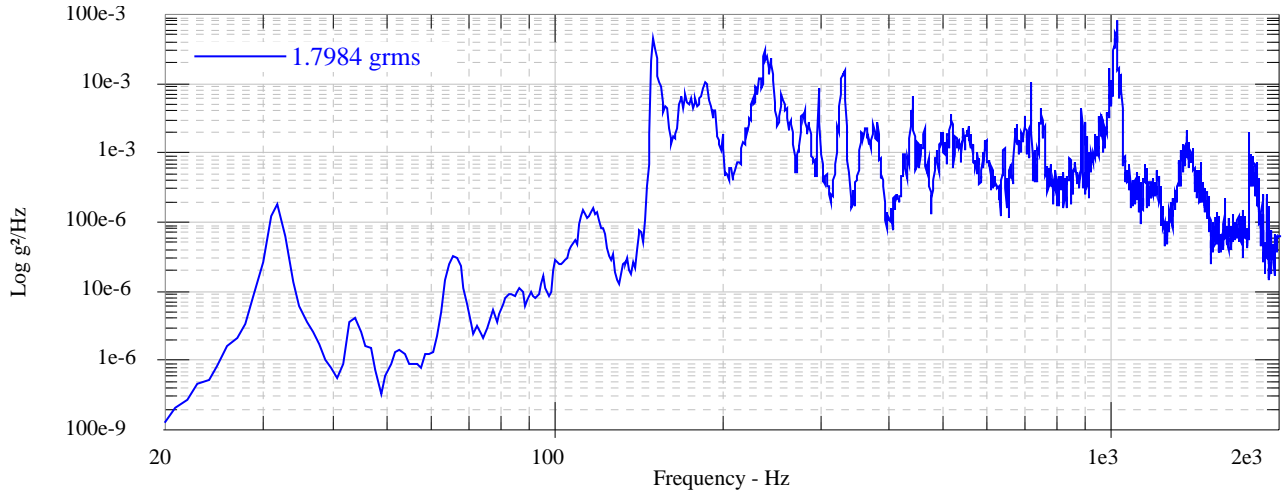


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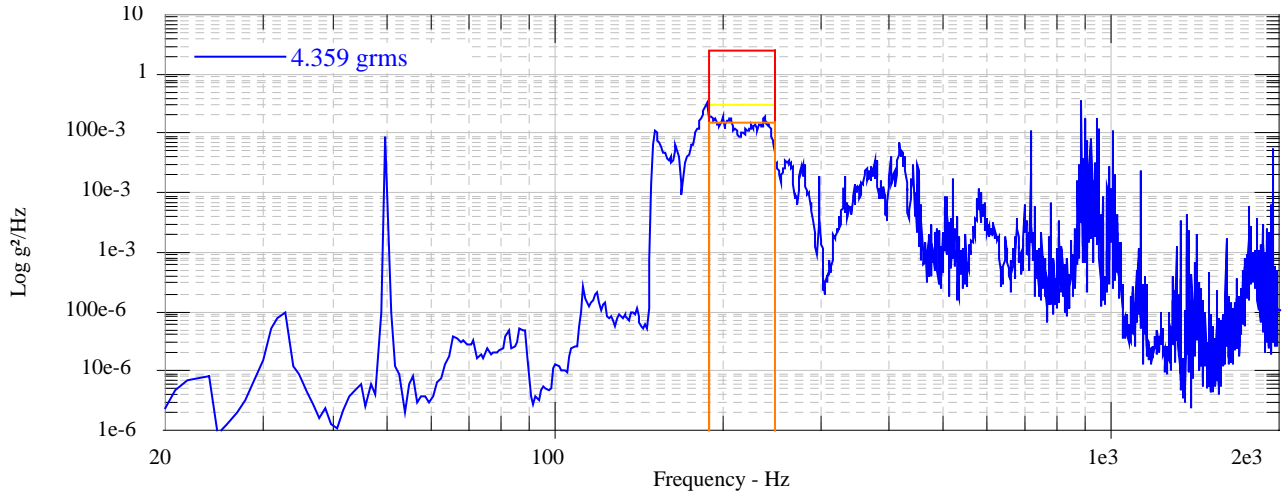
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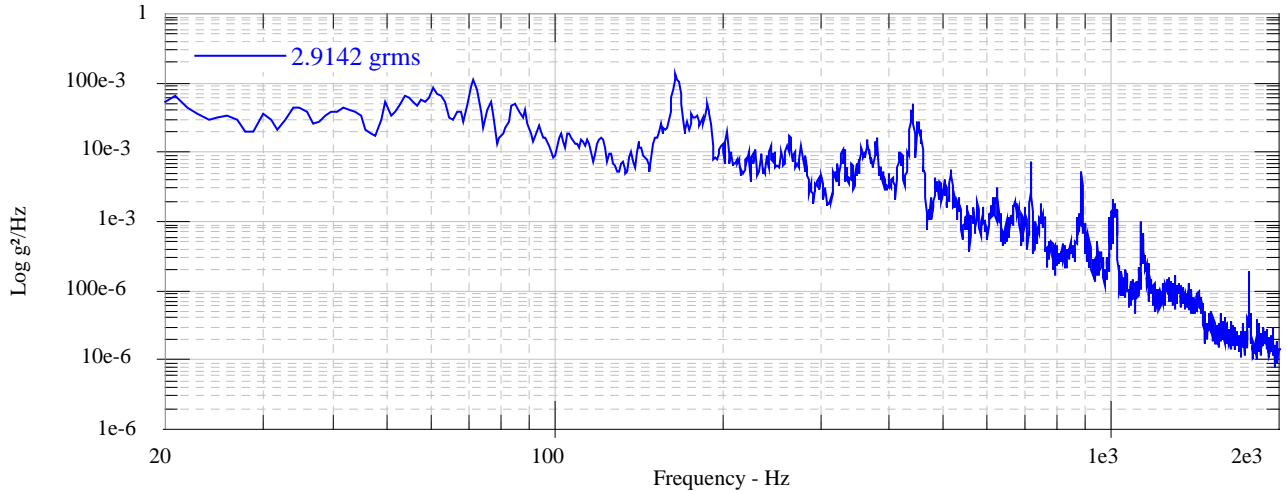
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

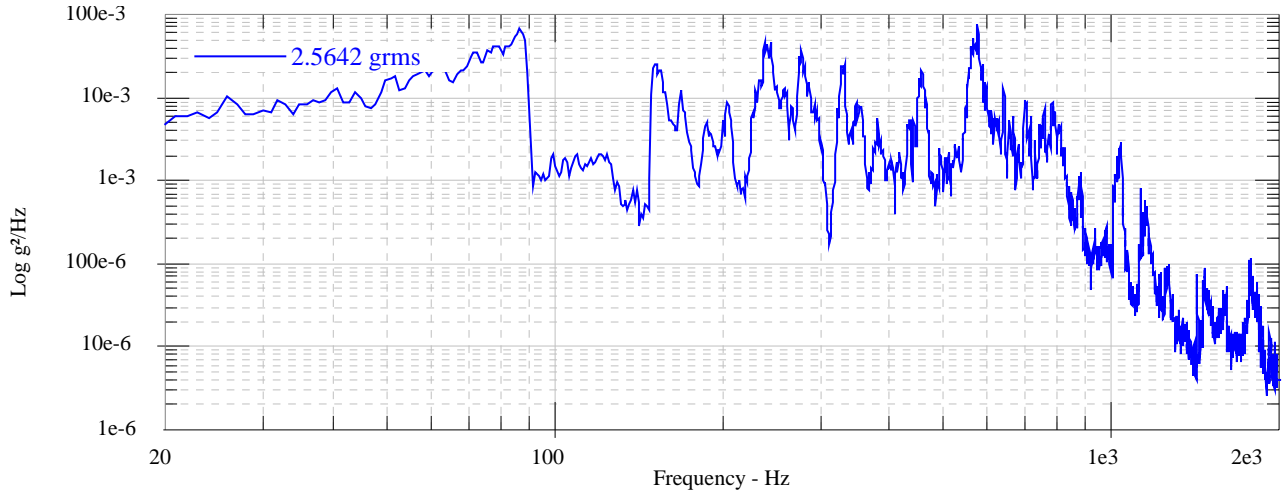


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Date : 7-Apr-04
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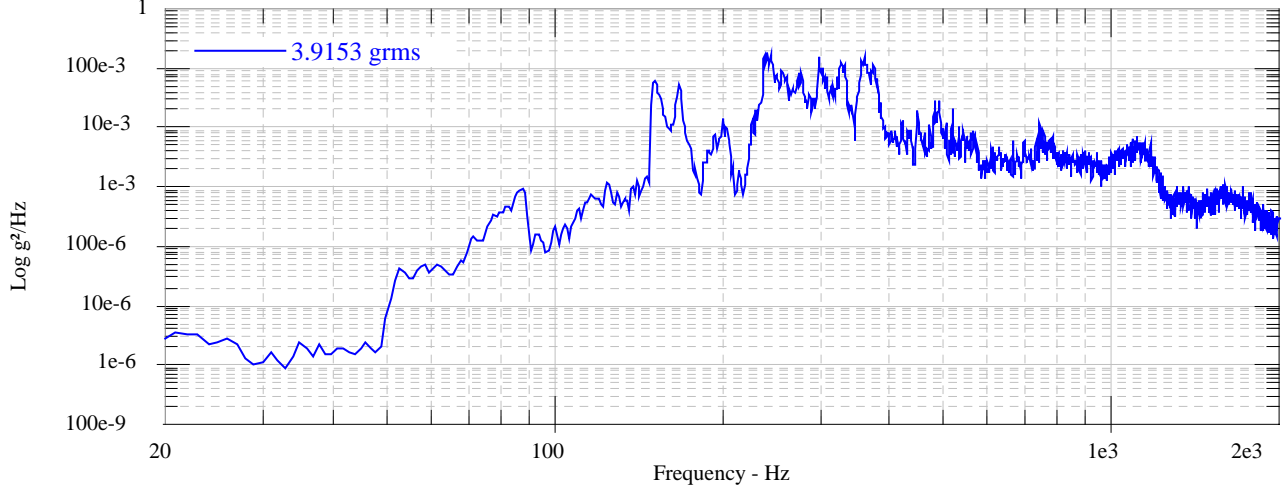
SPEC.Y Channel n° 19



OB.Y Channel n° 20



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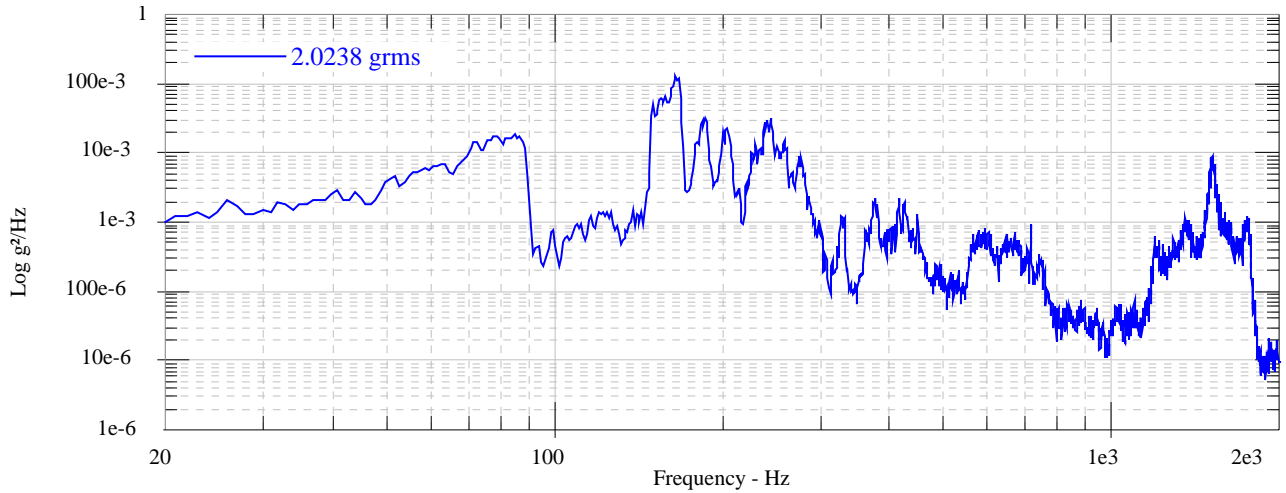


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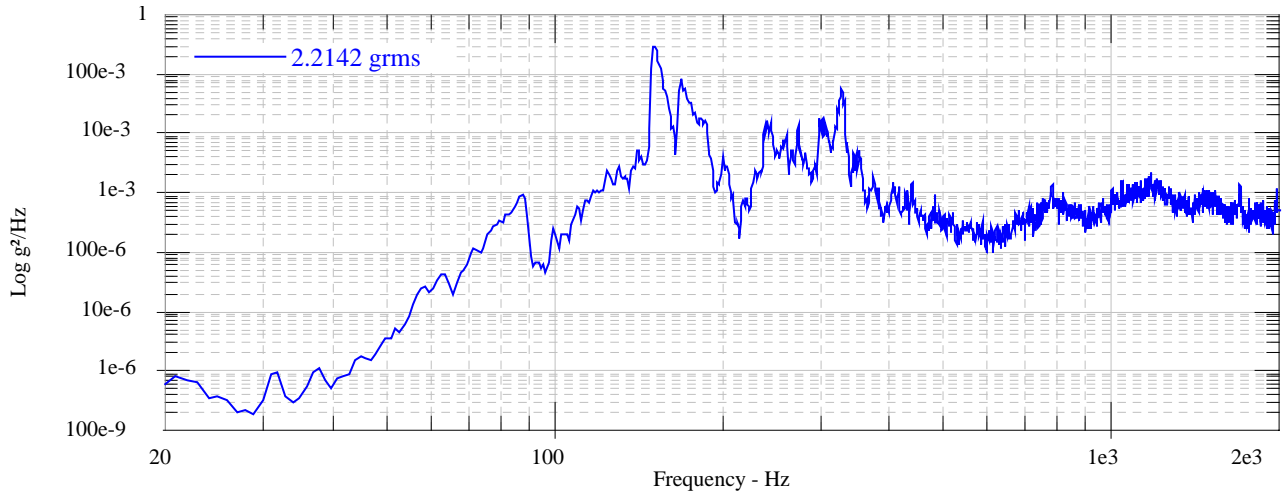
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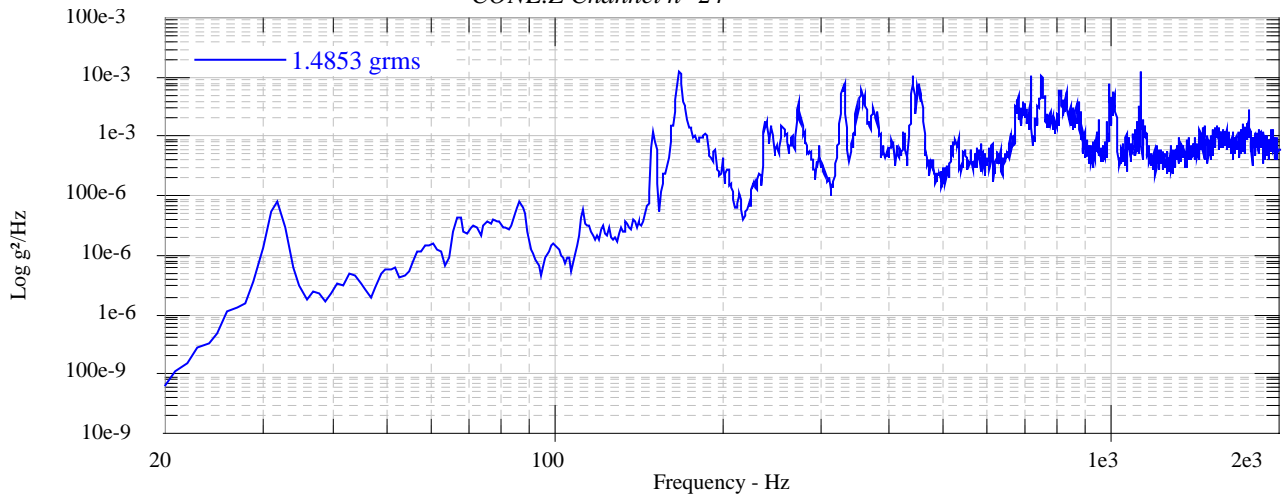
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

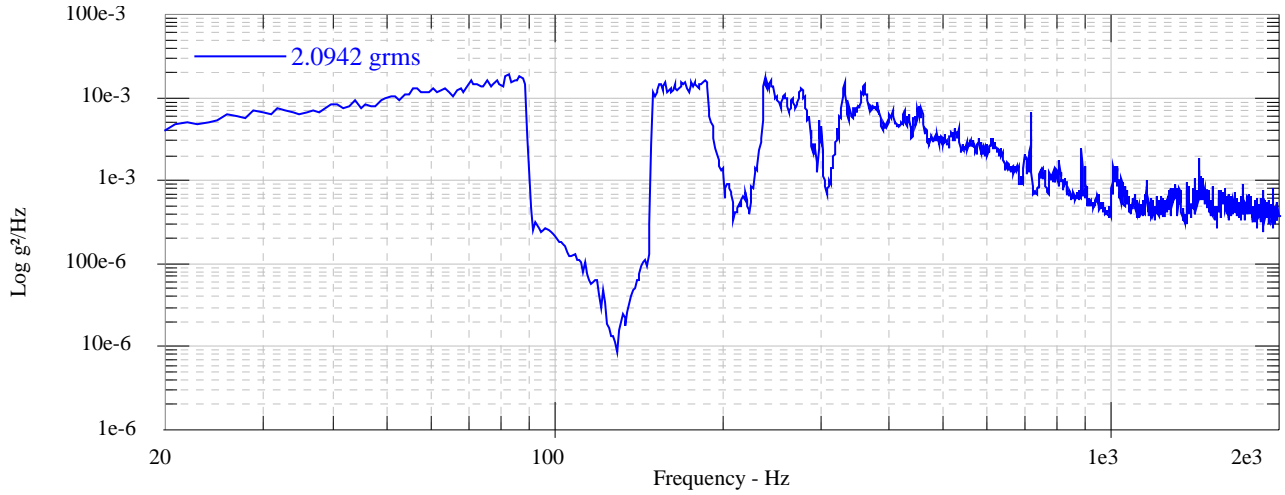


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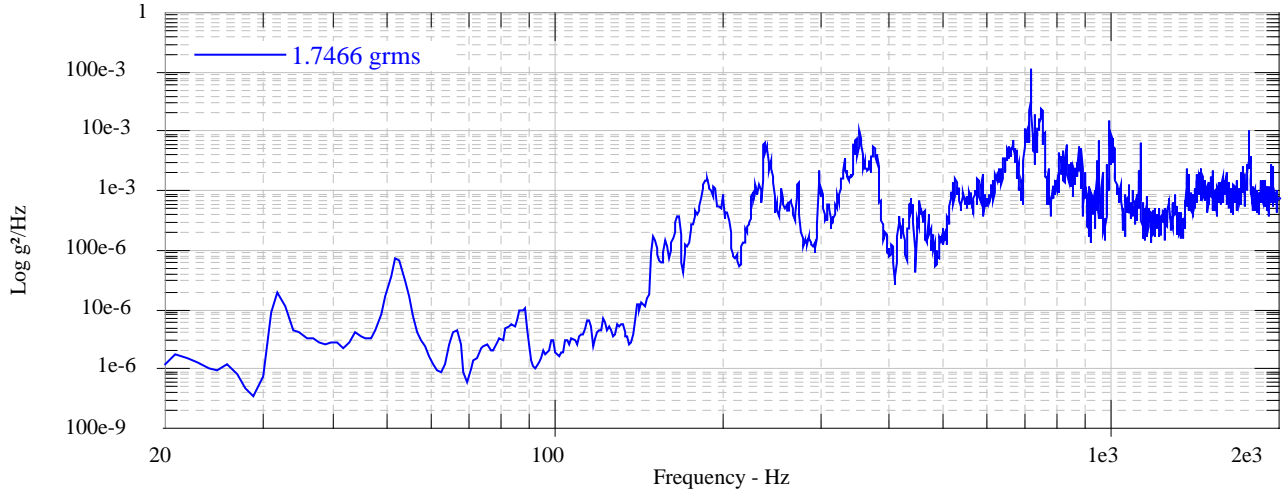
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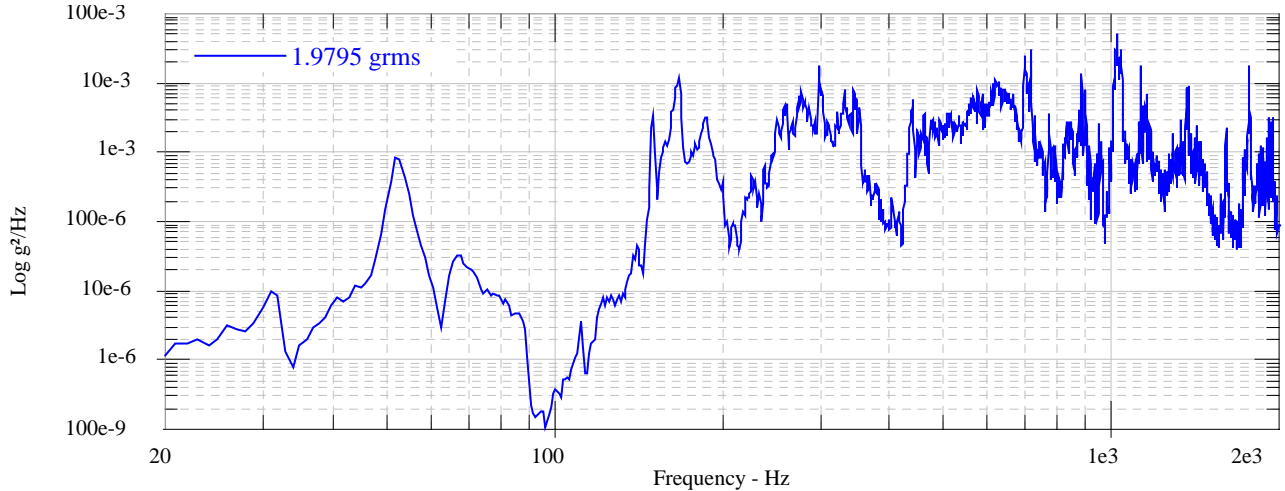
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

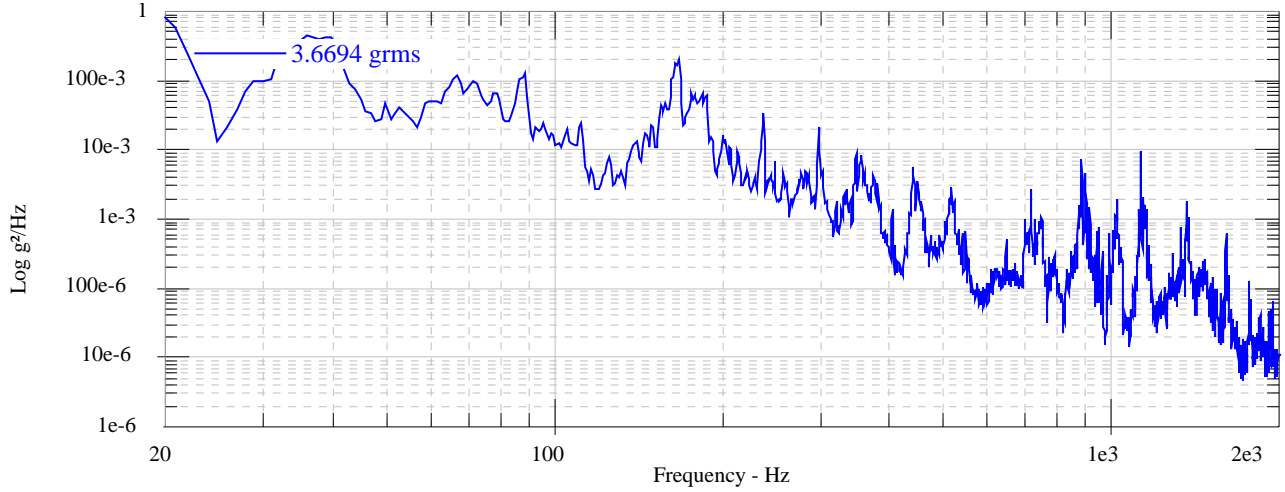


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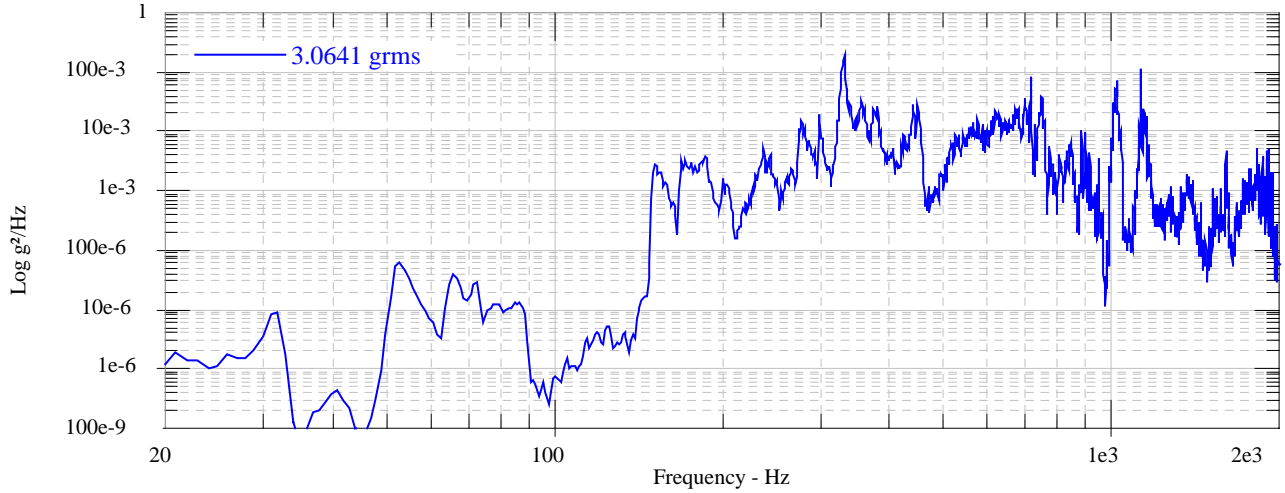
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Date : 7-Apr-04
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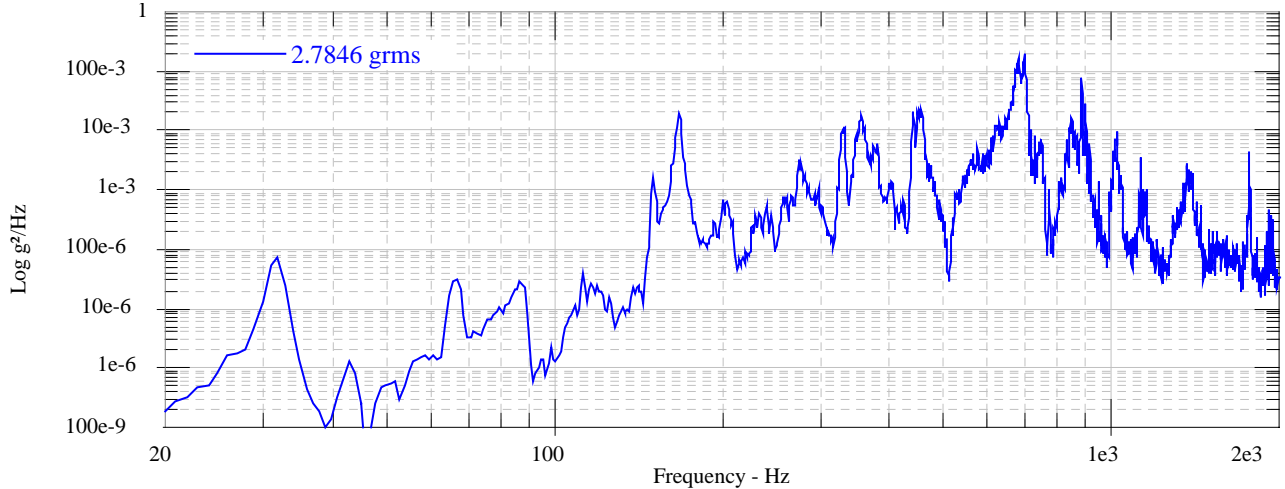
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30

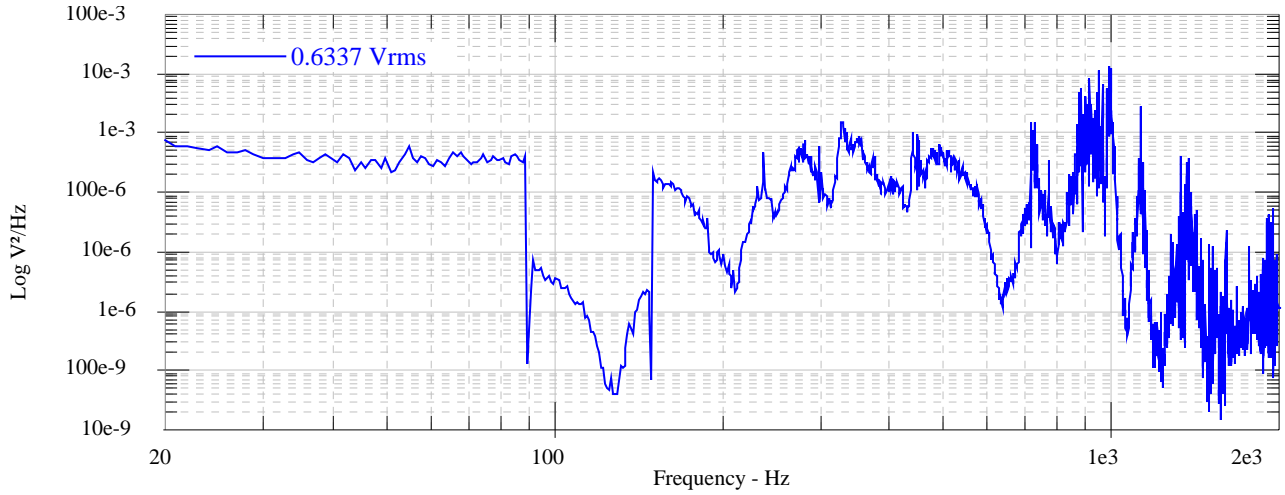


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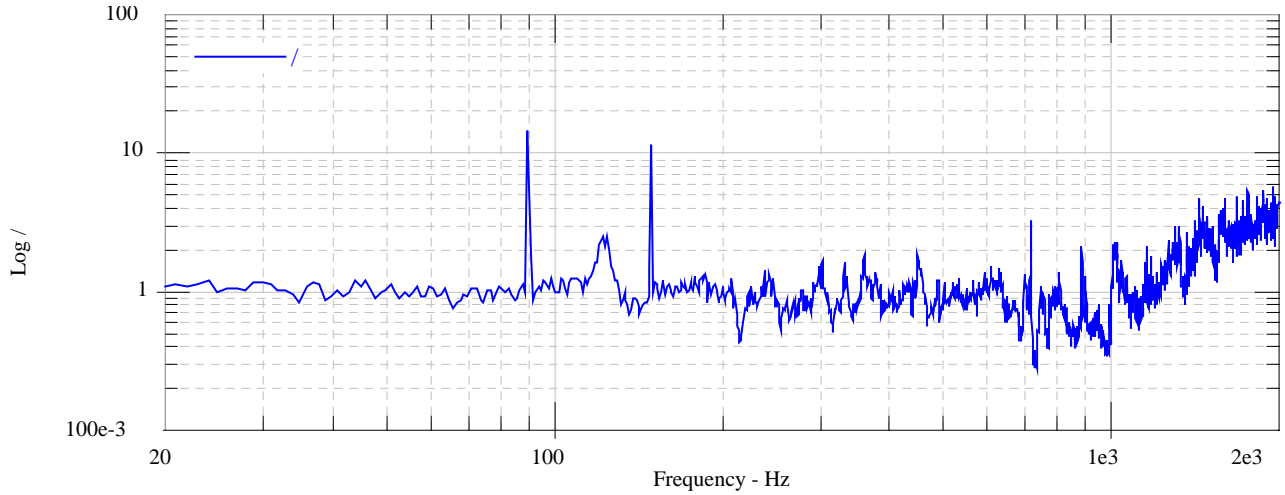
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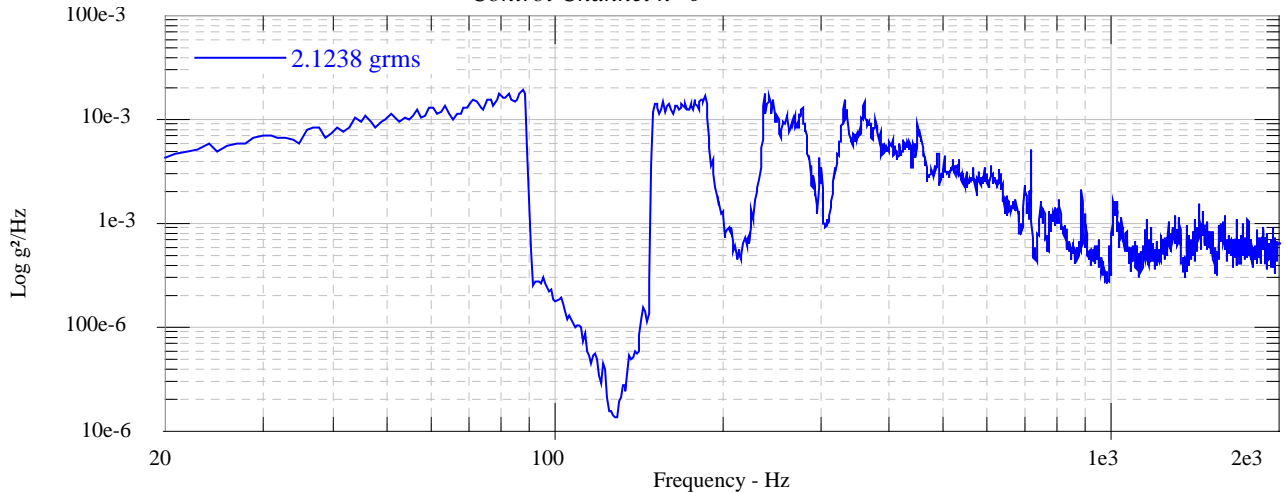
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

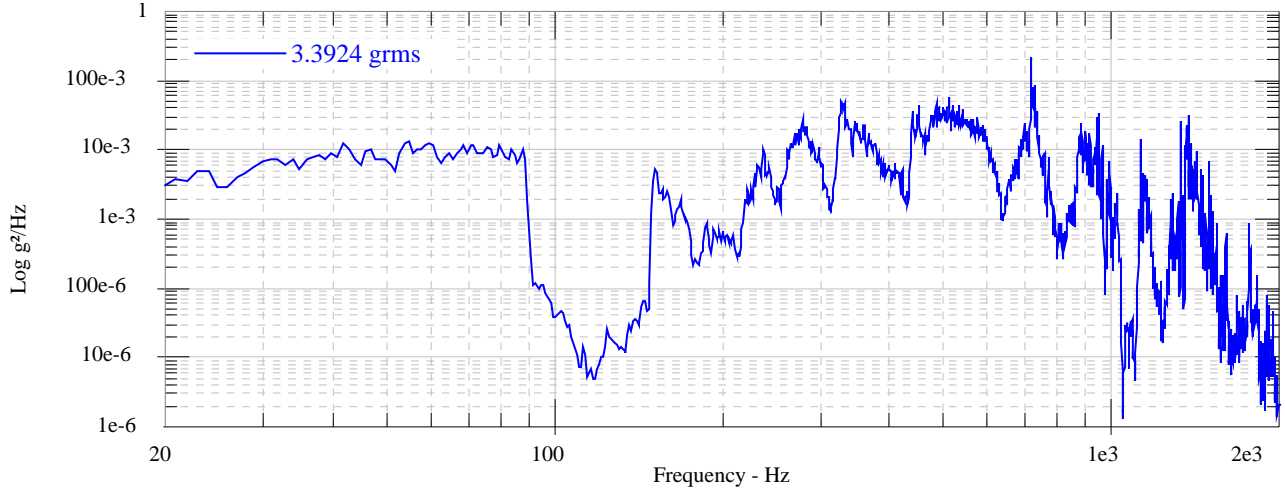


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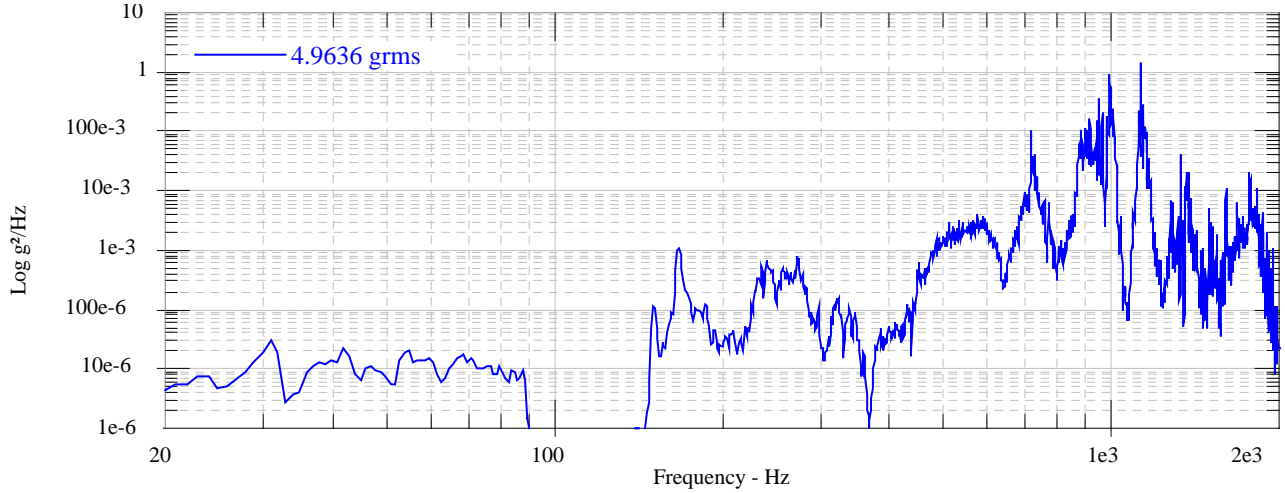
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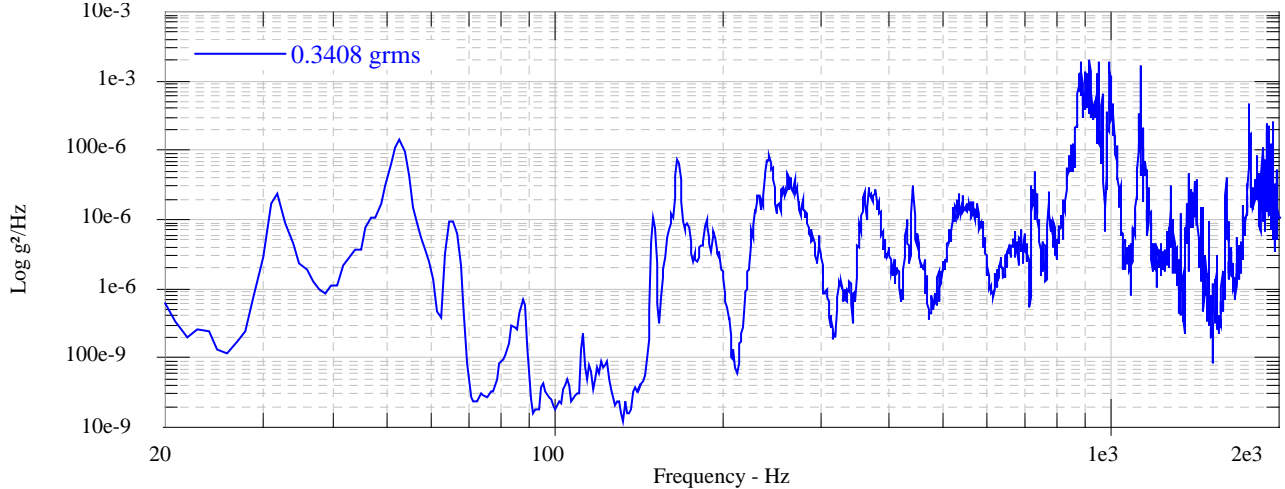
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

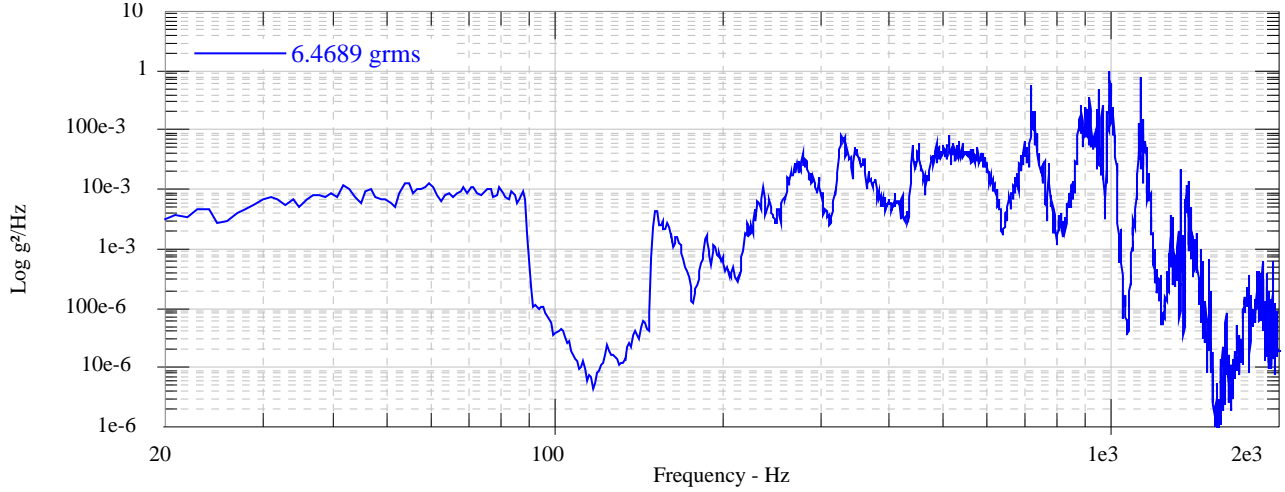


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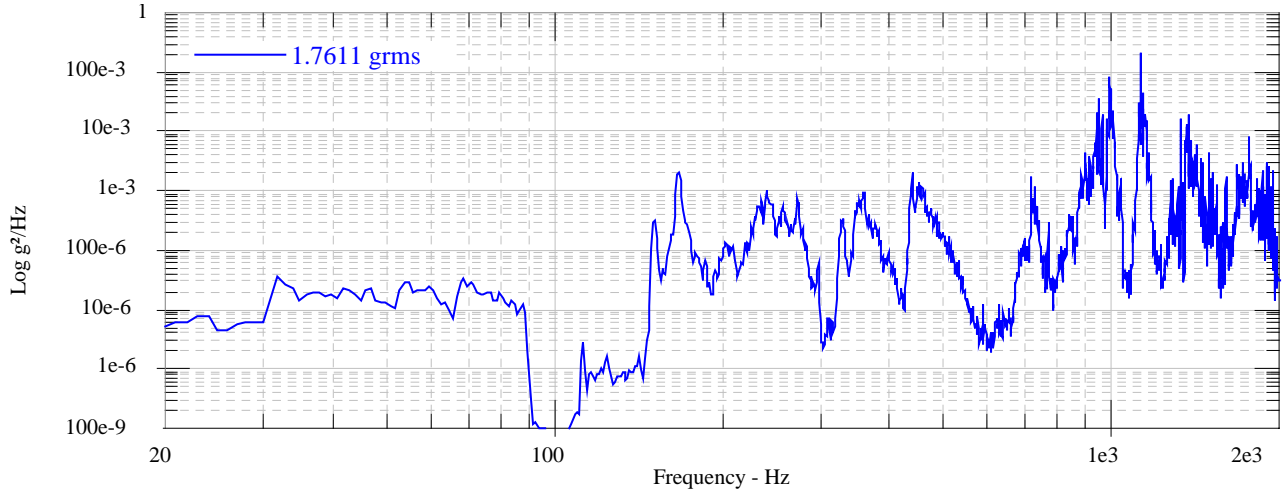
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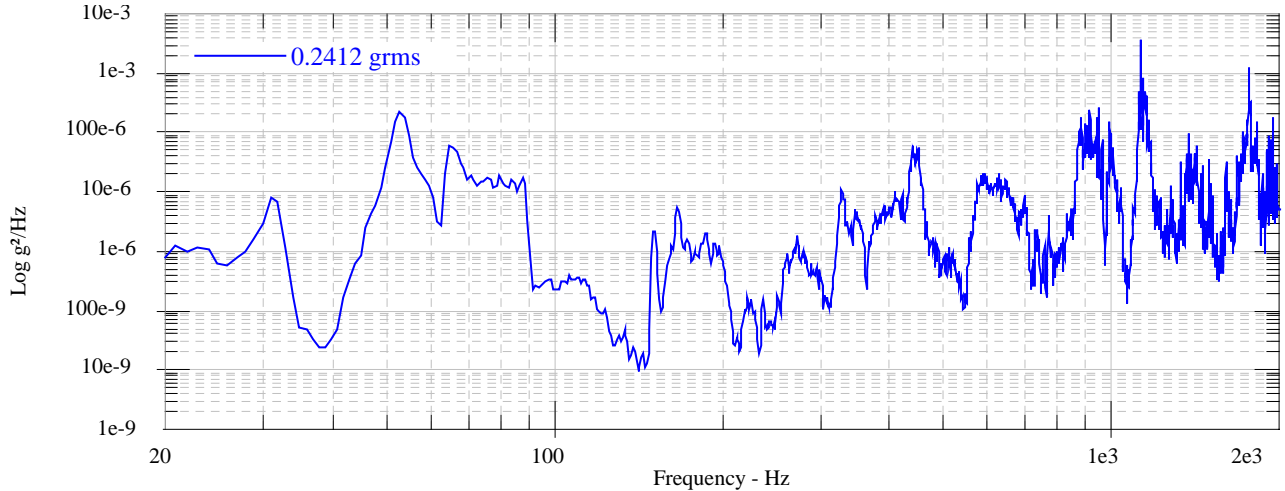
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SHK.2.X Channel n° 6

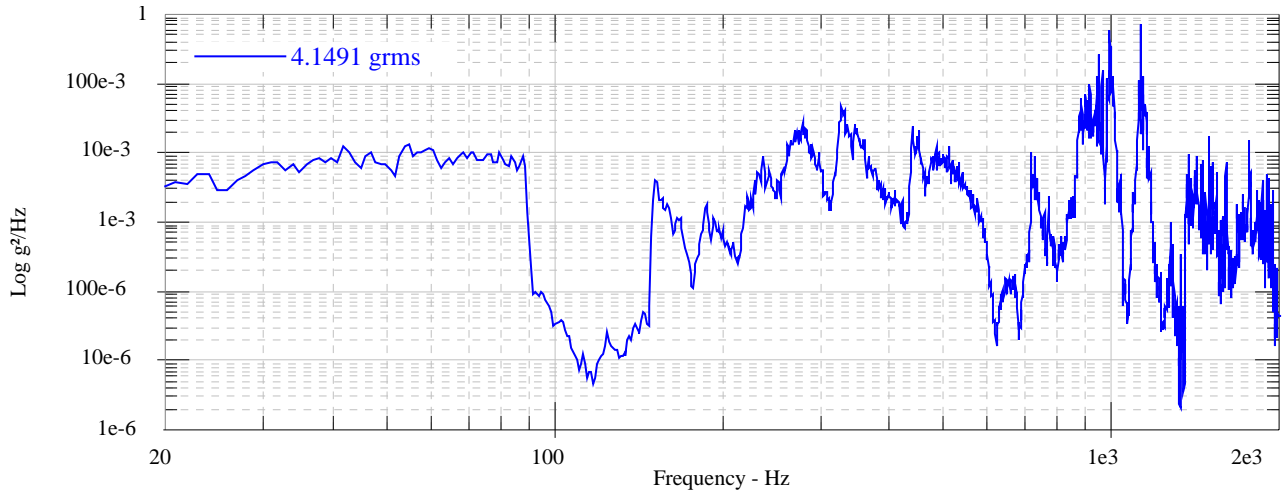


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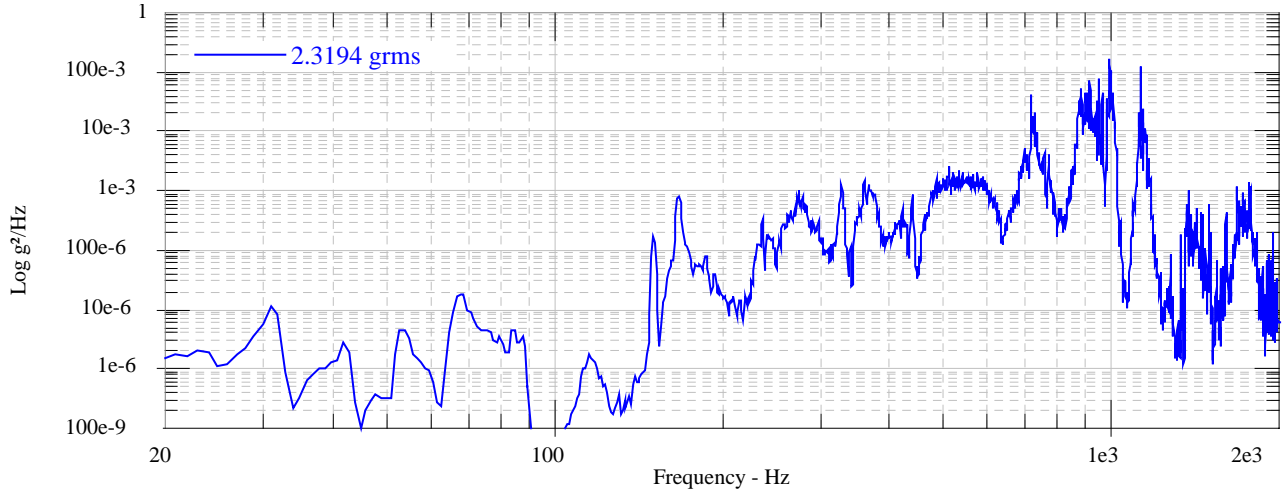
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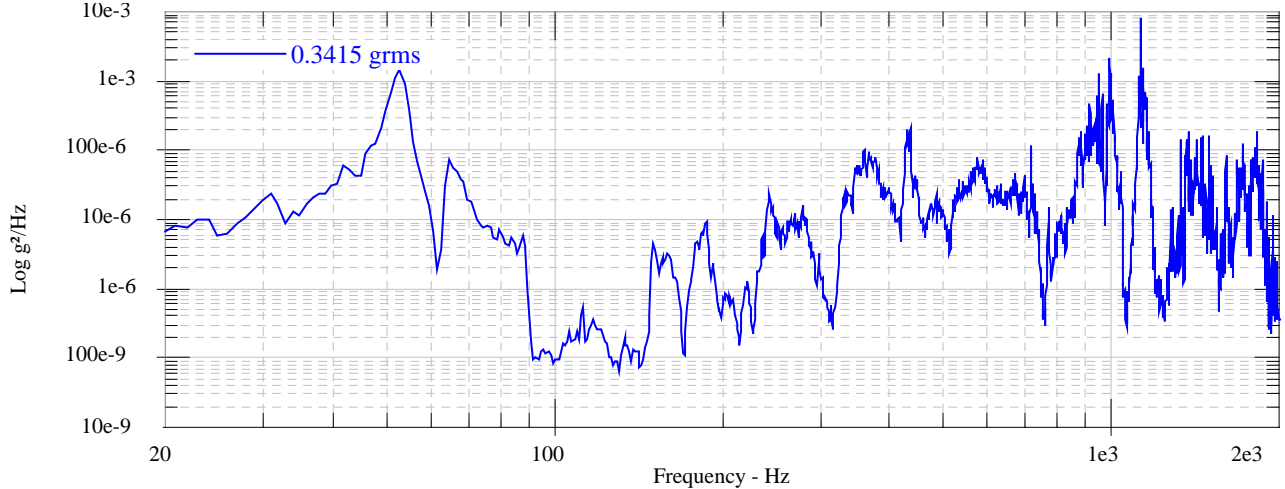
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

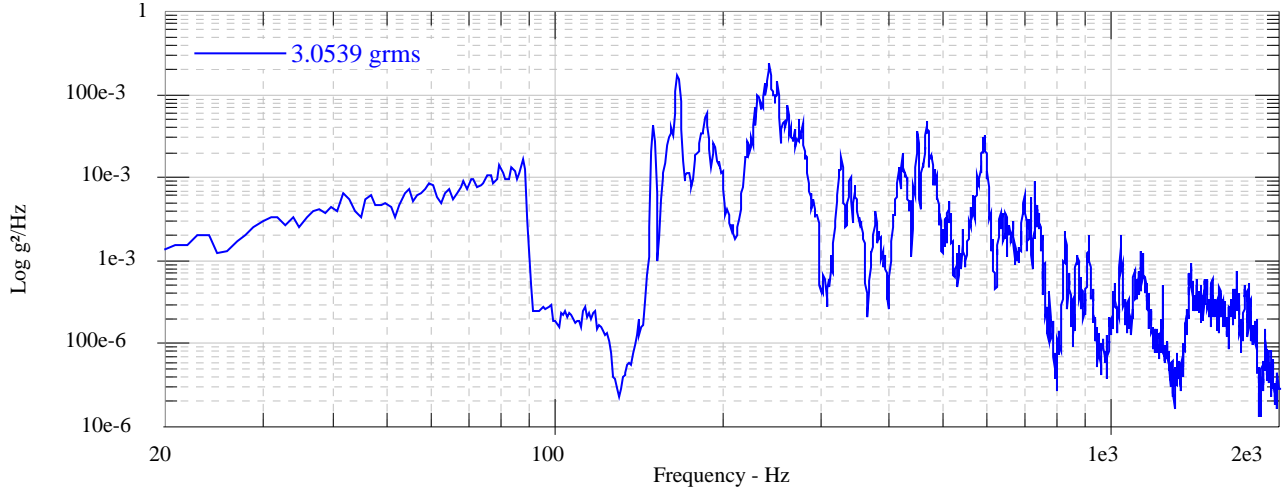


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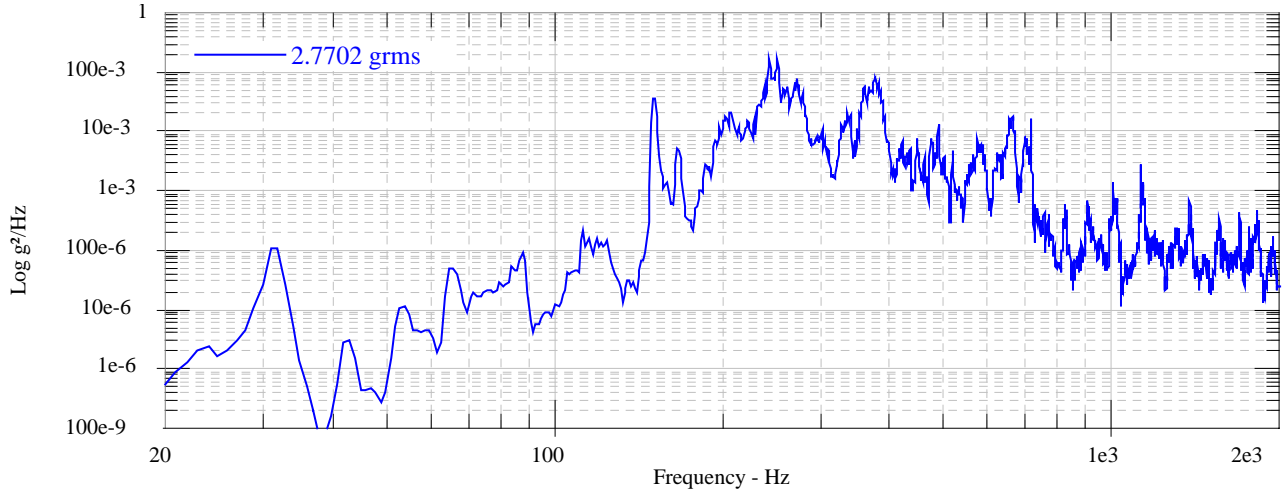
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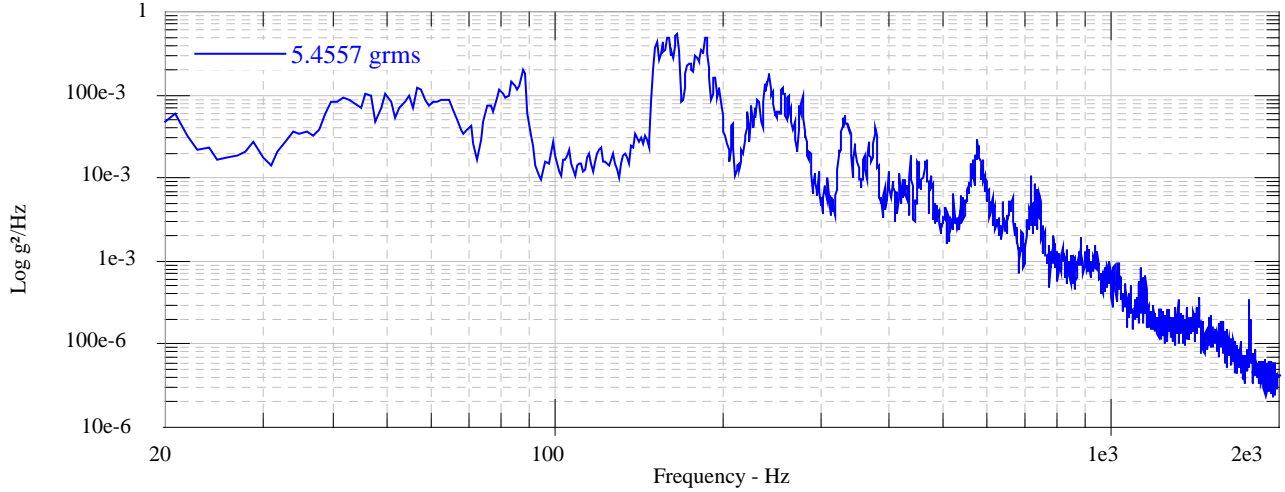
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PHS.Z Channel n° 11



PHE.XY Channel n° 12

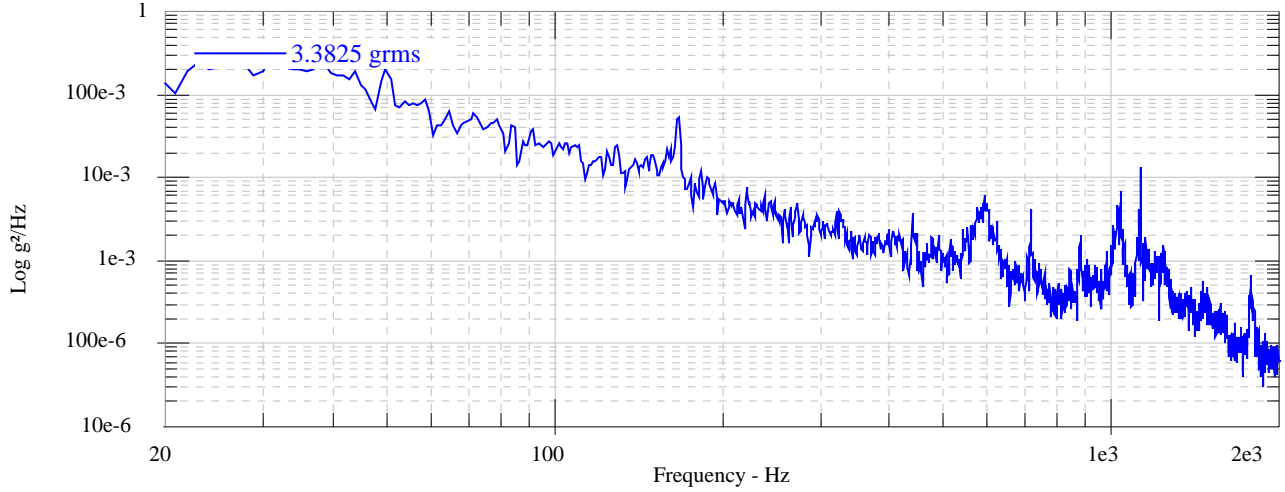


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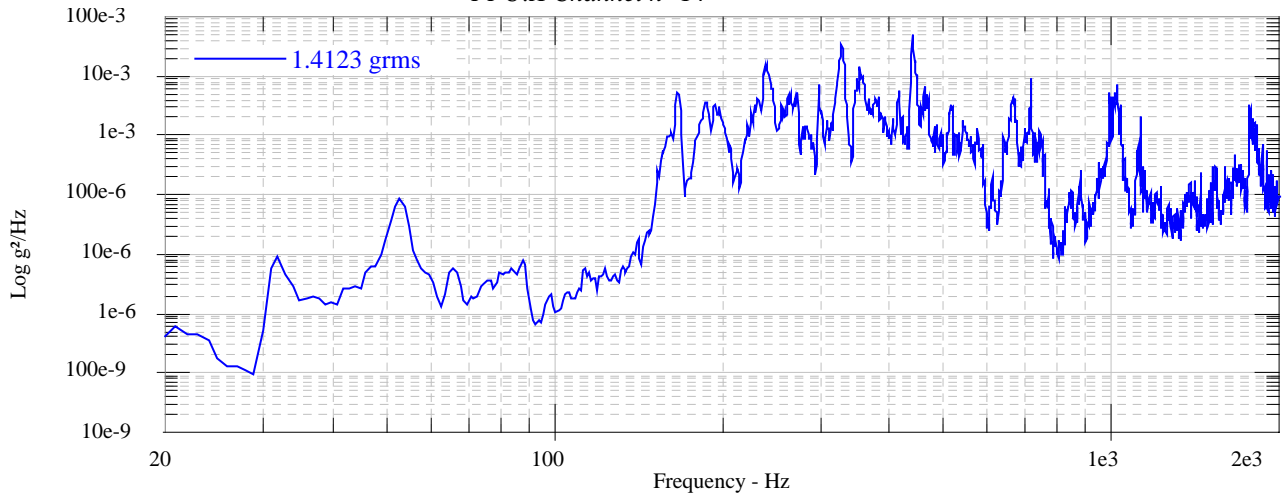
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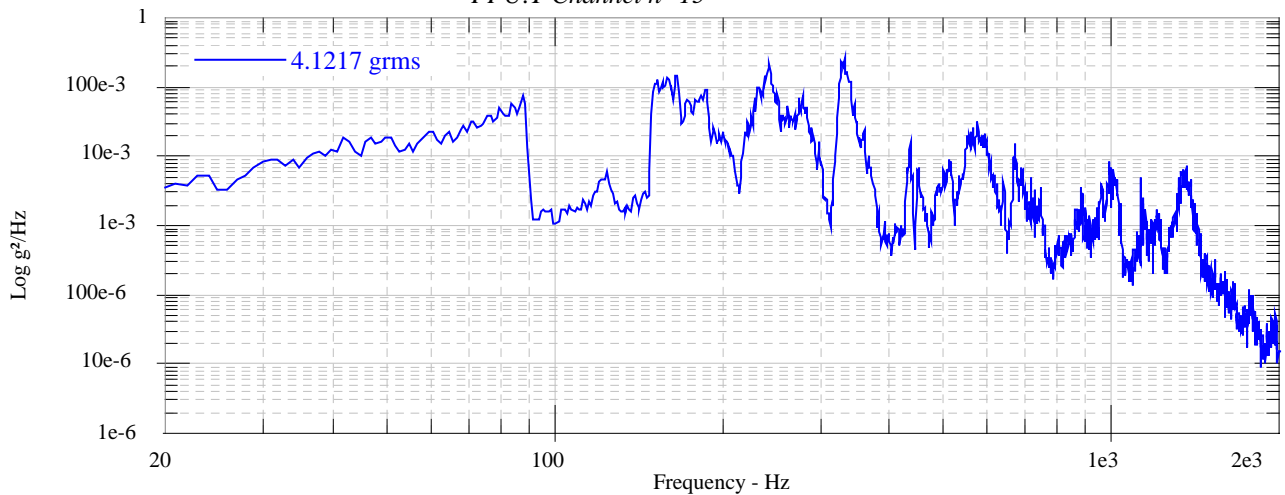
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FPU.X Channel n° 14



FPU.Y Channel n° 15

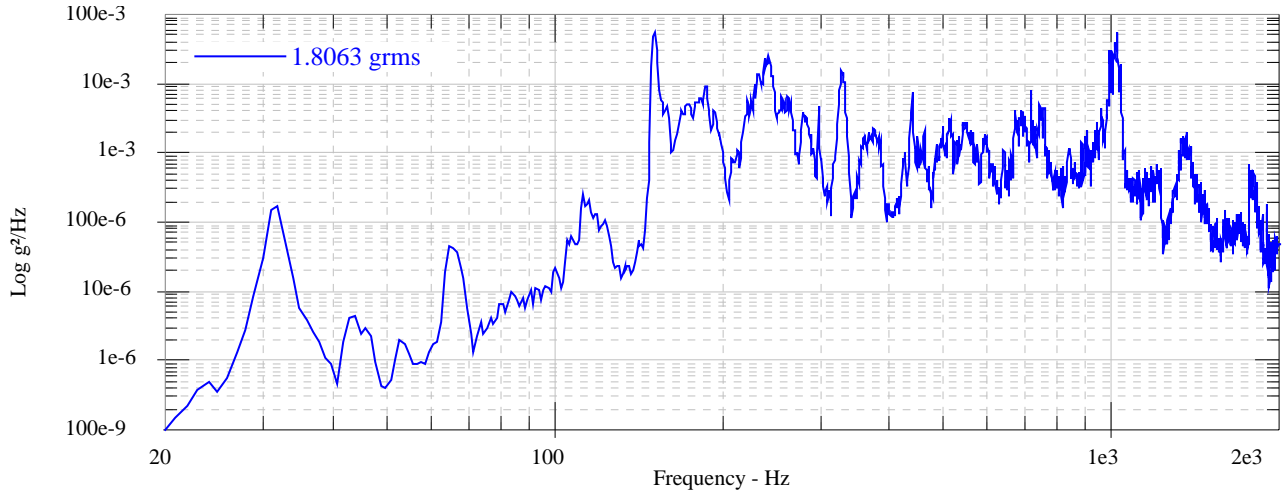


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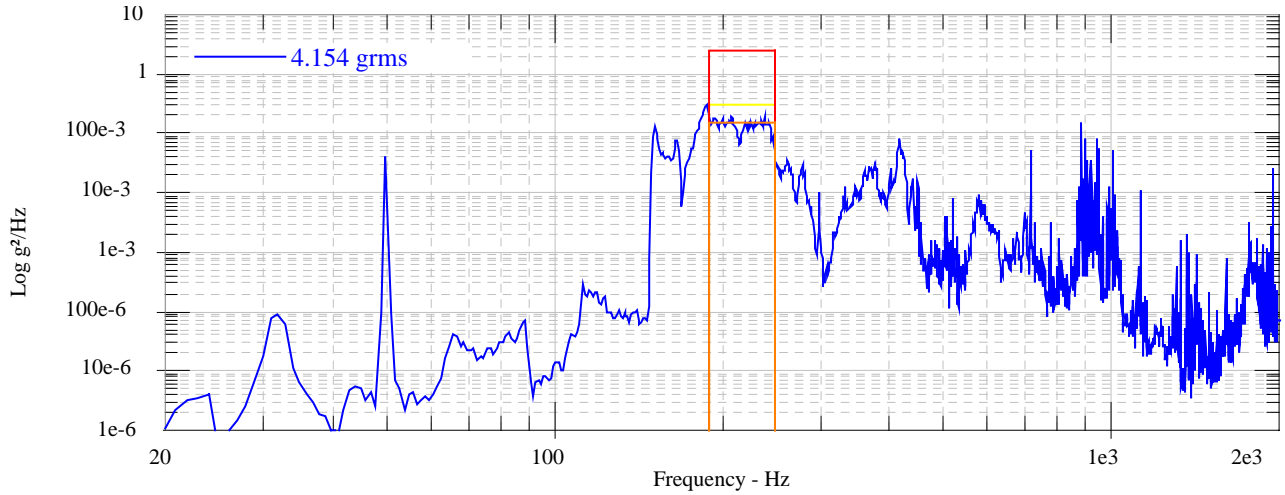
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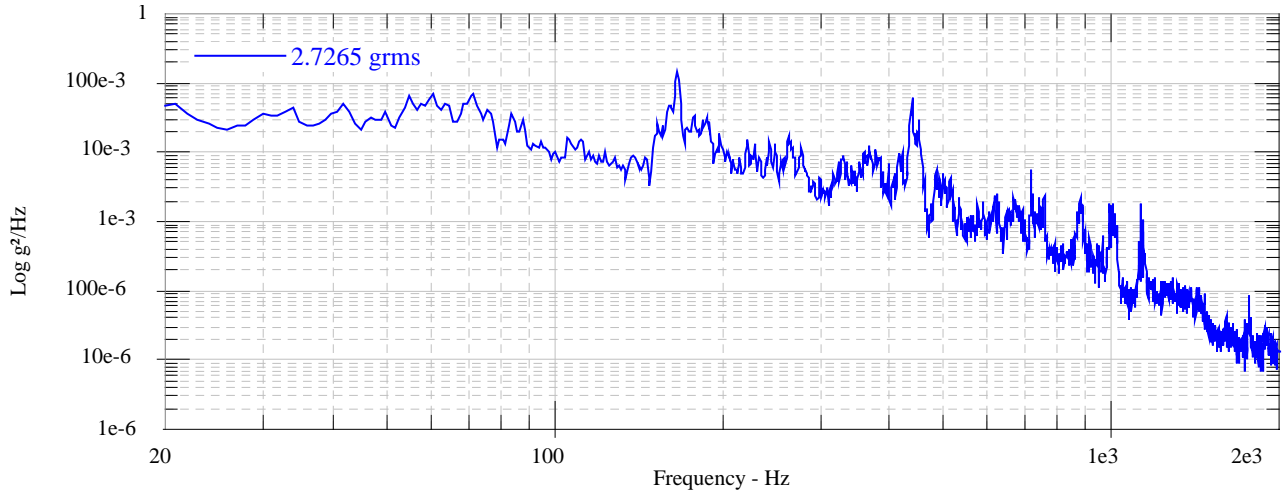
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

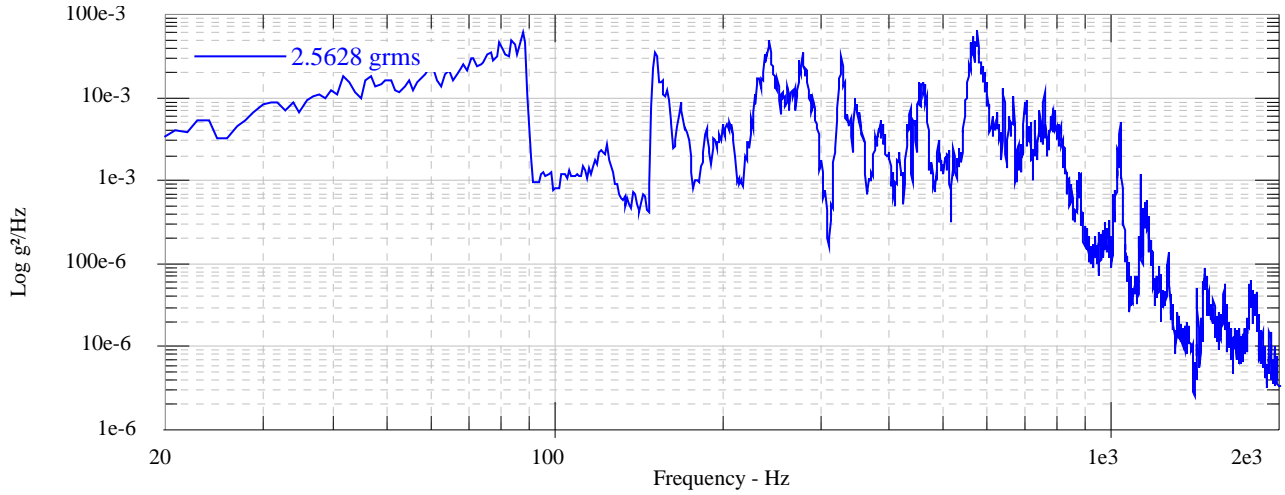


VIBRATION TEST REPORT
SPIRE QM

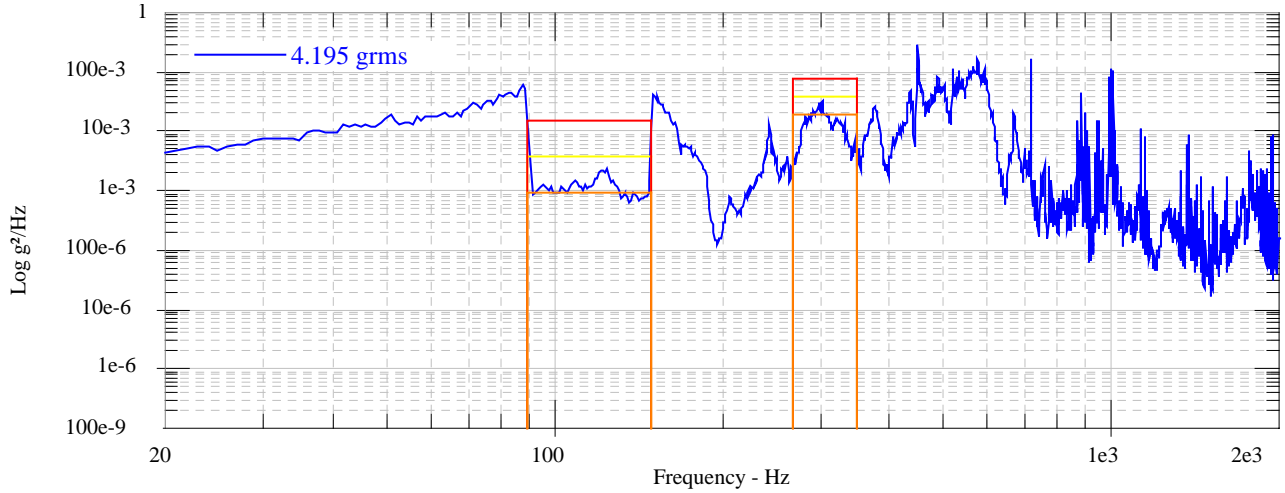
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 7-Apr-04
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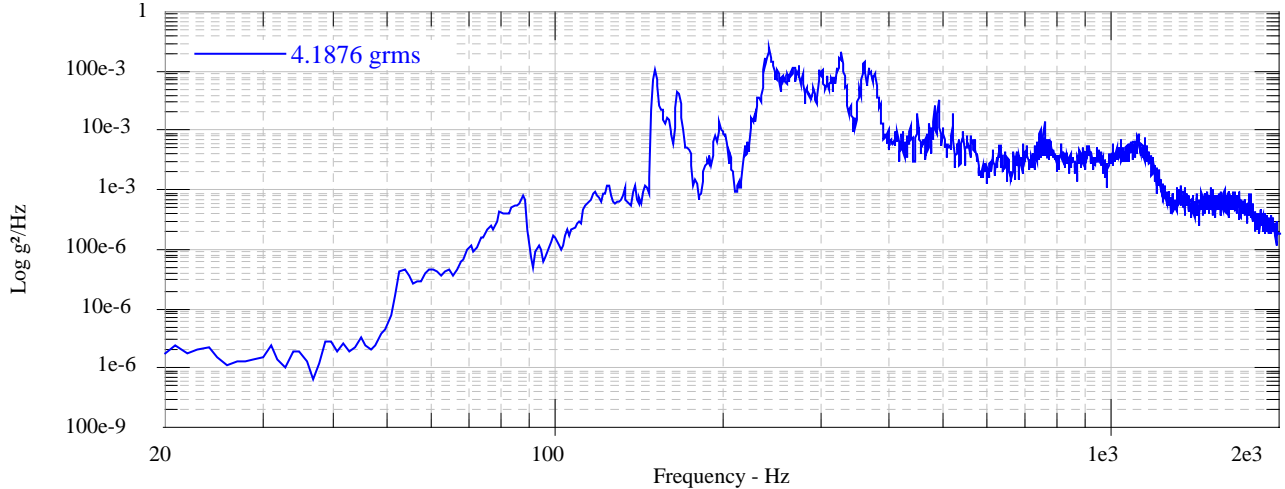
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

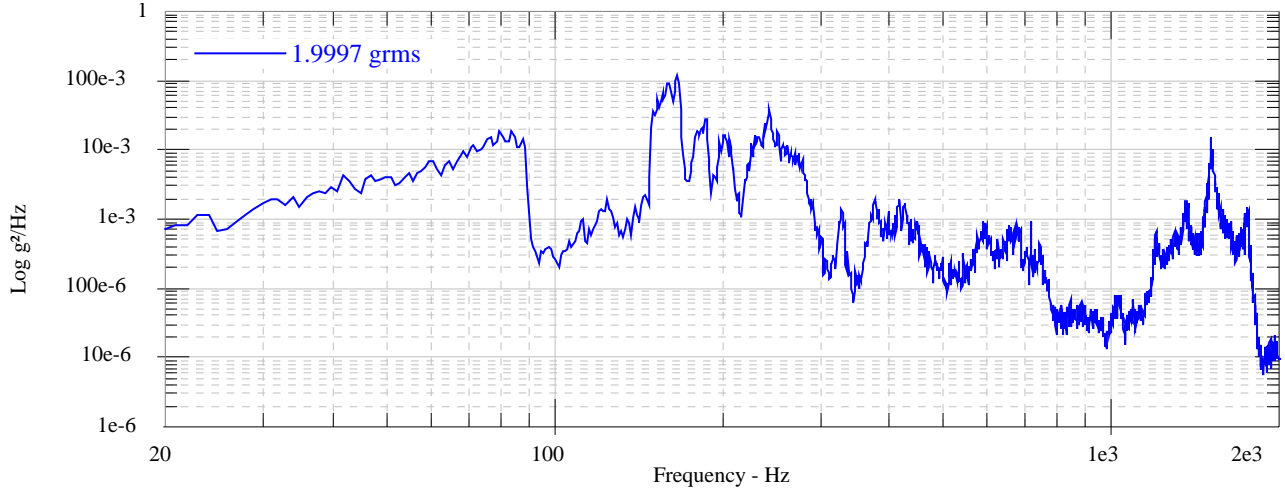


VIBRATION TEST REPORT
SPIRE QM

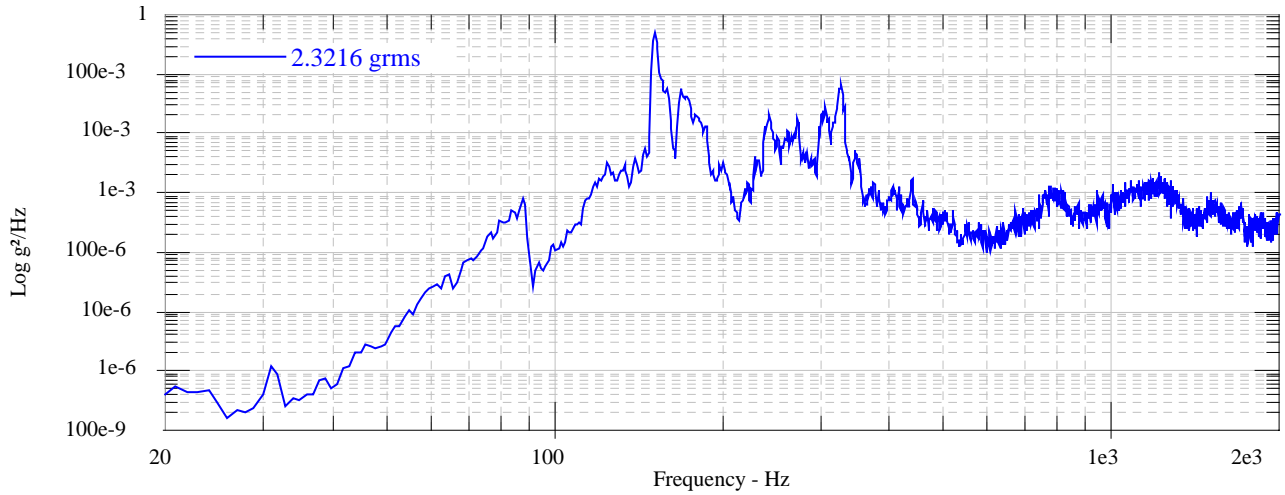
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 7-Apr-04
Page : HNA12Y - 20 / 22

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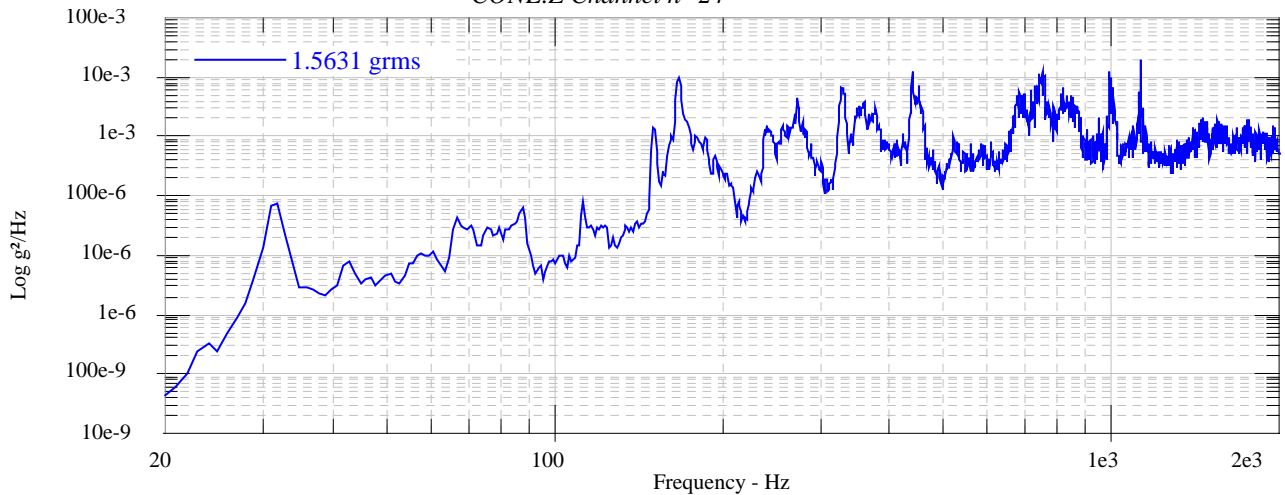
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

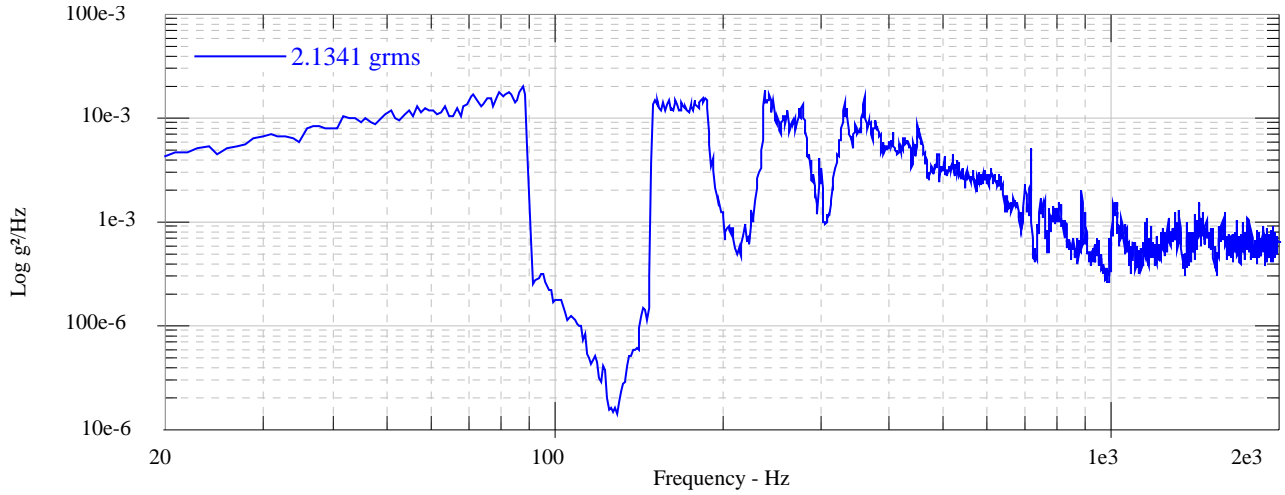


VIBRATION TEST REPORT
SPIRE QM

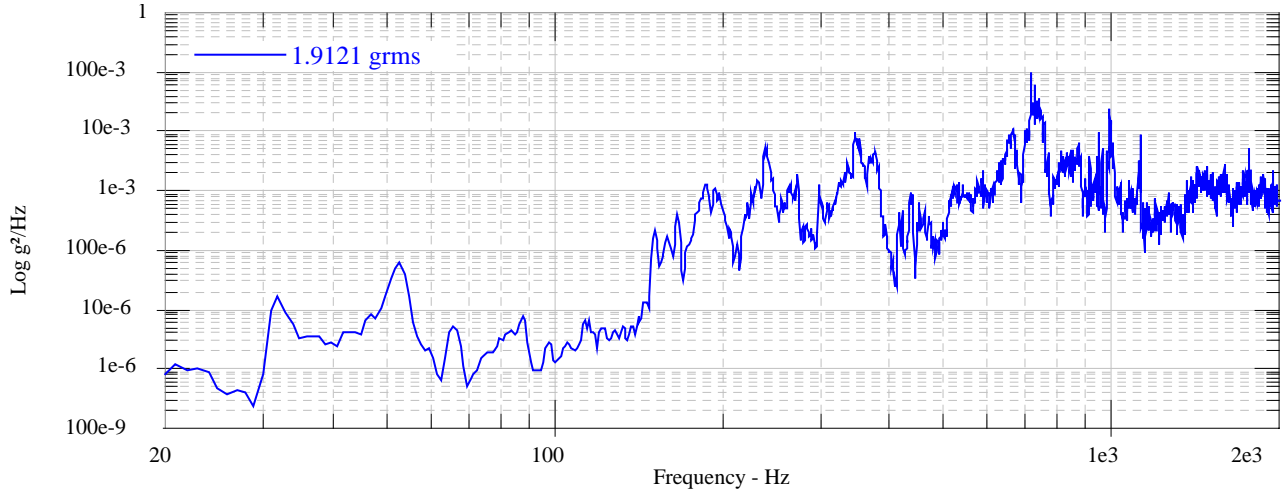
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 7-Apr-04
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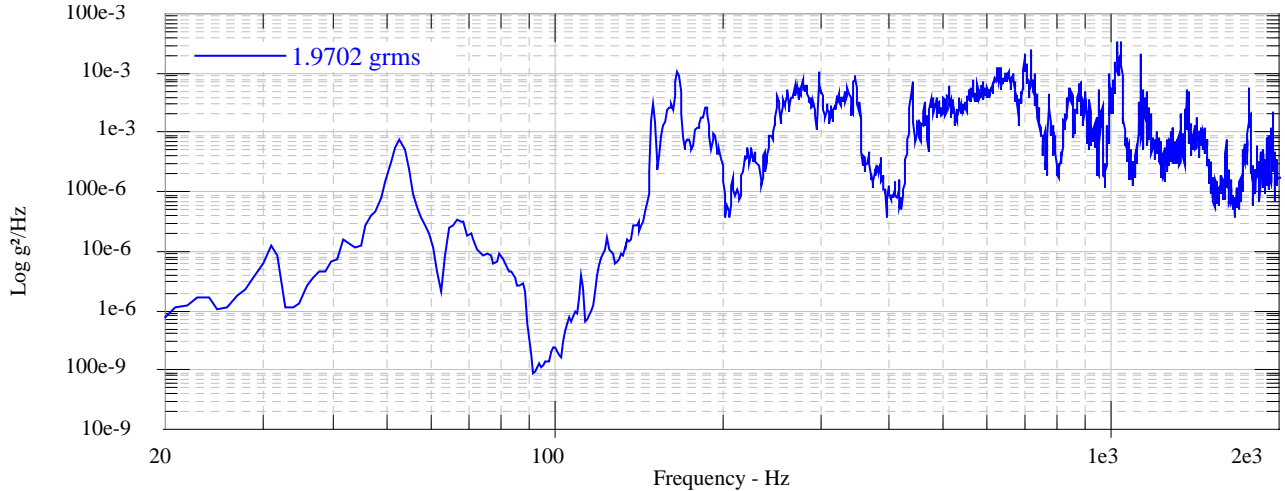
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

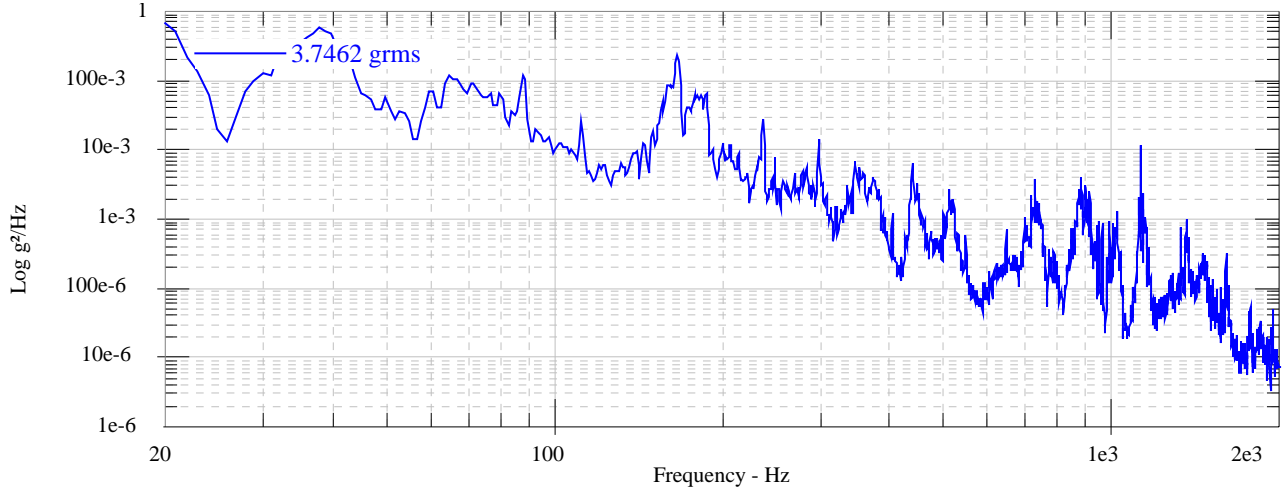


VIBRATION TEST REPORT
SPIRE QM

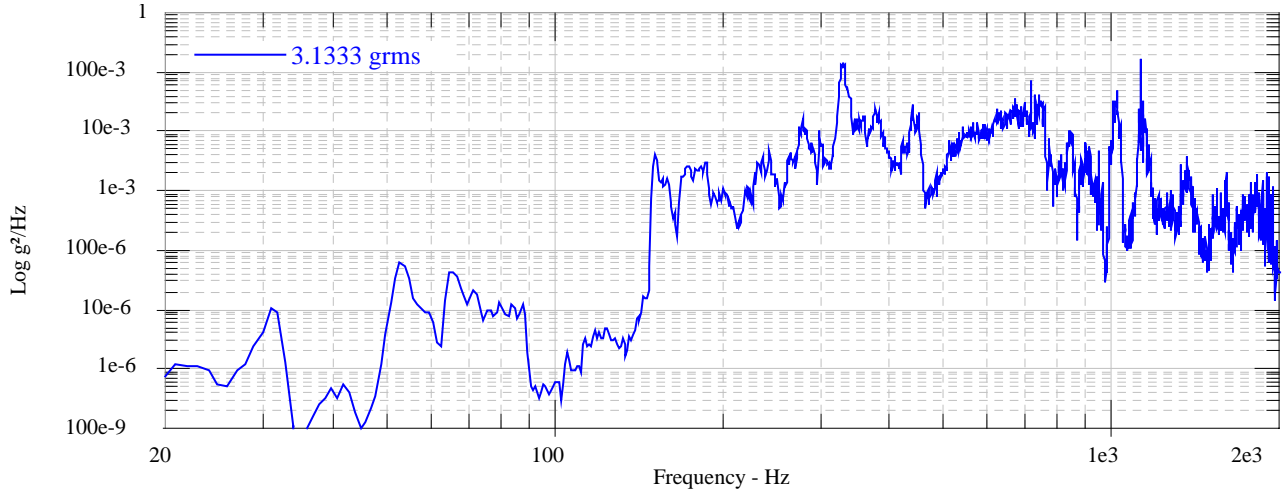
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Révision : 00
Date : 7-Apr-04
Page : HNA12Y - 22 / 22

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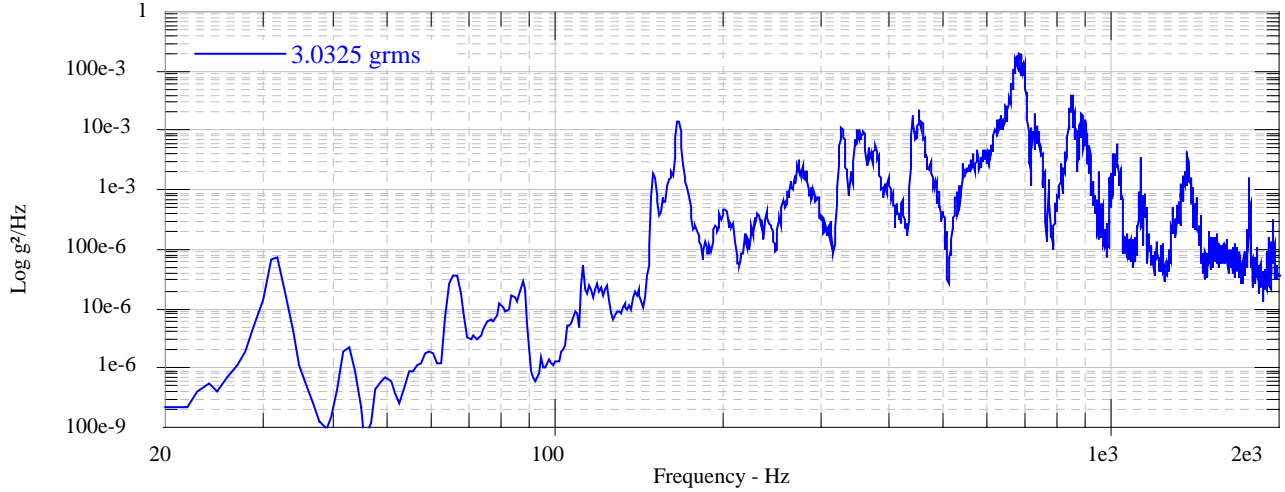
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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12.13 BNS13Y.

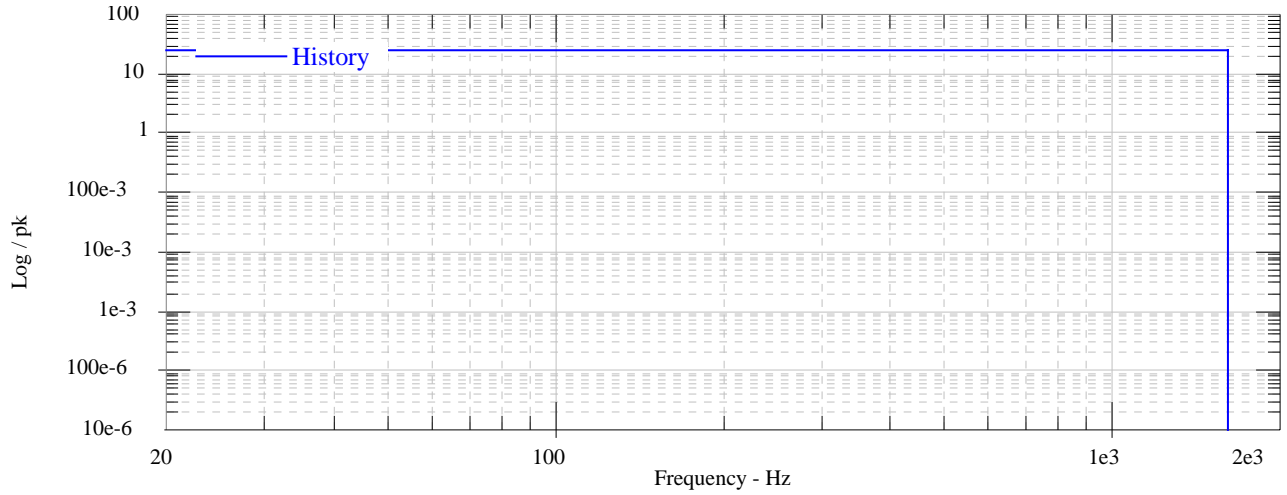
H:\Users\J-S.Servaye\Cryovibrations\Rapports\SPIRE_QM\BNS13Y.doc

VIBRATION TEST REPORT
SPIRE QM

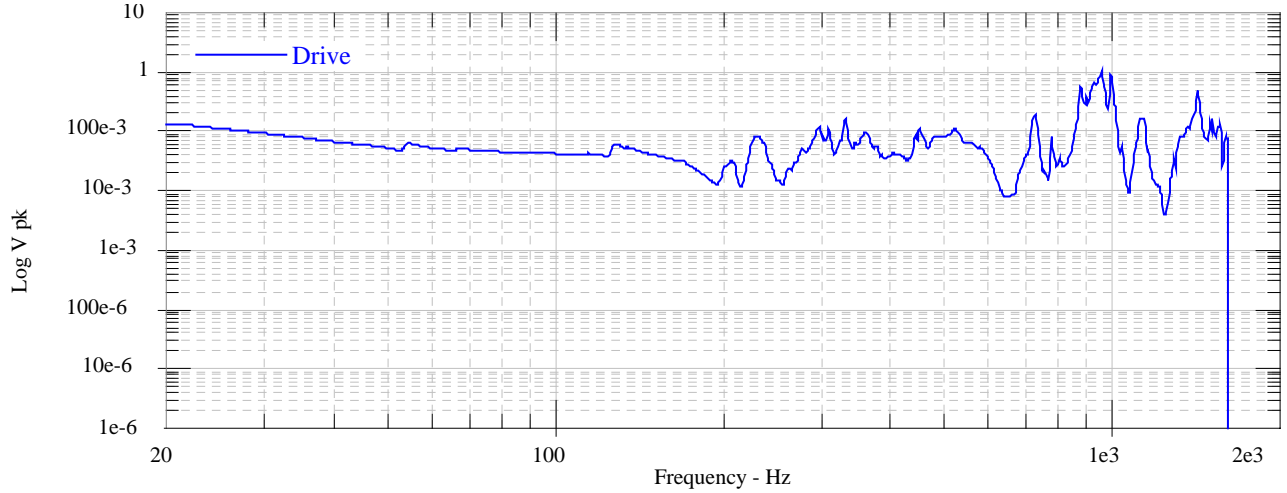
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 7-Apr-04
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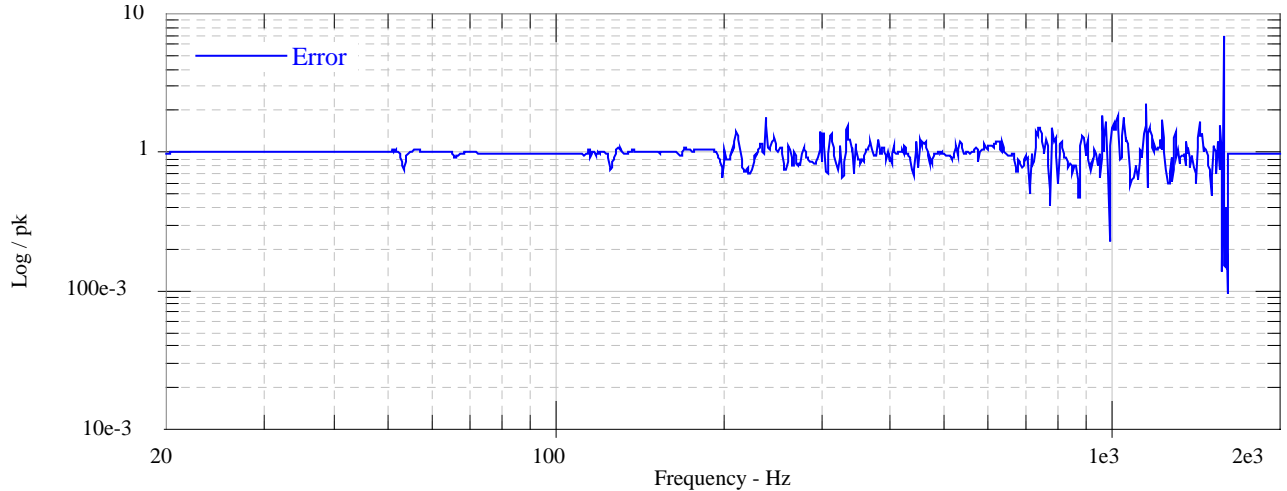
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

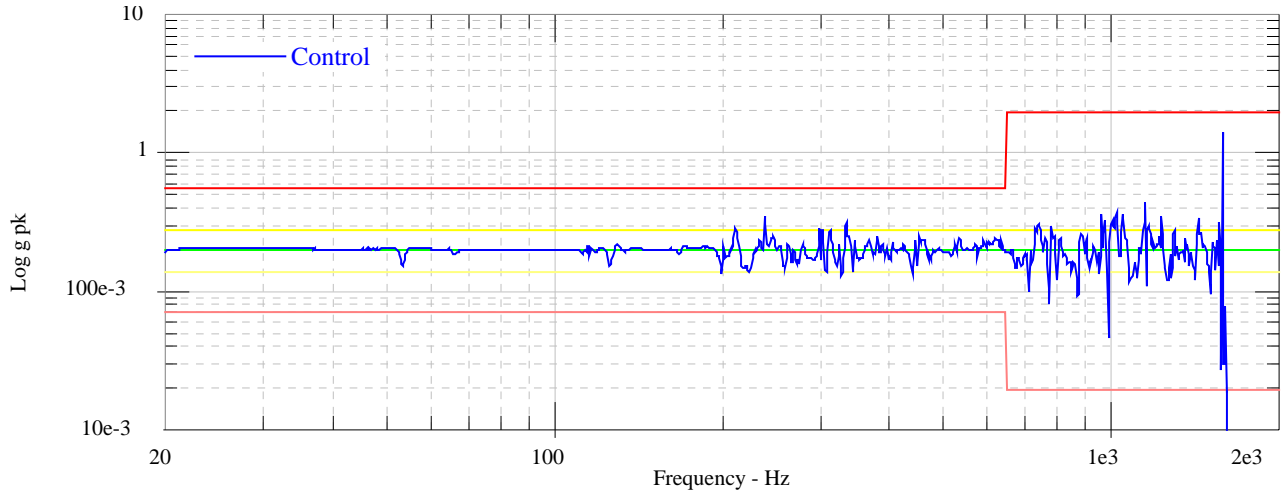


VIBRATION TEST REPORT
SPIRE QM

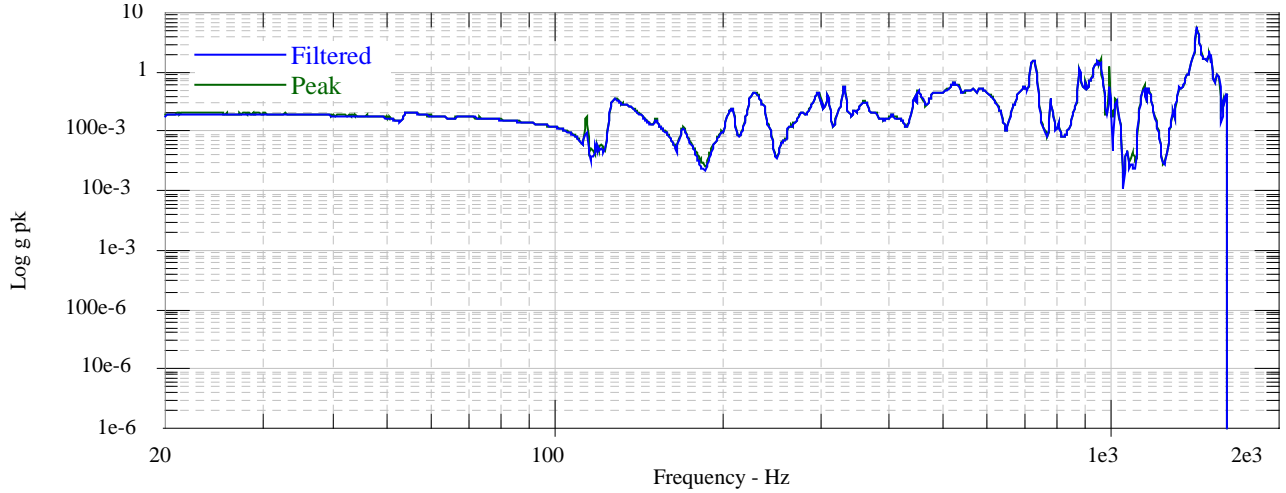
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Révision : 00
Date : 7-Apr-04
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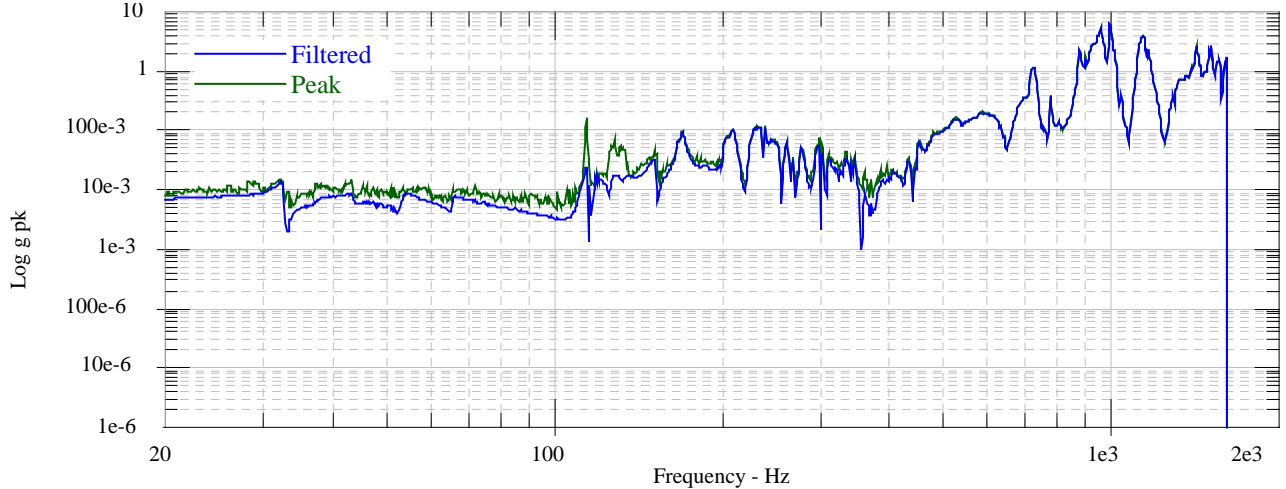
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

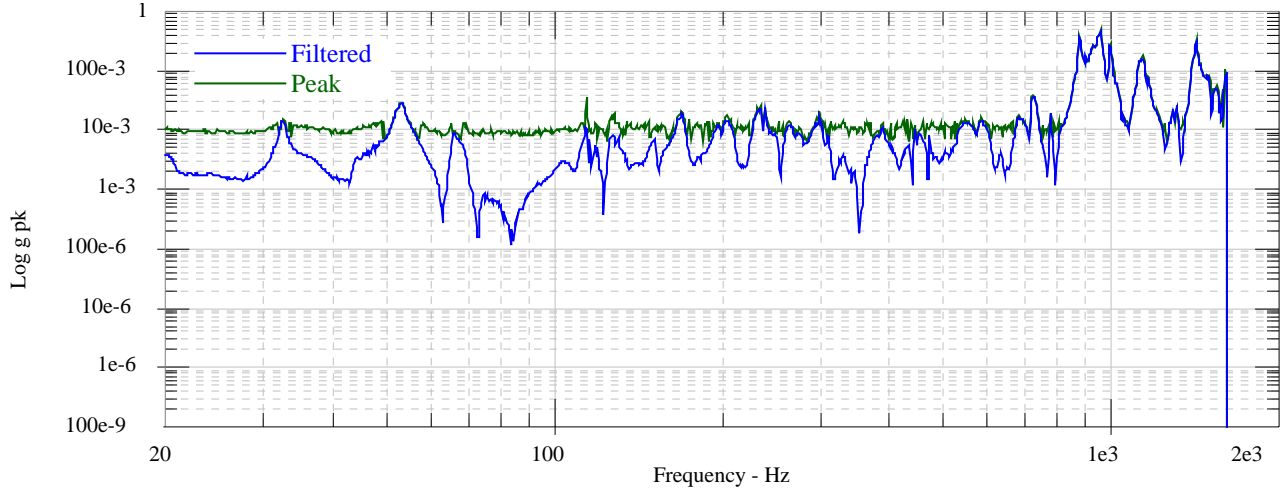


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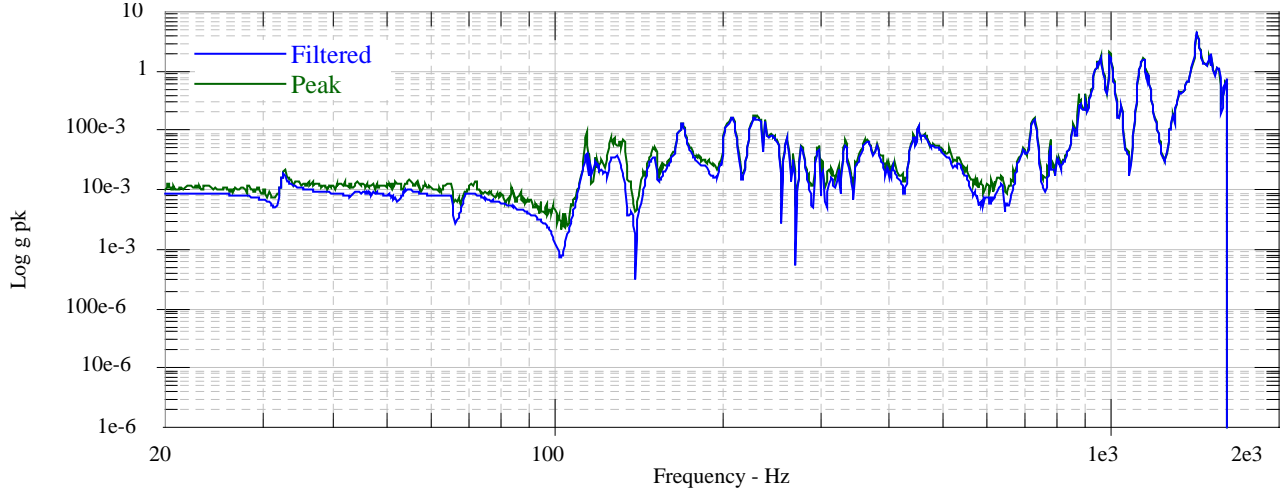
SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

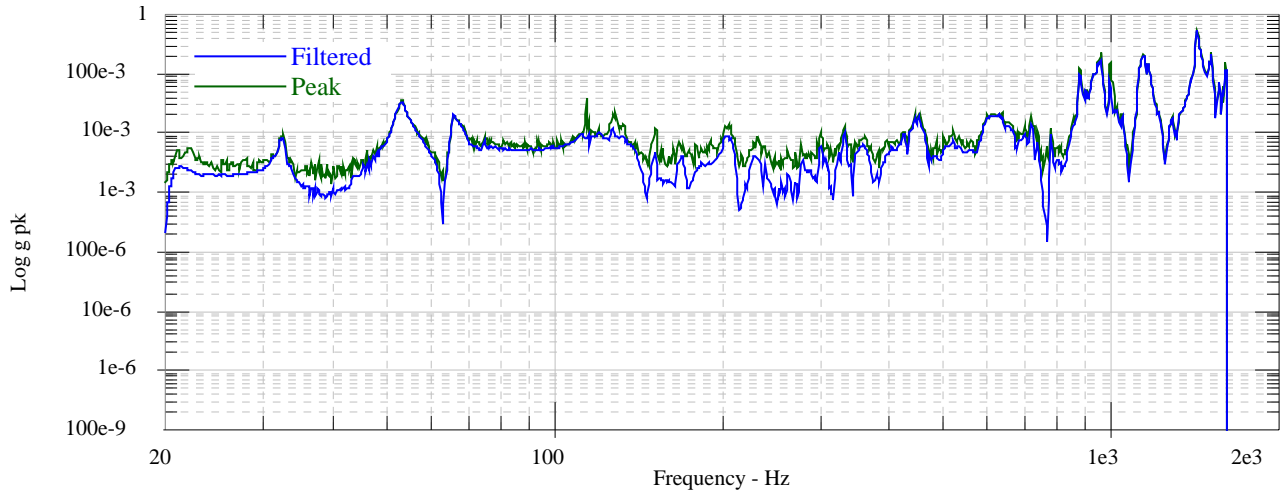


VIBRATION TEST REPORT
SPIRE QM

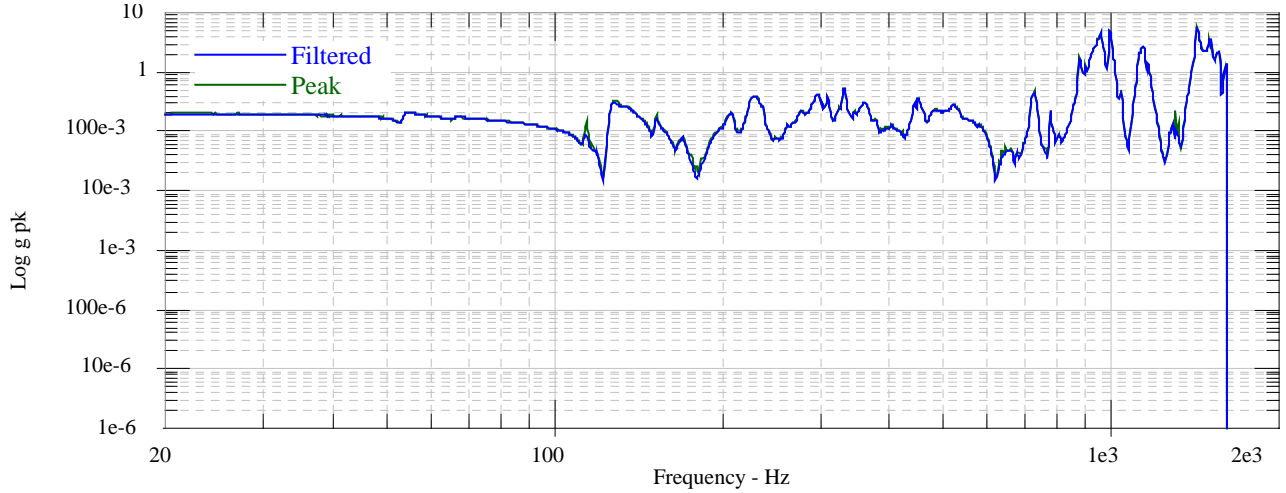
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Date : 7-Apr-04
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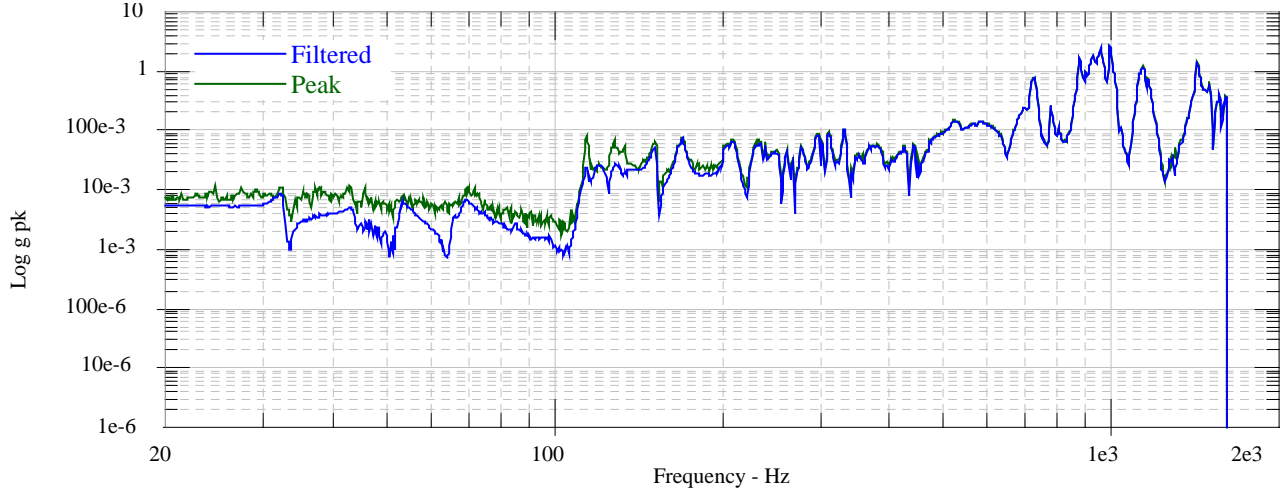
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

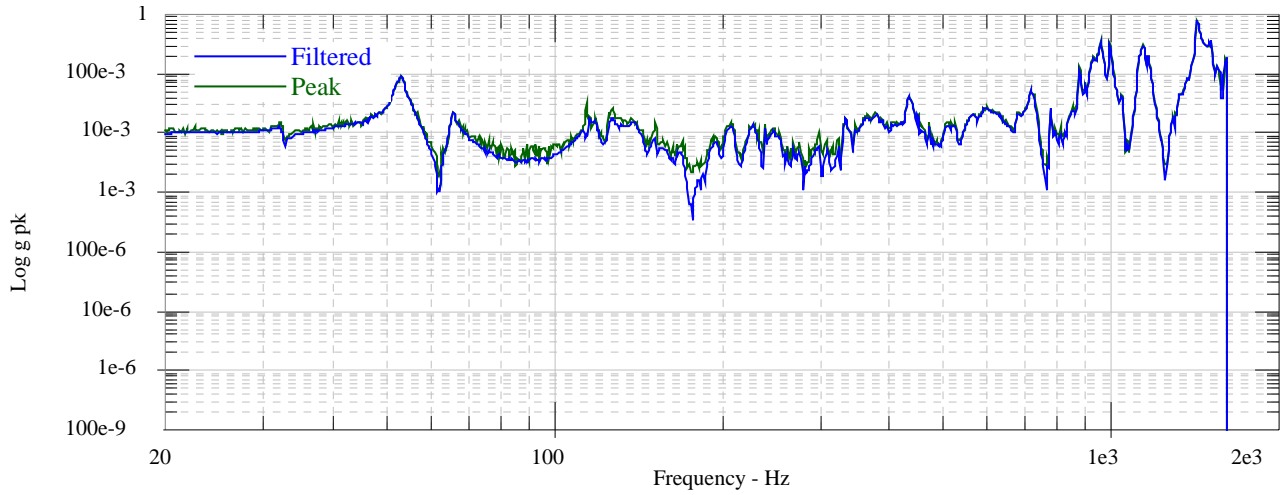


VIBRATION TEST REPORT
SPIRE QM

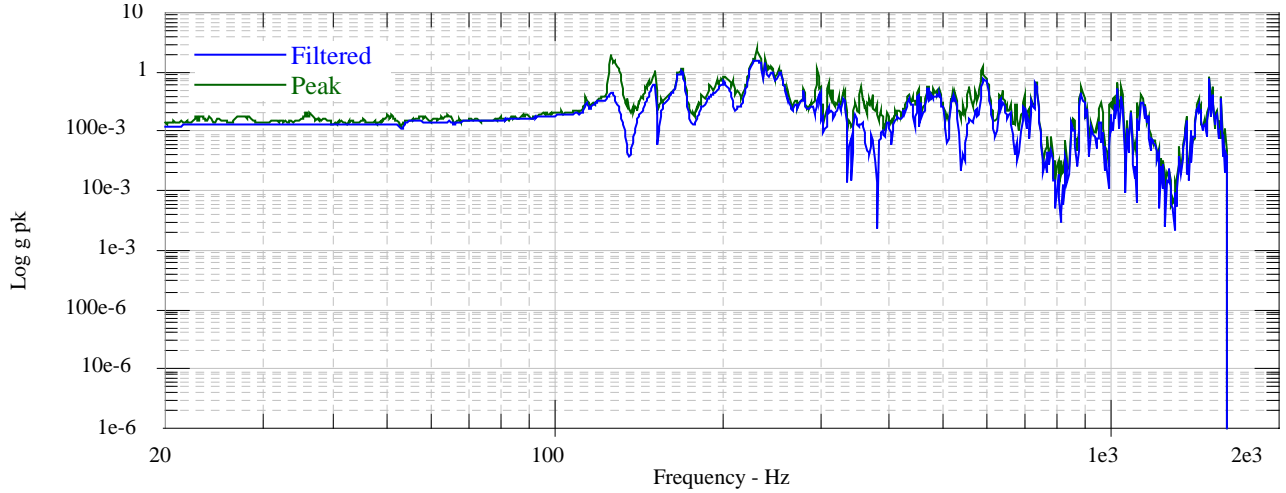
RP-CSL-CRYOV-04001
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Révision : 00
Date : 7-Apr-04
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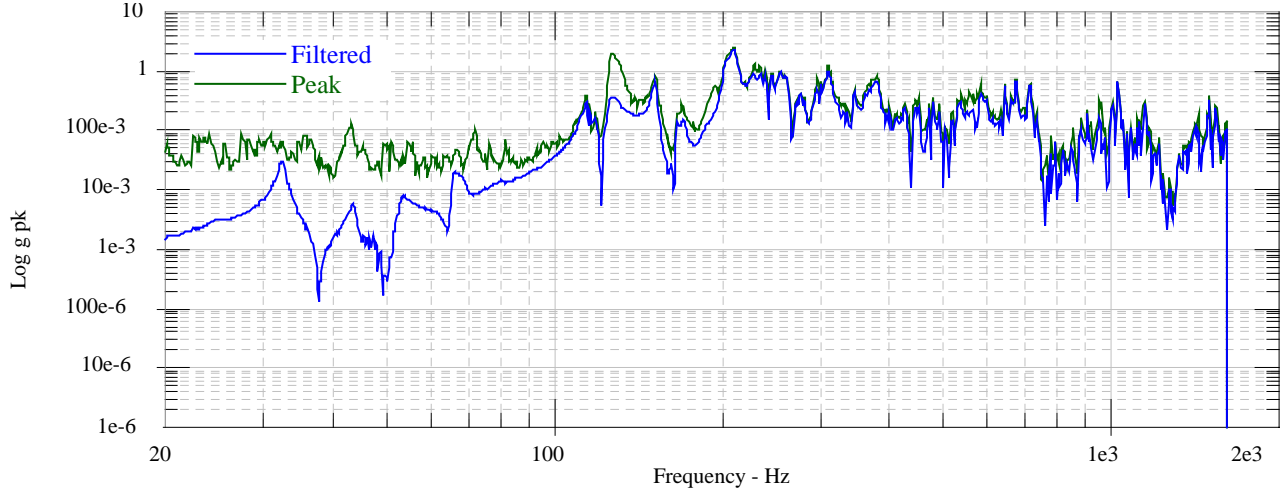
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

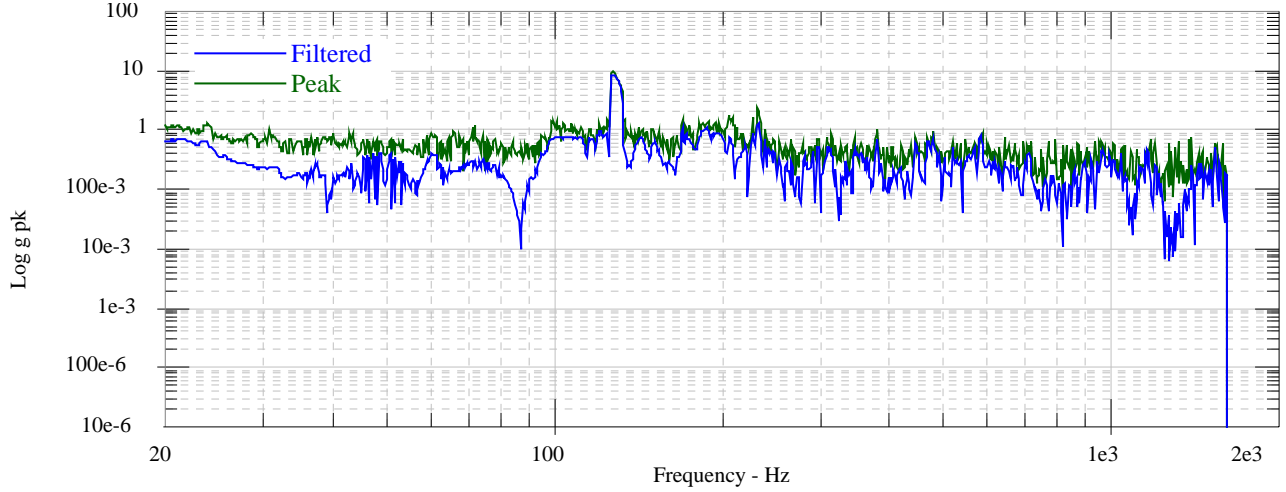


VIBRATION TEST REPORT
SPIRE QM

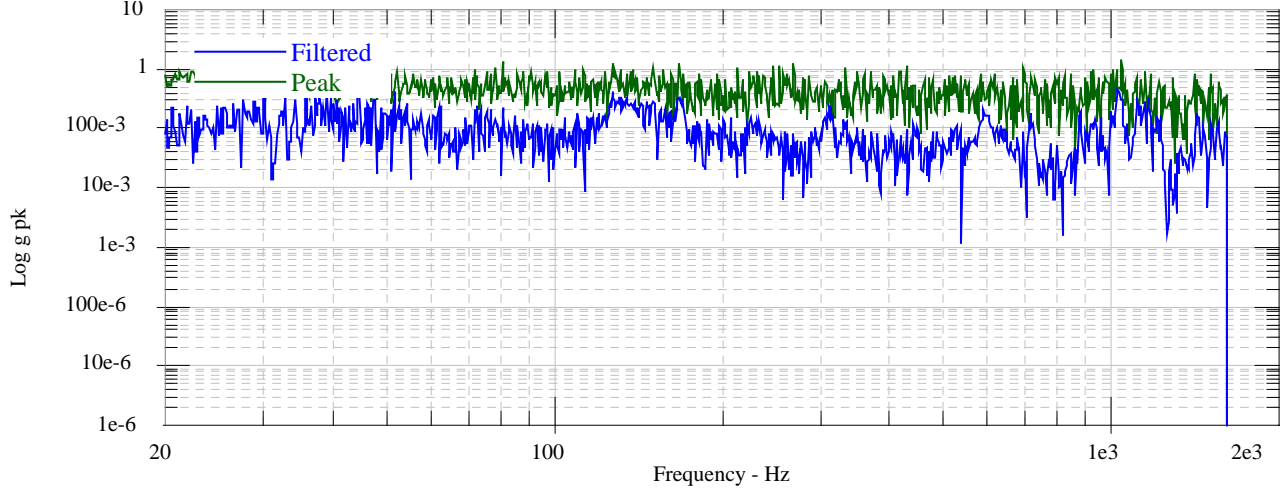
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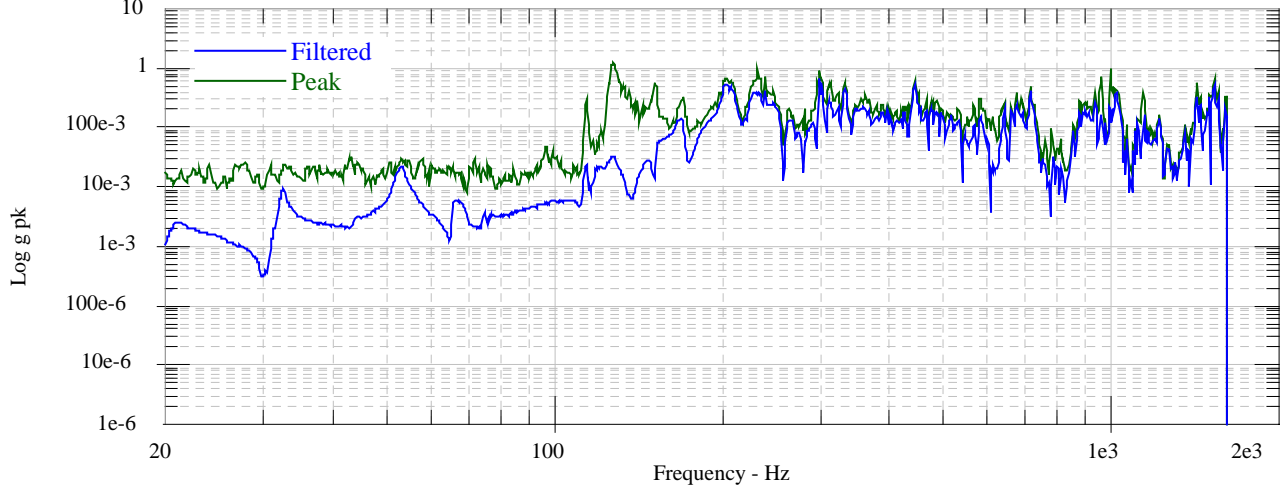
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

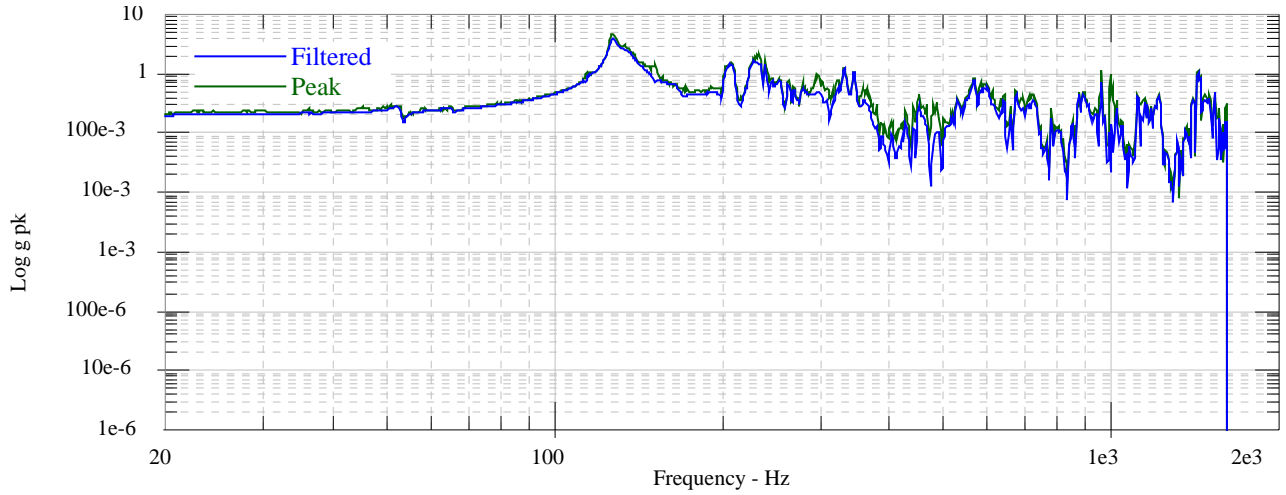


VIBRATION TEST REPORT
SPIRE QM

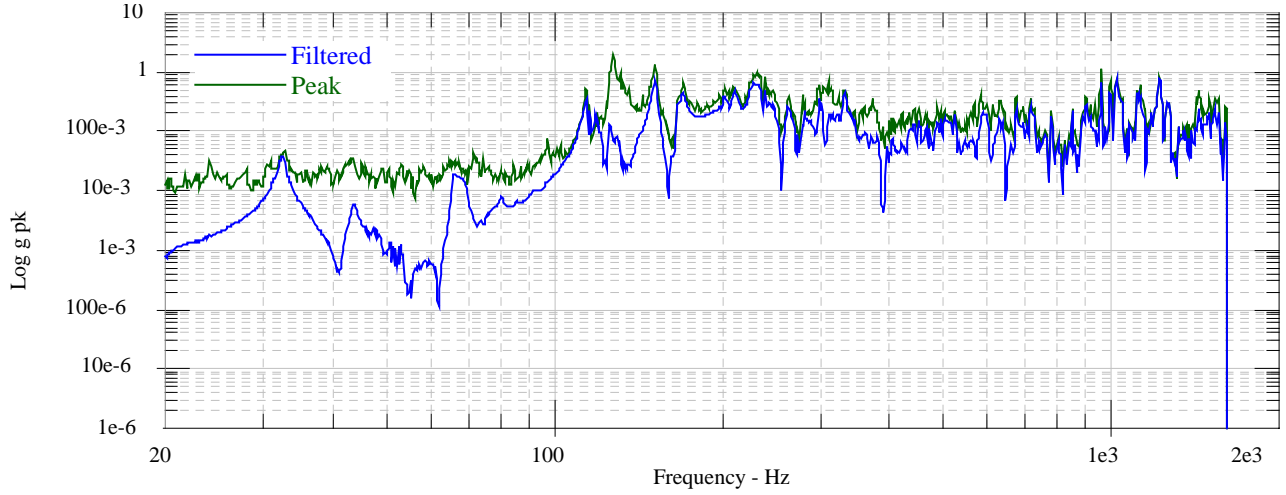
RP-CSL-CRYOV-04001
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Révision : 00
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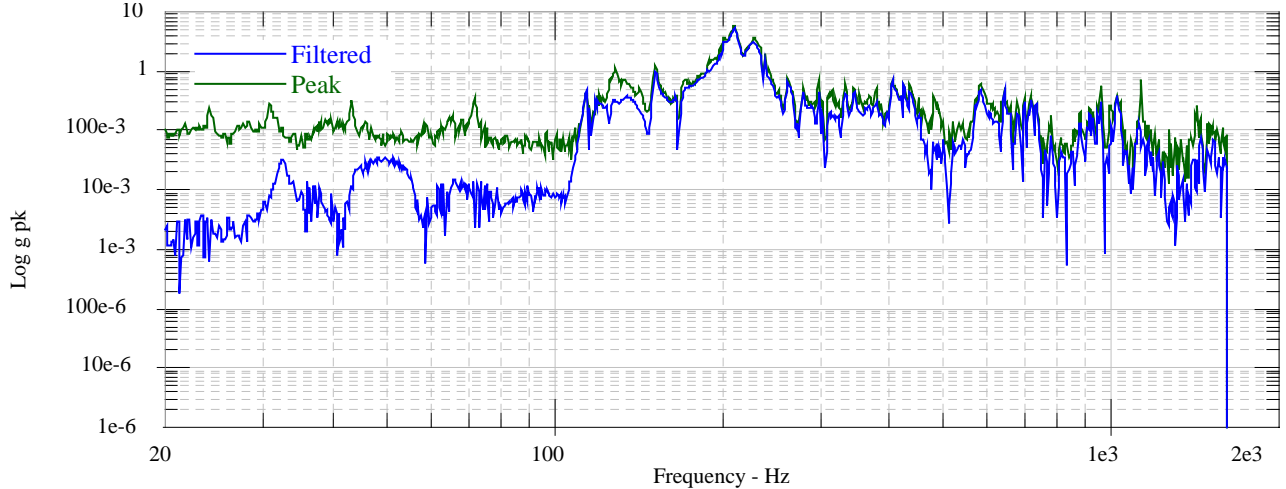
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

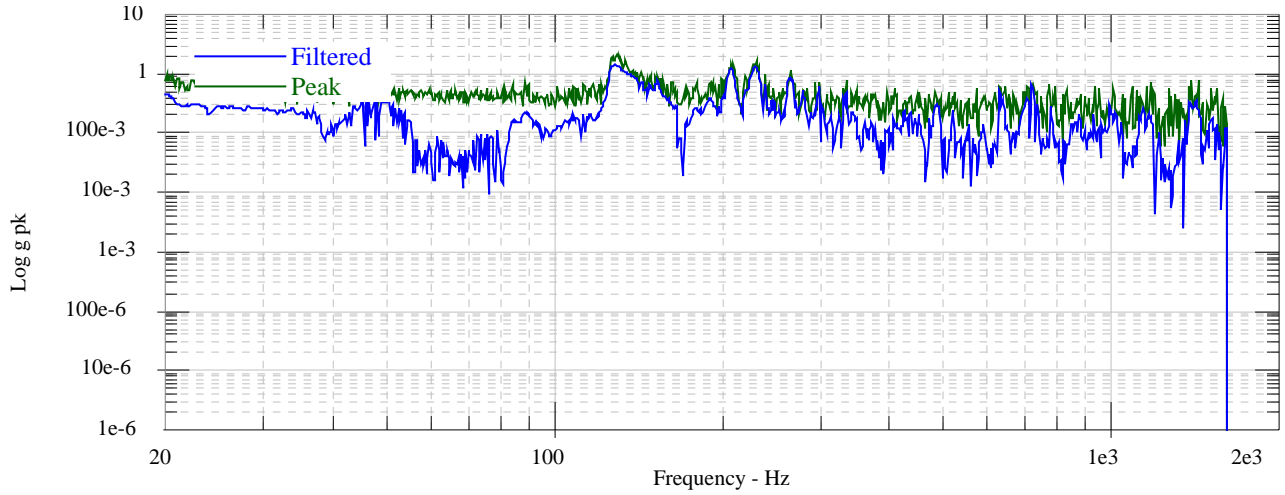


VIBRATION TEST REPORT
SPIRE QM

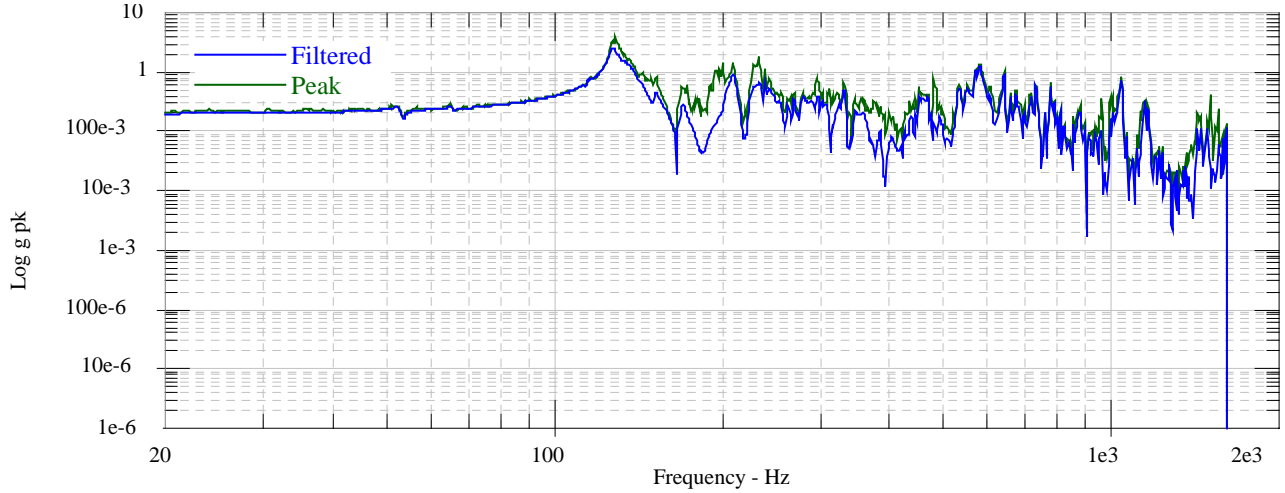
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Révision : 00
Date : 7-Apr-04
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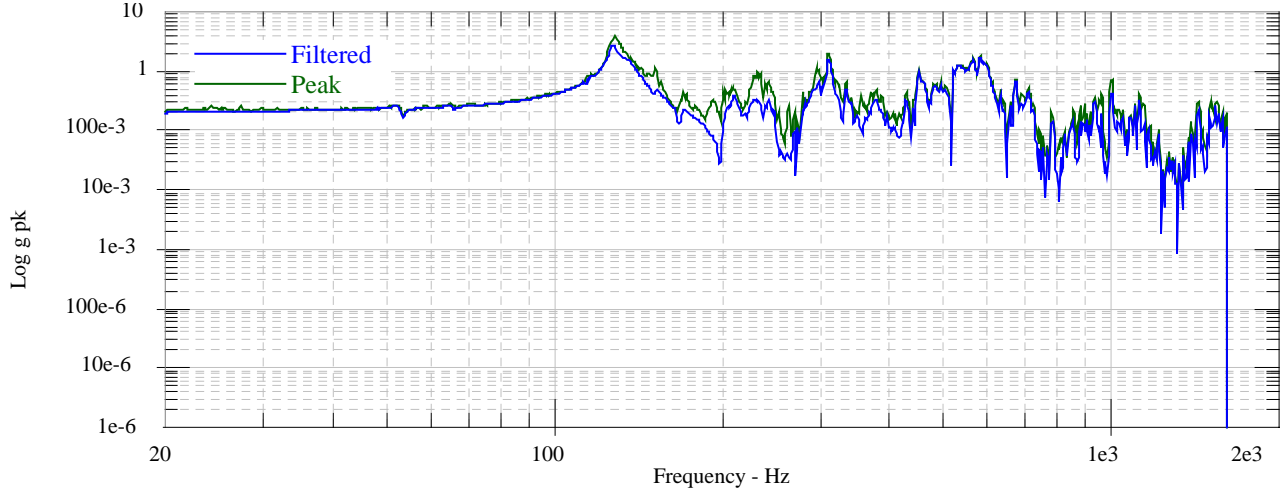
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

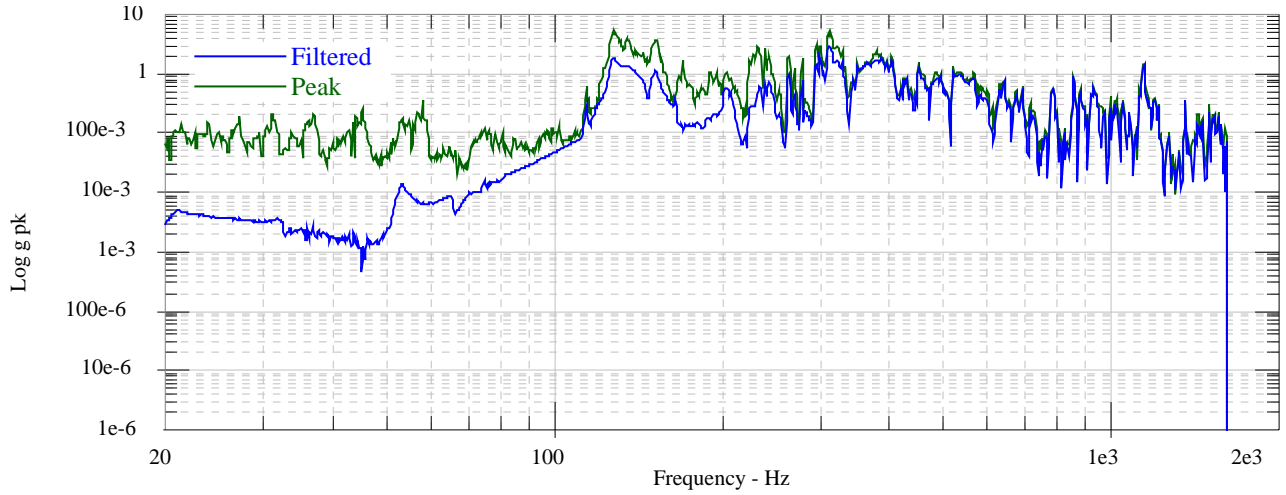


VIBRATION TEST REPORT
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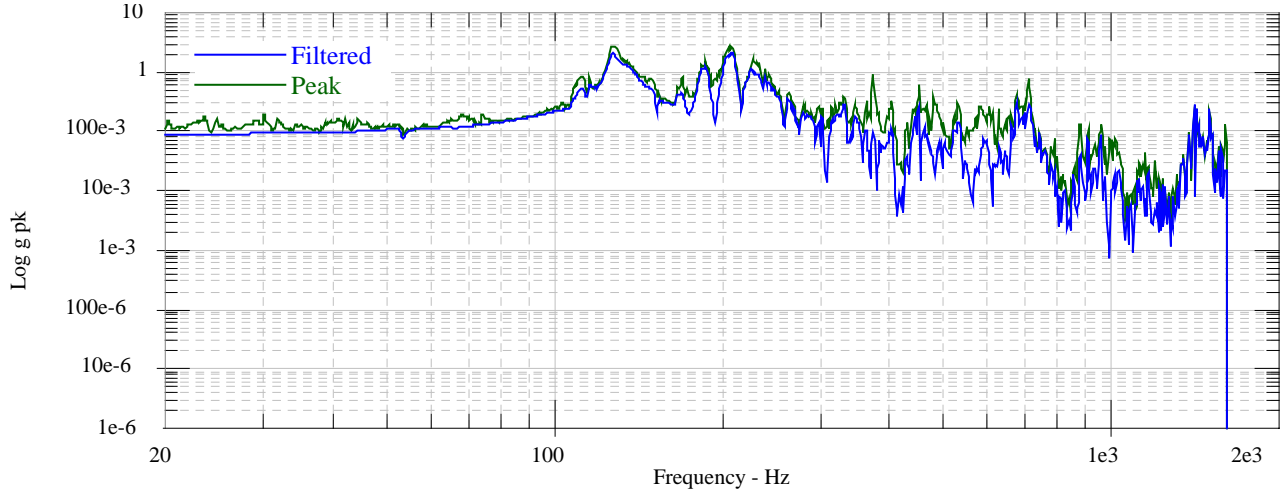
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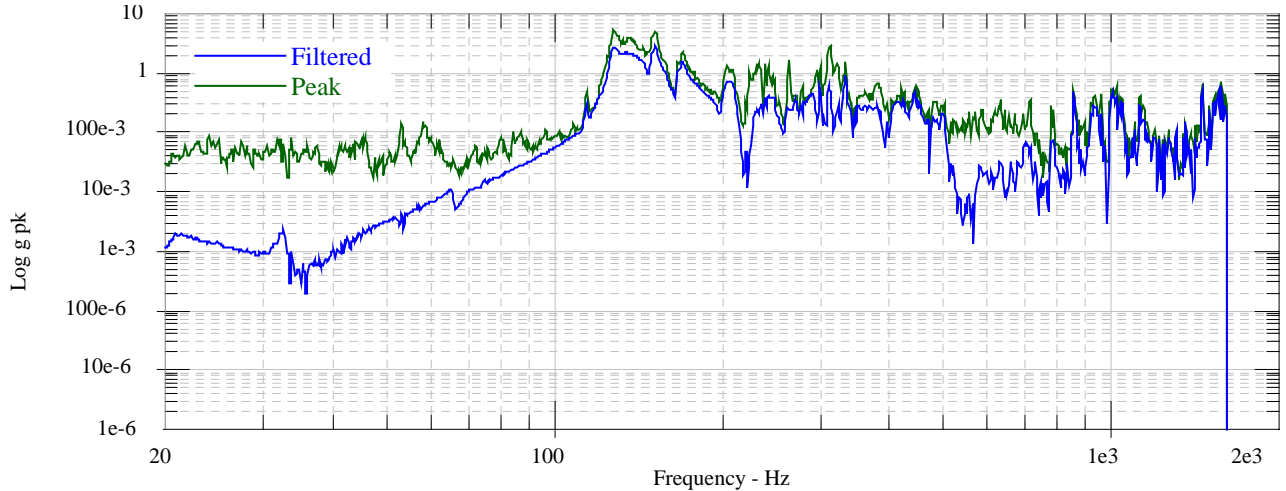
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

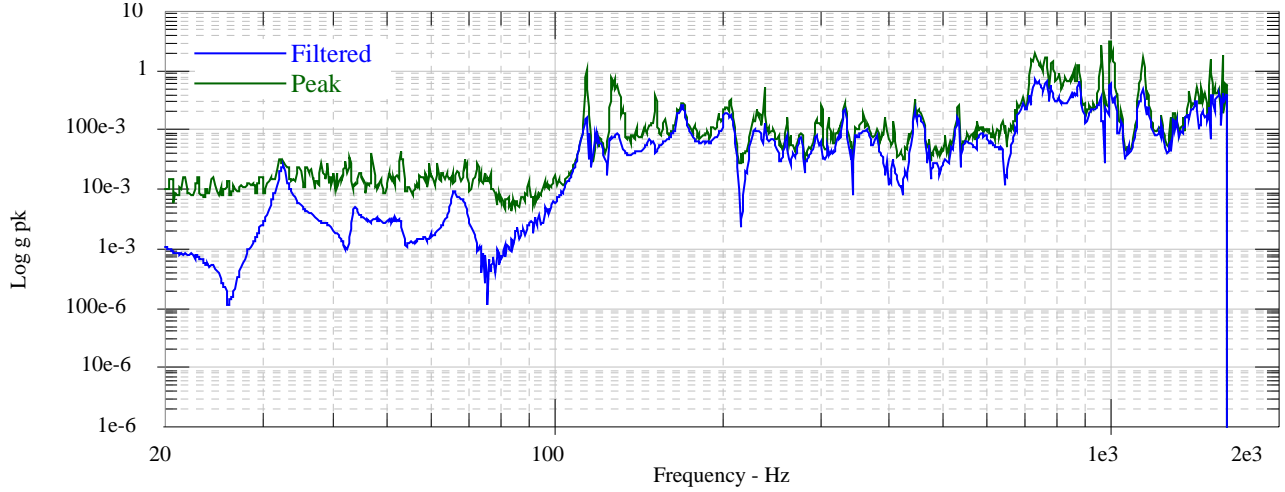


VIBRATION TEST REPORT
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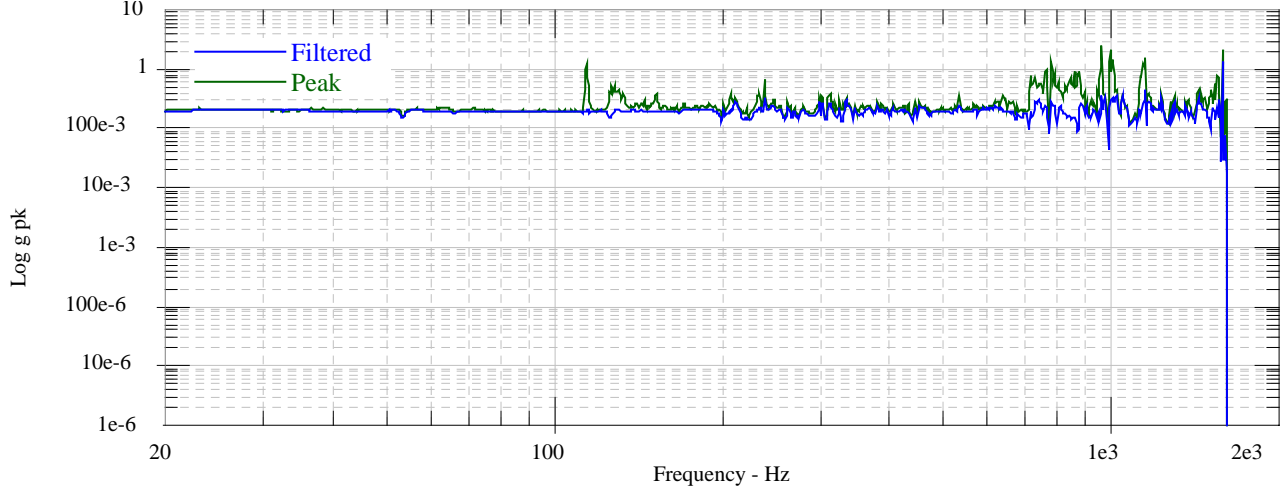
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Version : 01
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CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

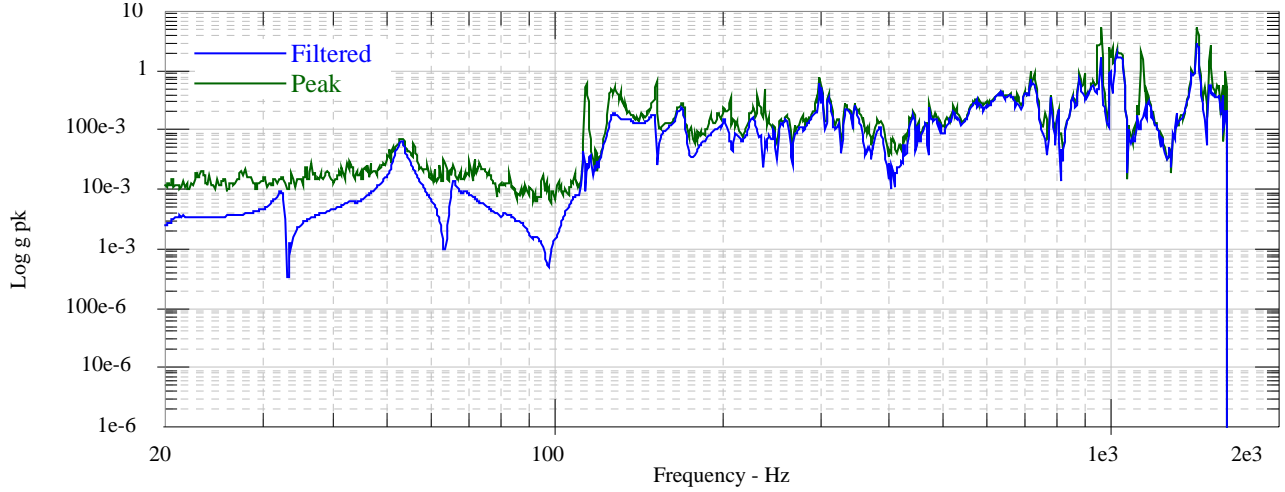


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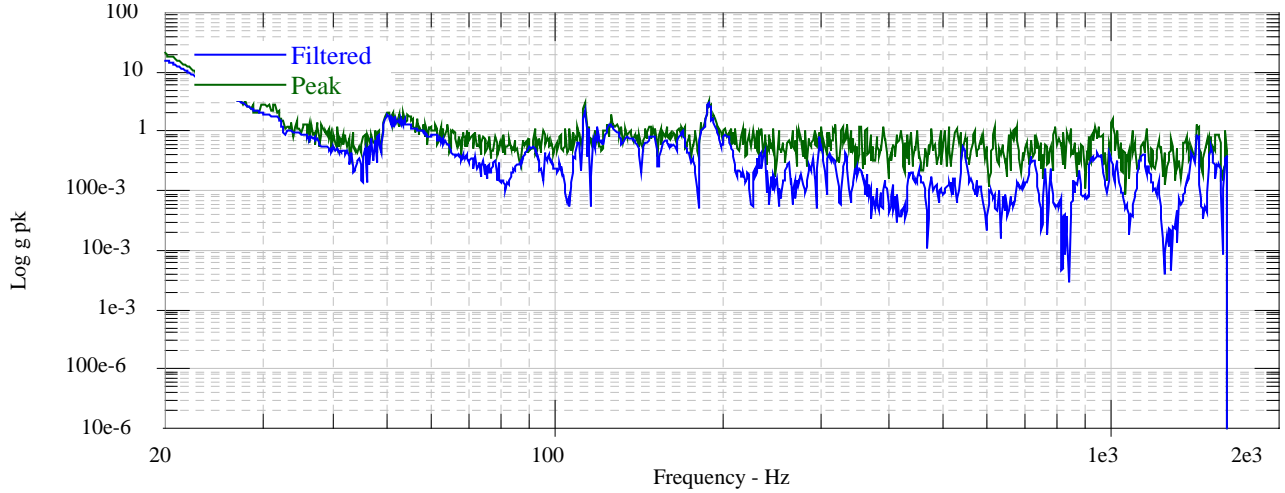
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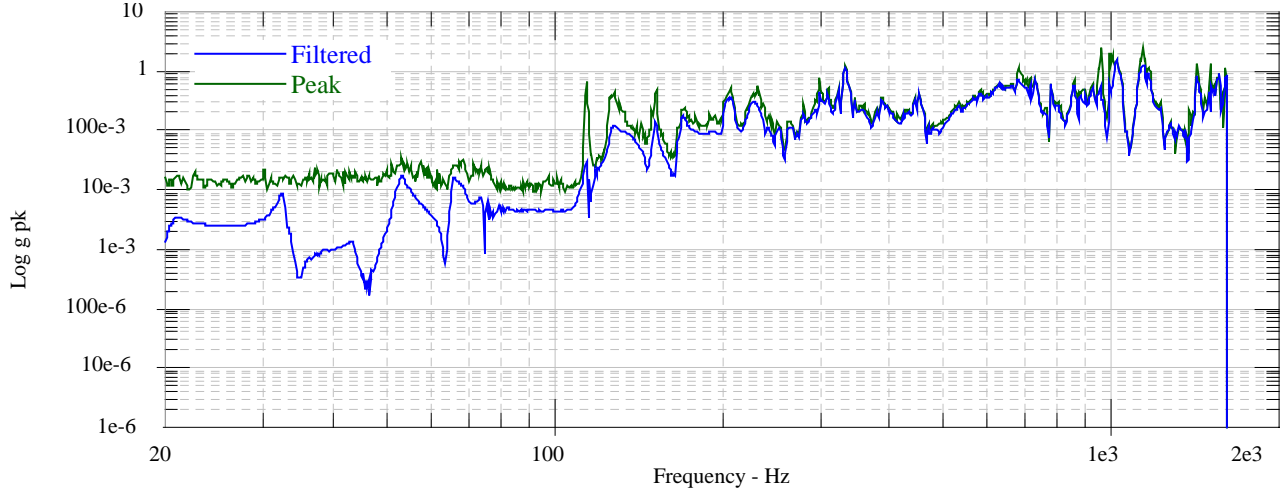
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-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

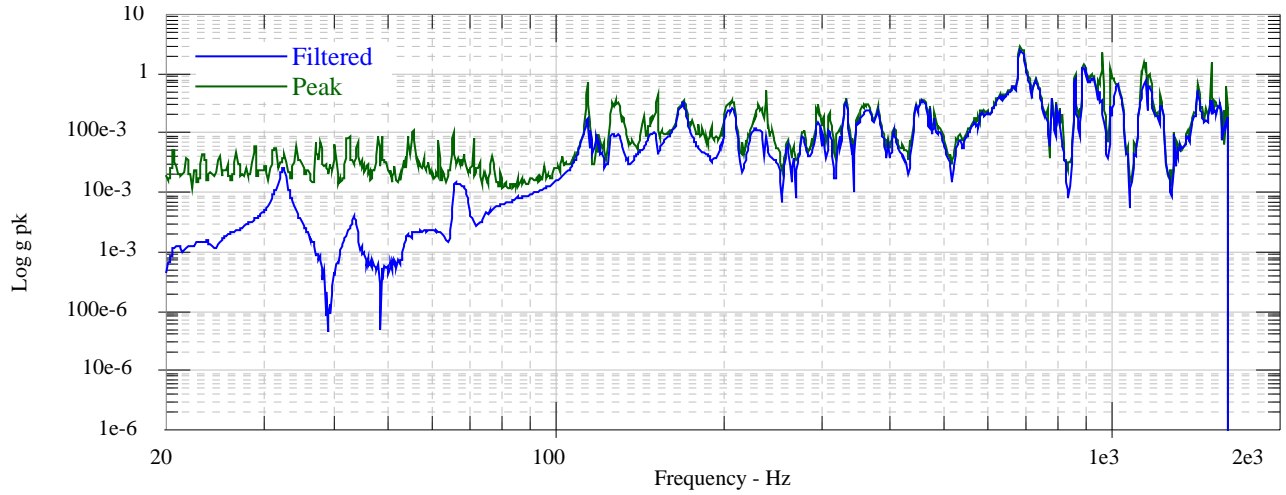


VIBRATION TEST REPORT
SPIRE QM

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+YAFRAME.Z Channel n° 30



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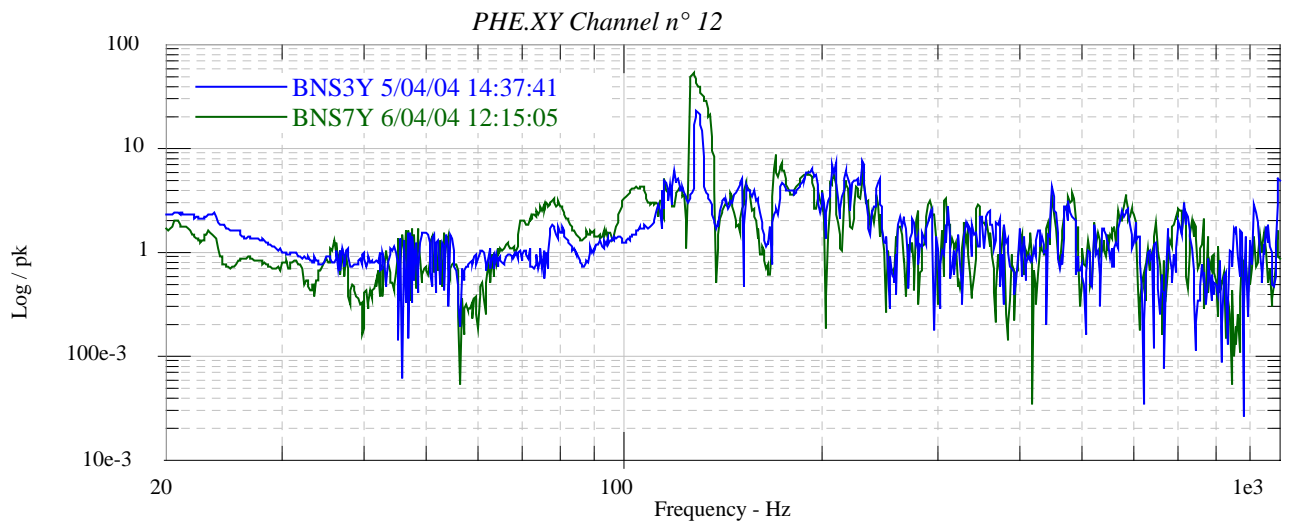
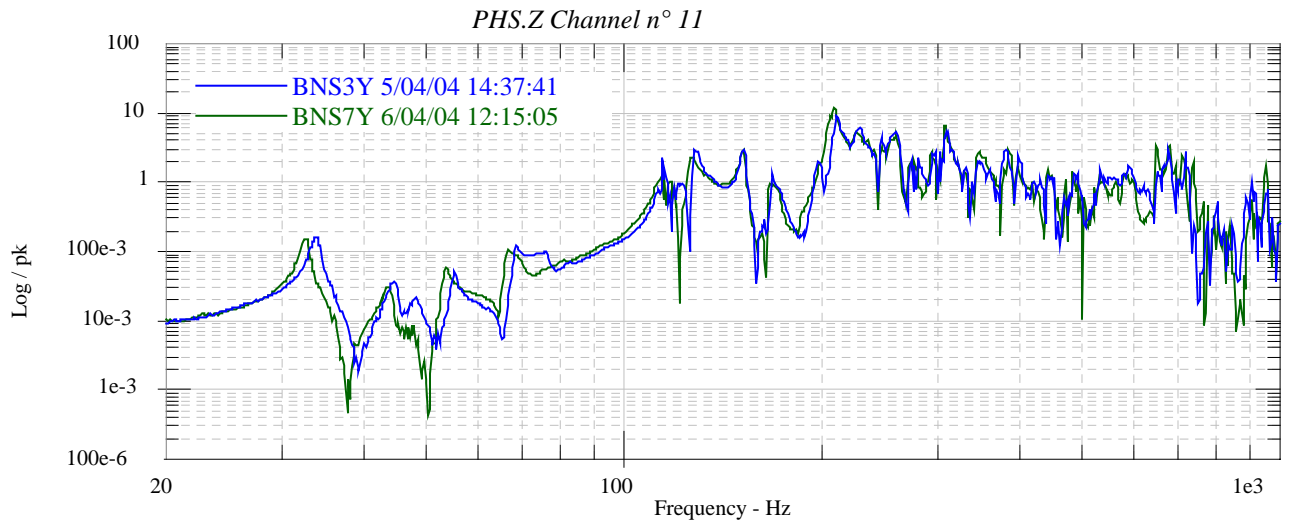
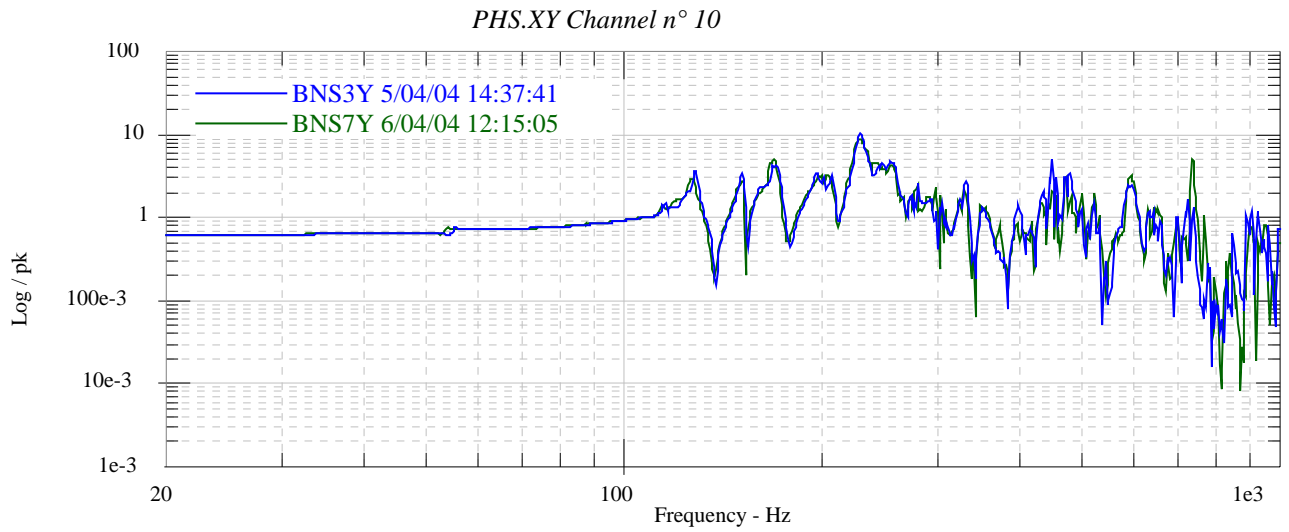
RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
Date : 7 May, 2004
Page : Annexe XIV

12.14 Comparison BNS_Y transfer functions pre and post high level sine.

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VIBRATION TEST REPORT
SPIRE QM

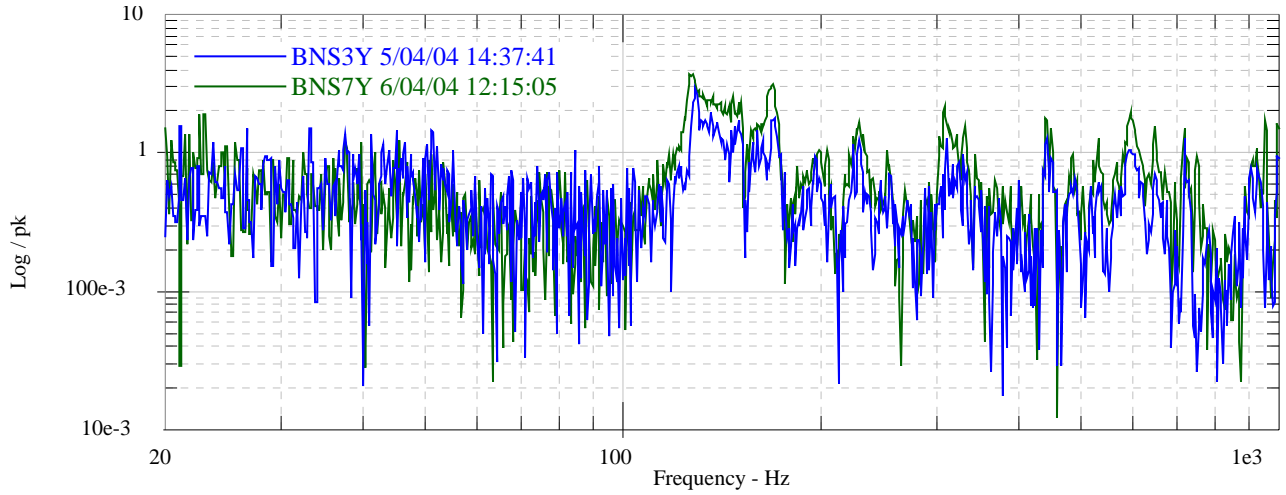
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
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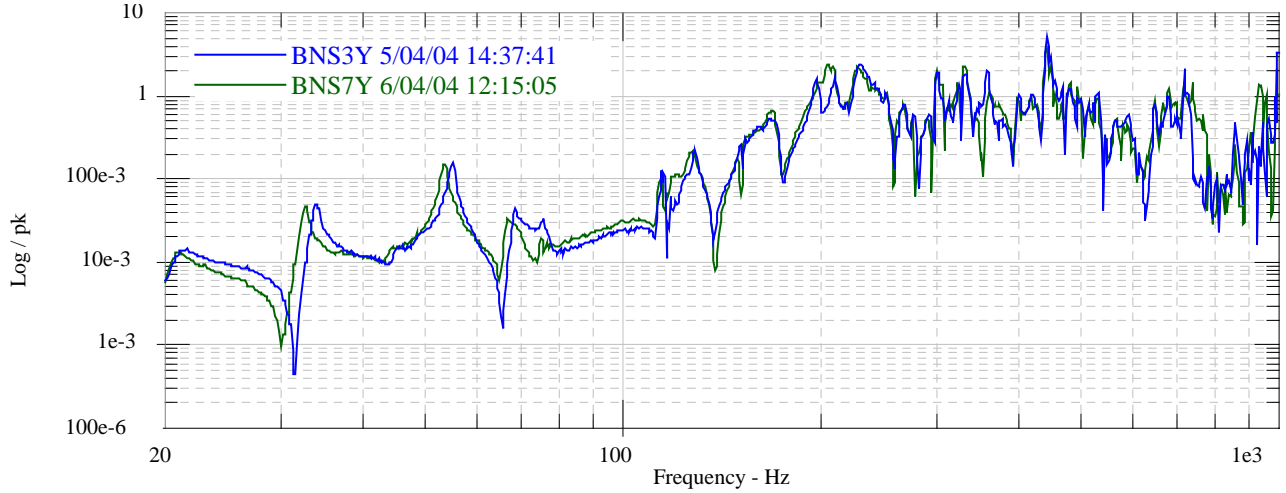
VIBRATION TEST REPORT
SPIRE QM

RP-CSL-CRYOV-04001
Version : 01
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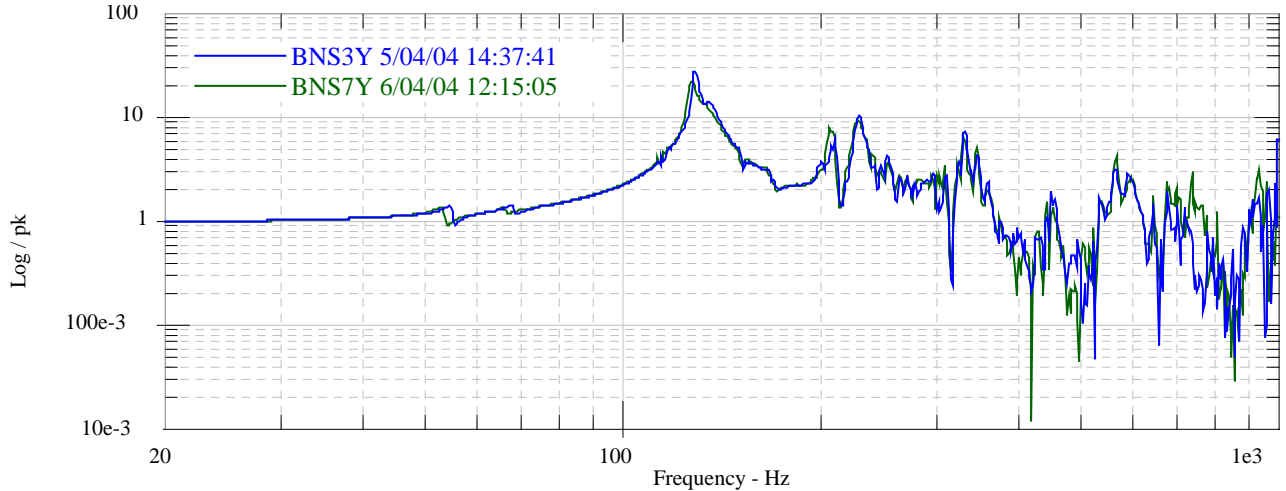
COOL.X Channel n° 13



FPU.X Channel n° 14

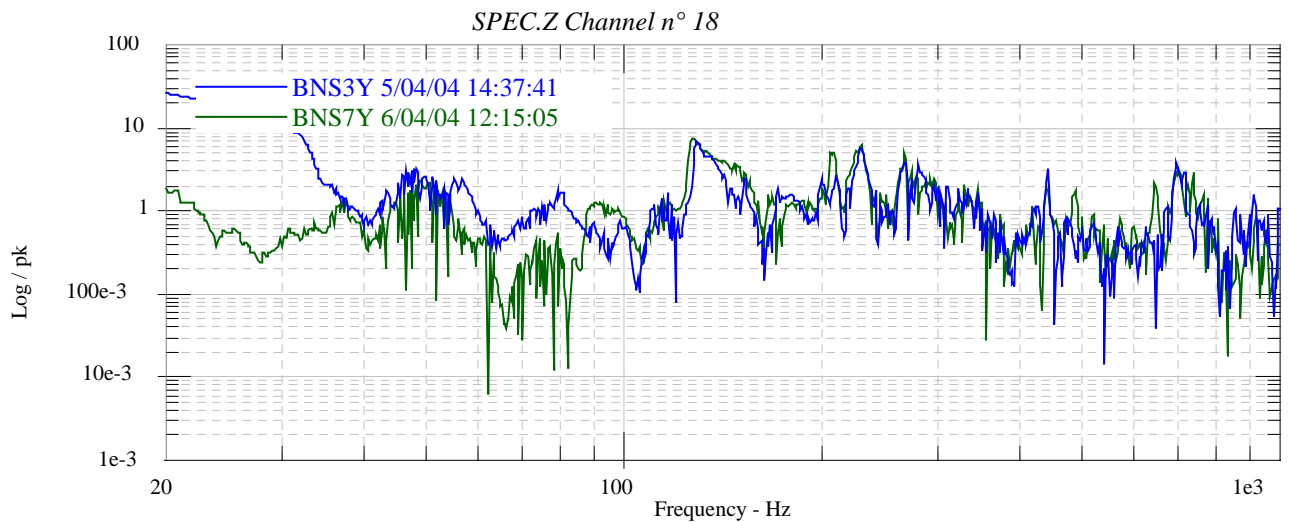
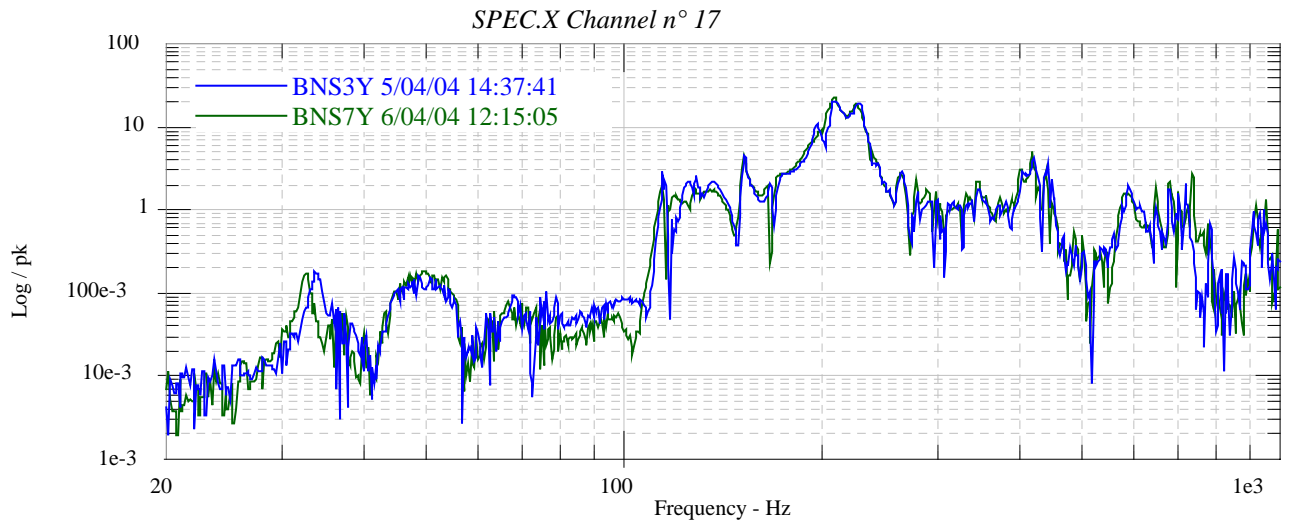
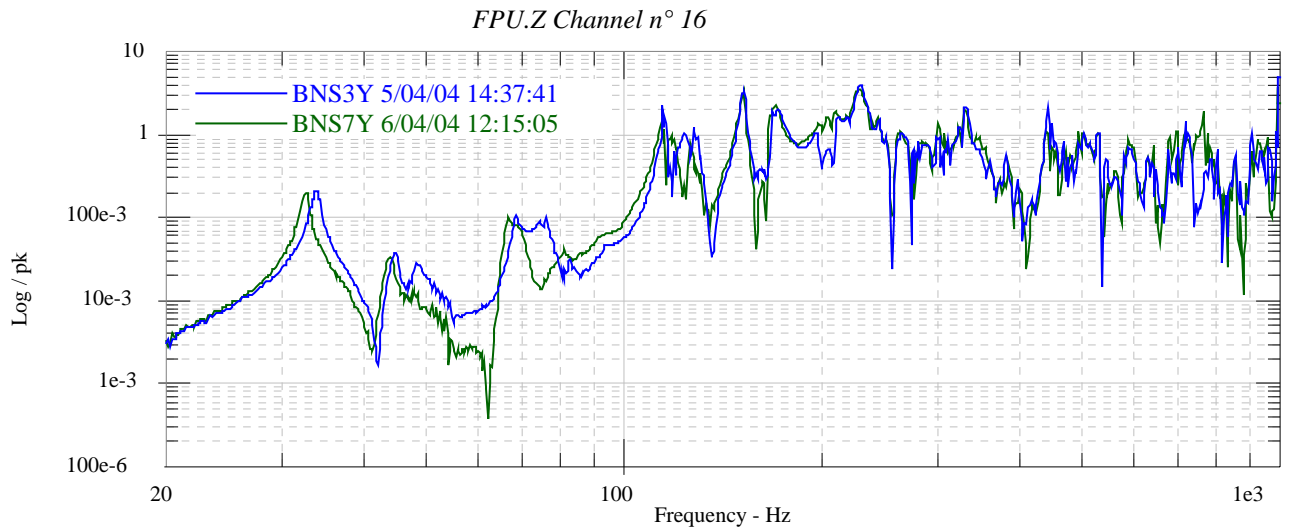


FPU.Y Channel n° 15



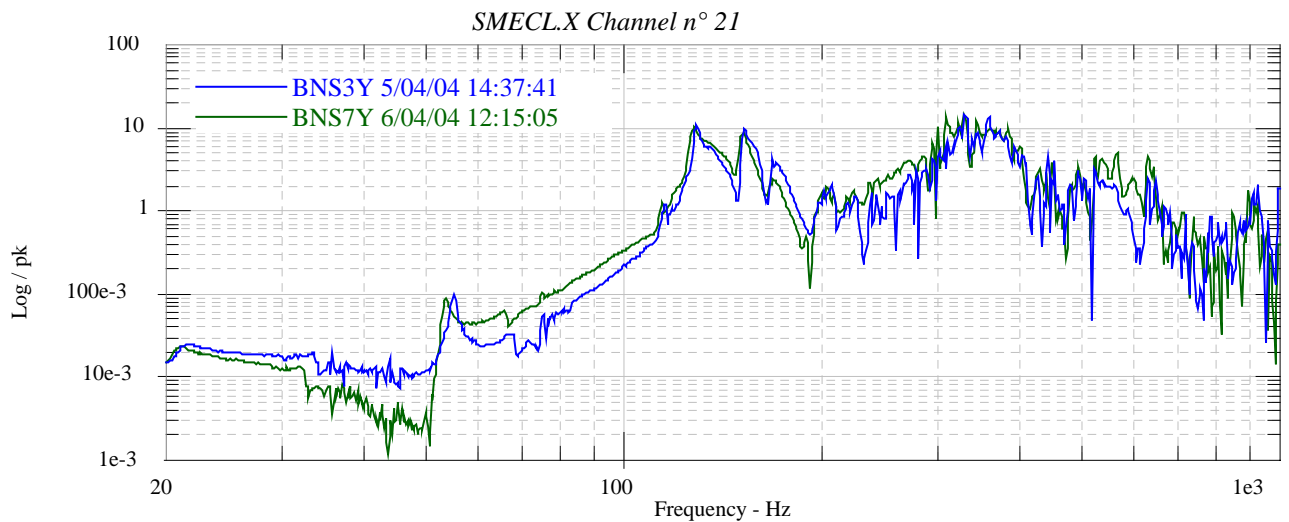
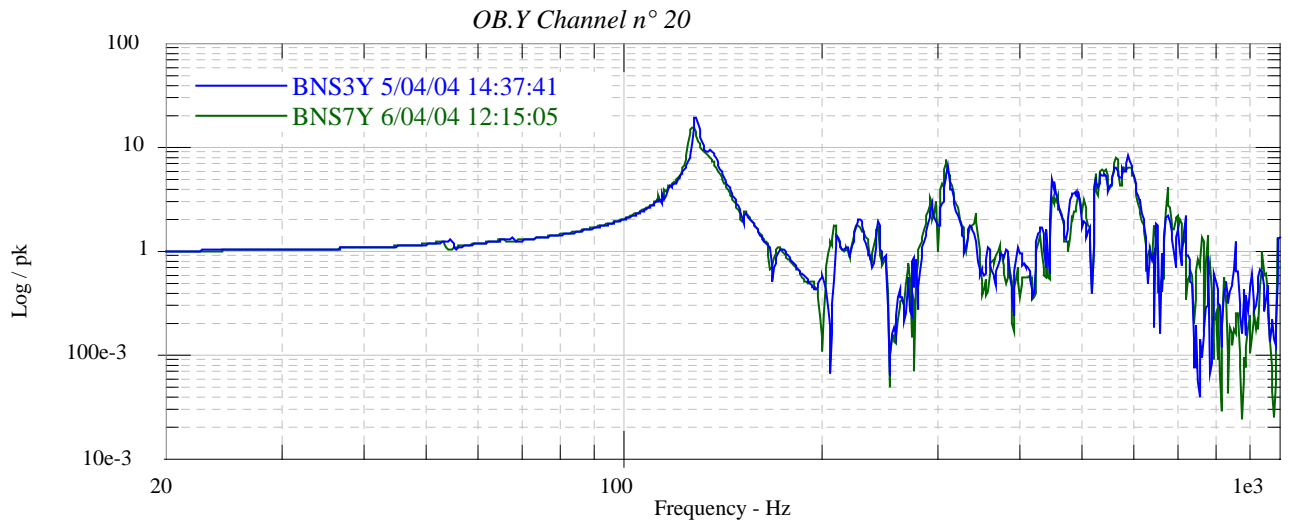
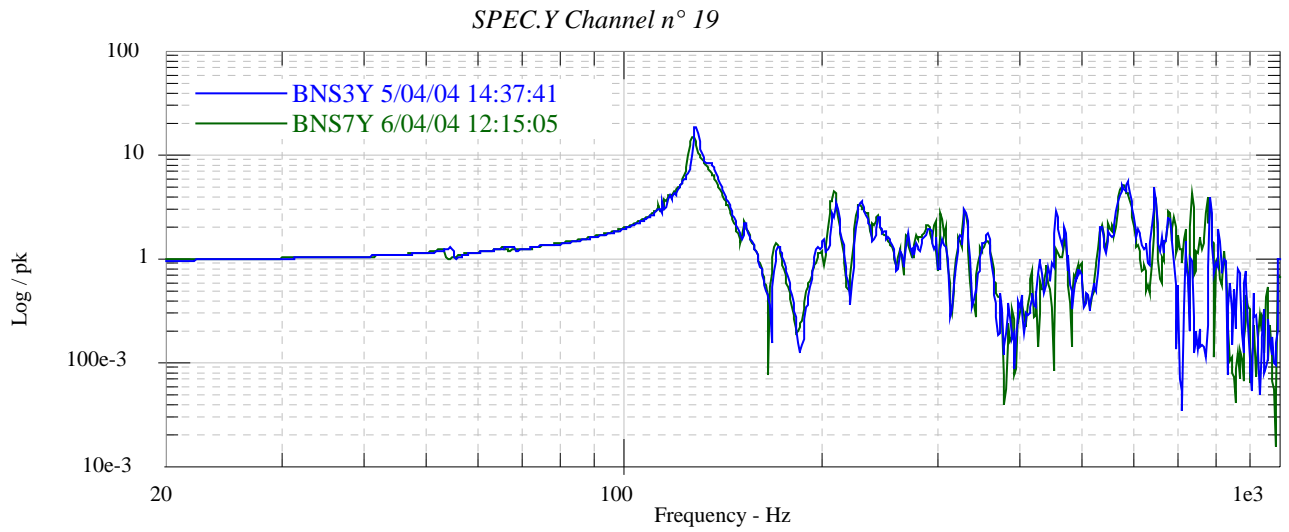
VIBRATION TEST REPORT
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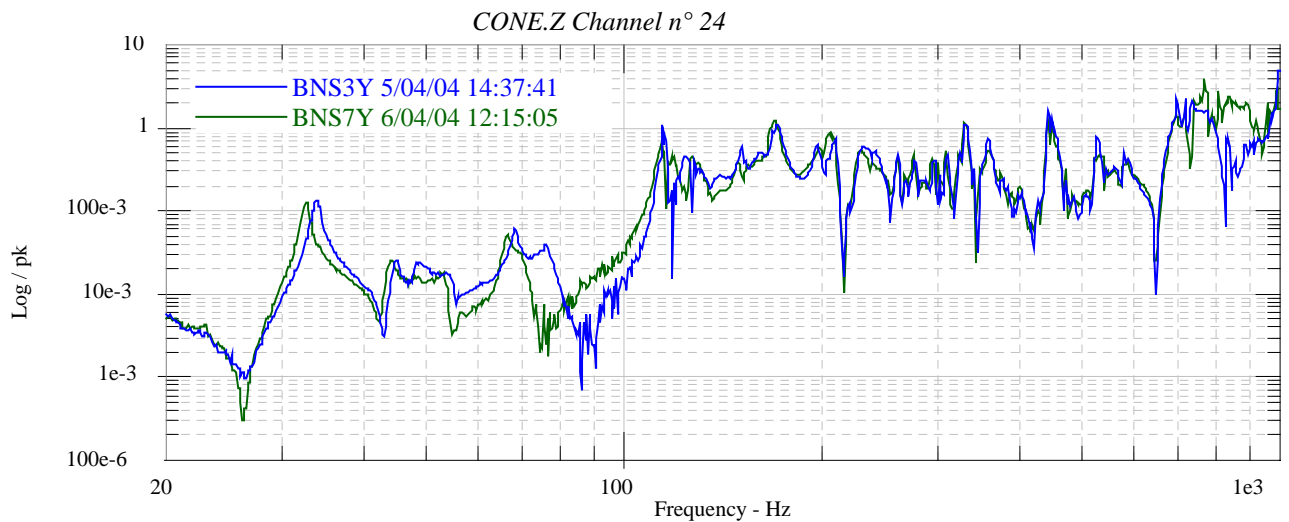
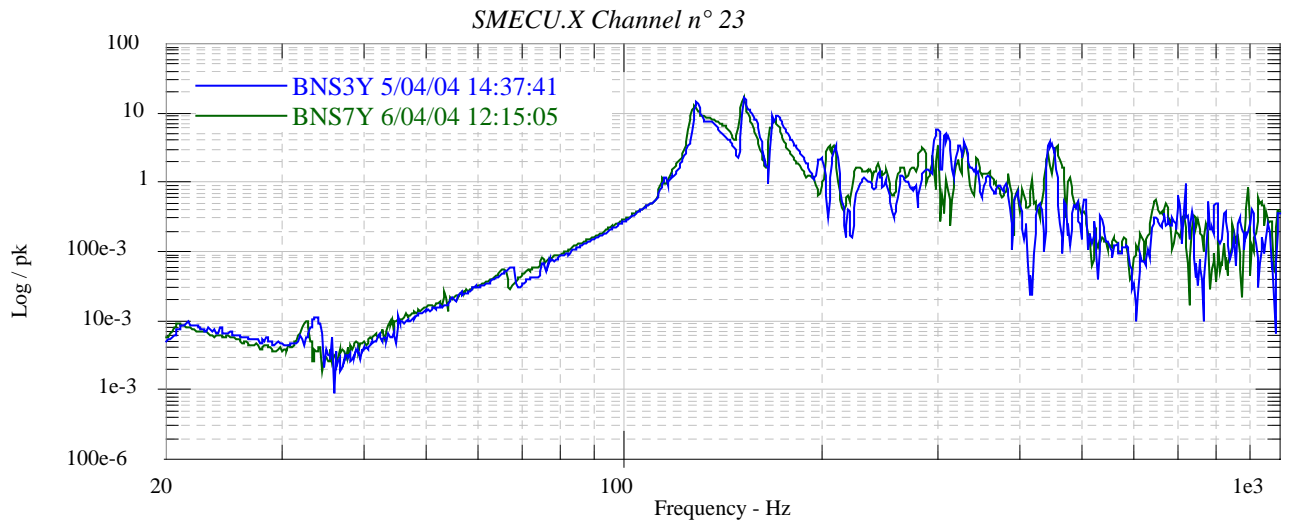
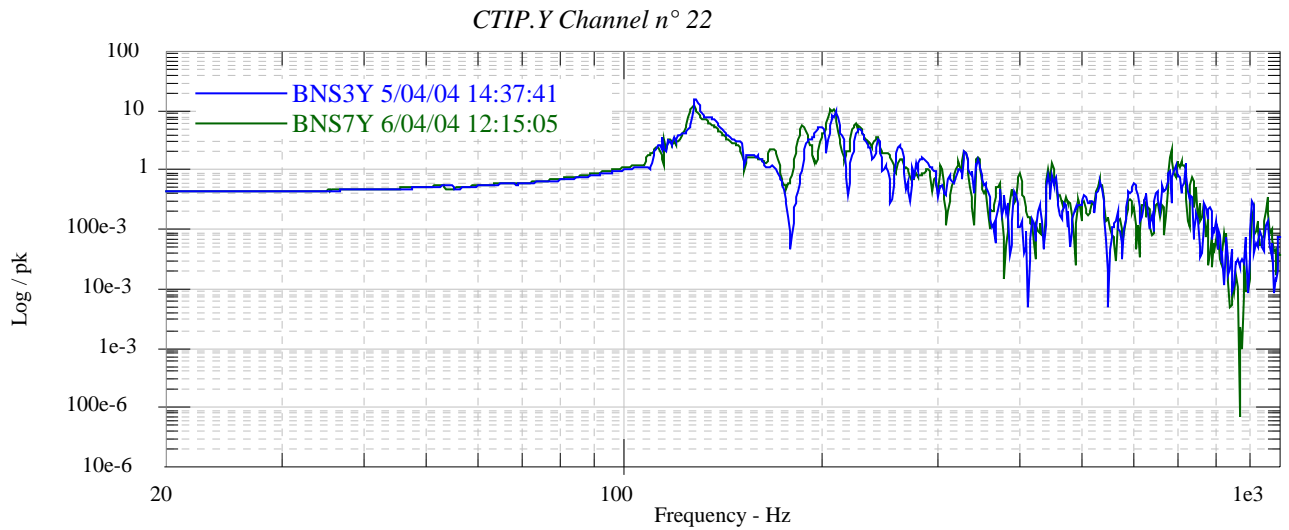
VIBRATION TEST REPORT
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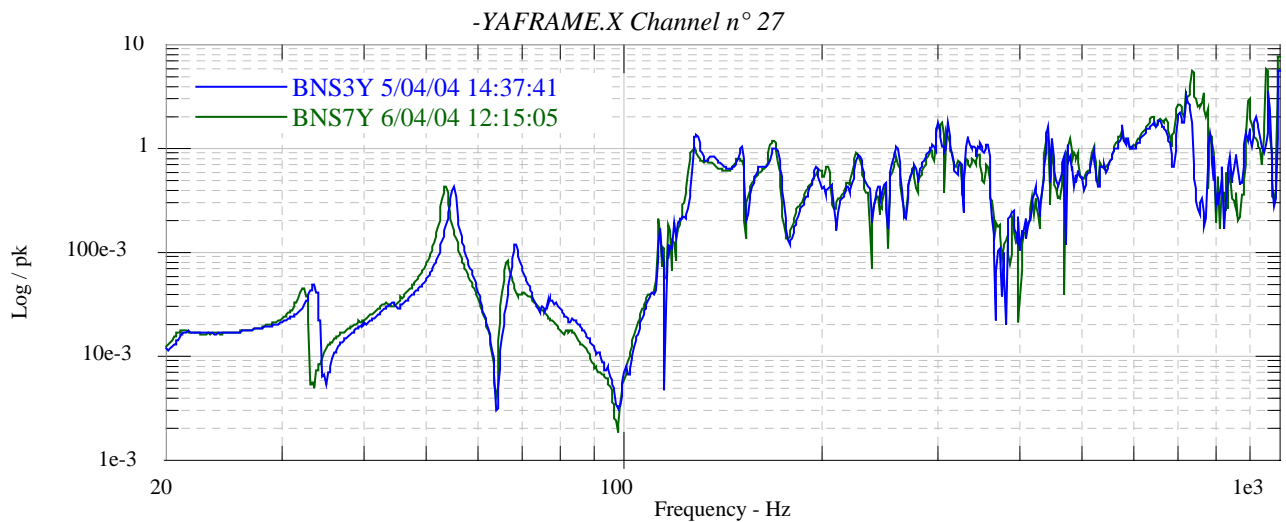
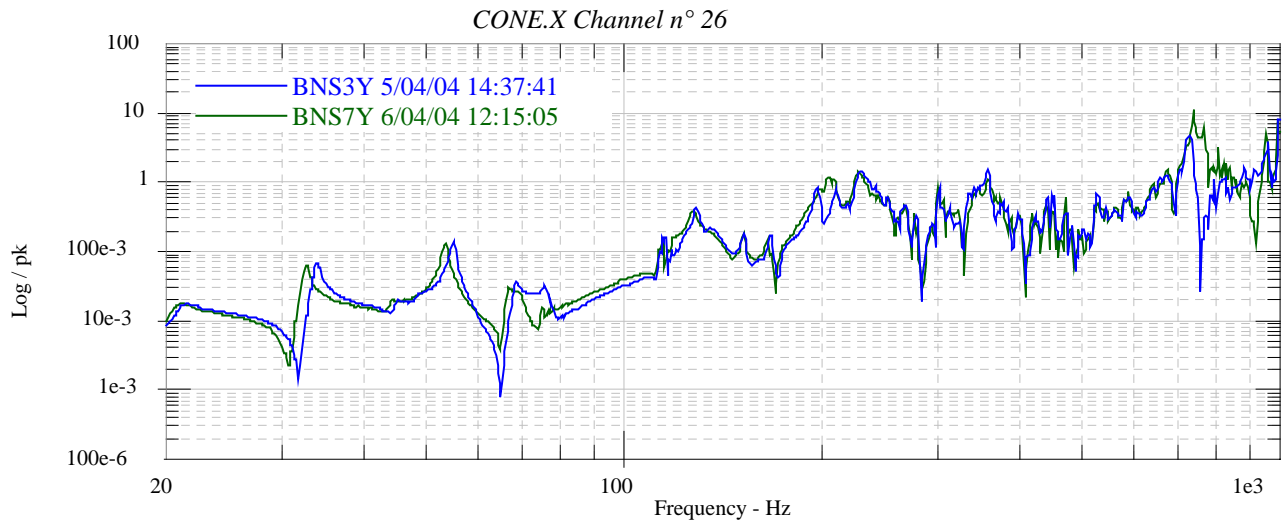
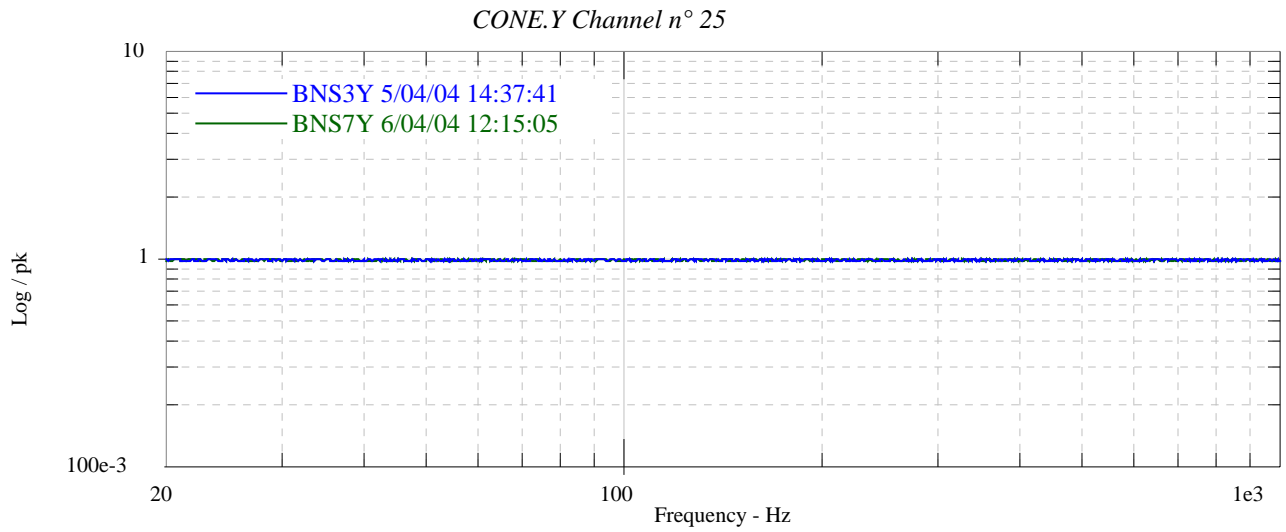
VIBRATION TEST REPORT
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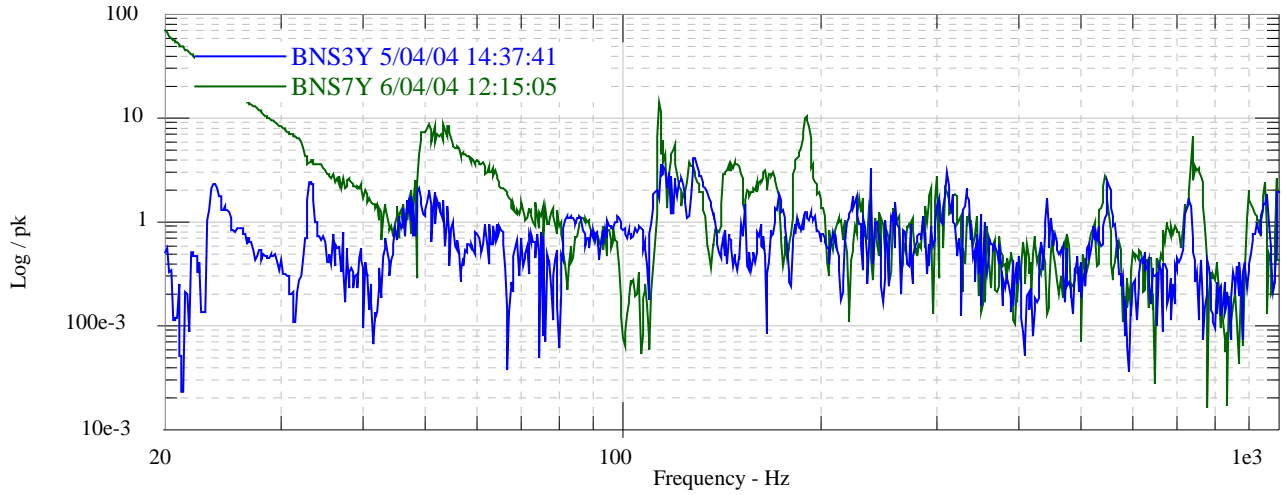
RP-CSL-CRYOV-04001
Version : 01
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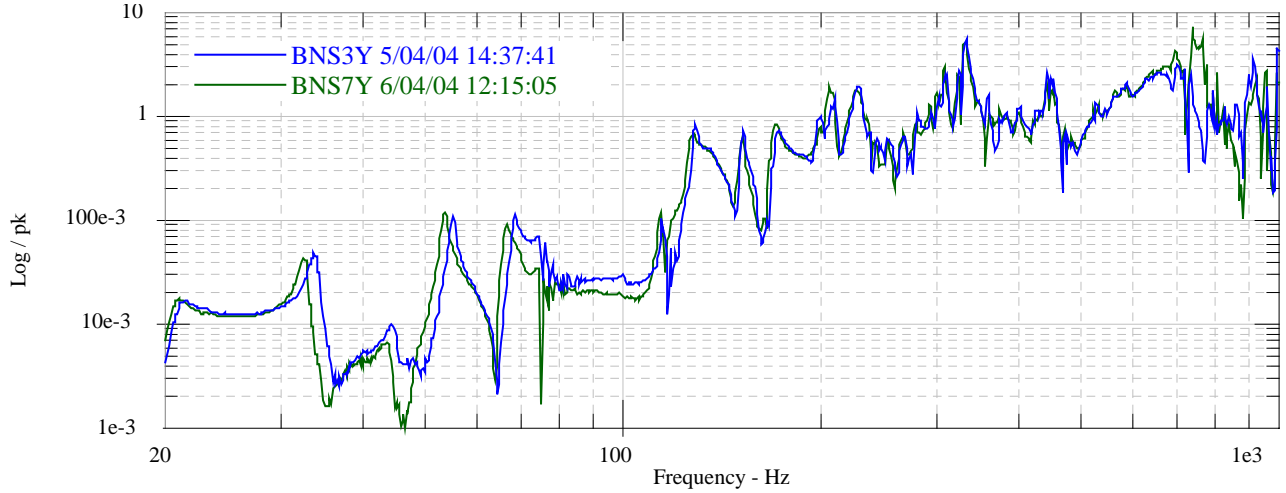
VIBRATION TEST REPORT
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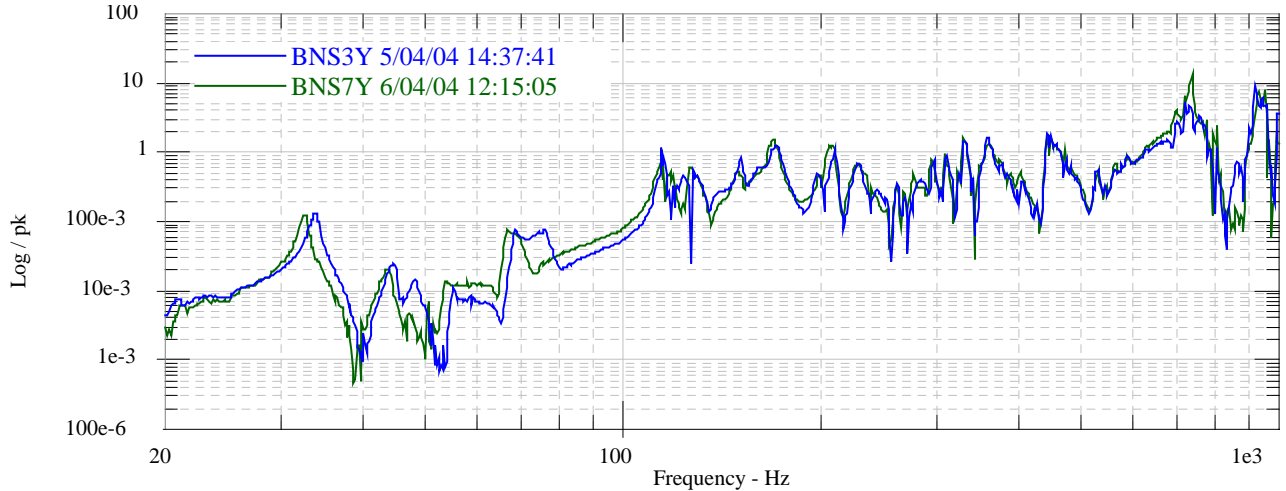
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



VIBRATION TEST REPORT
SPIRE QM

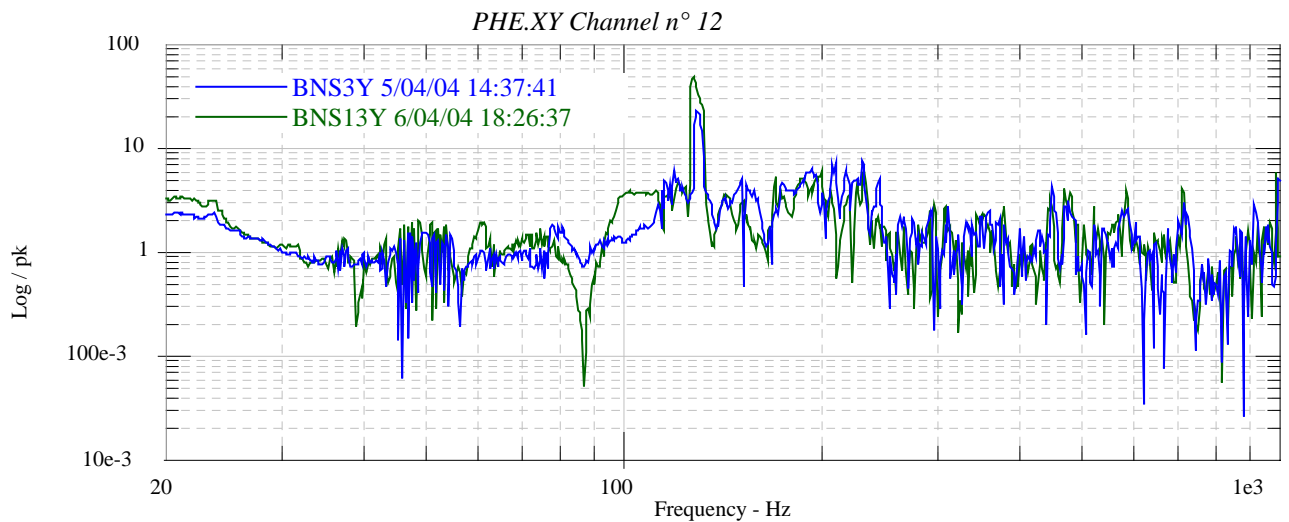
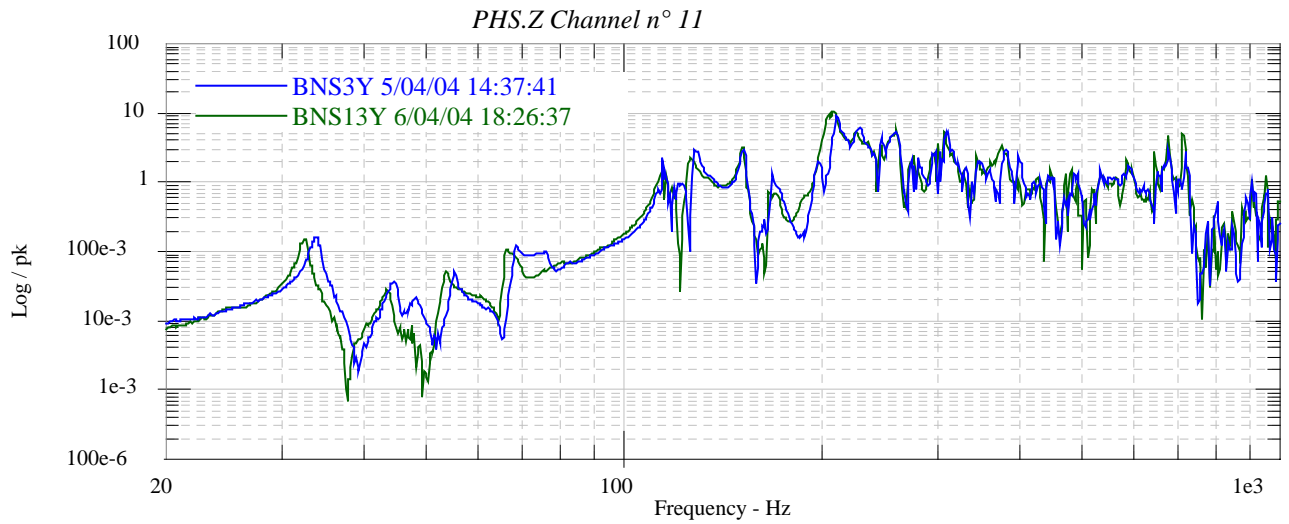
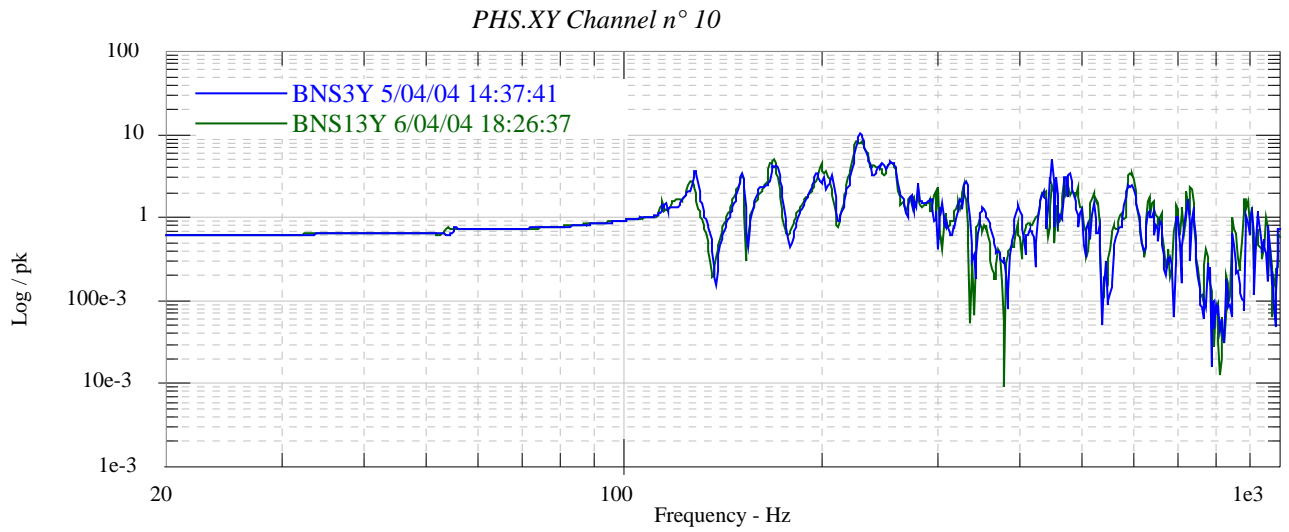
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12.15 Comparison BNS_Y transfer functions pre high level sine and post high level random.

H:\Users\J-S.Servaye\Cryovibrations\Rapports\SPIRE_QM\FT_BNS_Y_2.doc

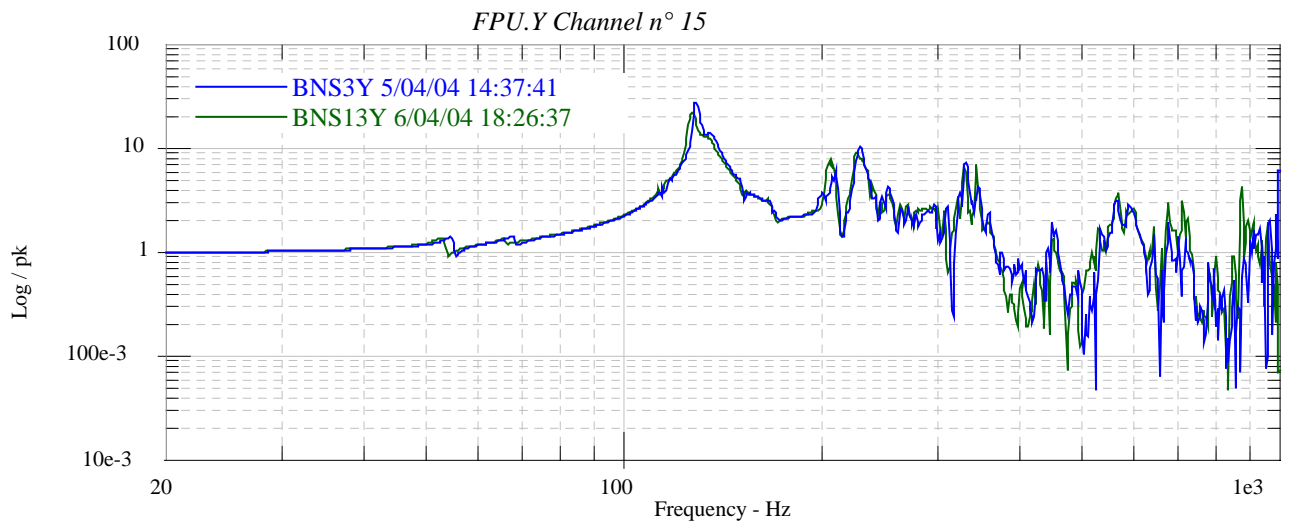
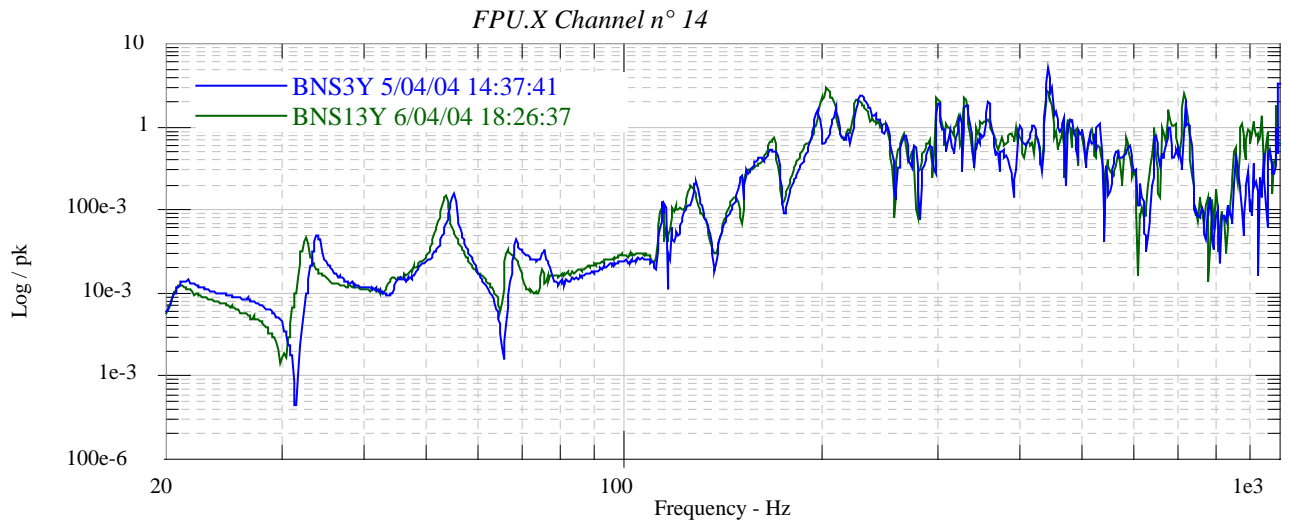
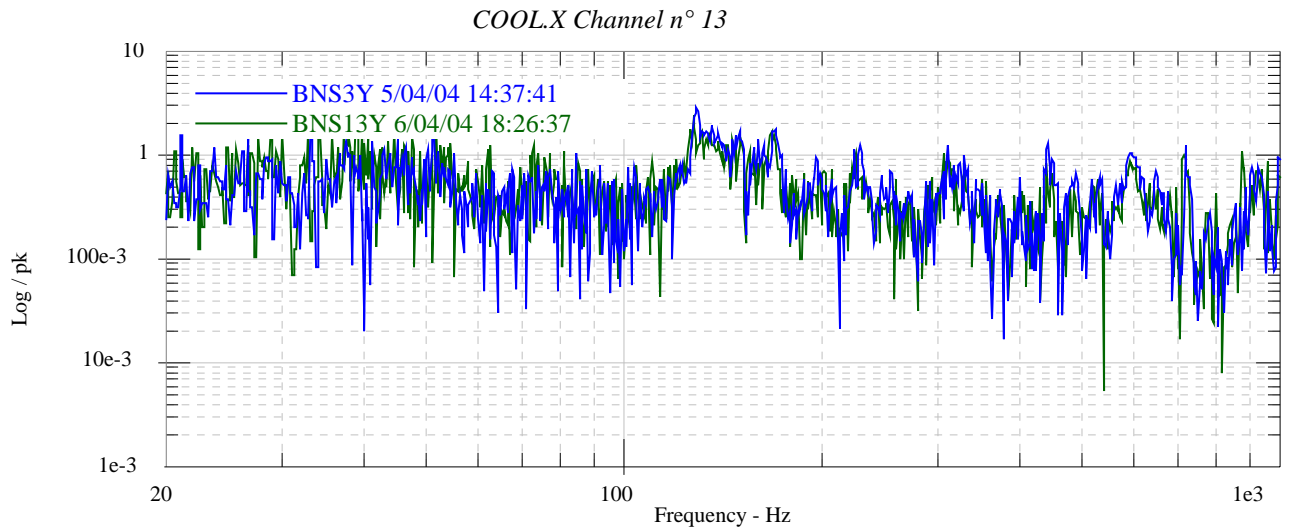
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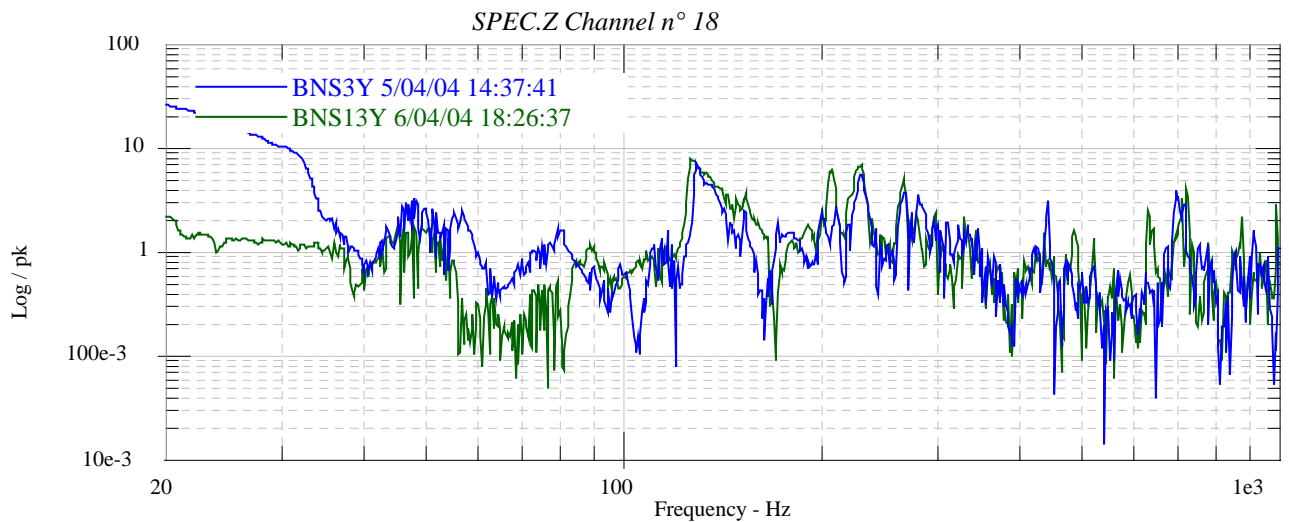
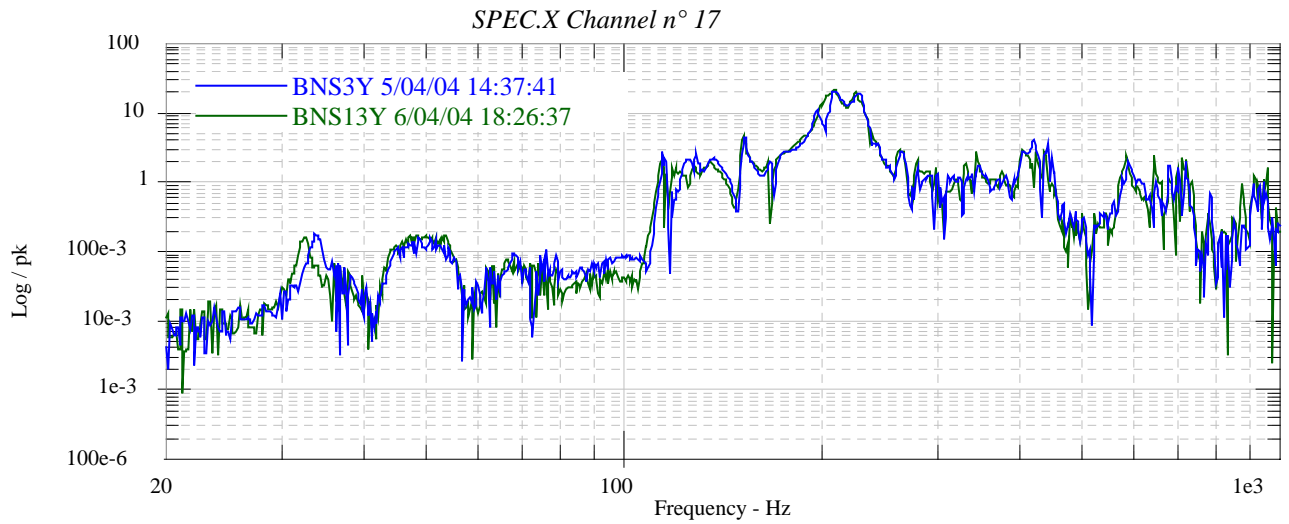
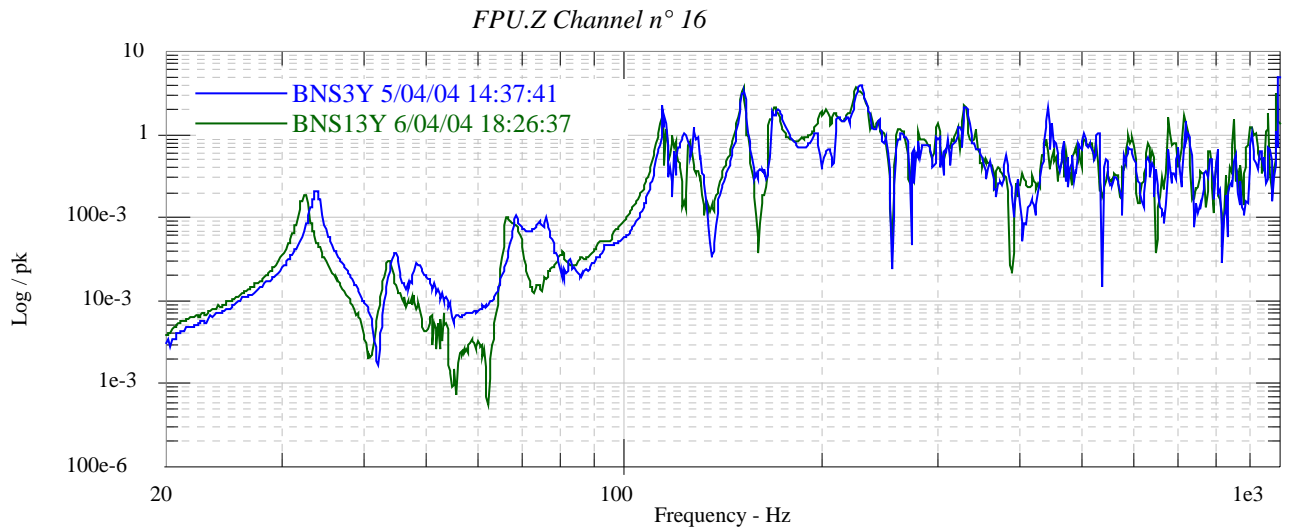
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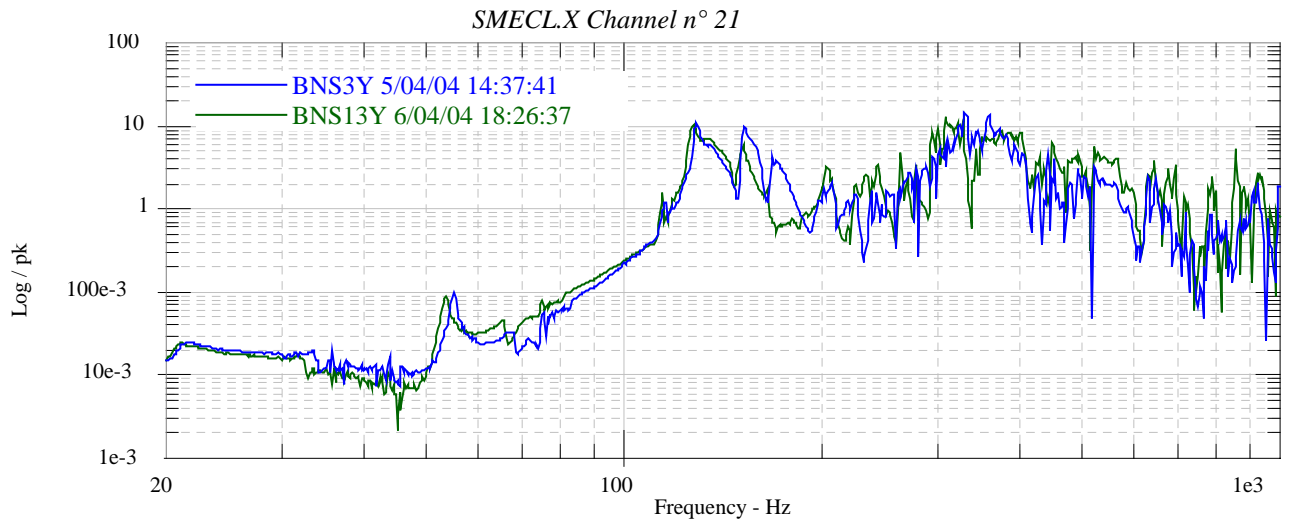
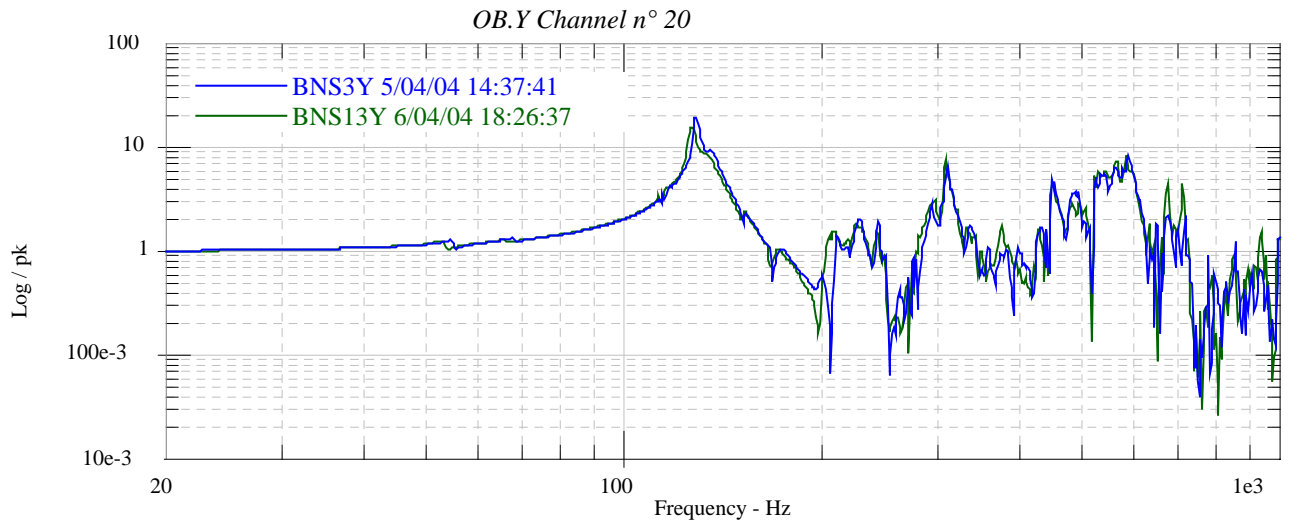
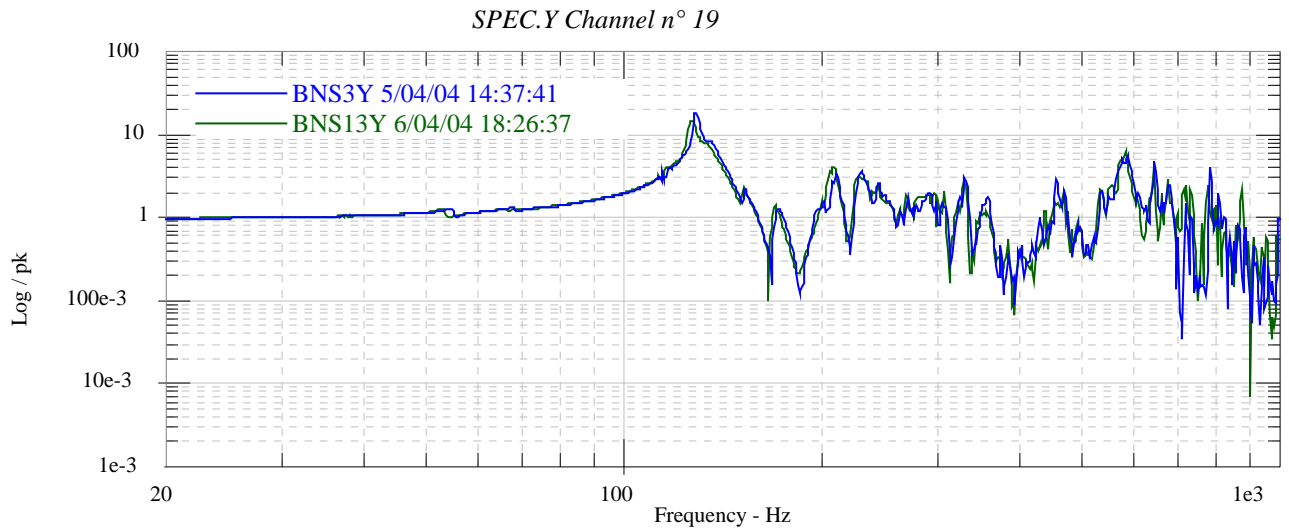
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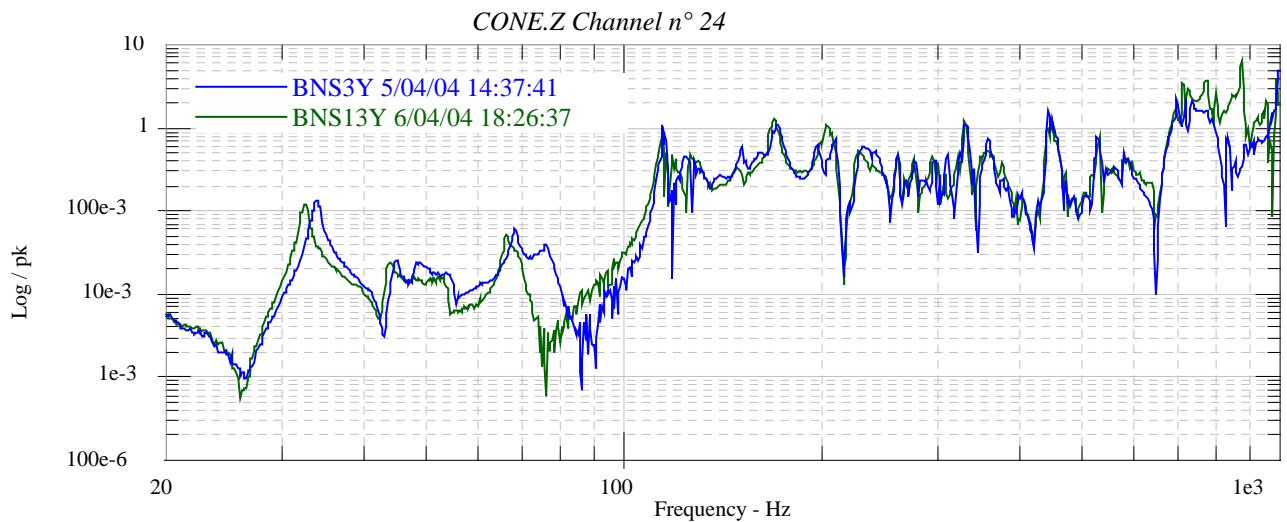
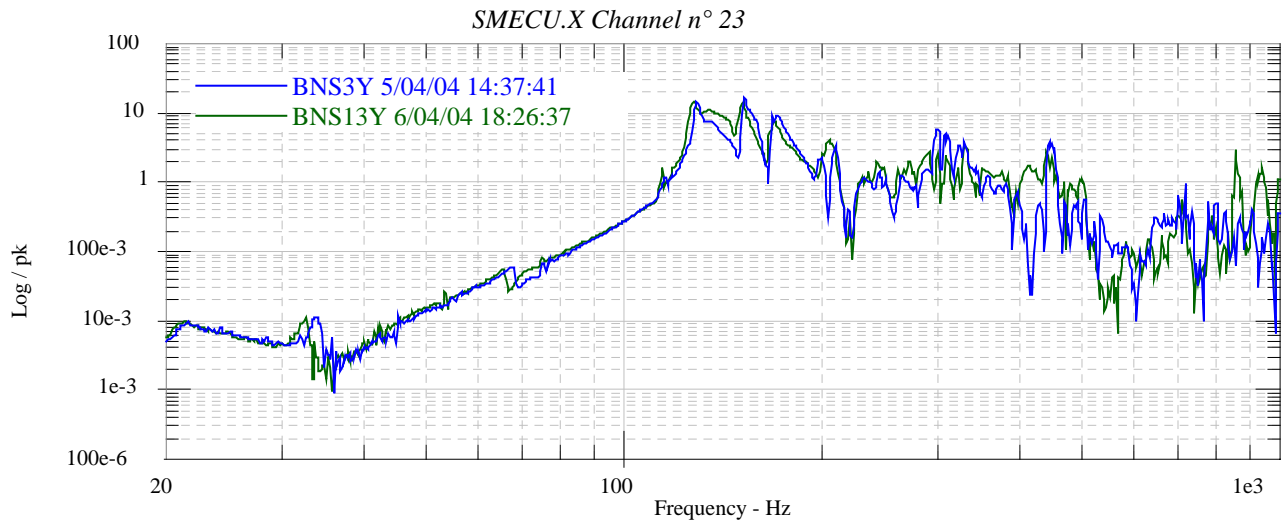
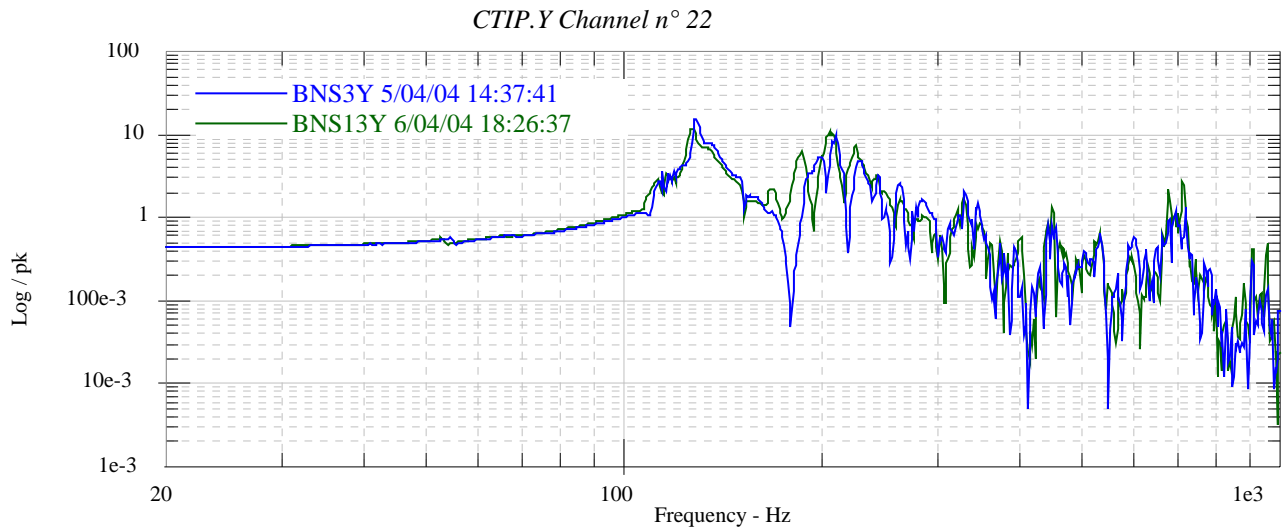
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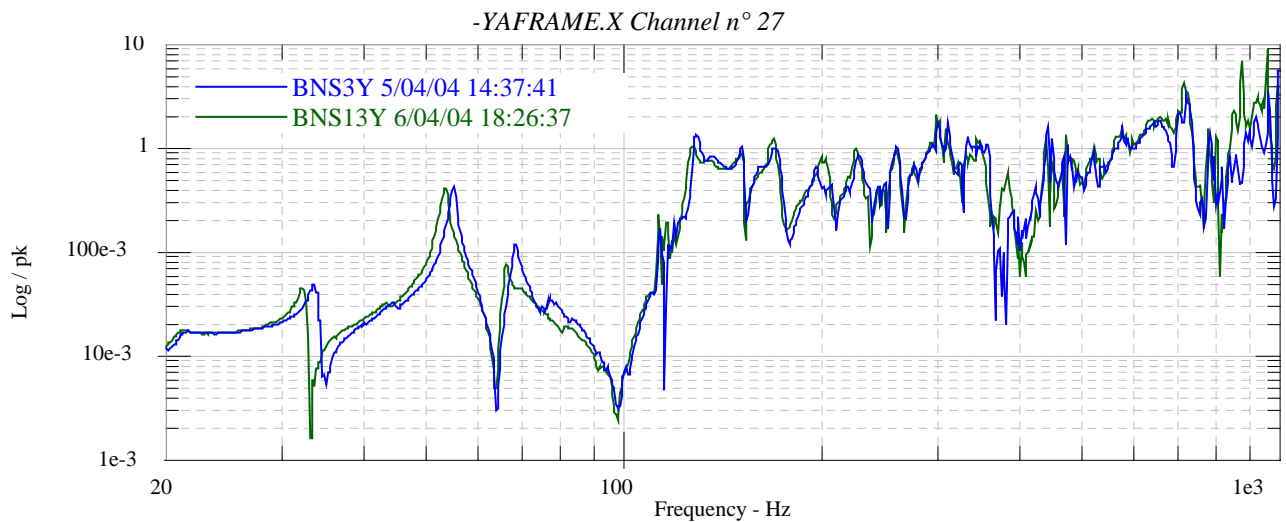
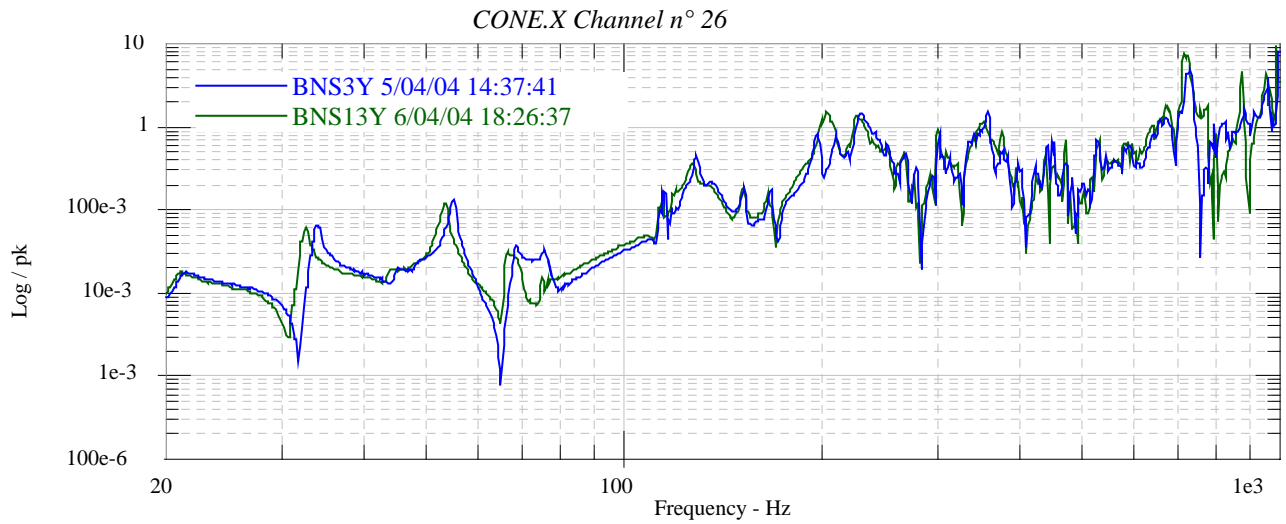
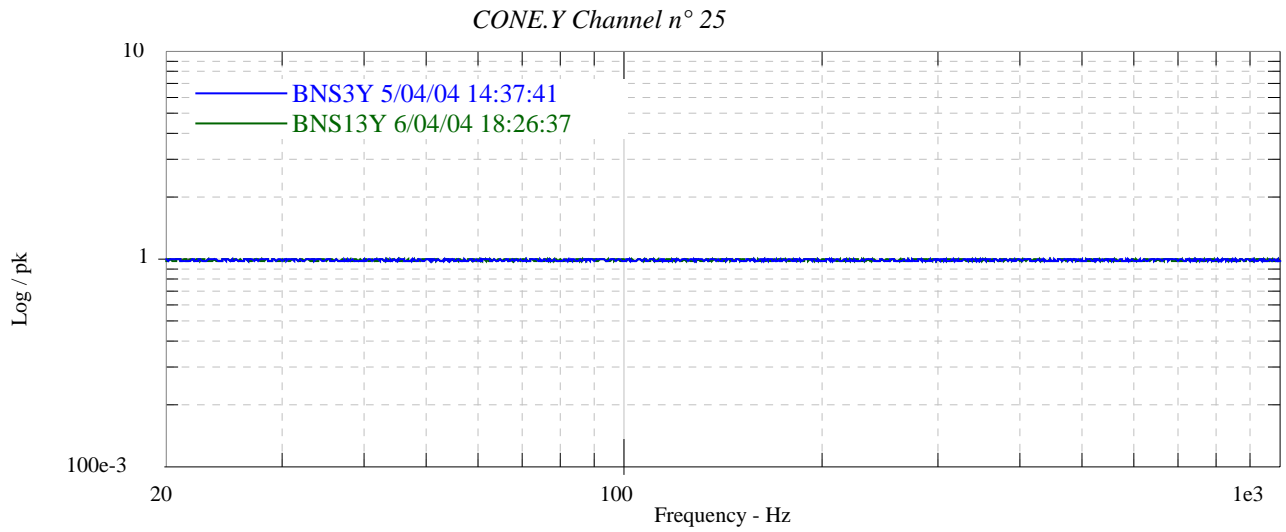
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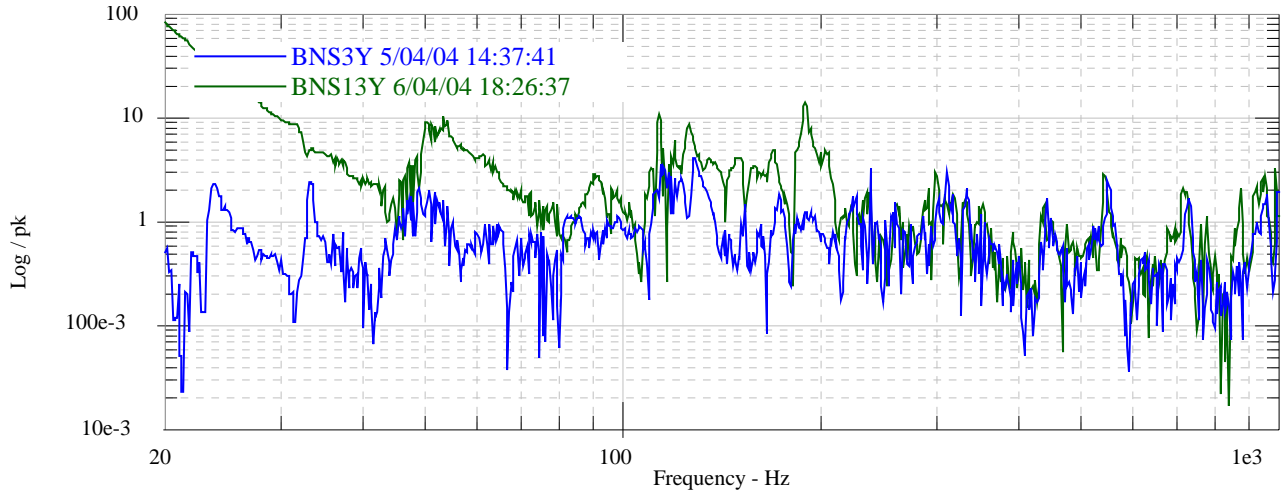
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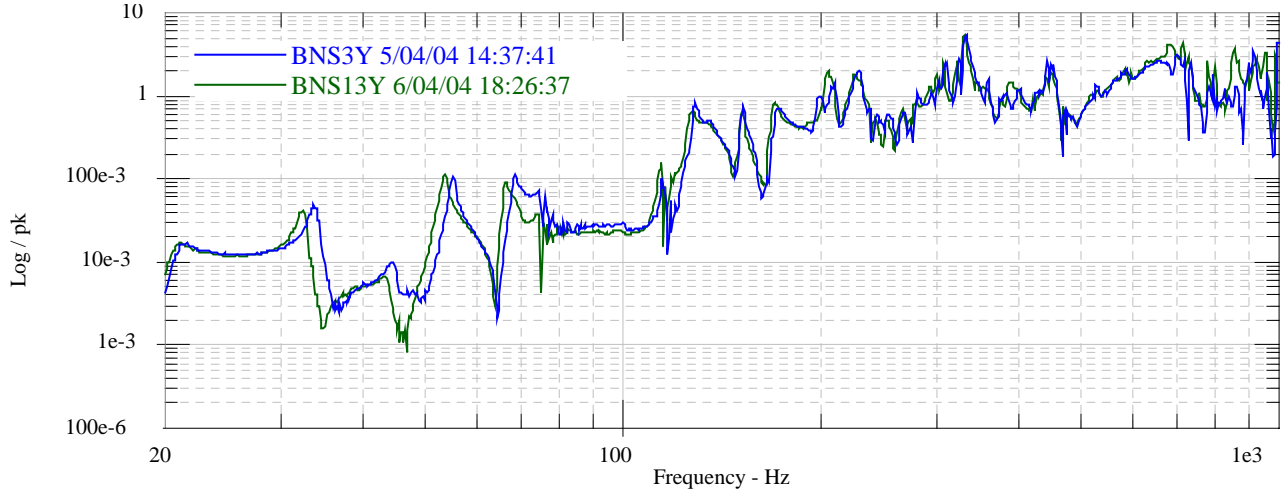
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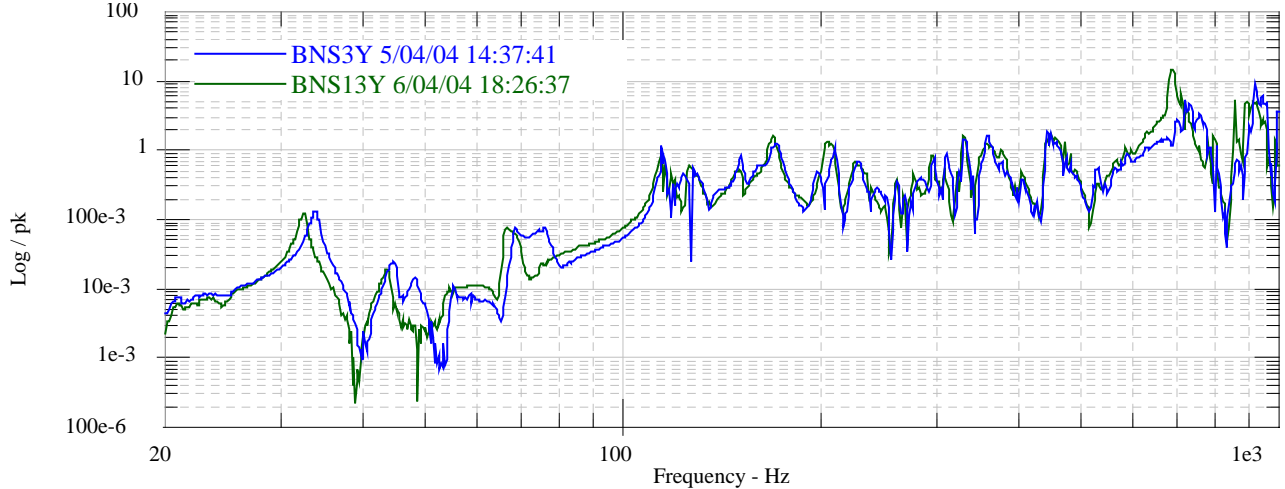
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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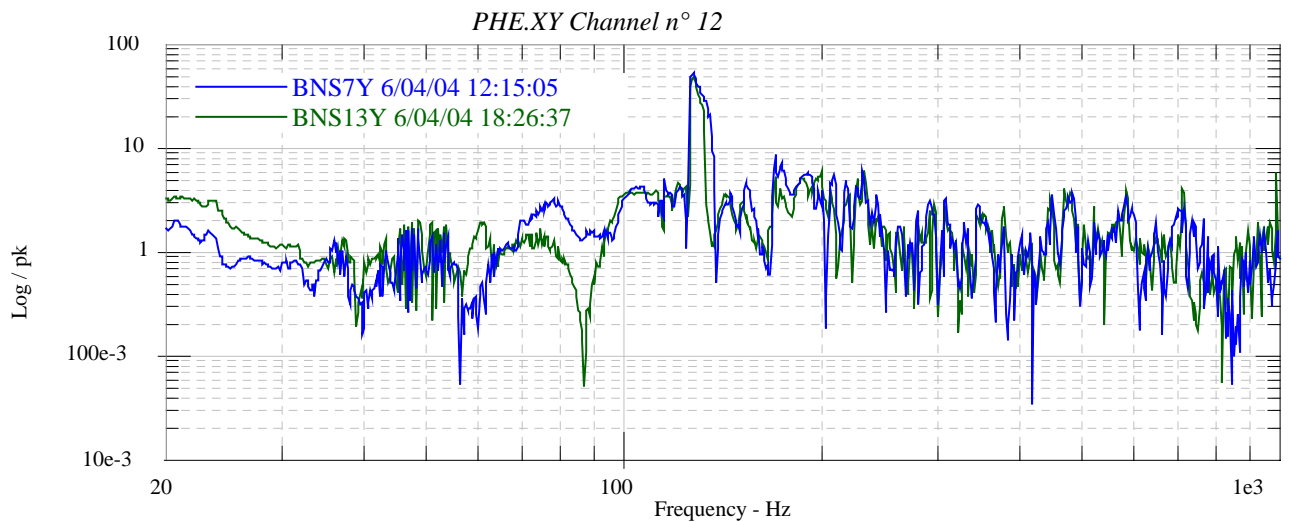
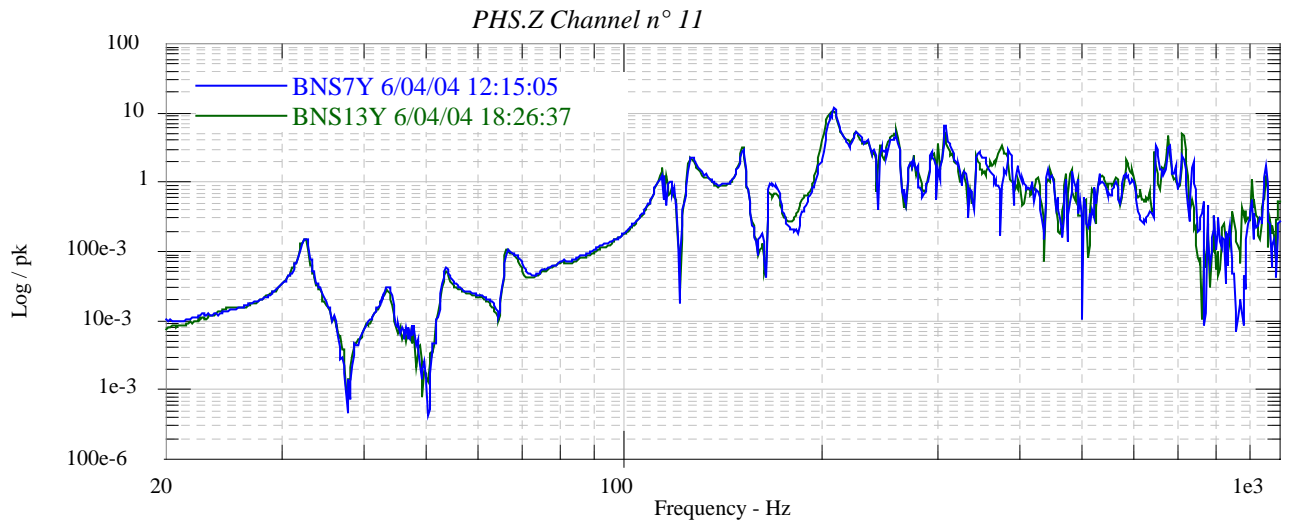
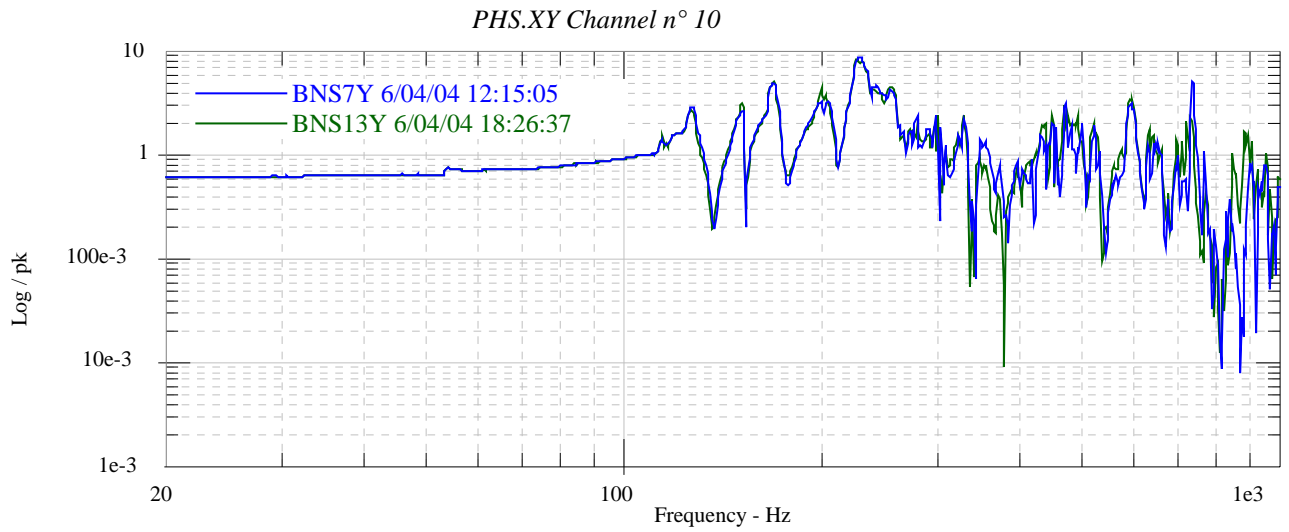
RP-CSL-CRYOV-04001
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12.16 Comparison BNS_Y transfer functions pre and post high level random.

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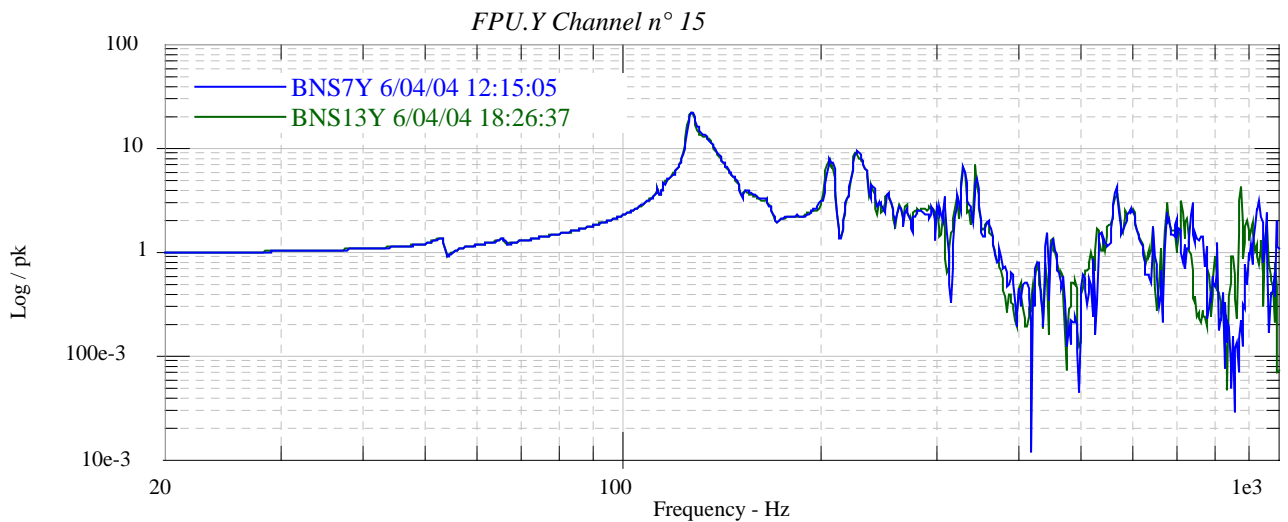
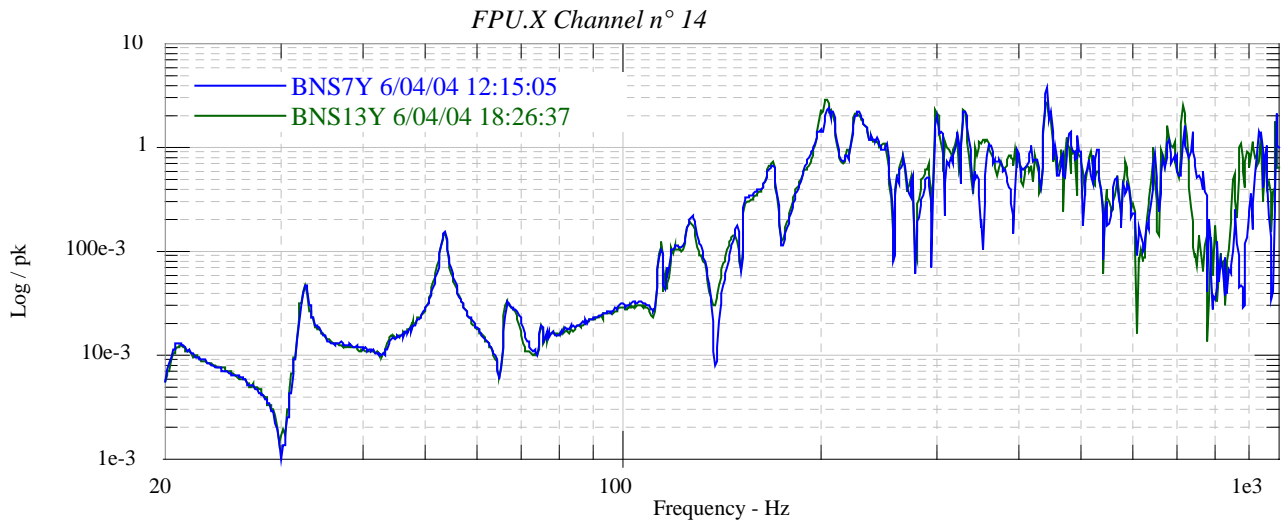
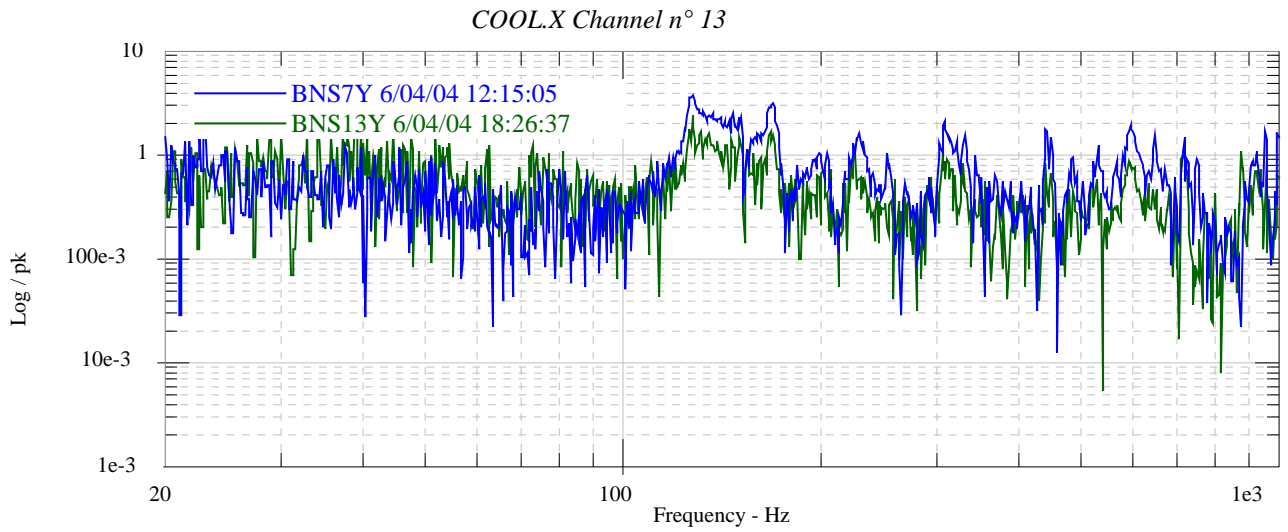
VIBRATION TEST REPORT
SPIRE QM

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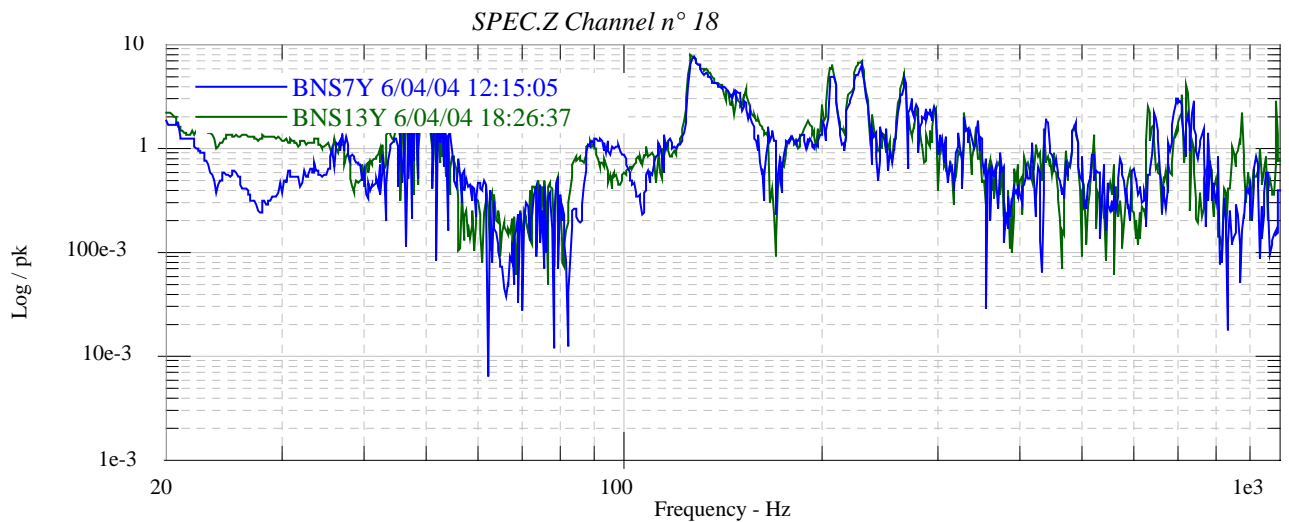
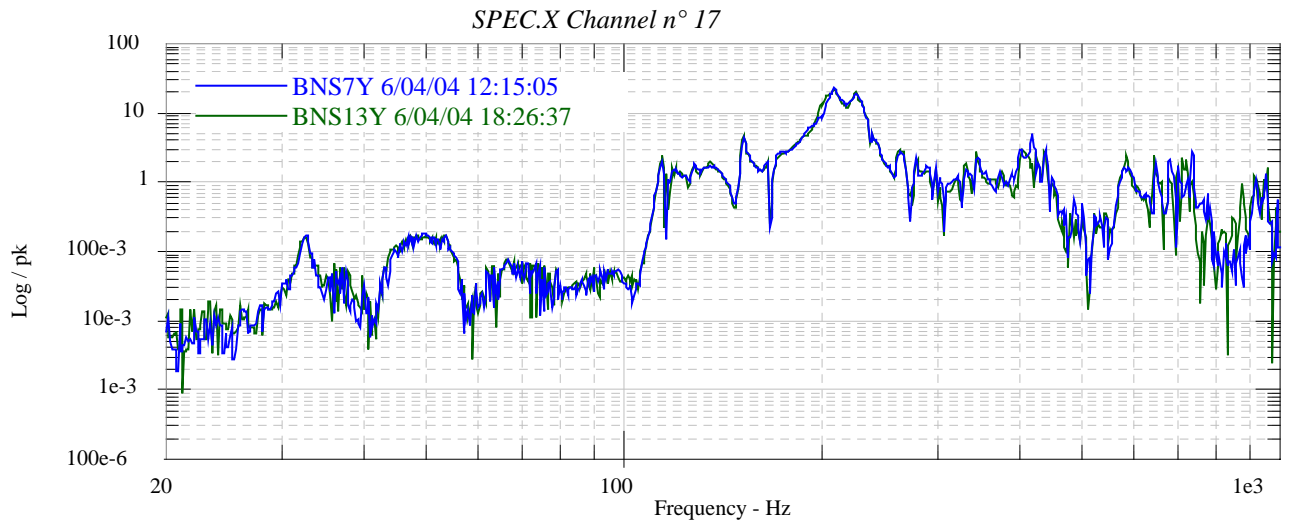
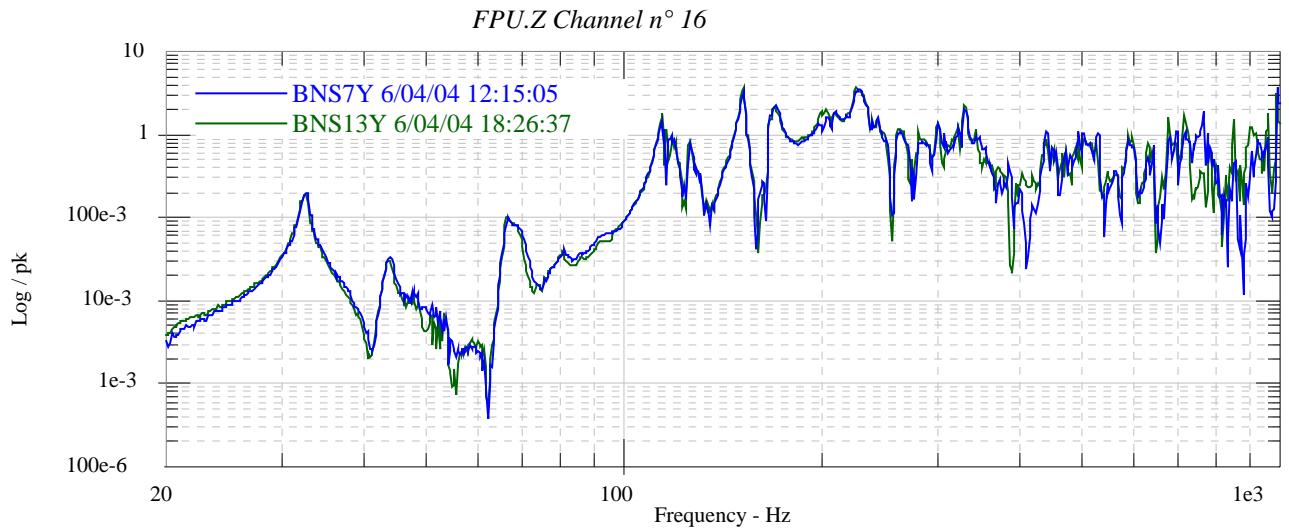
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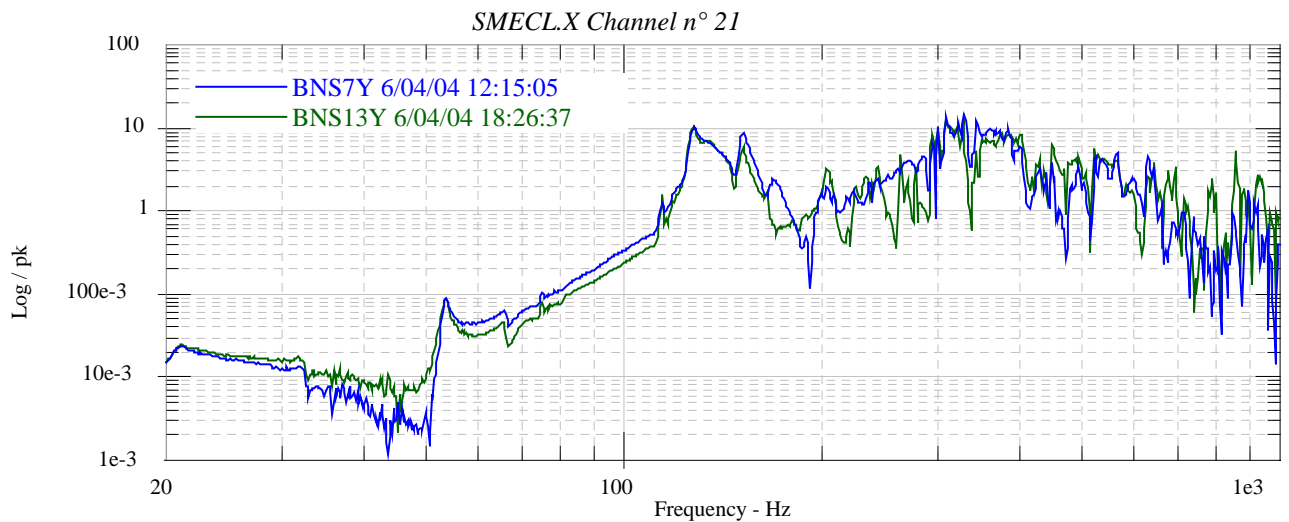
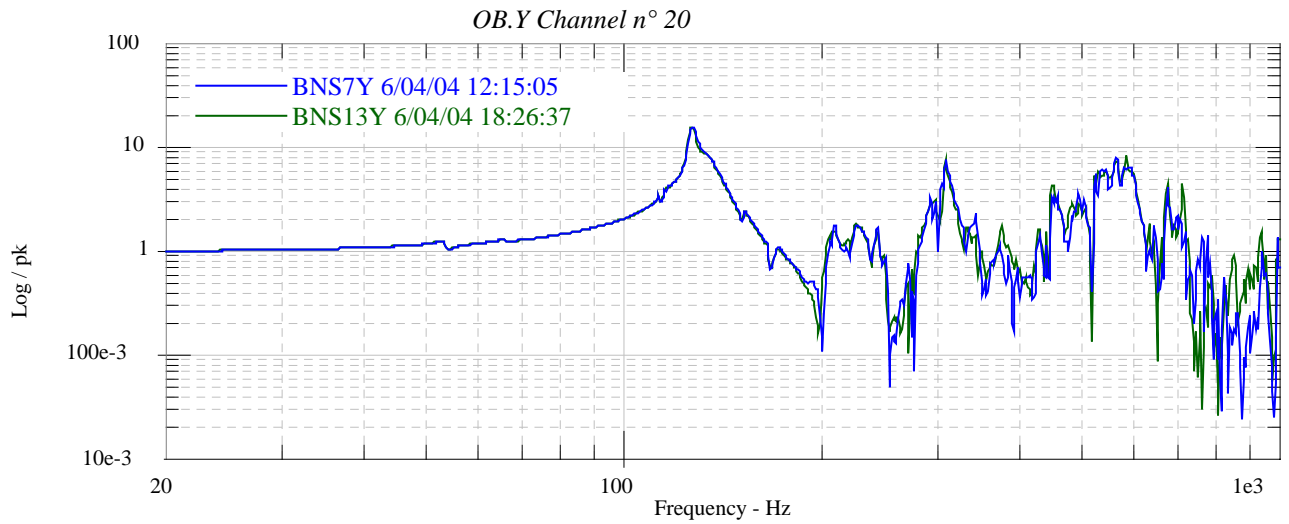
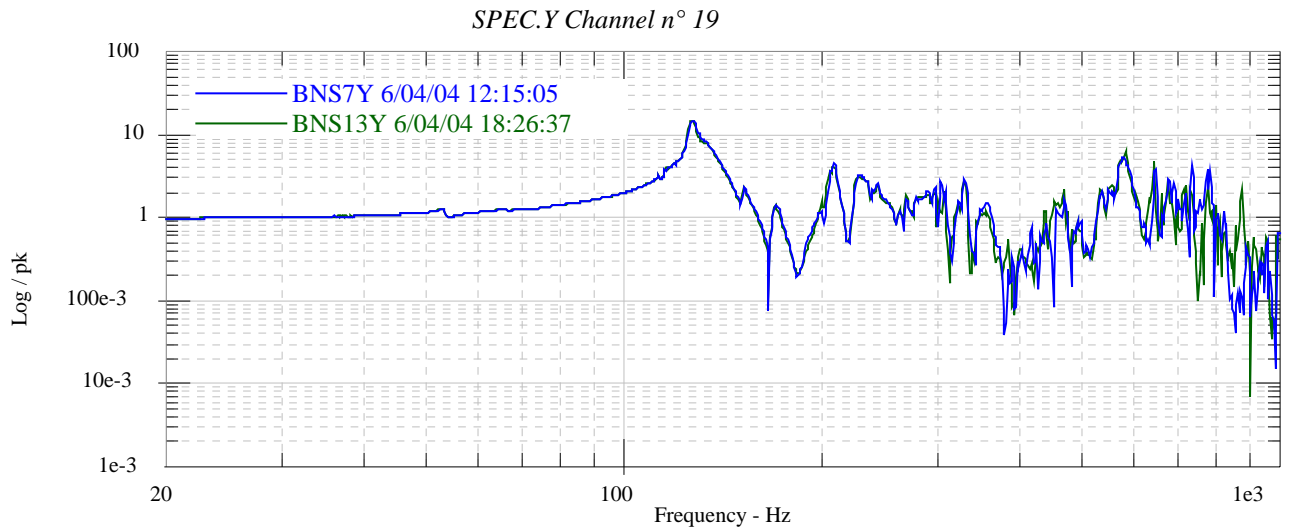
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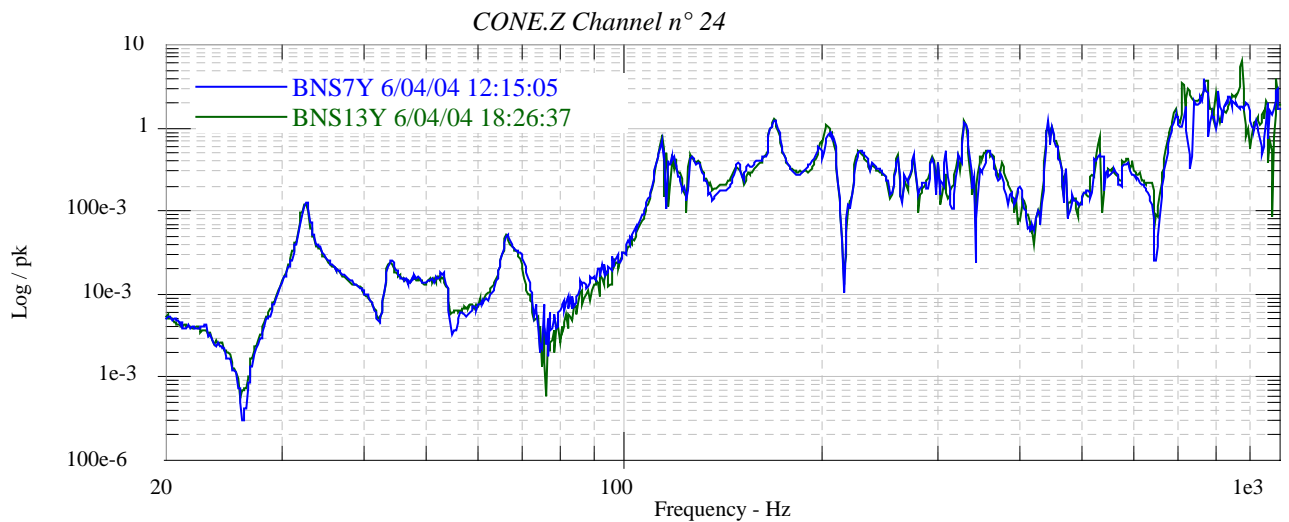
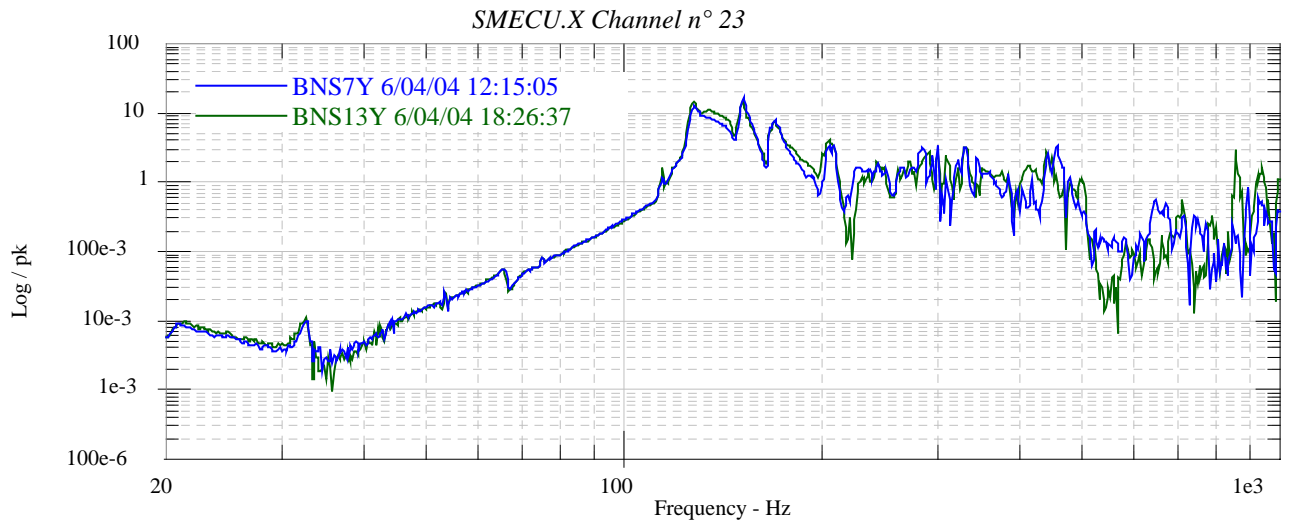
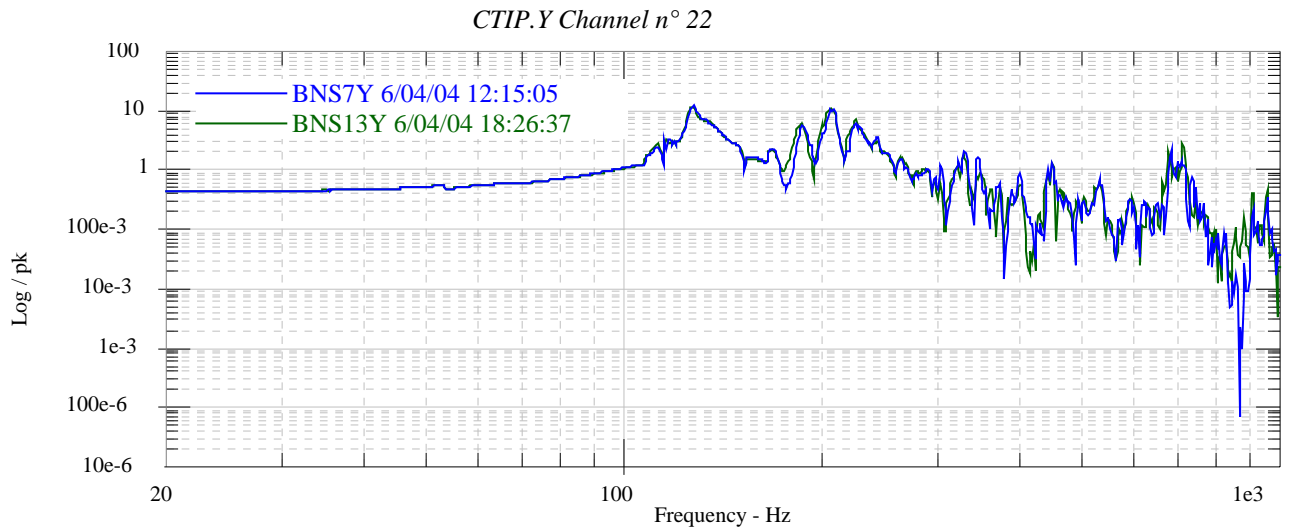
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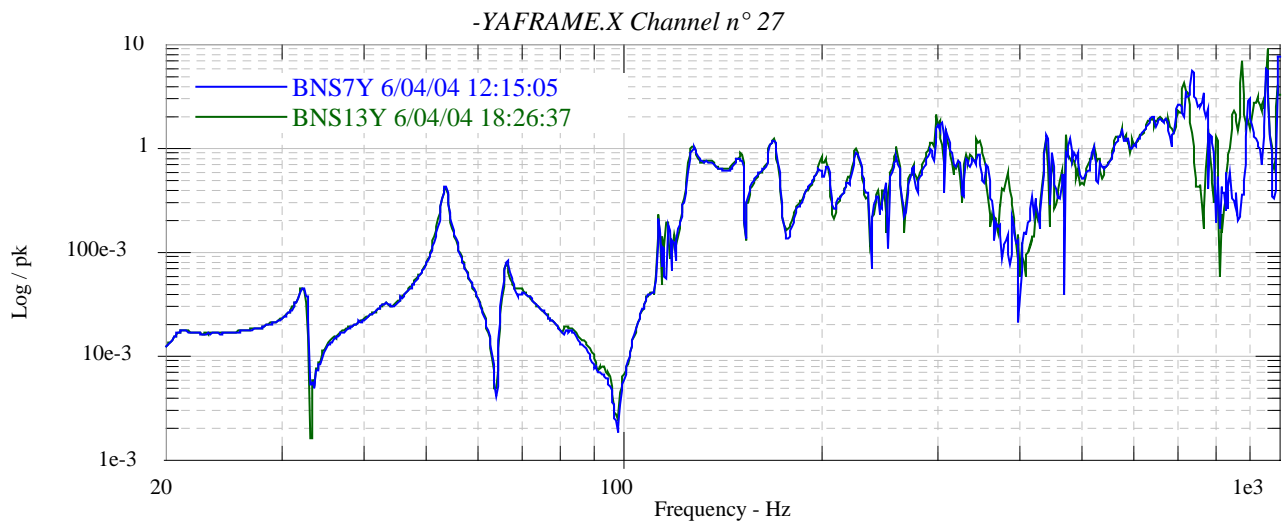
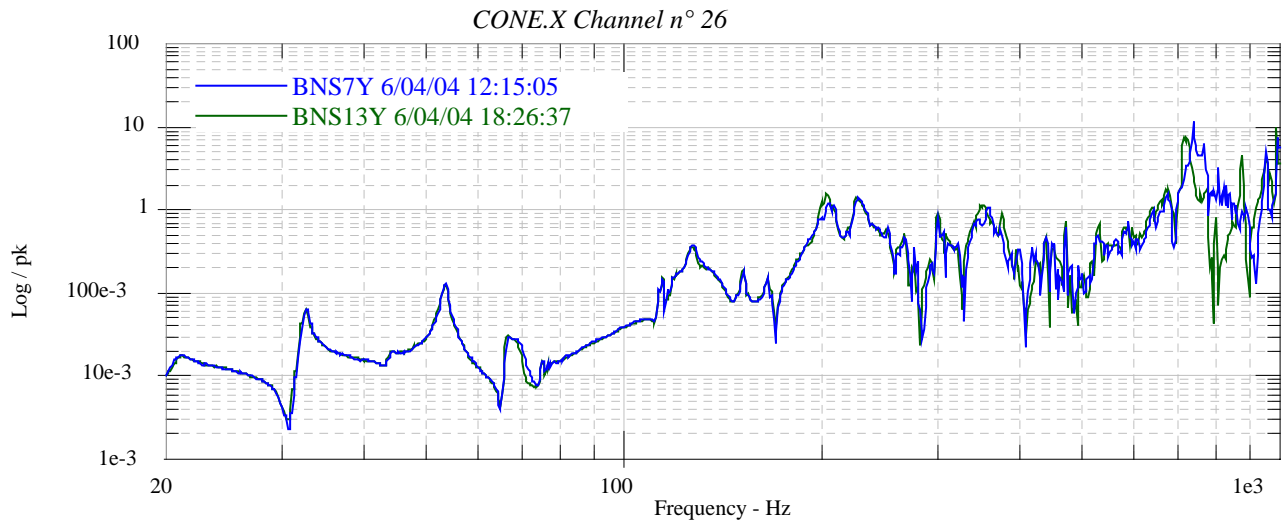
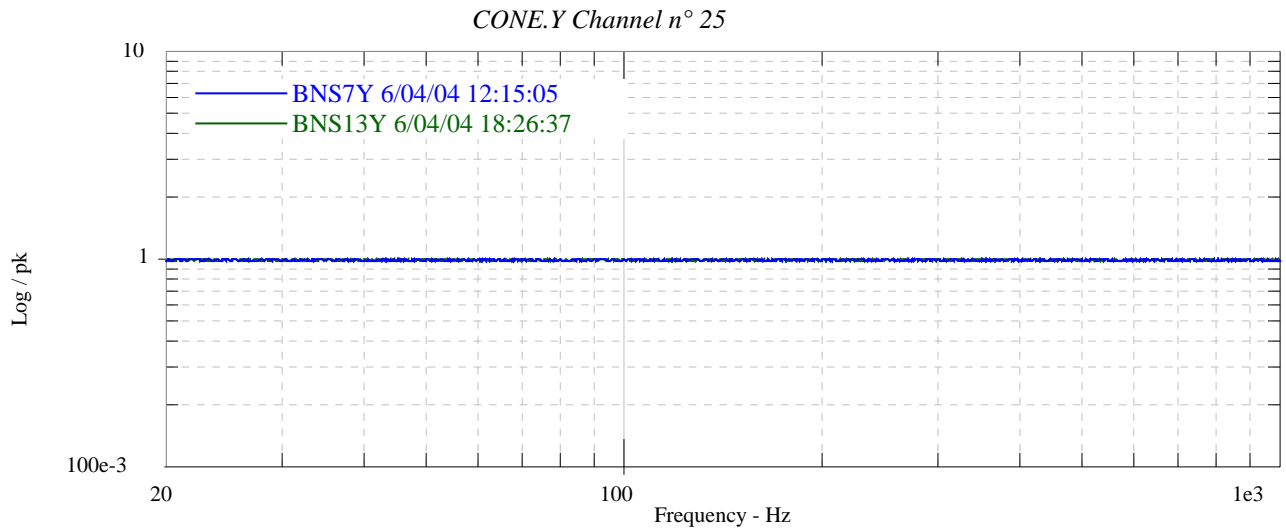
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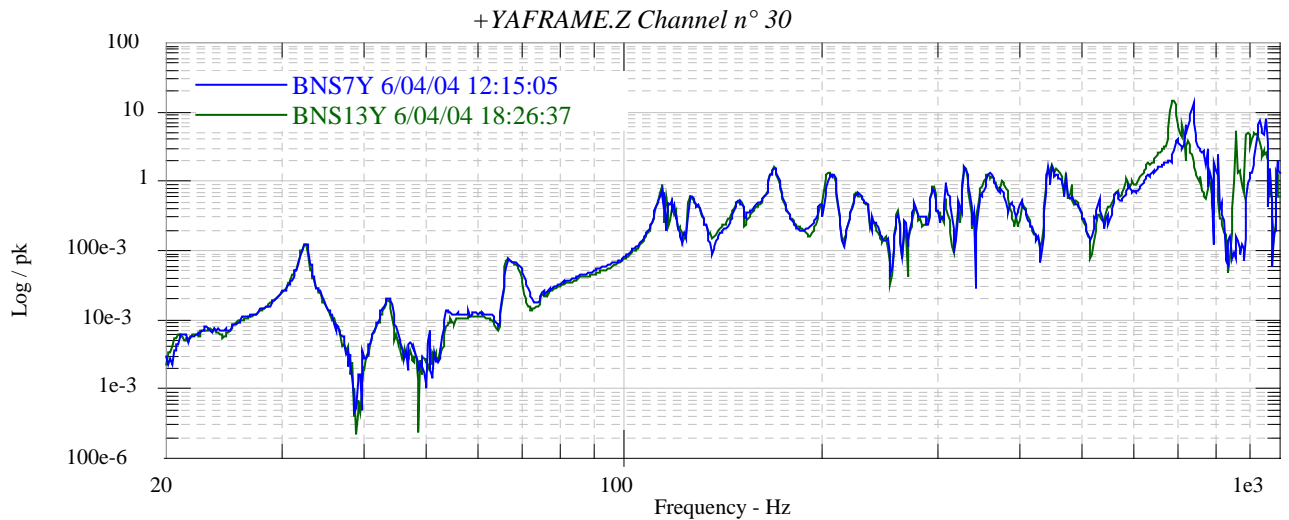
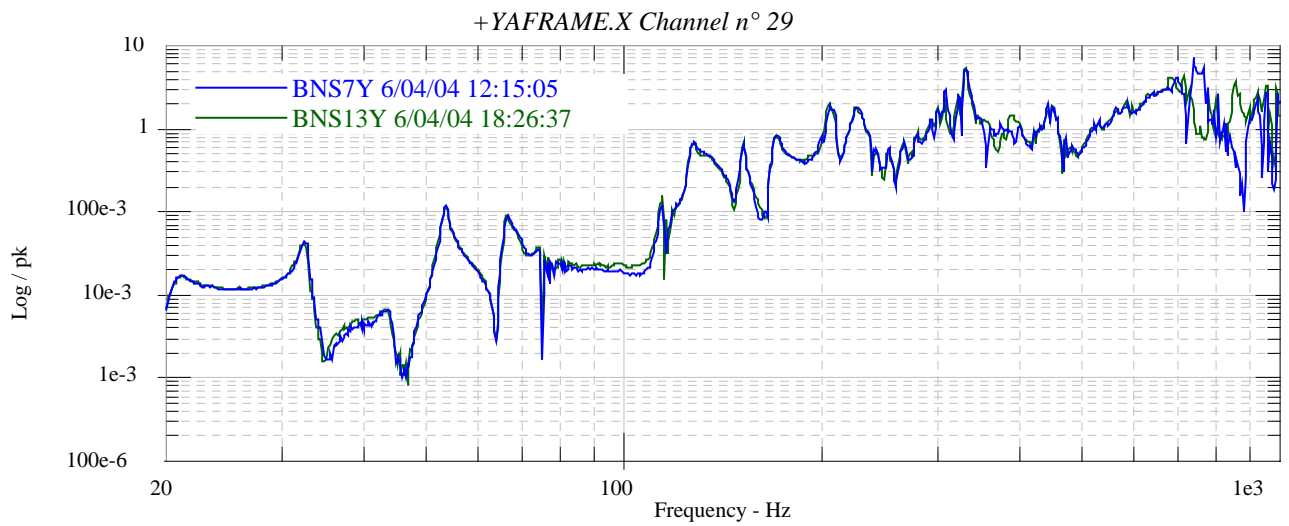
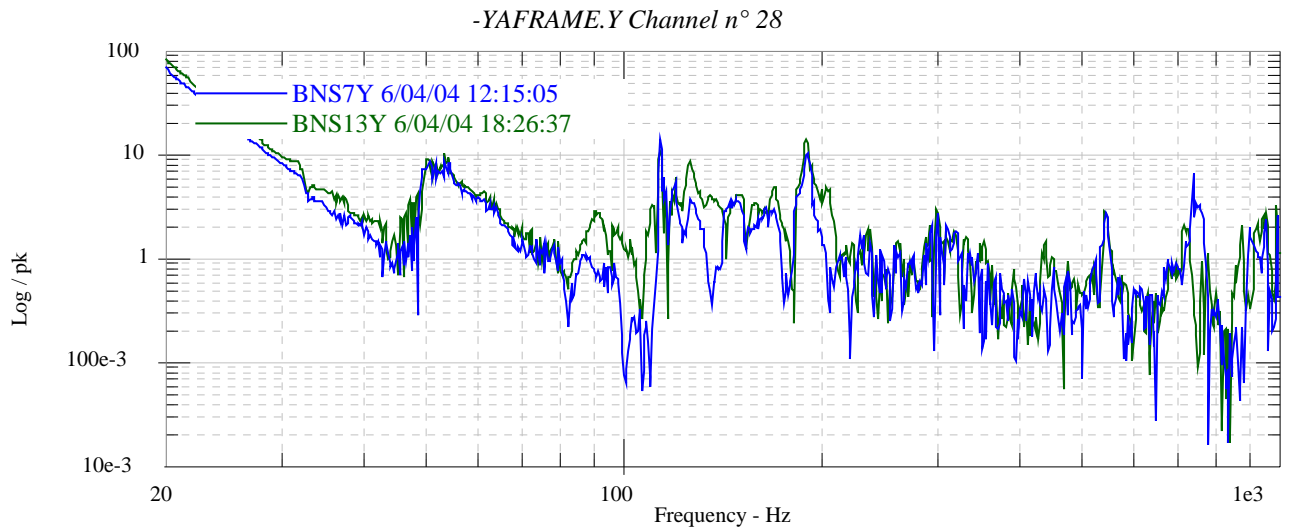
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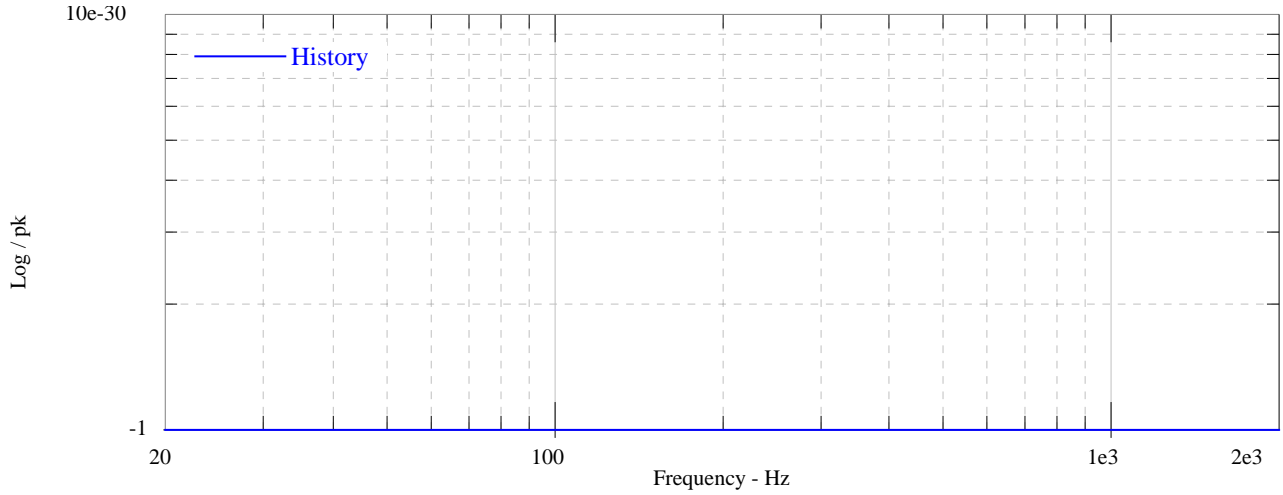
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SPIRE QM

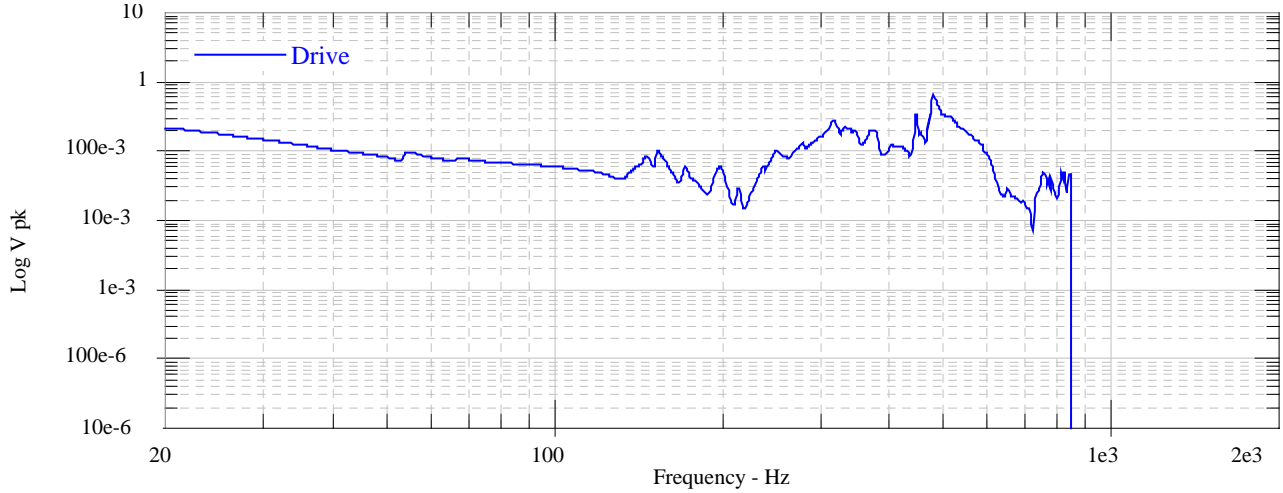
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 8-Apr-04
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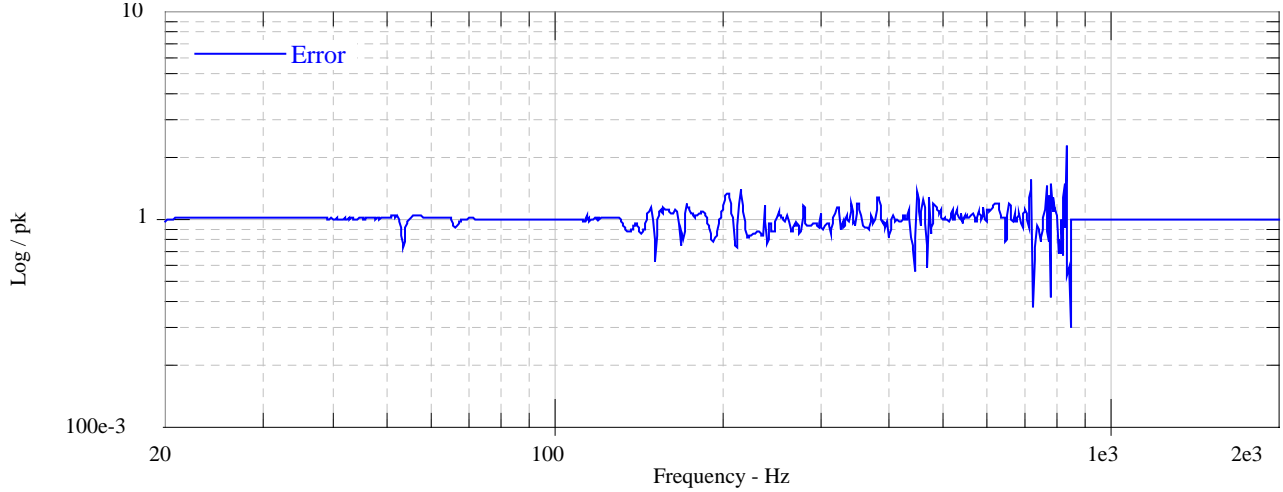
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

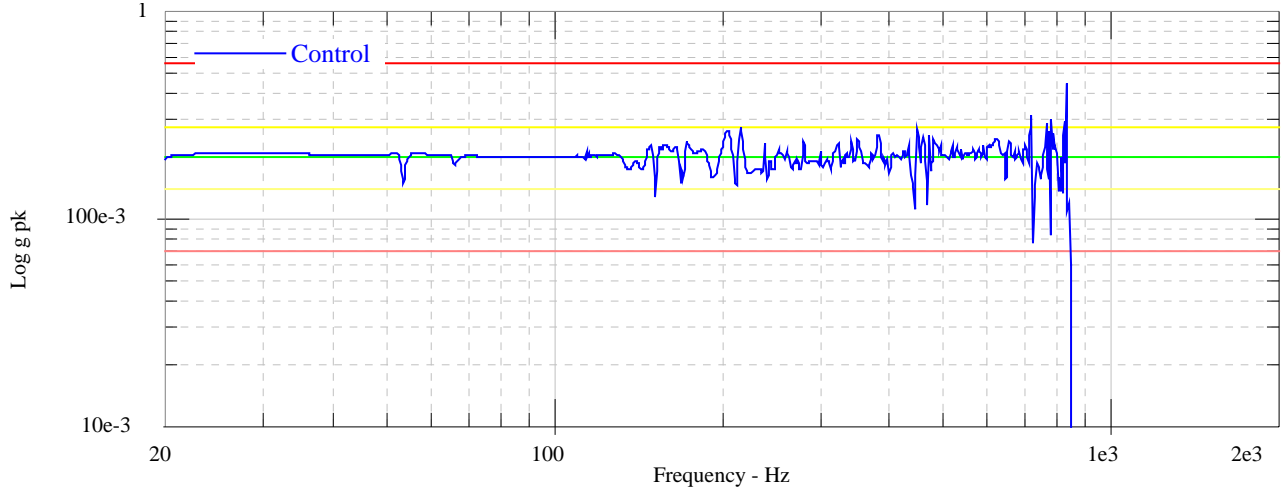


VIBRATION TEST REPORT
SPIRE QM

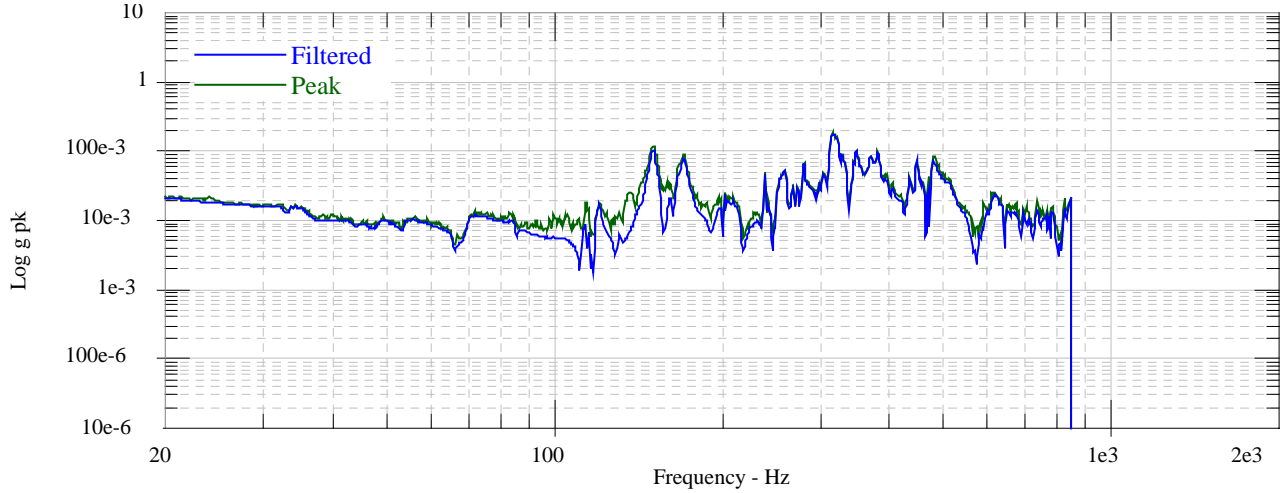
RP-CSL-CRYOV-04001
Version : 01
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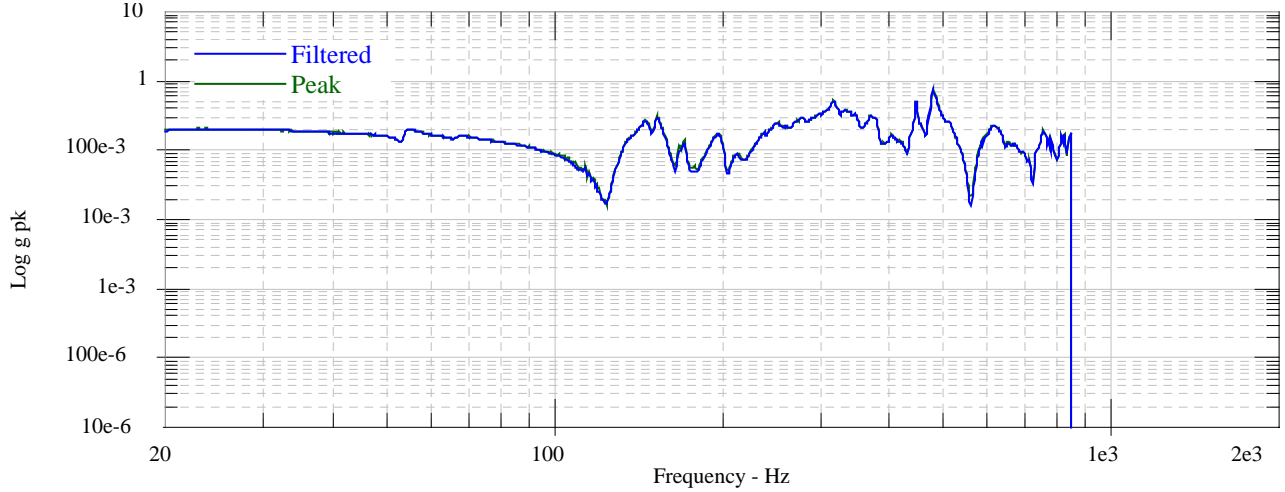
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

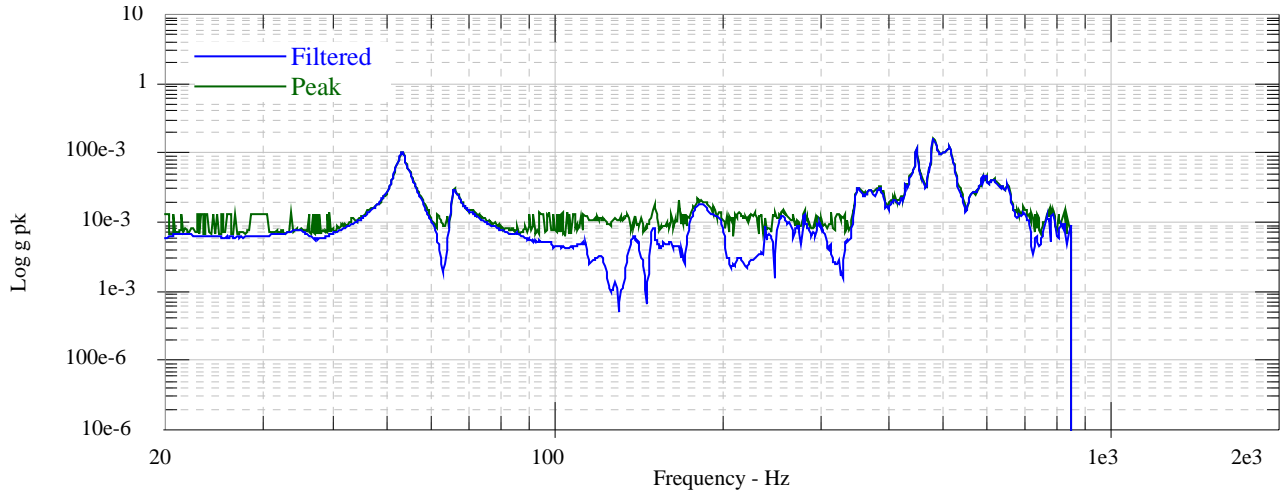


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SPIRE QM

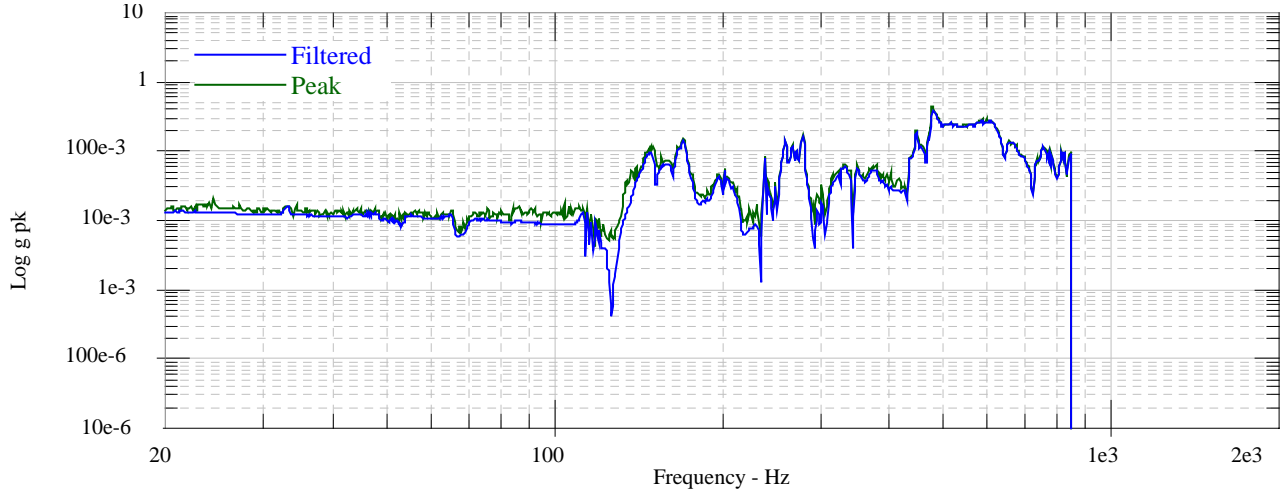
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SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

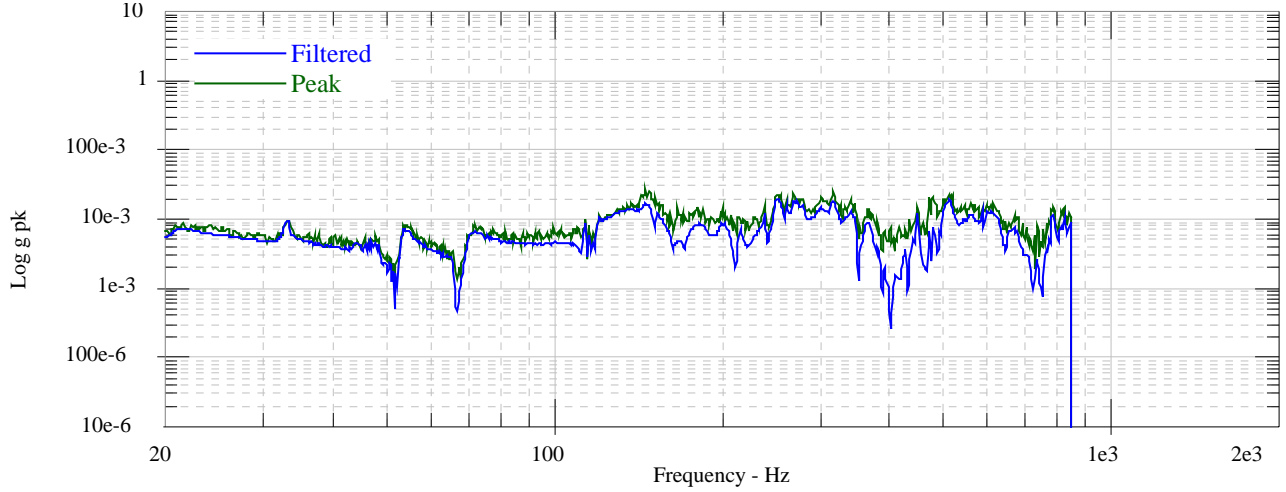


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SPIRE QM

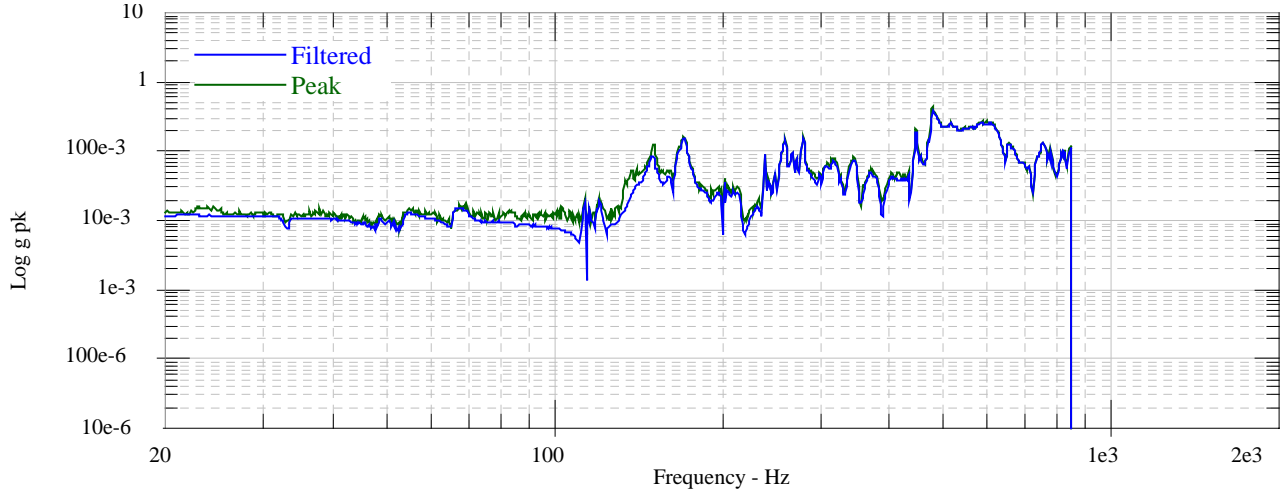
RP-CSL-CRYOV-04001
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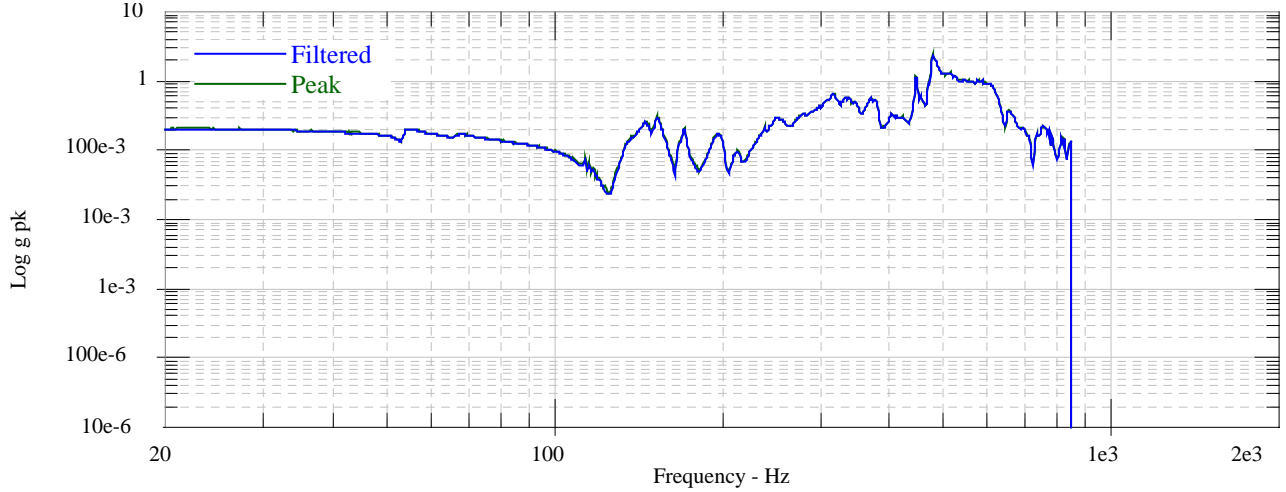
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

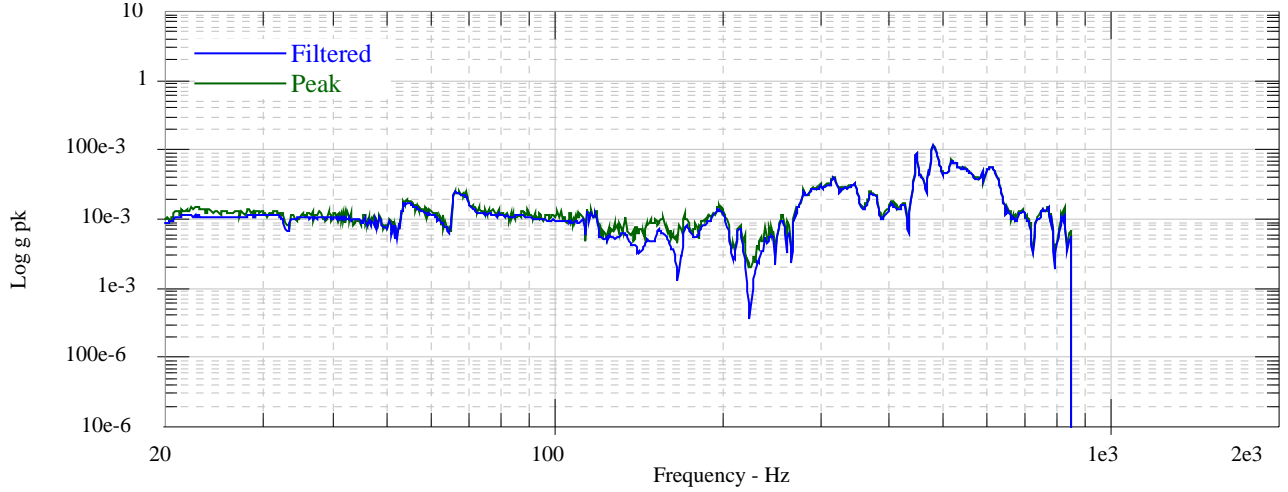


VIBRATION TEST REPORT
SPIRE QM

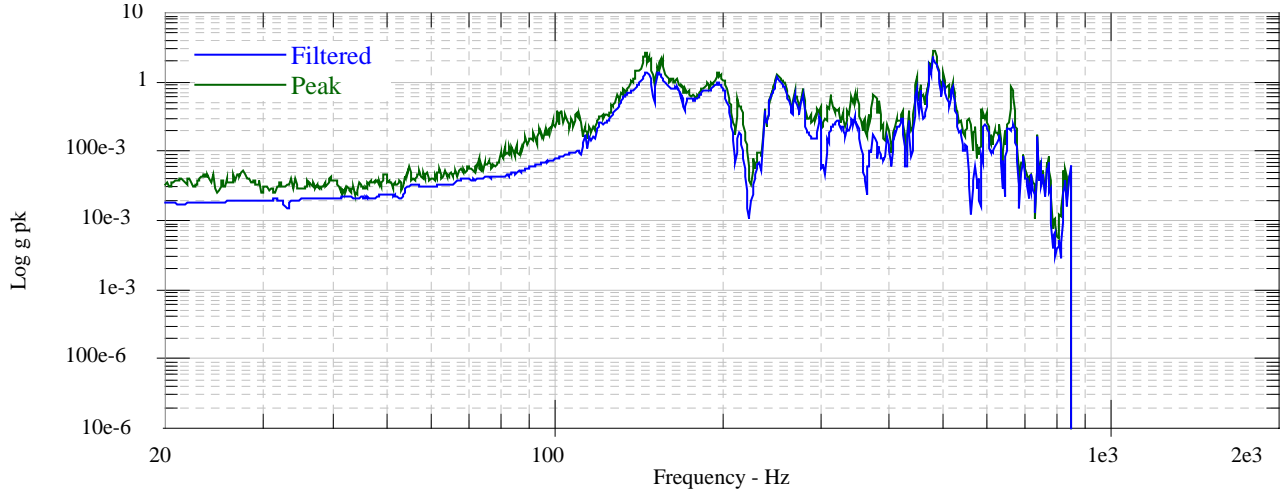
RP-CSL-CRYOV-04001
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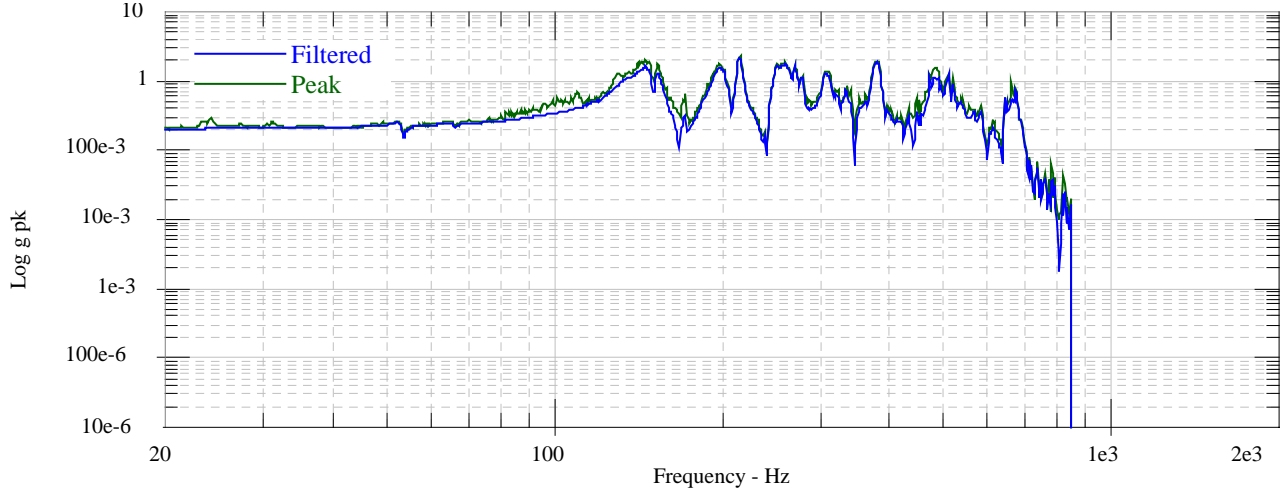
SHK.3.X Channel n° 9



PHS.XY Channel n° 10



PHS.Z Channel n° 11

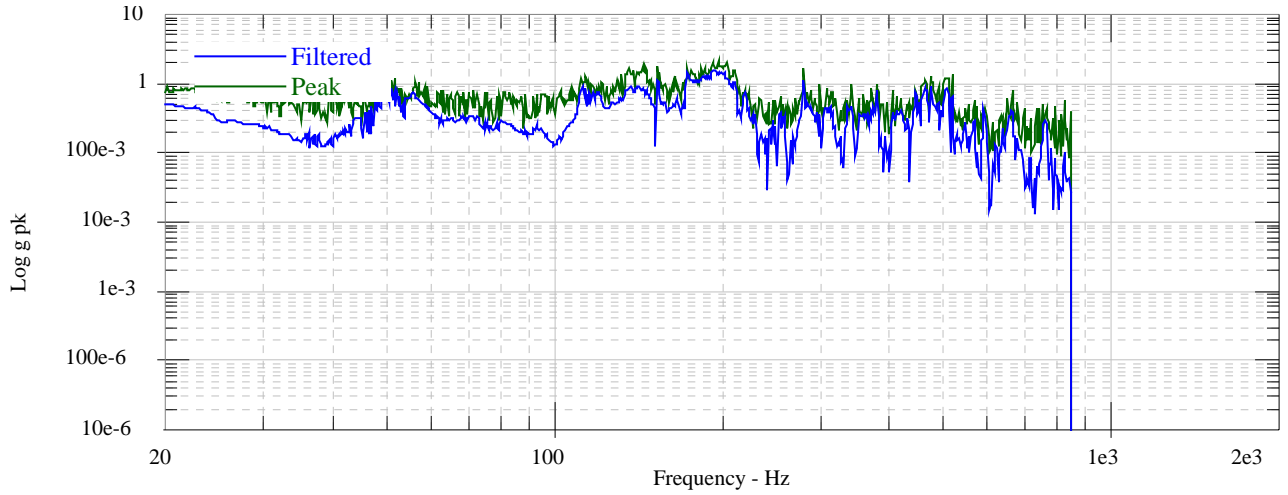


VIBRATION TEST REPORT
SPIRE QM

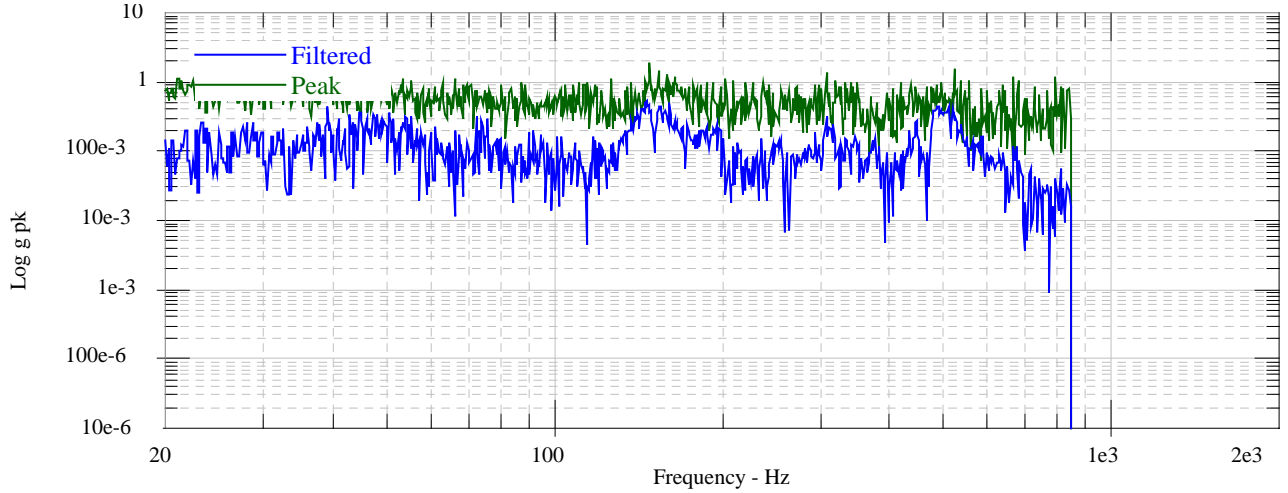
RP-CSL-CRYOV-04001
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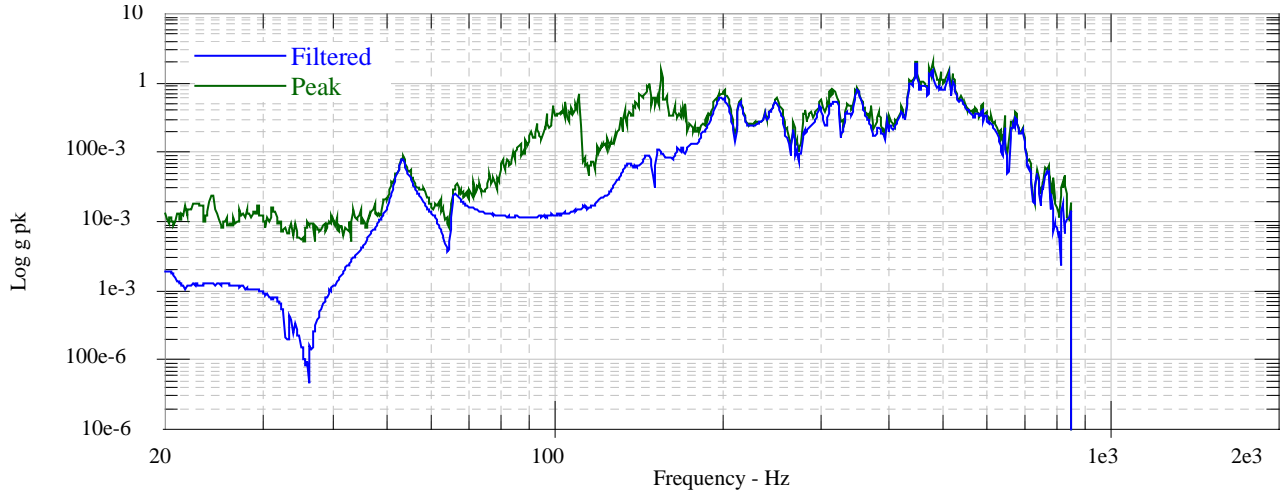
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

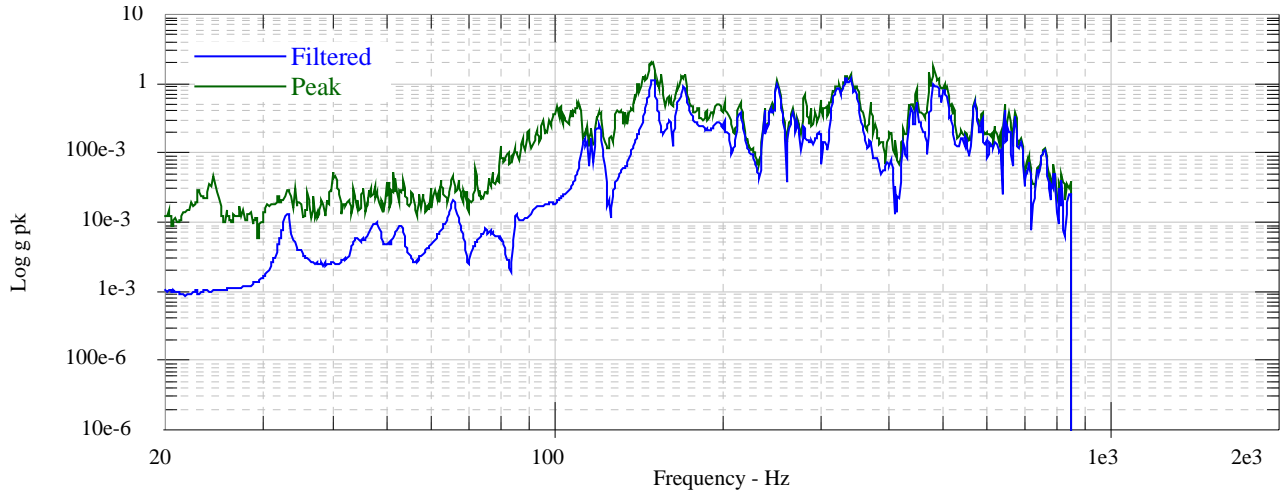


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SPIRE QM

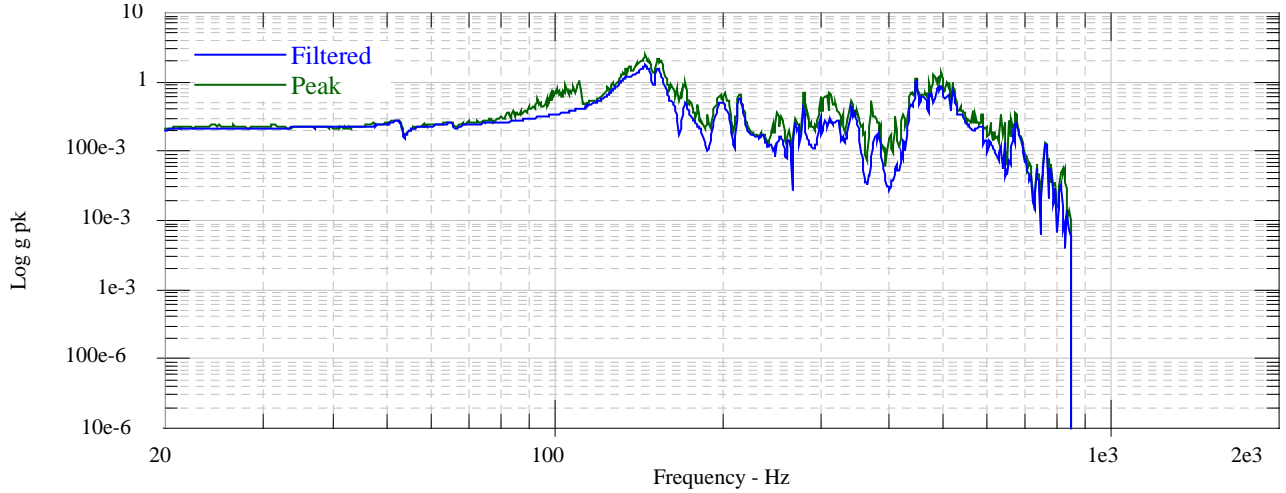
RP-CSL-CRYOV-04001
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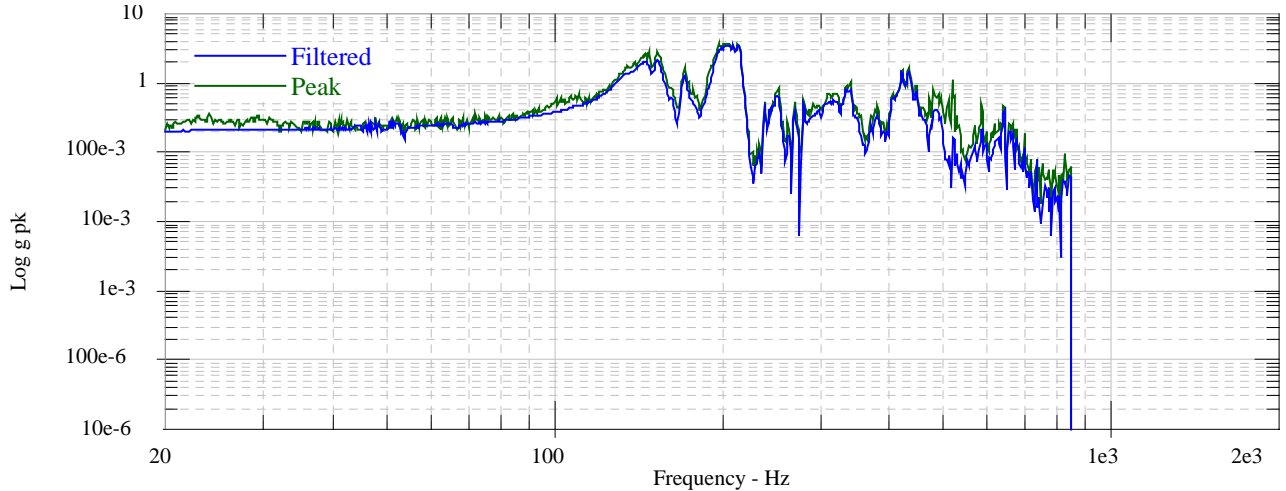
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

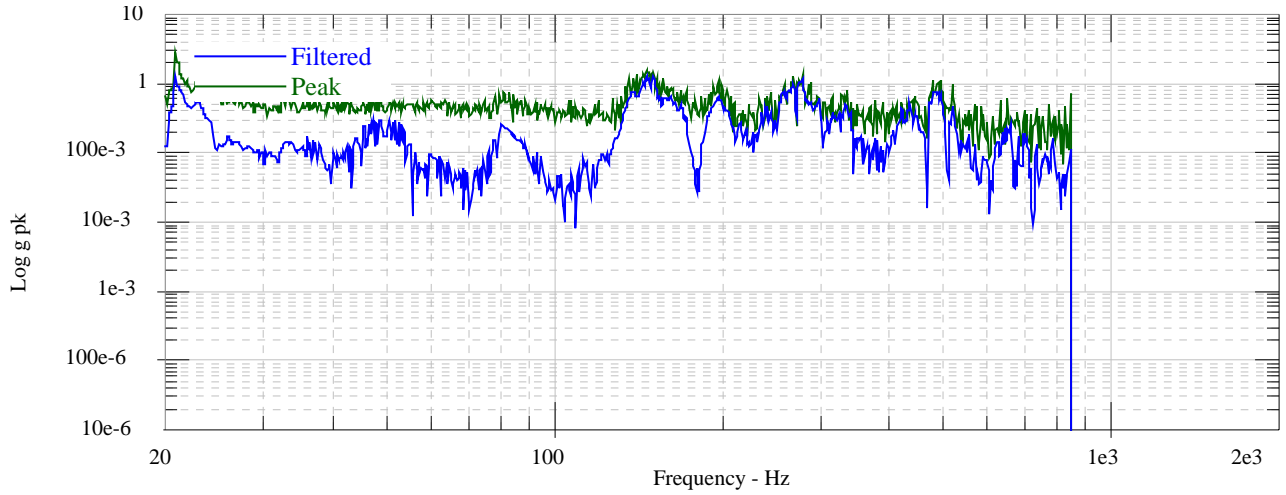


VIBRATION TEST REPORT
SPIRE QM

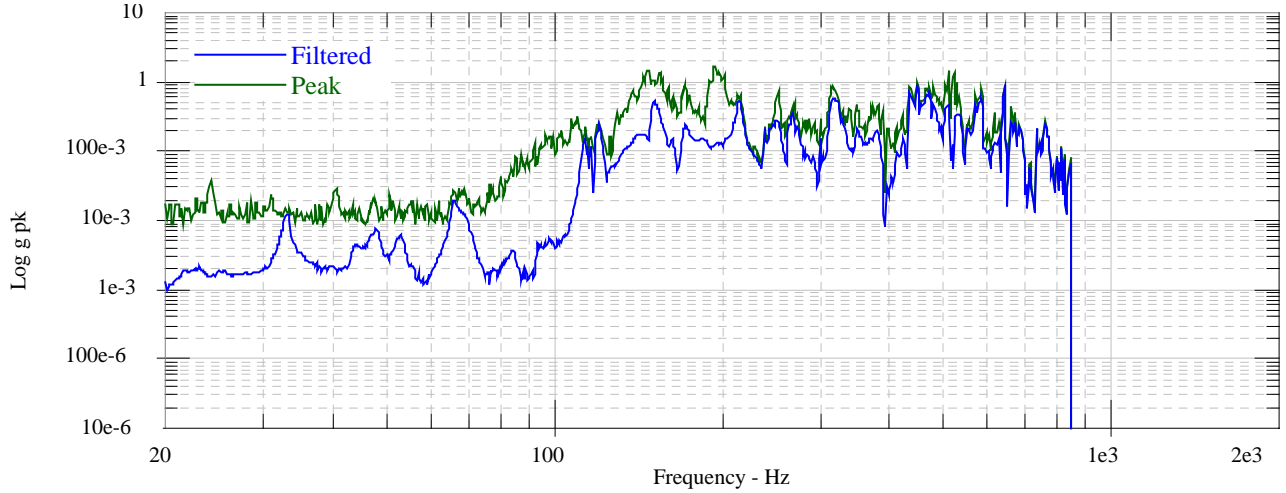
RP-CSL-CRYOV-04001
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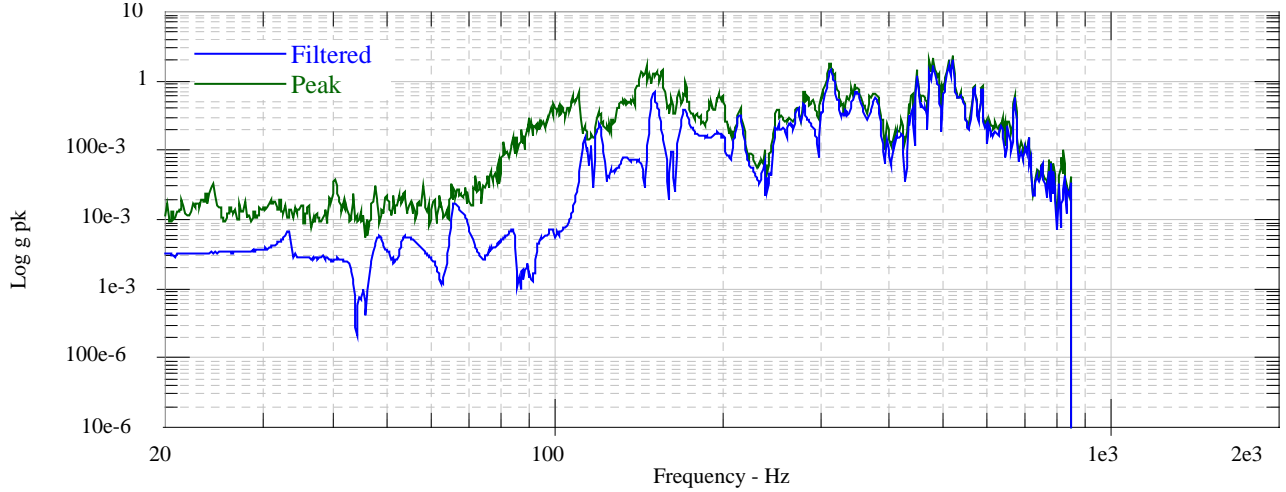
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

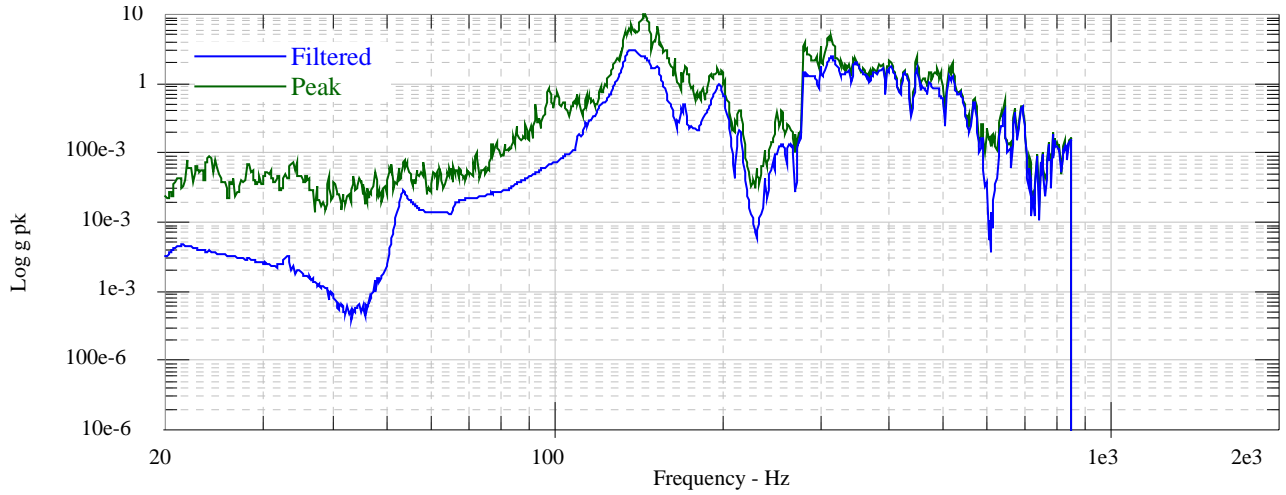


VIBRATION TEST REPORT
SPIRE QM

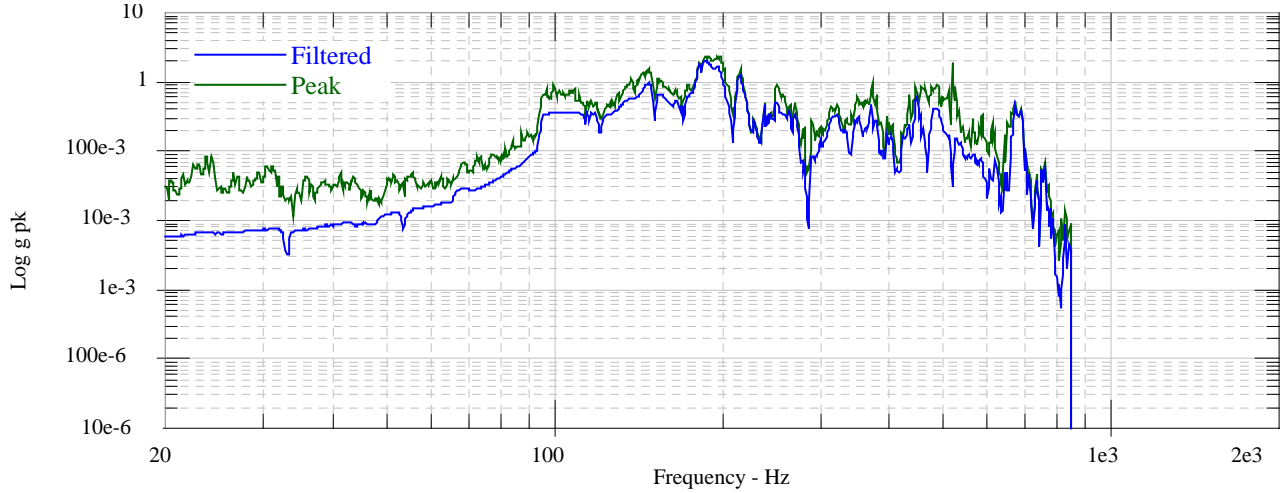
RP-CSL-CRYOV-04001
Version : 01
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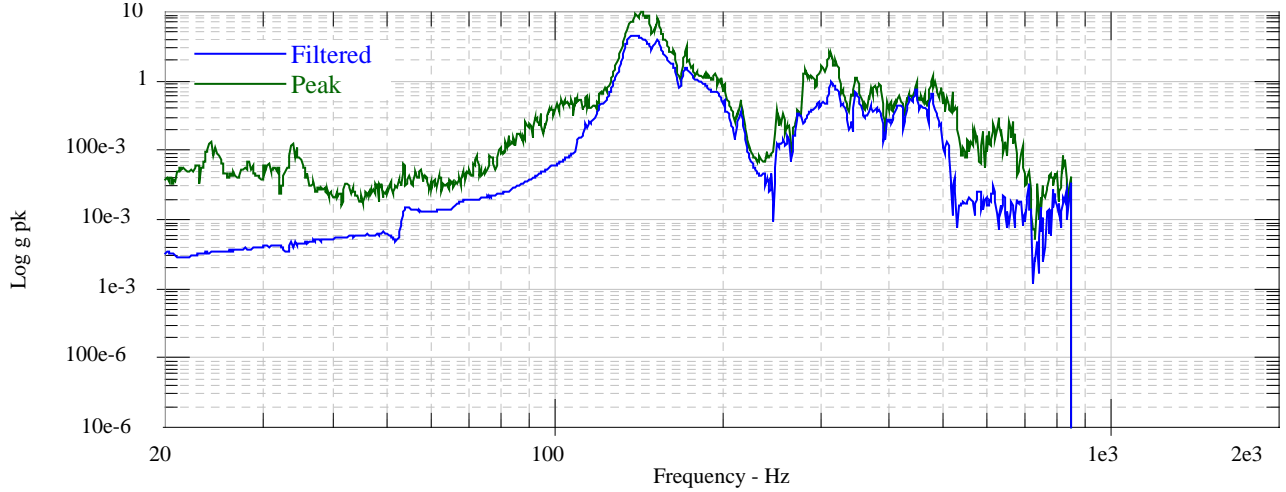
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CTIP.Y Channel n° 22



SMECU.X Channel n° 23

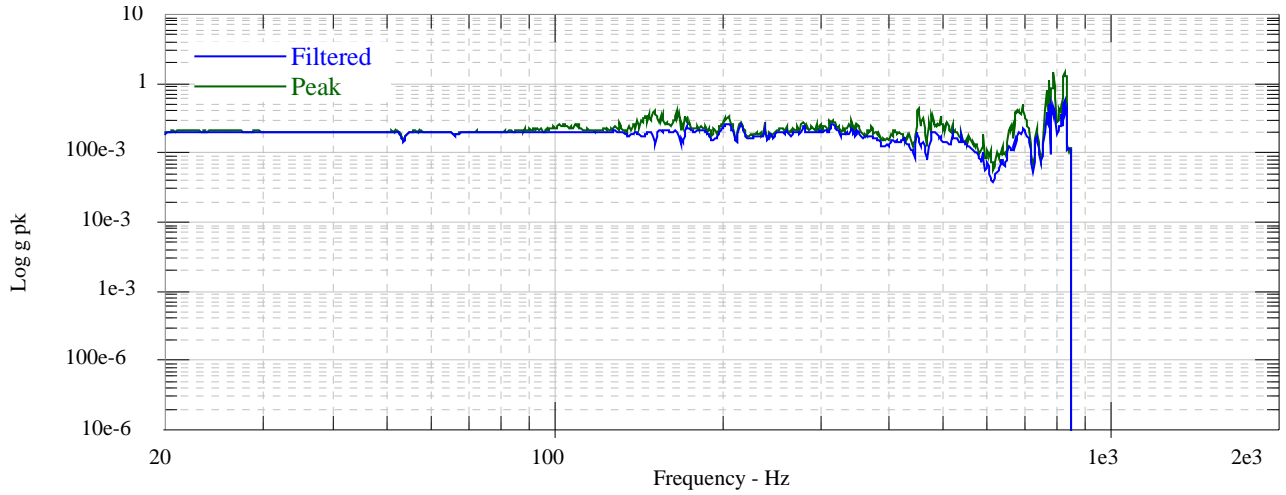


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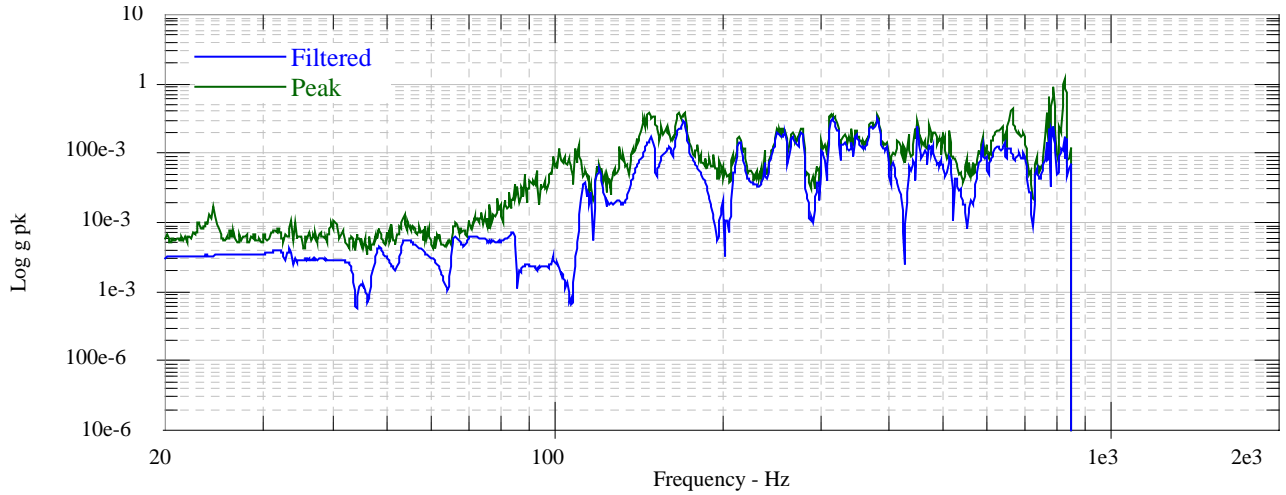
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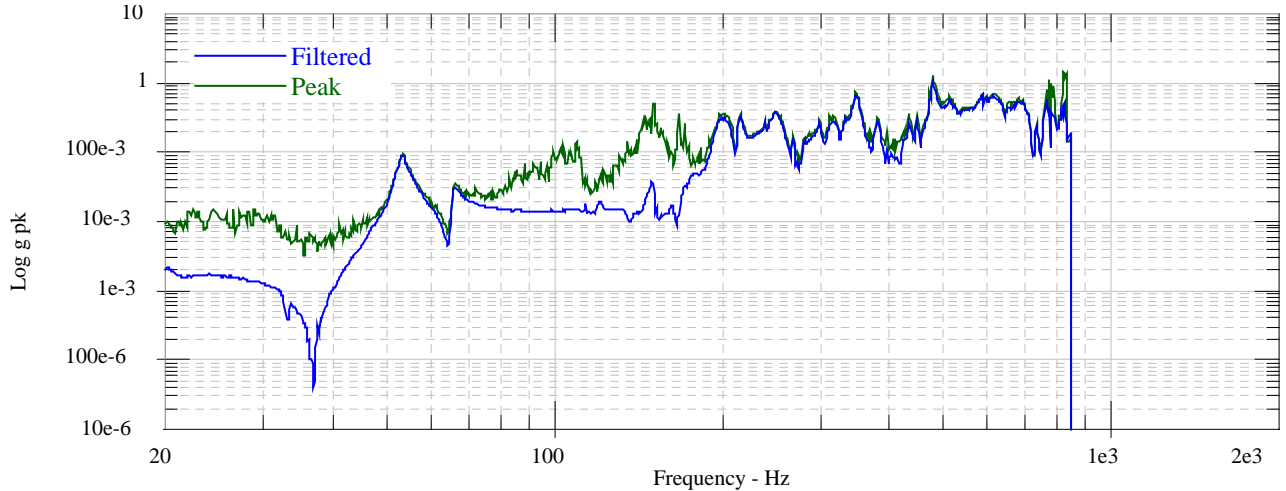
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26



VIBRATION TEST REPORT
SPIRE QM

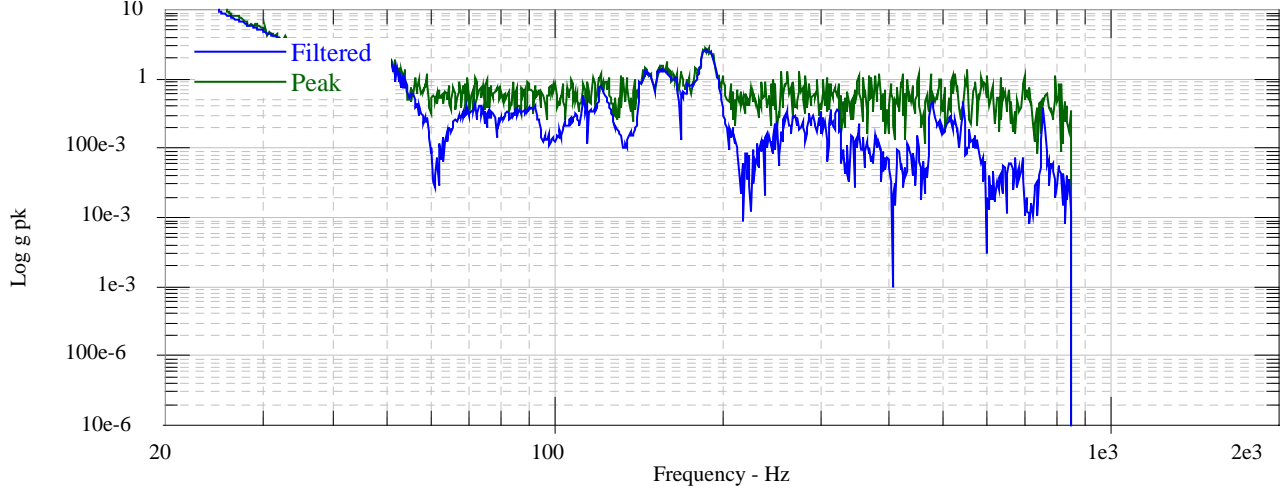
RP-CSL-CRYOV-04001
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-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

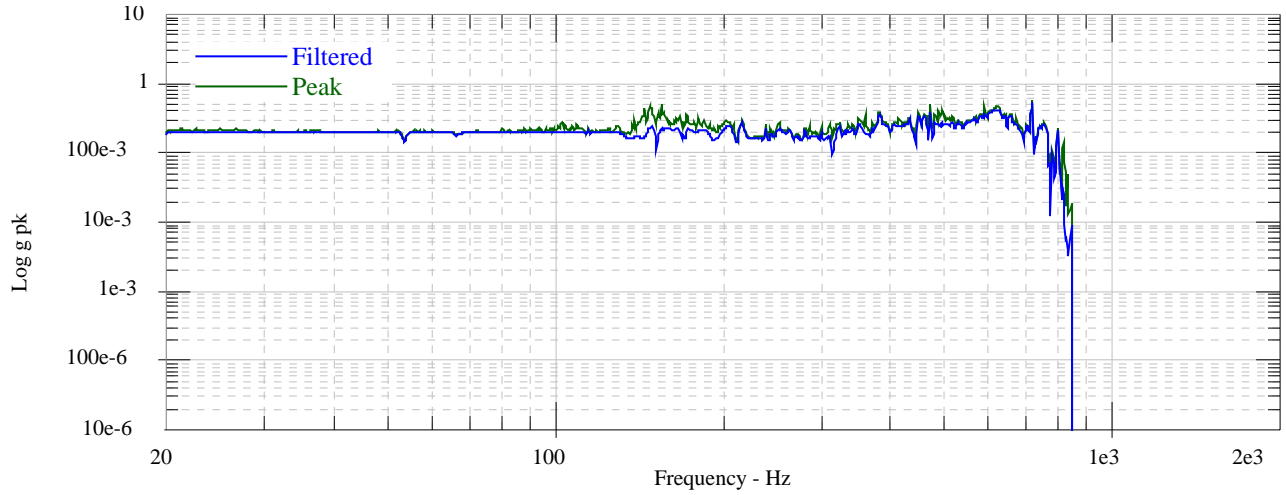


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SPIRE QM

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+YAFRAME.Z Channel n° 30



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SPIRE QM

RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
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12.18 NIS2Z.

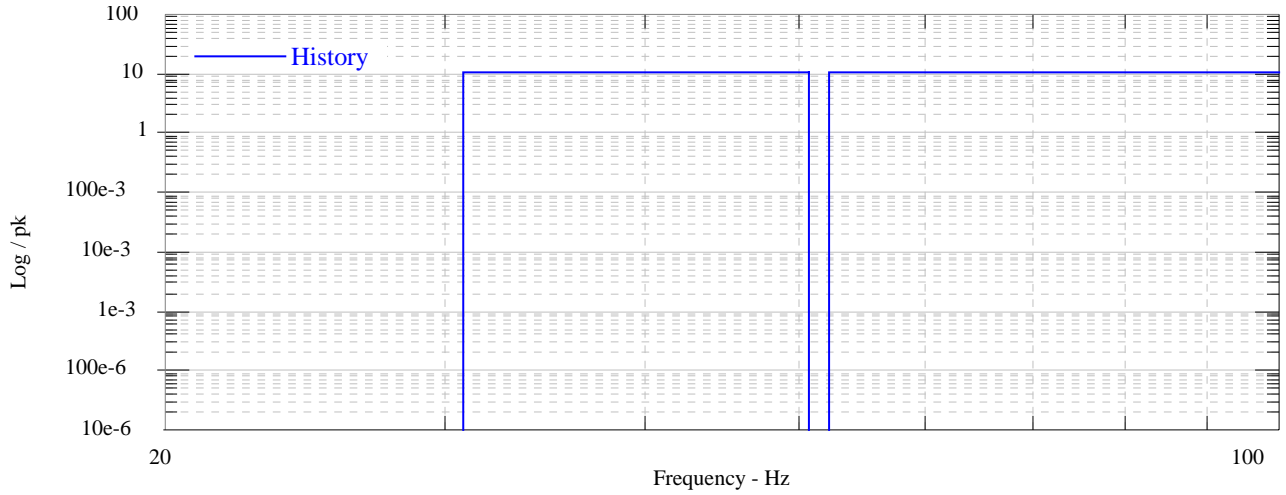
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VIBRATION TEST REPORT
SPIRE QM

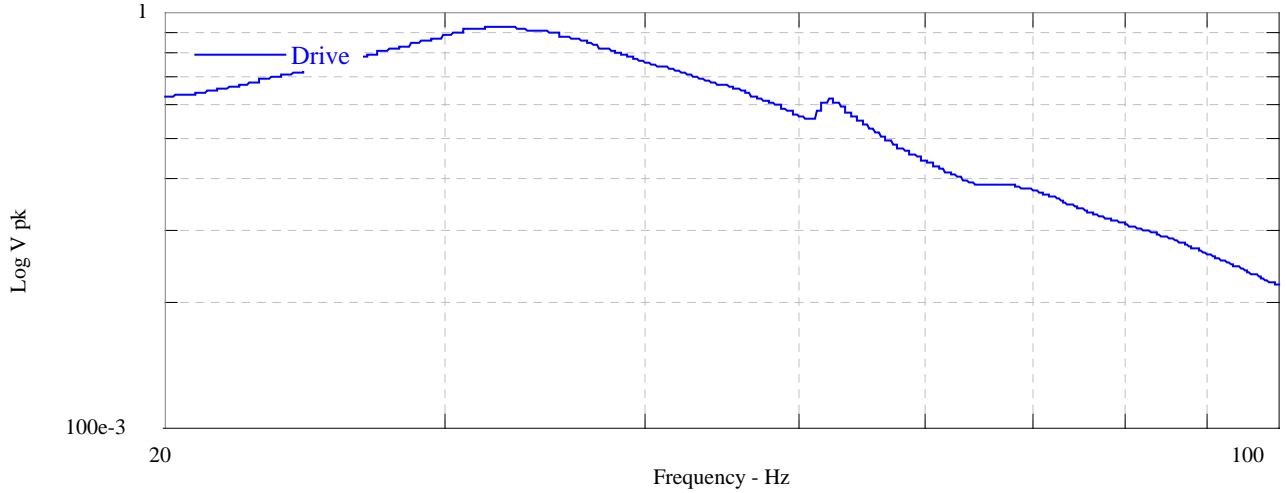
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Révision : 00
Date : 8-Apr-04
Page : NIS2Z - 1 / 12

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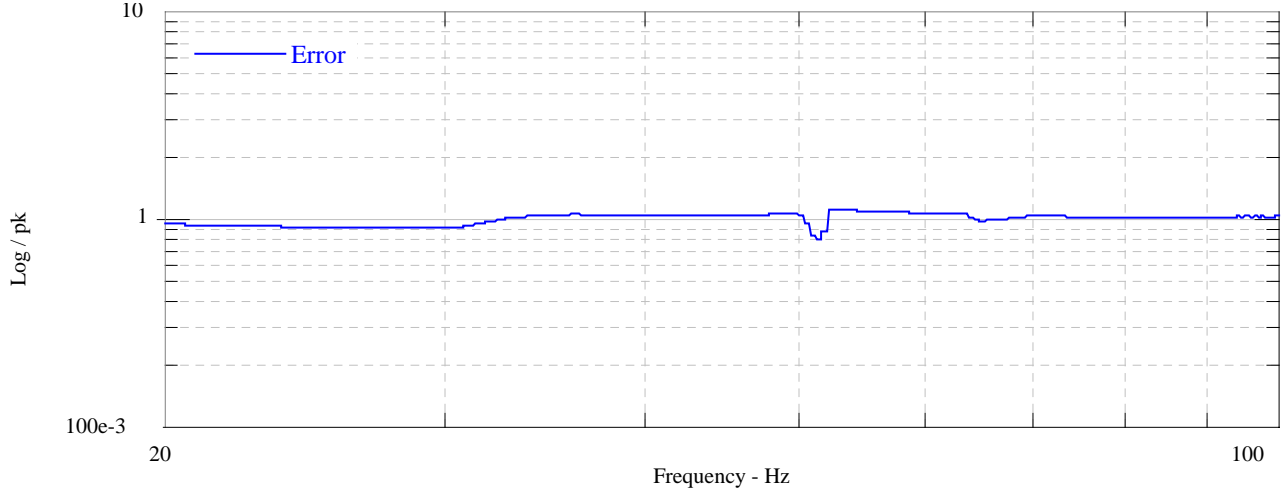
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

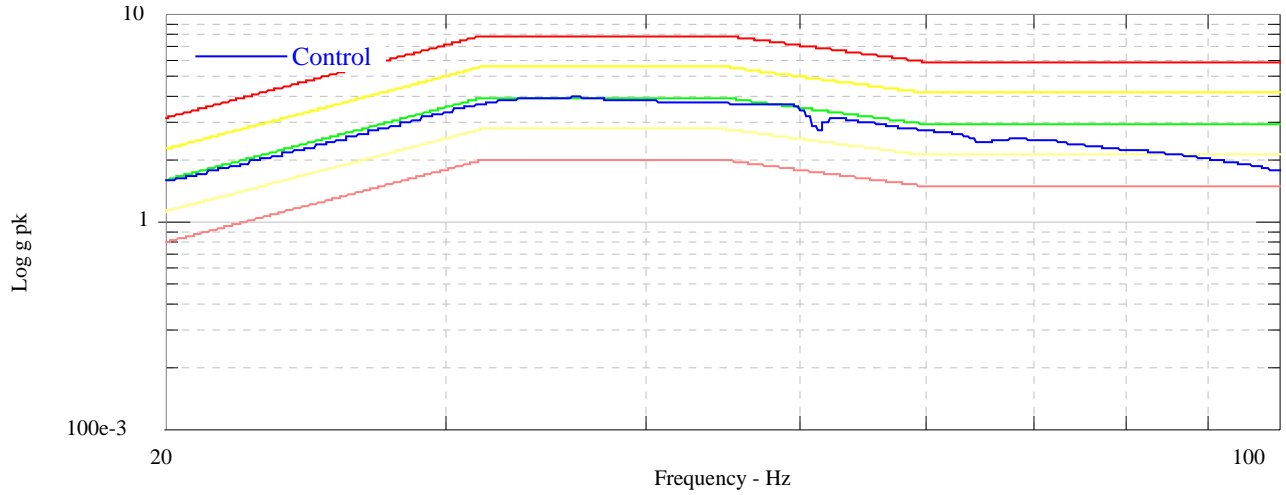


VIBRATION TEST REPORT
SPIRE QM

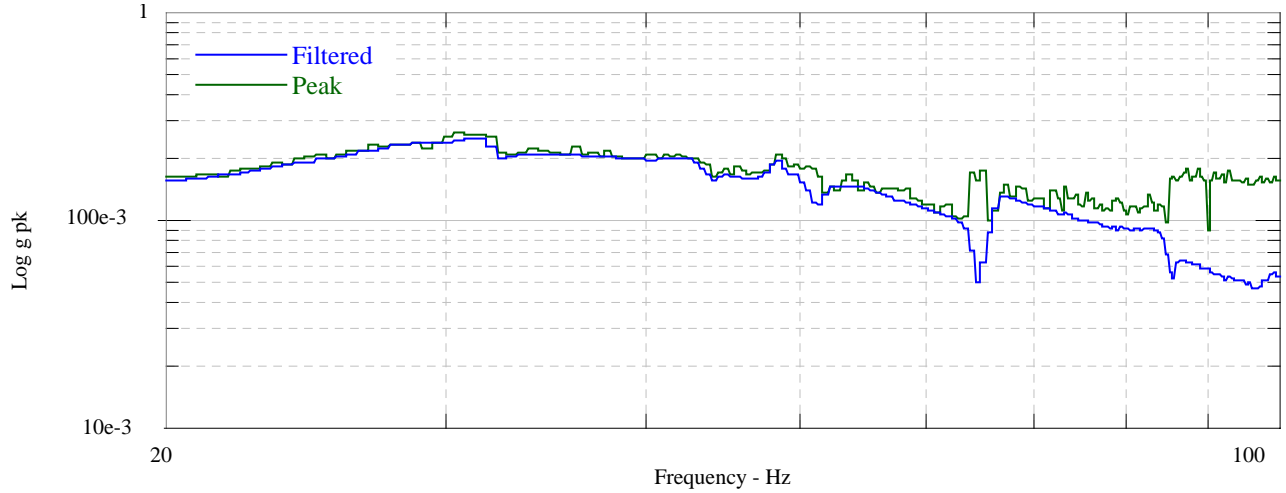
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Date : 8-Apr-04
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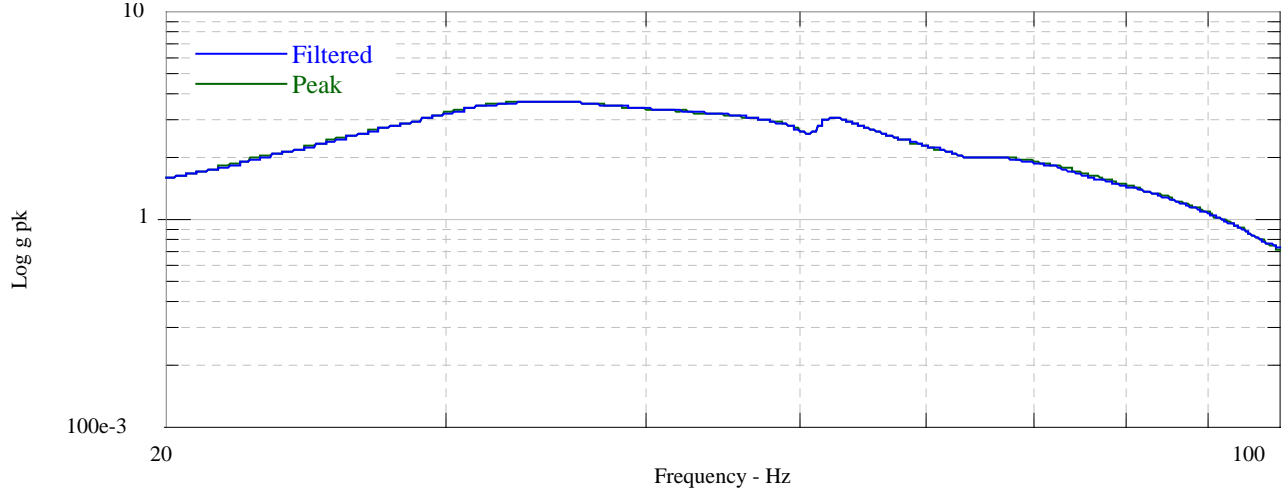
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SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

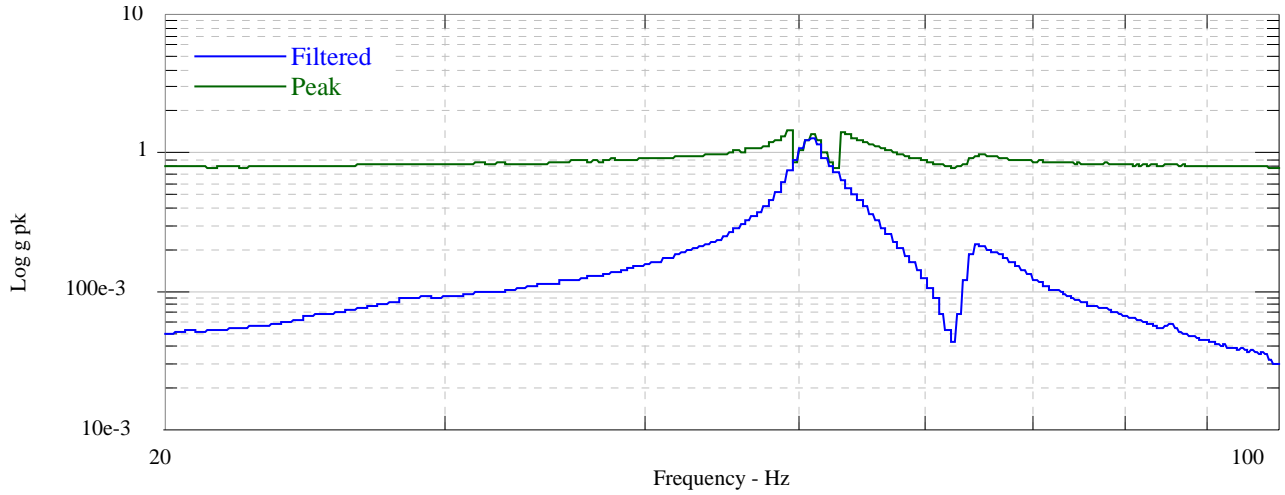


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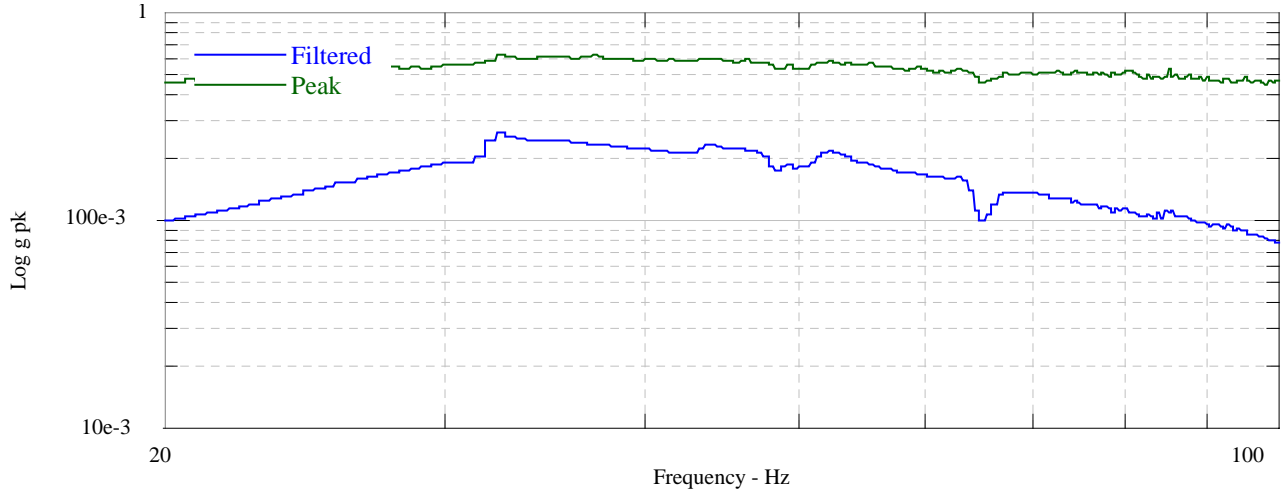
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Date : 8-Apr-04
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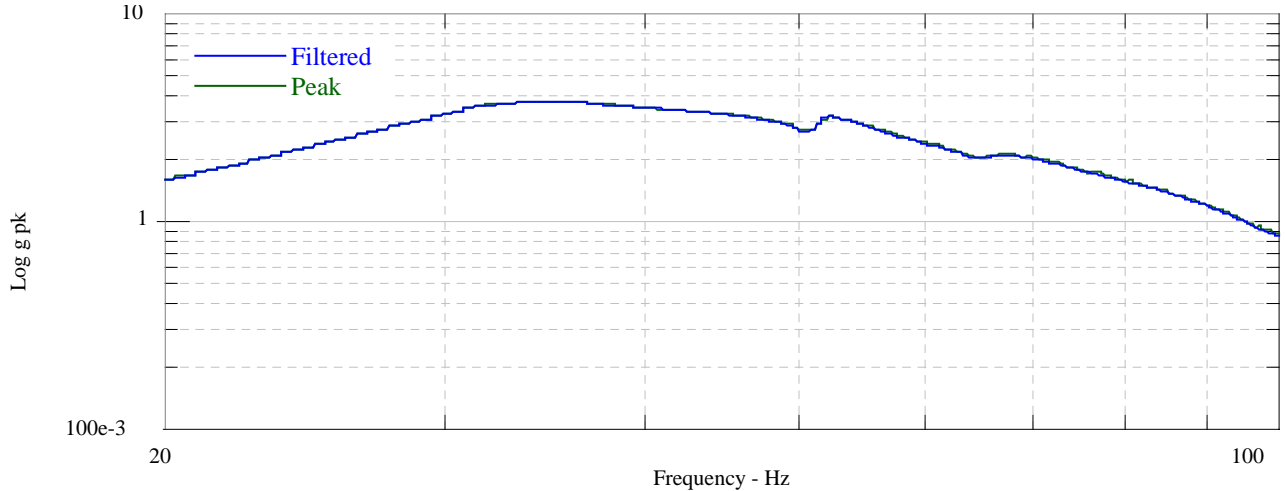
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

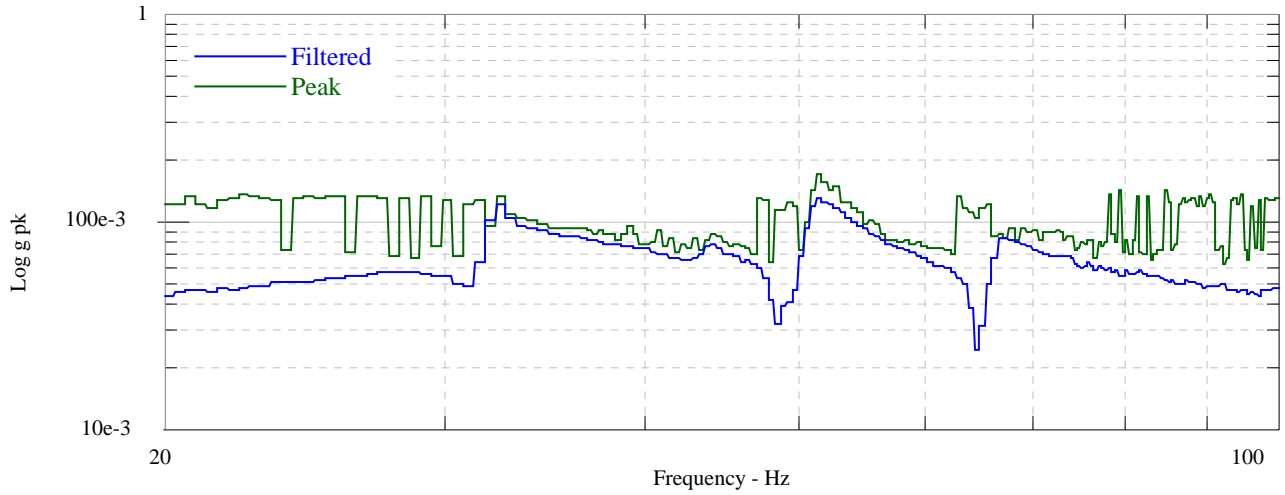


VIBRATION TEST REPORT
SPIRE QM

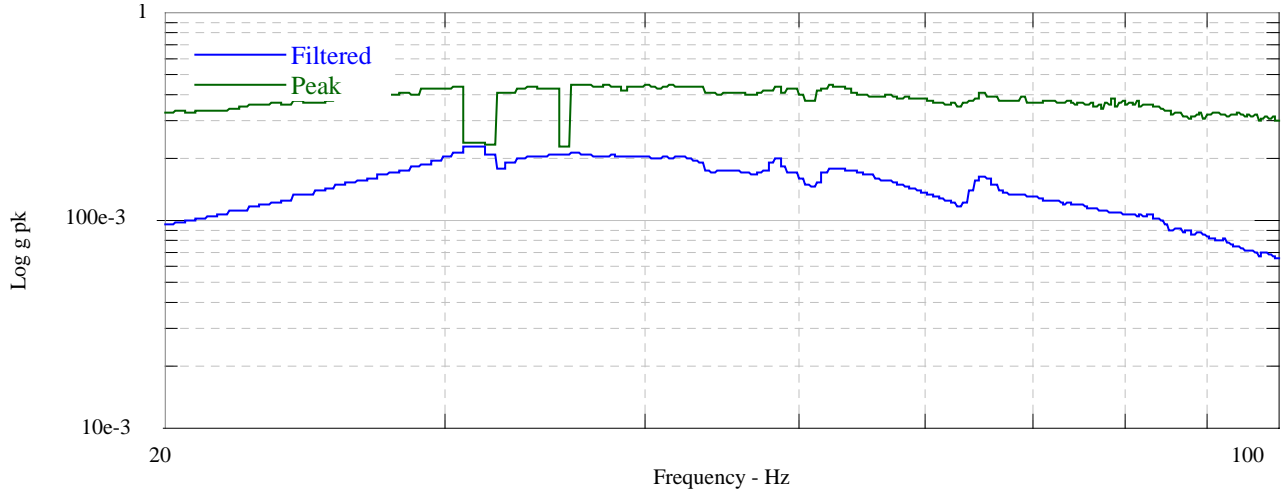
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Date : 8-Apr-04
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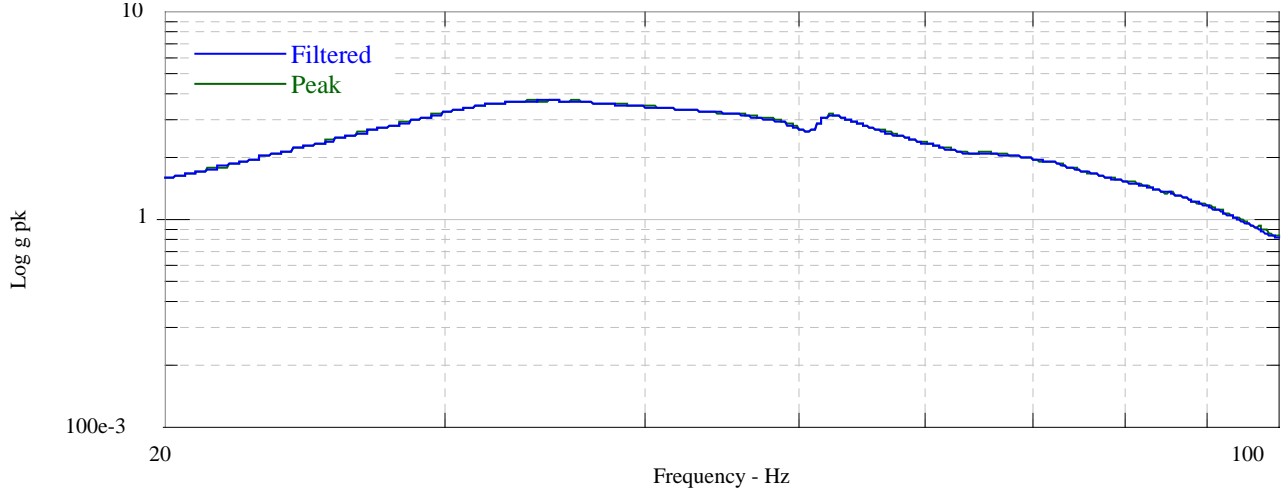
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

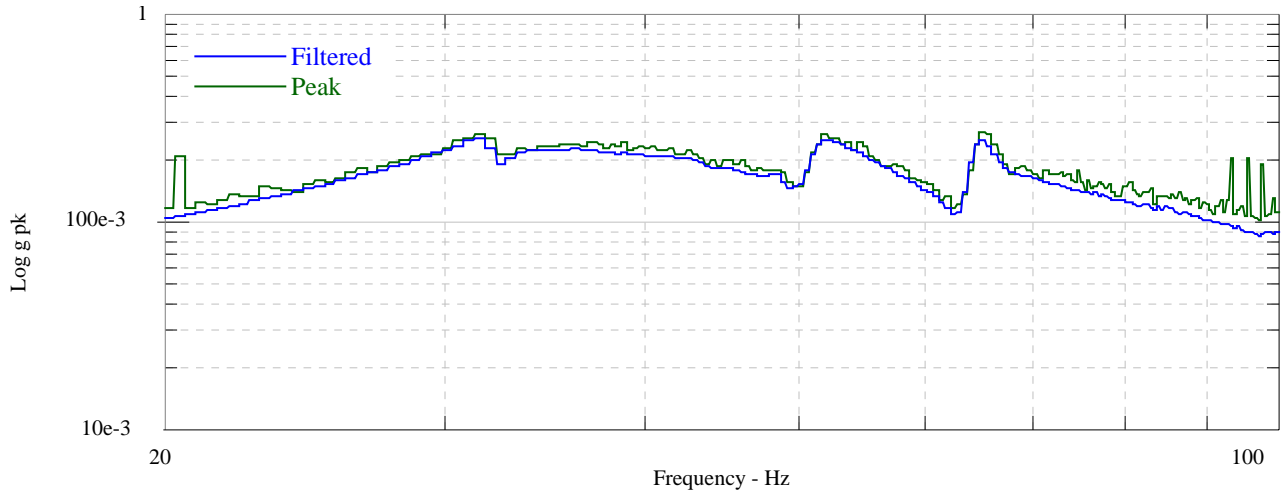


VIBRATION TEST REPORT
SPIRE QM

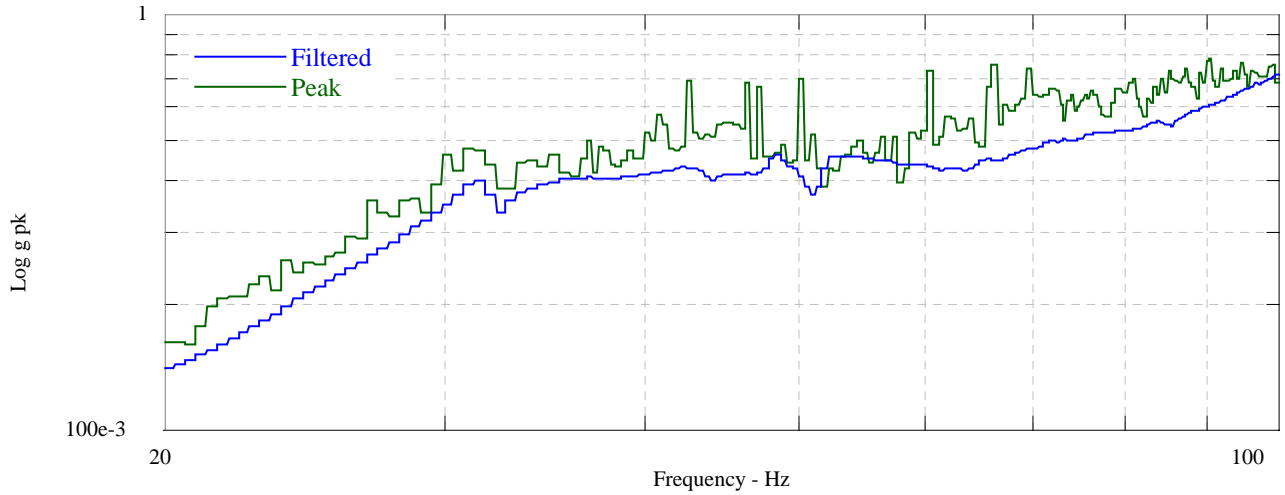
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Date : 8-Apr-04
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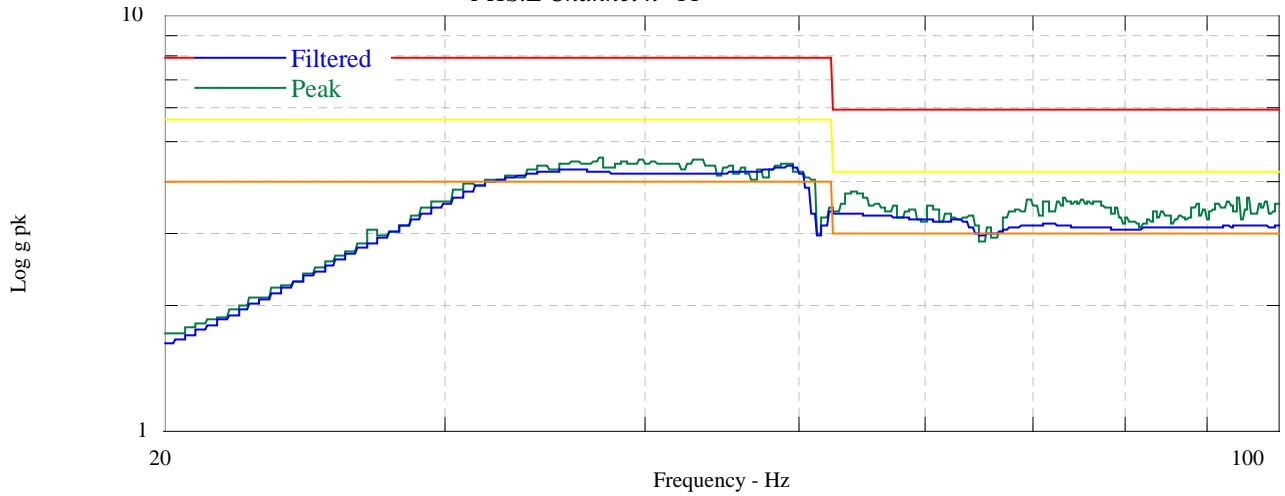
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

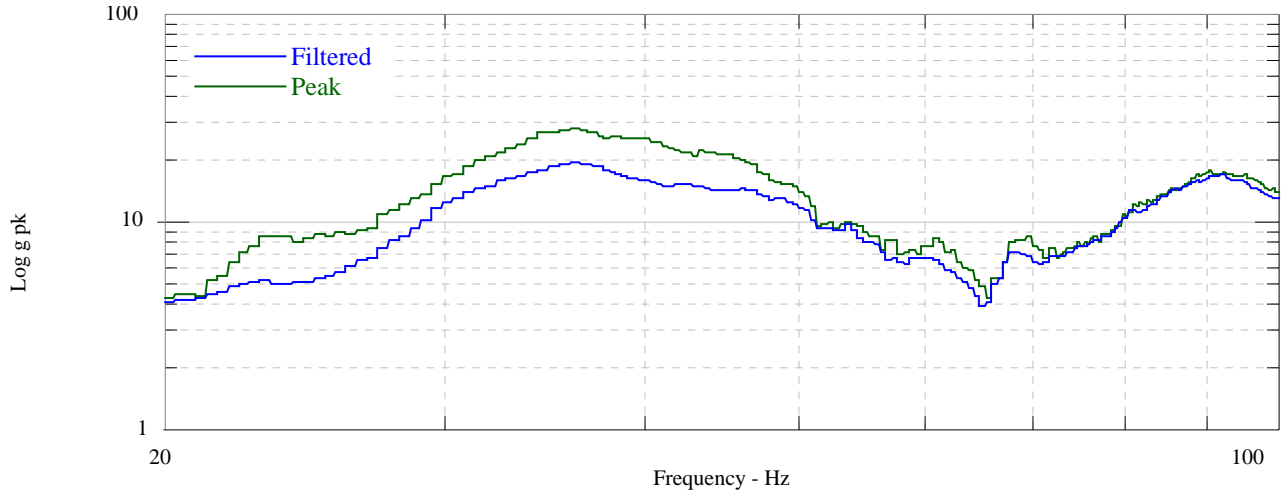


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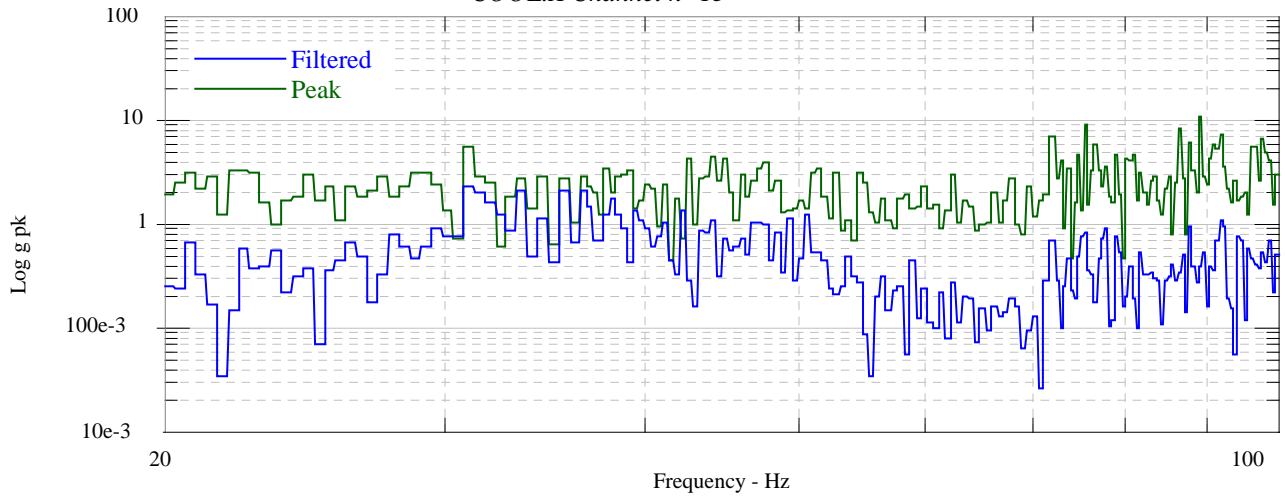
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Date : 8-Apr-04
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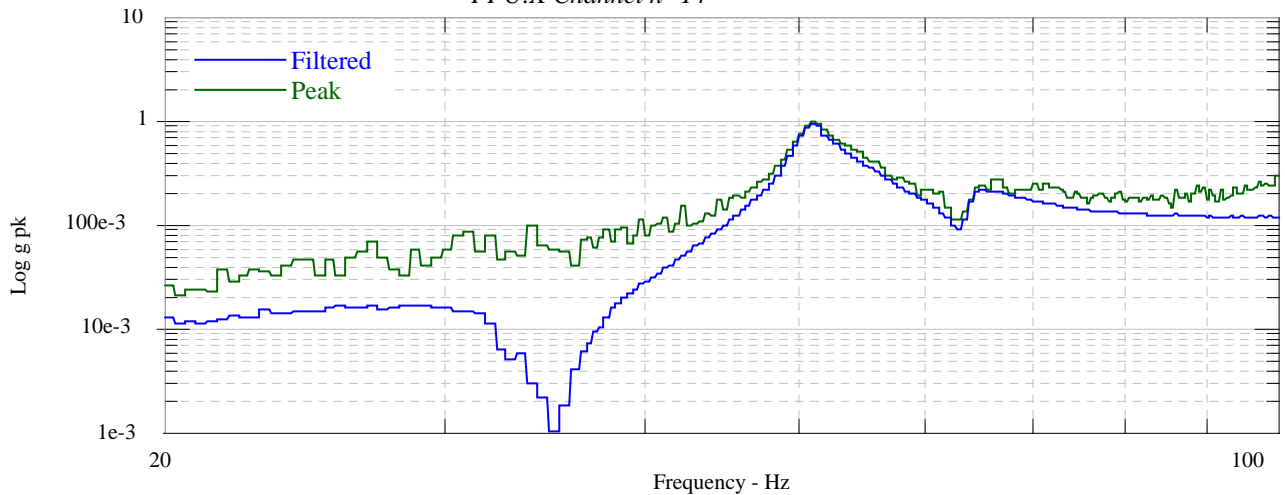
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COOL.X Channel n° 13



FPU.X Channel n° 14

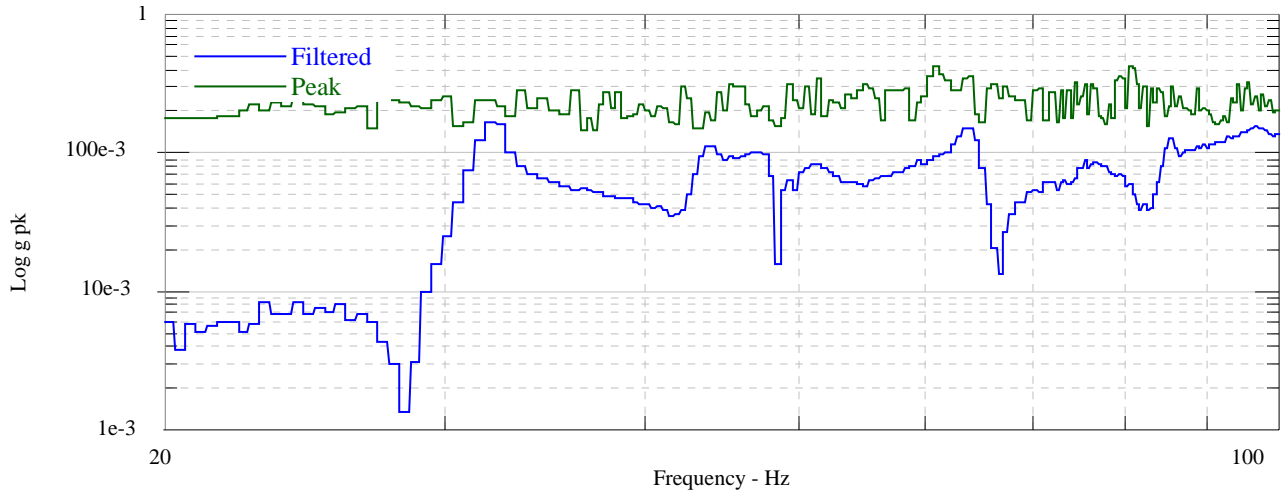


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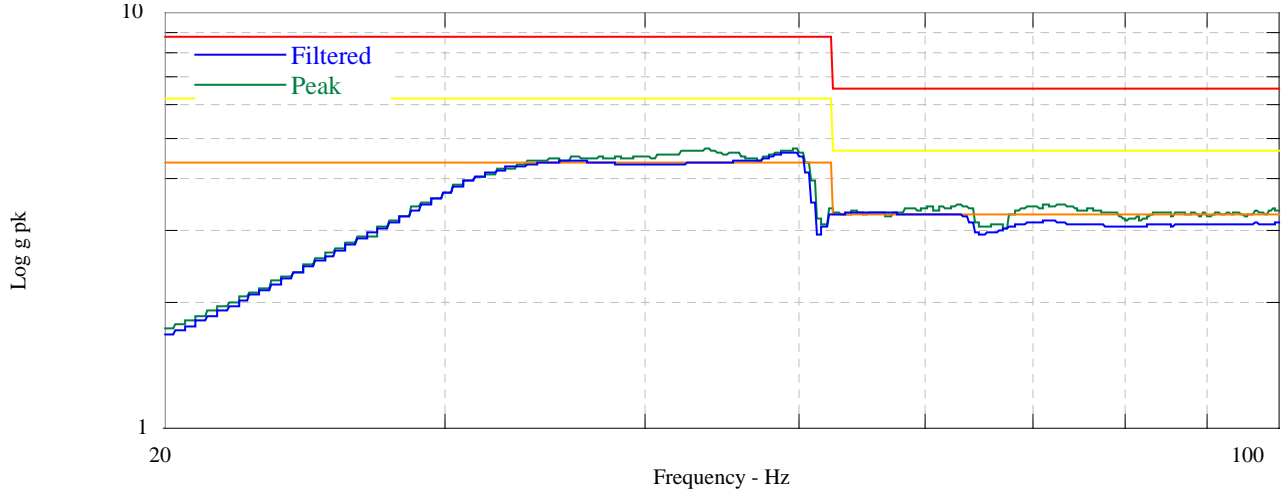
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Page : NIS2Z - 7 / 12

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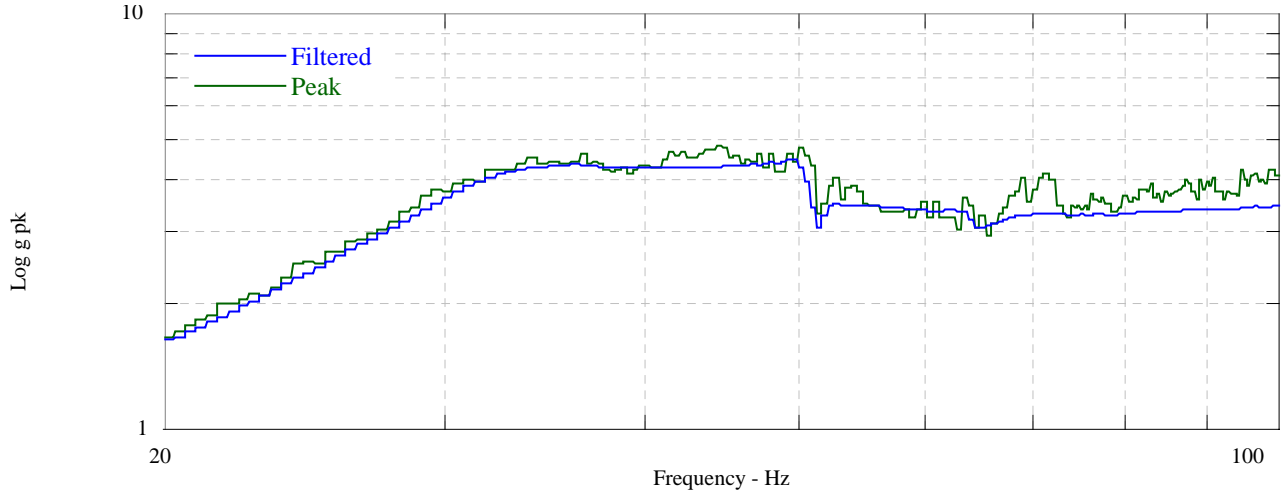
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

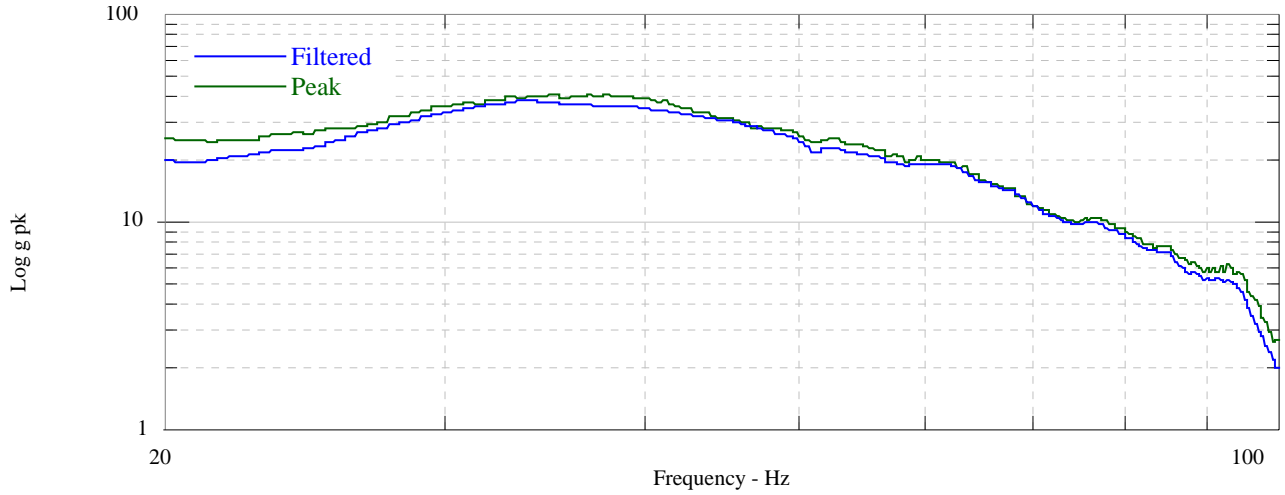


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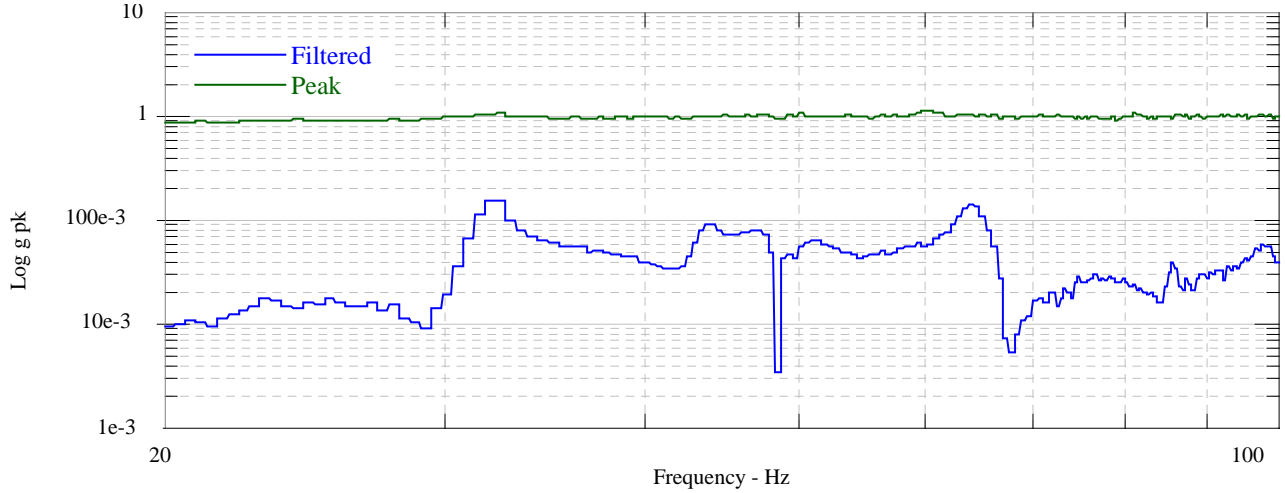
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Date : 8-Apr-04
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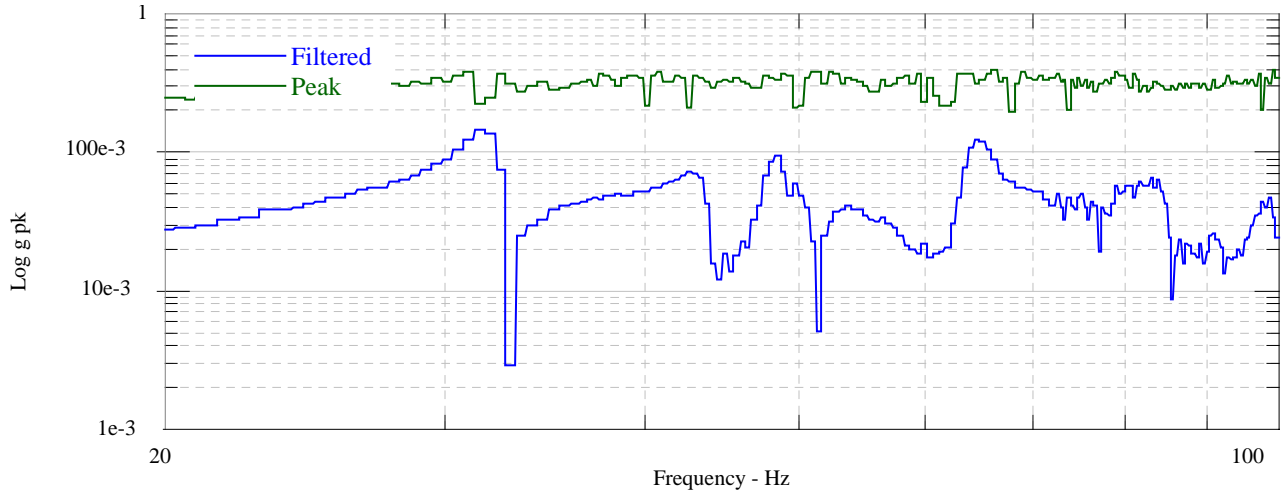
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

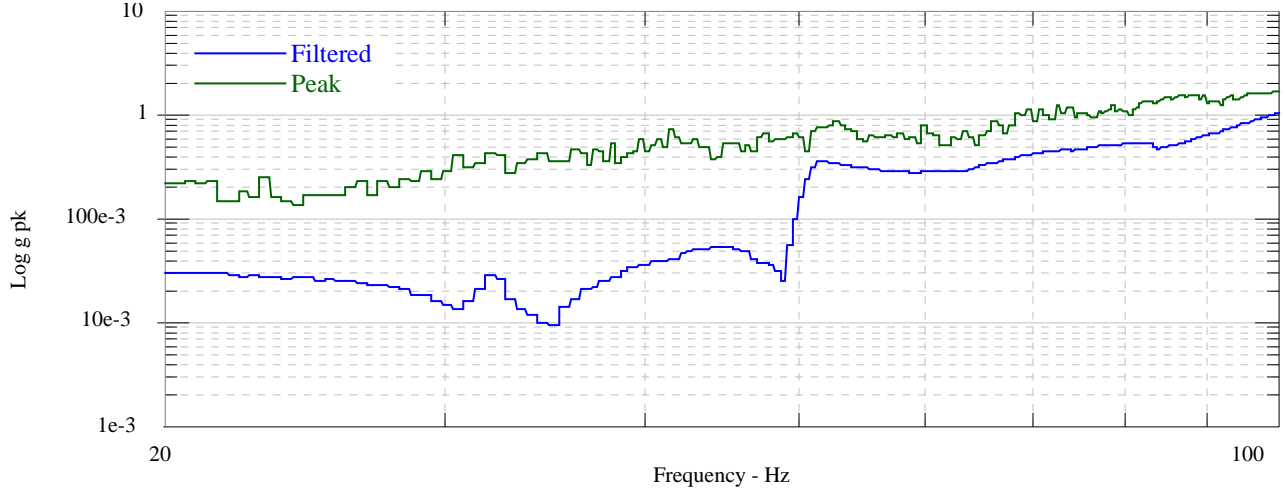


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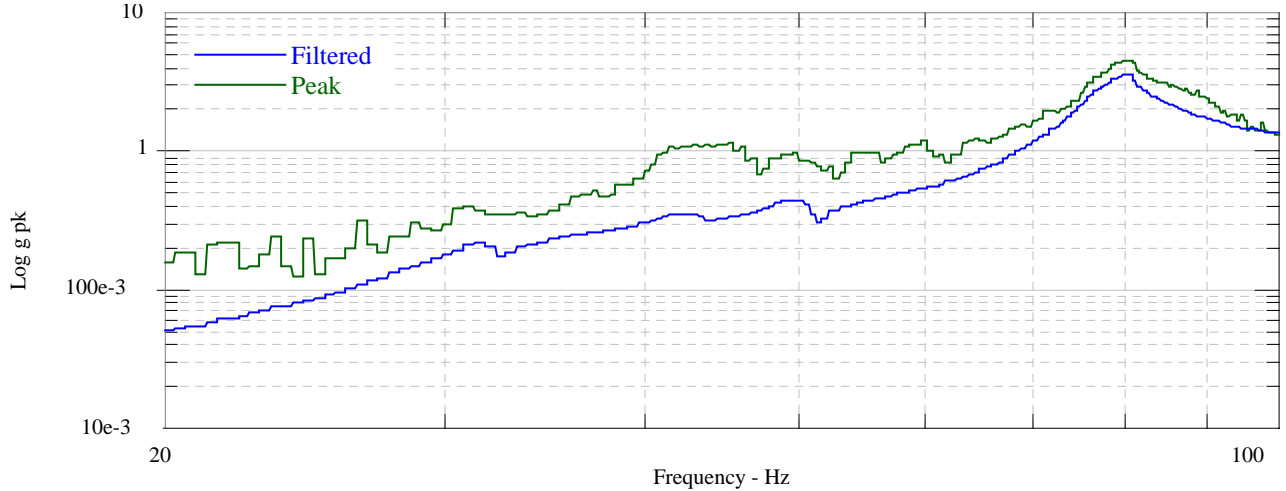
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Version : 01
Révision : 00
Date : 8-Apr-04
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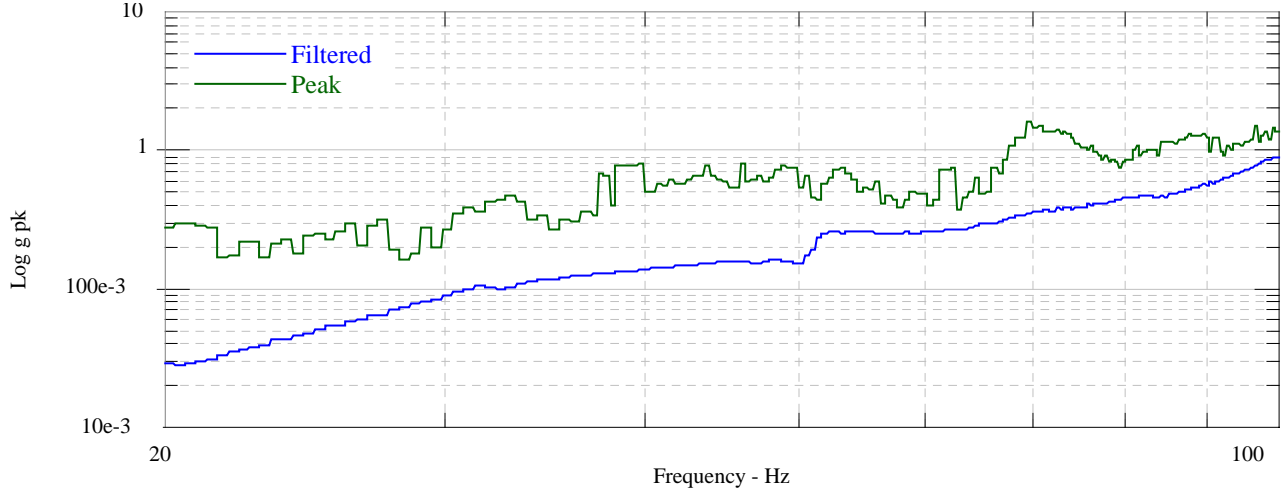
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CTIP.Y Channel n° 22



SMECU.X Channel n° 23

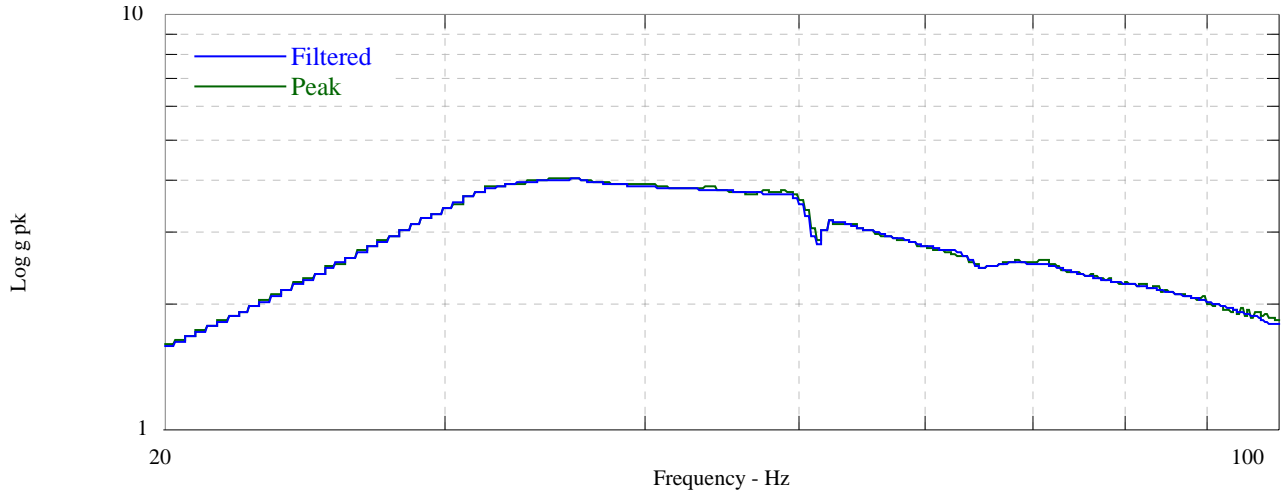


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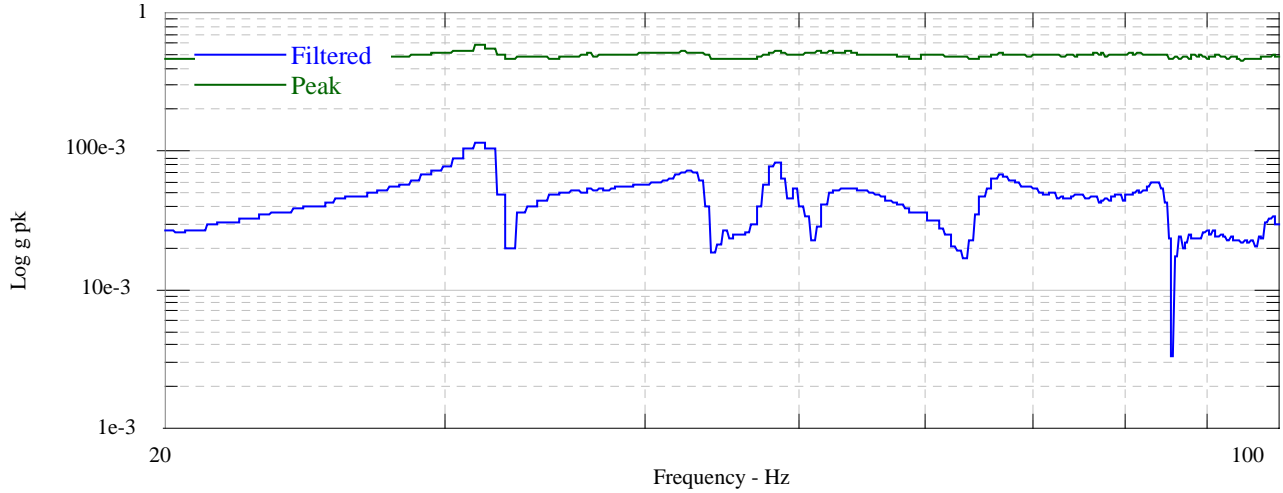
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Date : 8-Apr-04
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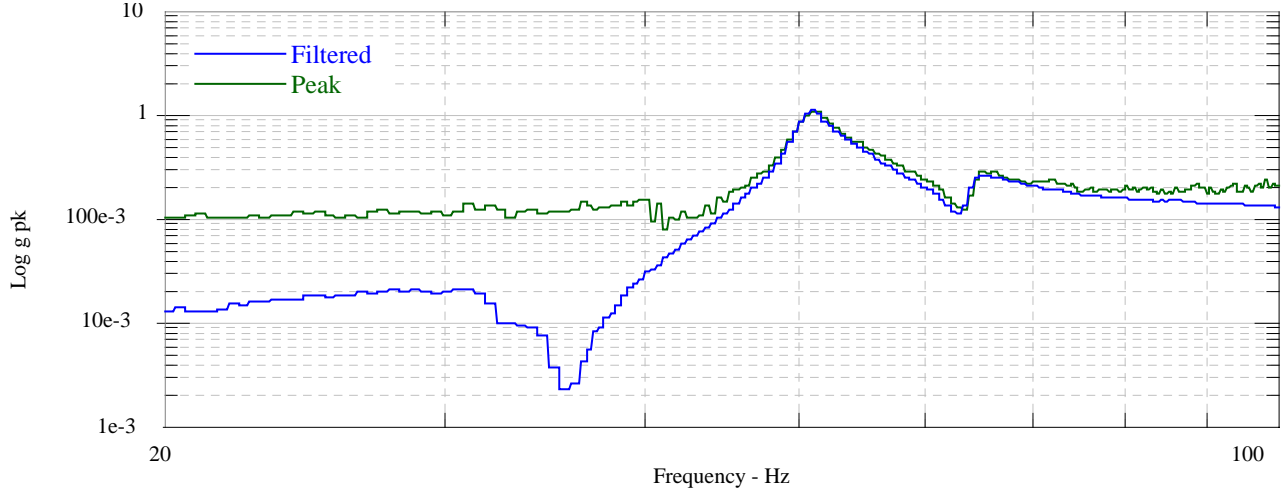
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

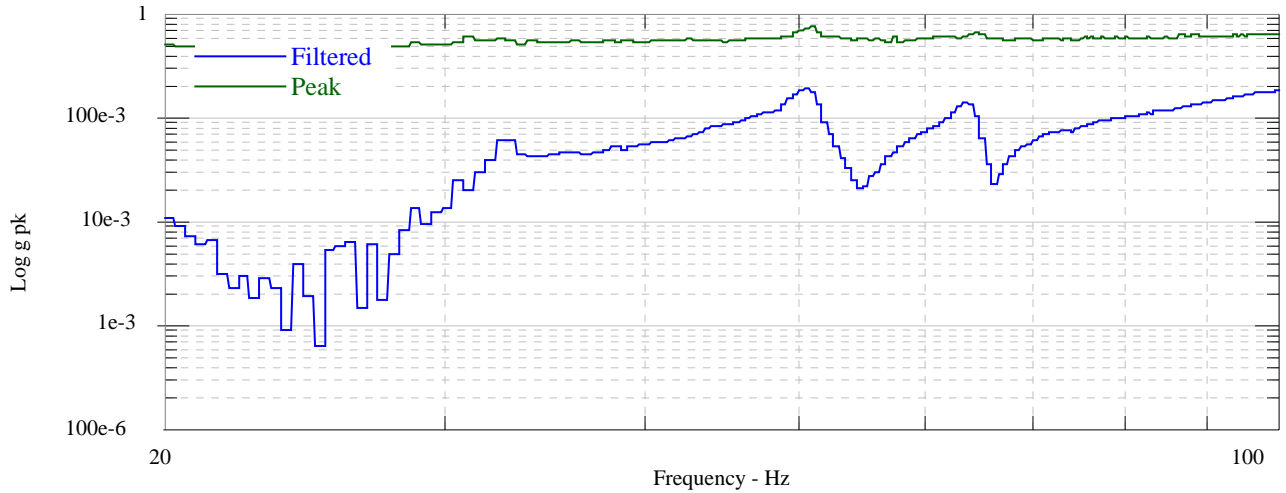


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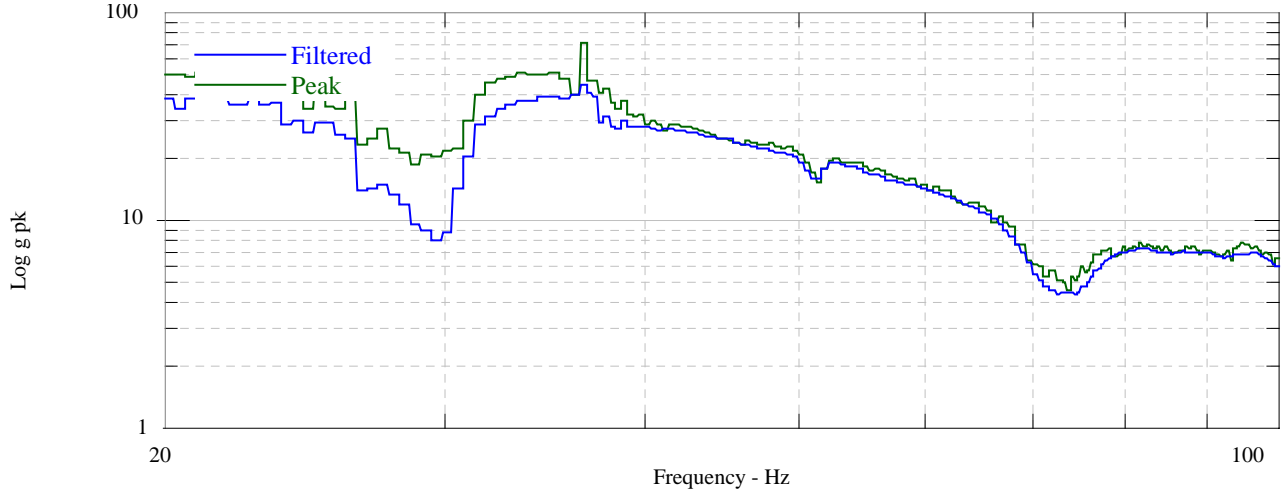
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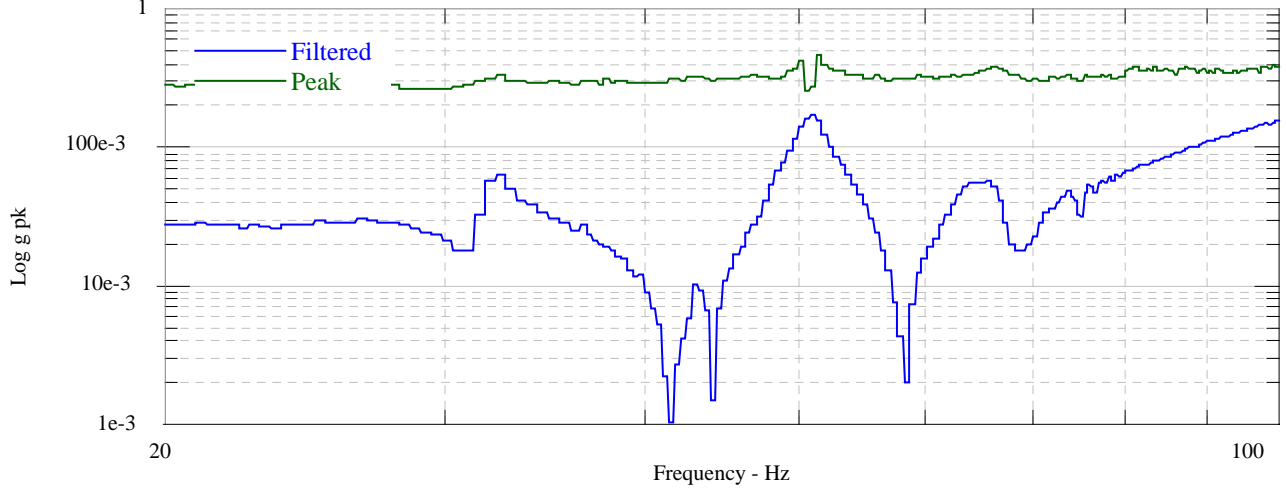
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-YAFRAME.Y Channel n° 28



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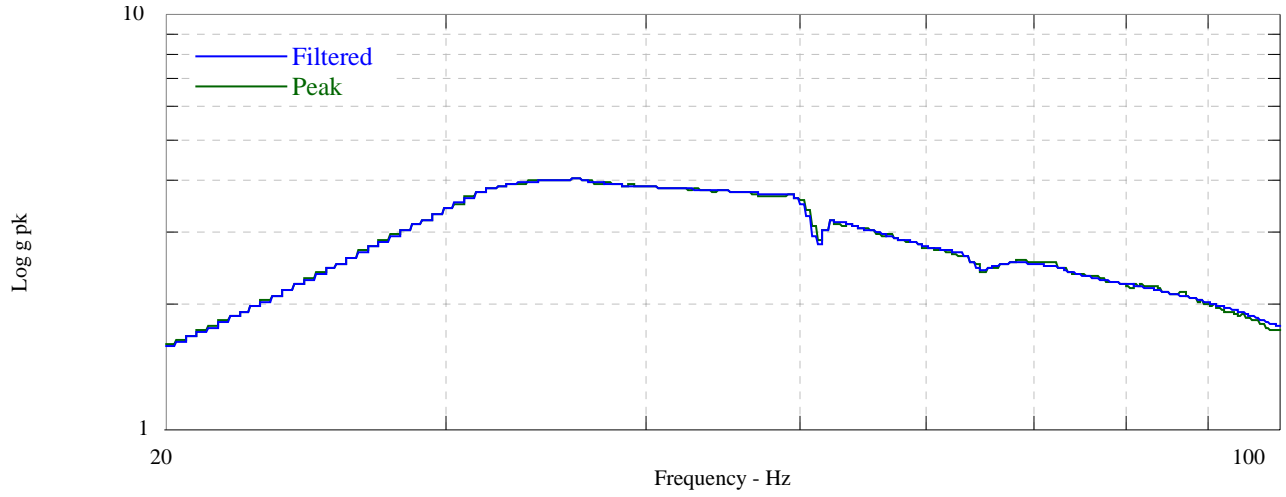


VIBRATION TEST REPORT
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+YAFRAME.Z Channel n° 30



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12.19 HNS3Z.

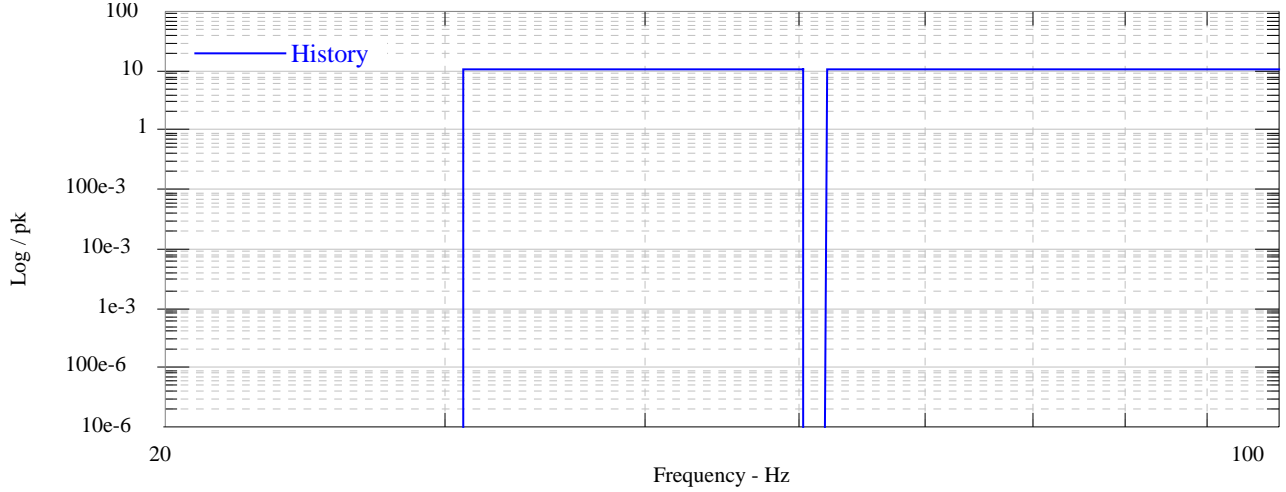
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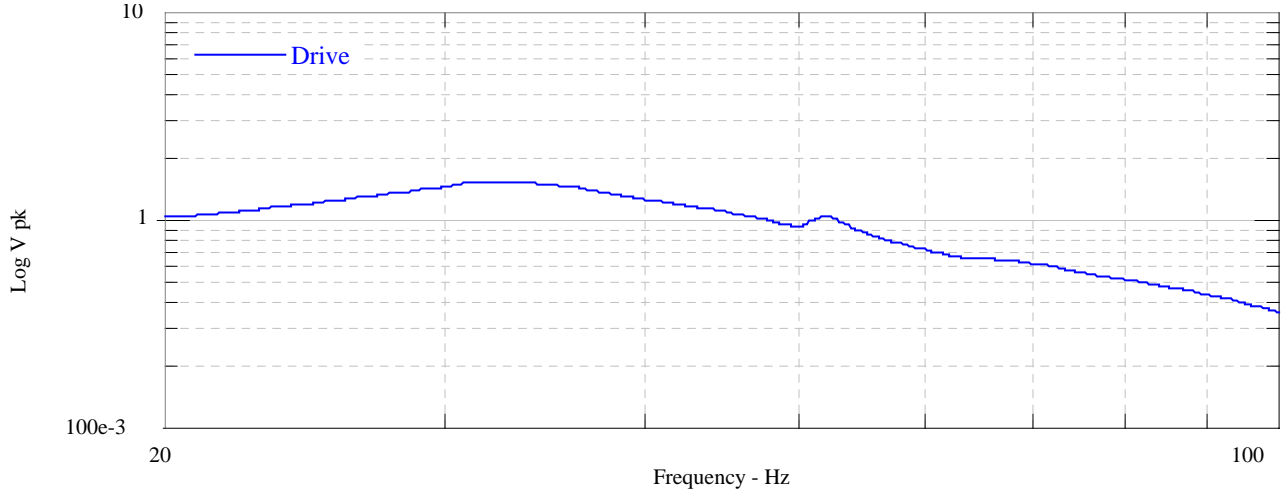
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Révision : 00
Date : 8-Apr-04
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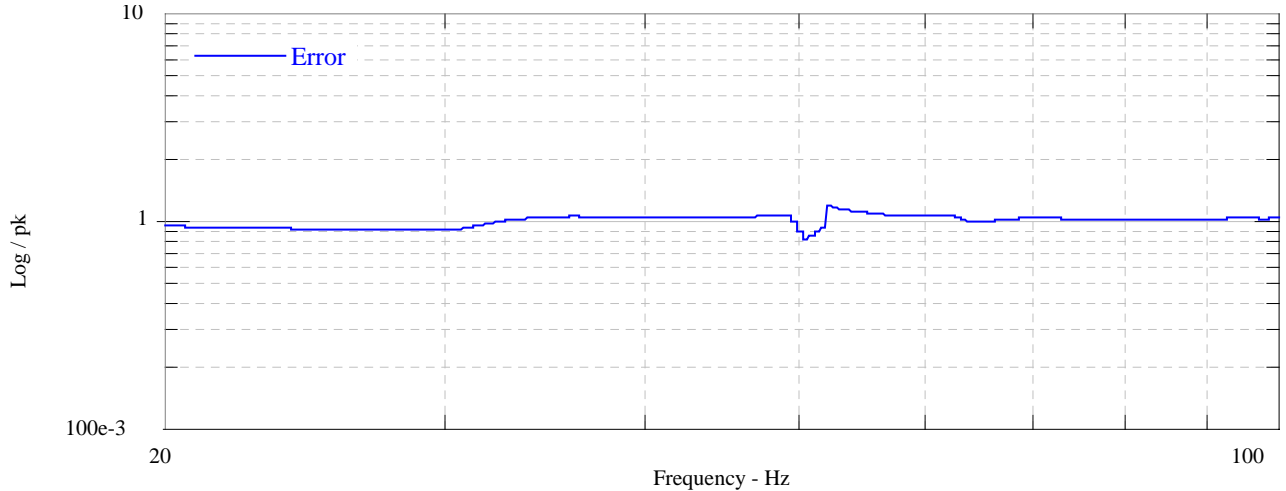
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

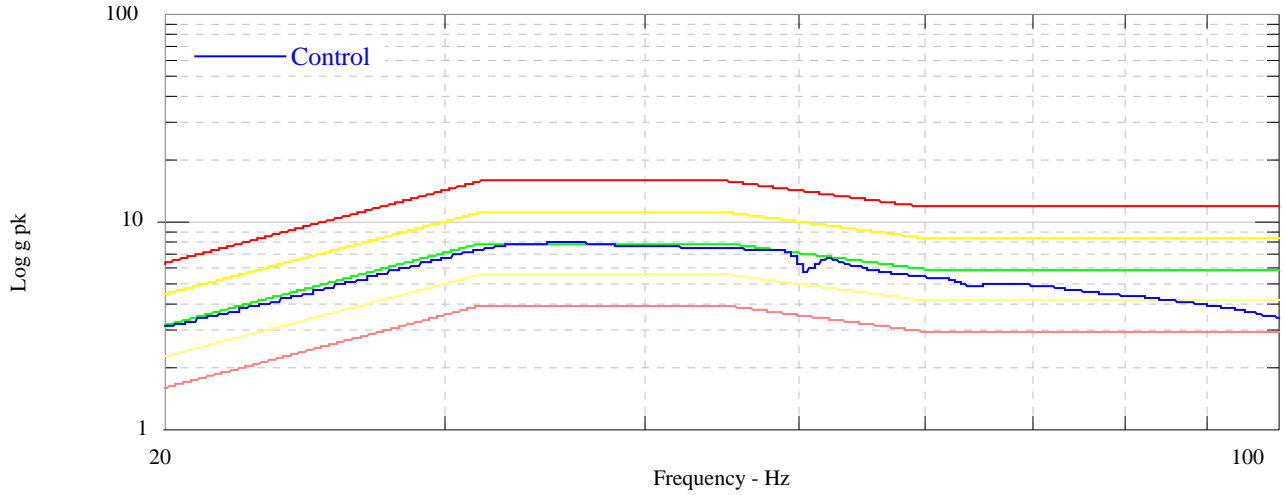


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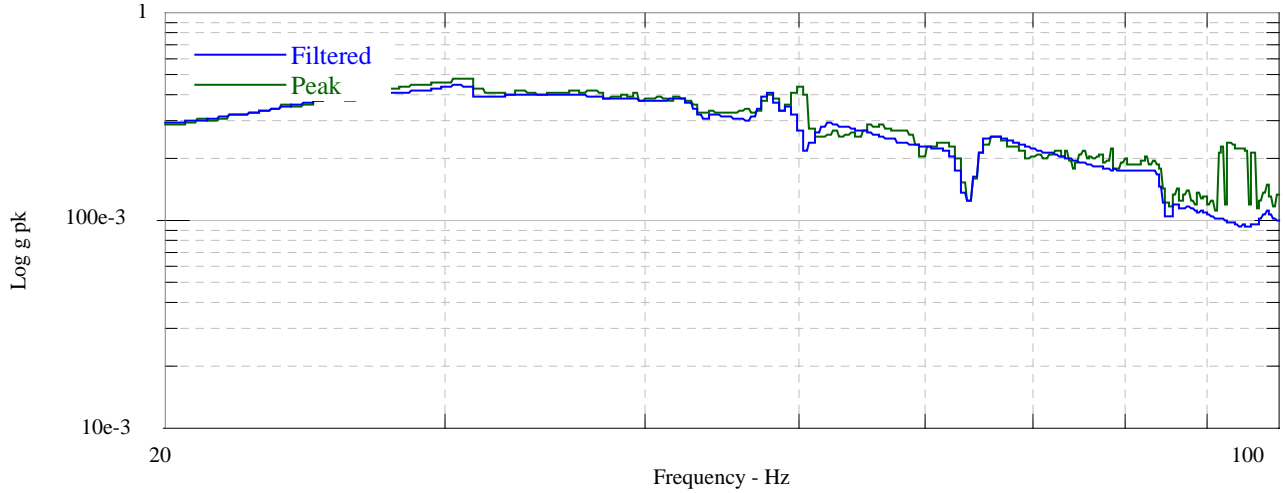
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Date : 8-Apr-04
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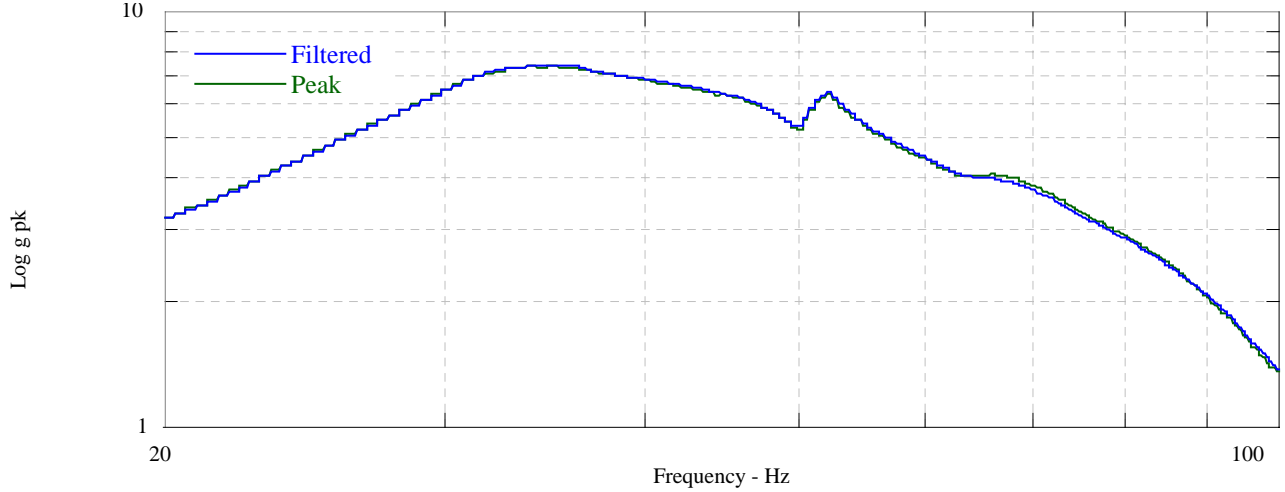
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

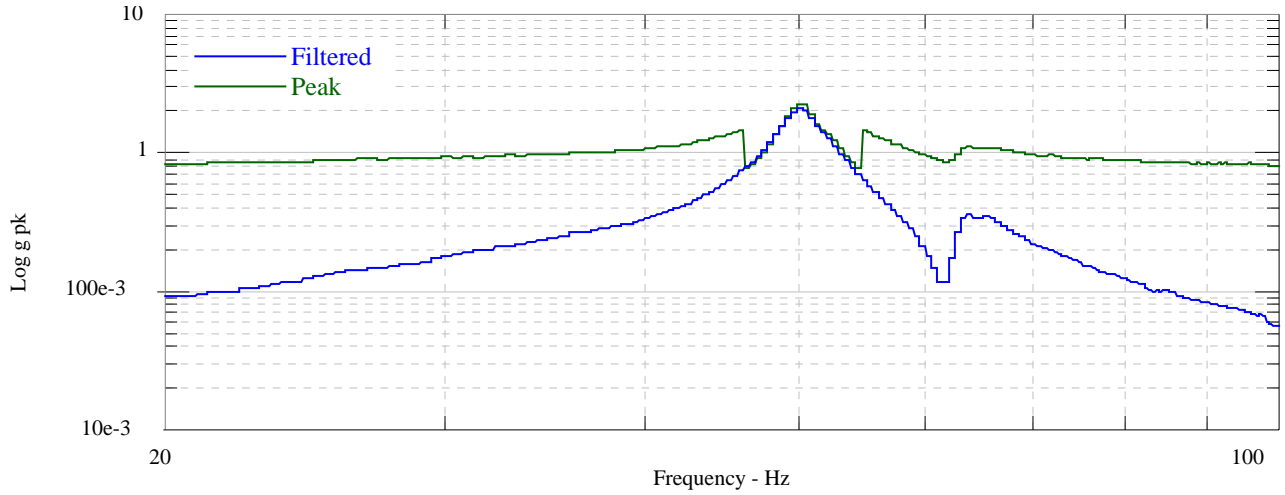


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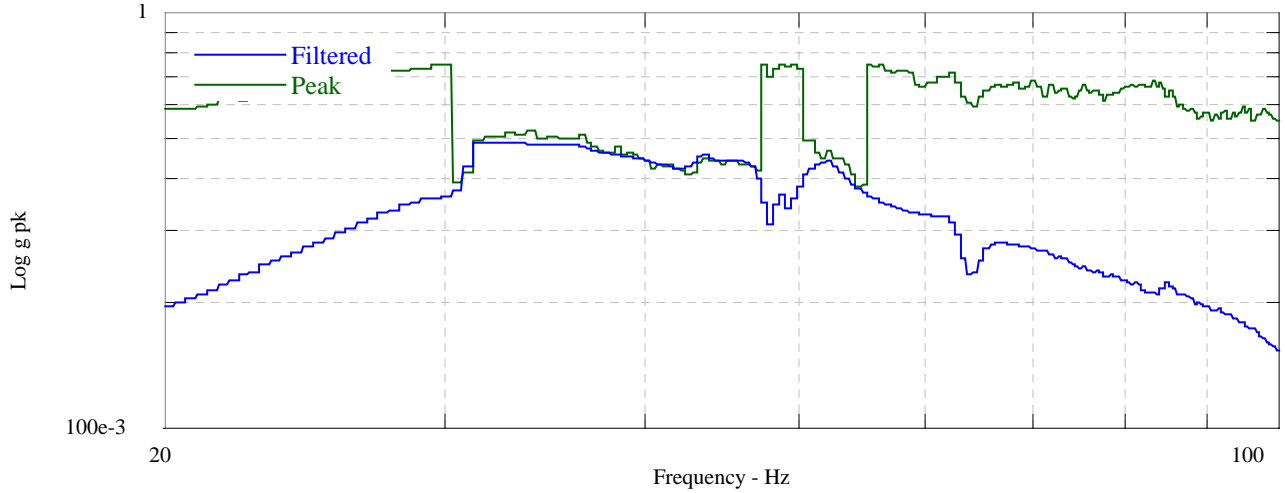
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Date : 8-Apr-04
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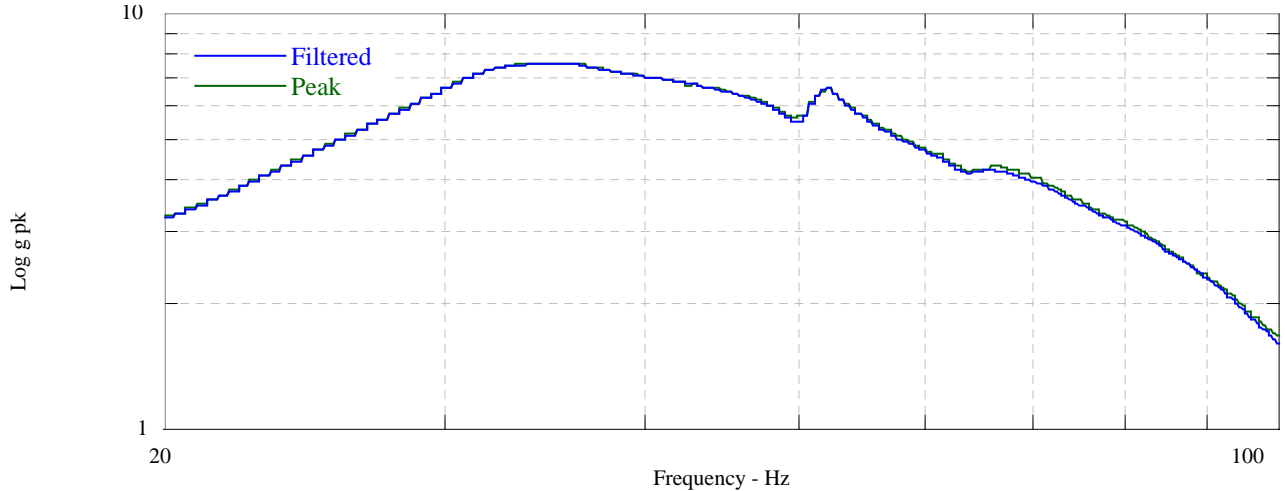
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

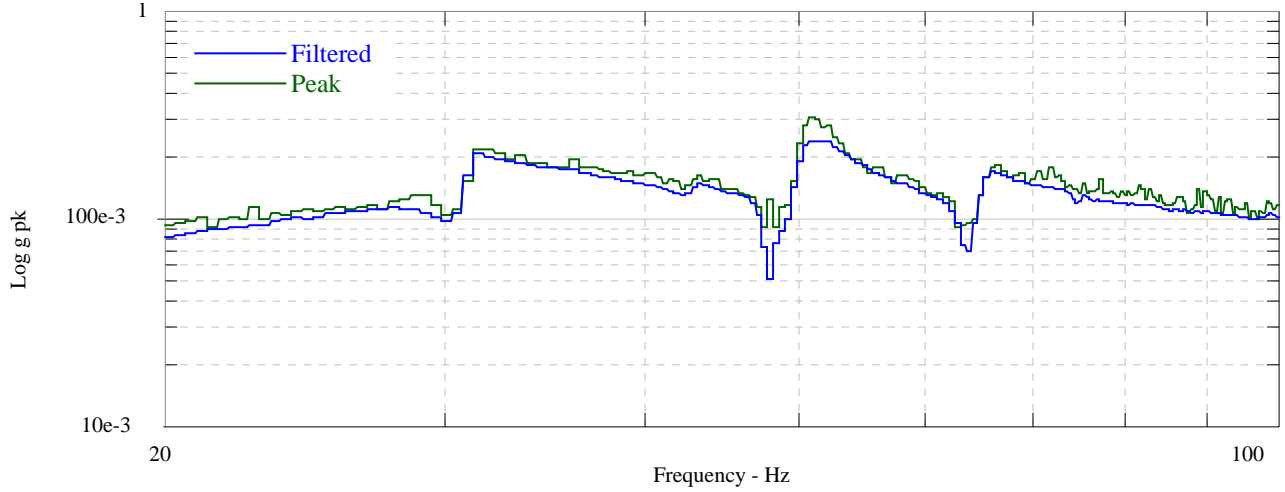


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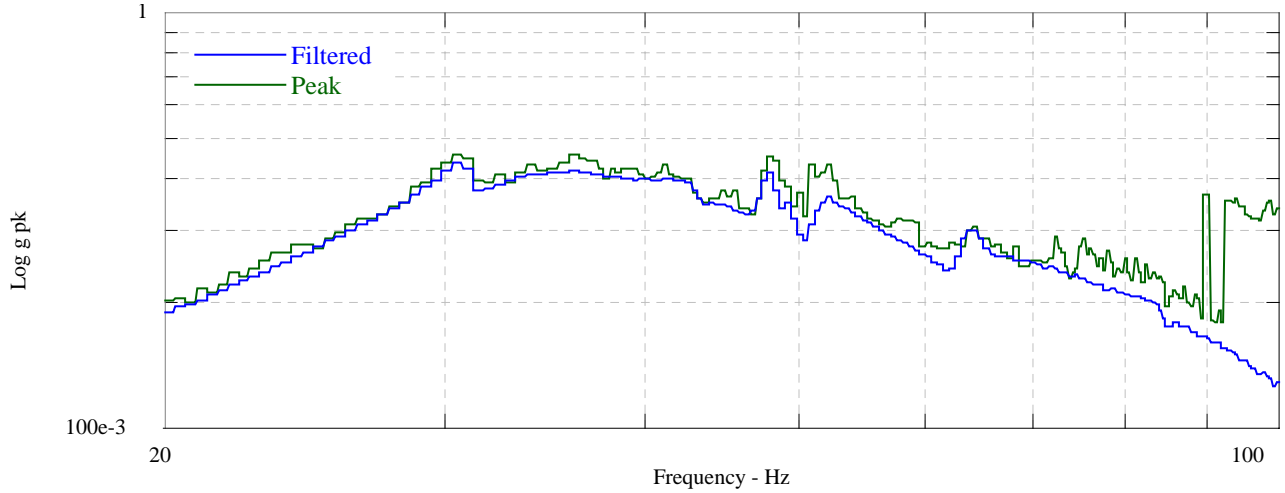
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Date : 8-Apr-04
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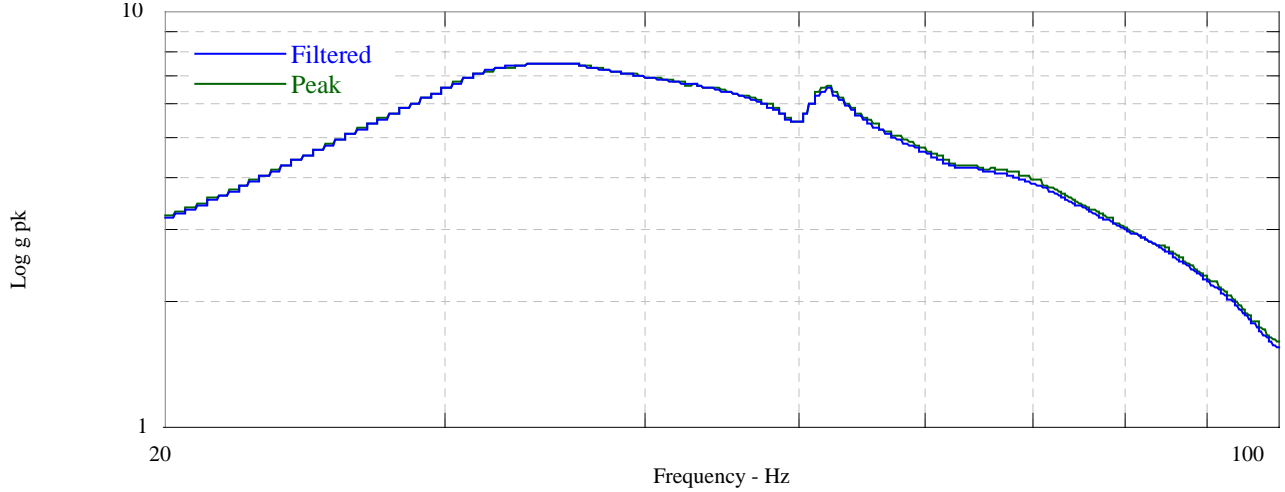
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

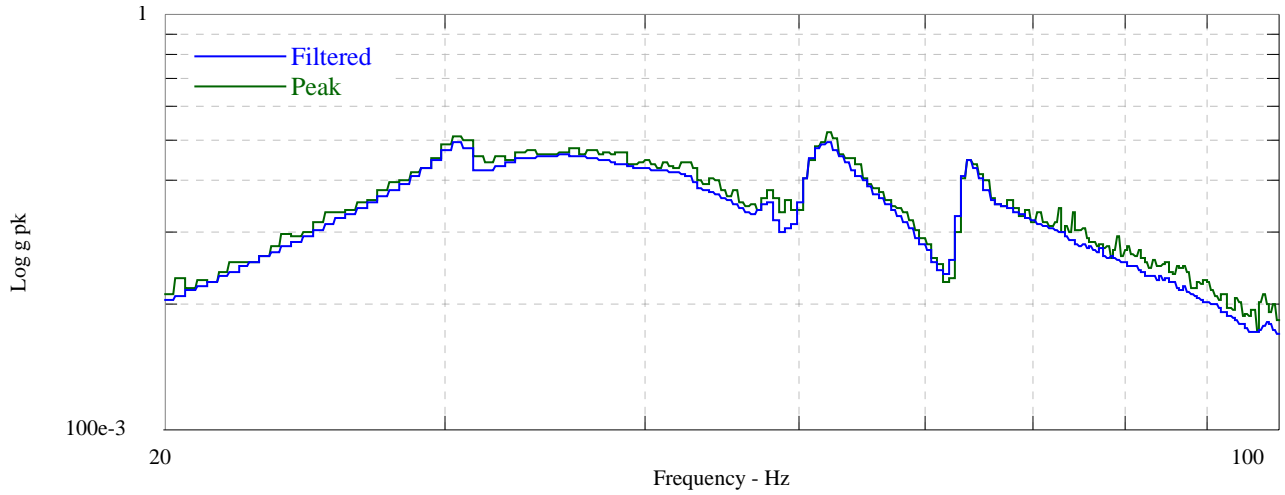


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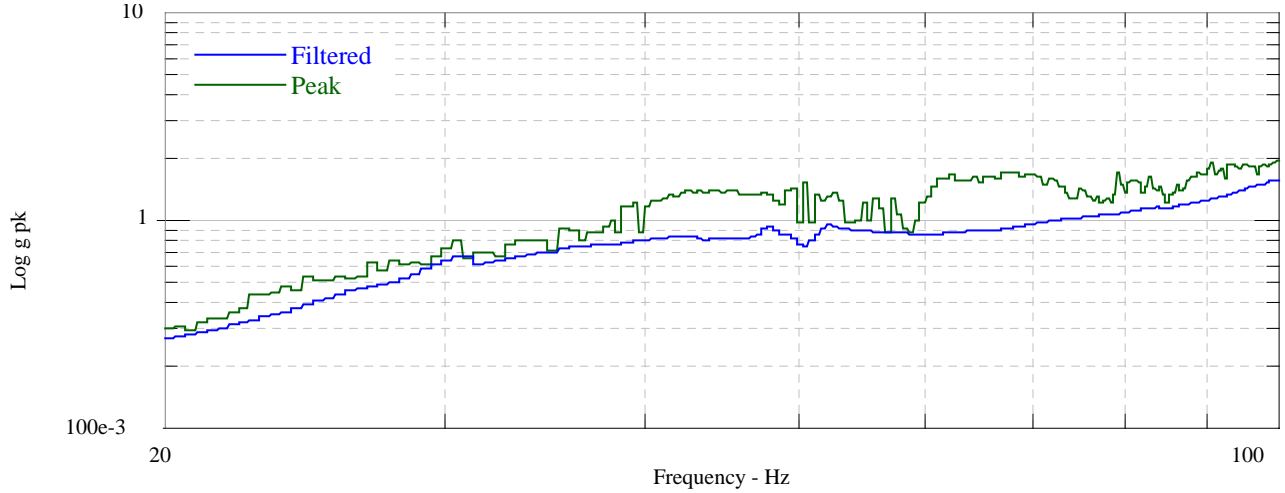
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Date : 8-Apr-04
Page : HNS3Z - 5 / 12

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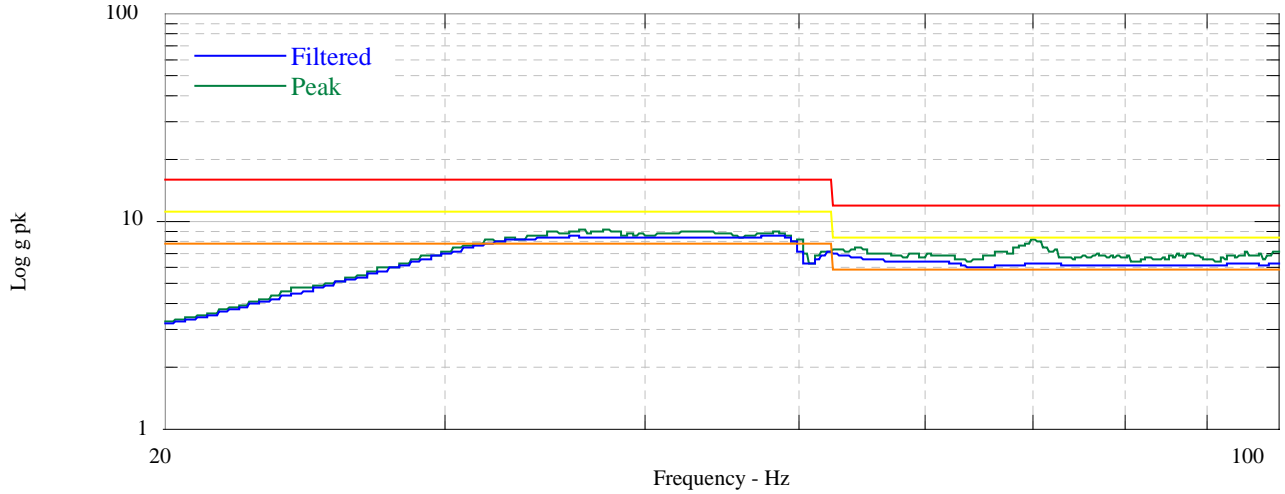
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

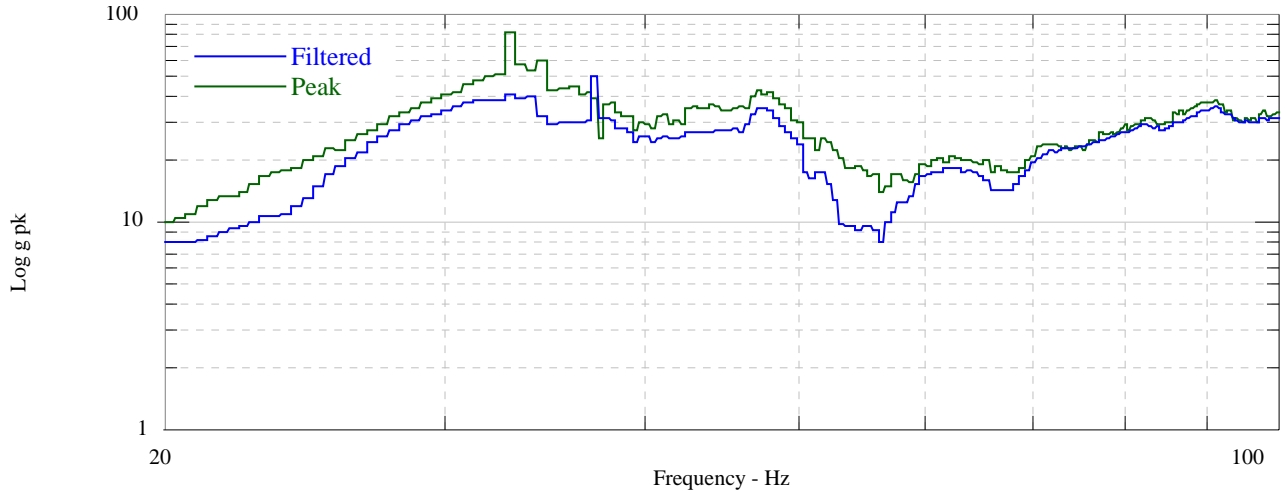


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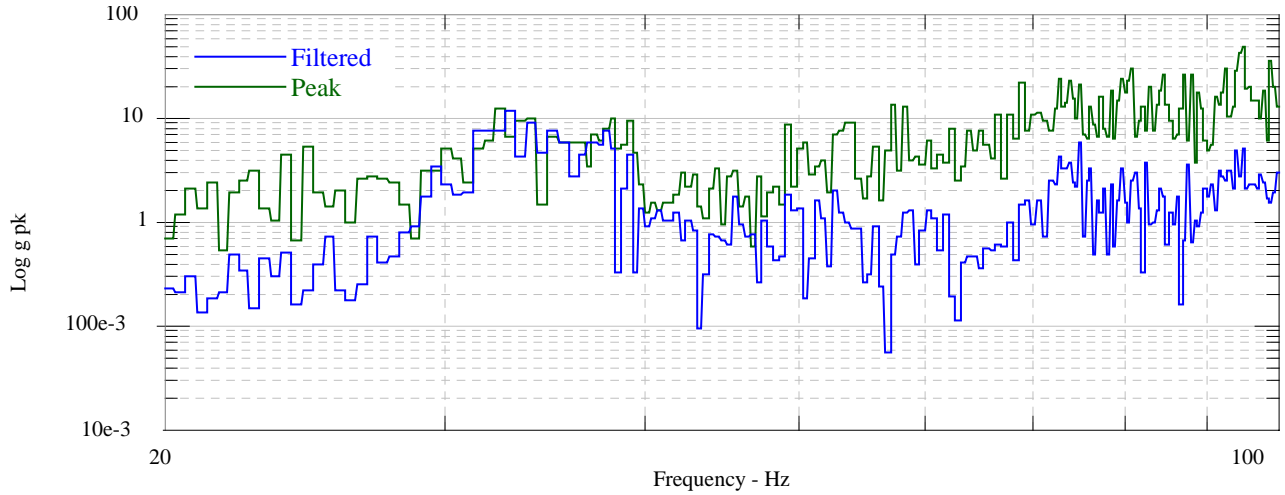
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Date : 8-Apr-04
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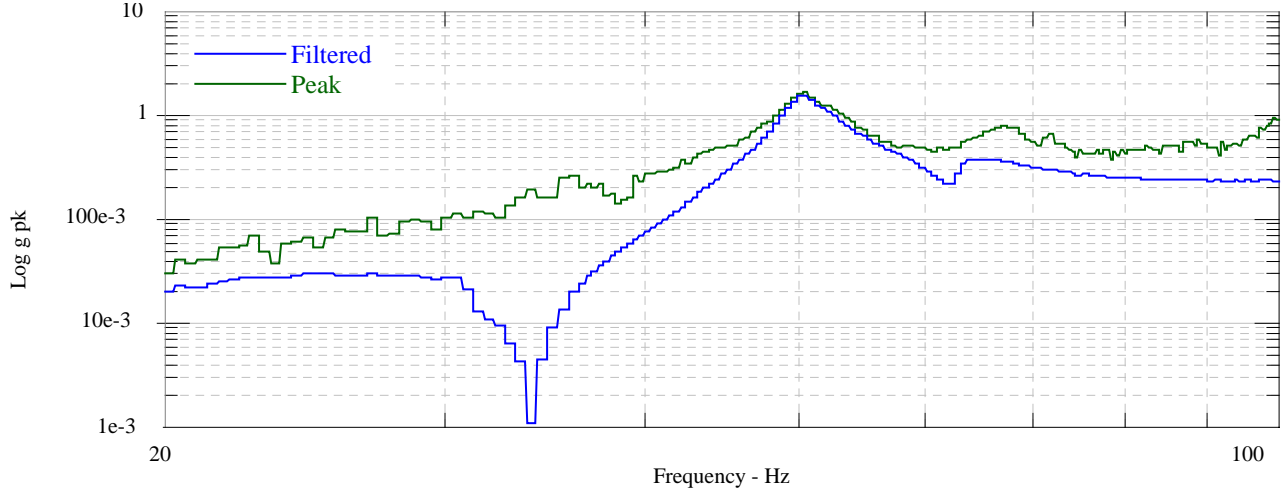
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COOL.X Channel n° 13



FPU.X Channel n° 14

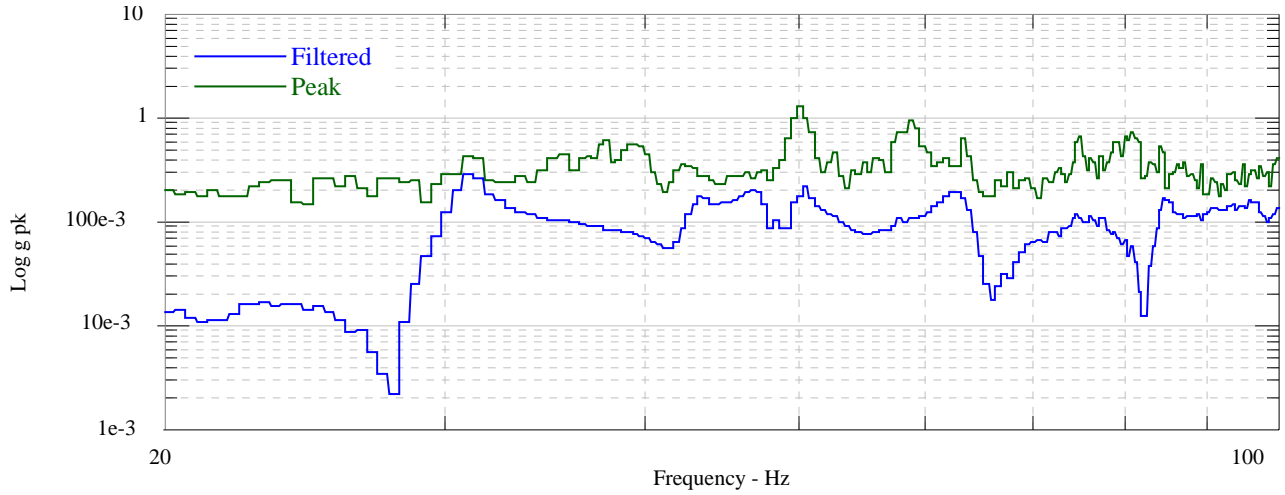


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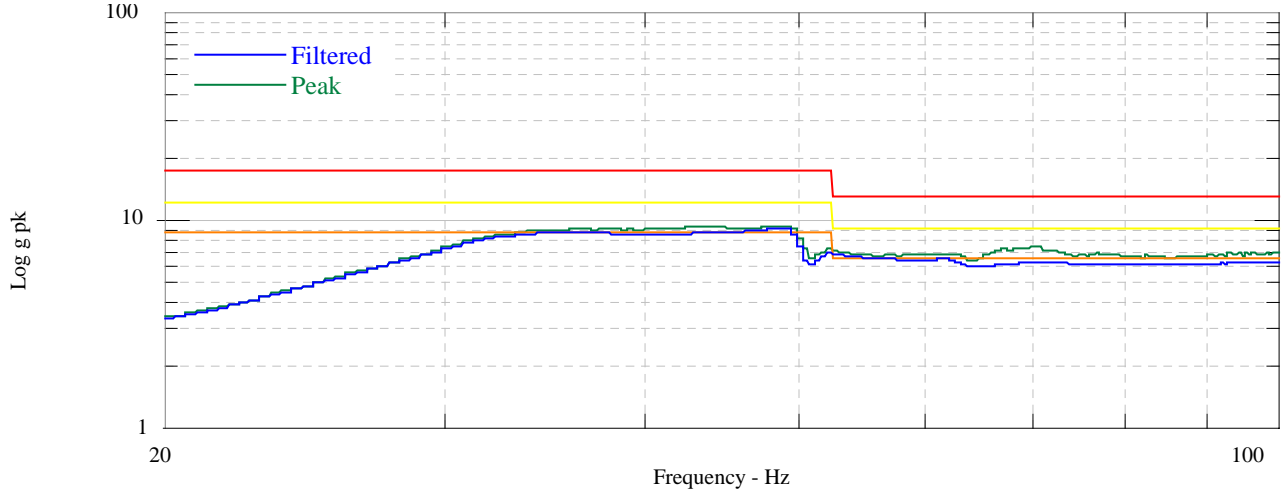
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Date : 8-Apr-04
Page : HNS3Z - 7 / 12

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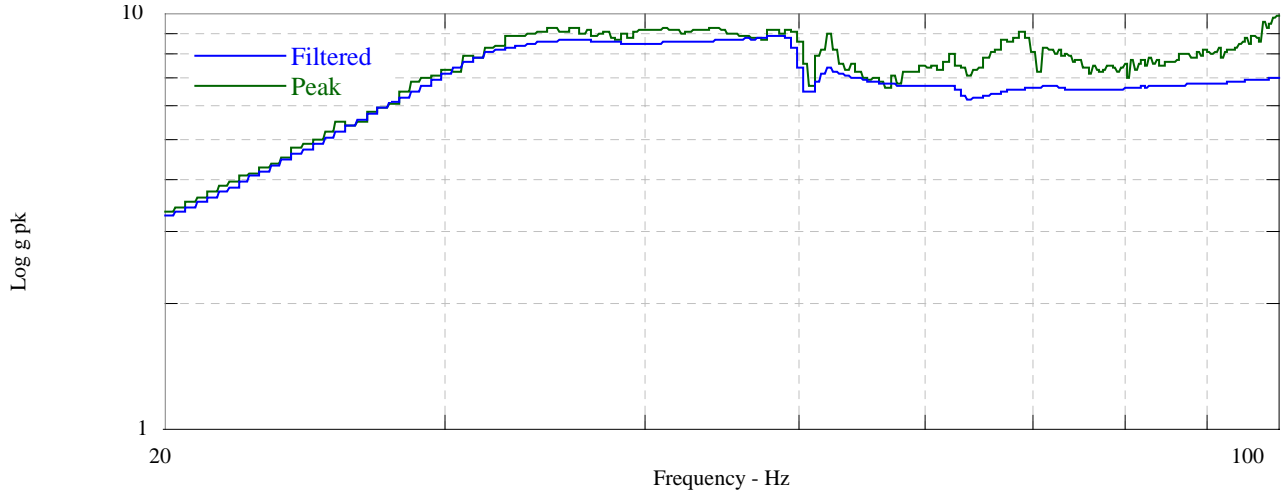
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

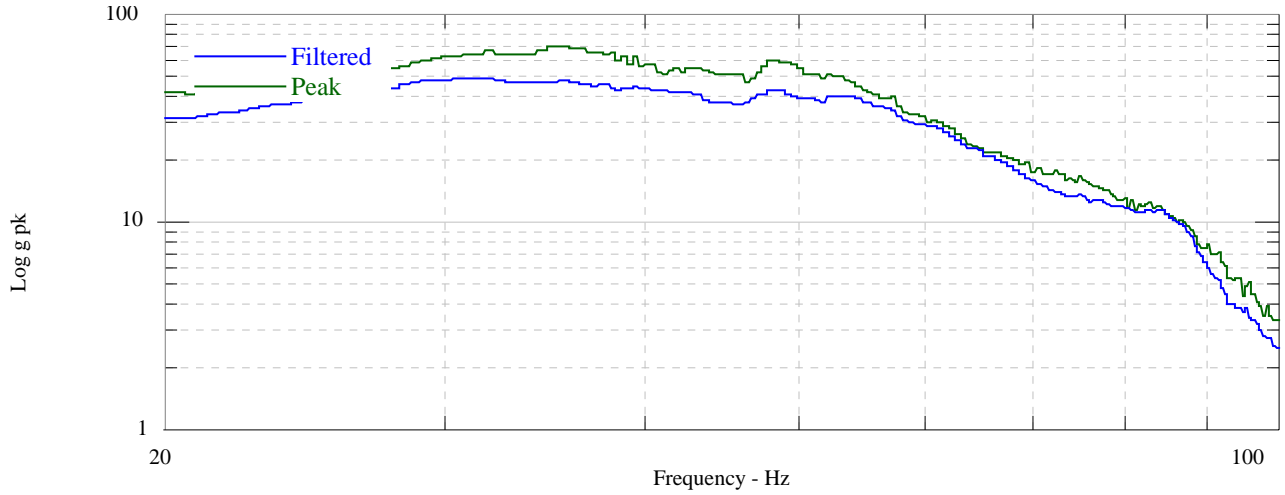


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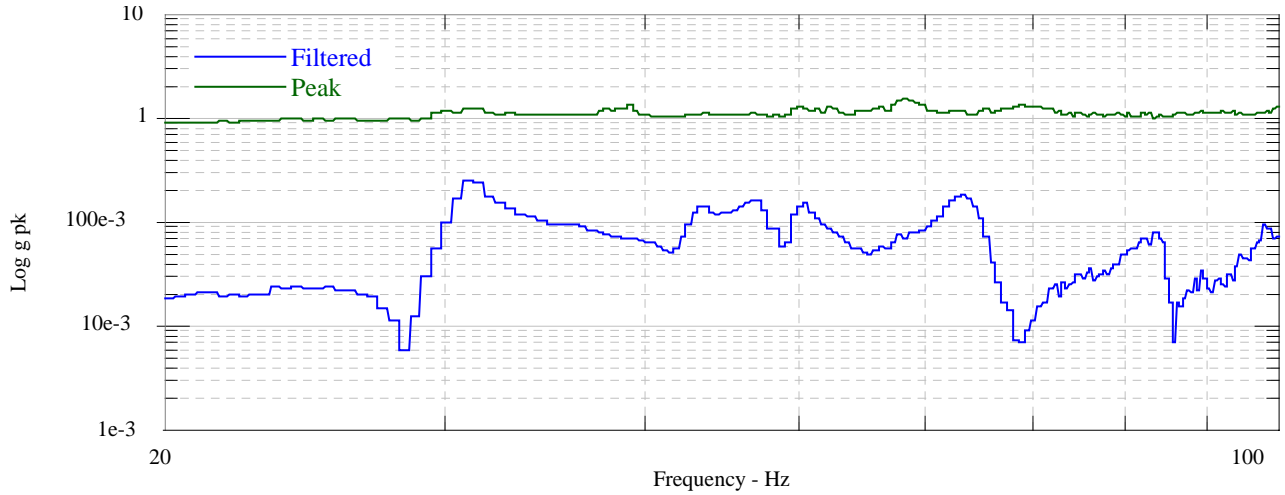
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Date : 8-Apr-04
Page : HNS3Z - 8 / 12

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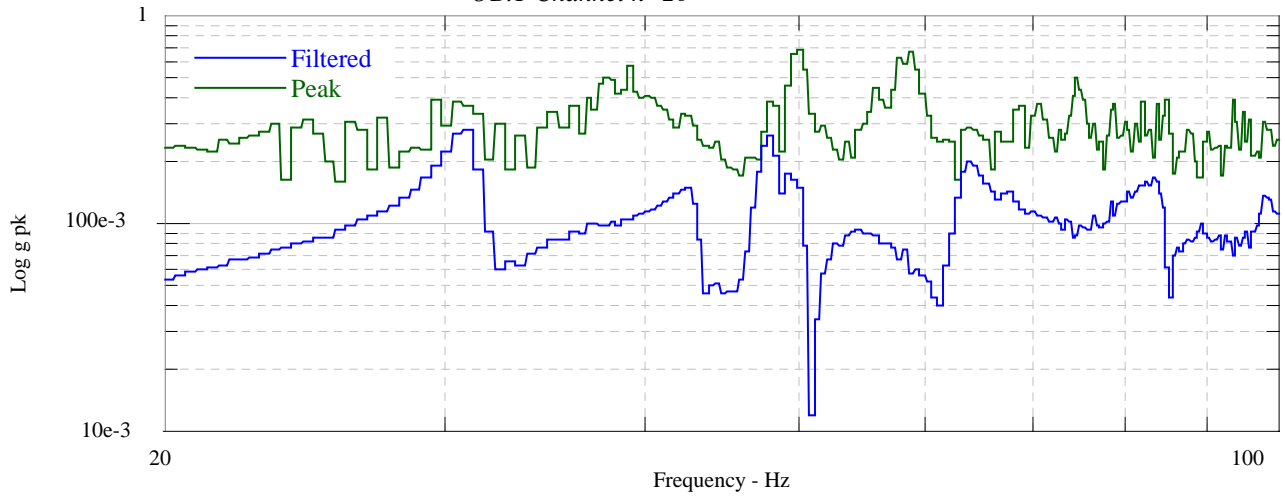
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

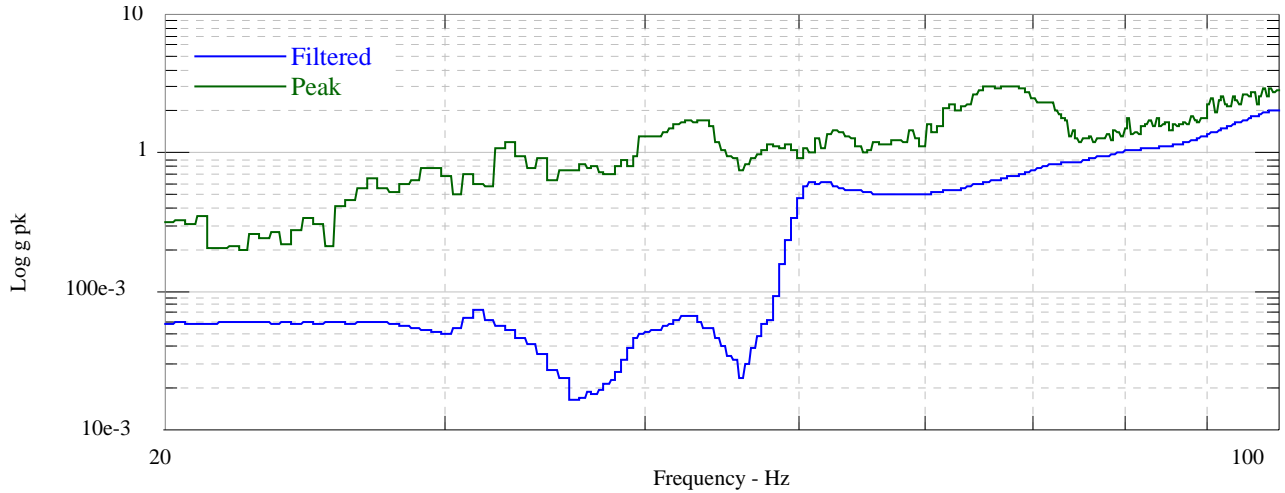


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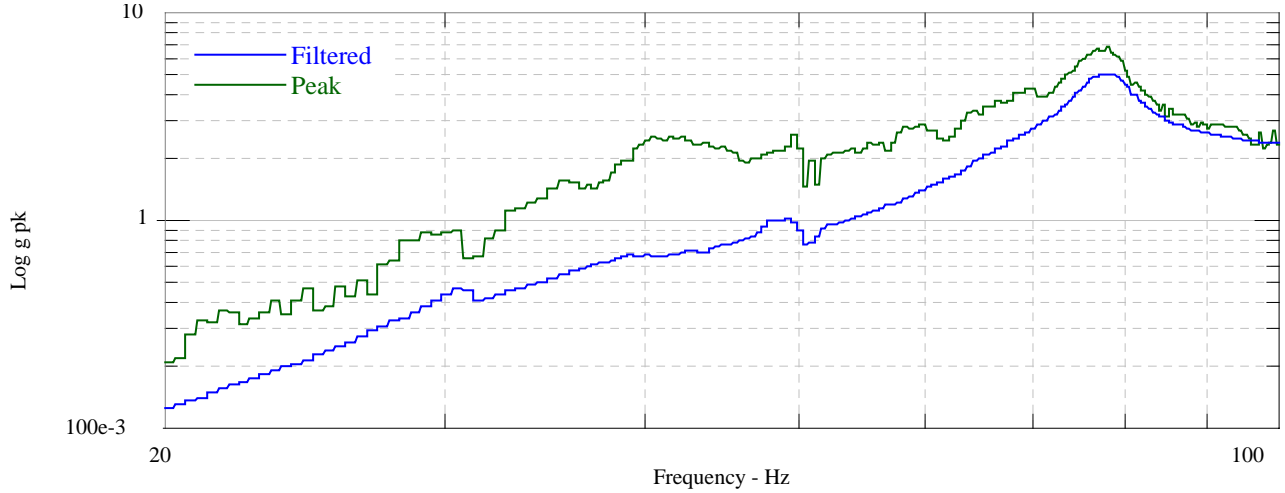
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Version : 01
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Date : 8-Apr-04
Page : HNS3Z - 9 / 12

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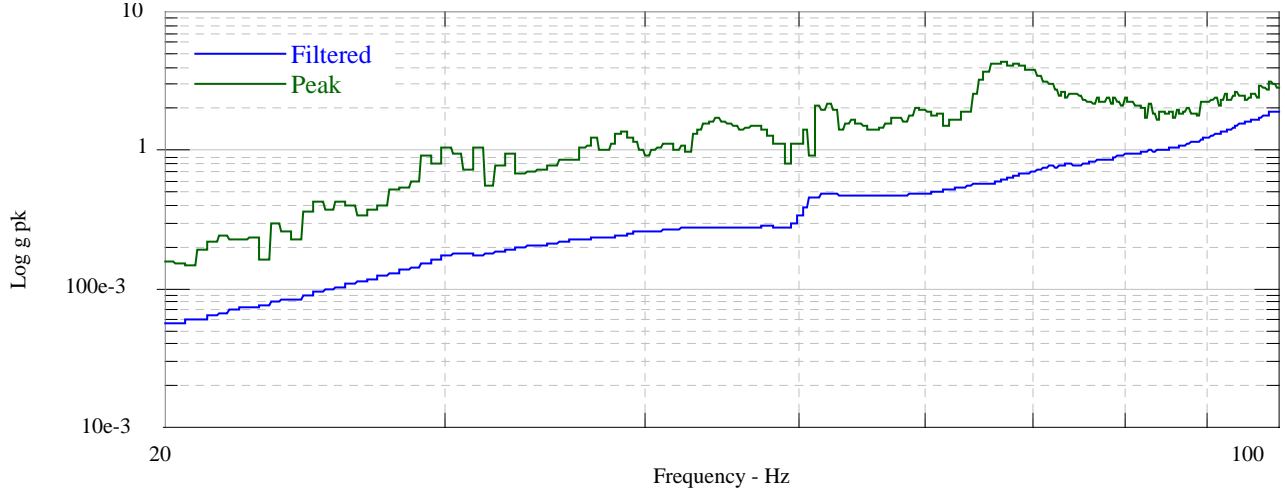
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CTIP.Y Channel n° 22



SMECU.X Channel n° 23

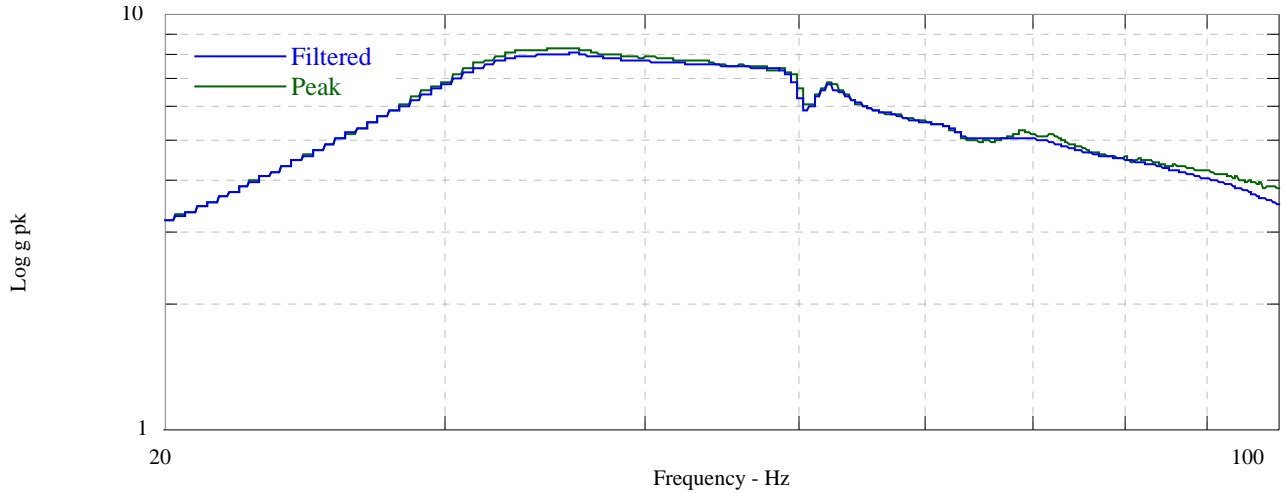


VIBRATION TEST REPORT
SPIRE QM

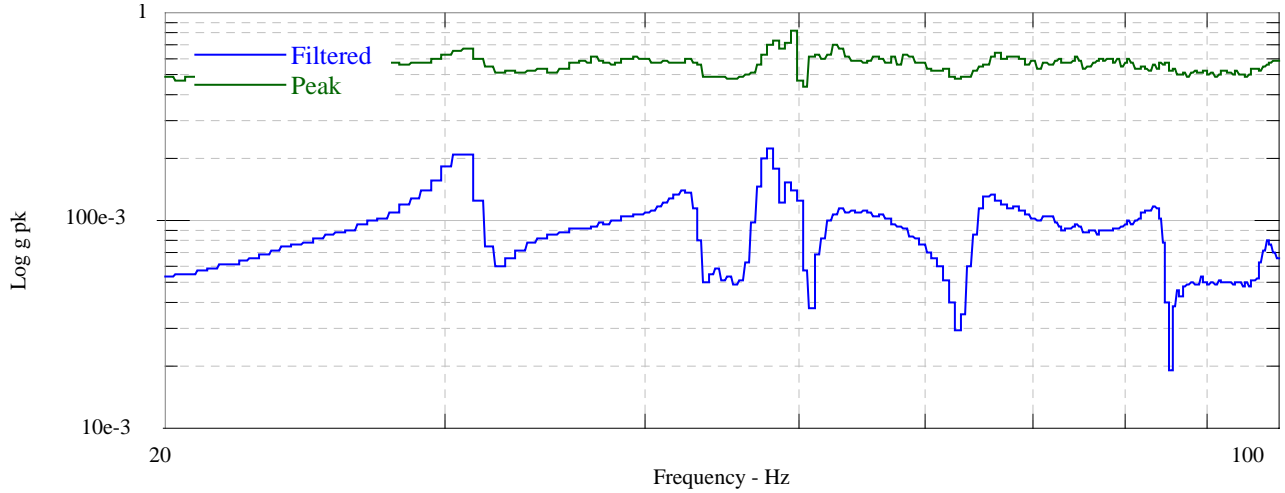
RP-CSL-CRYOV-04001
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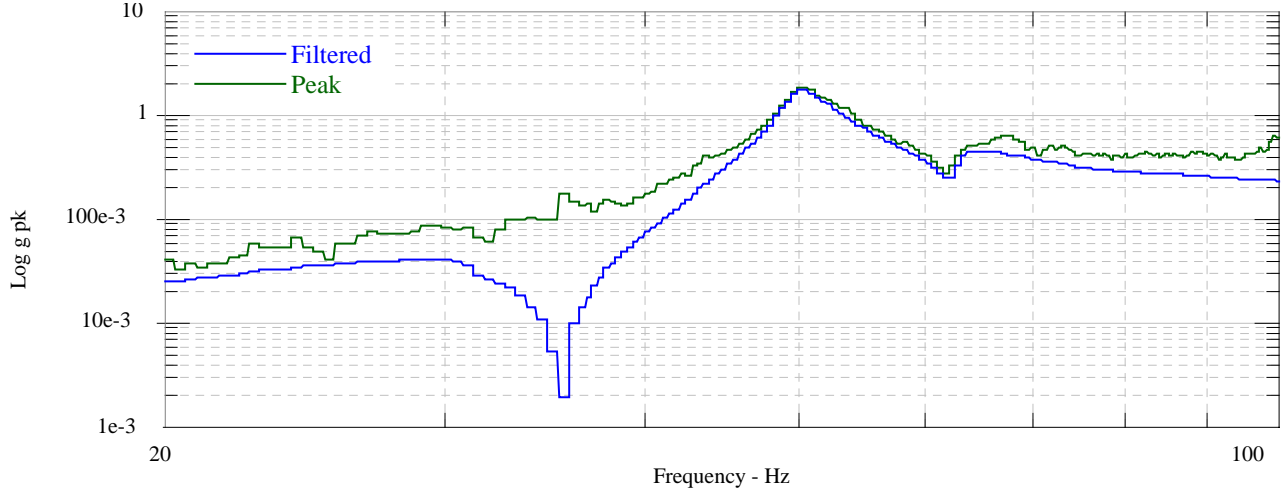
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CONE.Y Channel n° 25



CONE.X Channel n° 26

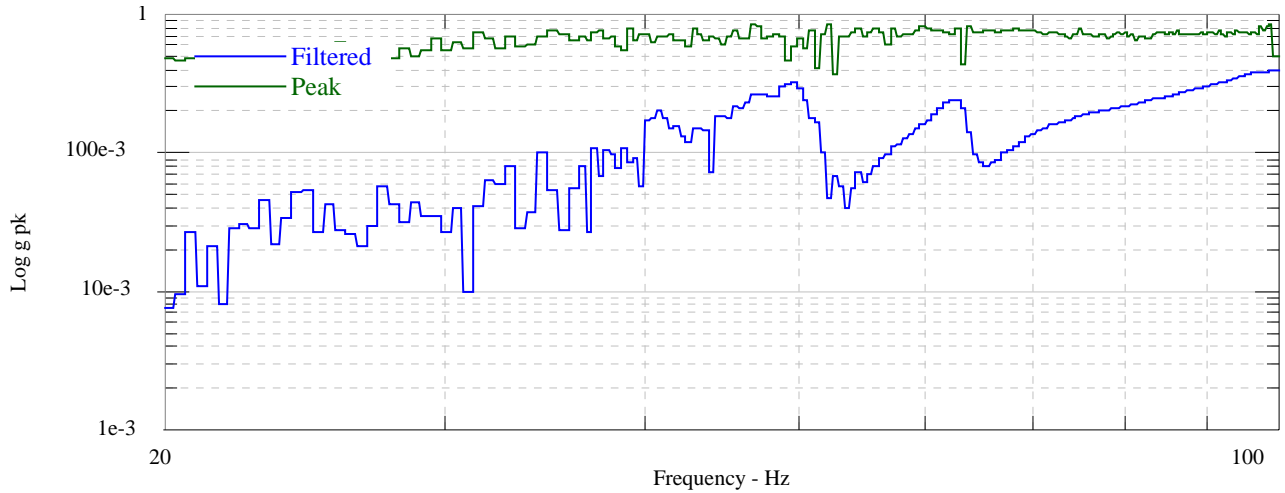


VIBRATION TEST REPORT
SPIRE QM

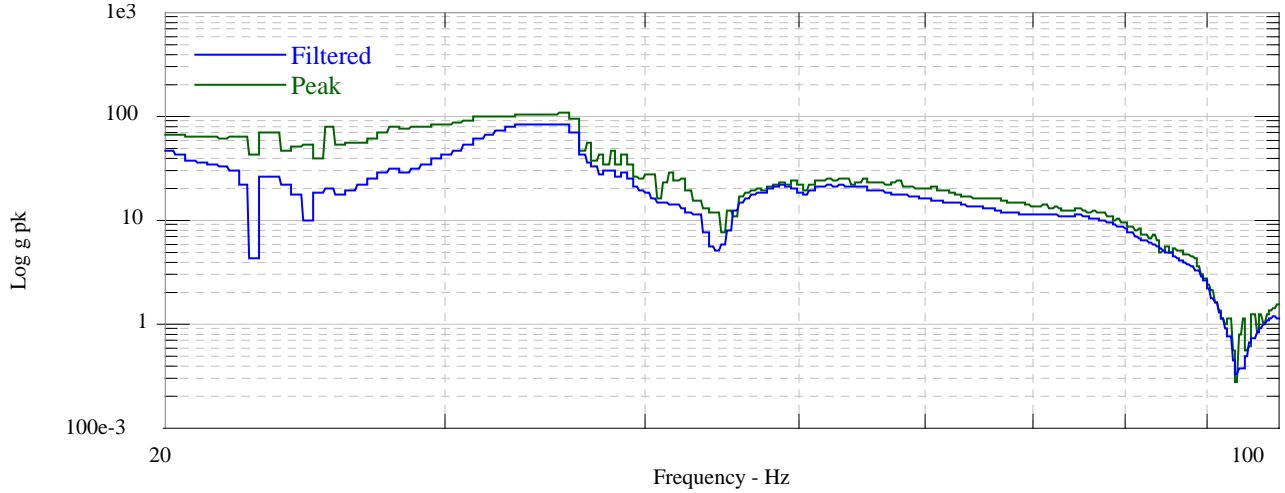
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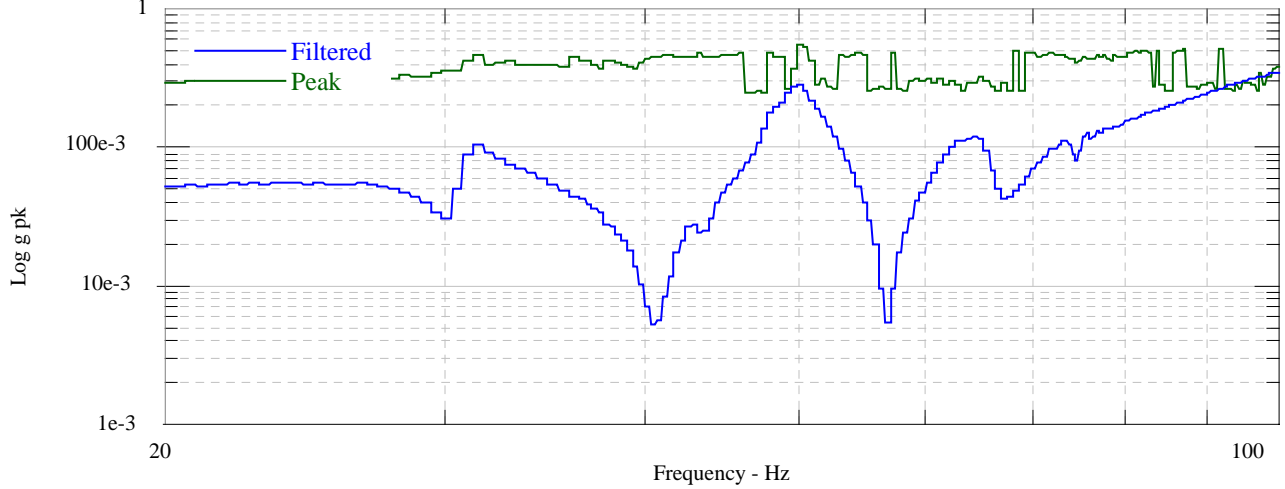
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-YAFRAME.Y Channel n° 28



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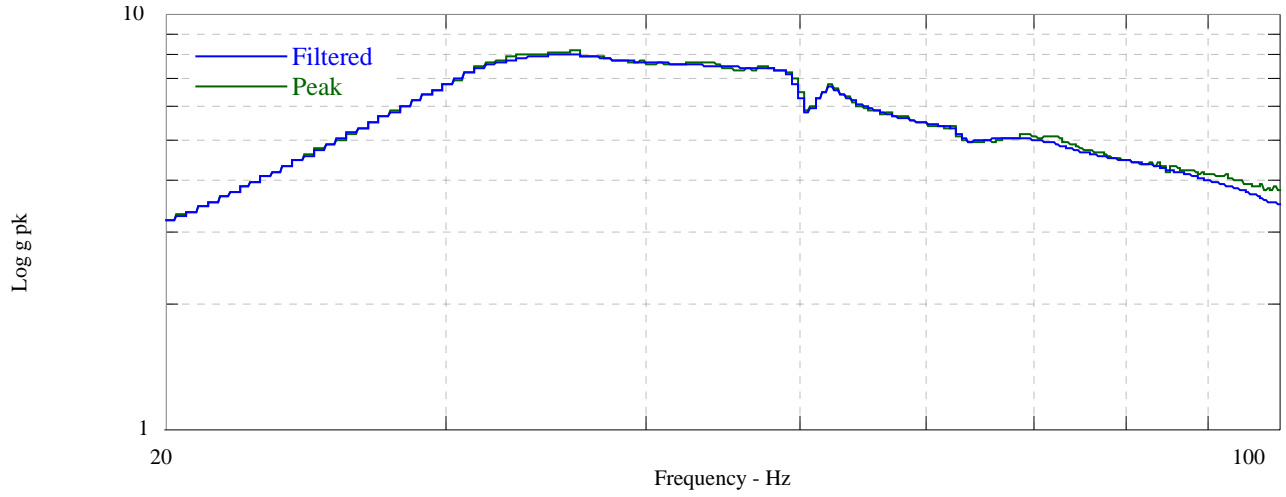


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+YAFRAME.Z Channel n° 30



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SPIRE QM

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12.20 BNS4Z.

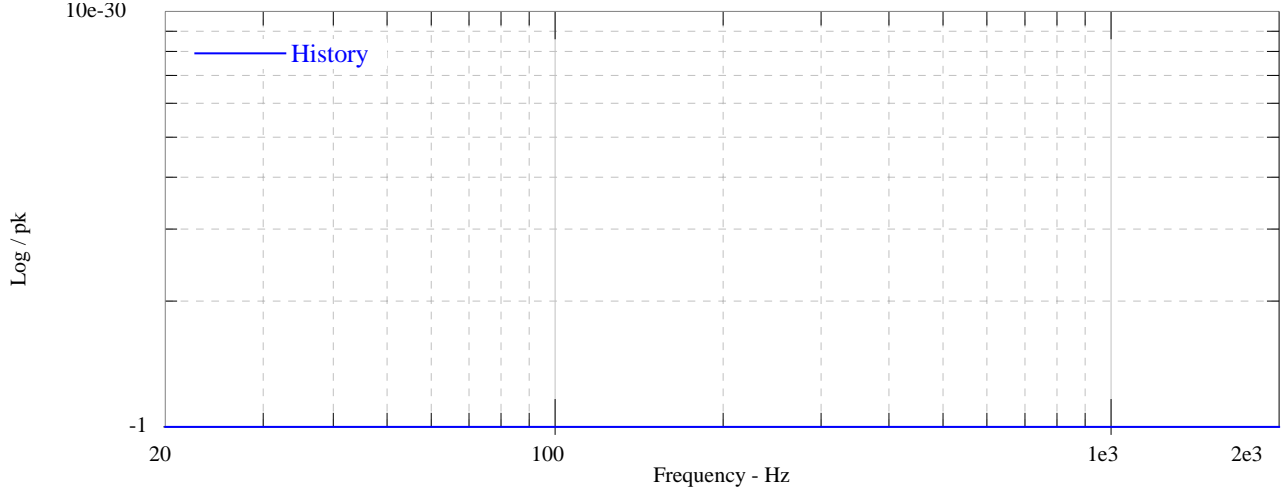
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VIBRATION TEST REPORT
SPIRE QM

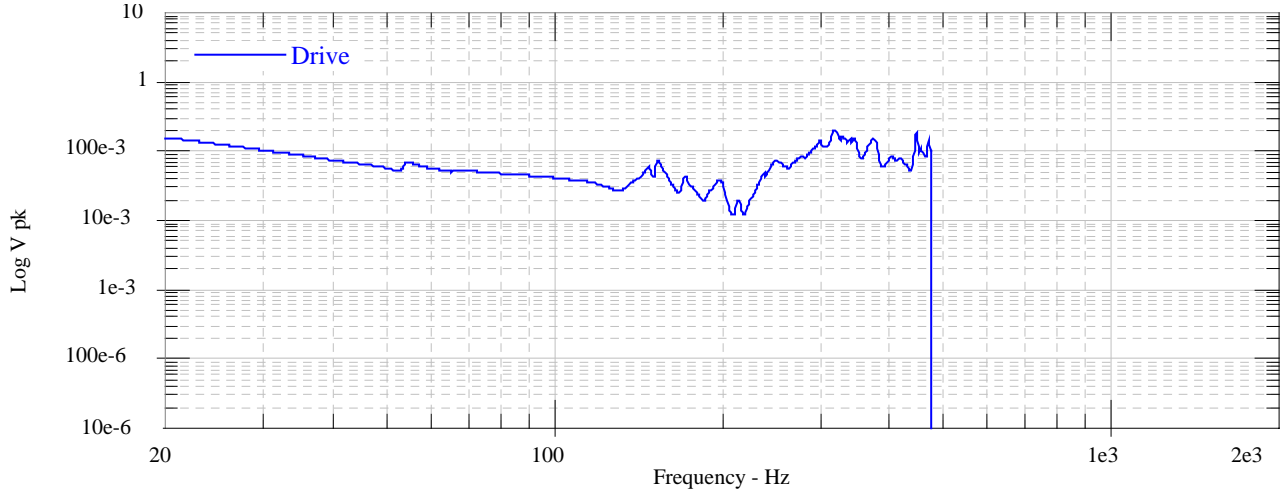
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Date : 8-Apr-04
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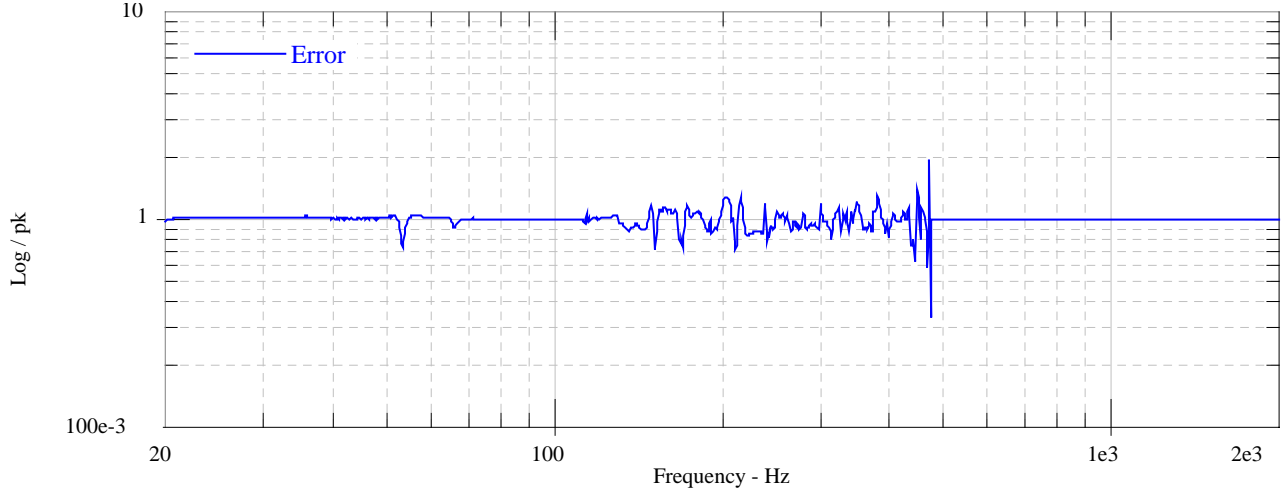
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Drive Channel n° -2



Error Channel n° -1

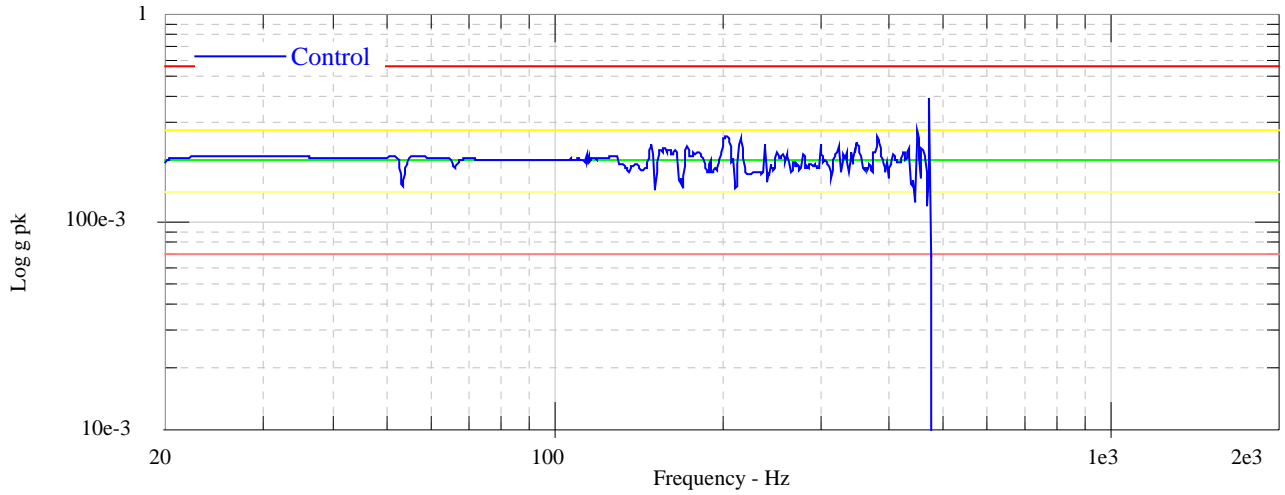


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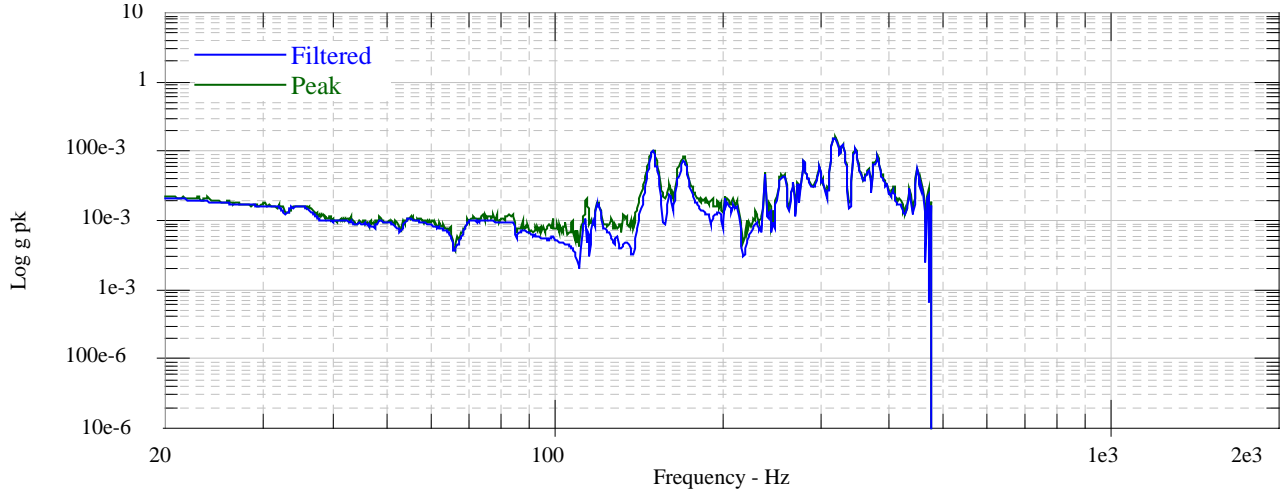
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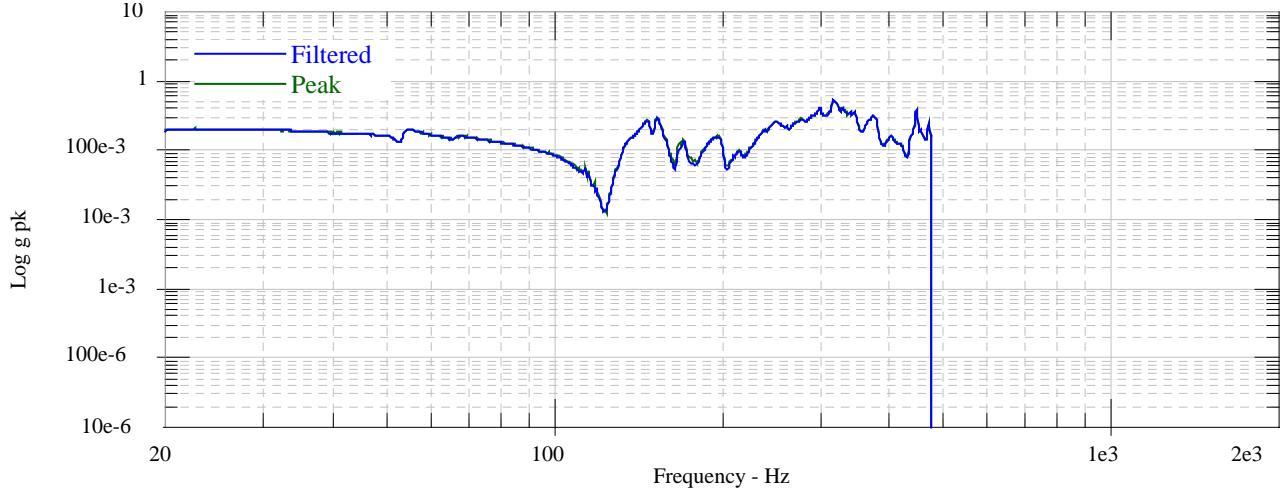
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

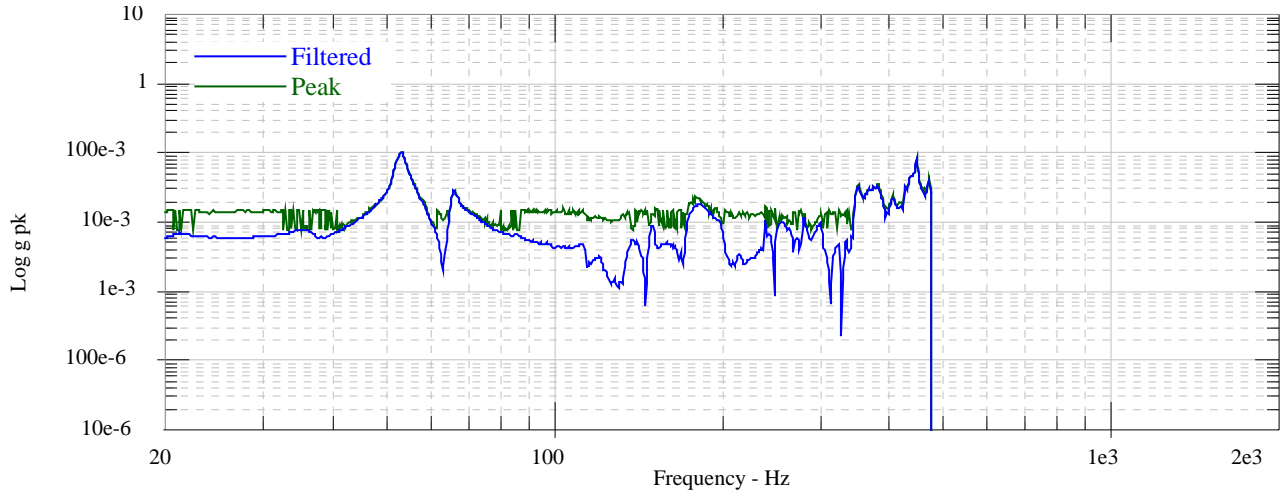


VIBRATION TEST REPORT
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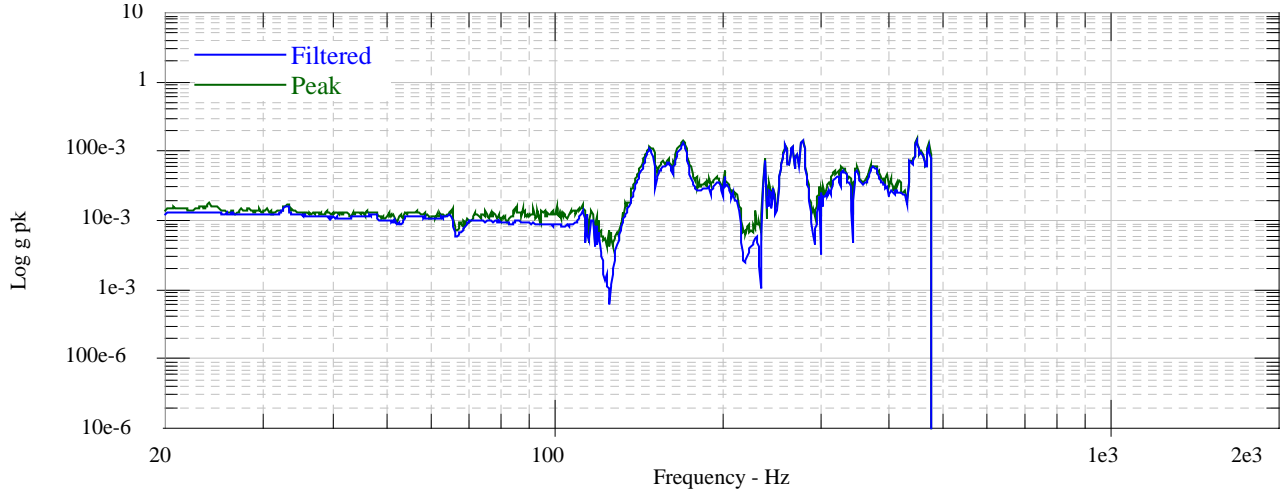
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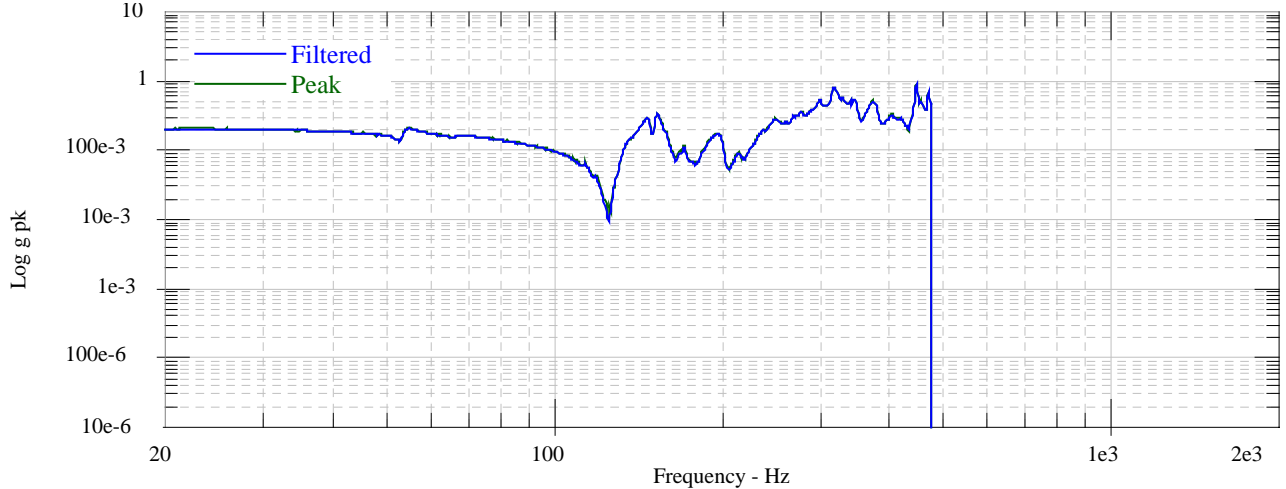
SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

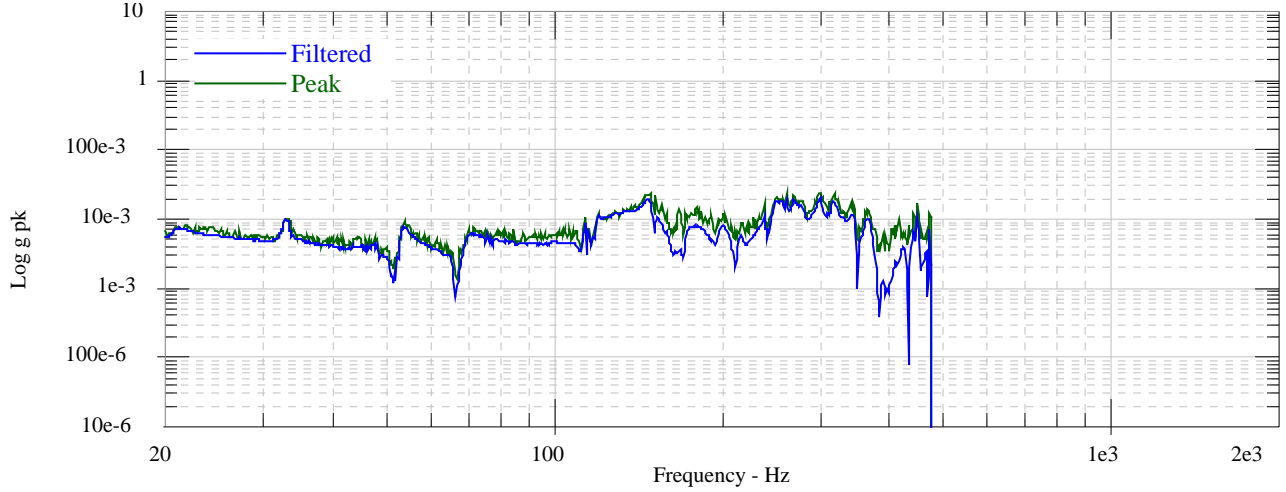


VIBRATION TEST REPORT
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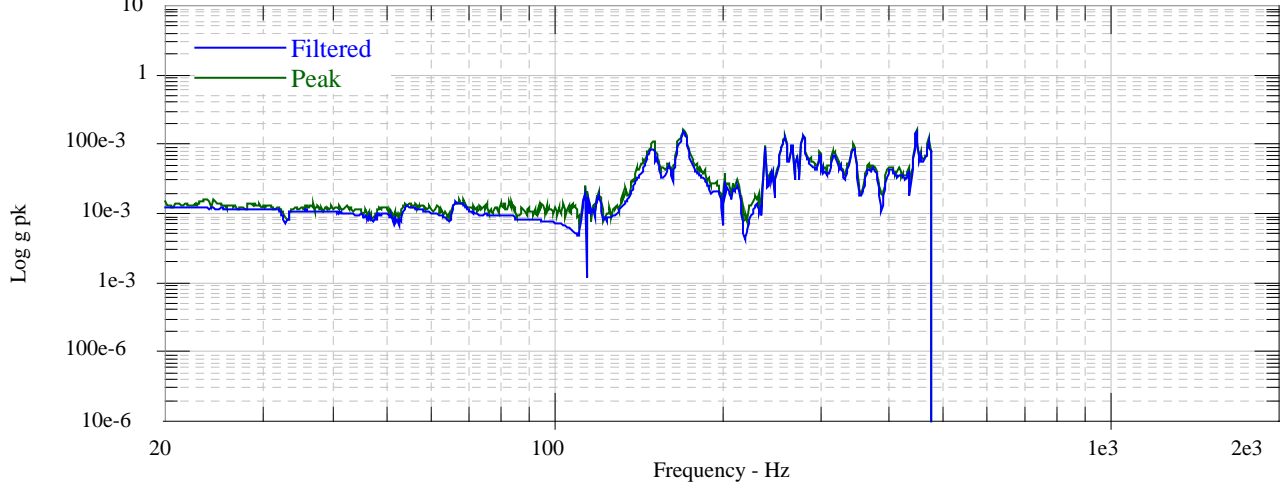
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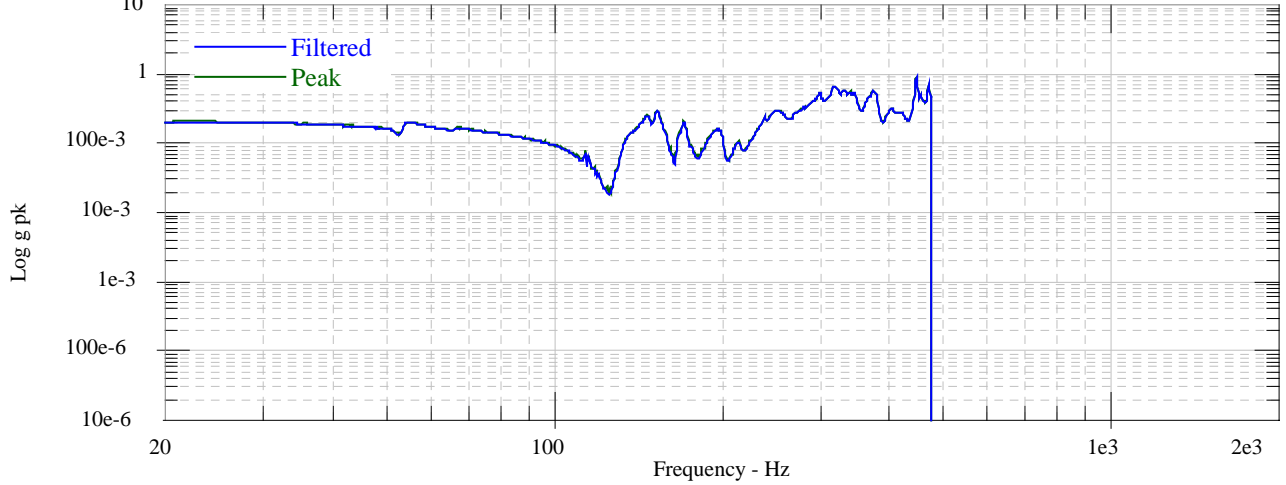
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

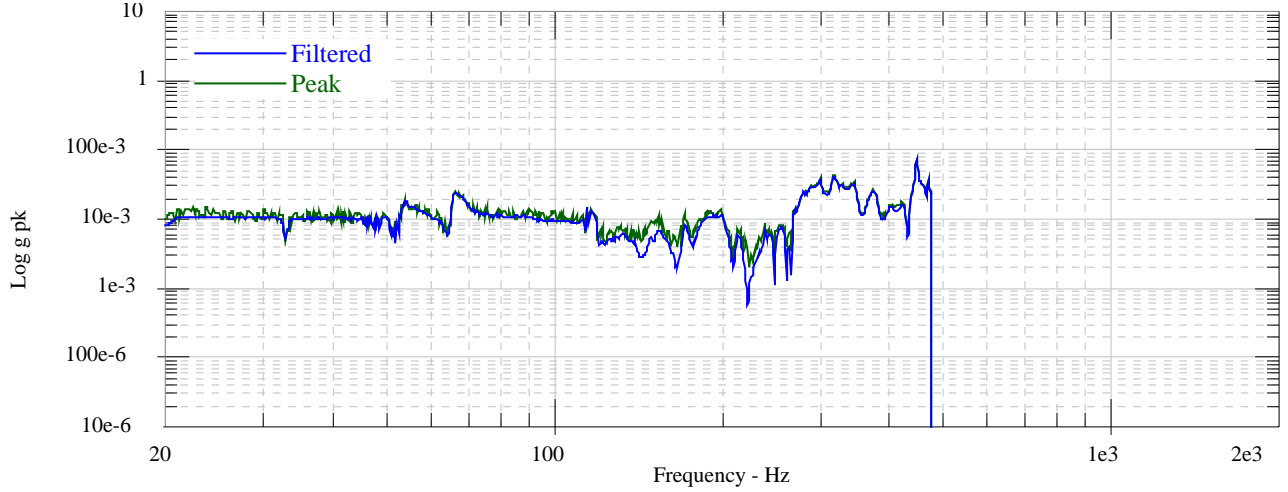


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SPIRE QM

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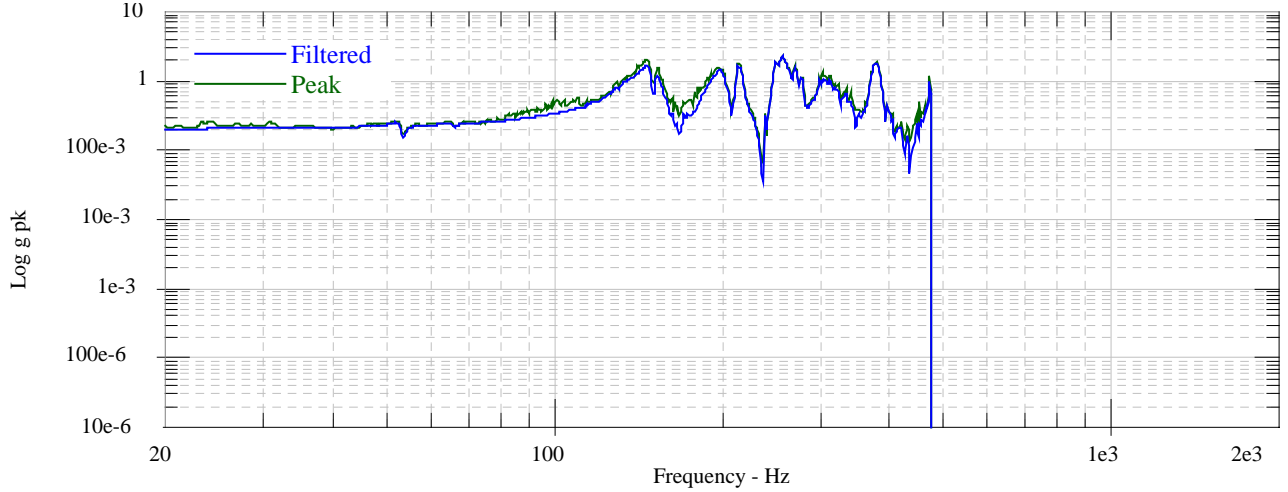
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

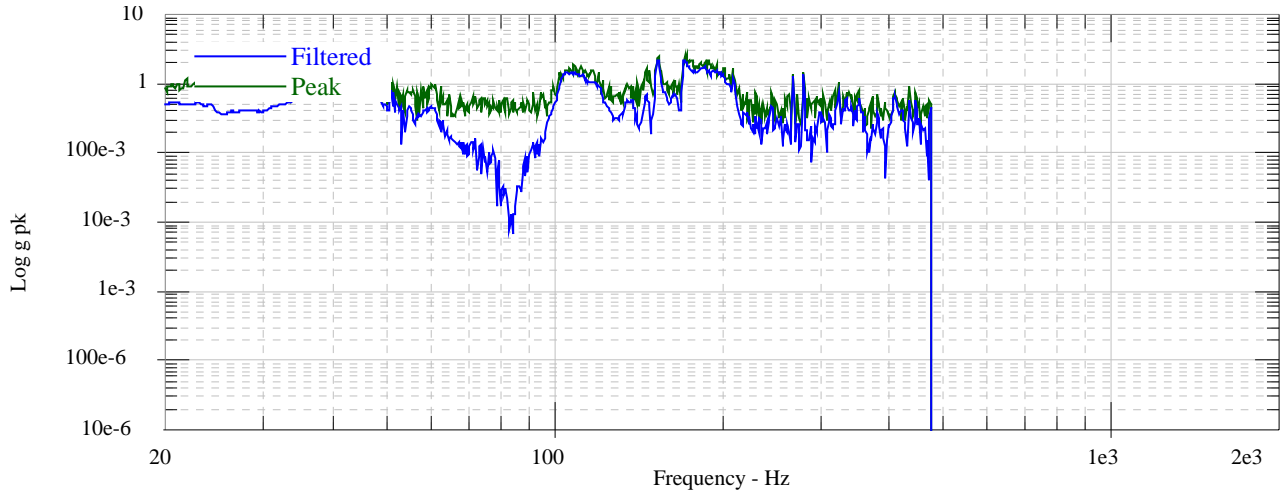


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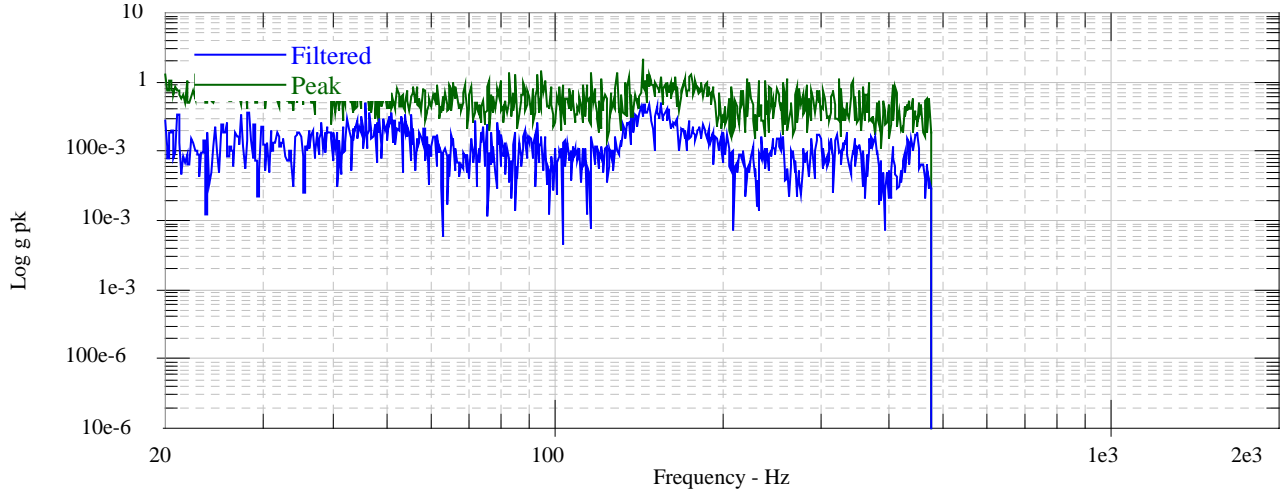
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Date : 8-Apr-04
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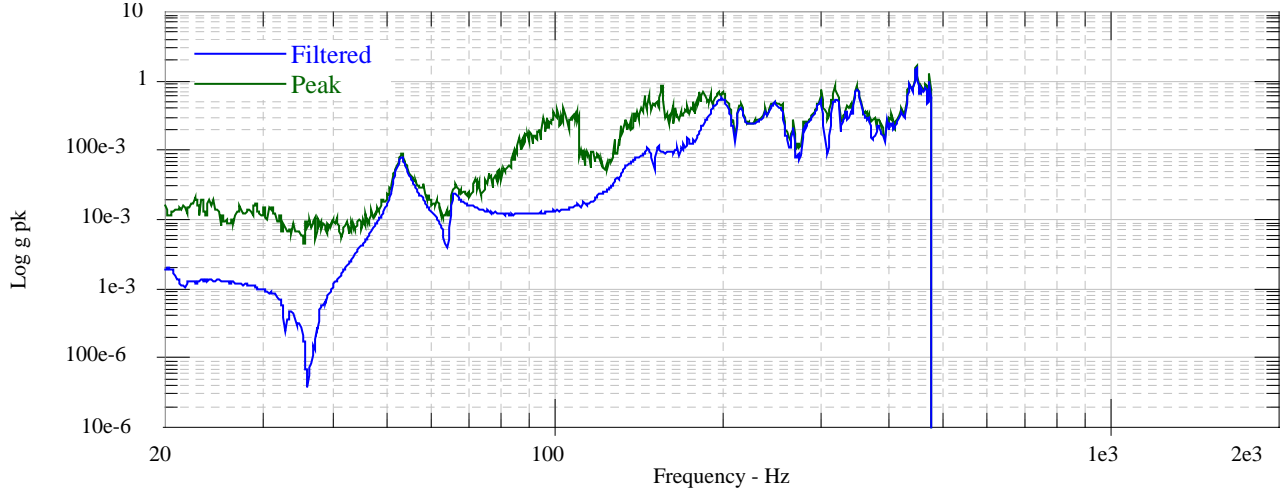
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COOL.X Channel n° 13



FPU.X Channel n° 14

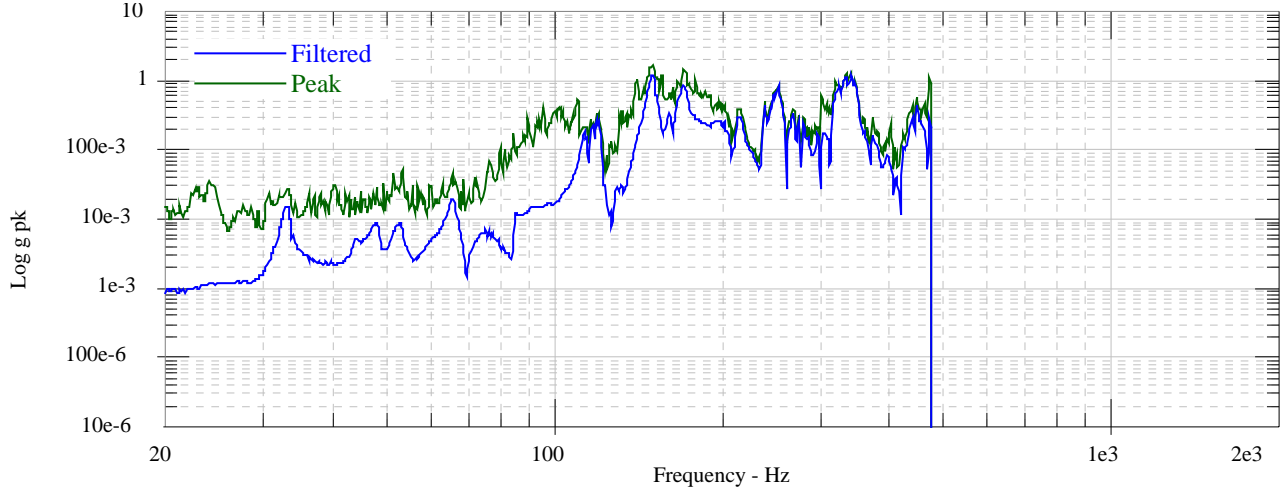


VIBRATION TEST REPORT
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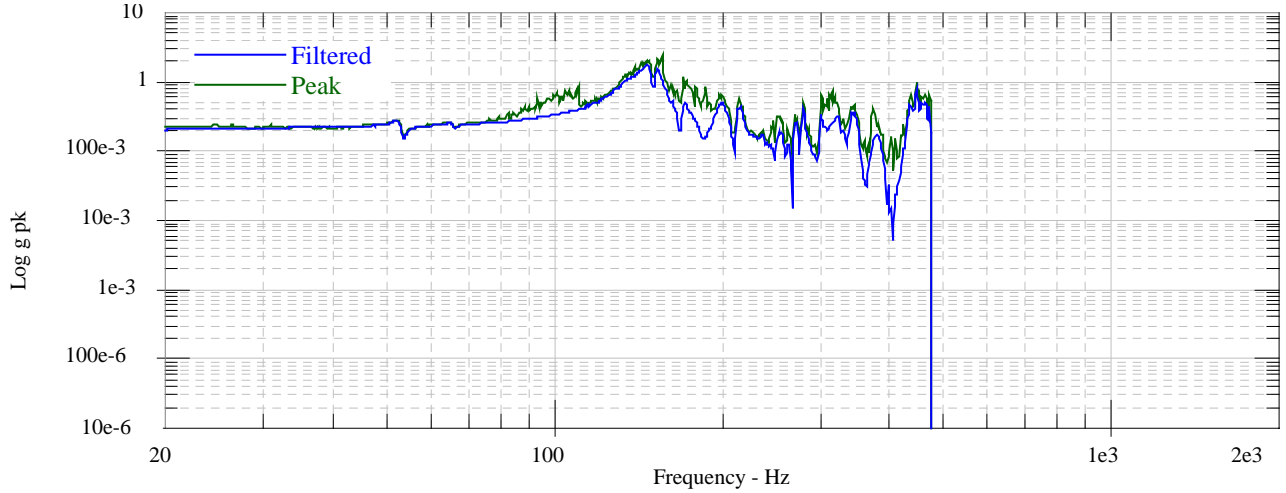
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Date : 8-Apr-04
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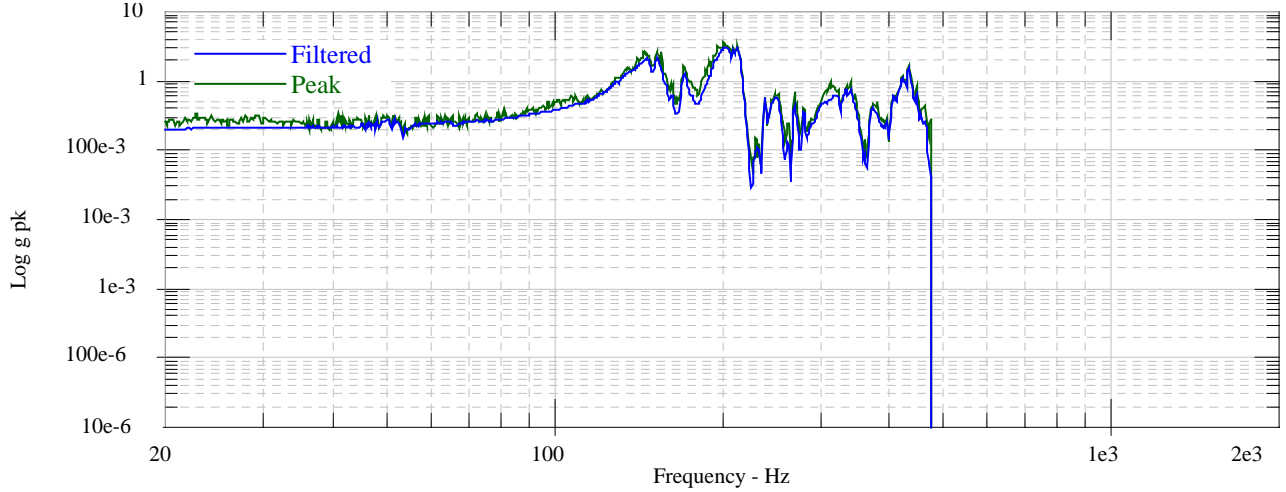
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

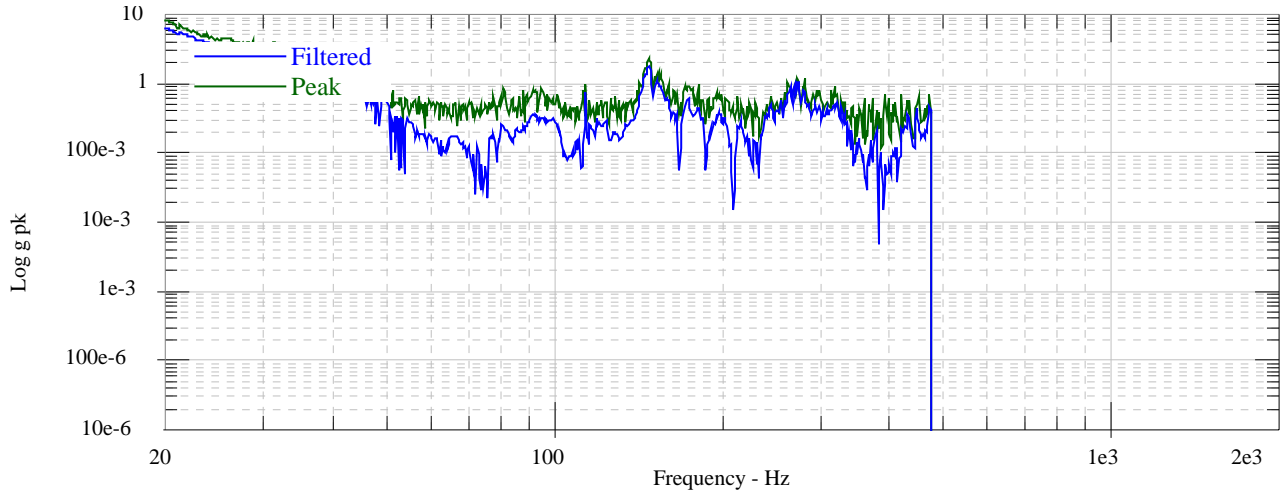


VIBRATION TEST REPORT
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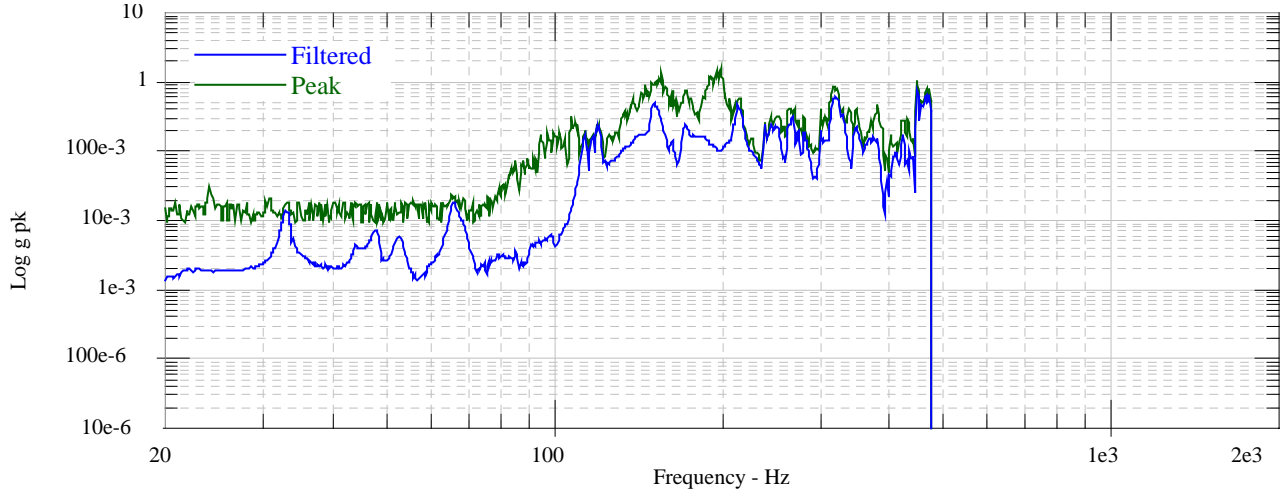
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Date : 8-Apr-04
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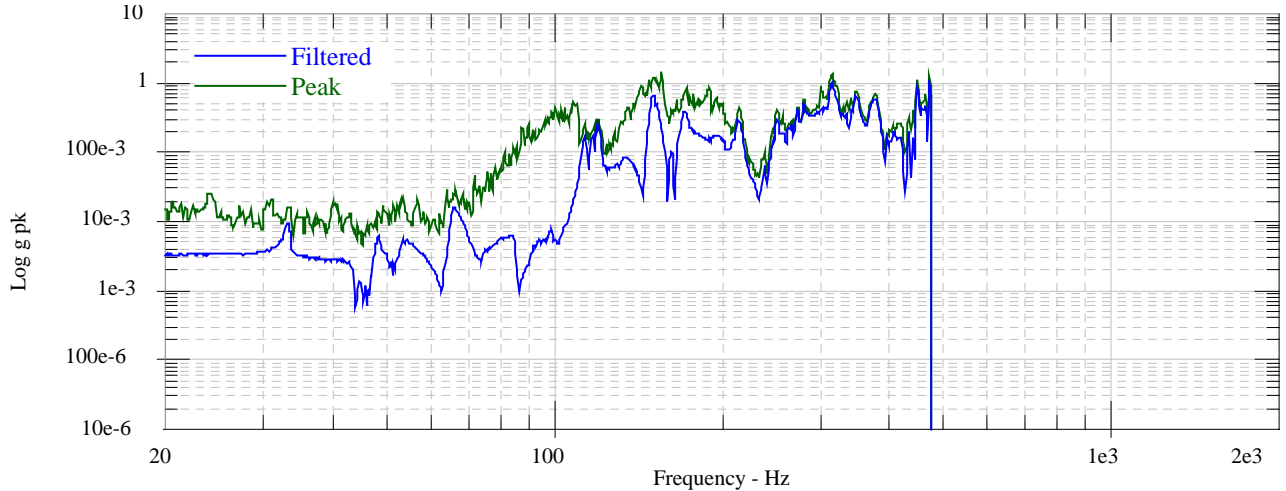
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SPEC.Y Channel n° 19



OB.Y Channel n° 20

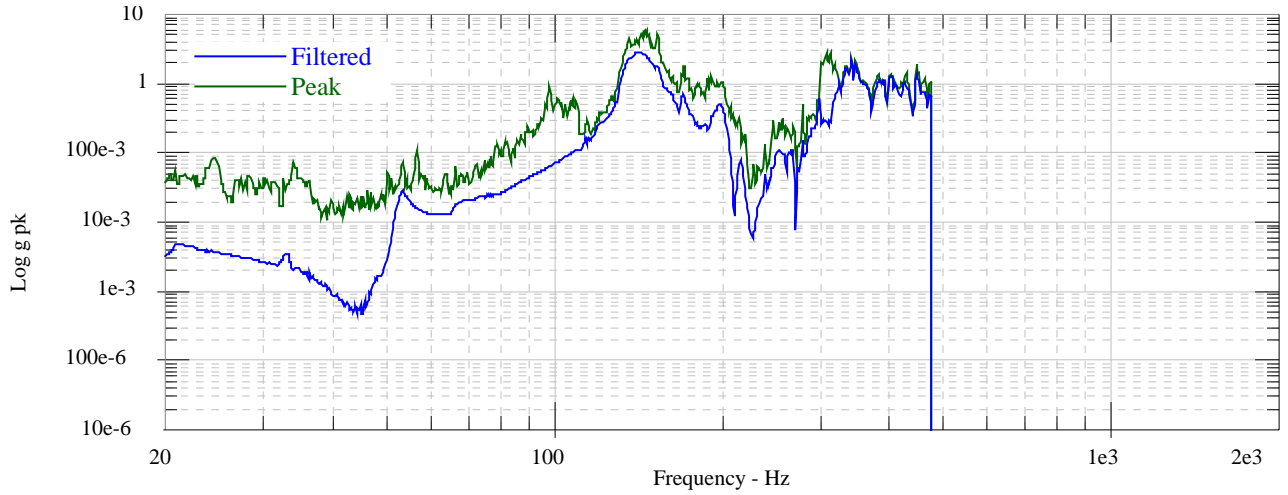


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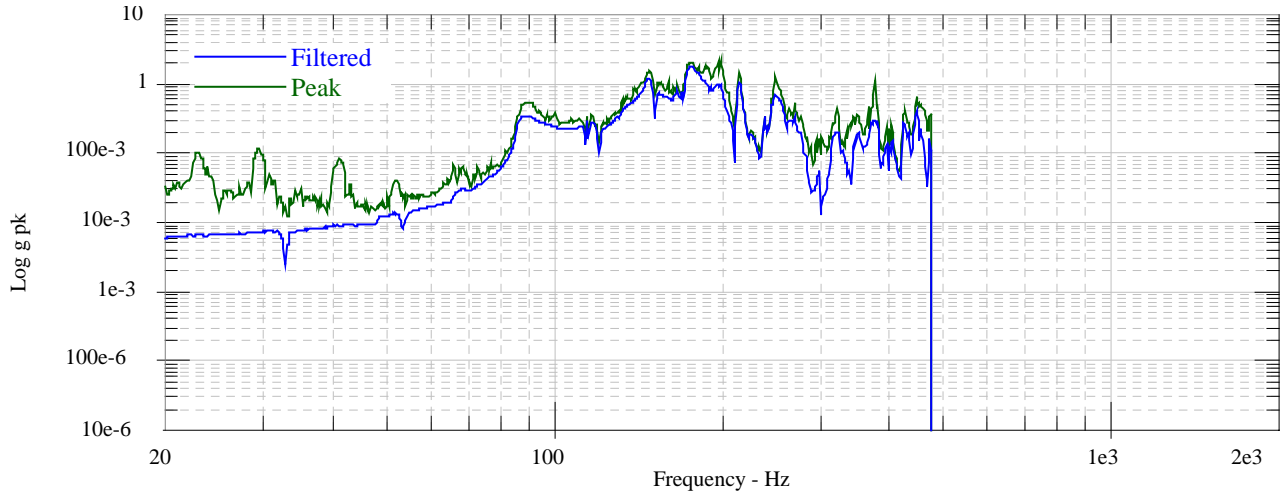
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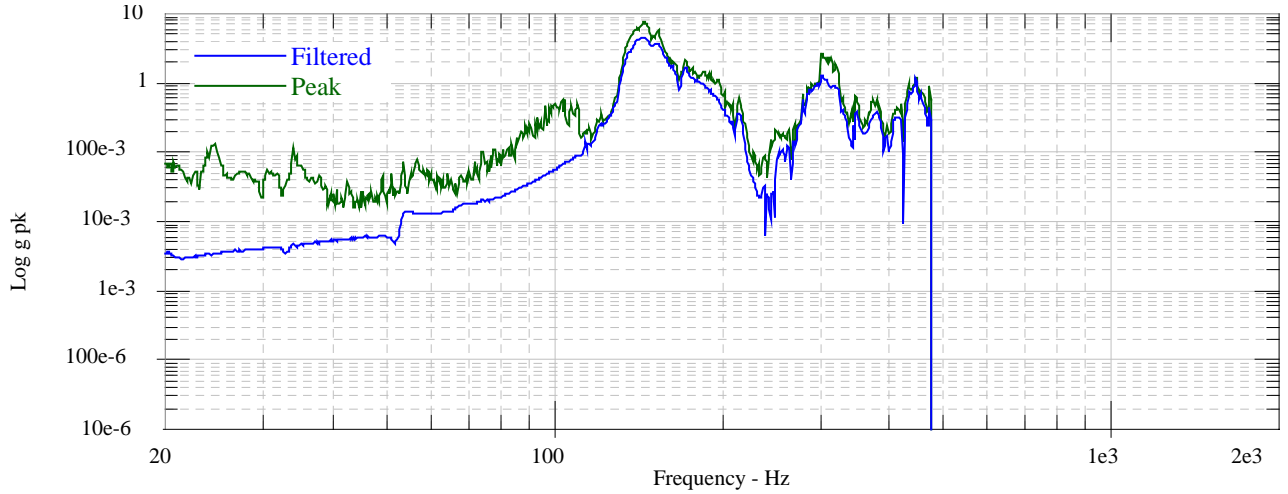
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CTIP.Y Channel n° 22



SMECU.X Channel n° 23

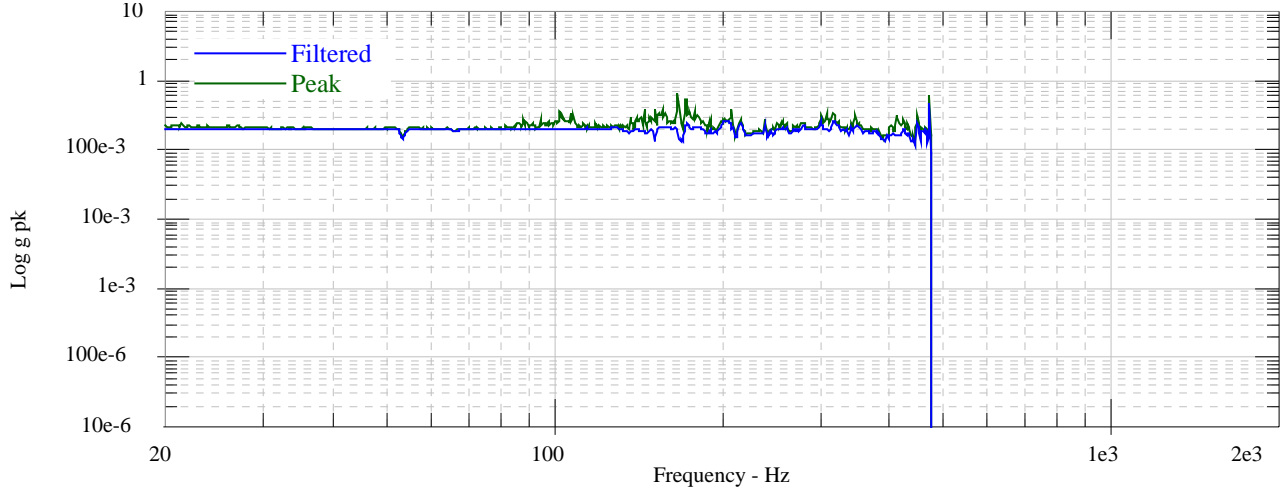


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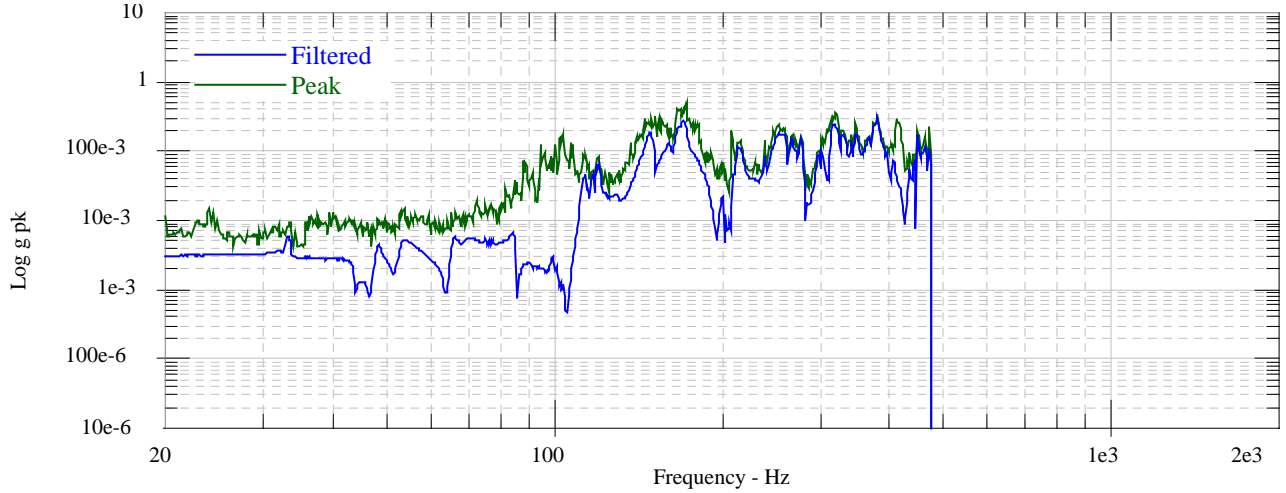
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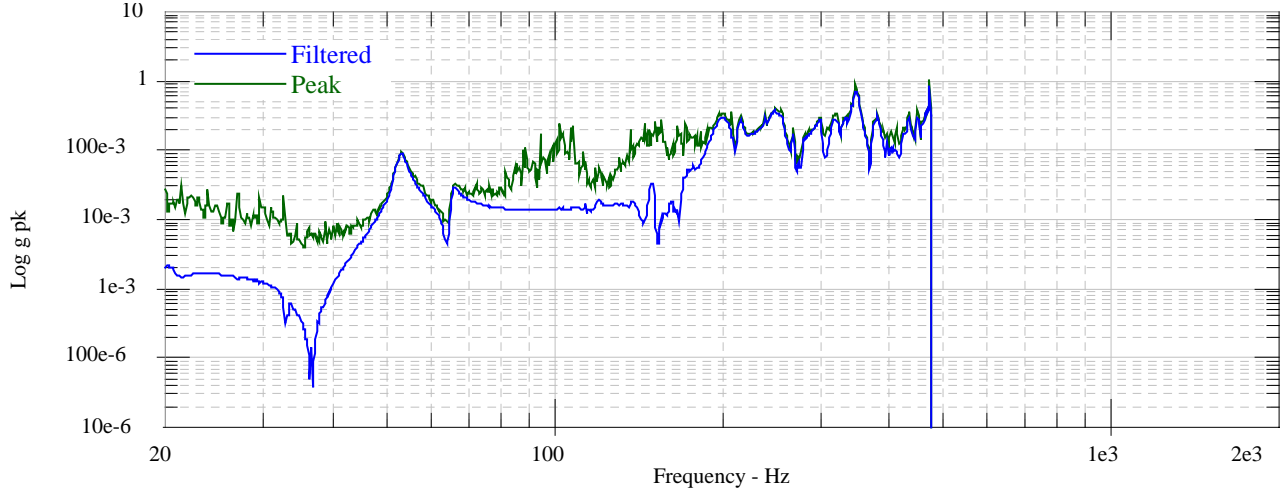
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

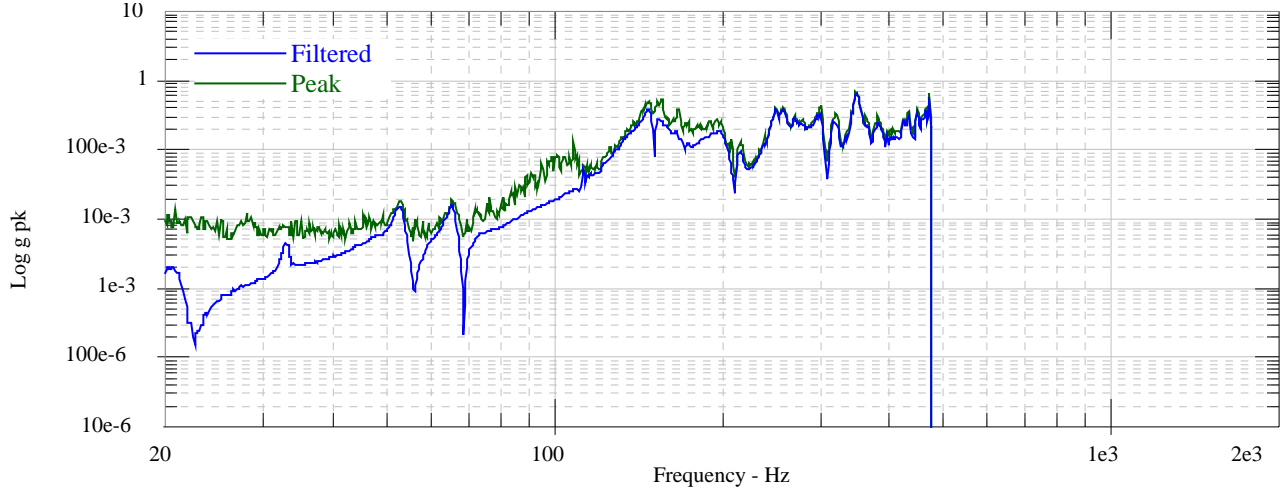


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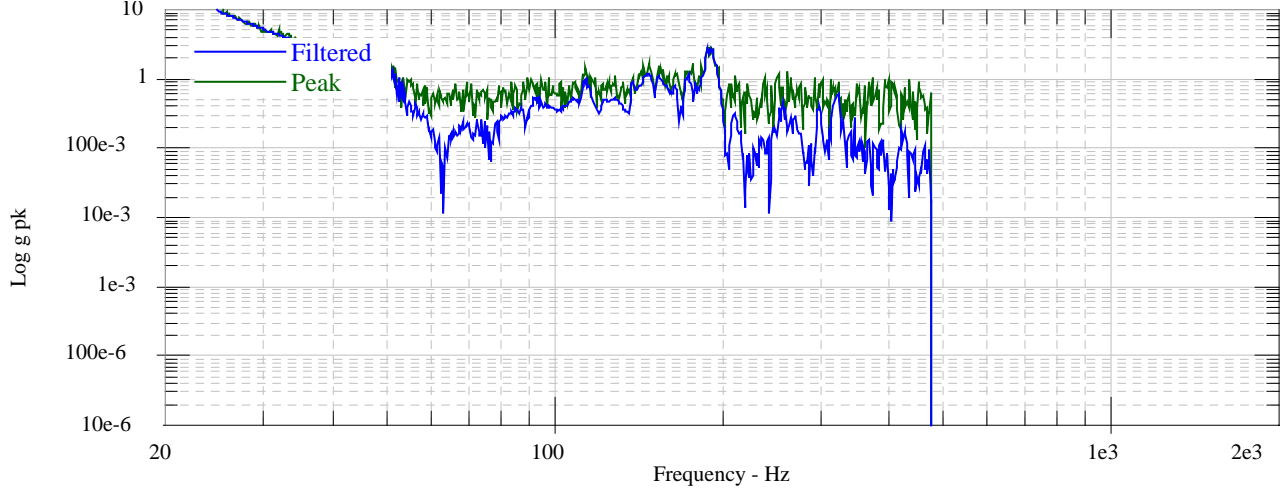
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-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

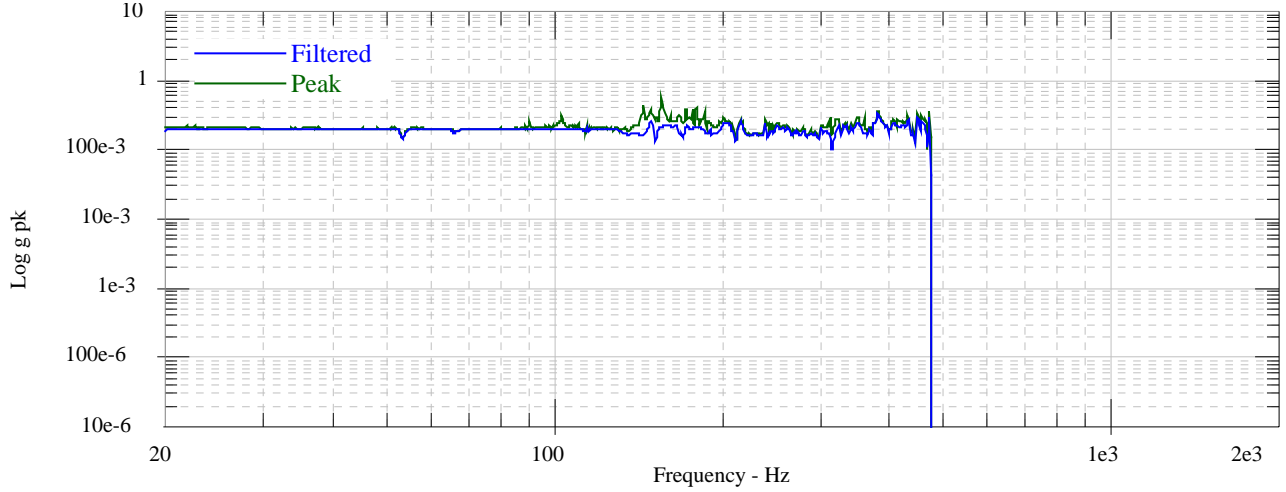


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Date : 8-Apr-04
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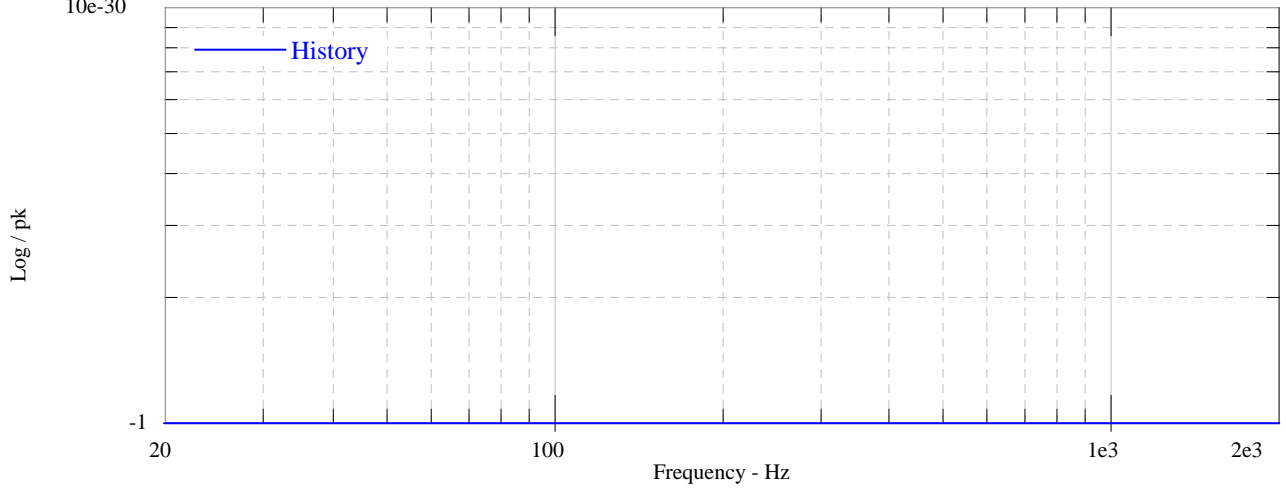
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+YAFRAME.Z Channel n° 30

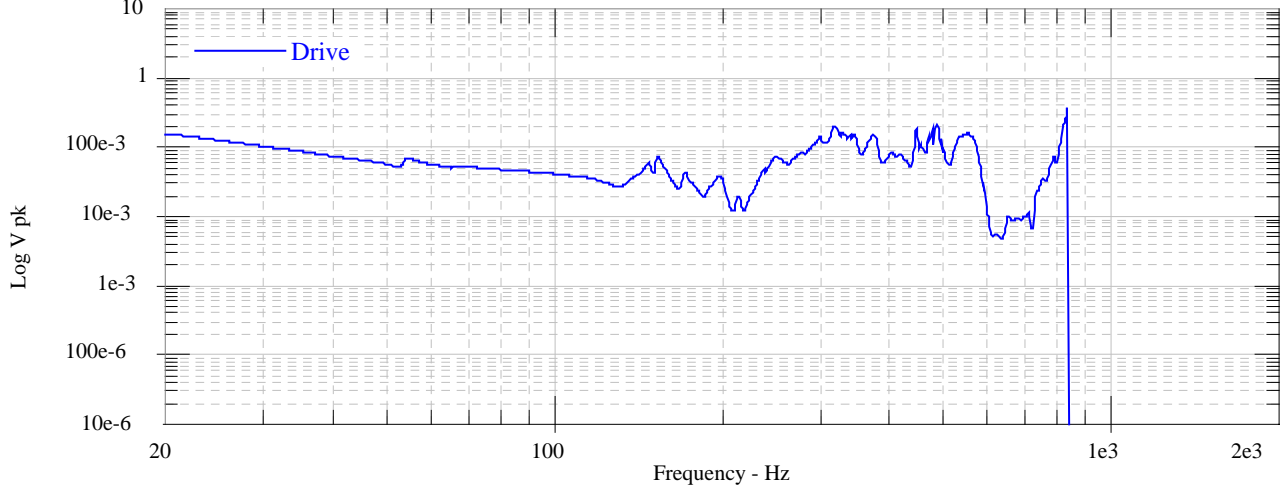


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History Channel n° -3



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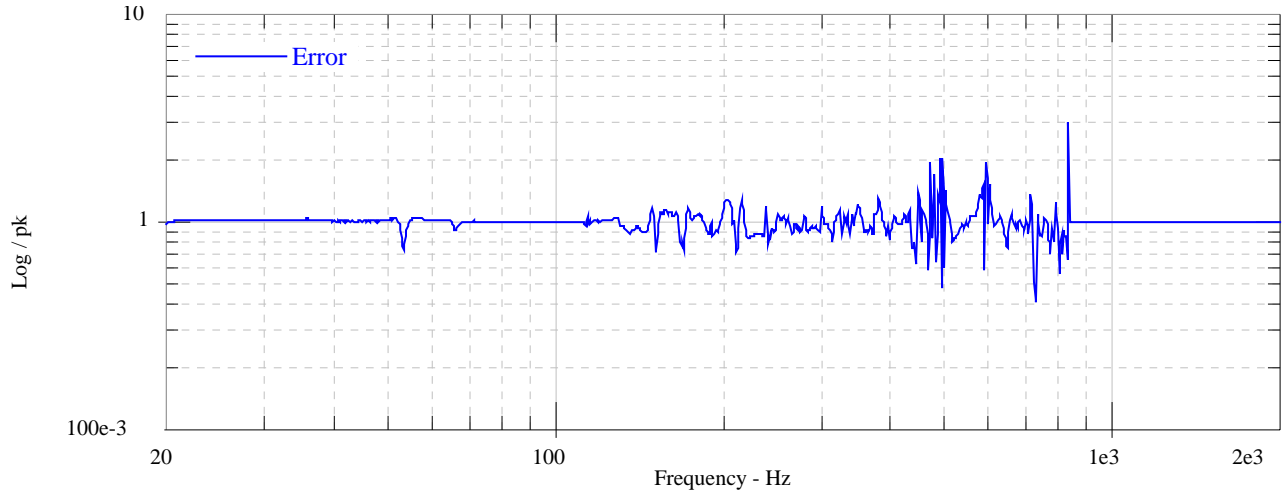


VIBRATION TEST REPORT
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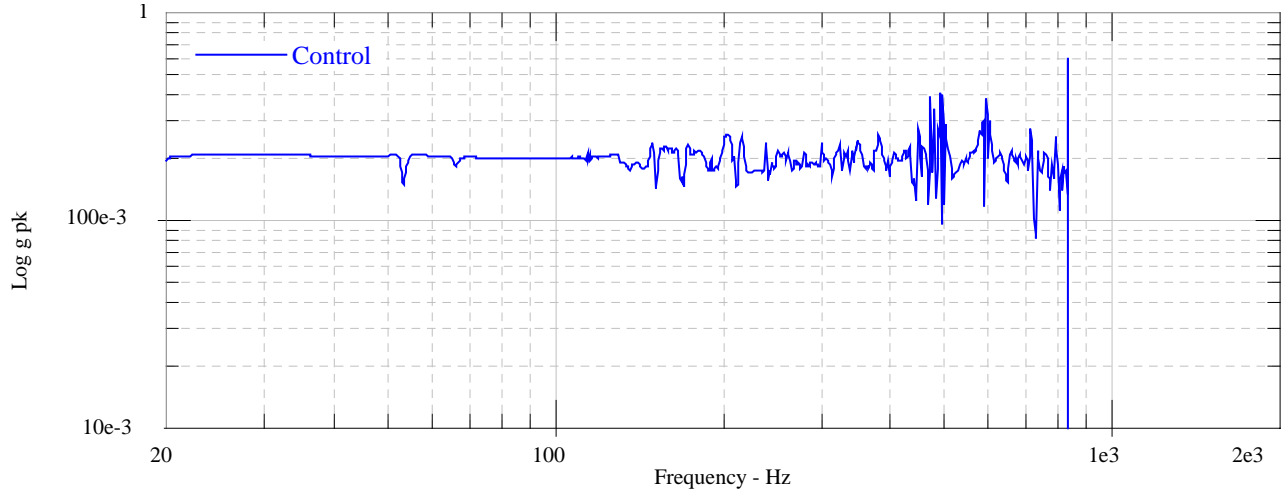
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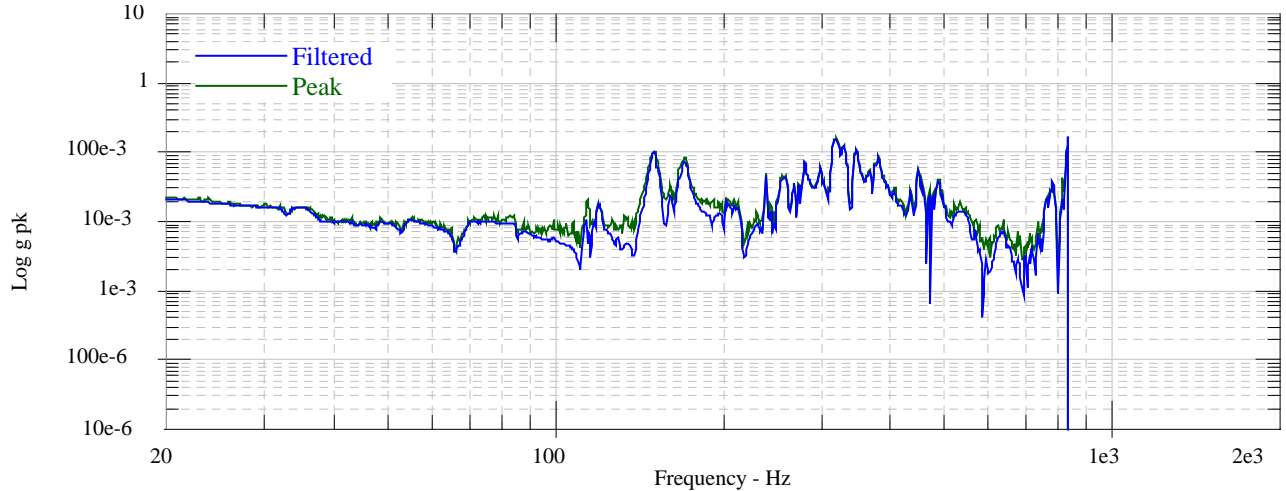
Error Channel n° -1



Control Channel n° 0



SHK.1.Y Channel n° 1

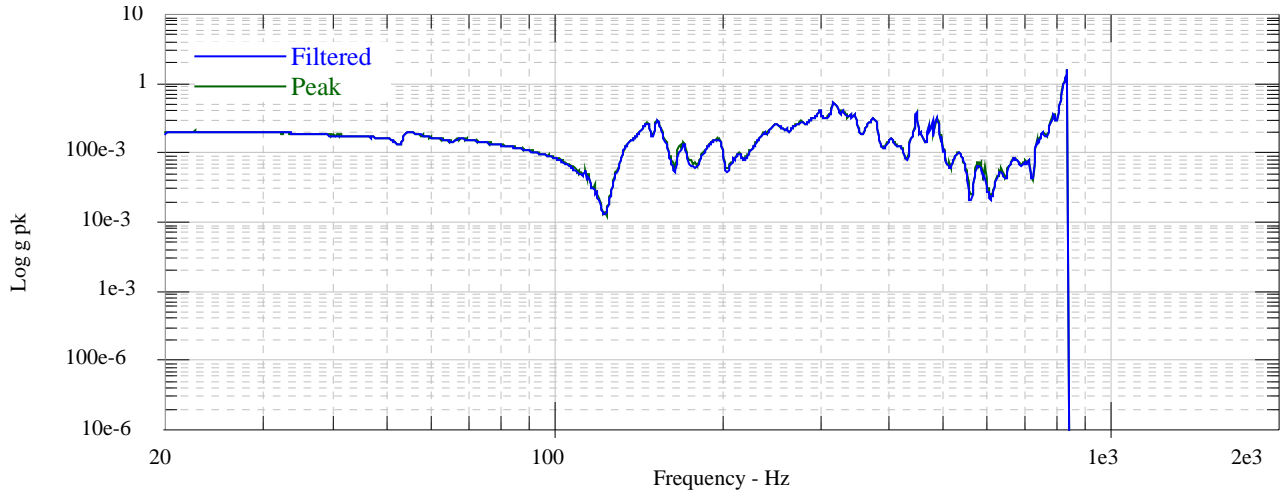


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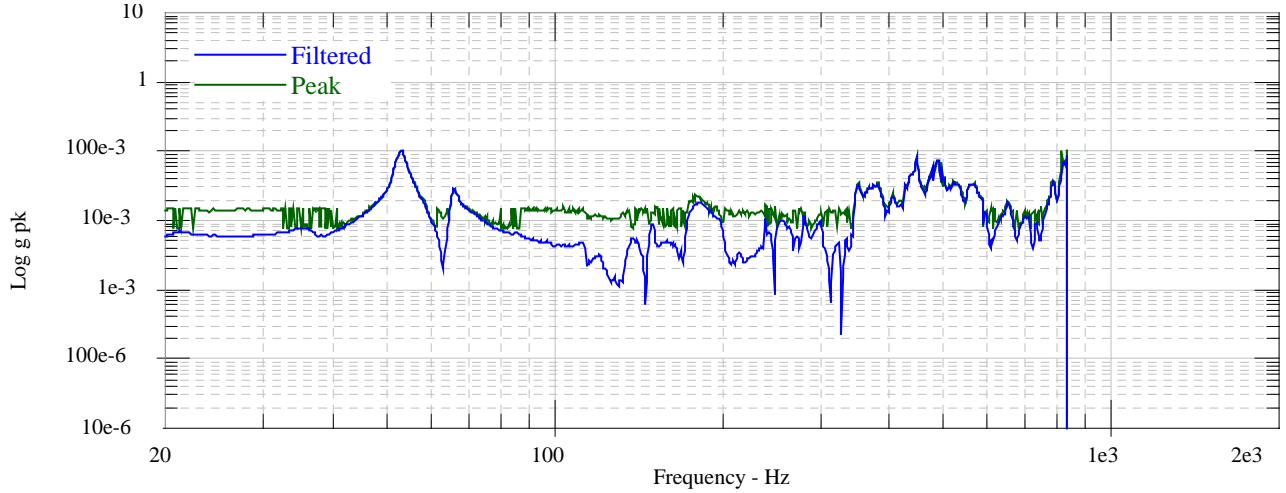
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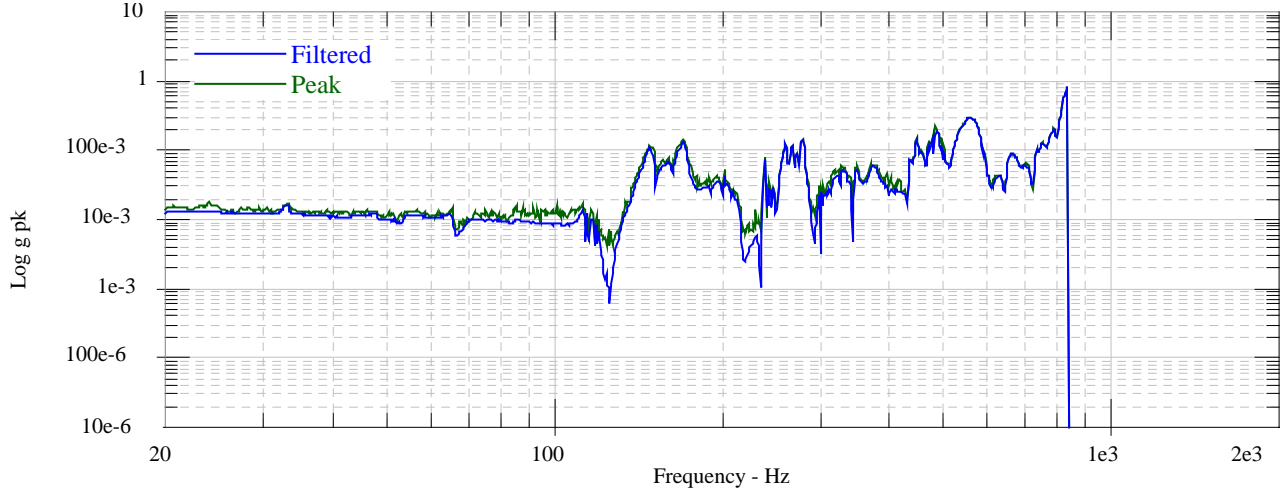
SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4

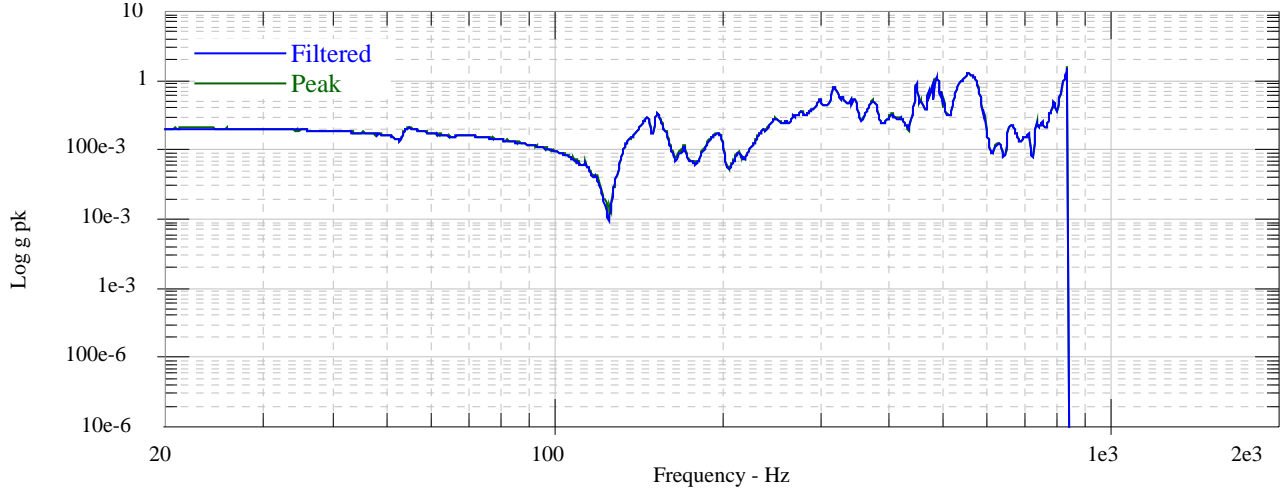


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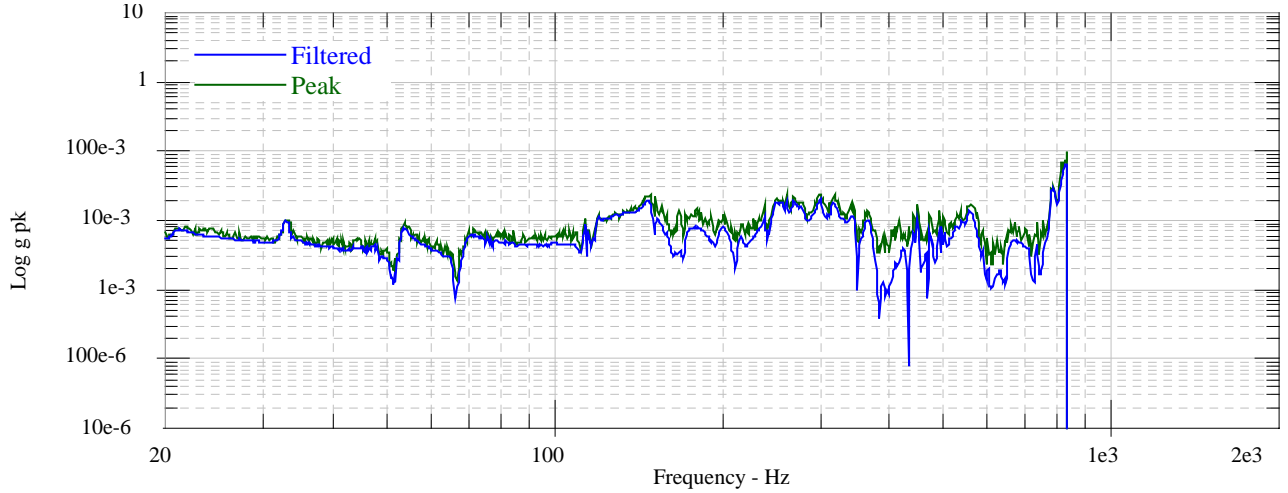
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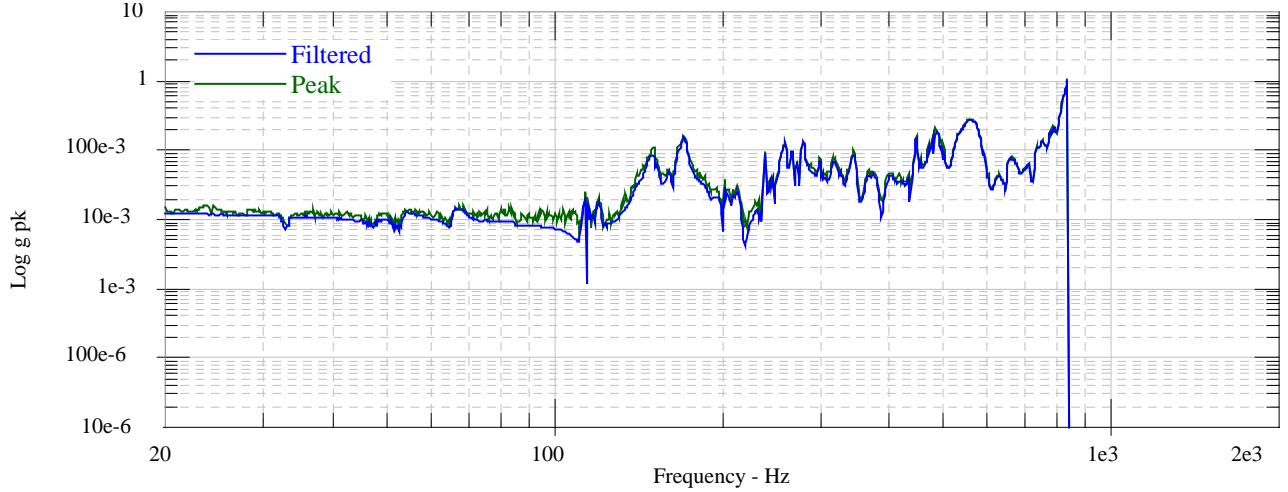
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SHK.3.Y Channel n° 7

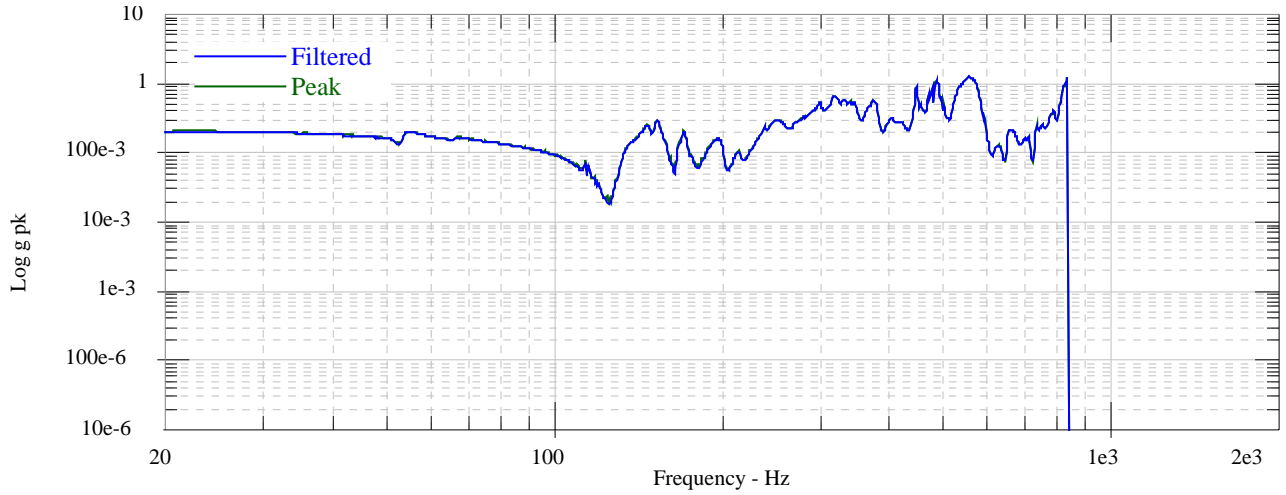


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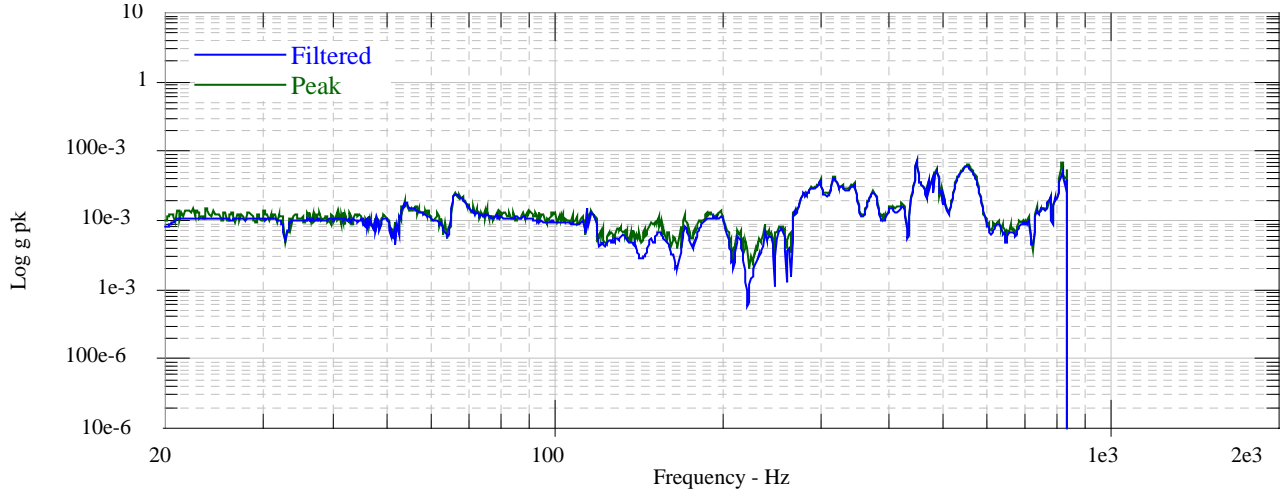
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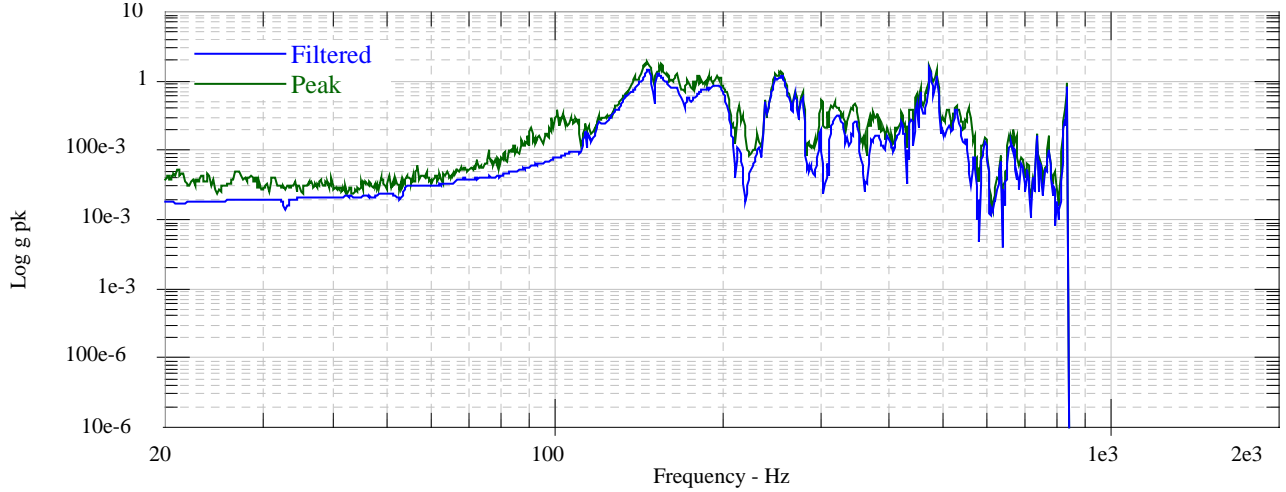
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SHK.3.X Channel n° 9



PHS.XY Channel n° 10

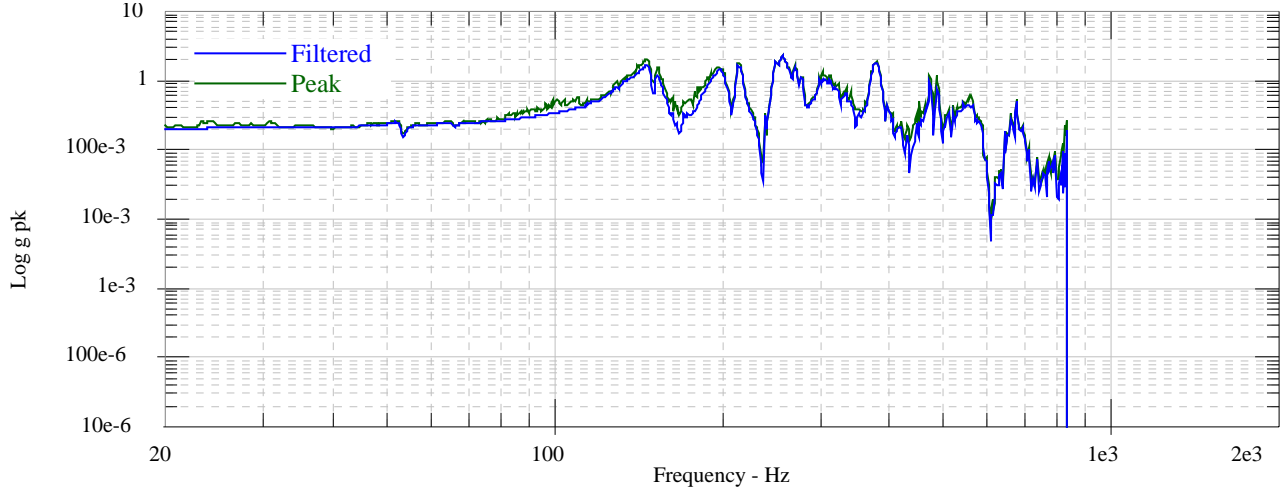


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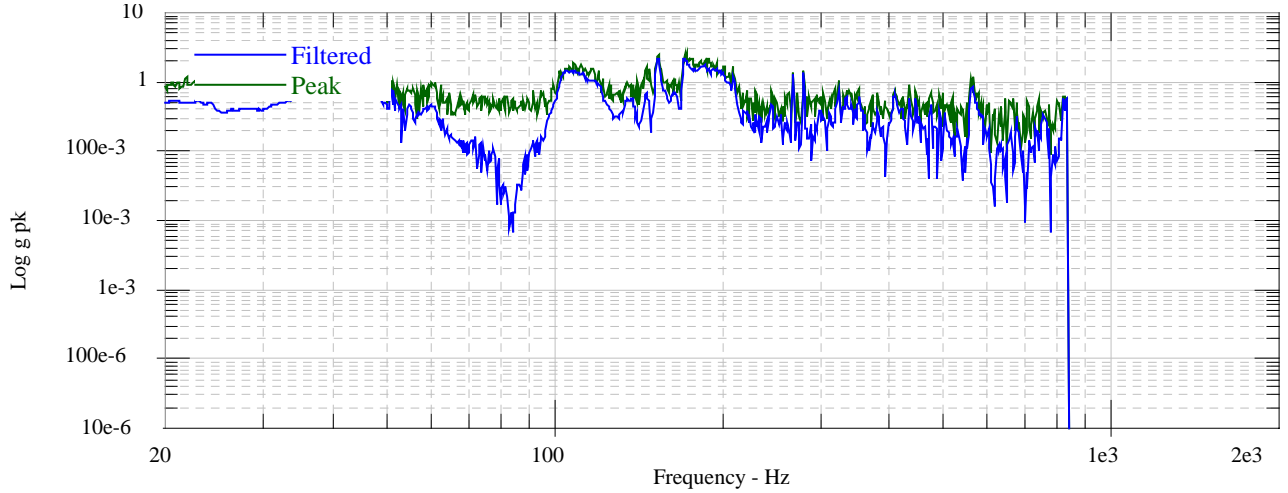
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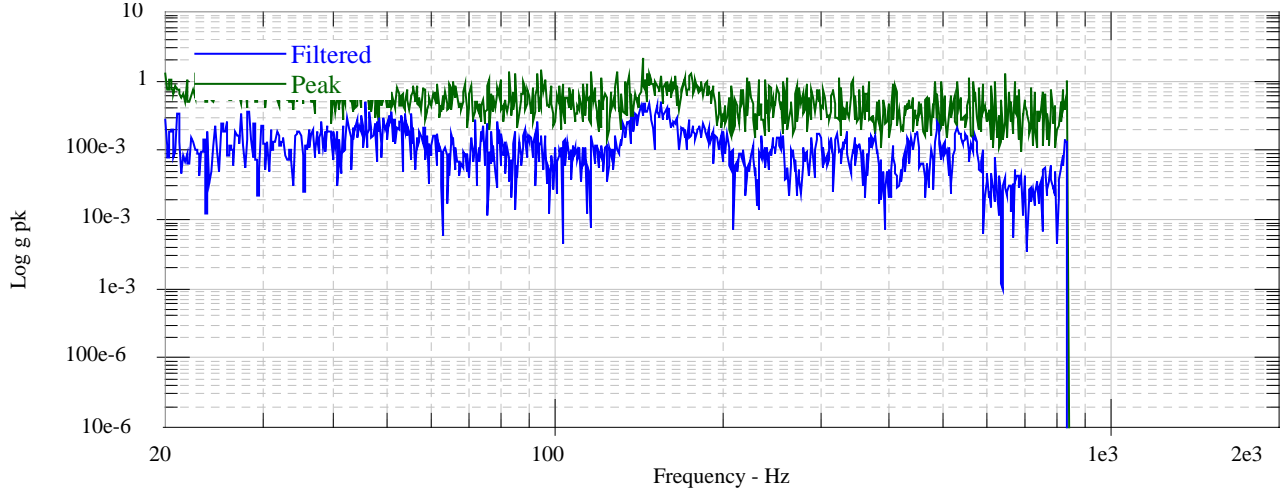
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COOLX Channel n° 13



VIBRATION TEST REPORT
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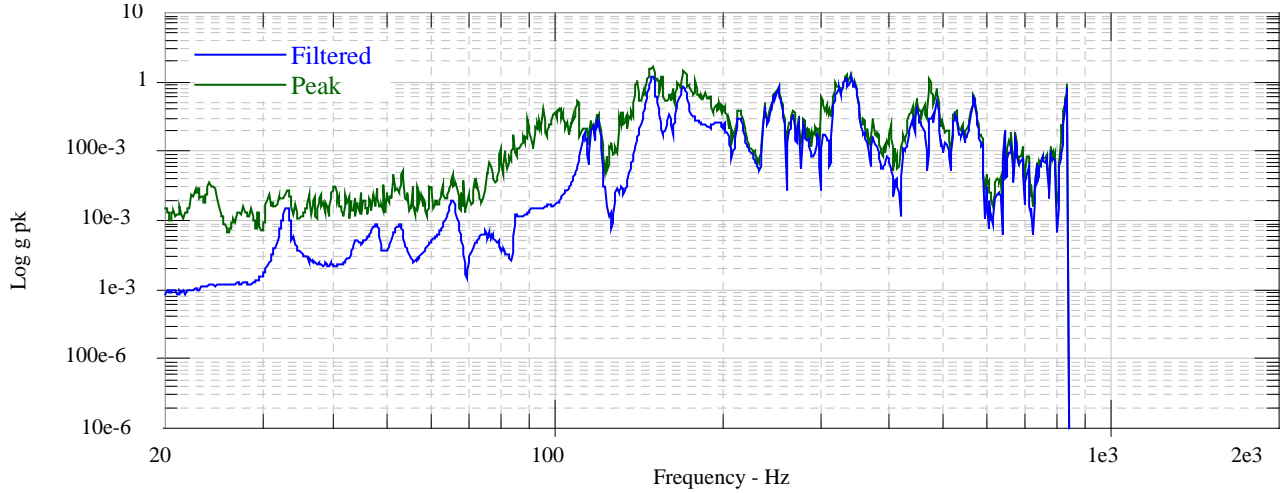
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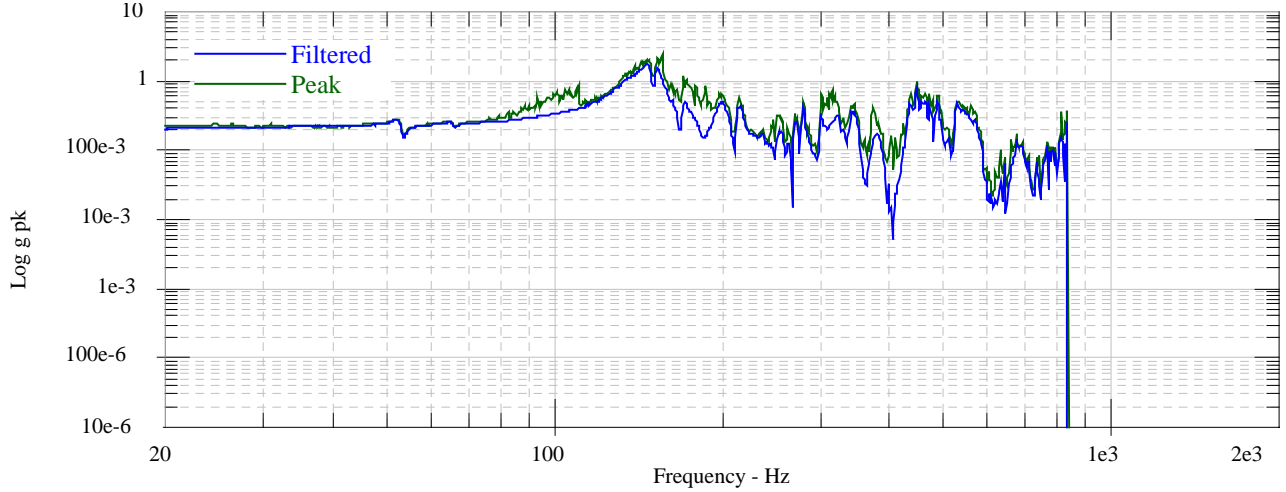
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FPU.Y Channel n° 15



FPU.Z Channel n° 16

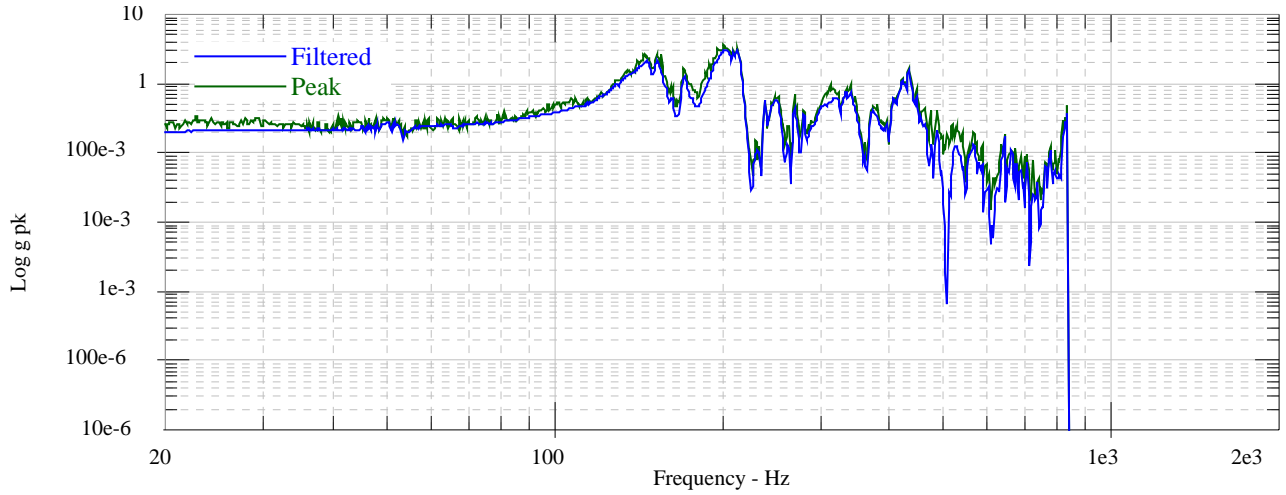


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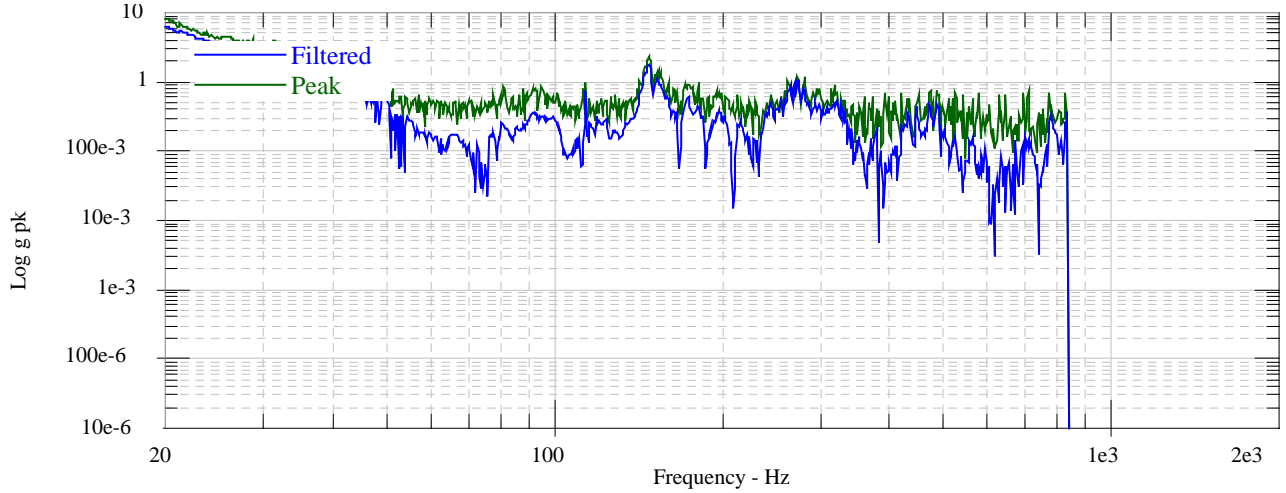
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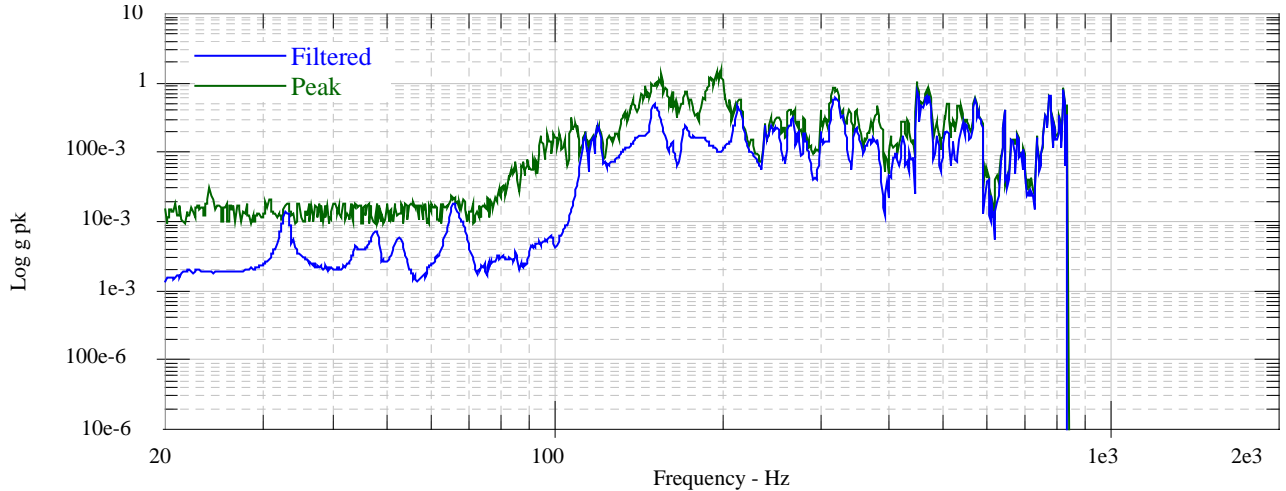
SPEC.X Channel n° 17



SPEC.Z Channel n° 18



SPEC.Y Channel n° 19

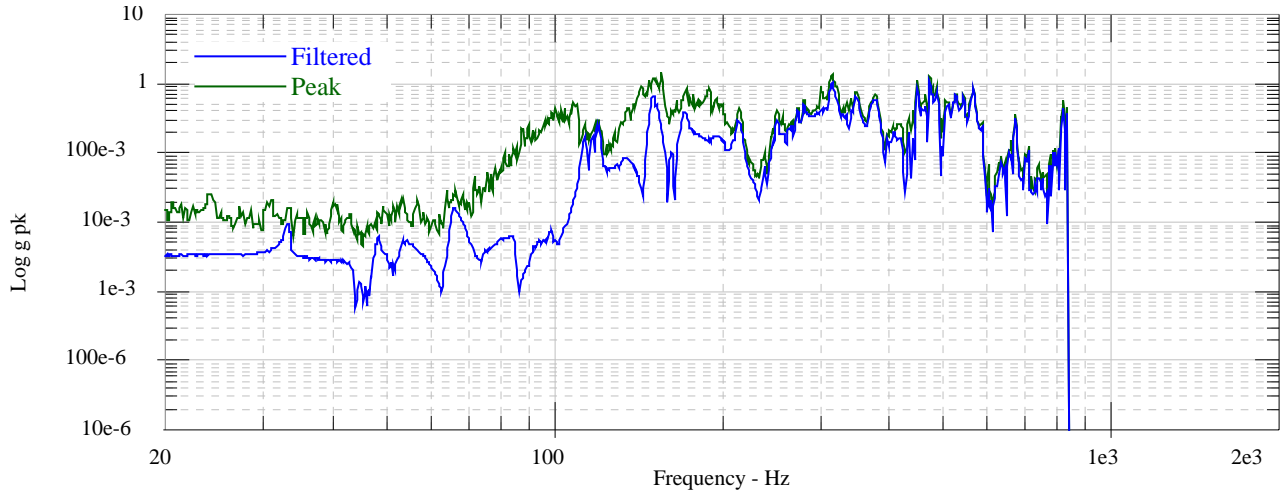


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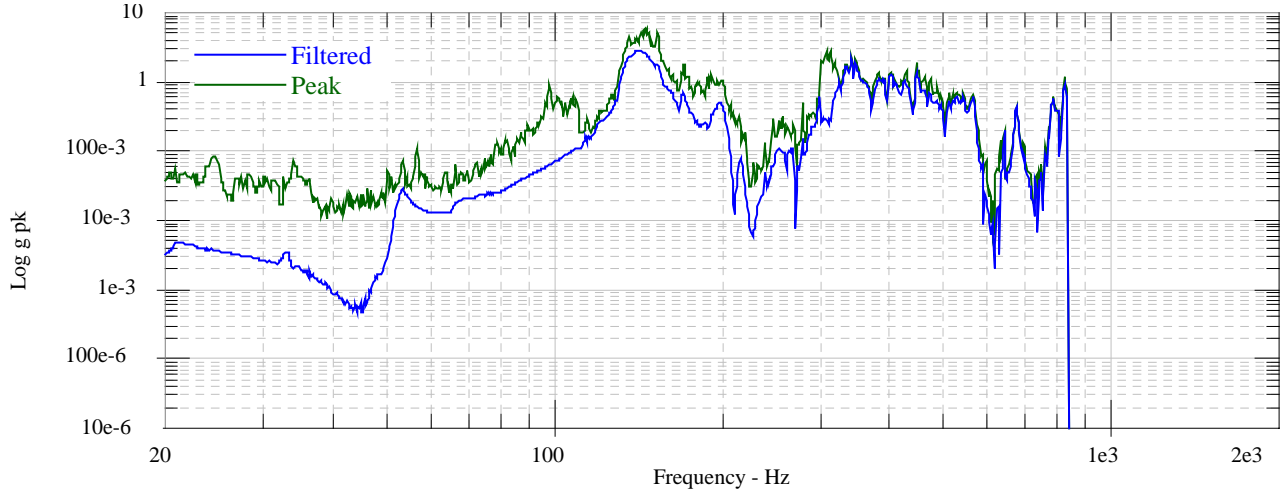
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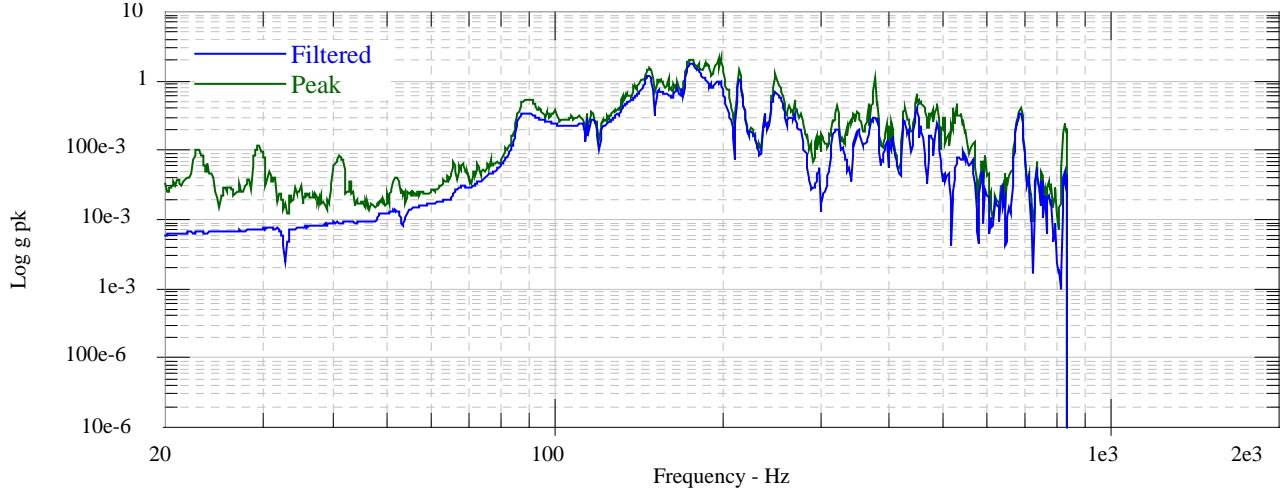
OB.Y Channel n° 20



SMECL.X Channel n° 21



CTIP.Y Channel n° 22

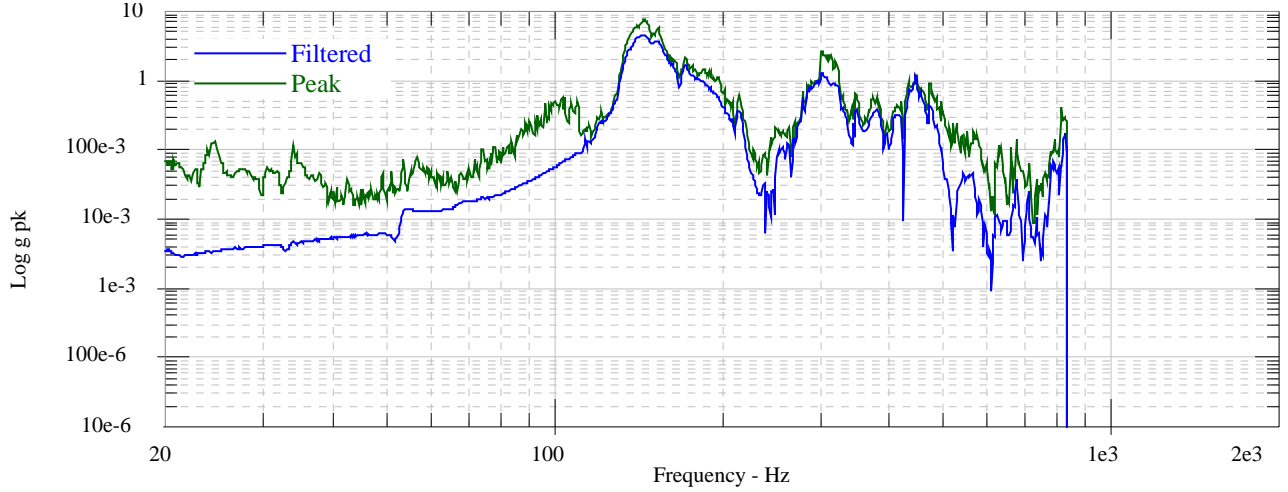


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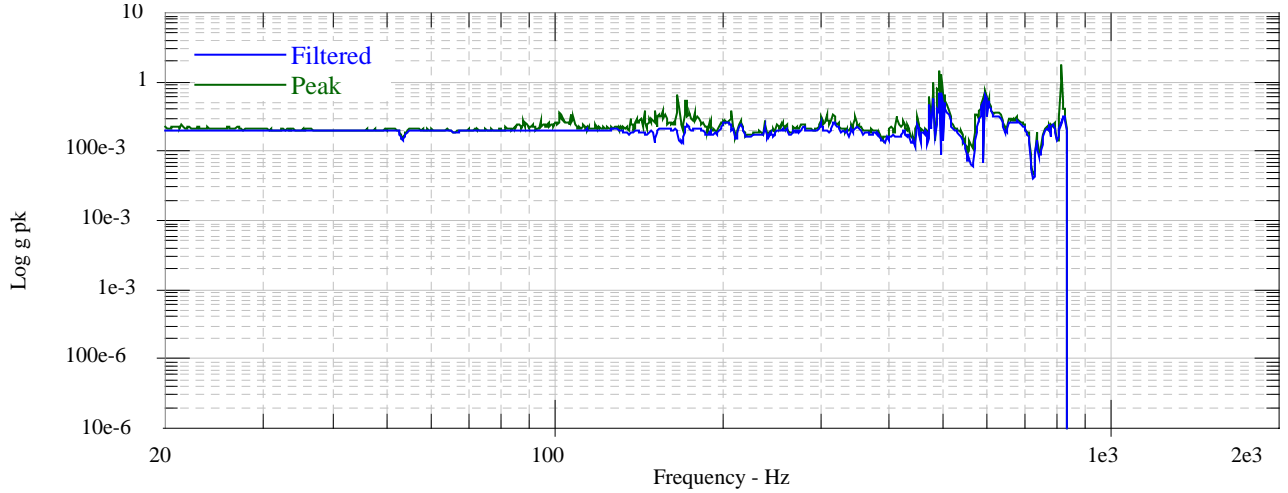
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Version : 01
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SMECU.X Channel n° 23



CONE.Z Channel n° 24



CONE.Y Channel n° 25

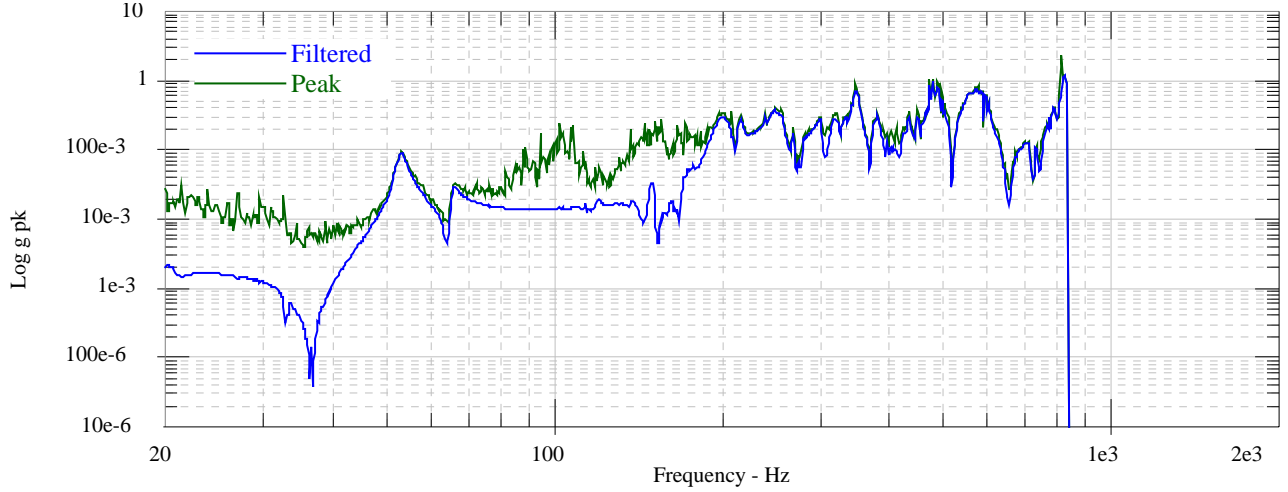


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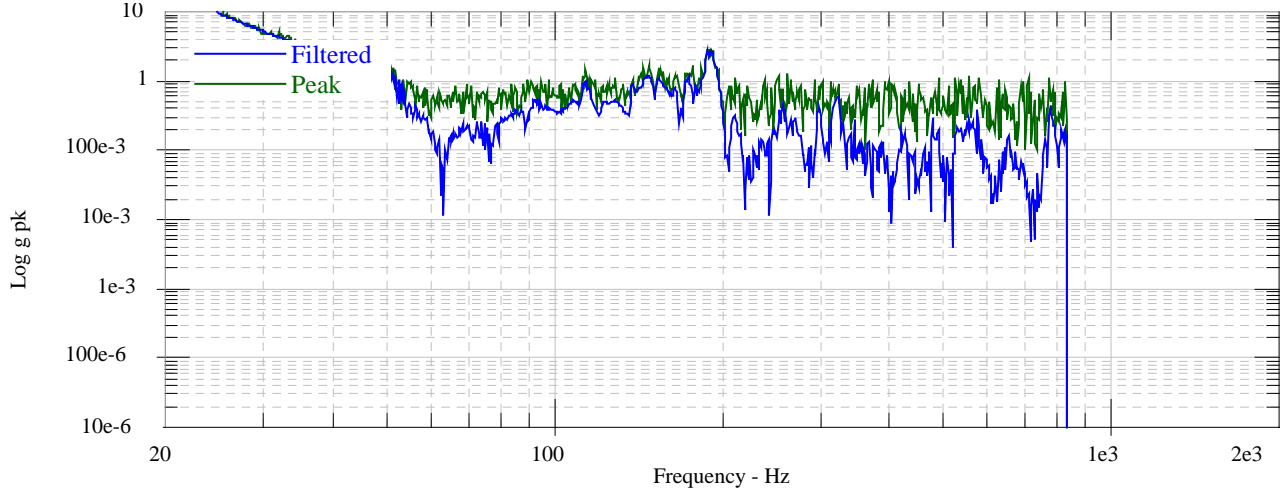
CONE.X Channel n° 26



-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28

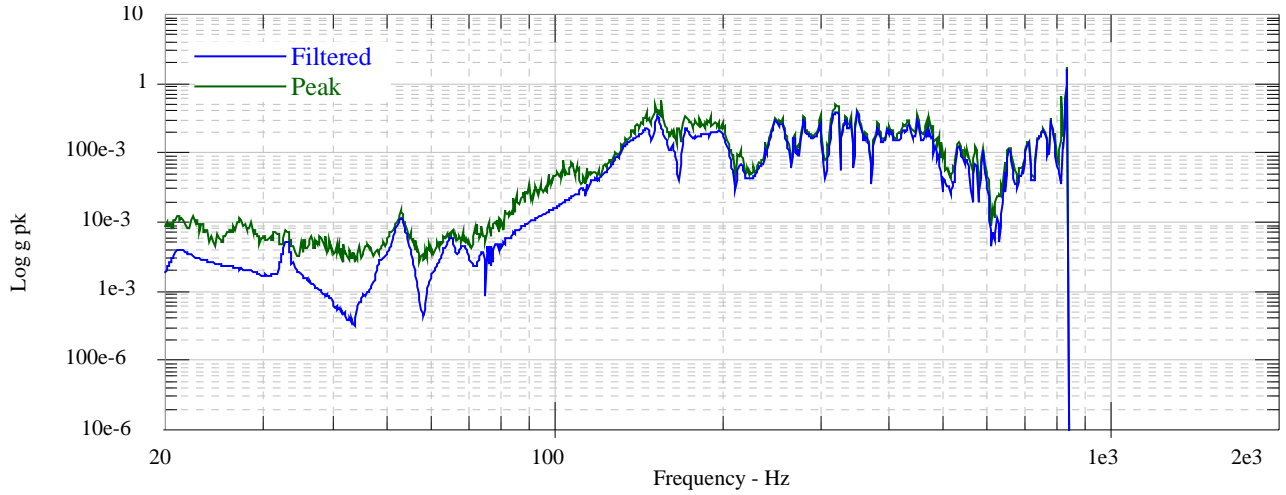


VIBRATION TEST REPORT
SPIRE QM

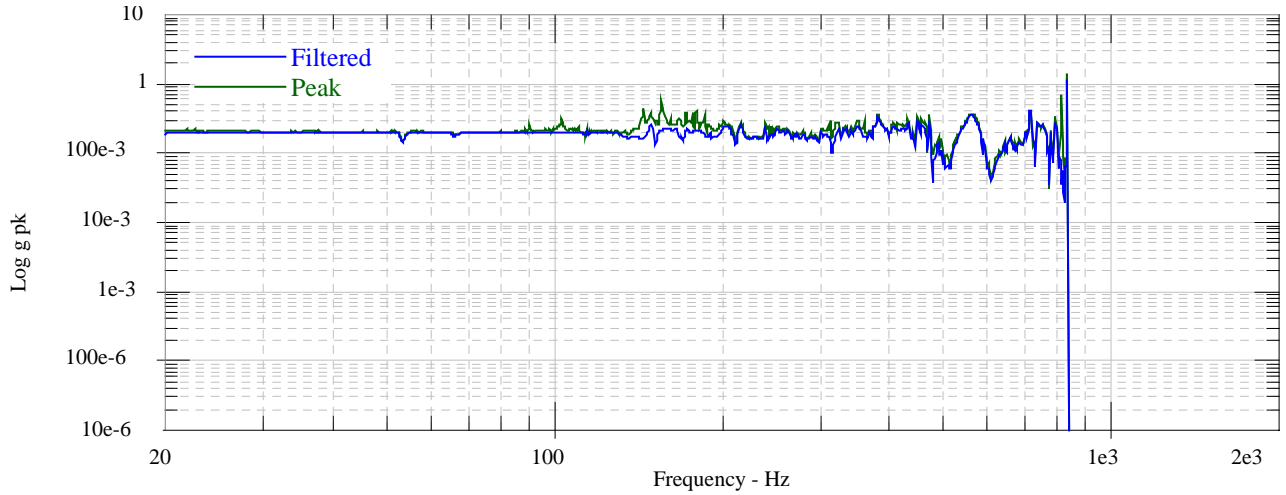
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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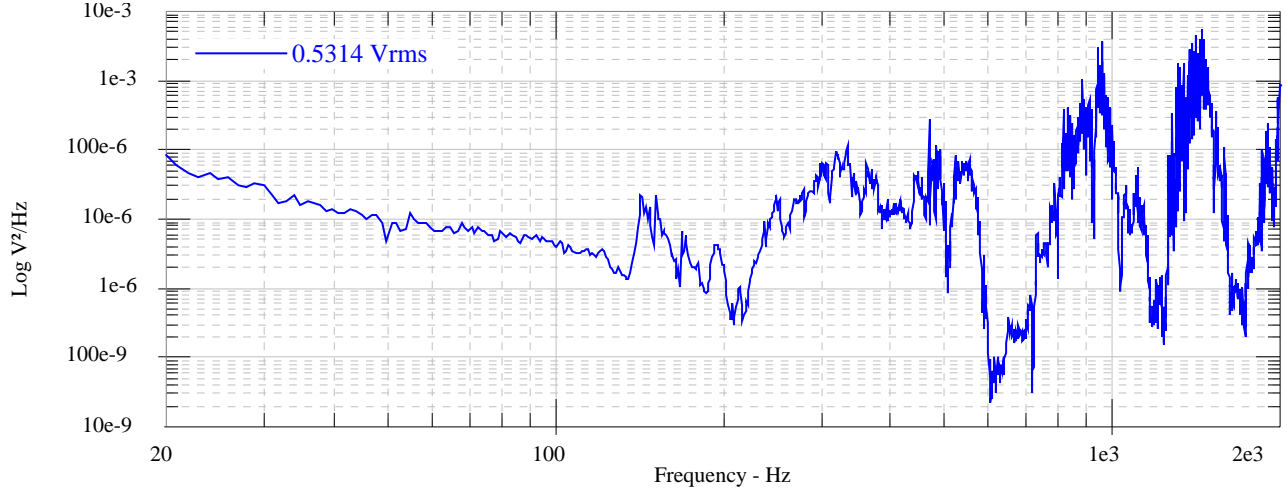
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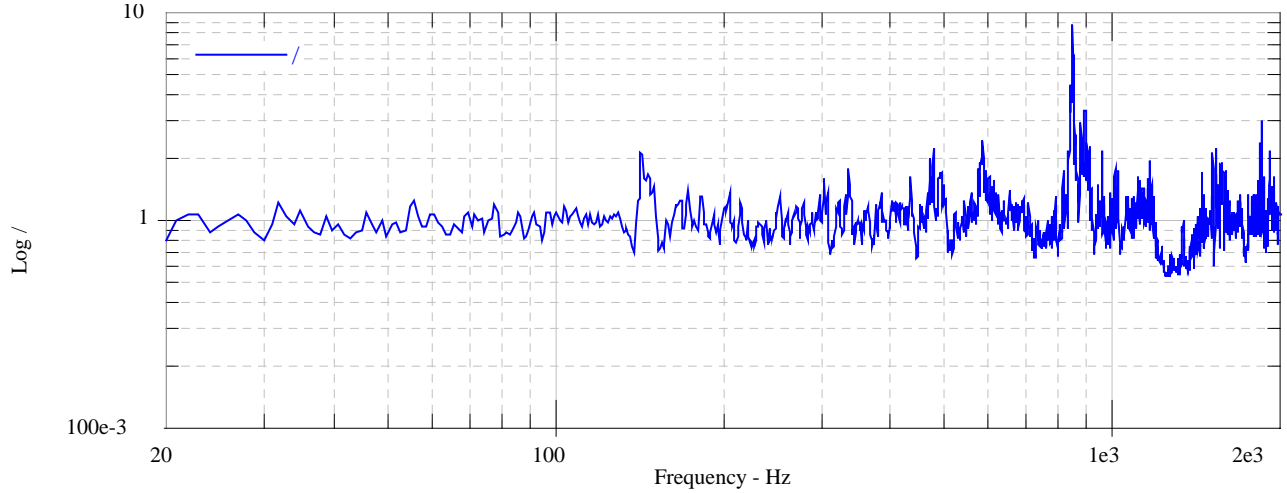
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Révision : 00
Date : 8-Apr-04
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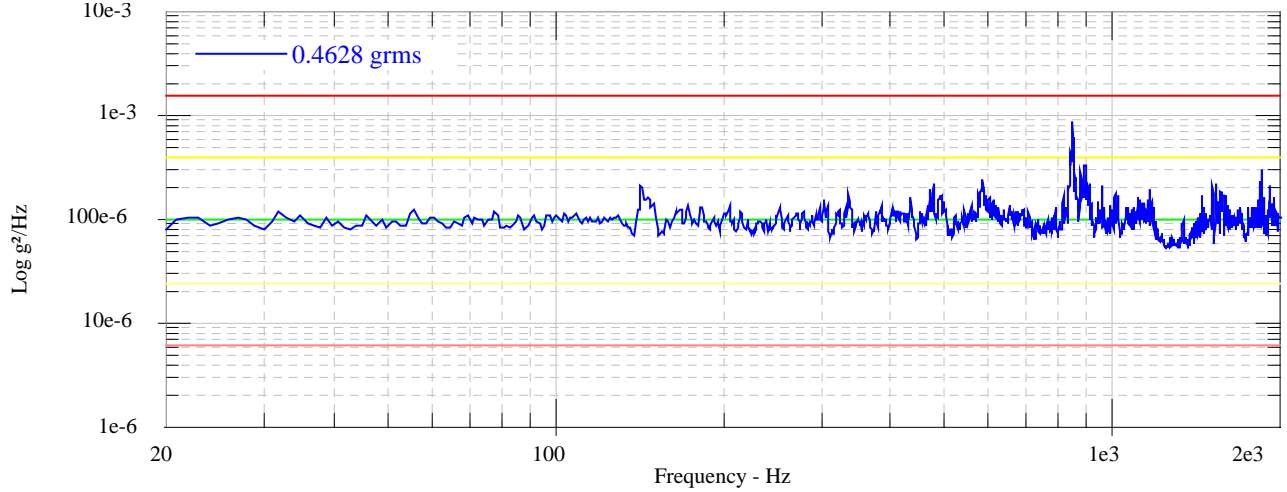
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Error Channel n° -1



Control Channel n° 0

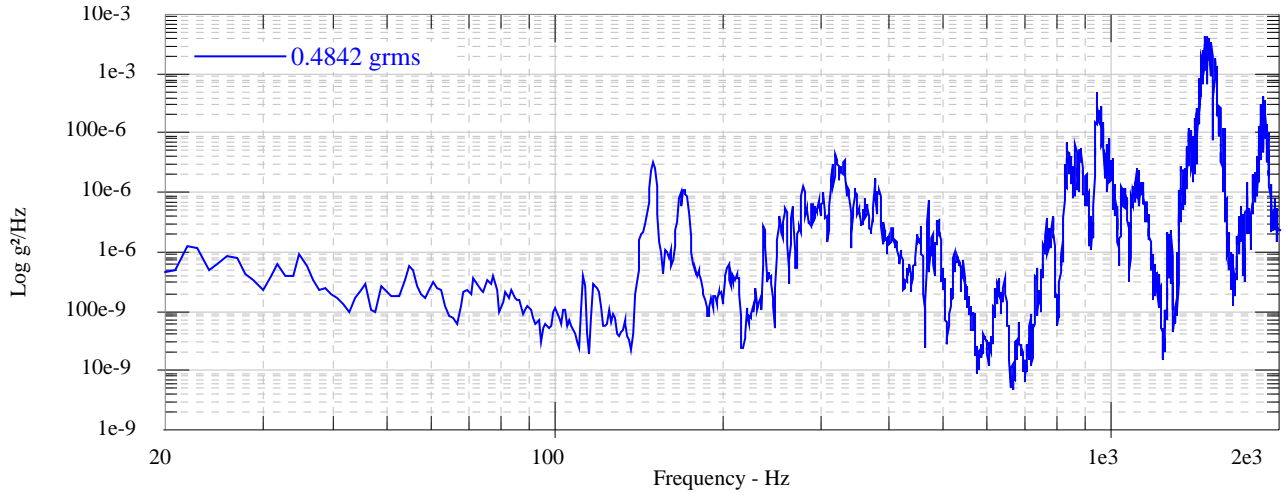


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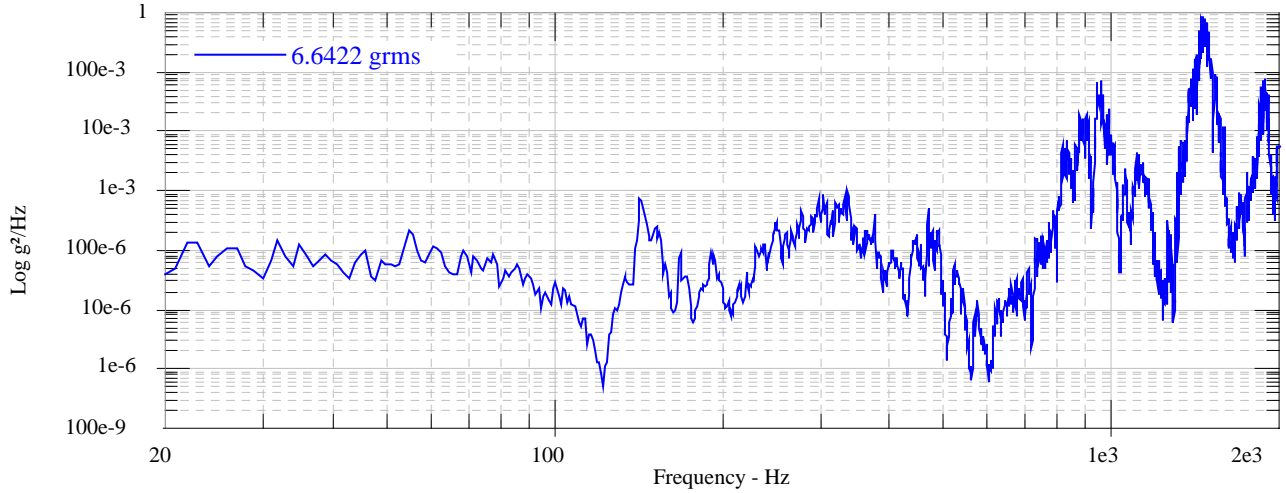
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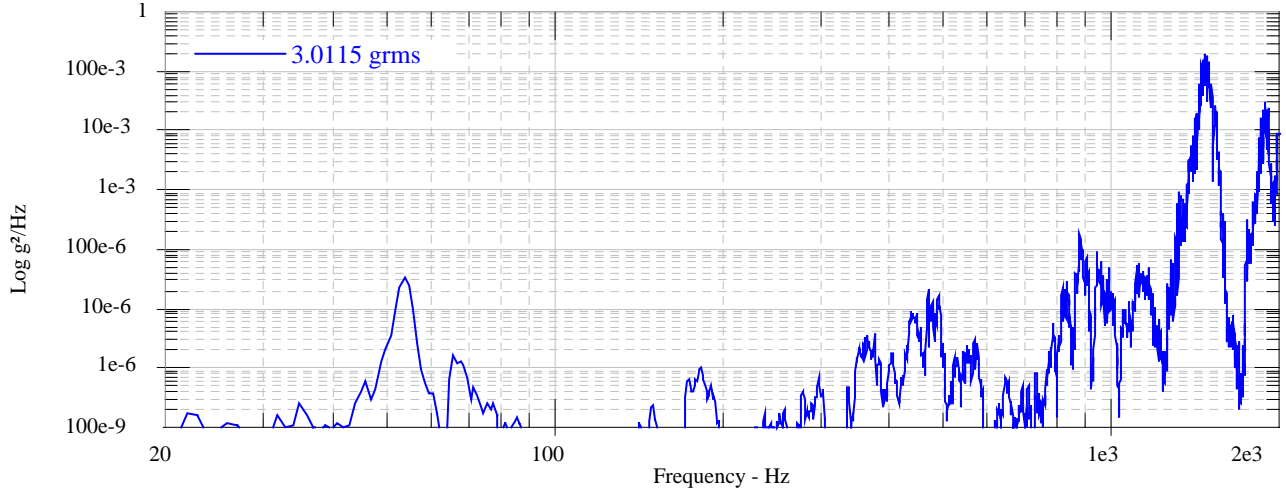
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

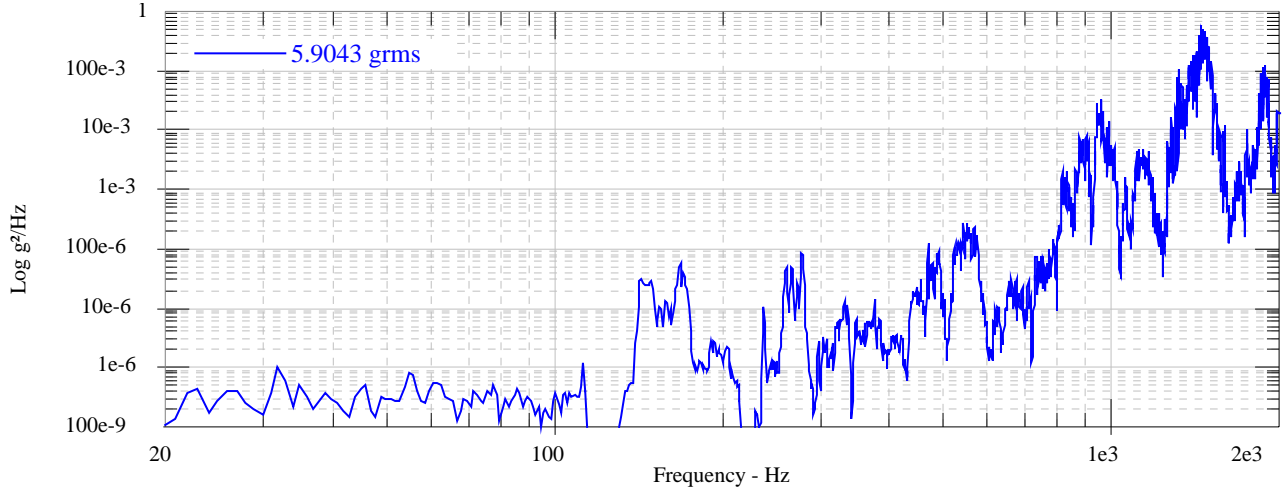


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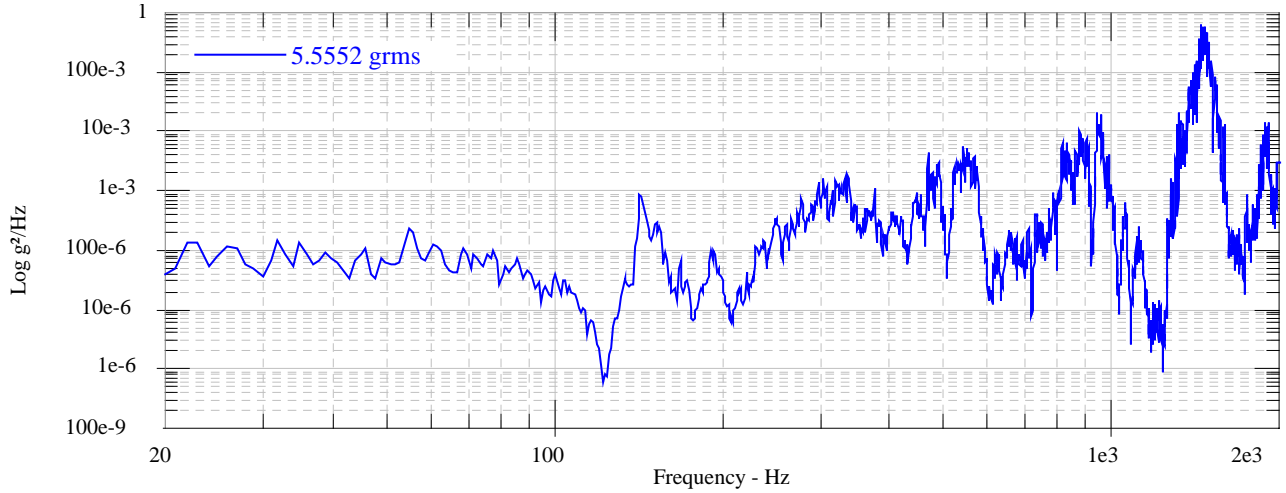
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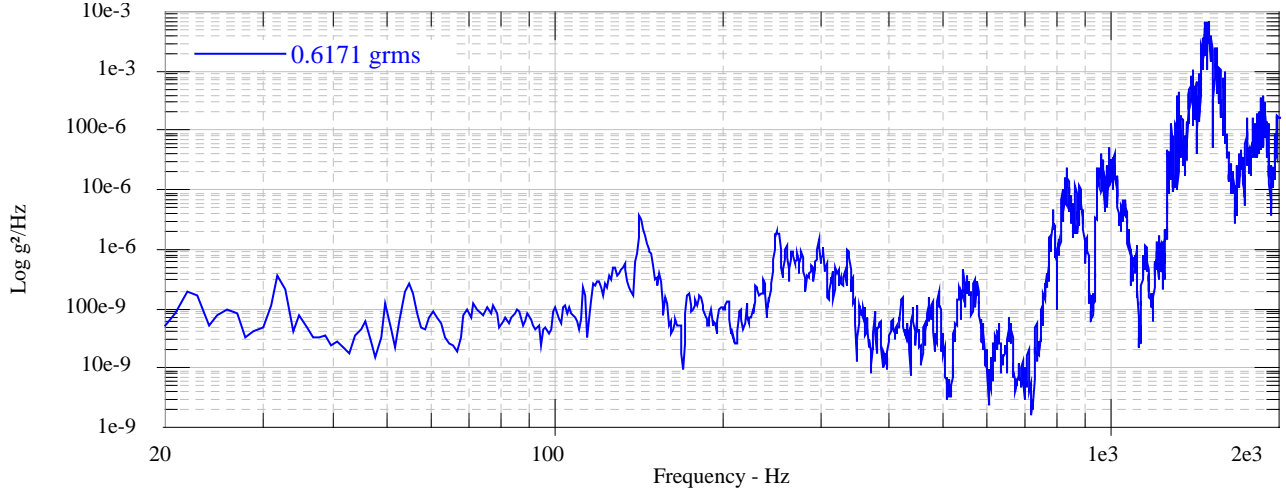
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

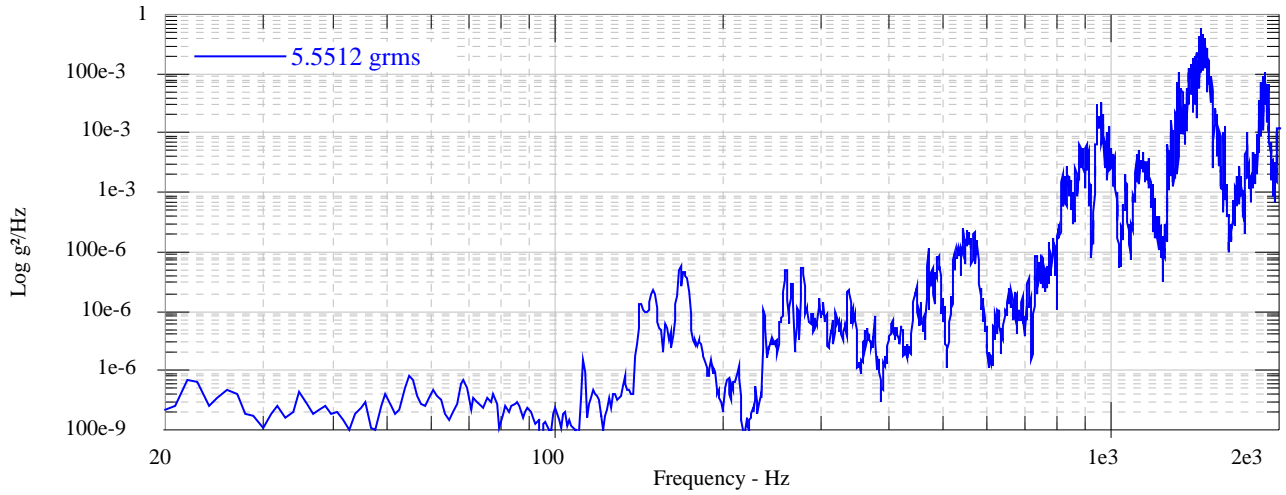


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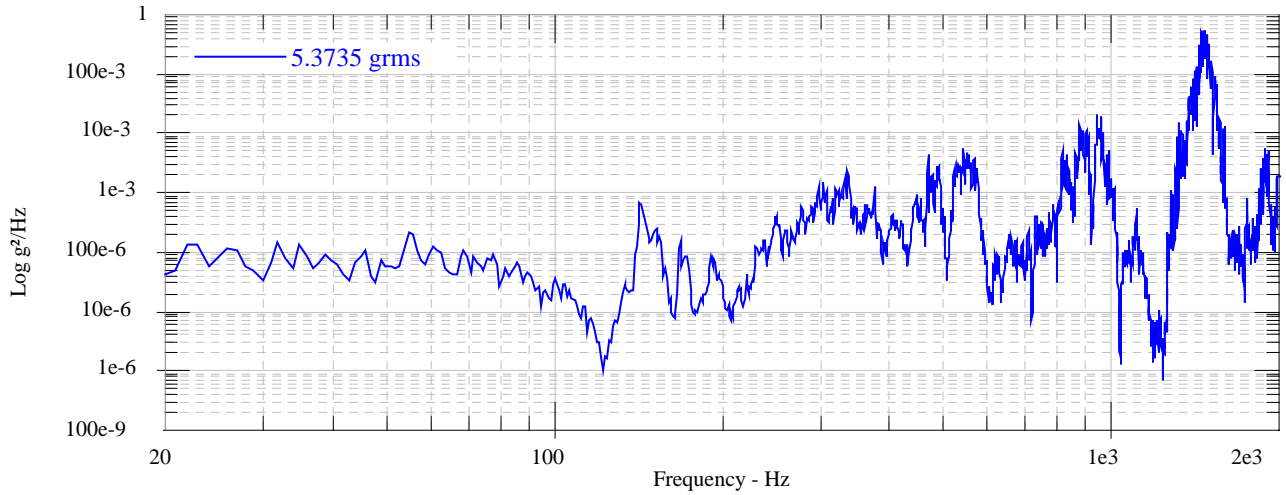
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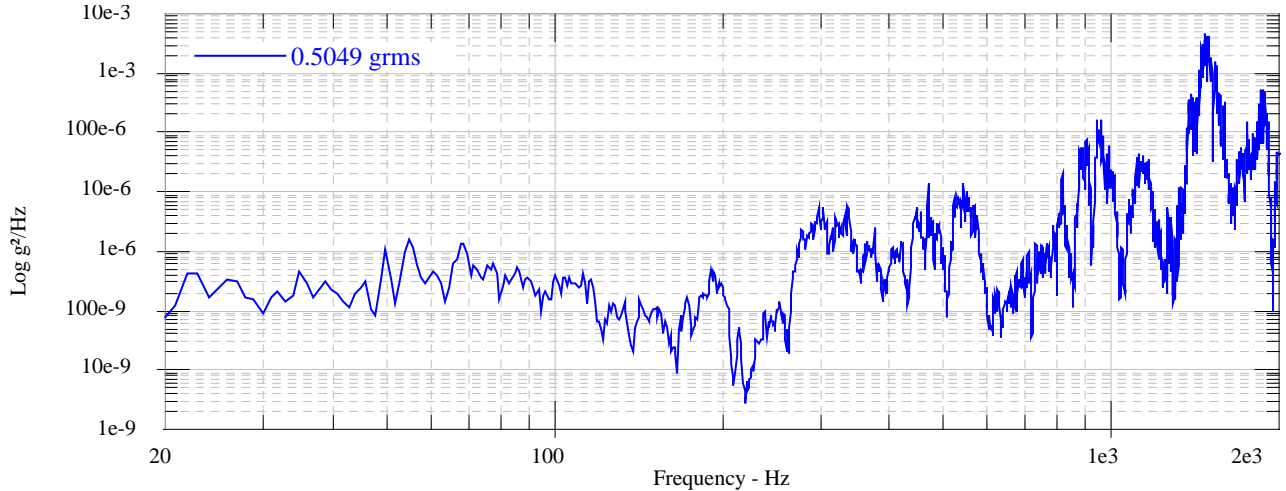
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

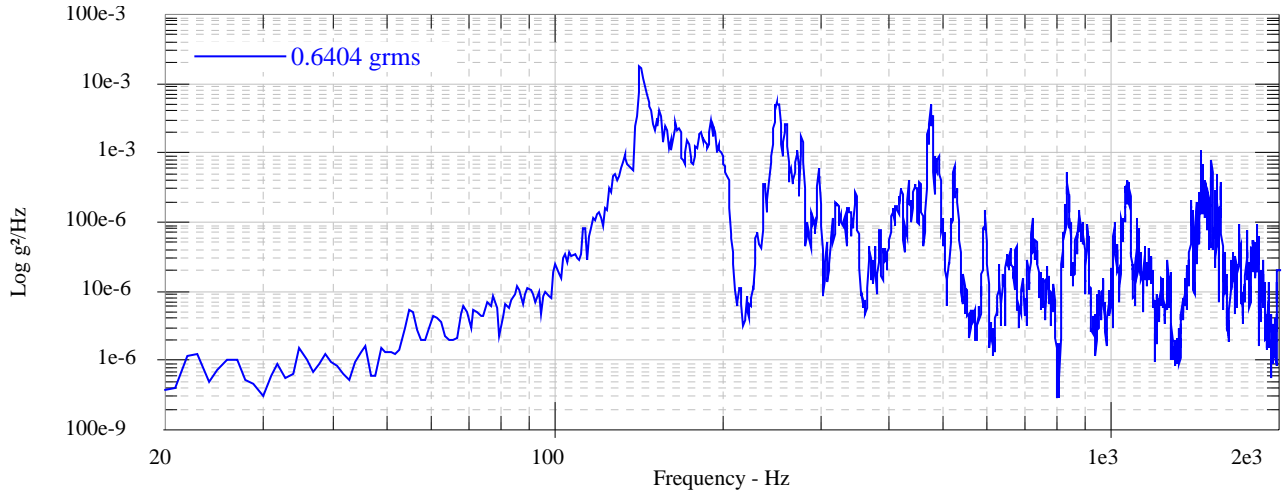


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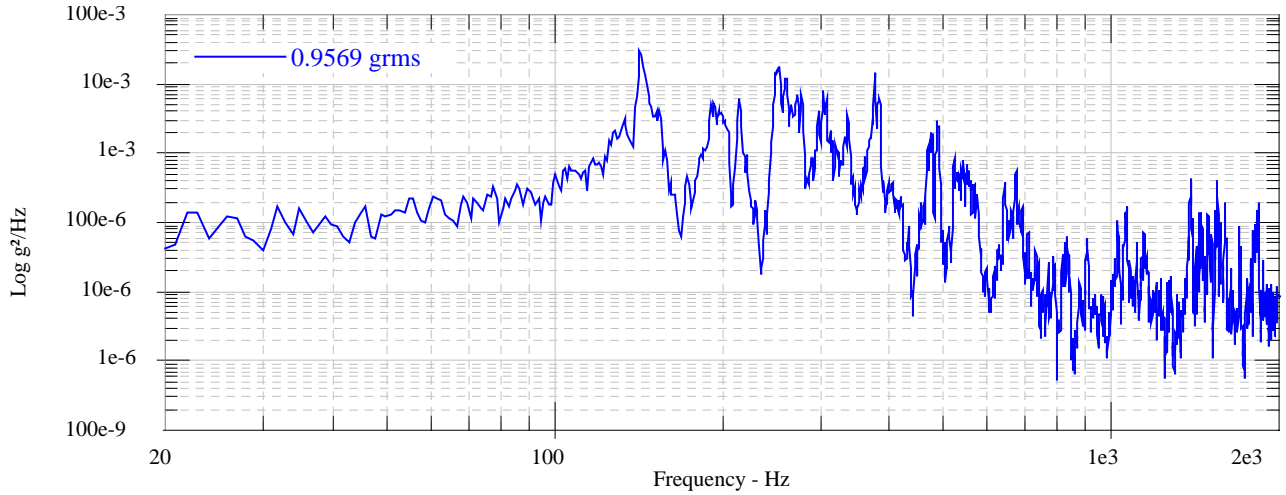
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Date : 8-Apr-04
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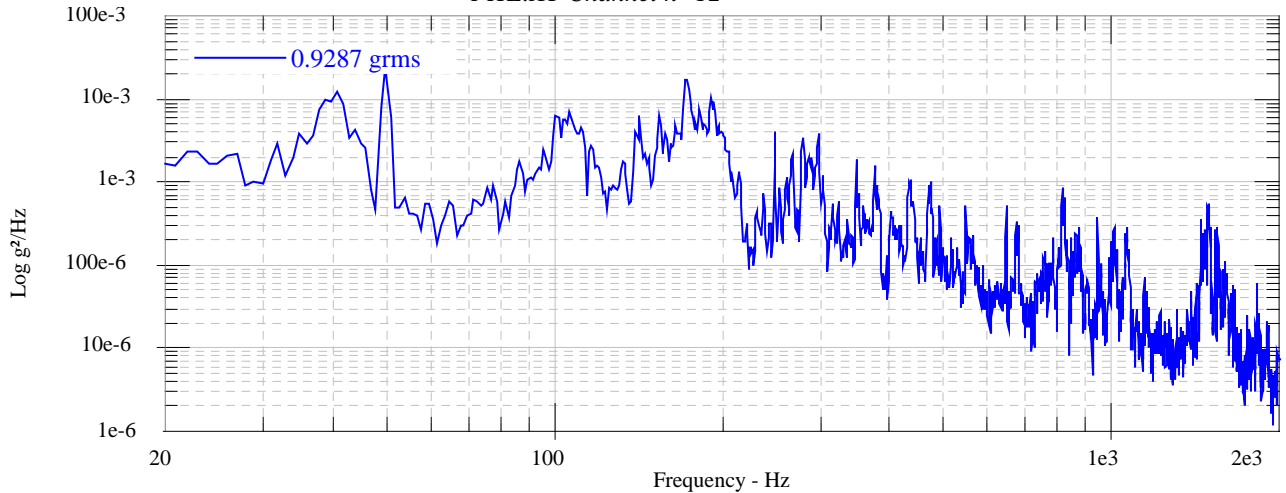
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

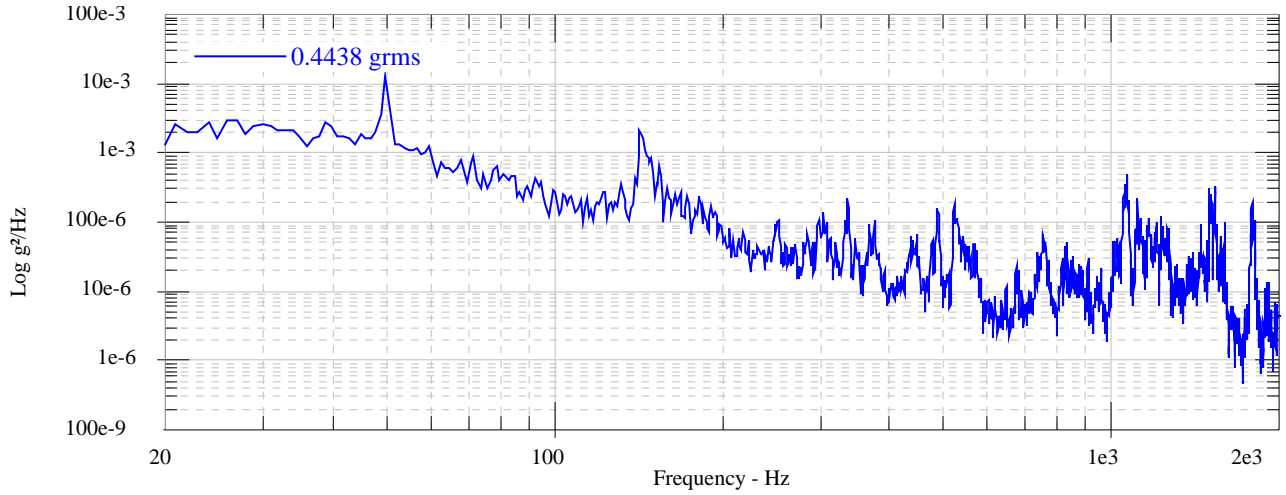


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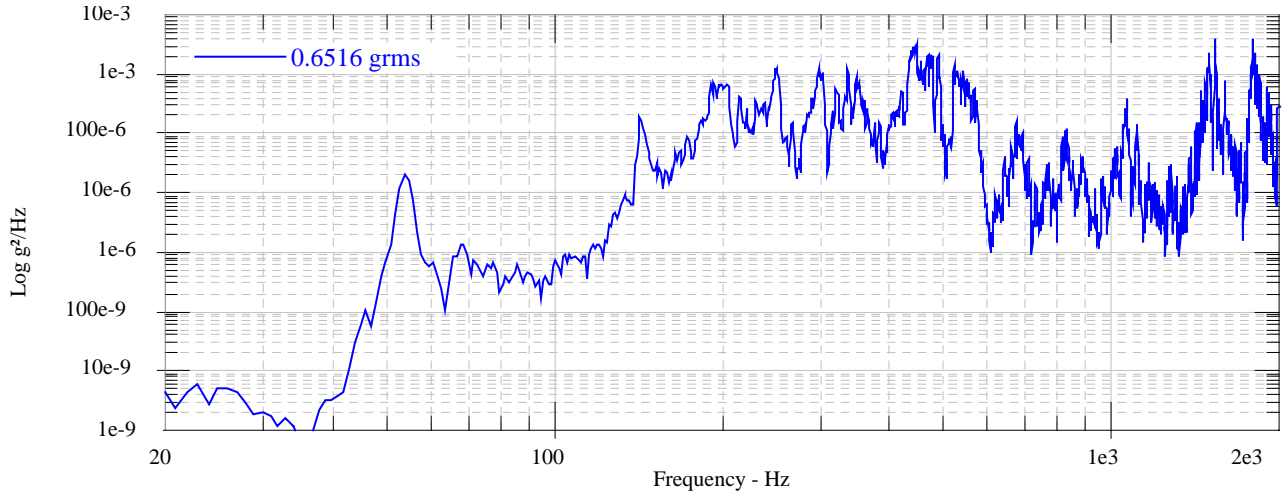
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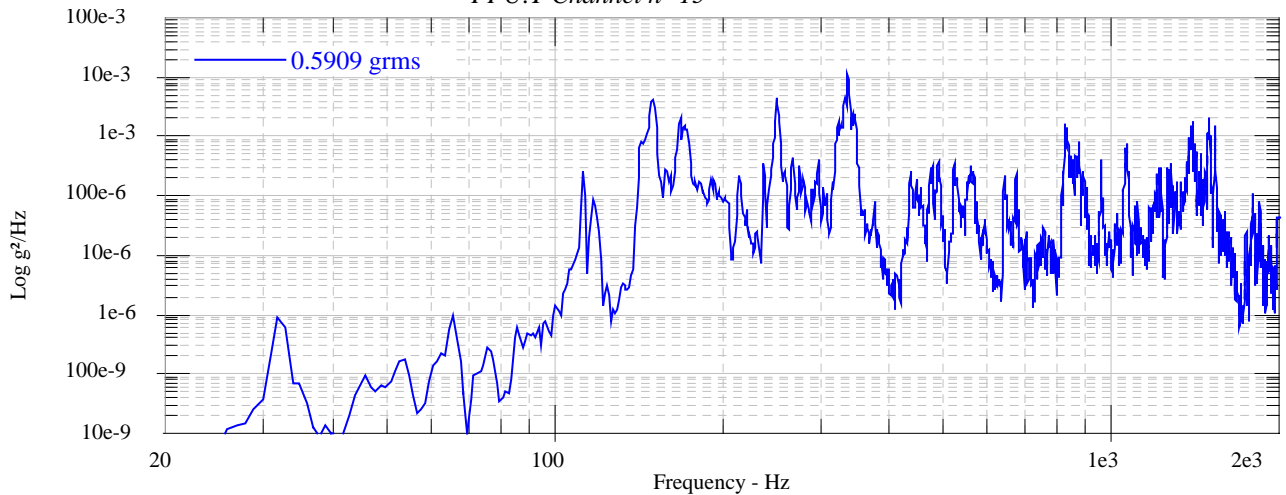
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

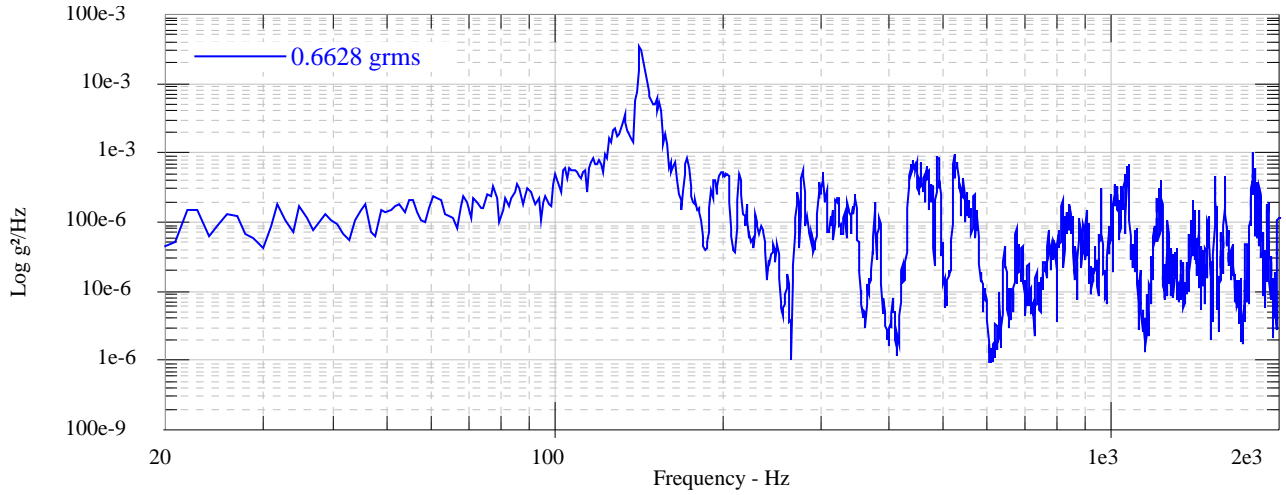


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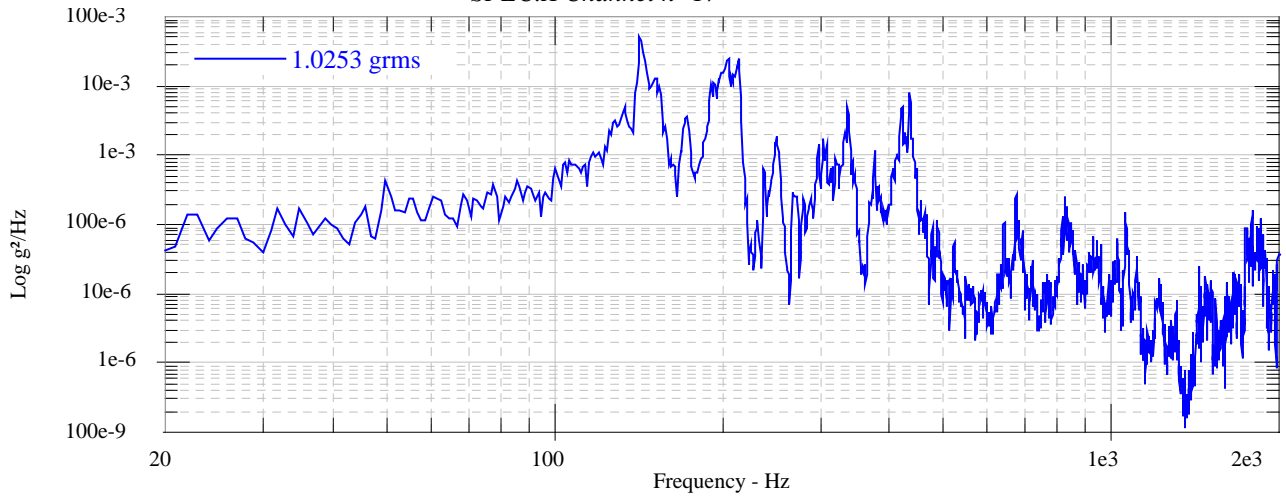
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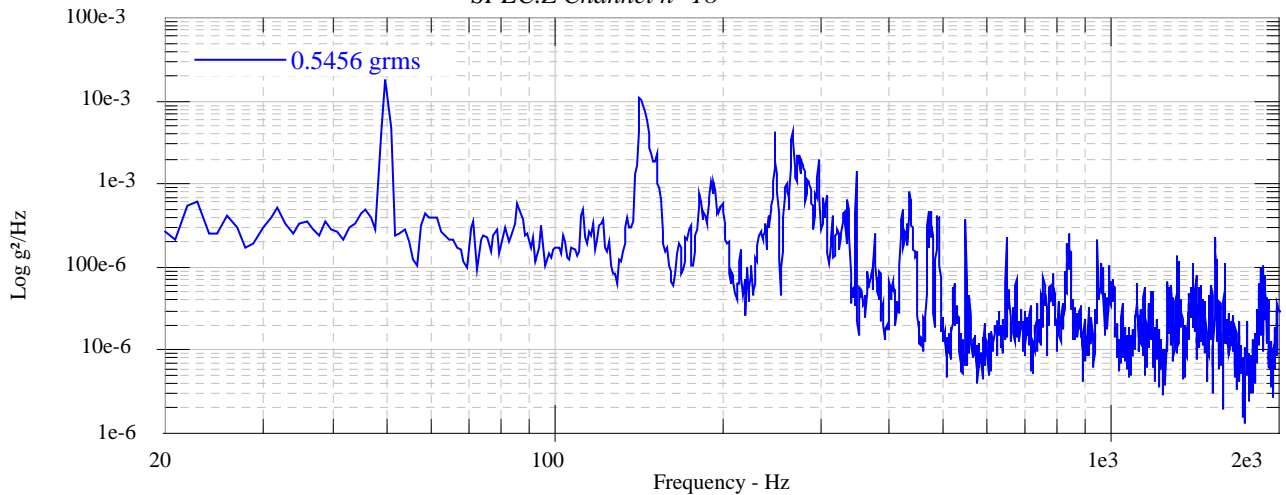
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

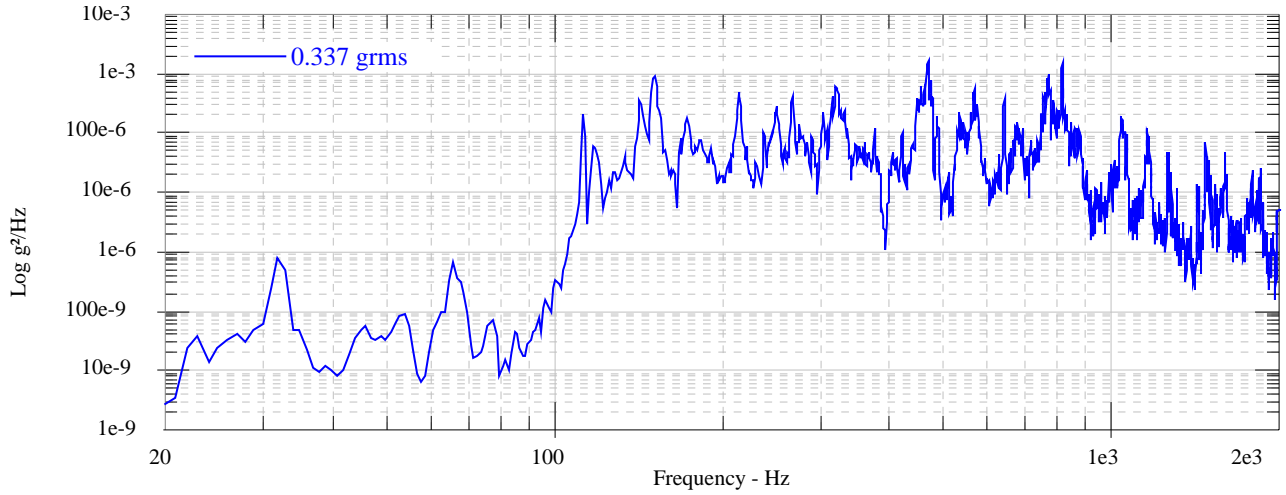


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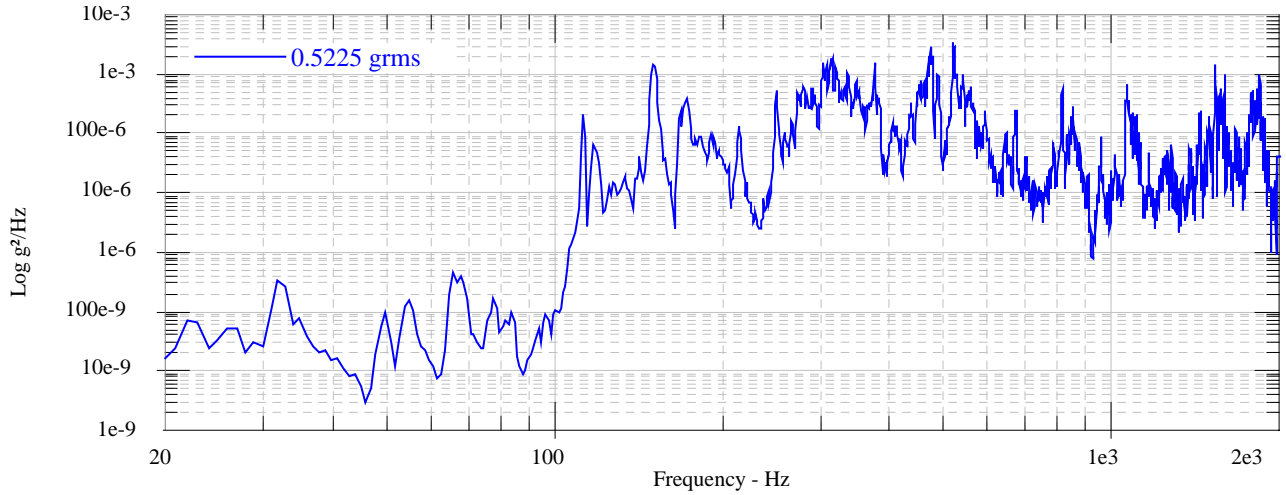
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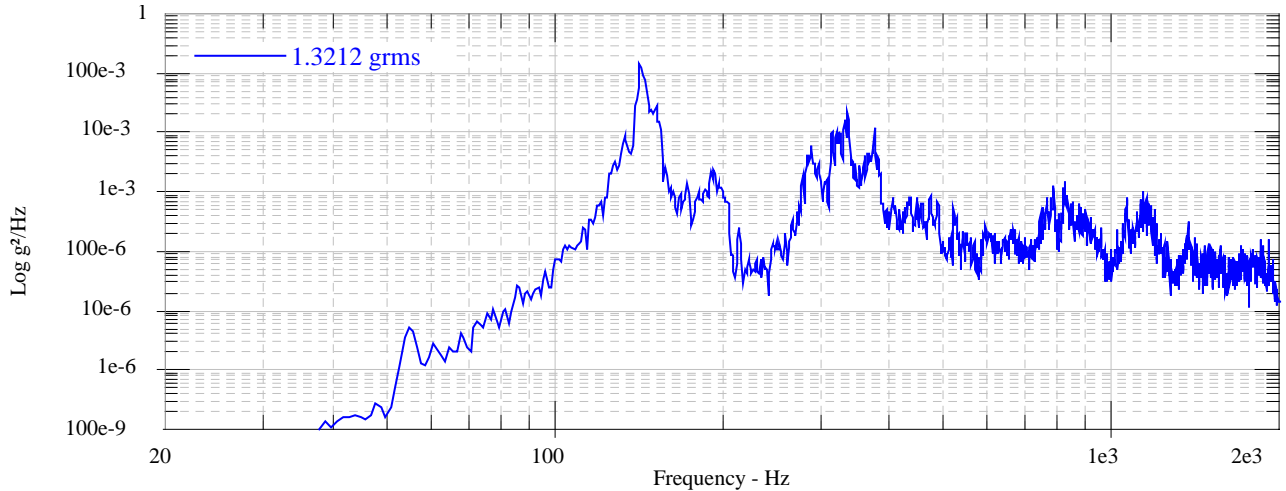
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

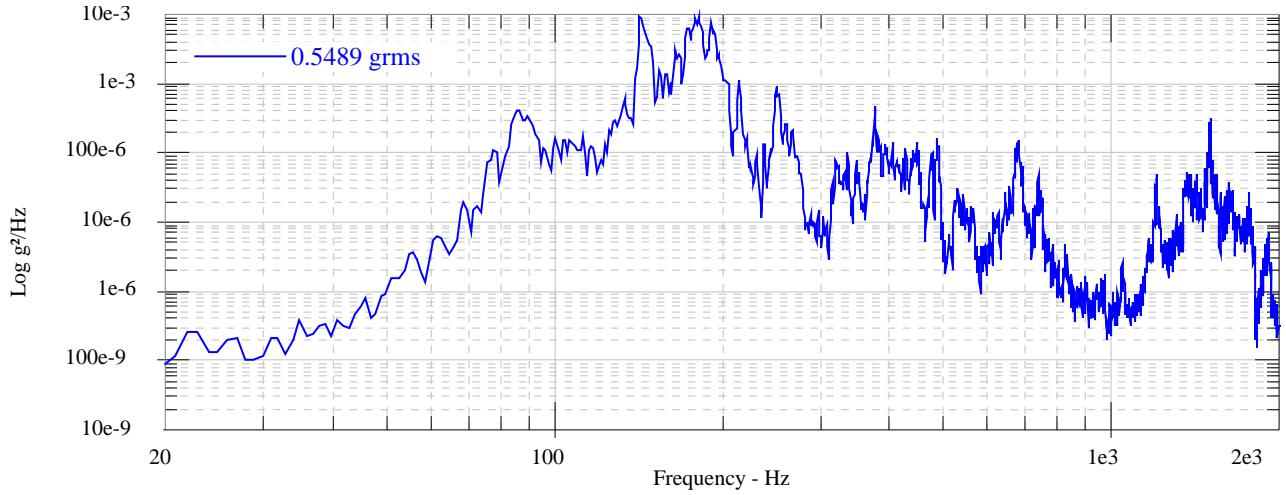


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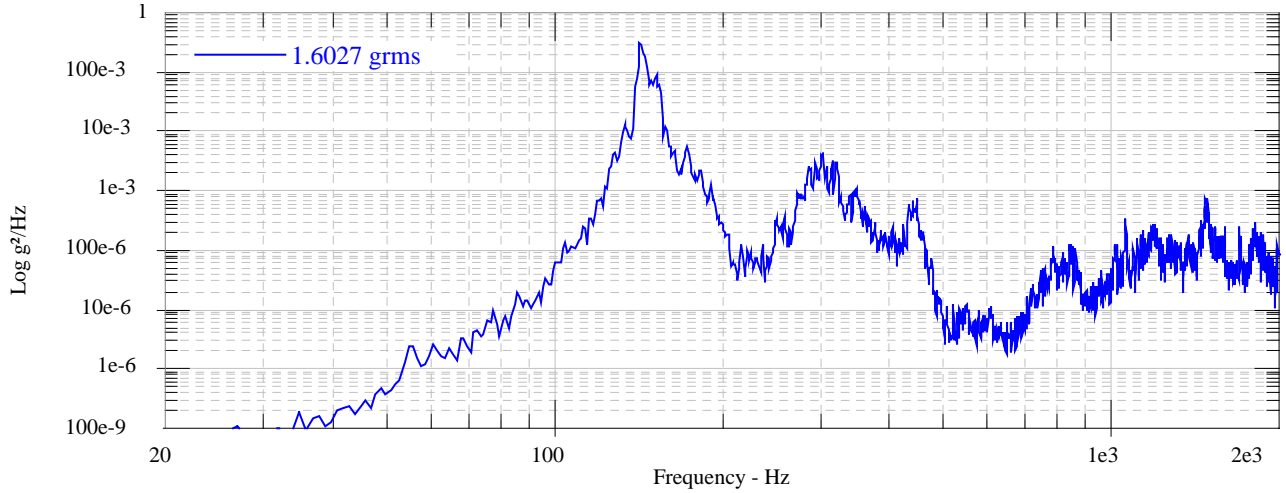
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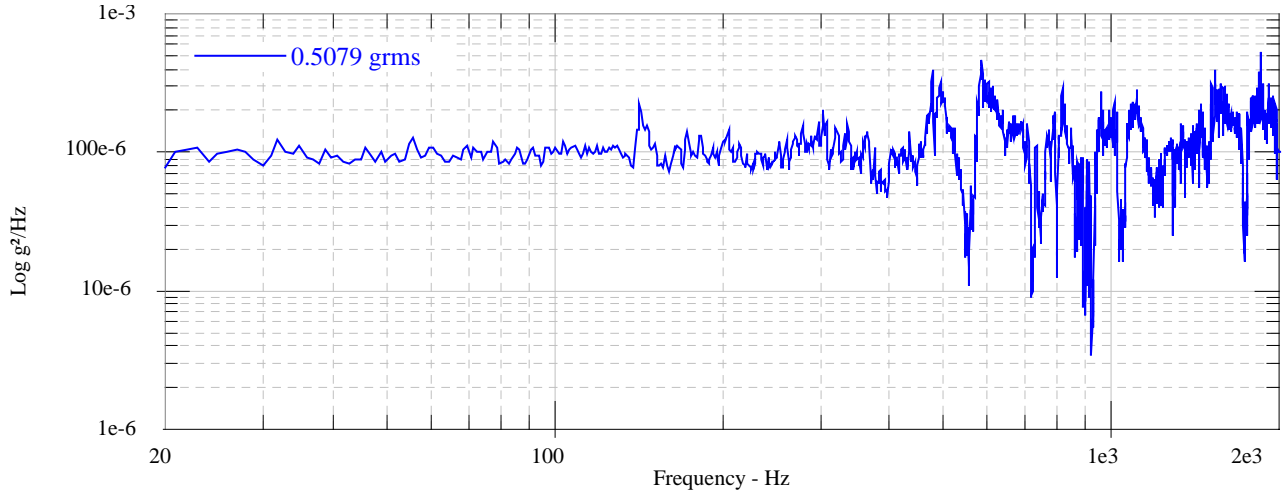
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

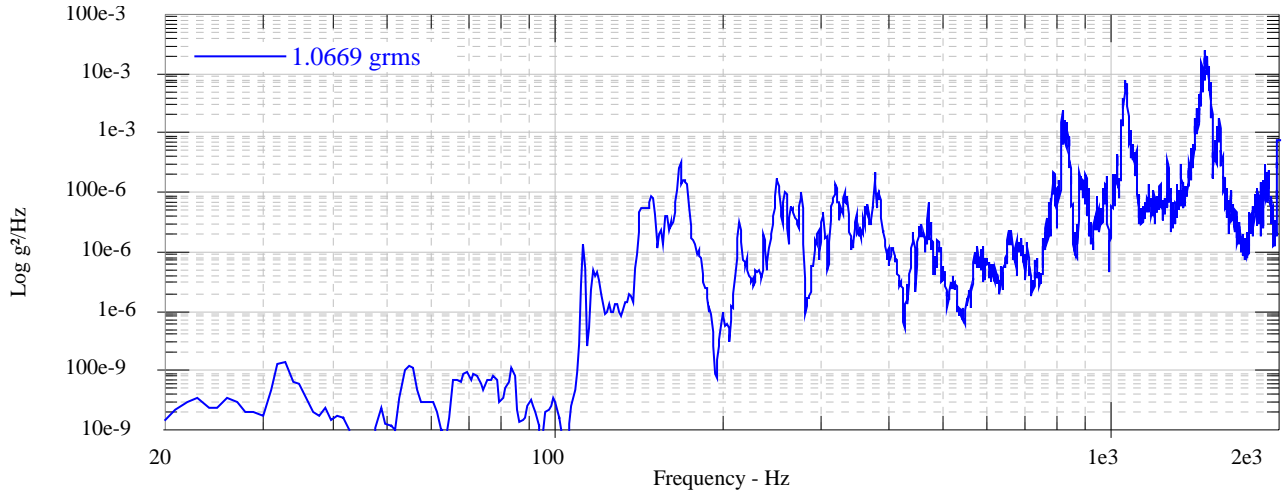


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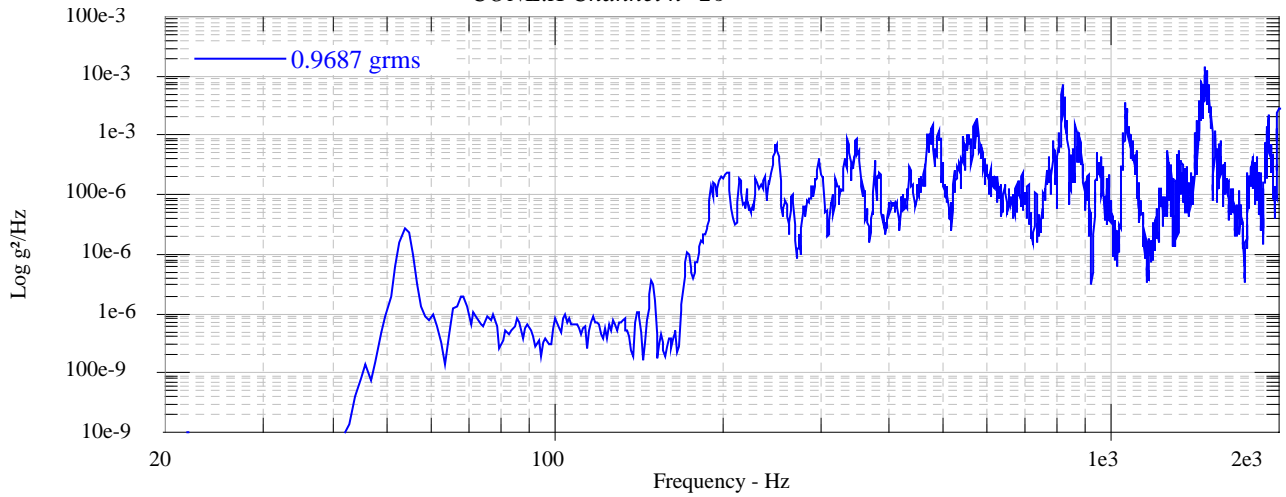
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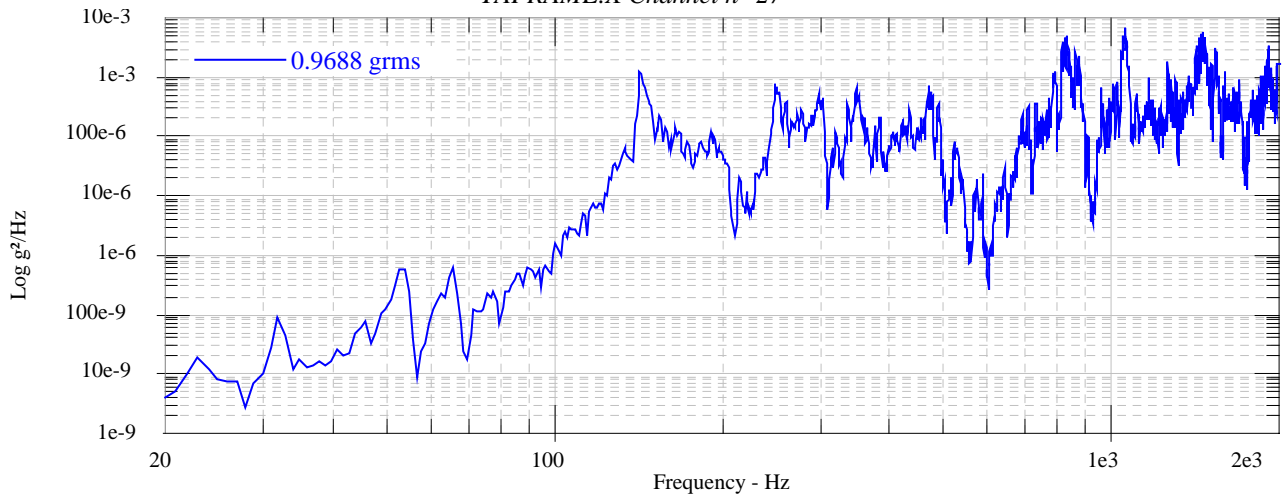
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

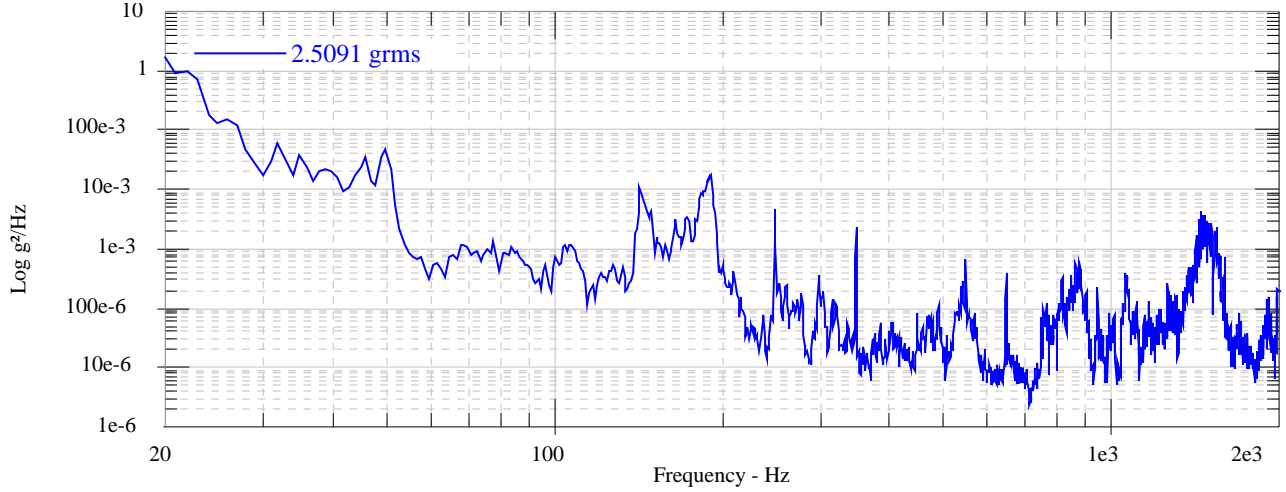


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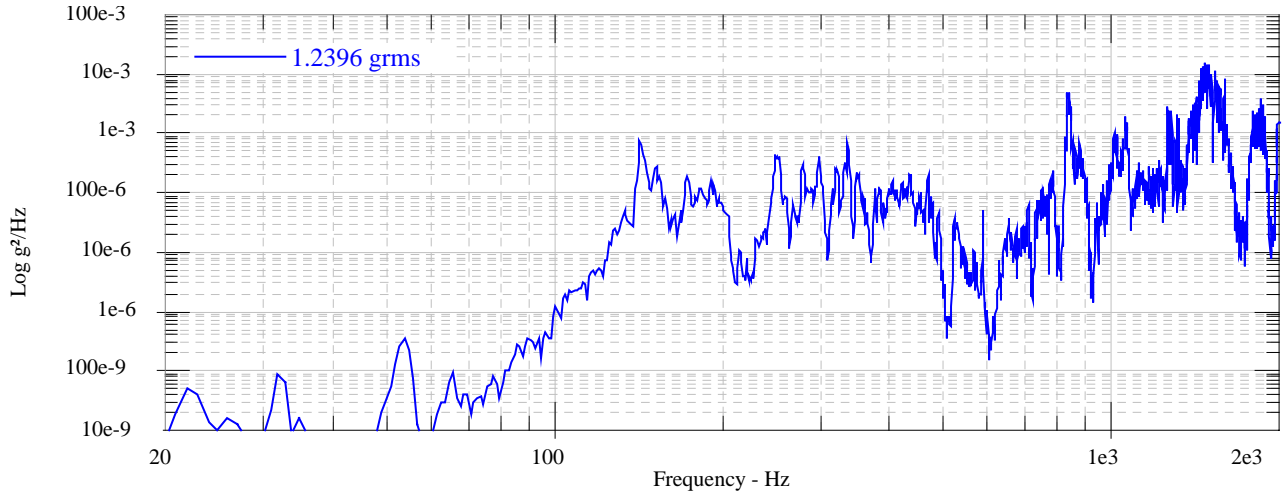
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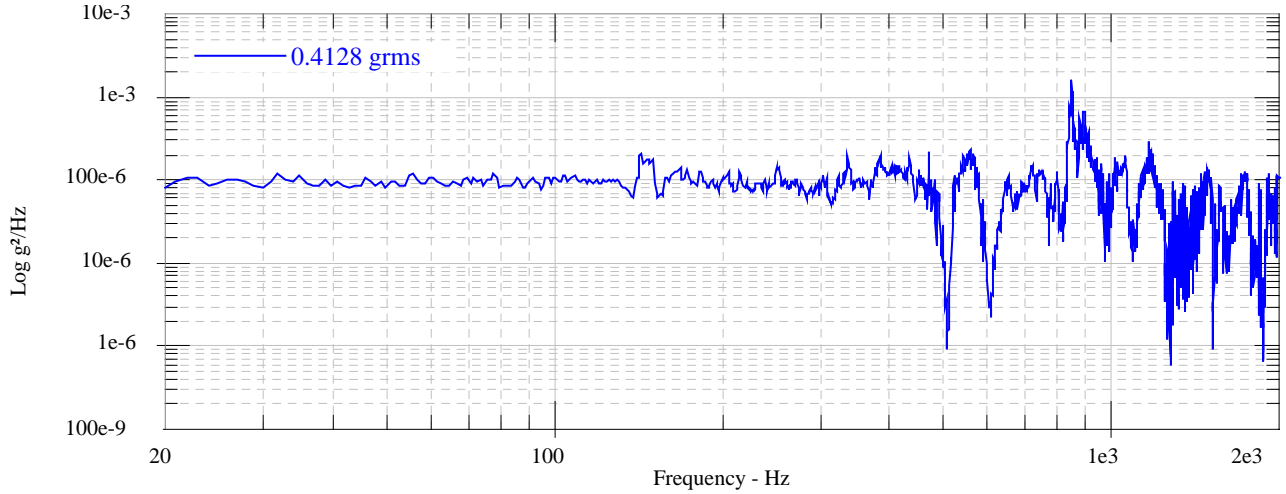
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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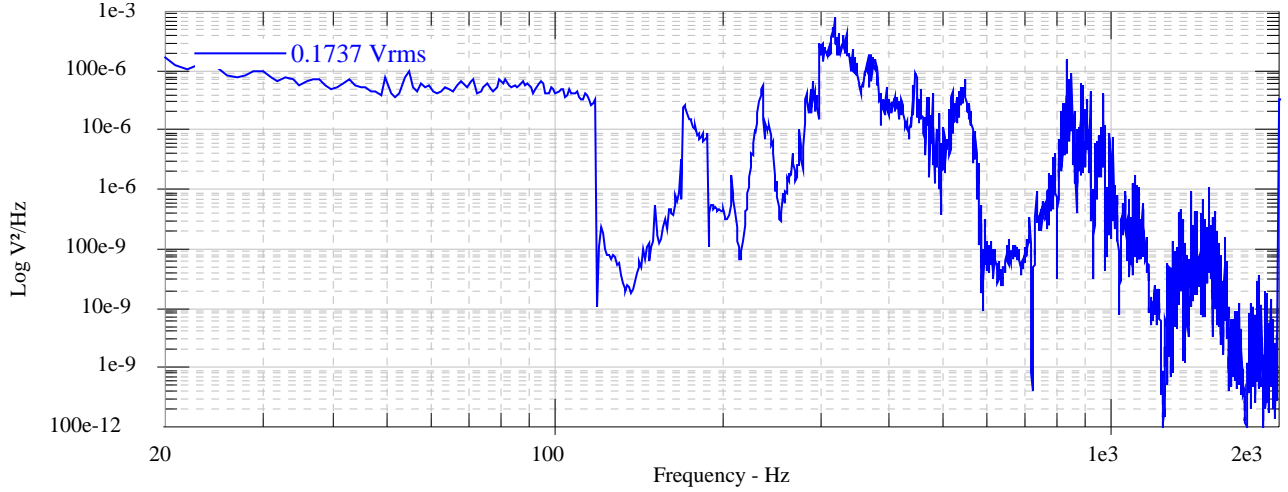
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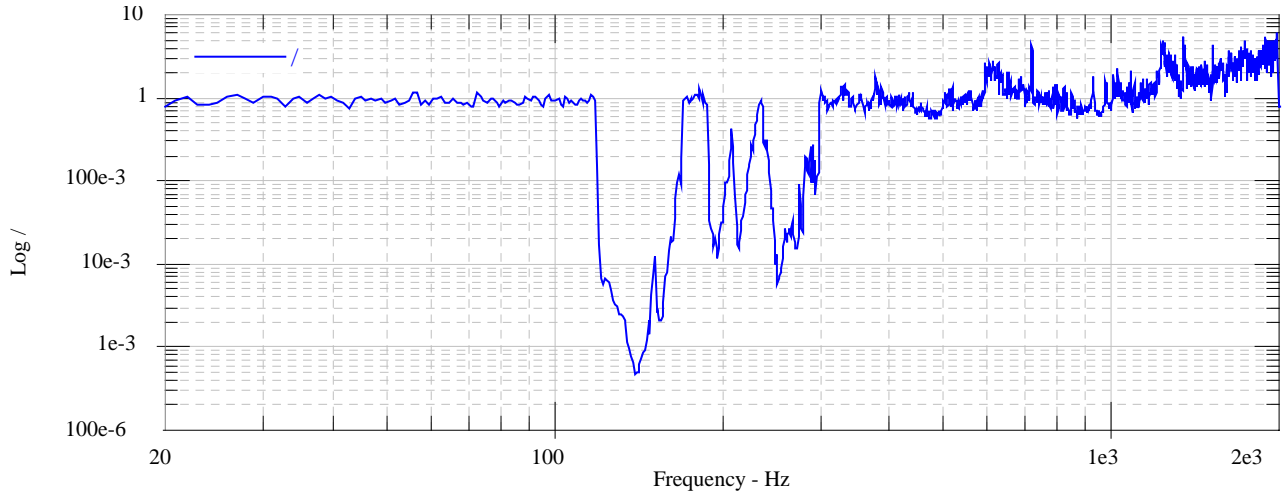
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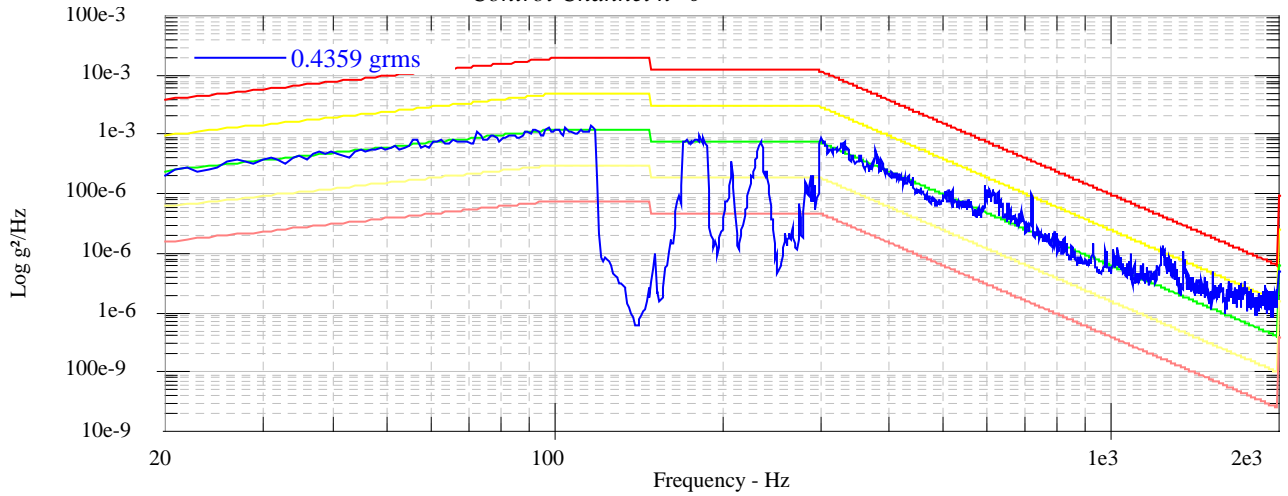
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

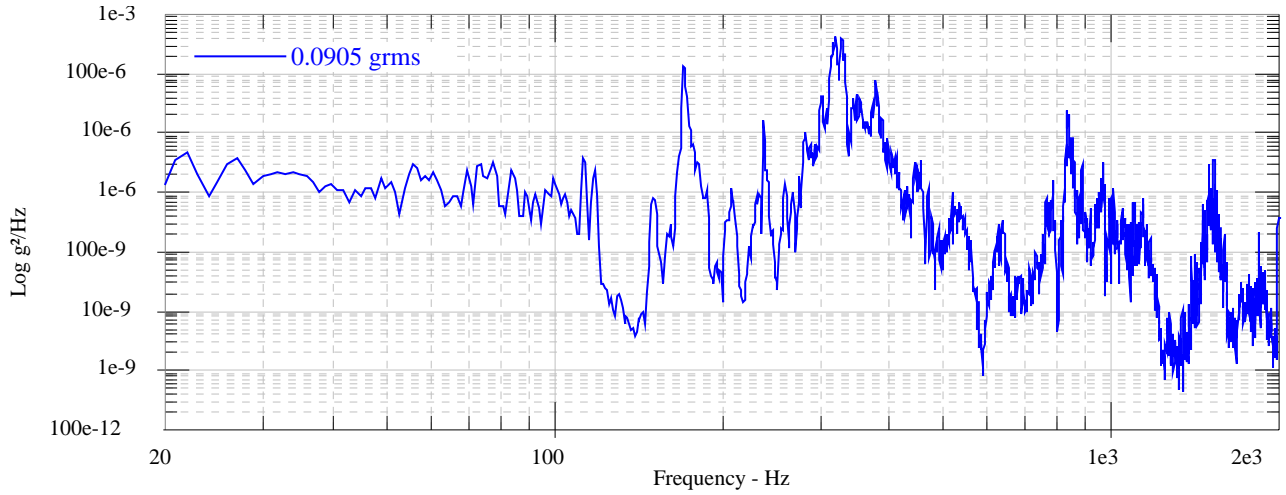


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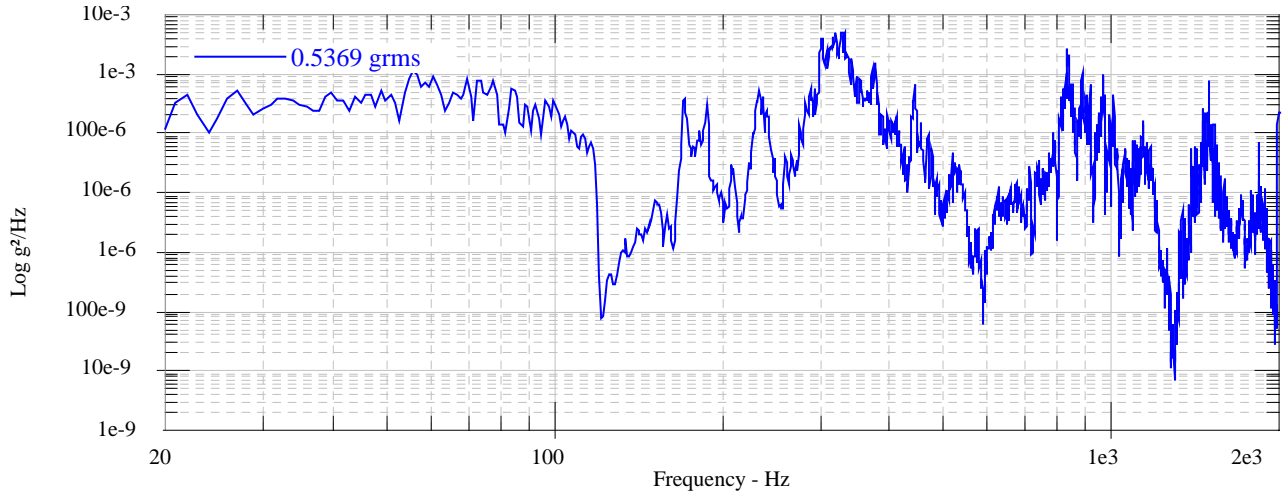
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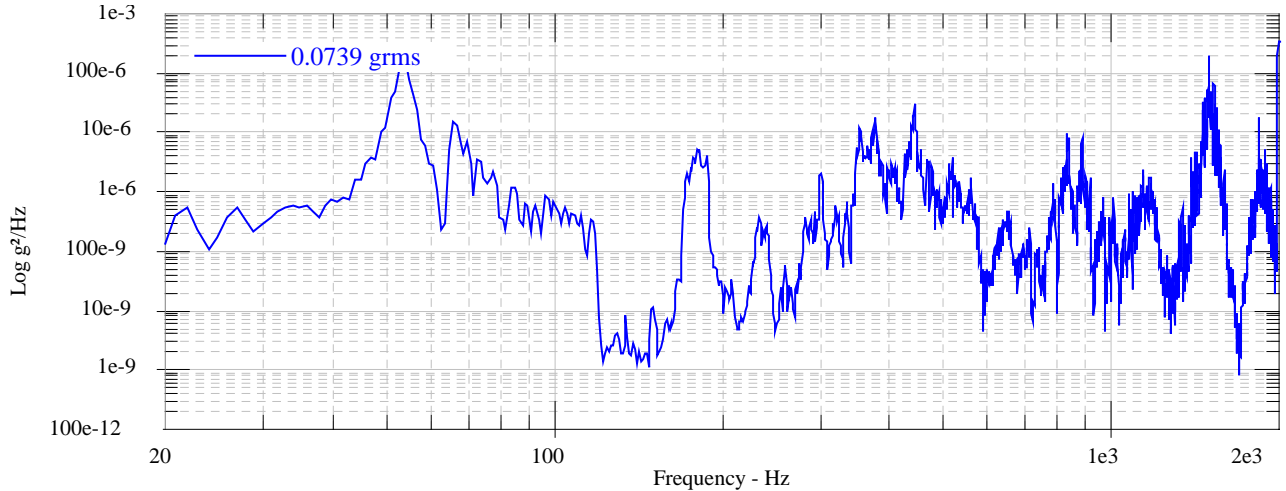
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

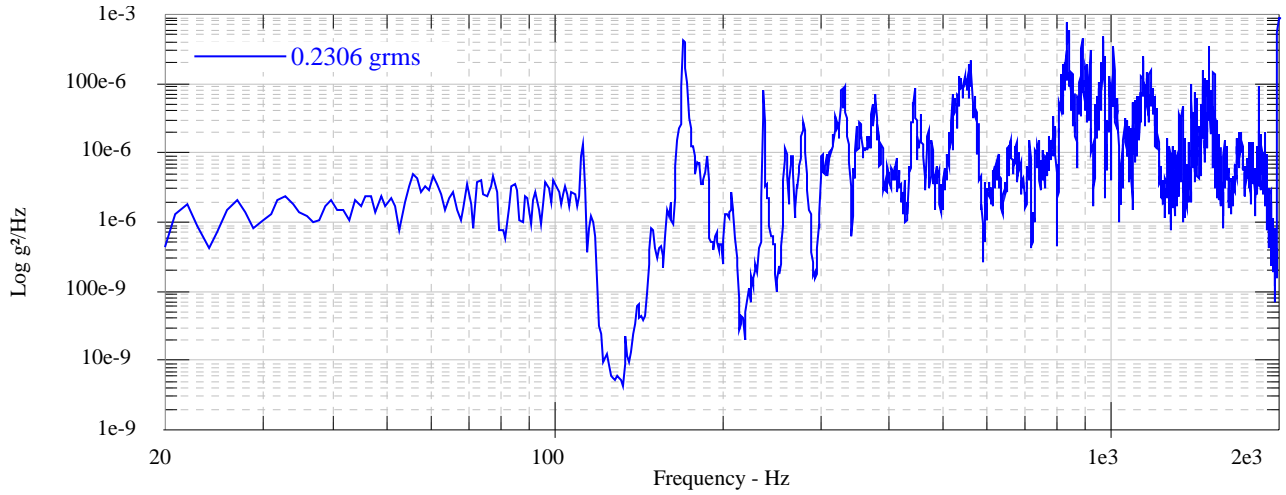


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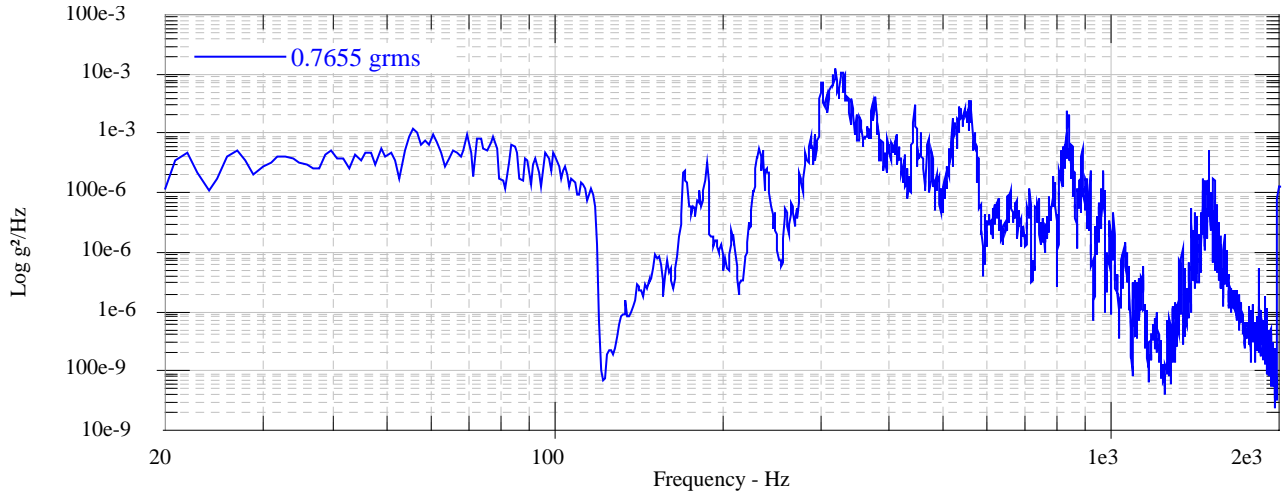
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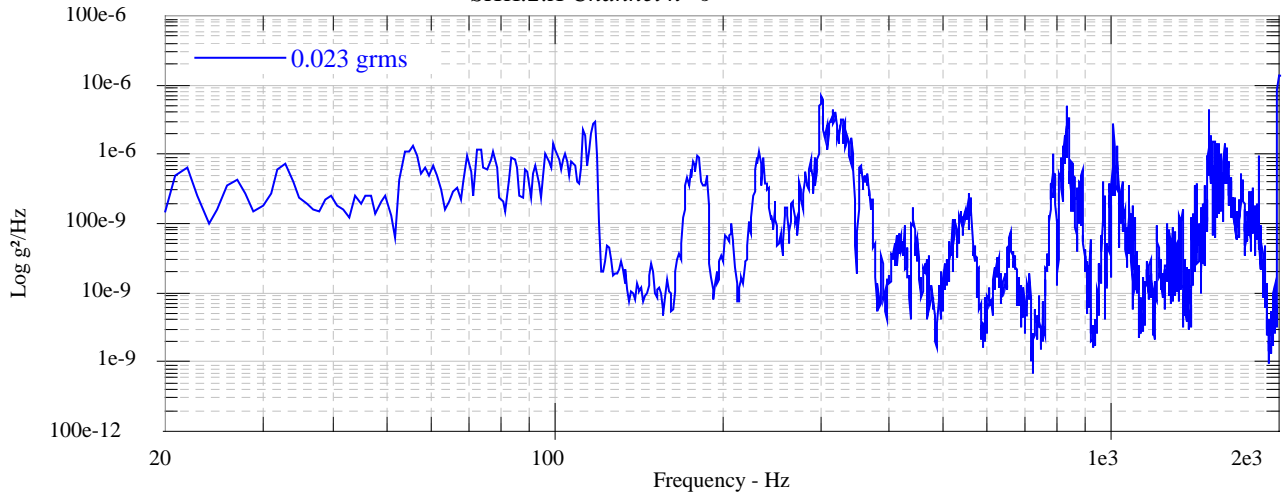
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SHK.2.X Channel n° 6

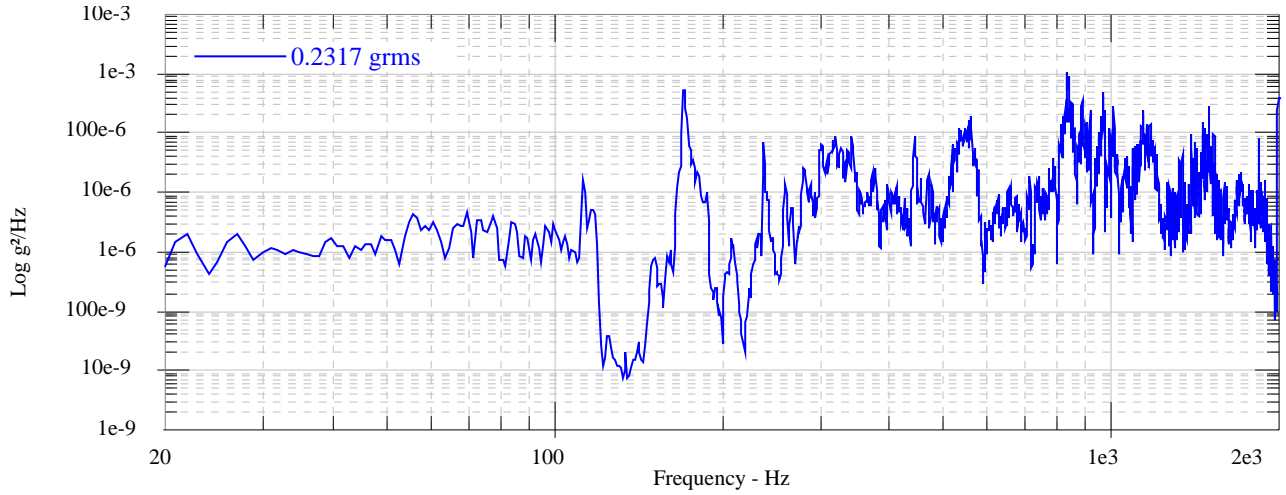


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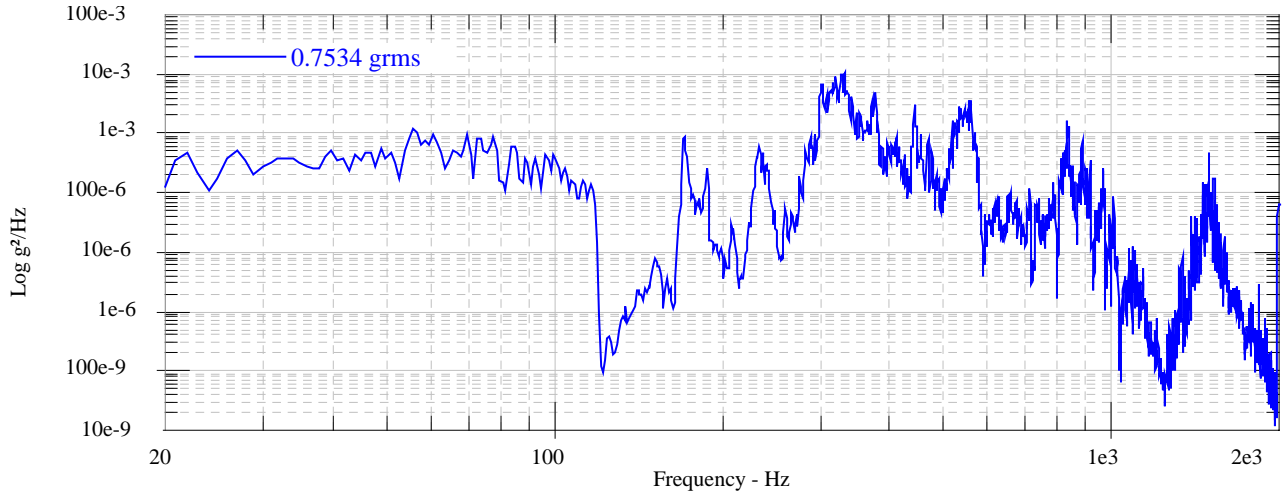
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Date : 8-Apr-04
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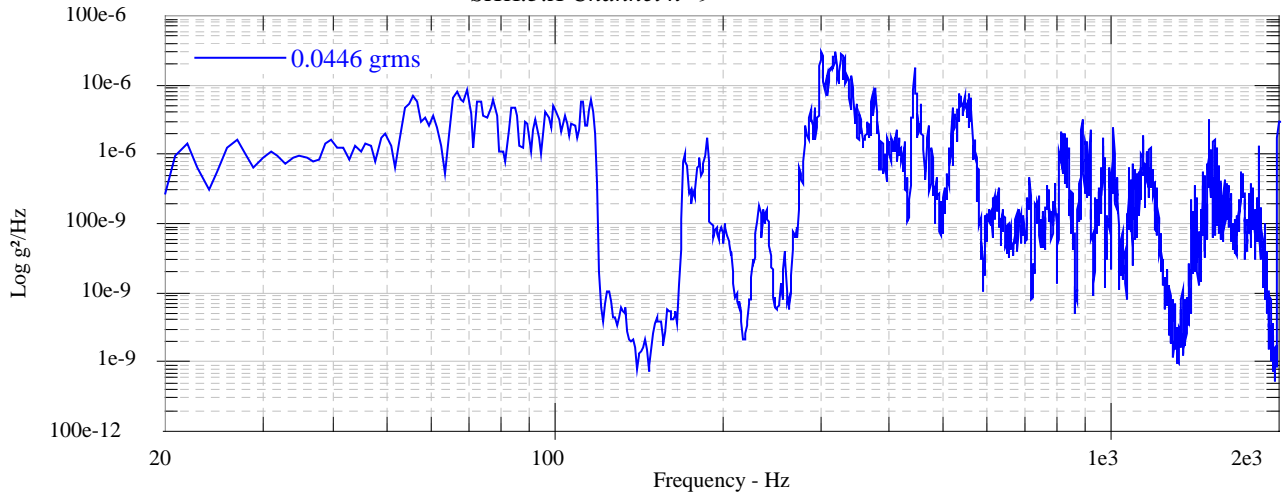
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

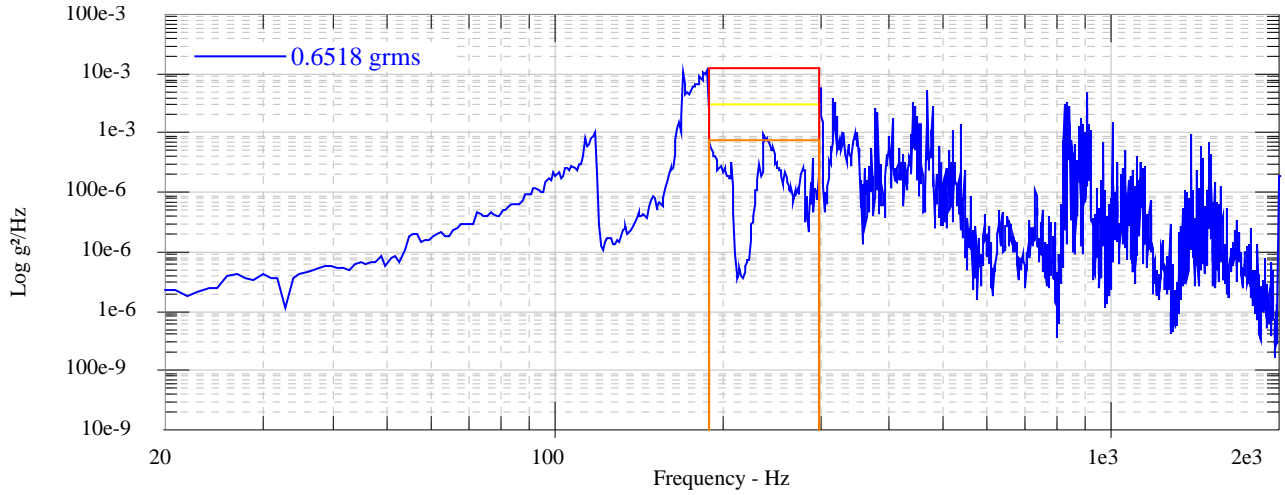


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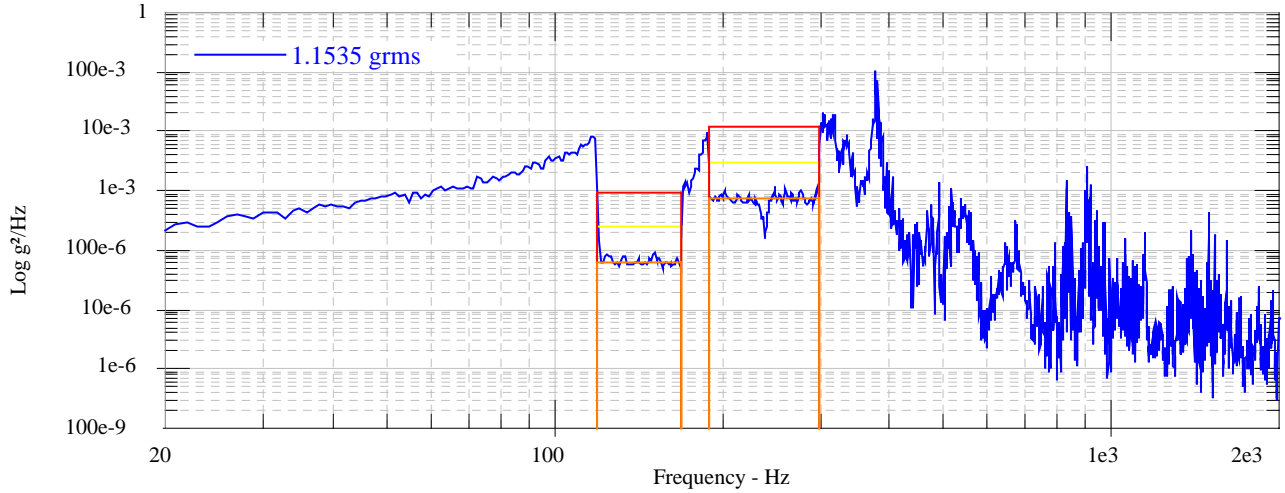
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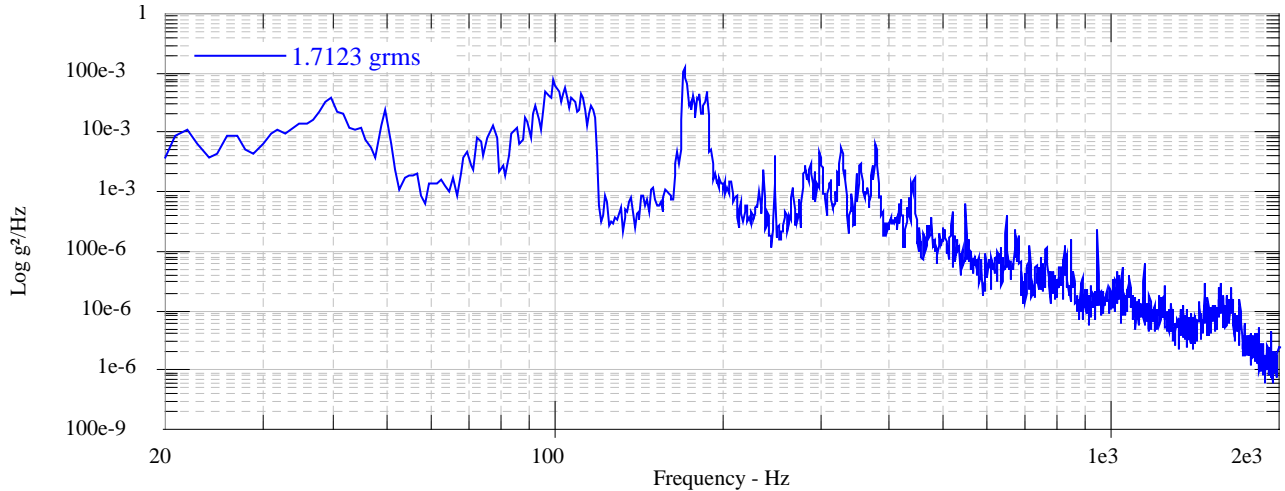
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PHS.Z Channel n° 11



PHE.XY Channel n° 12

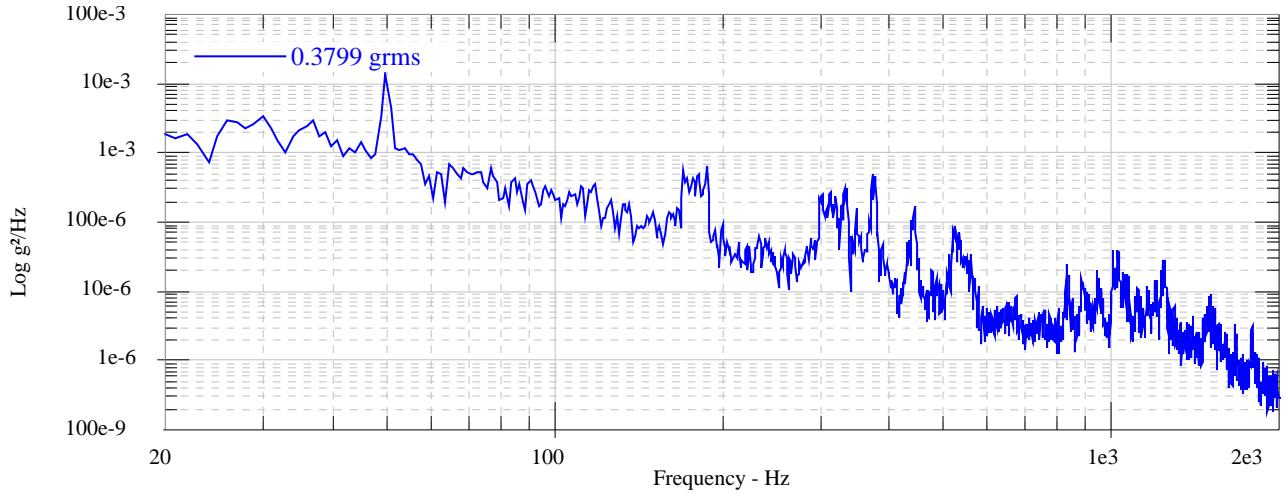


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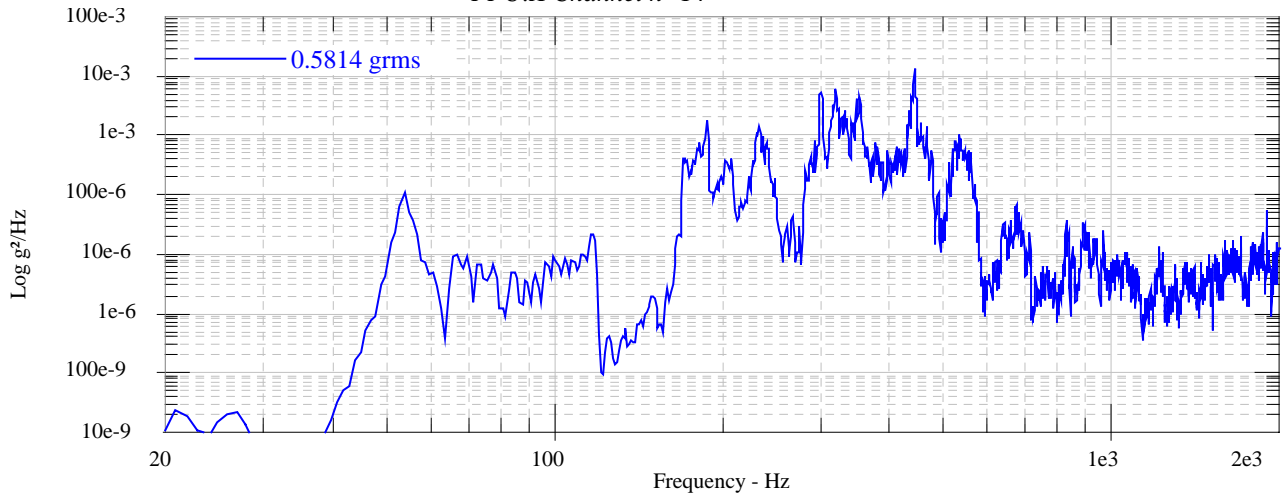
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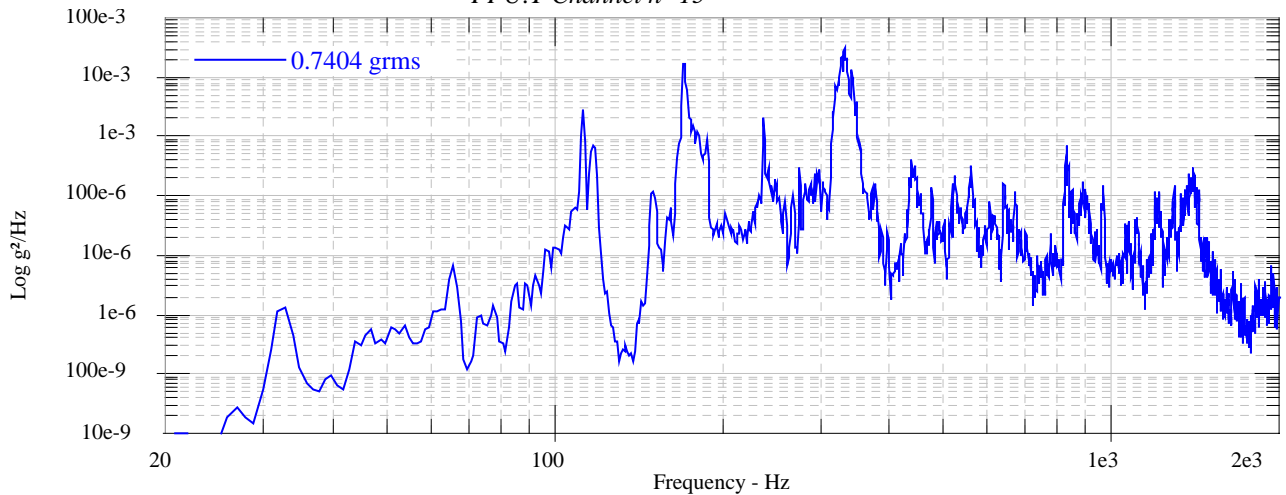
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

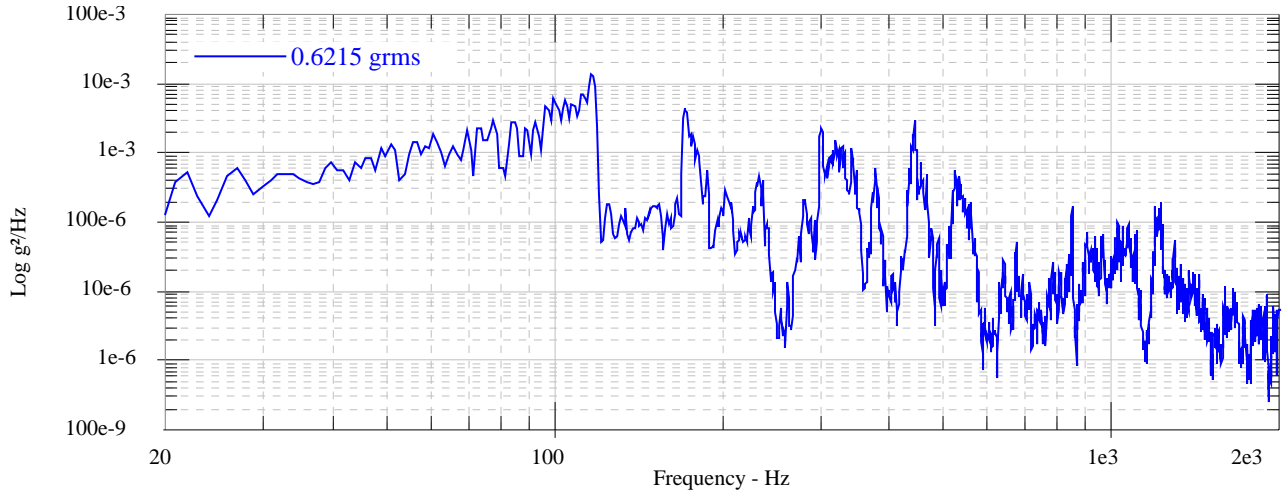


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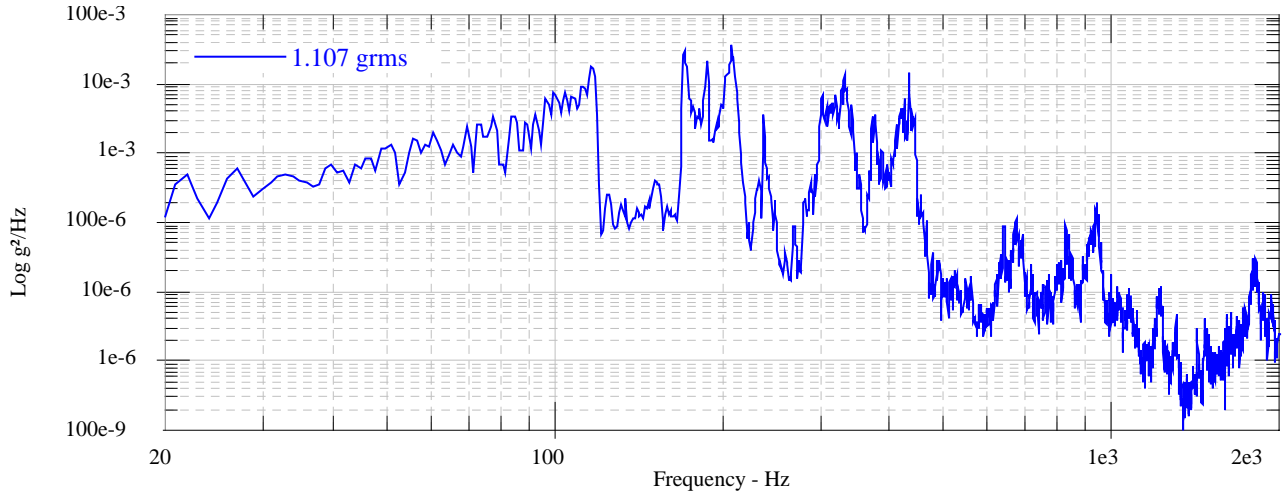
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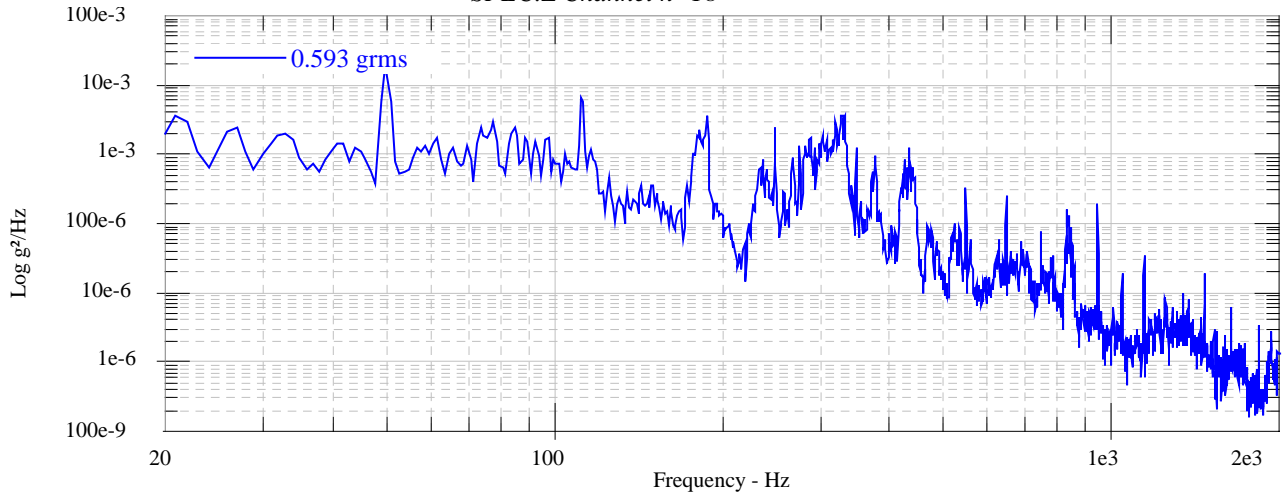
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

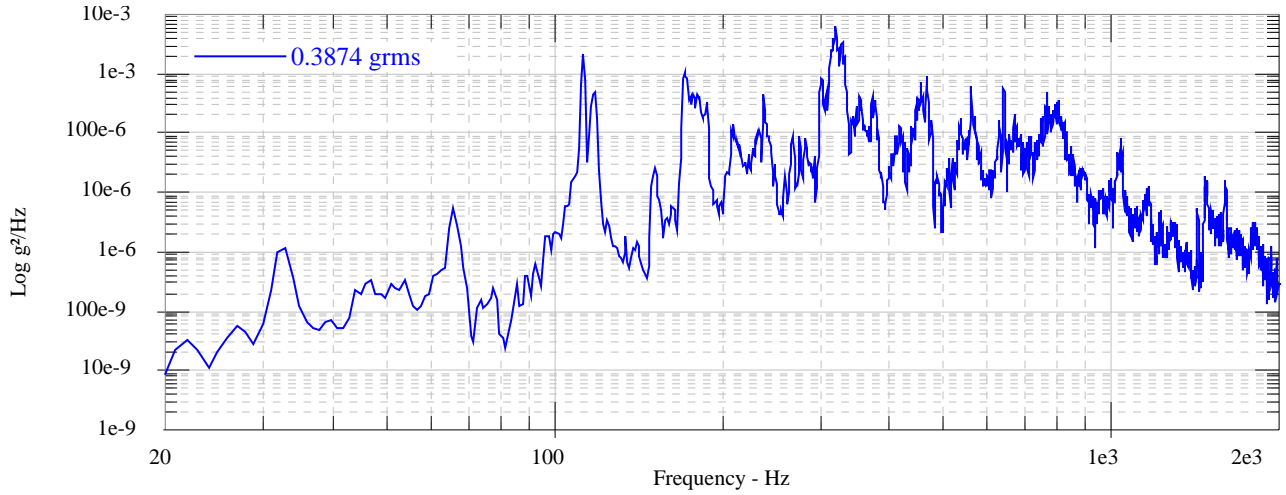


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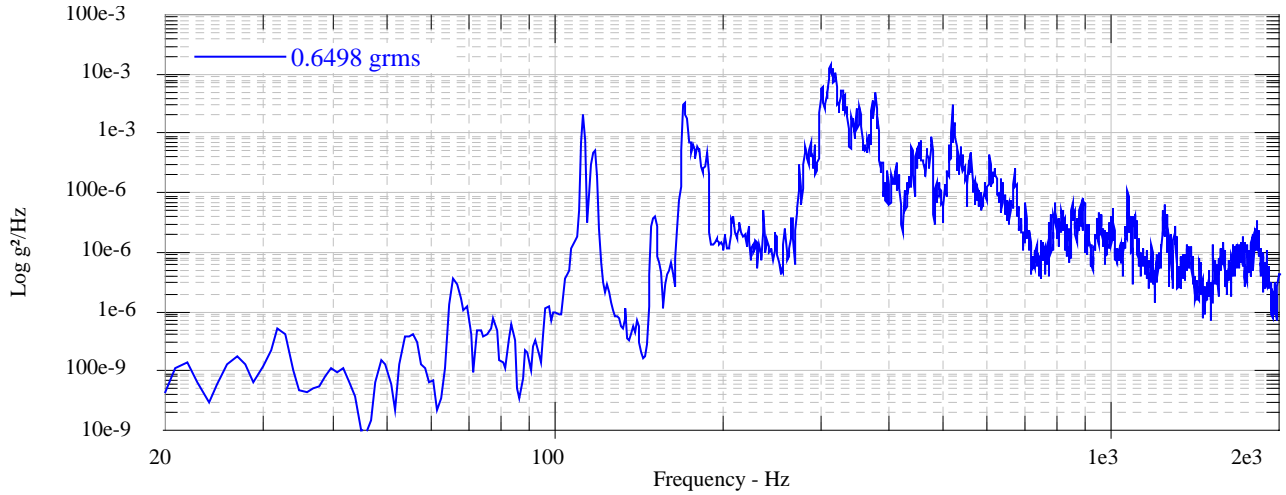
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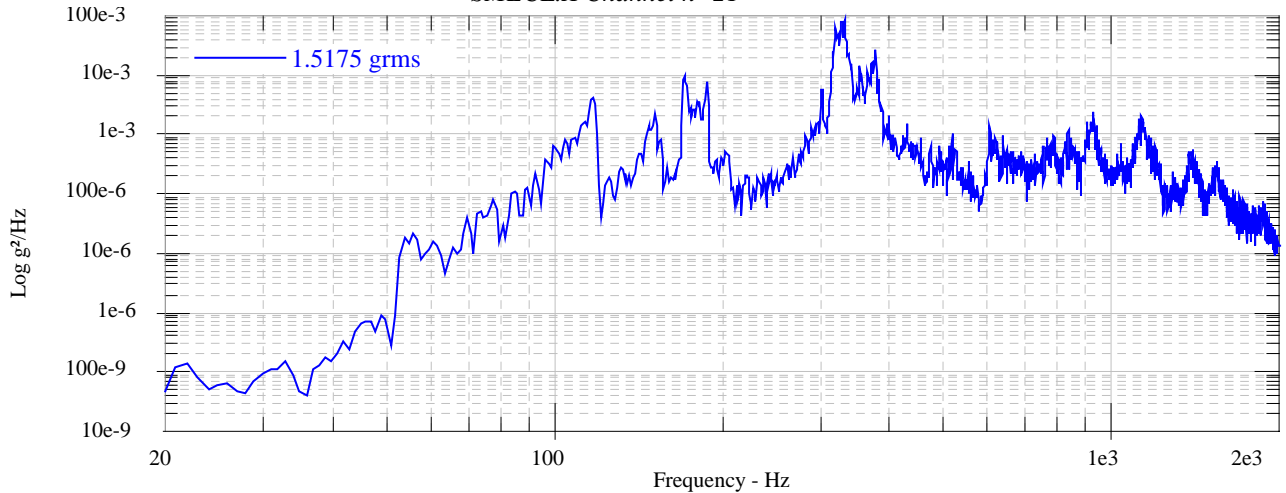
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

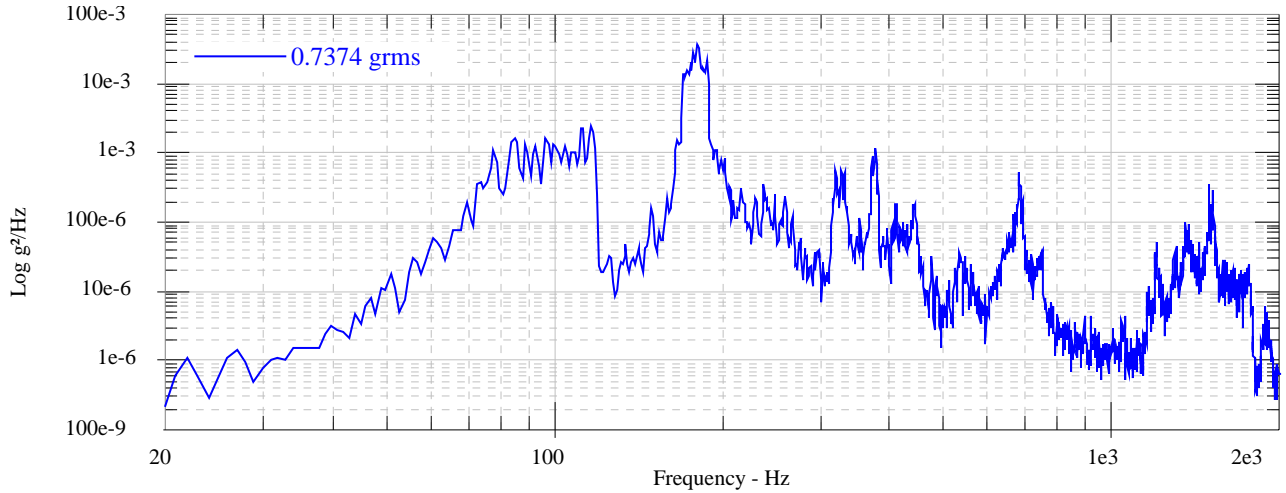


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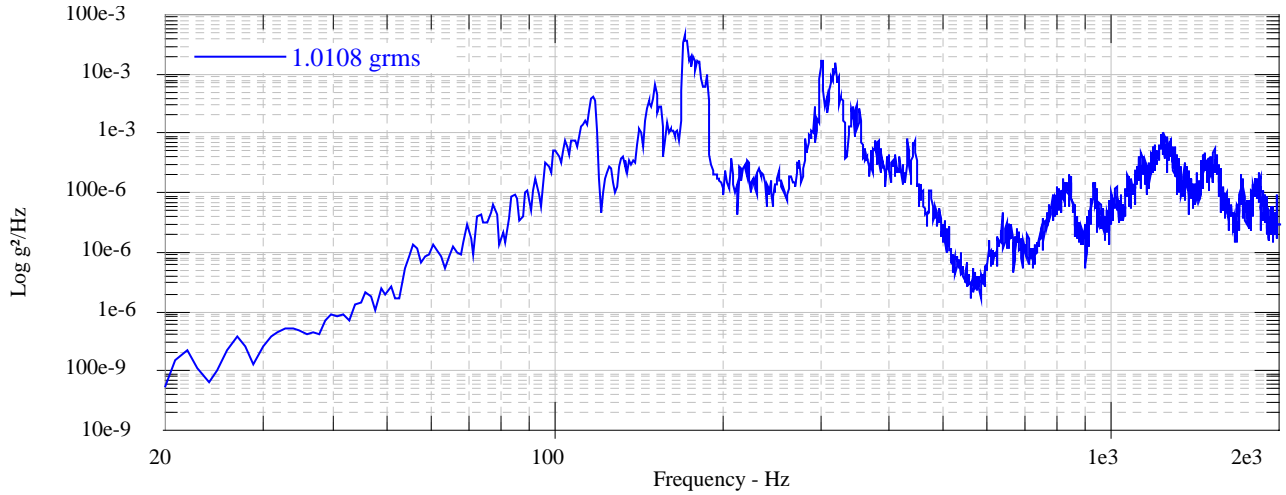
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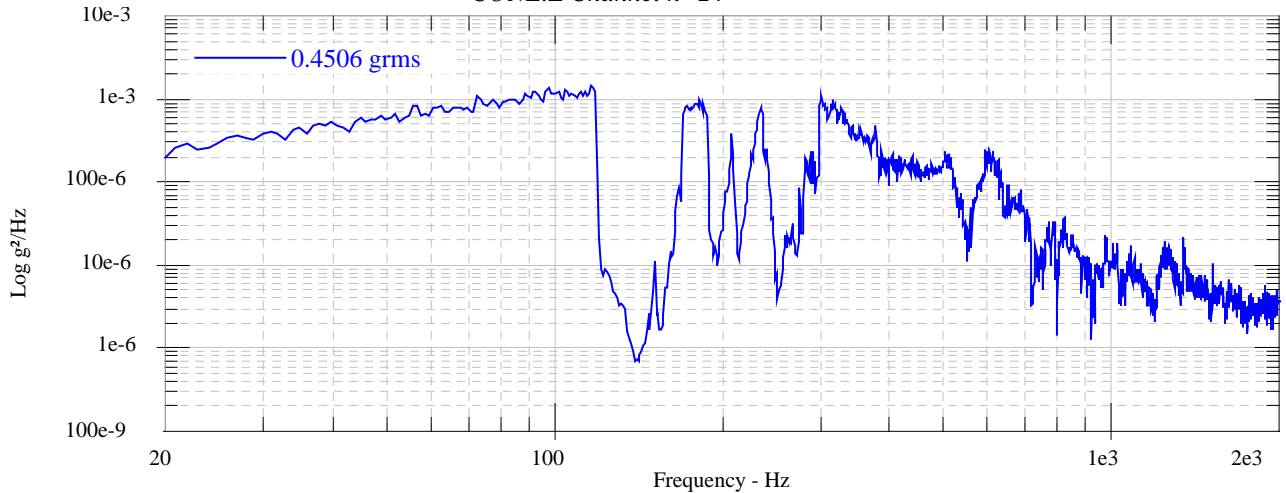
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

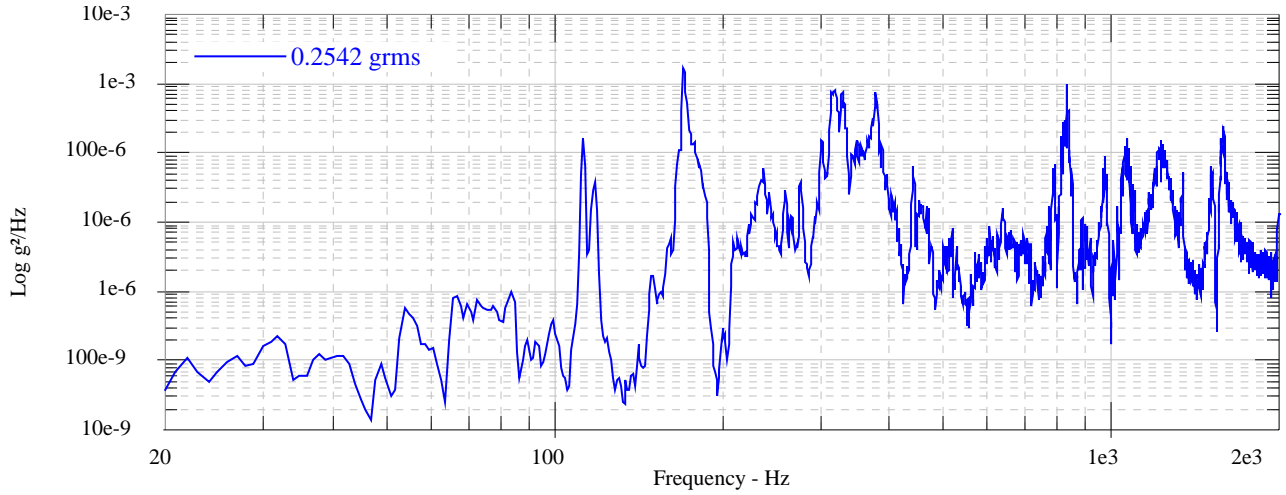


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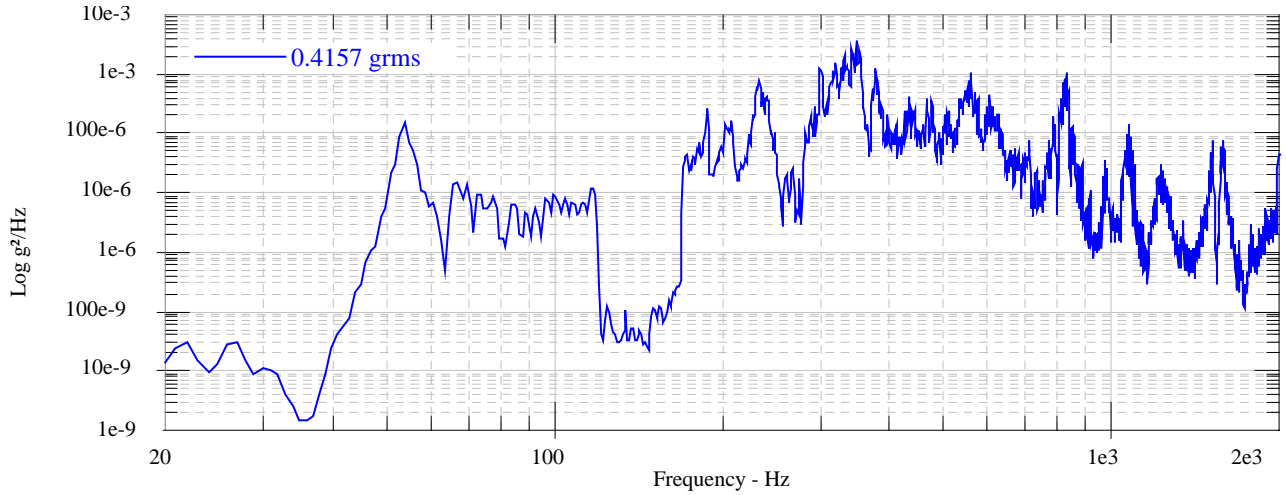
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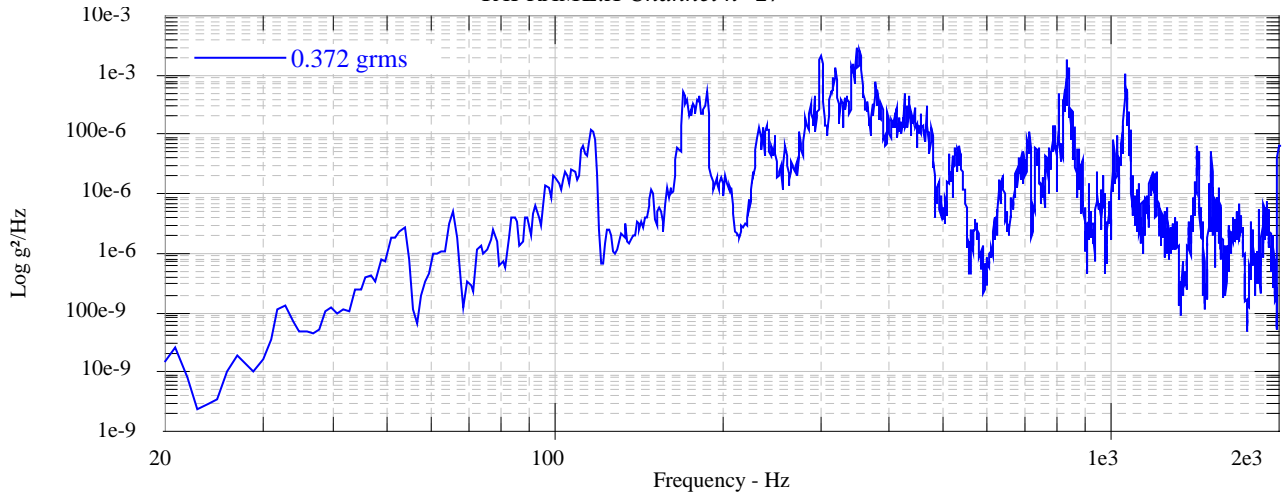
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

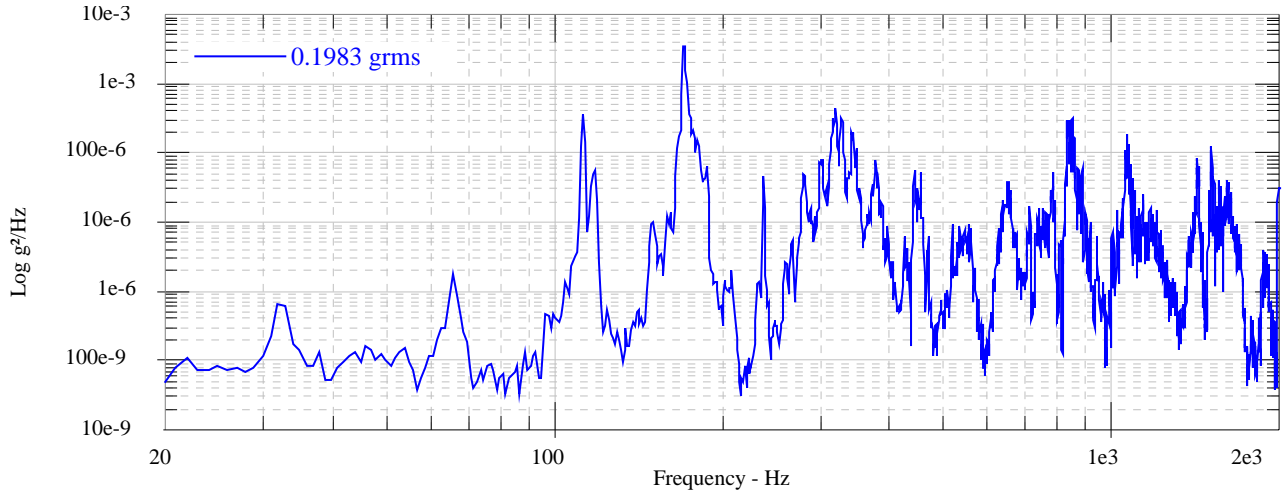


VIBRATION TEST REPORT
SPIRE QM

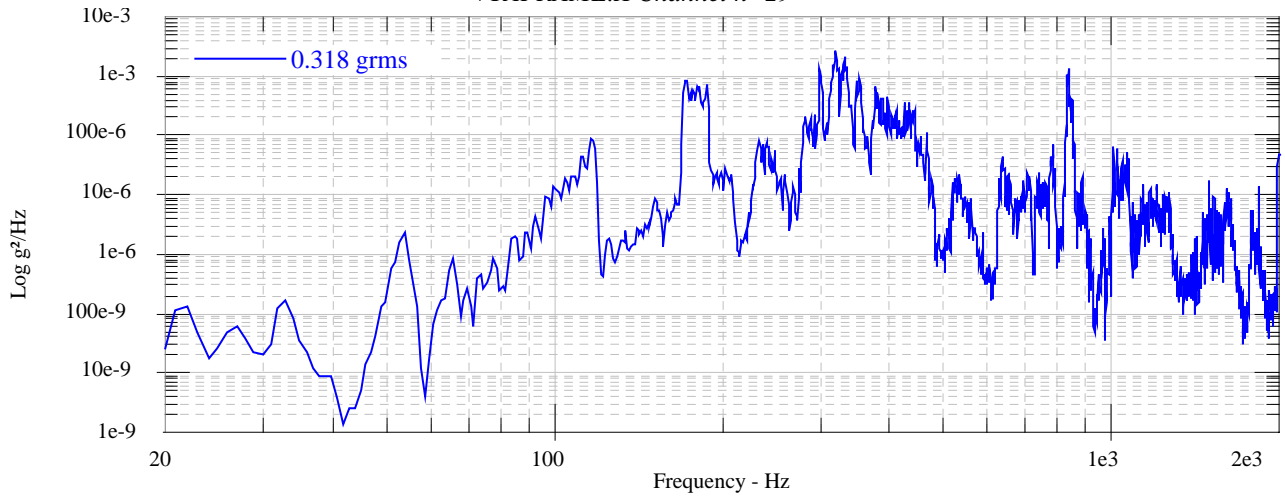
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Version : 01
Révision : 00
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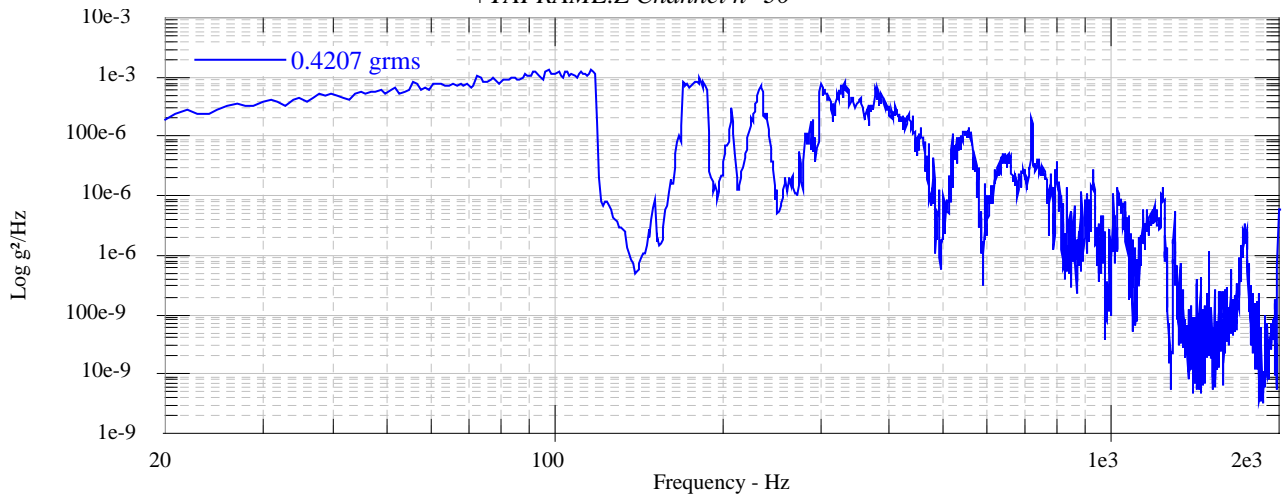
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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SPIRE QM

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Révision : **00**
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12.23 NIA7Z.

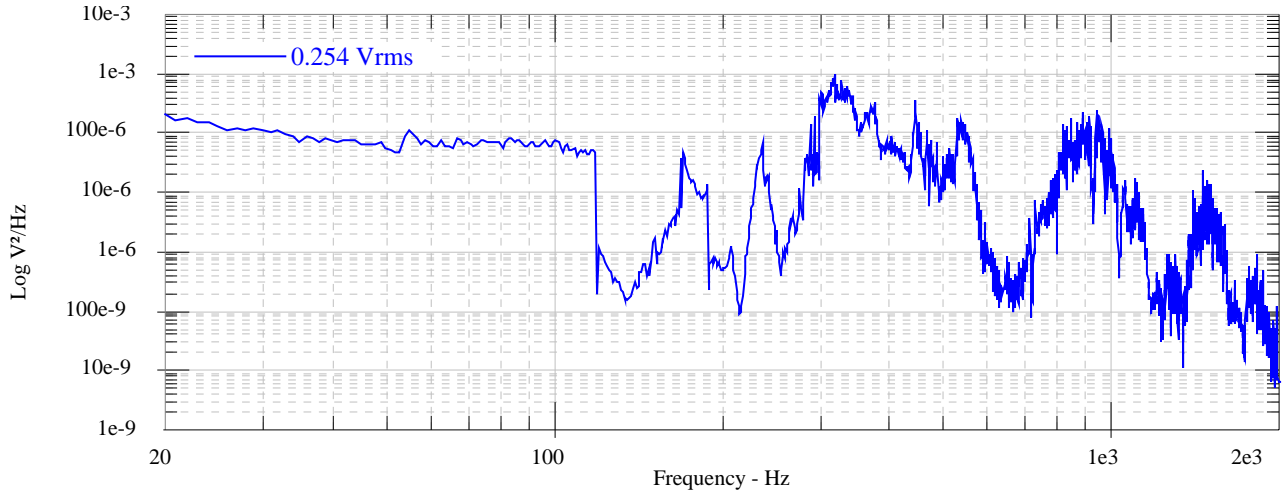
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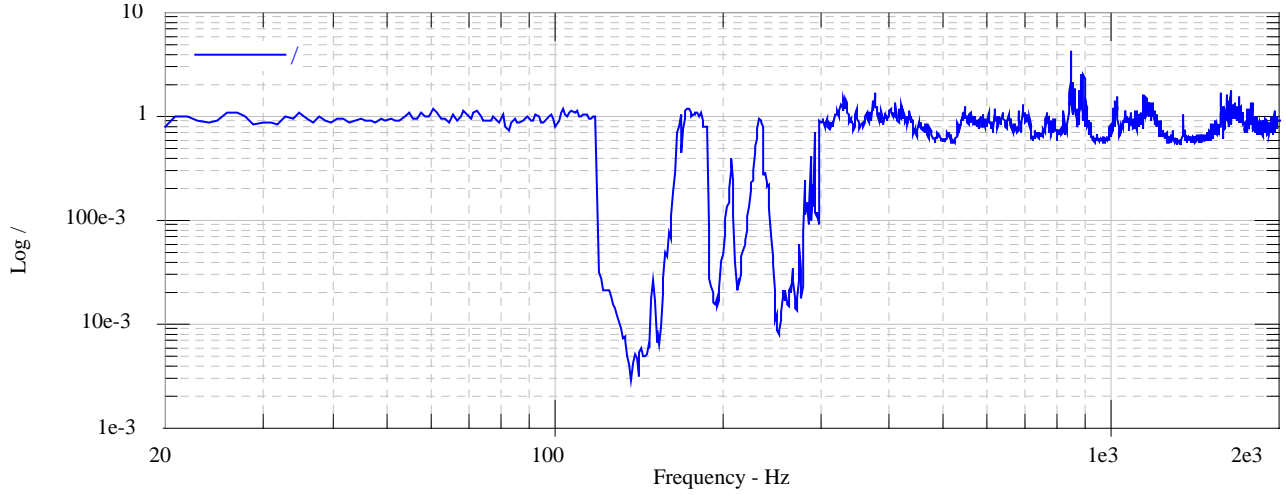
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Révision : 00
Date : 8-Apr-04
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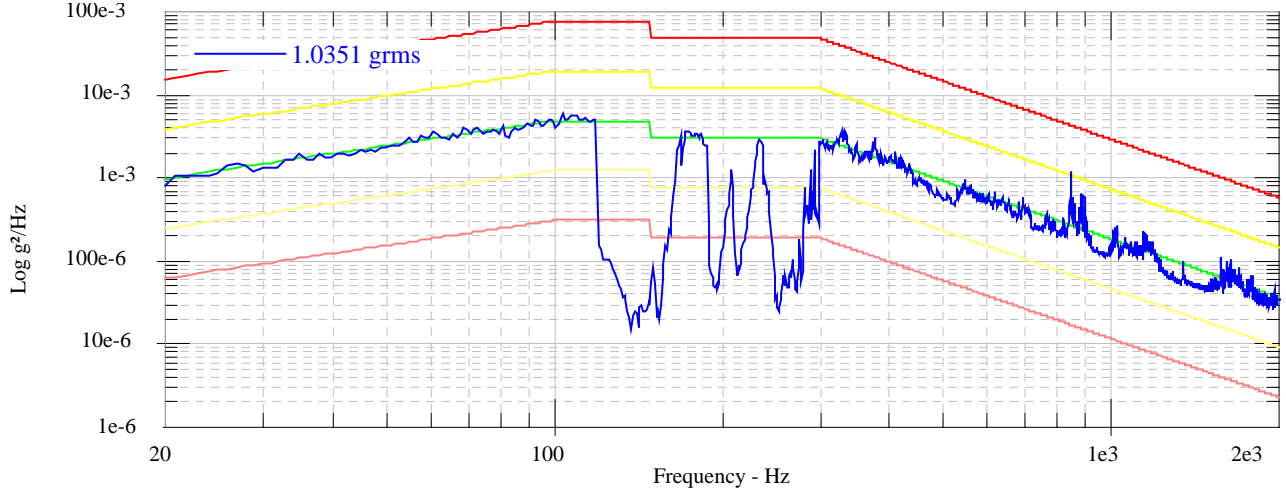
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

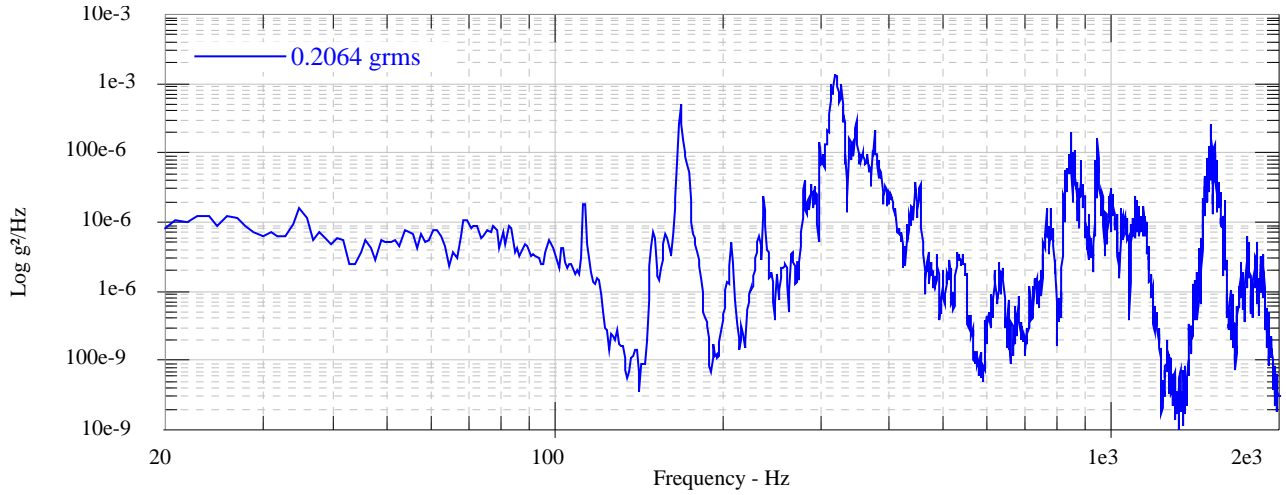


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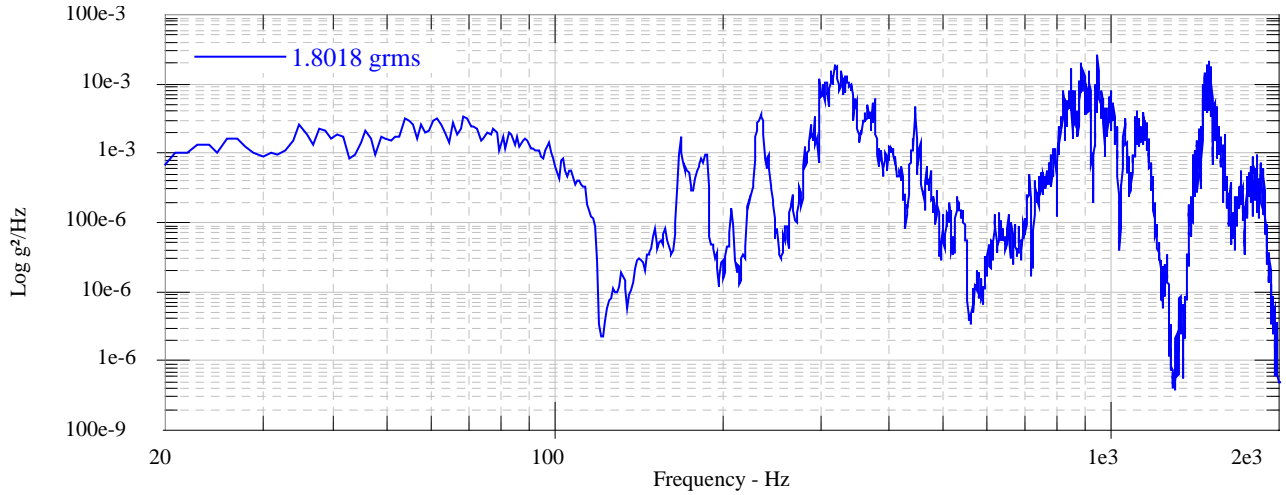
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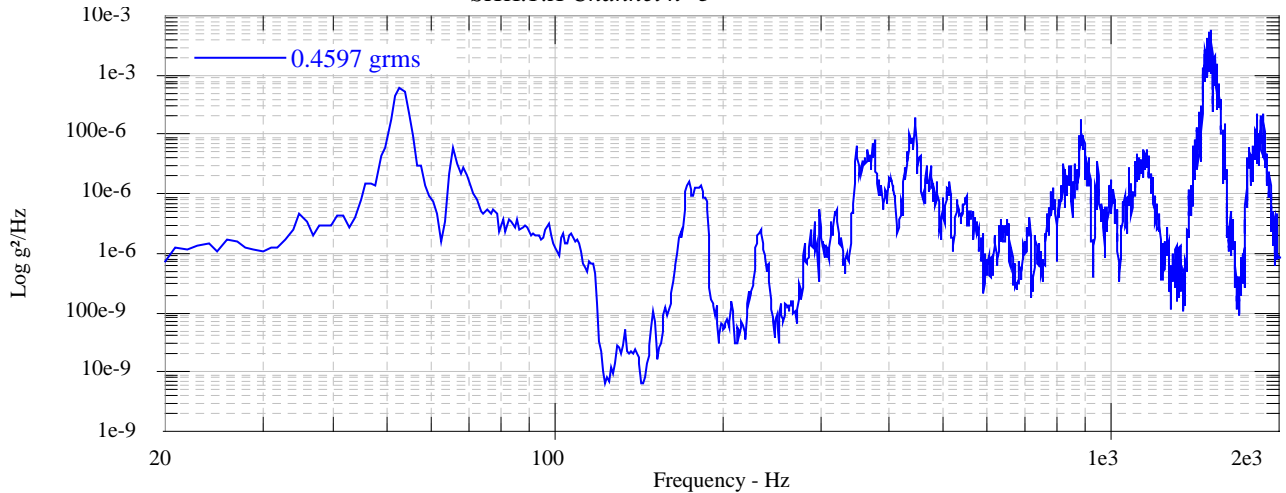
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

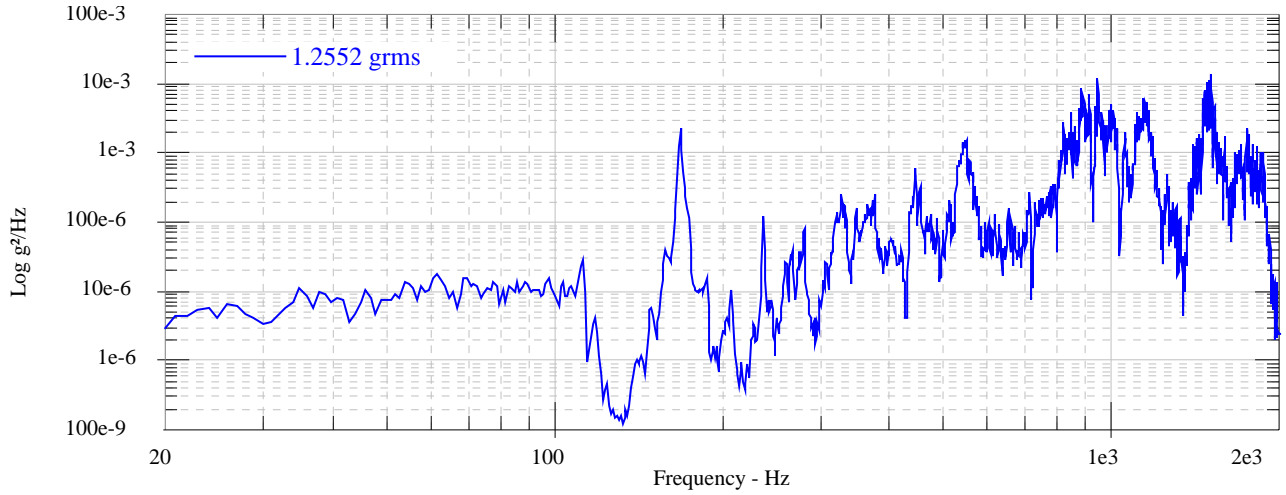


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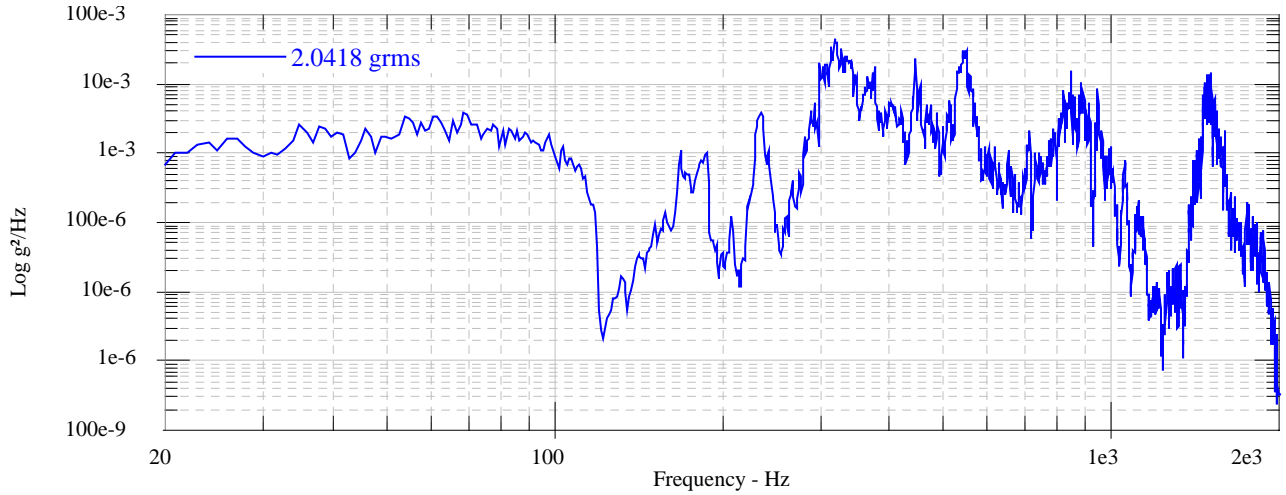
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Date : 8-Apr-04
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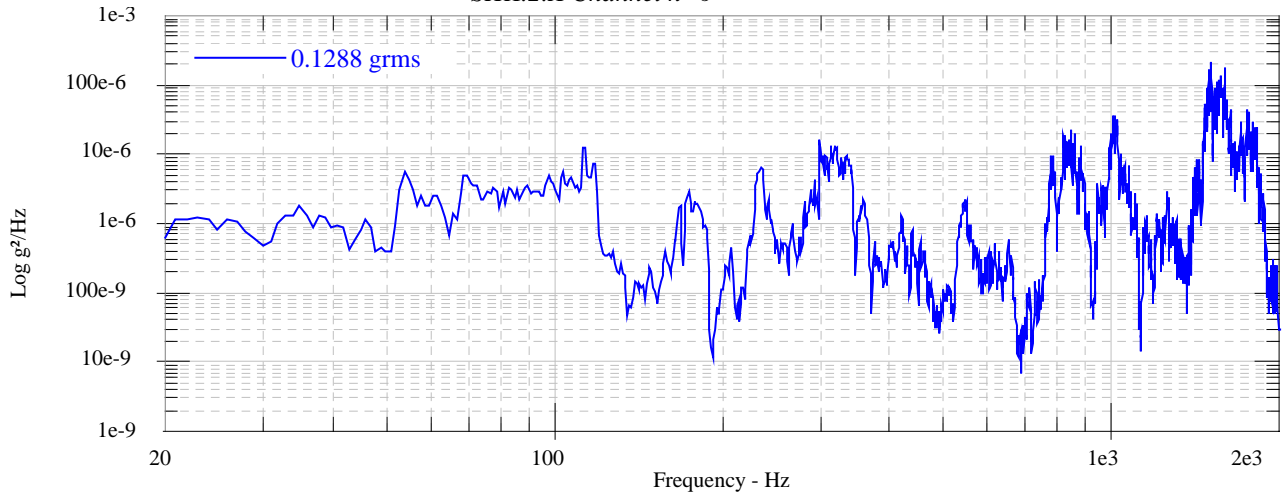
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SHK.2.X Channel n° 6

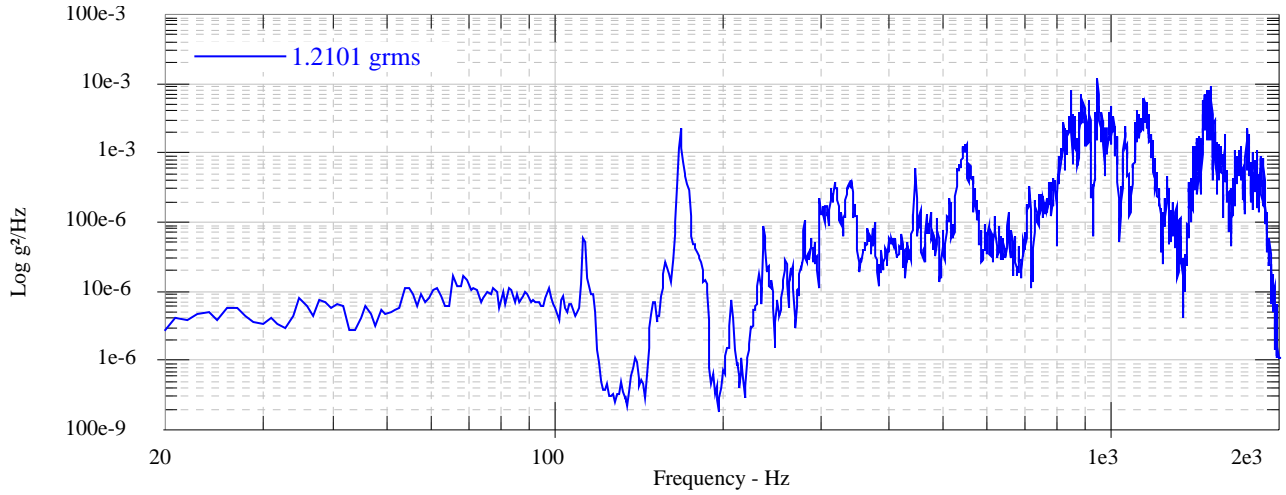


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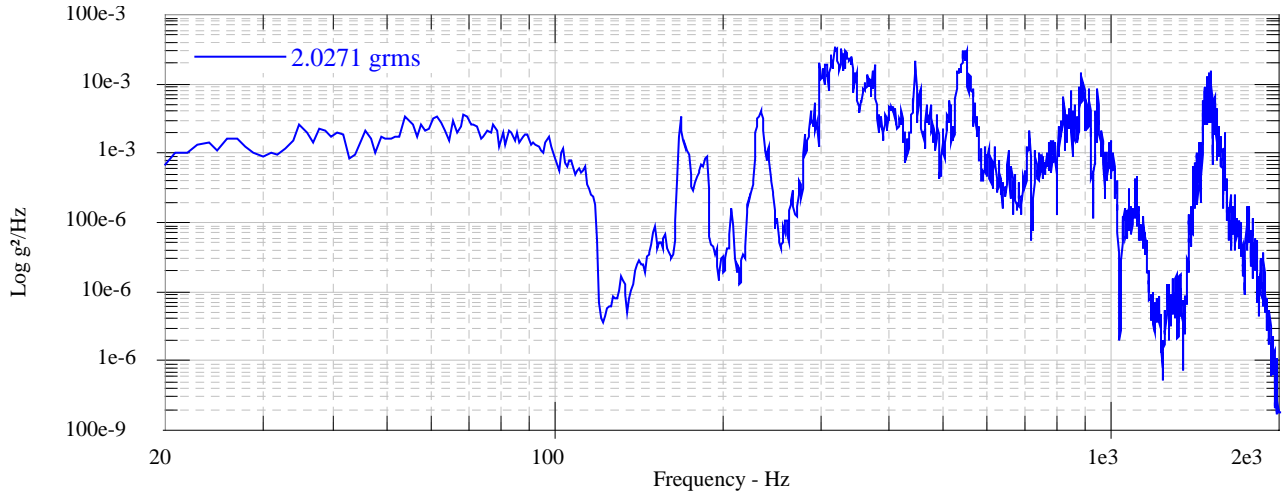
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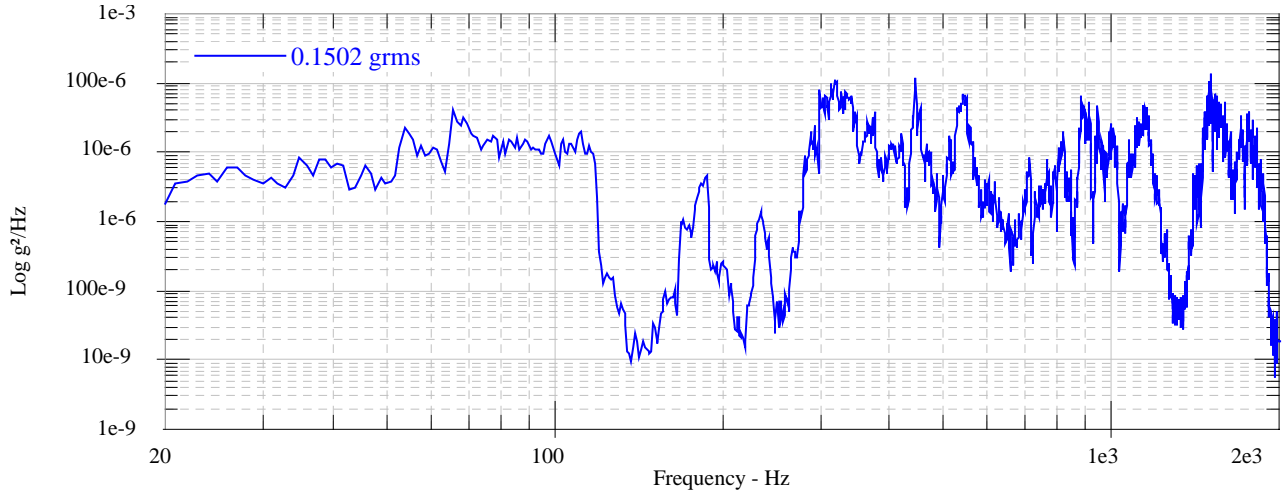
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

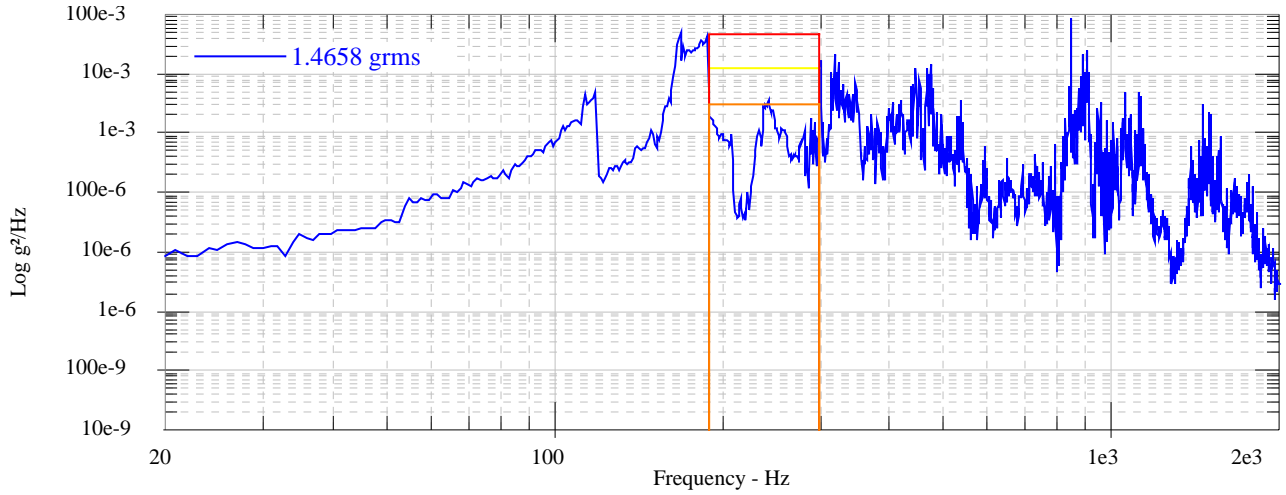


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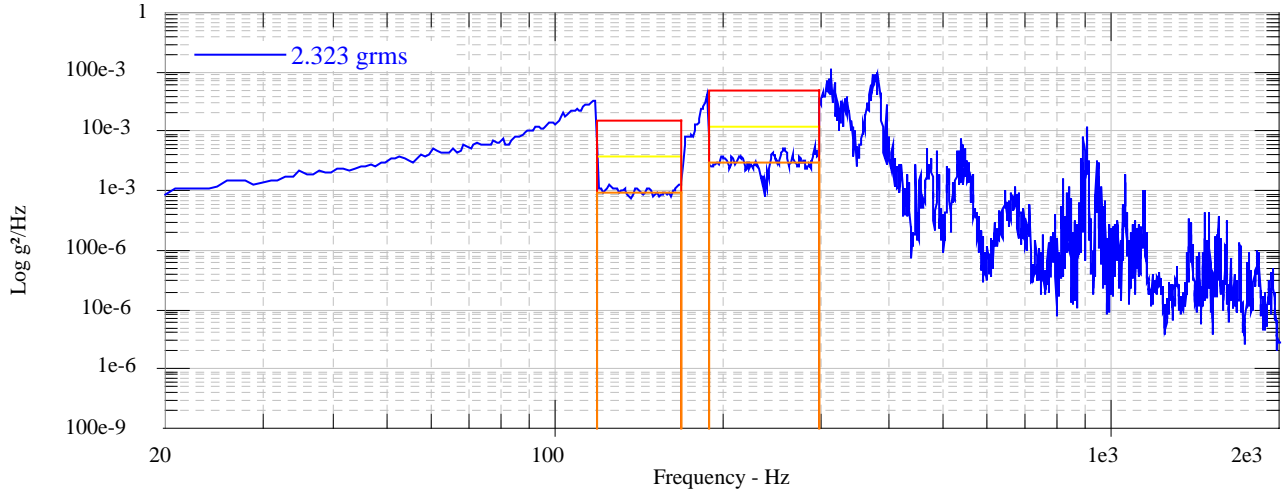
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Date : 8-Apr-04
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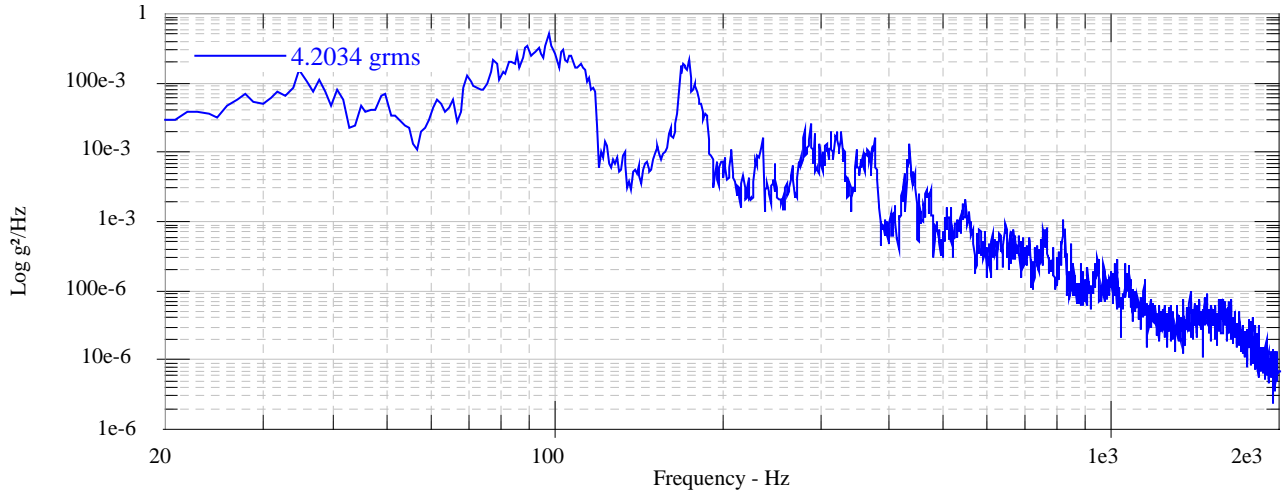
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

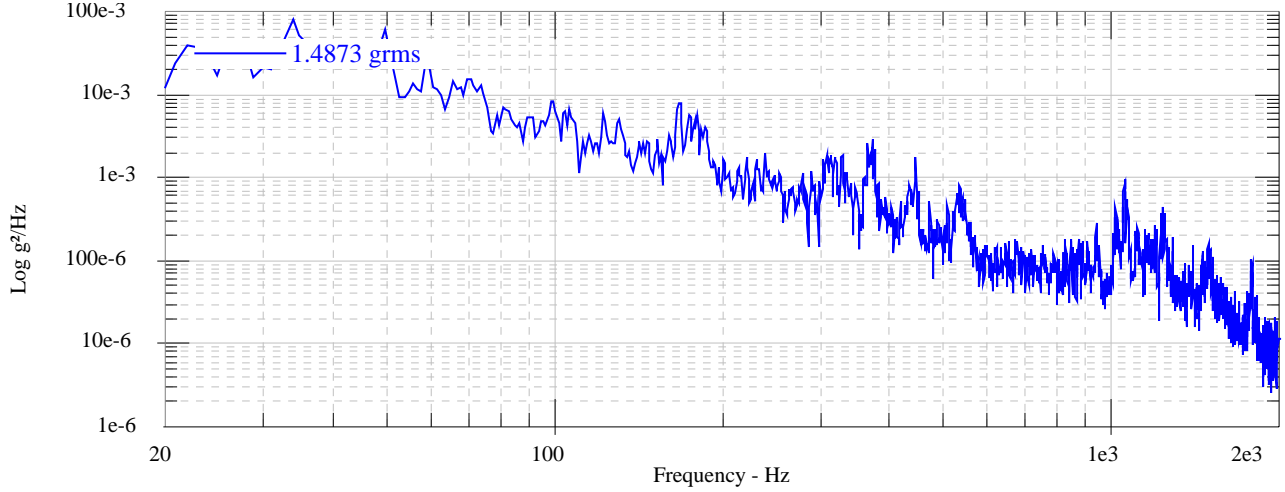


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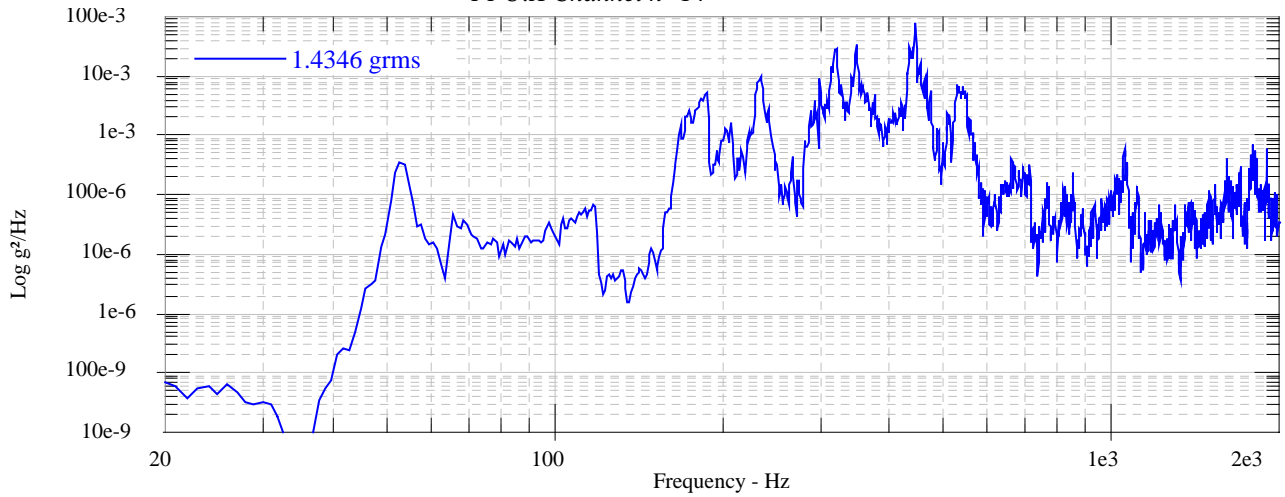
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Révision : 00
Date : 8-Apr-04
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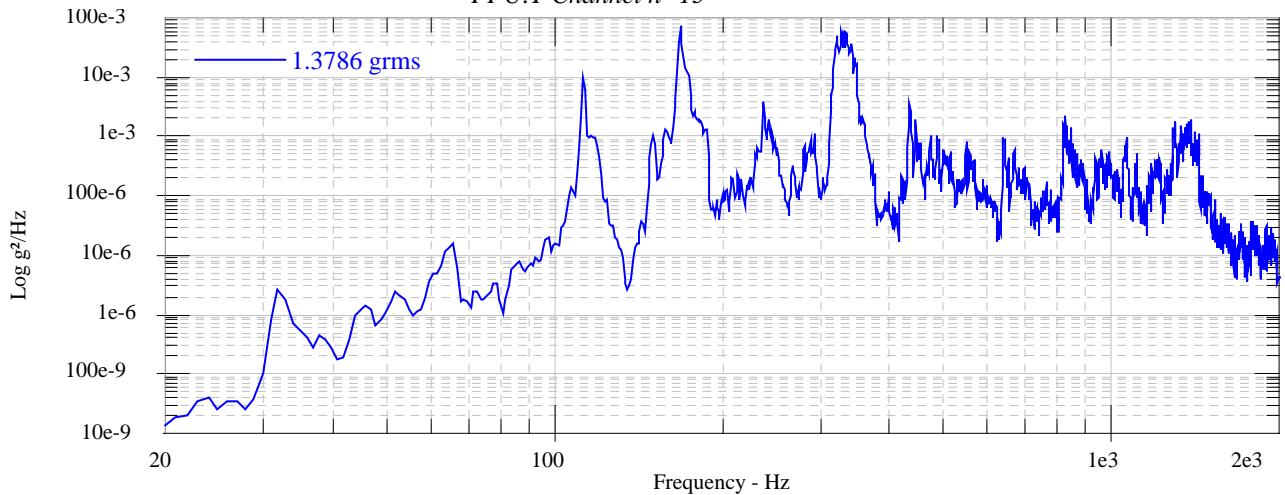
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

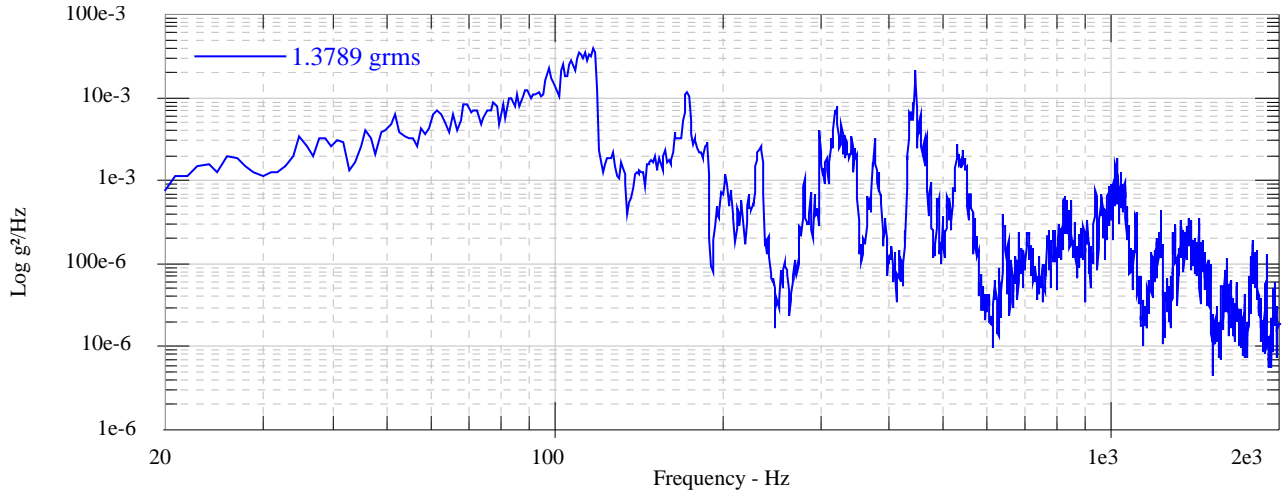


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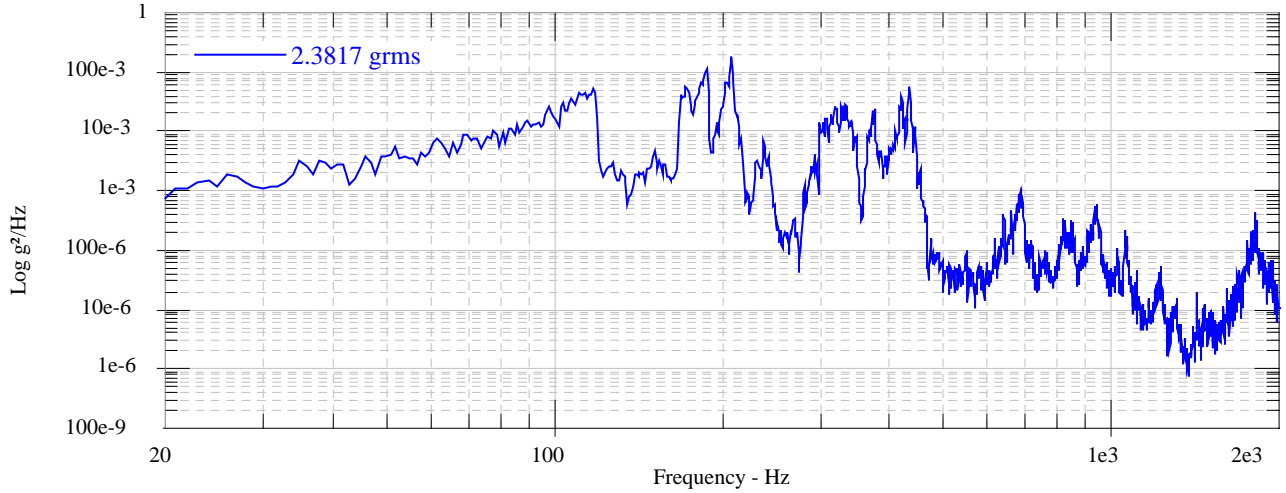
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Révision : 00
Date : 8-Apr-04
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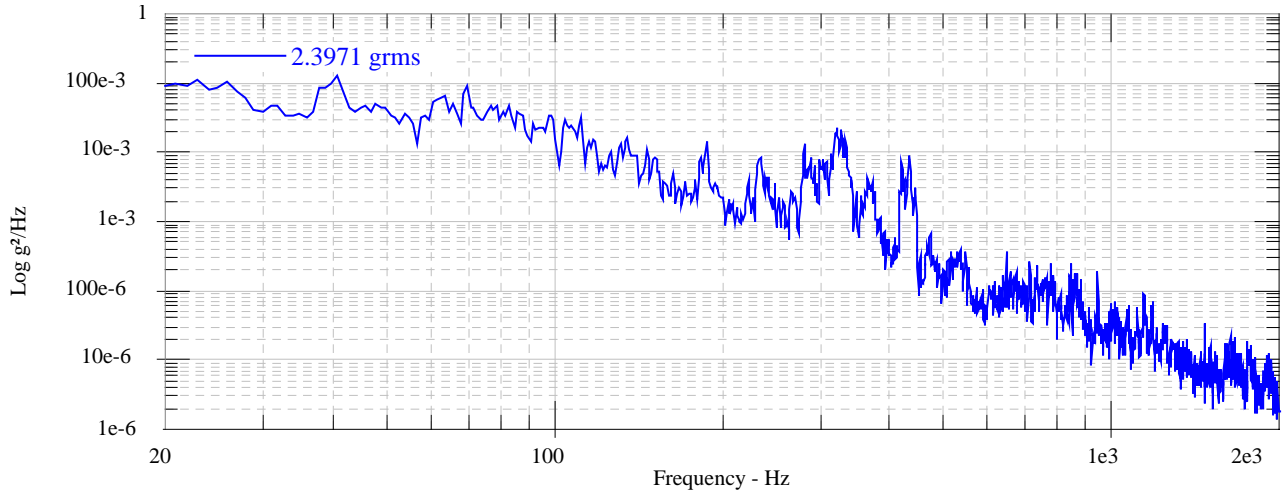
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

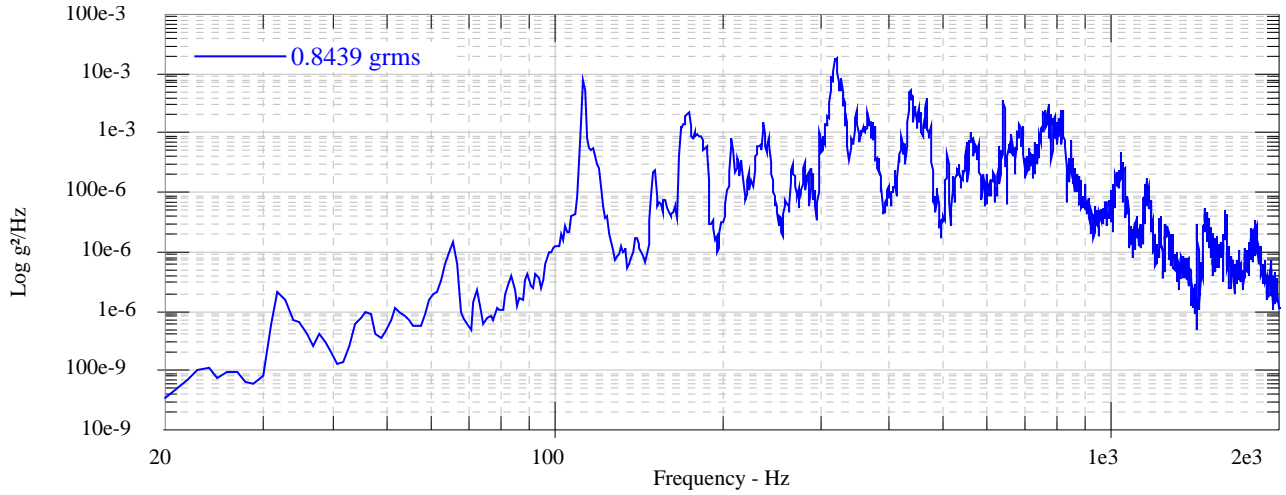


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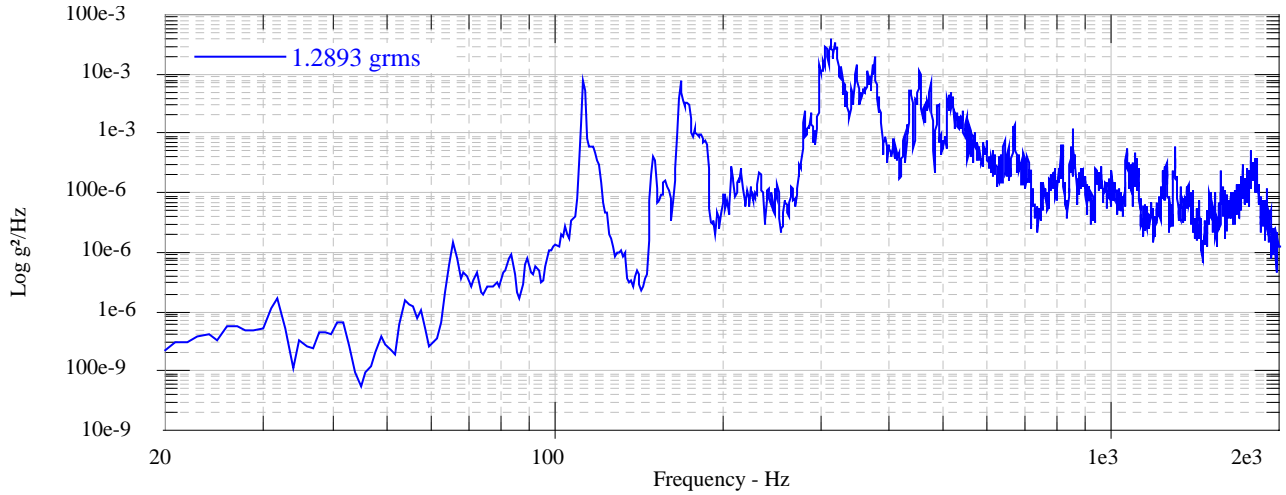
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Date : 8-Apr-04
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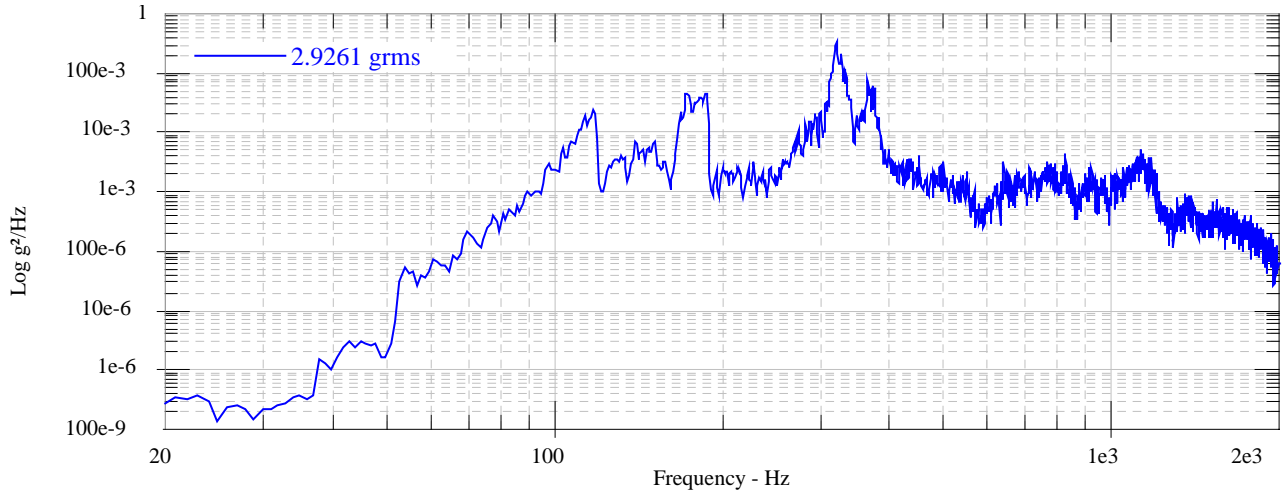
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

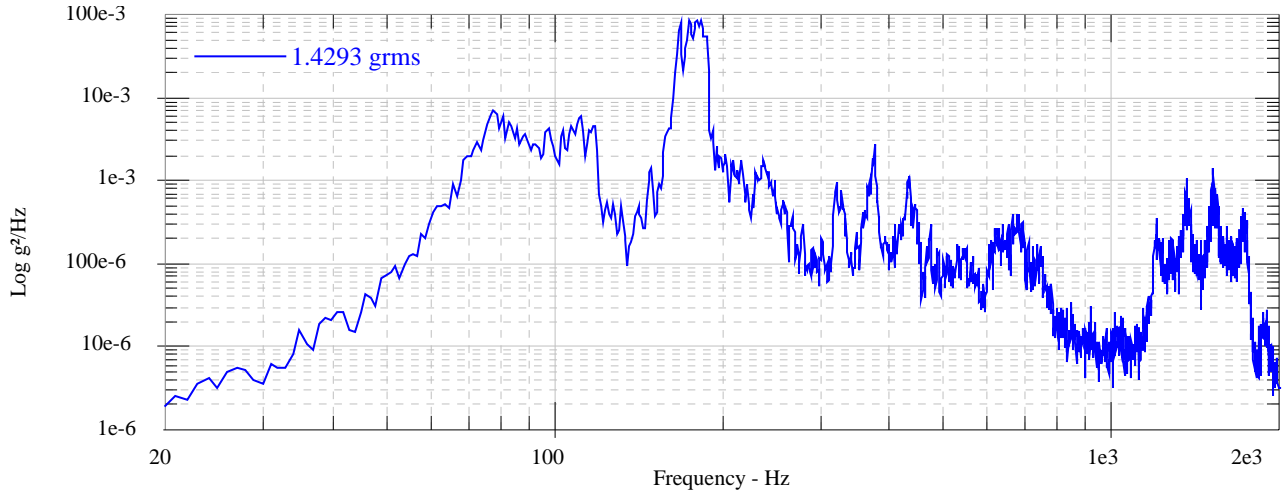


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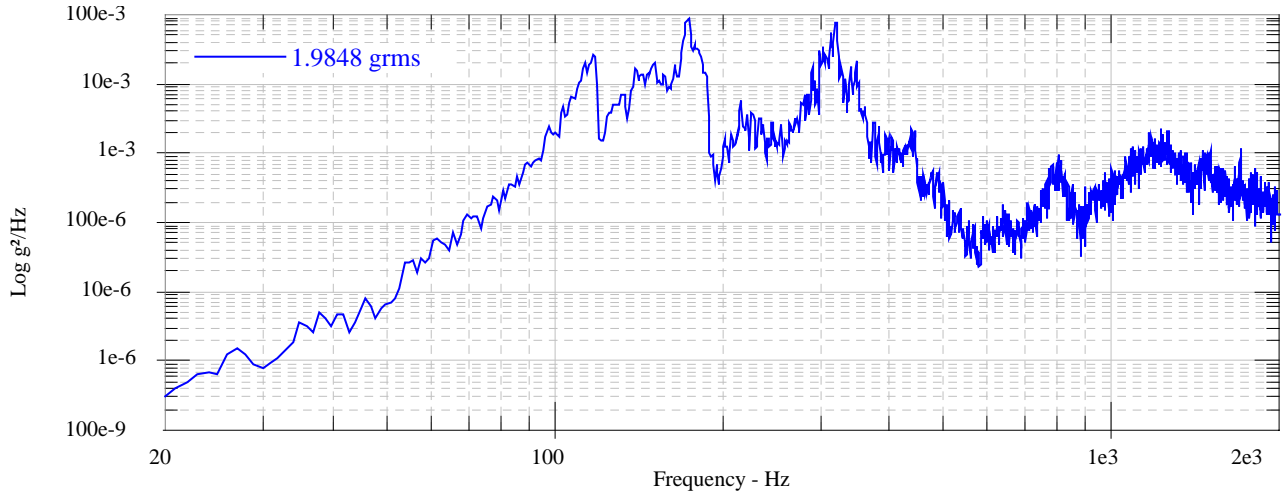
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Date : 8-Apr-04
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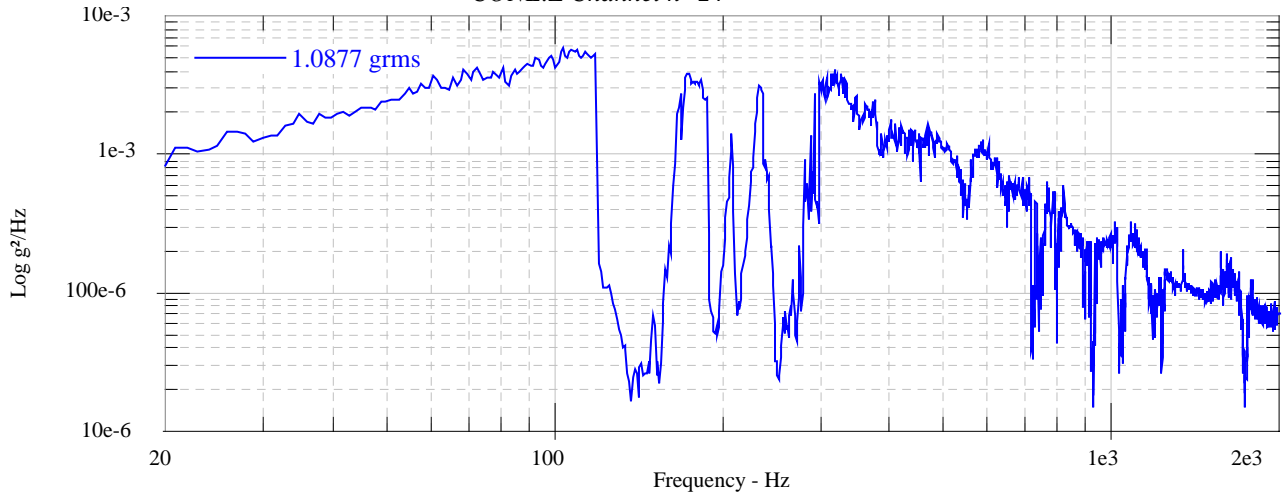
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

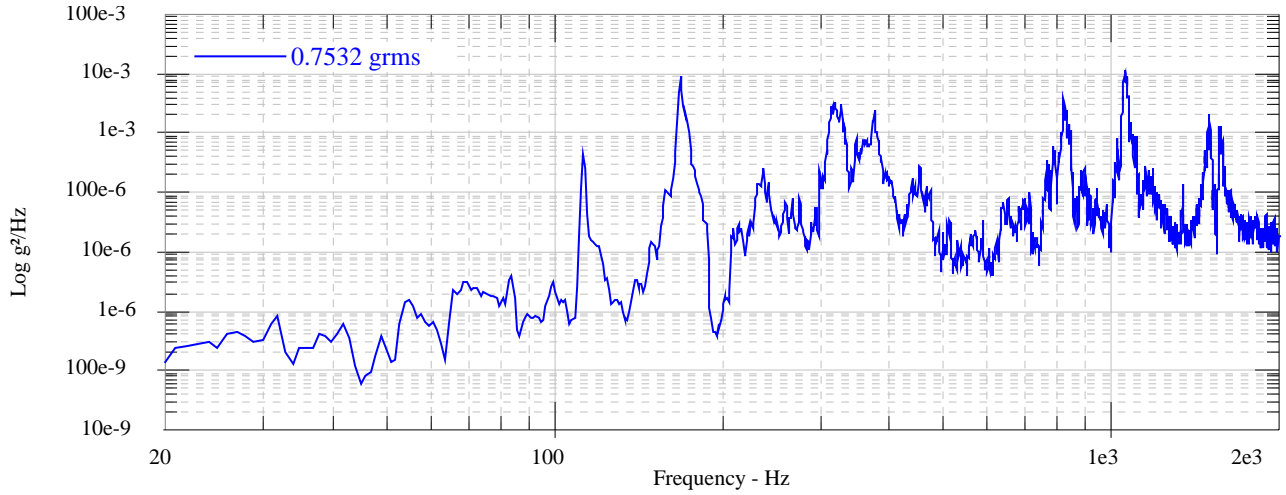


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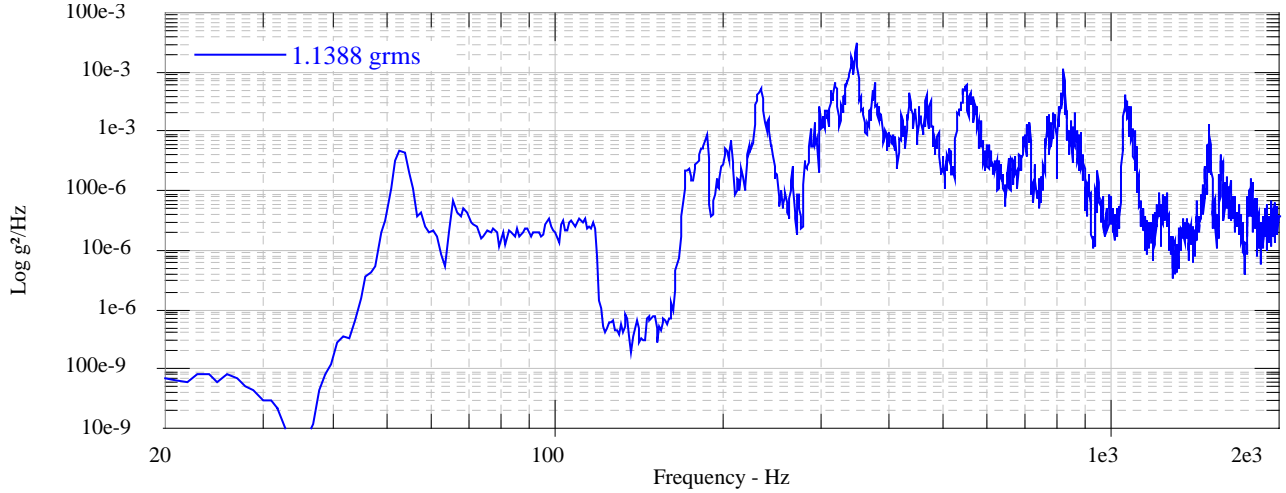
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Date : 8-Apr-04
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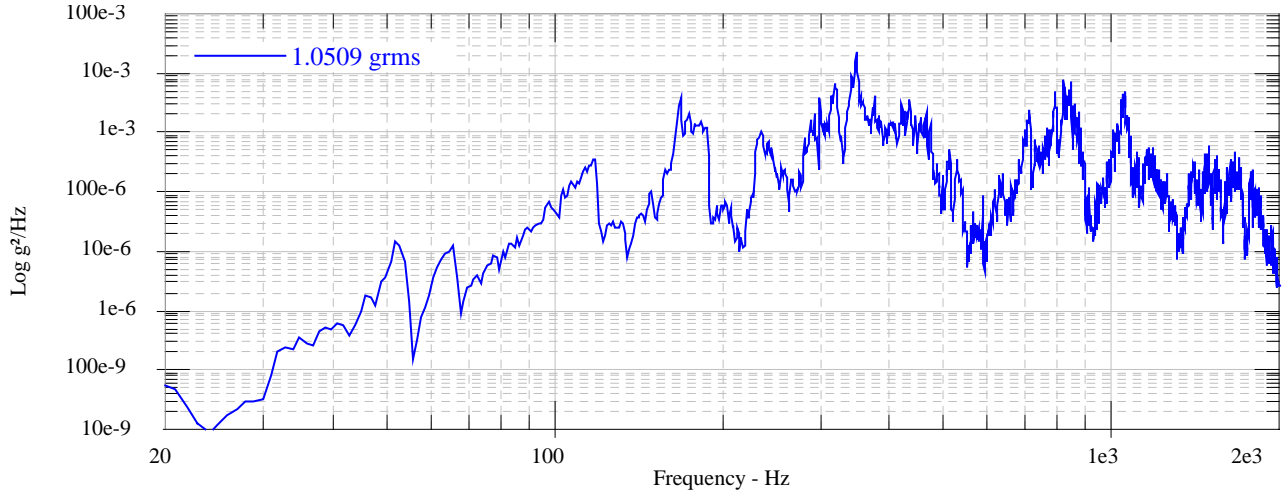
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CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

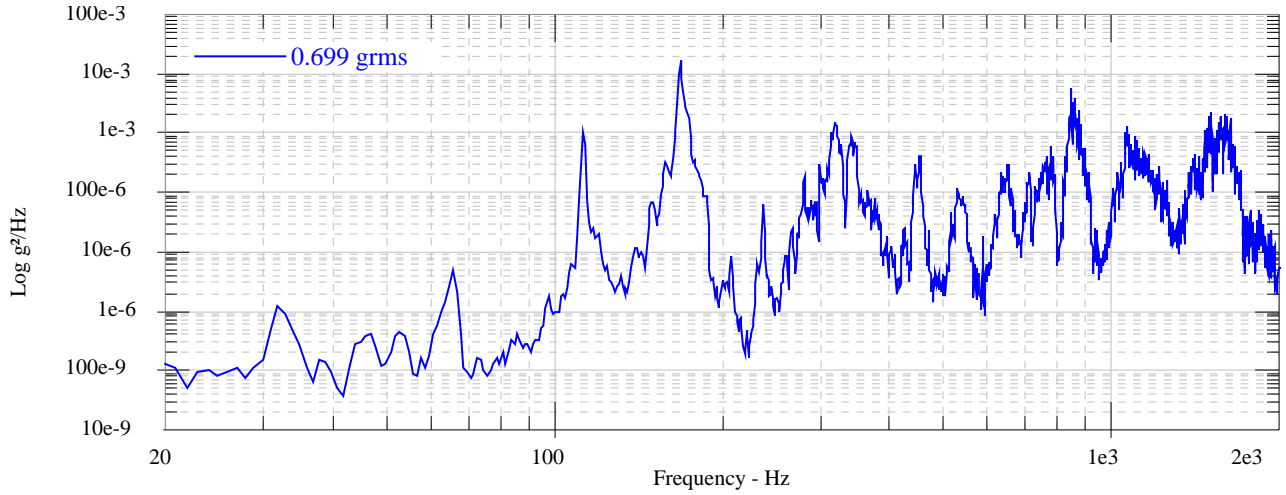


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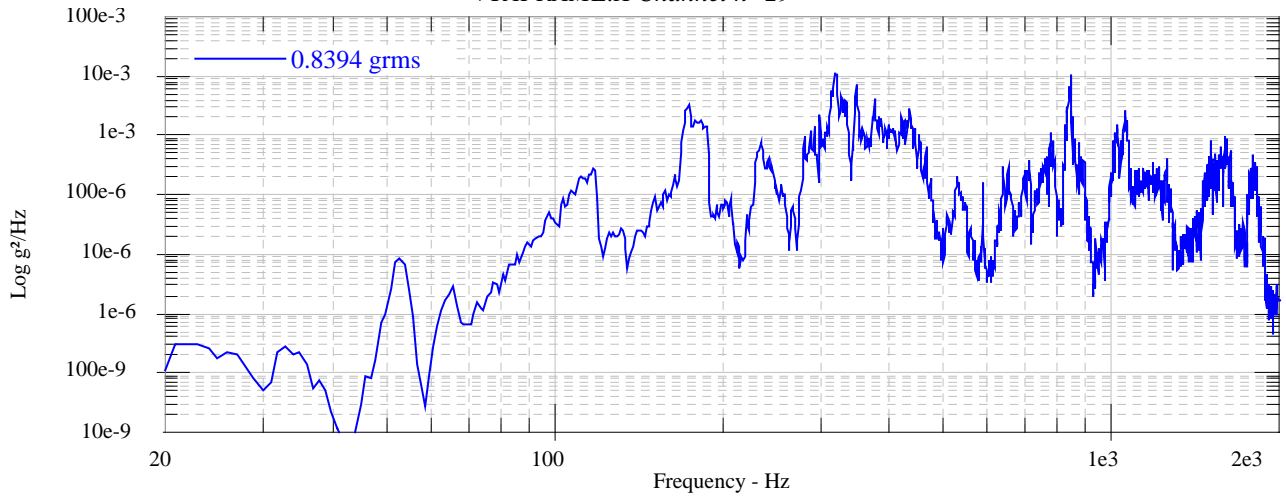
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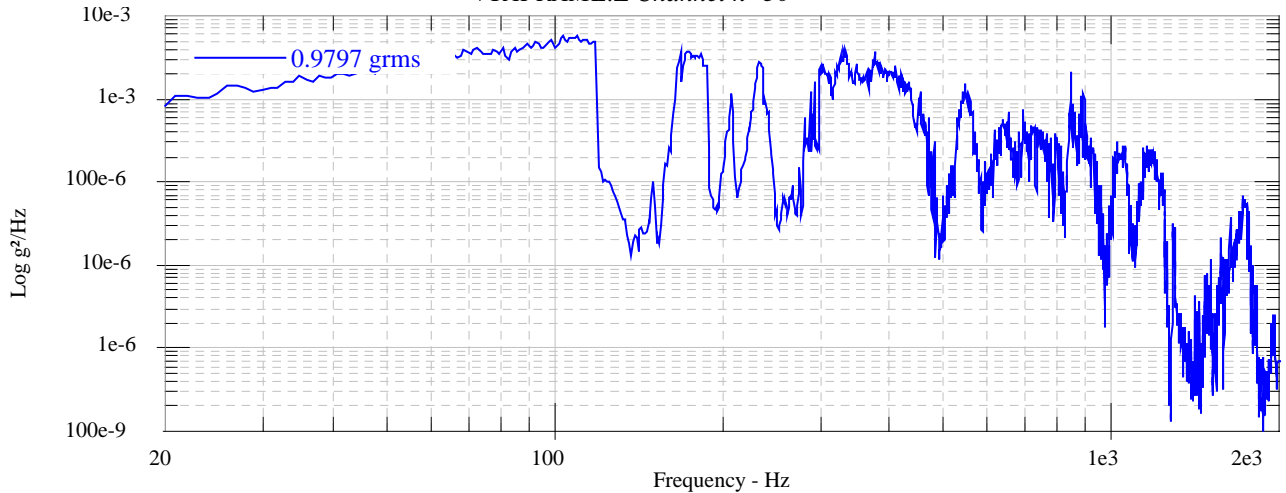
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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SPIRE QM

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12.24 HNA8Z.

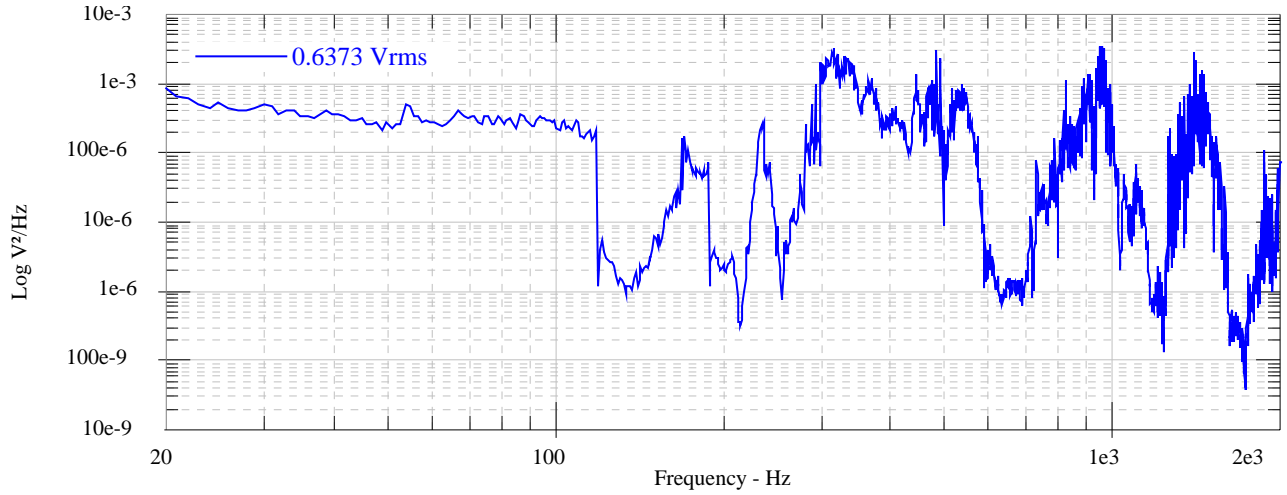
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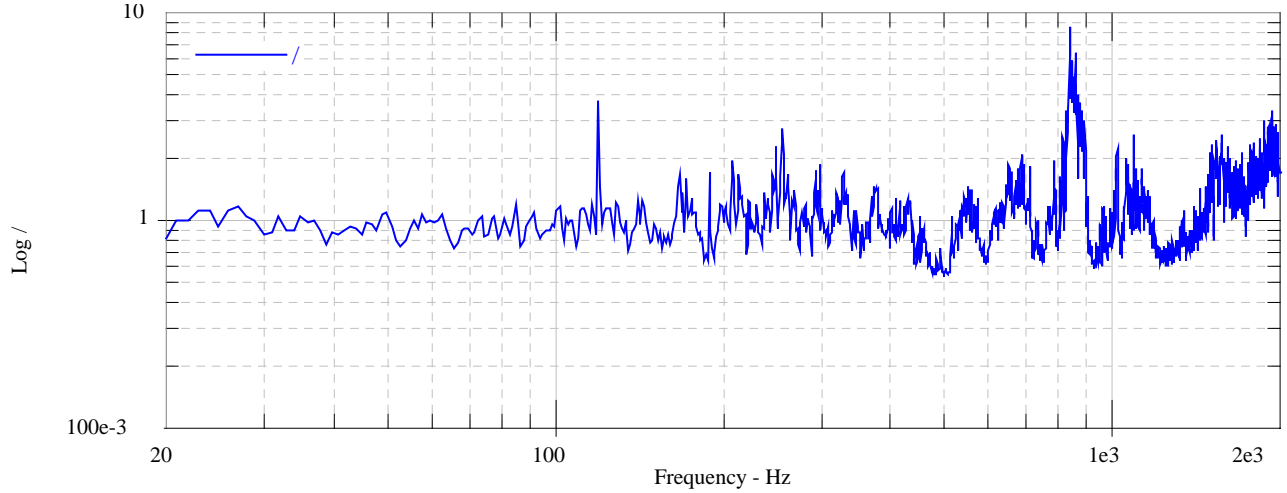
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Date : 8-Apr-04
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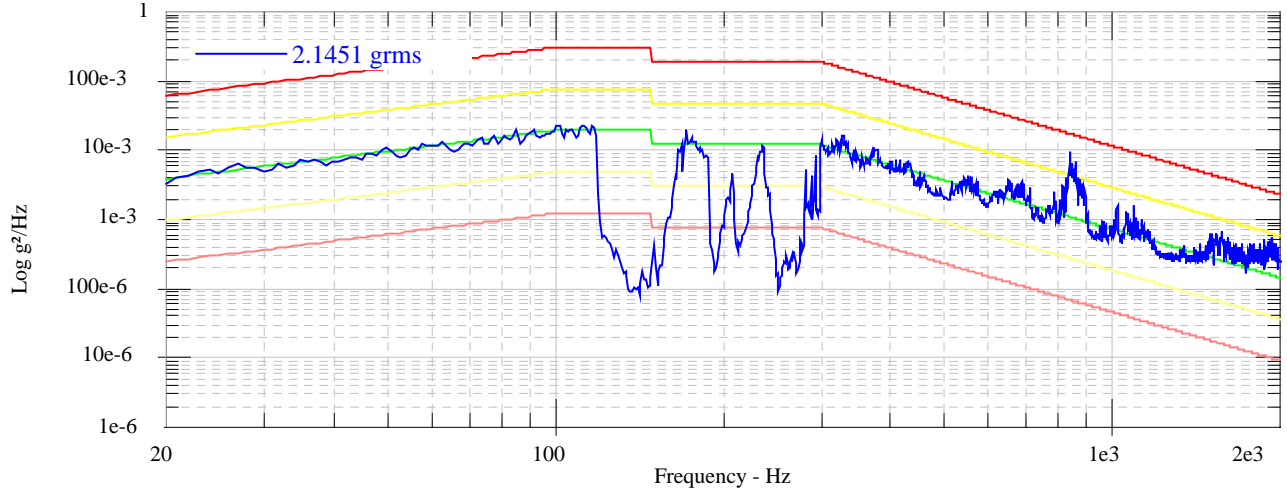
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

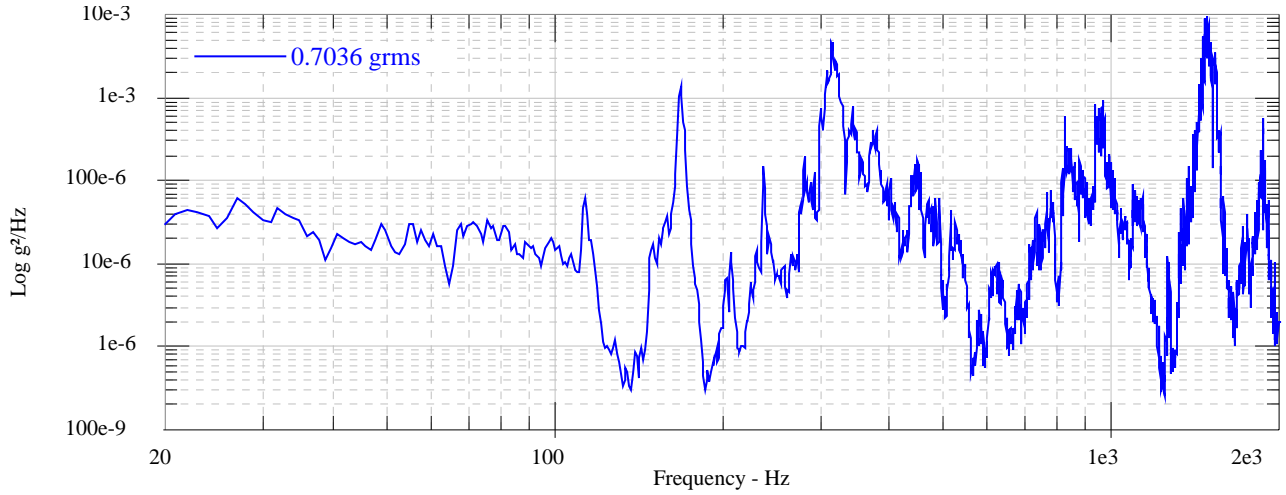


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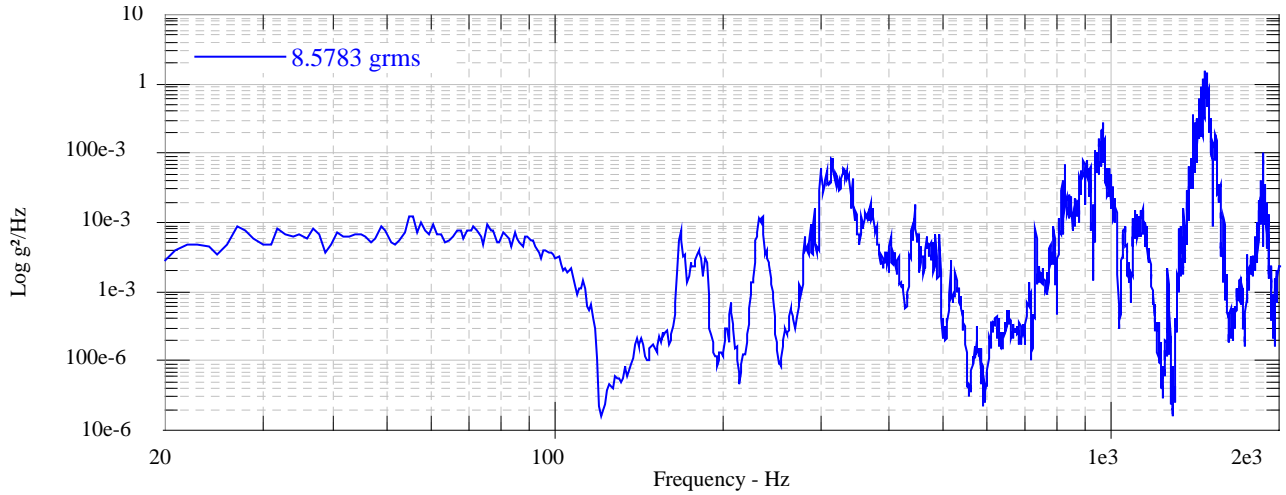
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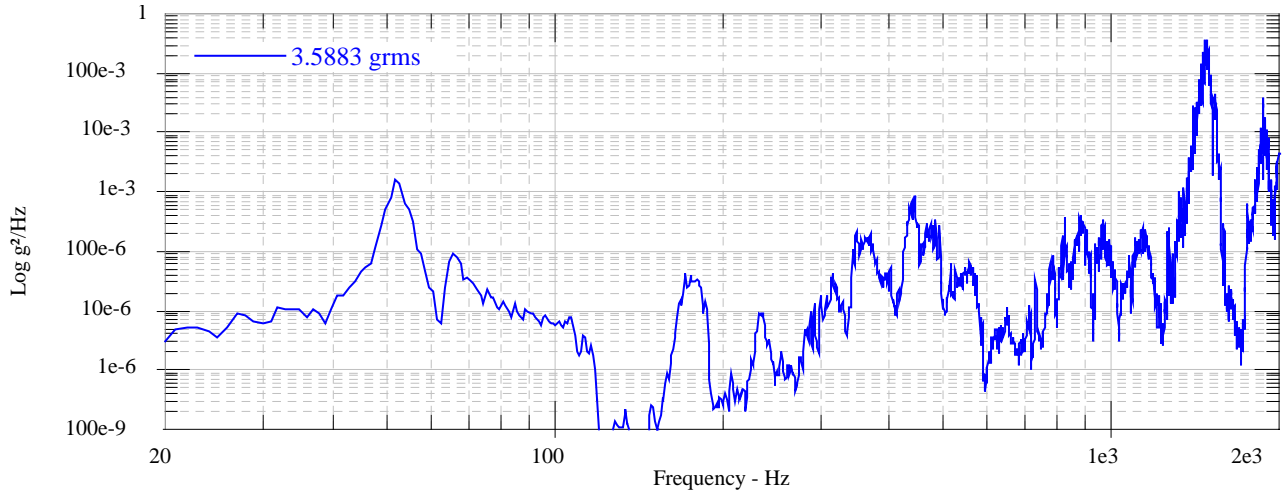
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

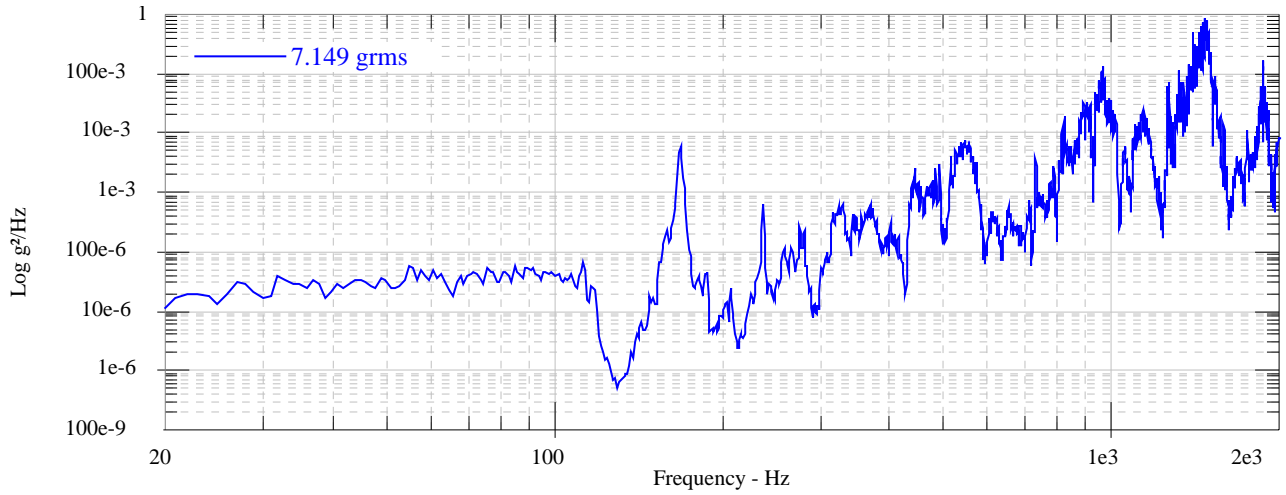


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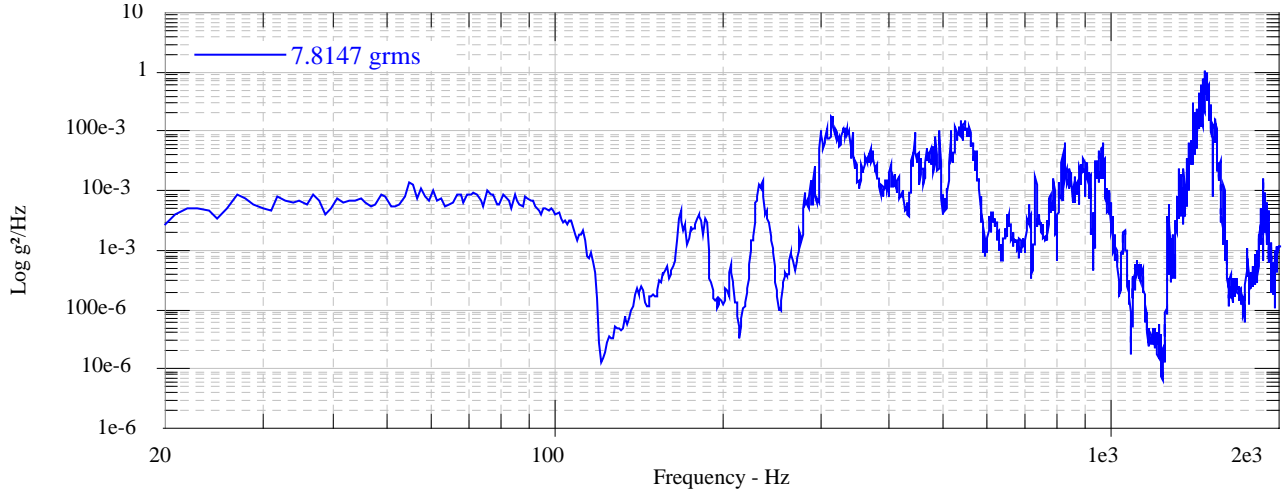
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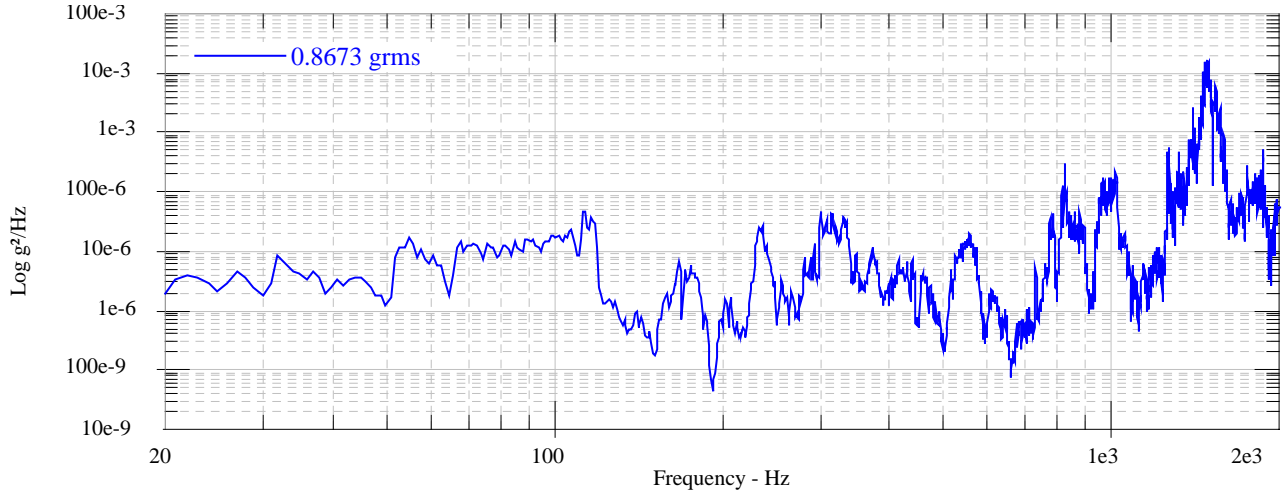
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SHK.2.X Channel n° 6

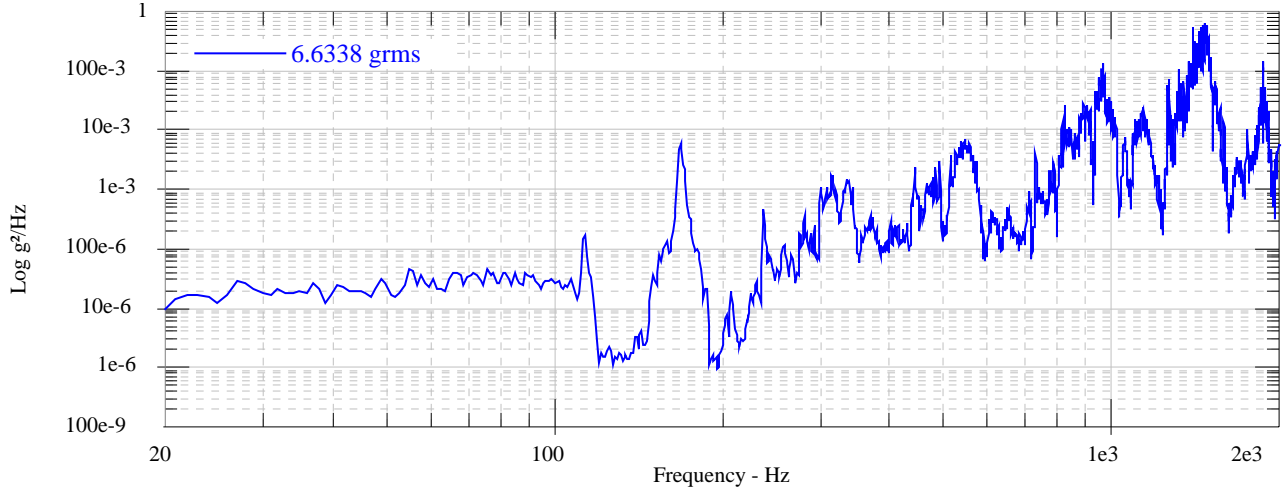


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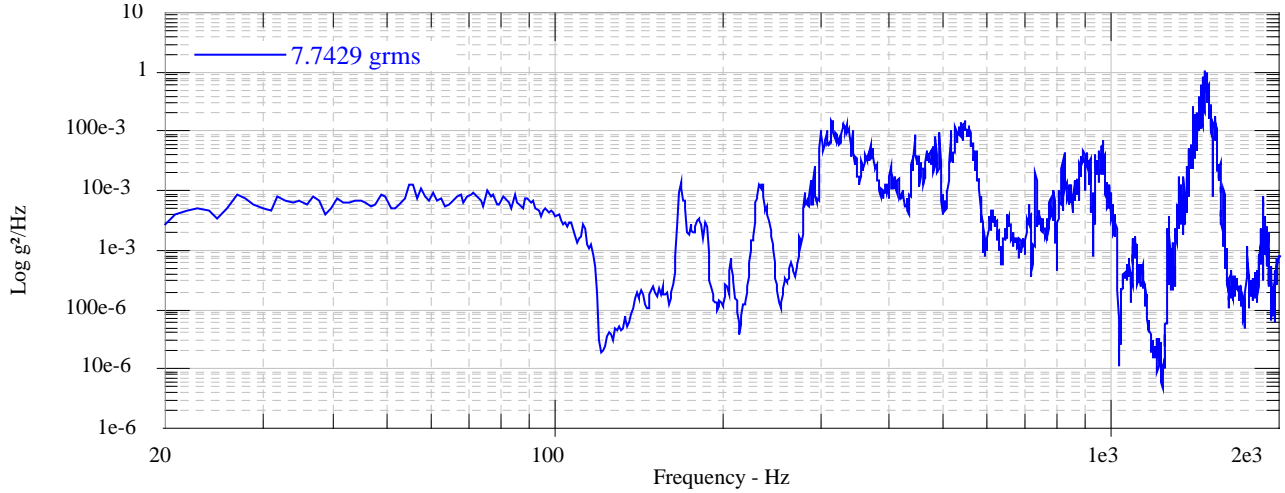
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Date : 8-Apr-04
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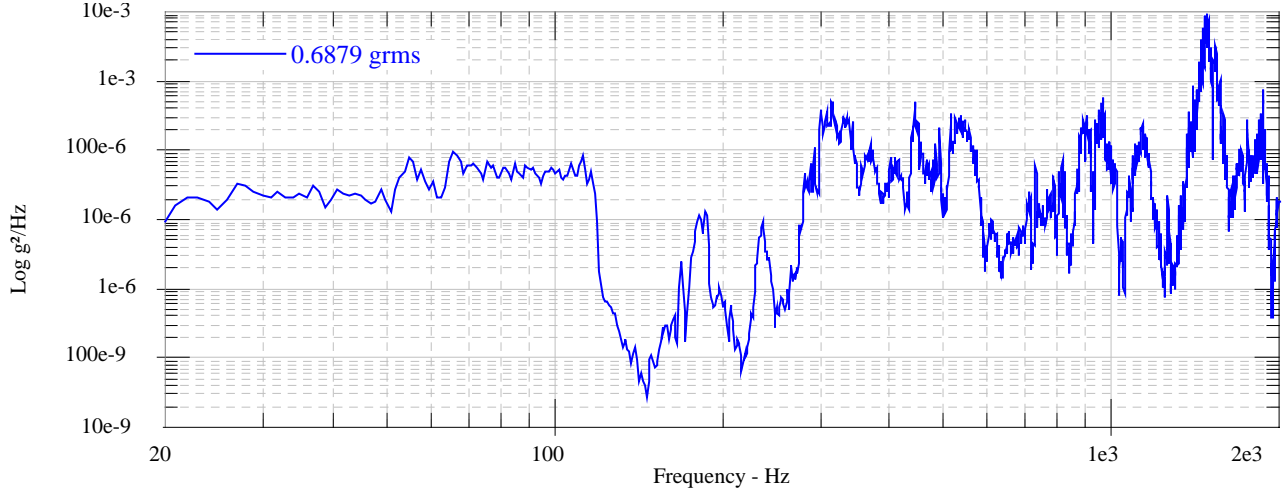
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

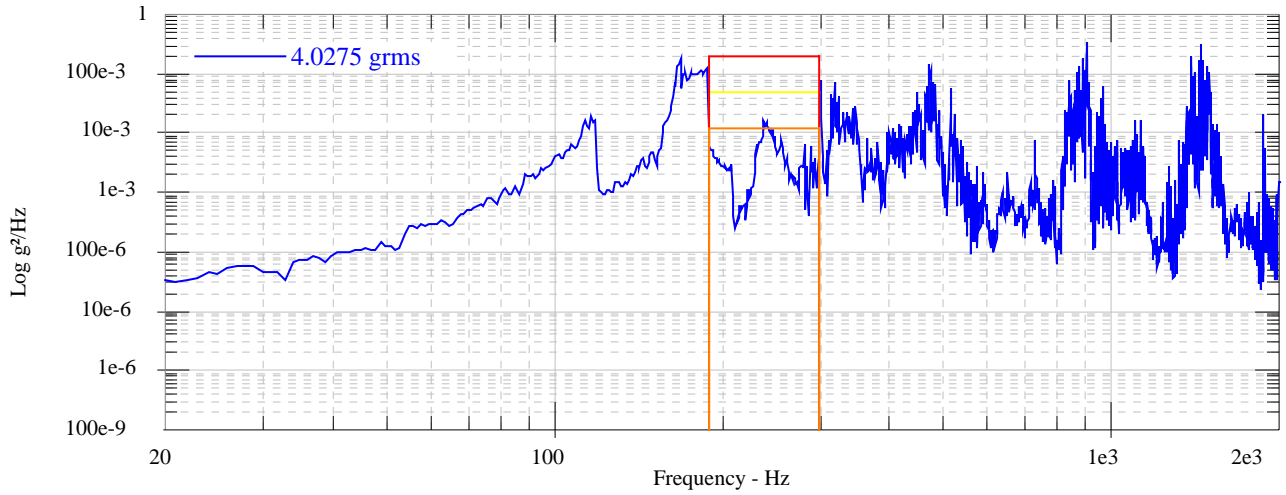


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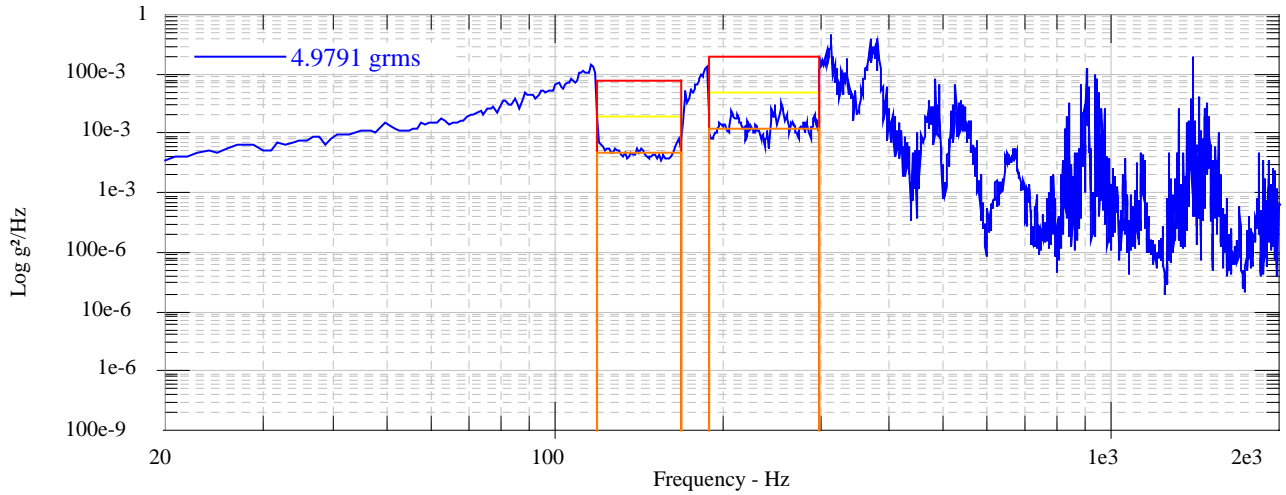
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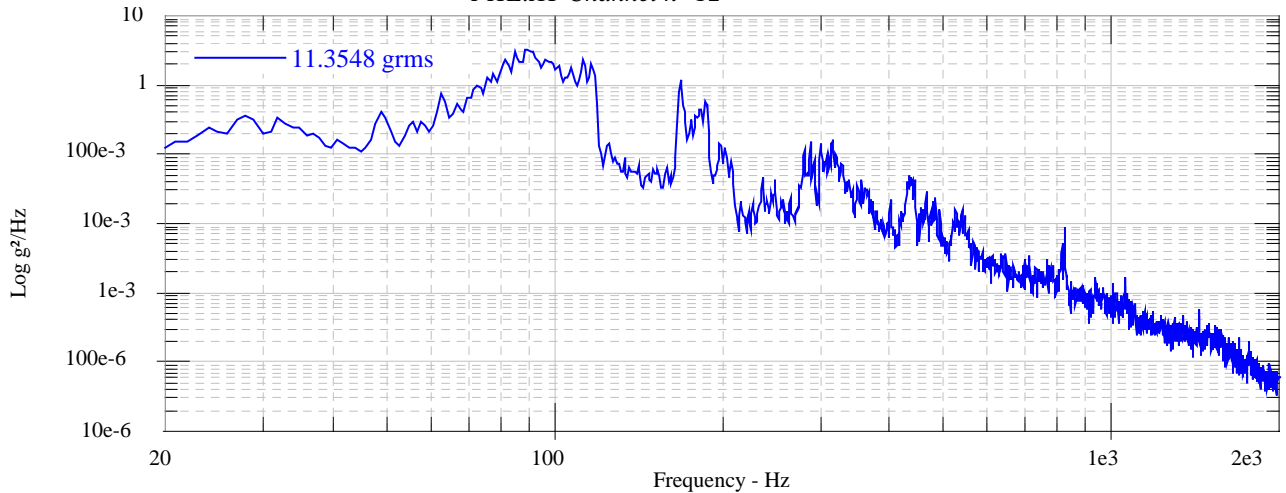
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PHS.Z Channel n° 11



PHE.XY Channel n° 12

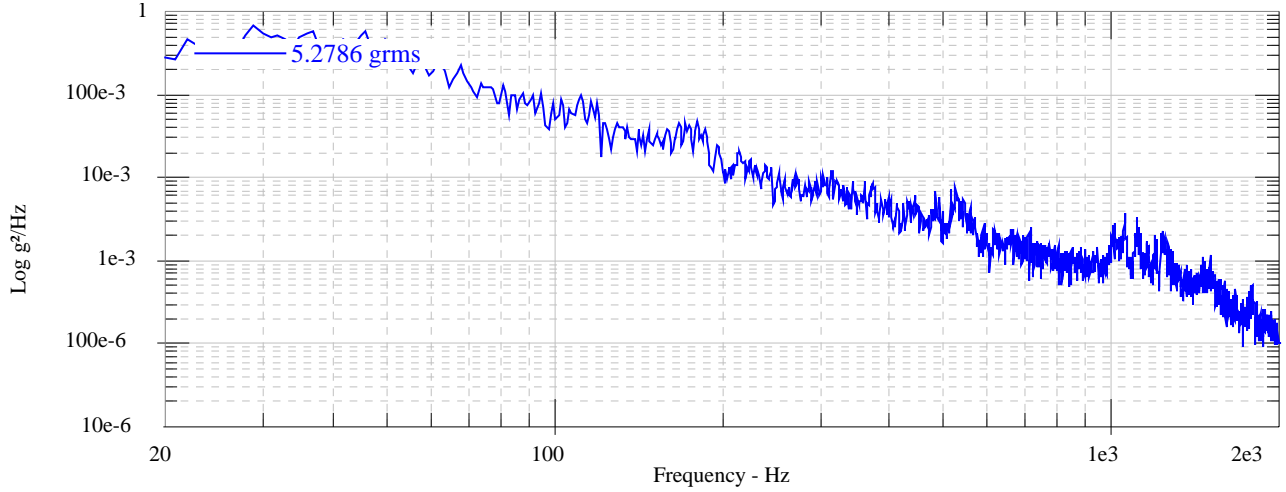


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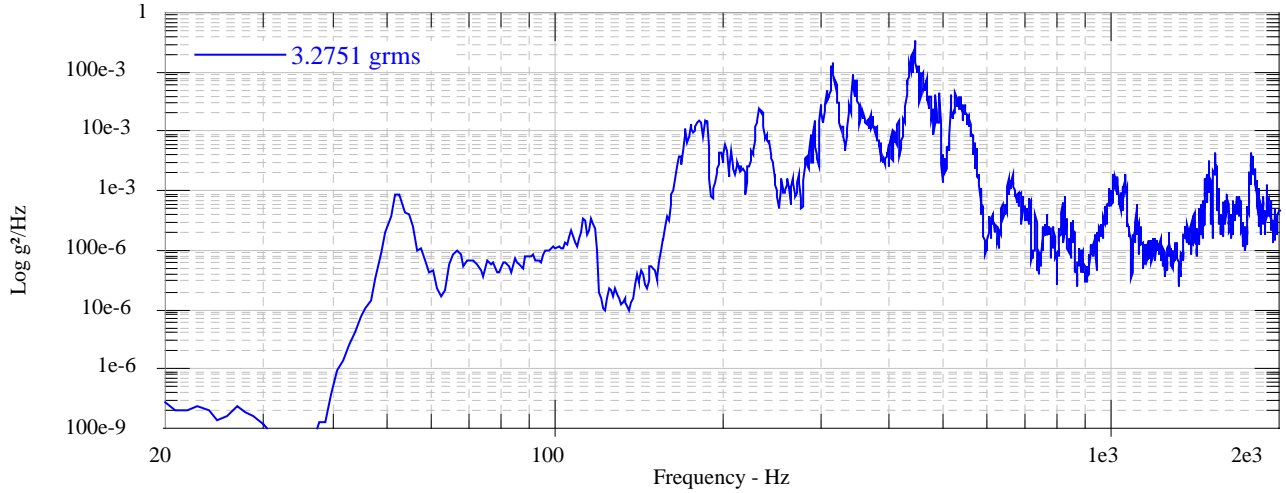
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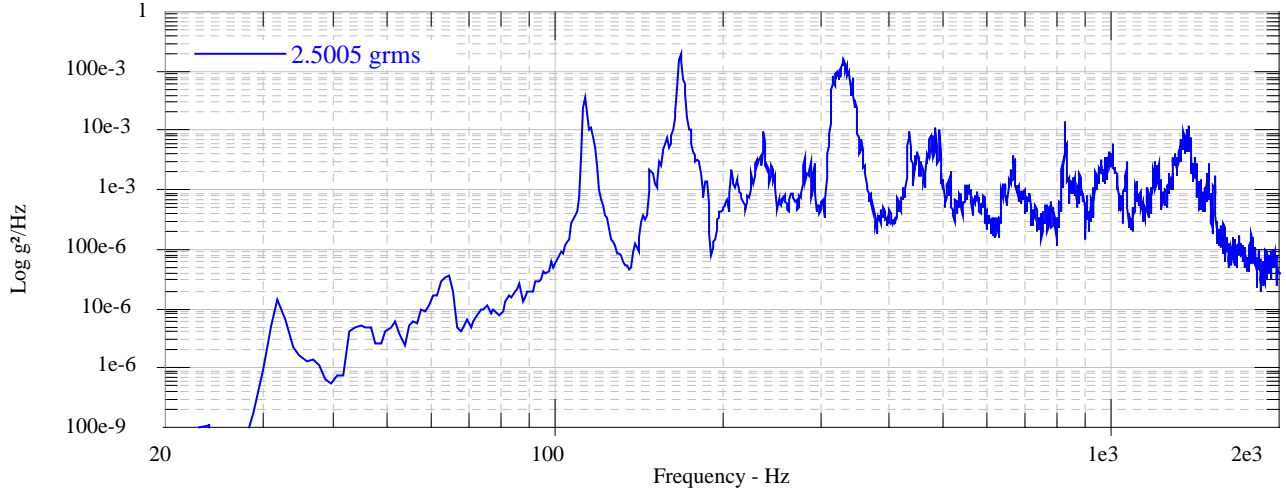
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

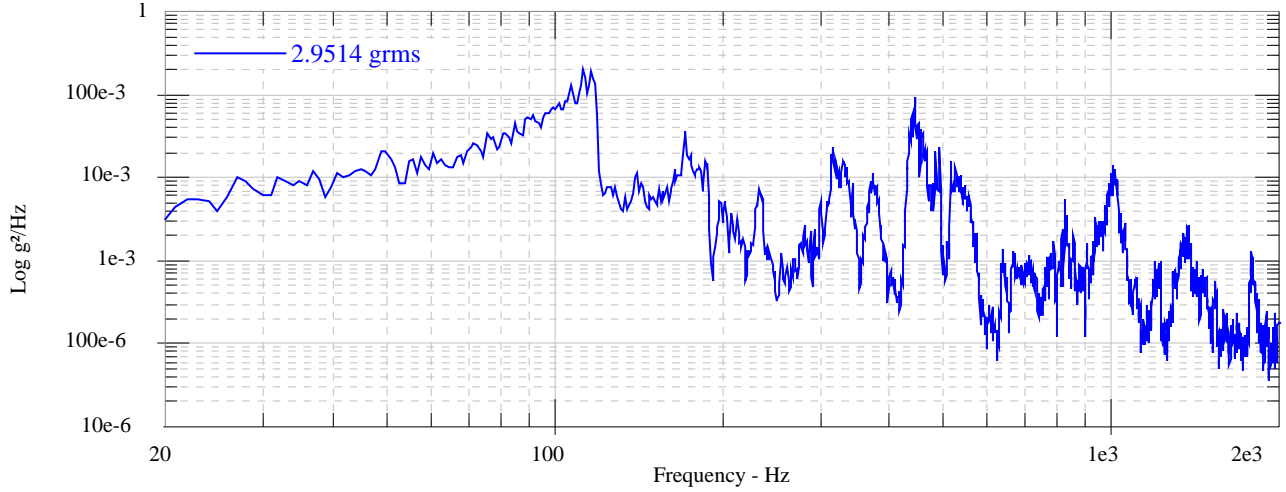


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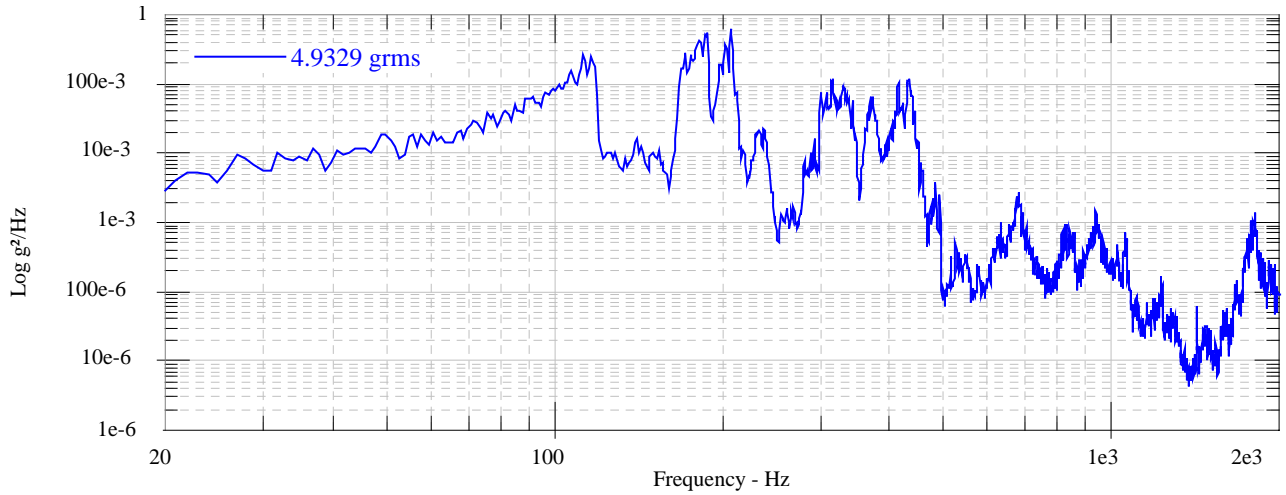
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Date : 8-Apr-04
Page : HNA8Z - 7 / 22

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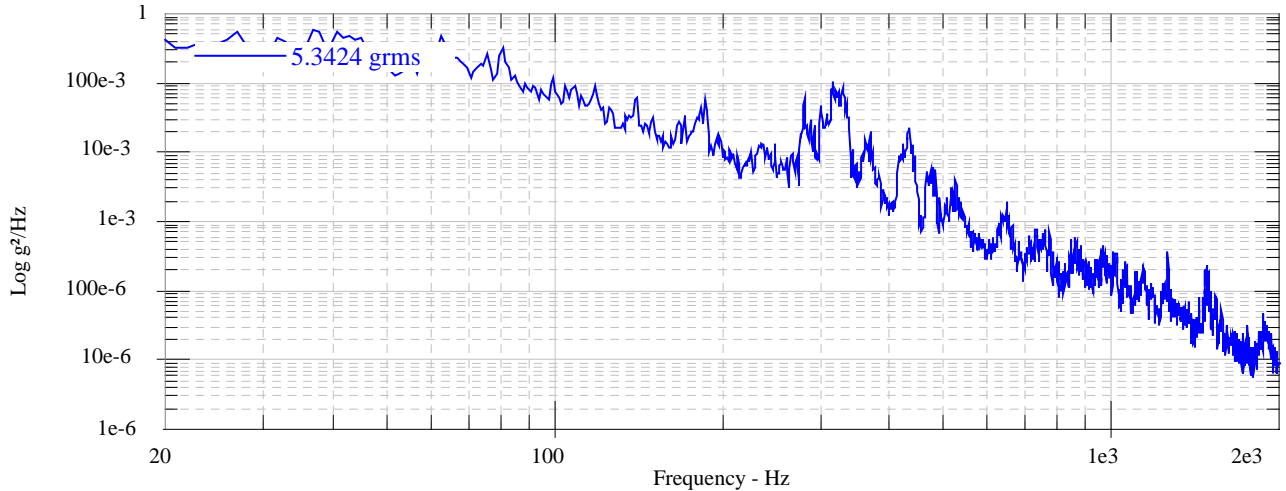
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

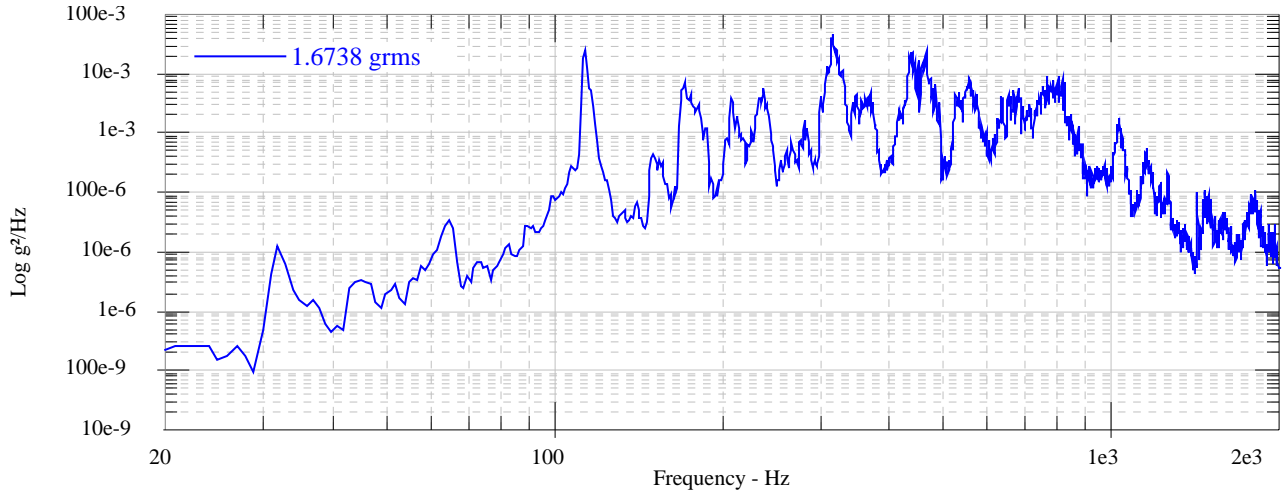


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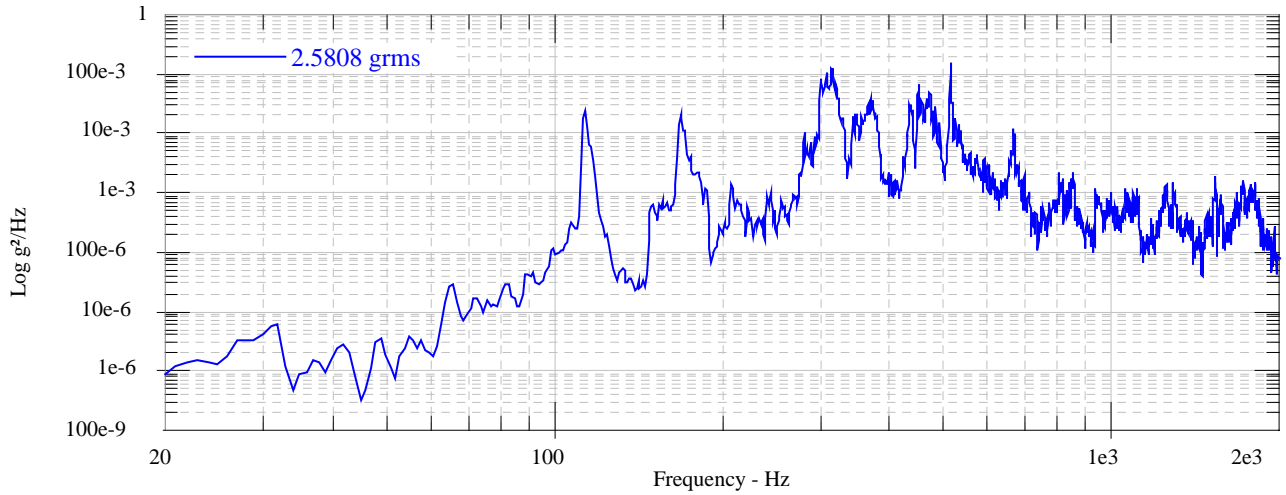
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Date : 8-Apr-04
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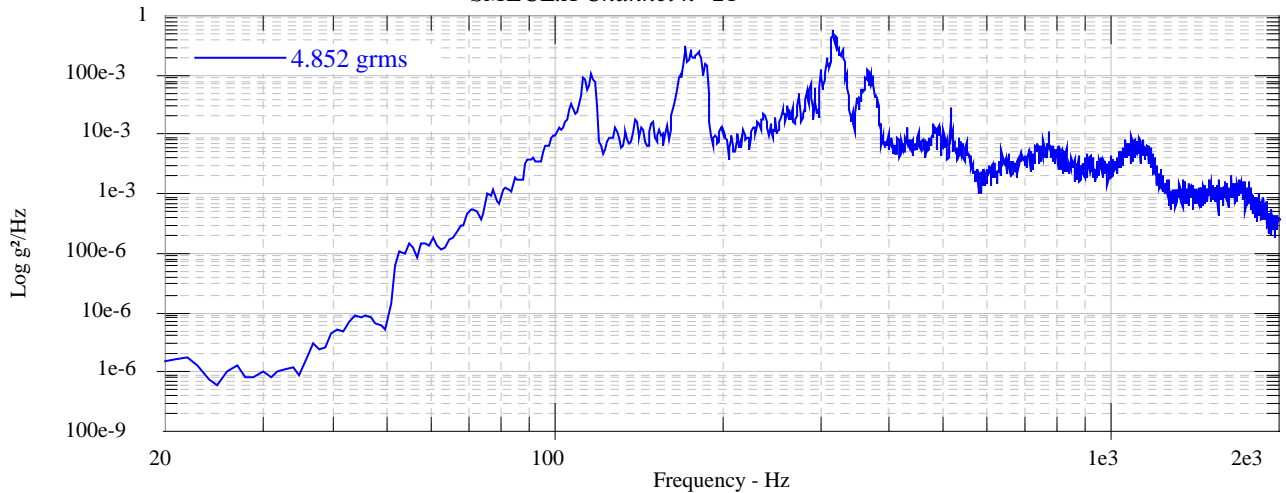
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

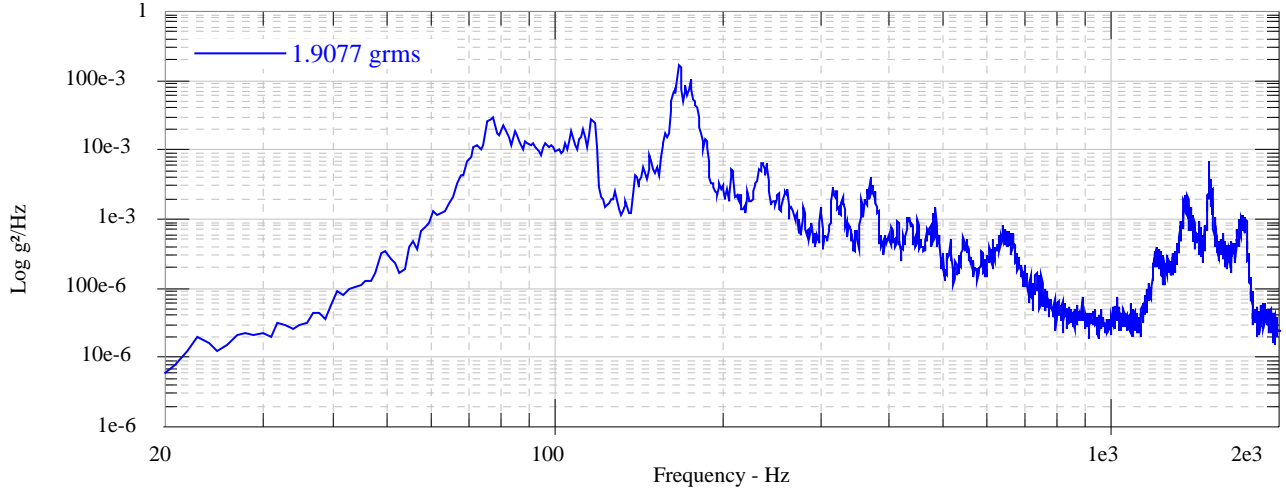


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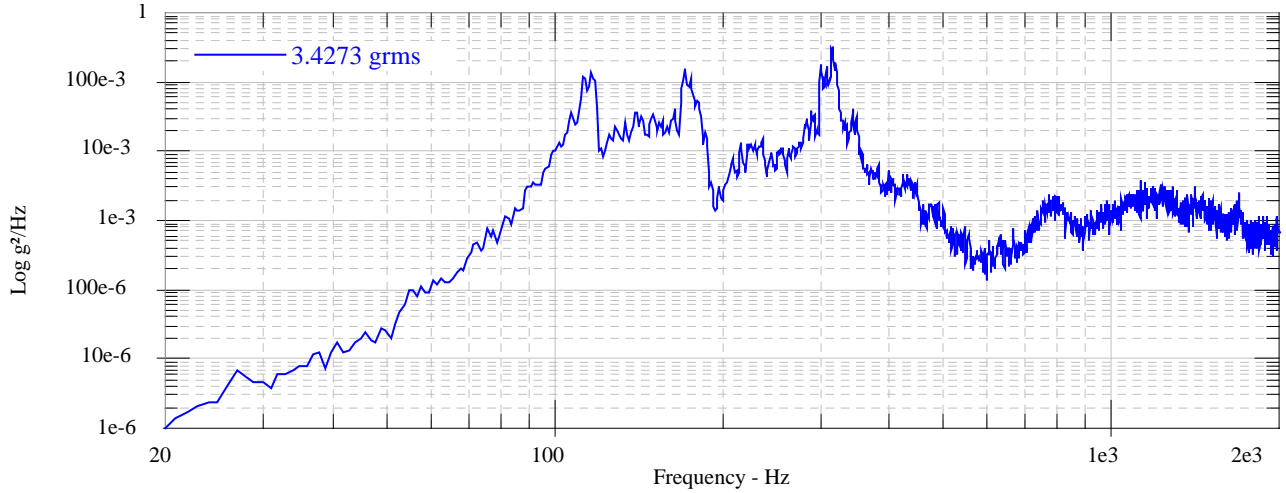
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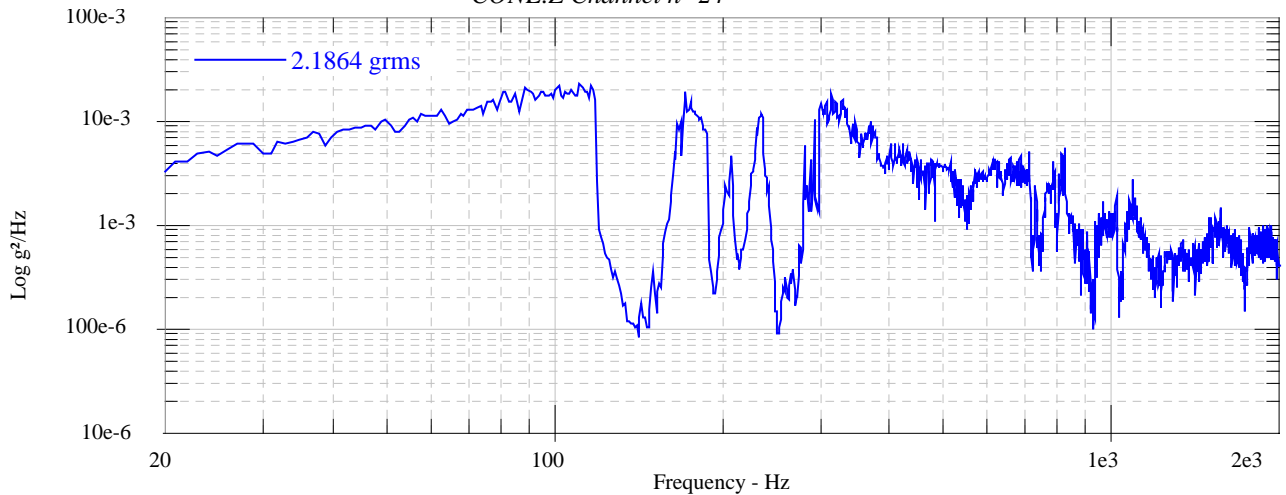
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

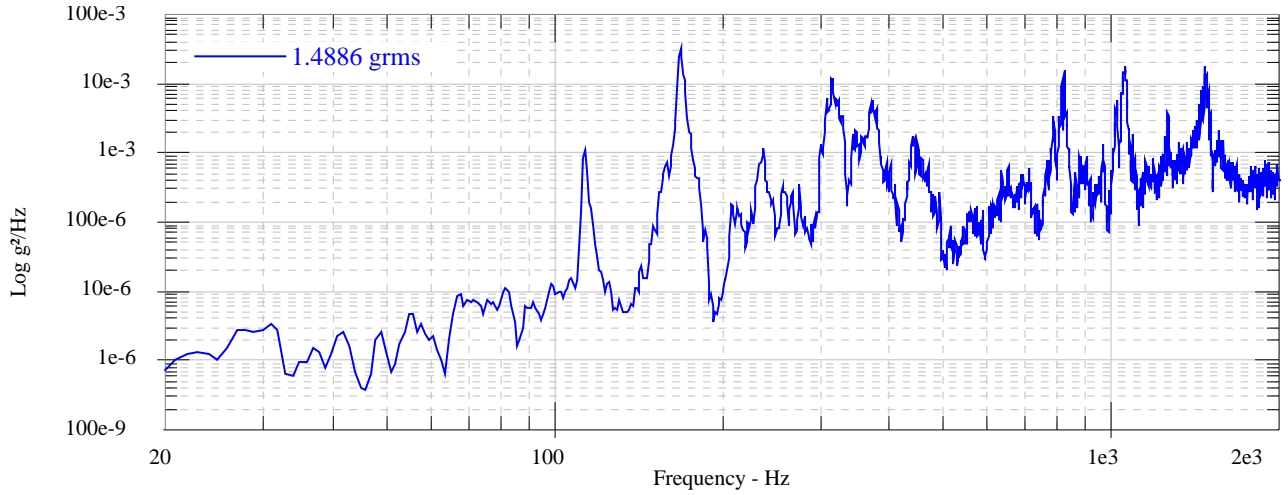


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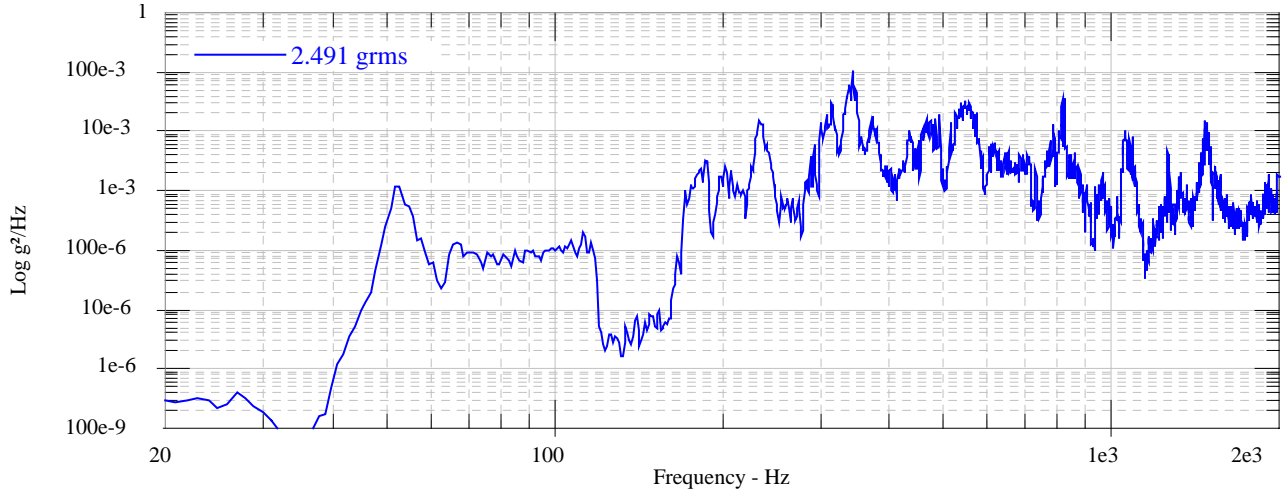
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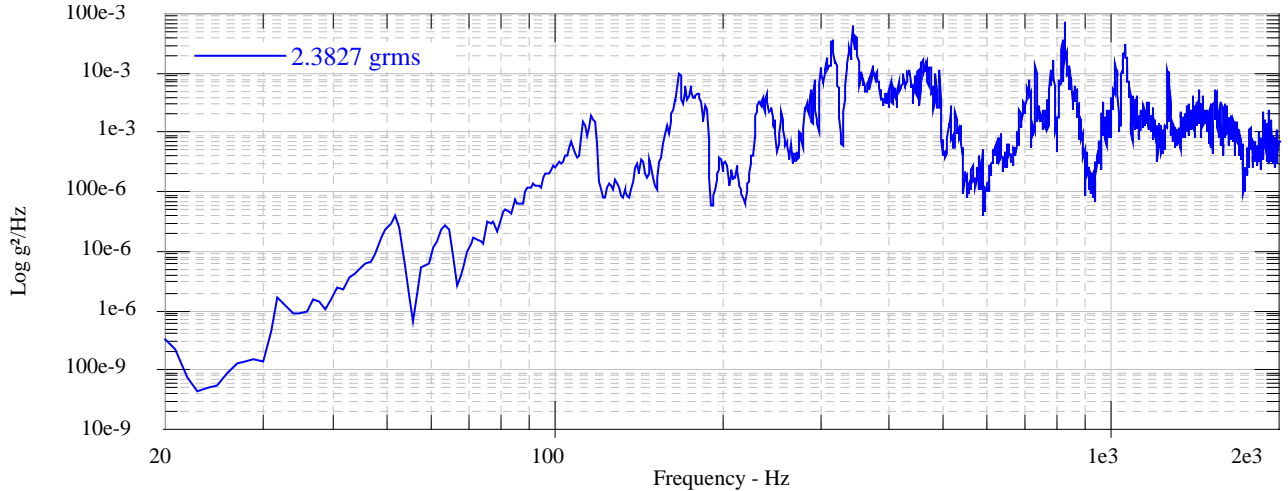
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

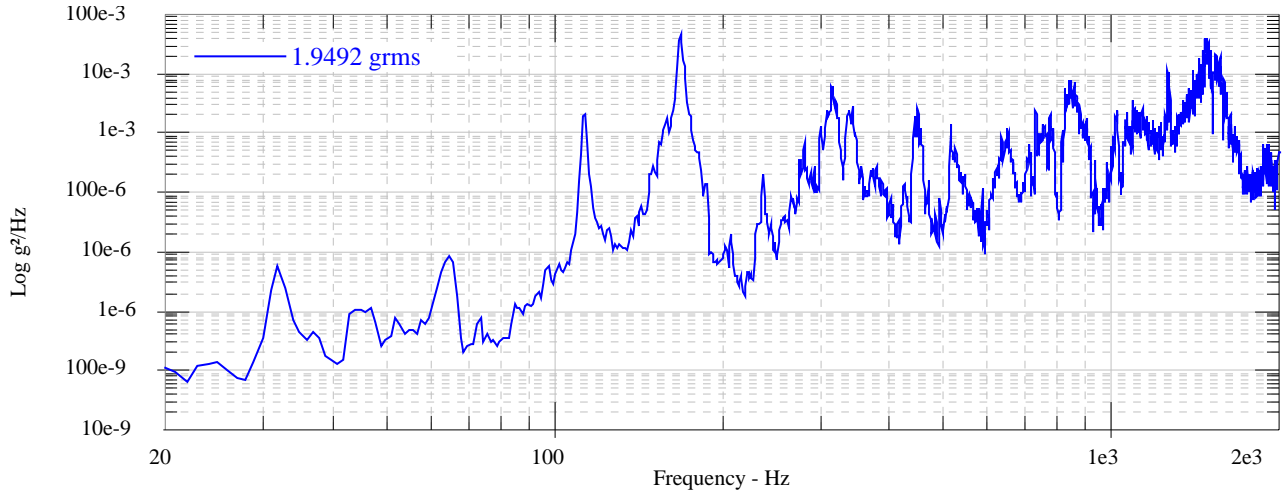


VIBRATION TEST REPORT
SPIRE QM

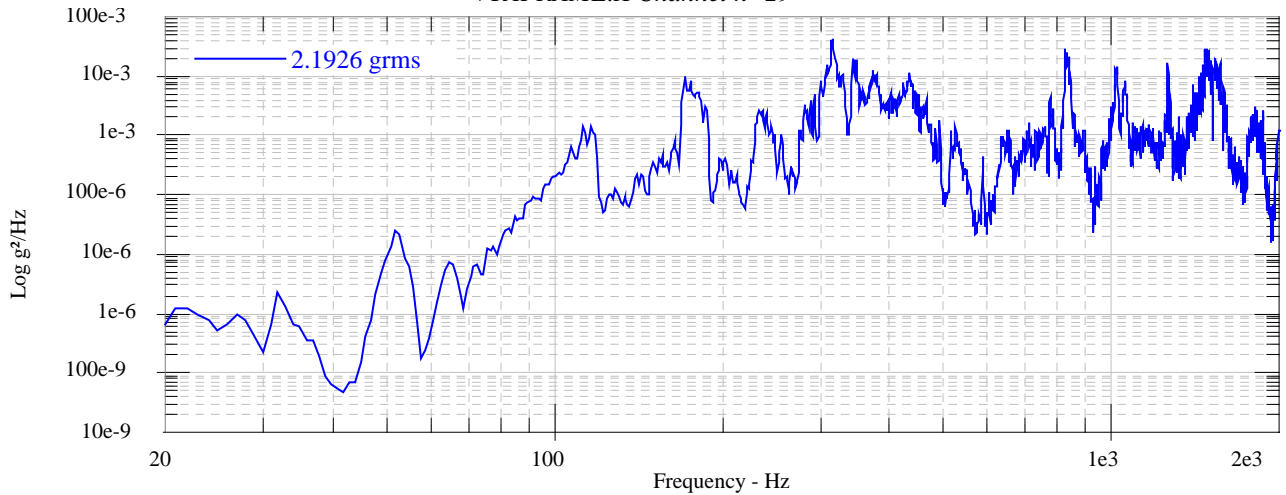
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Version : 01
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Date : 8-Apr-04
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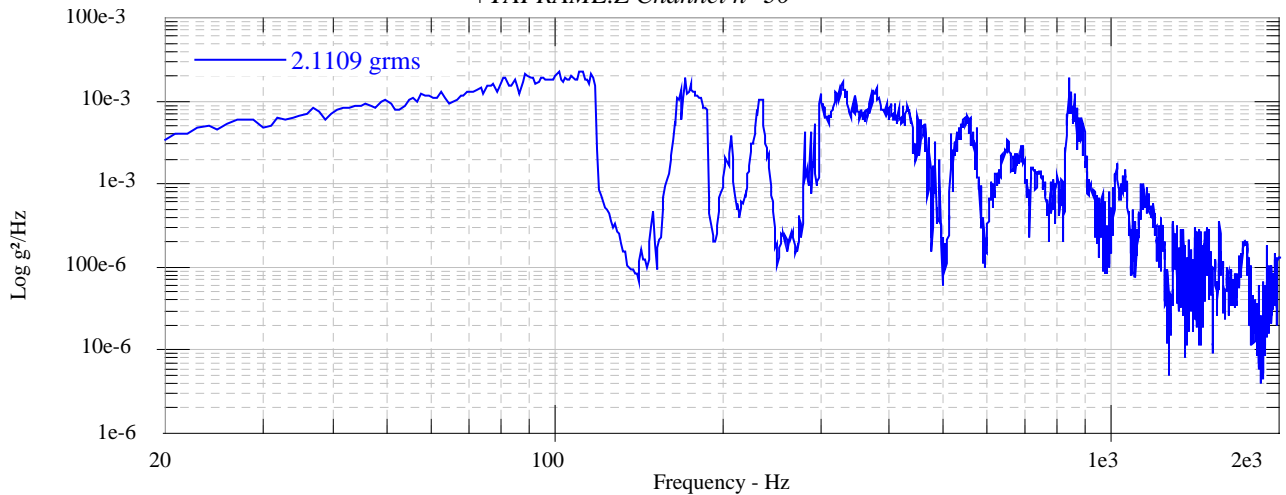
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30

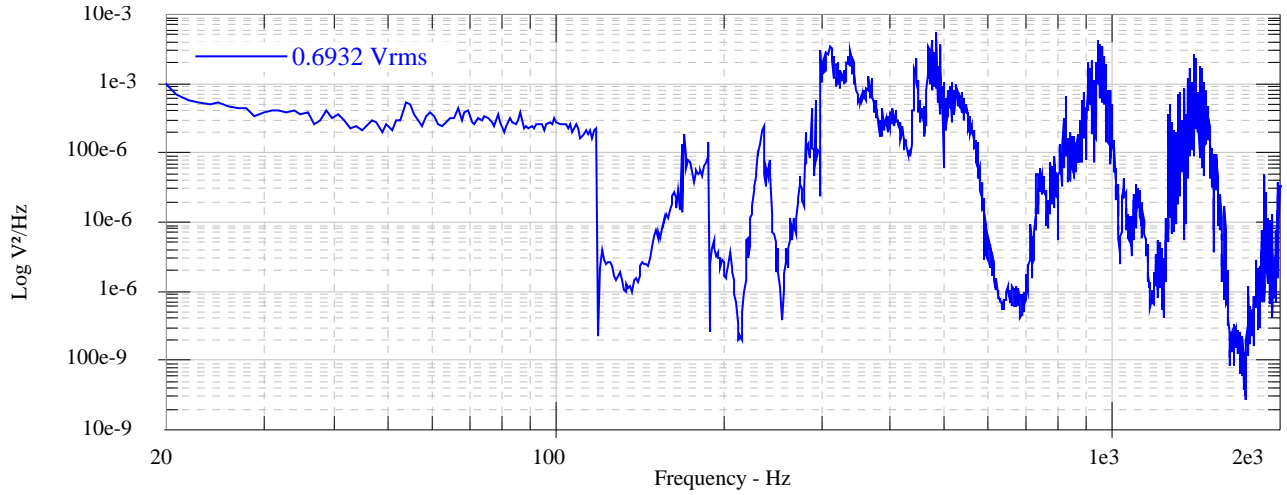


VIBRATION TEST REPORT
SPIRE QM

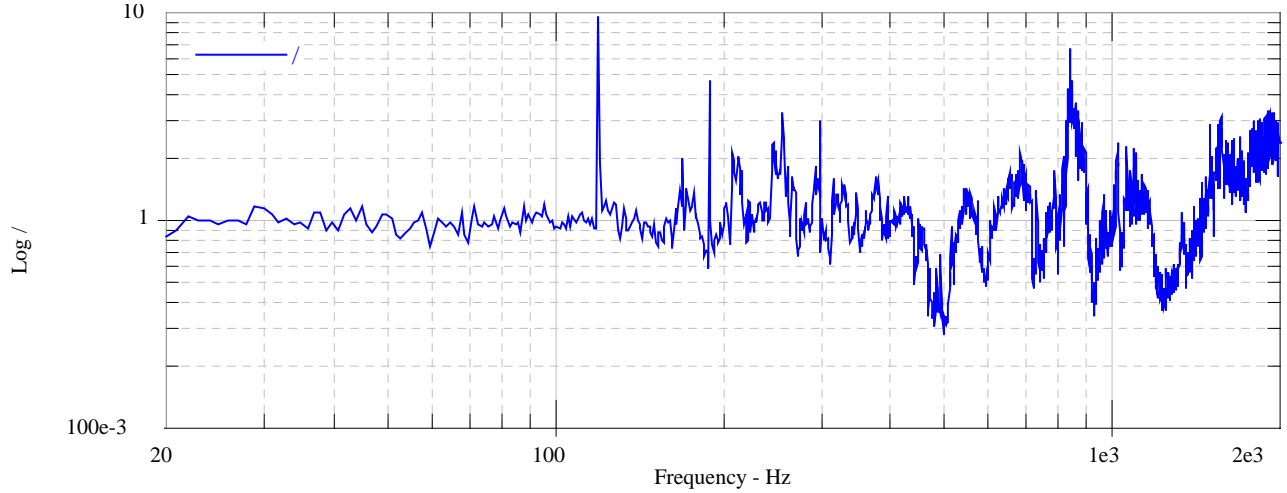
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Révision : 00
Date : 8-Apr-04
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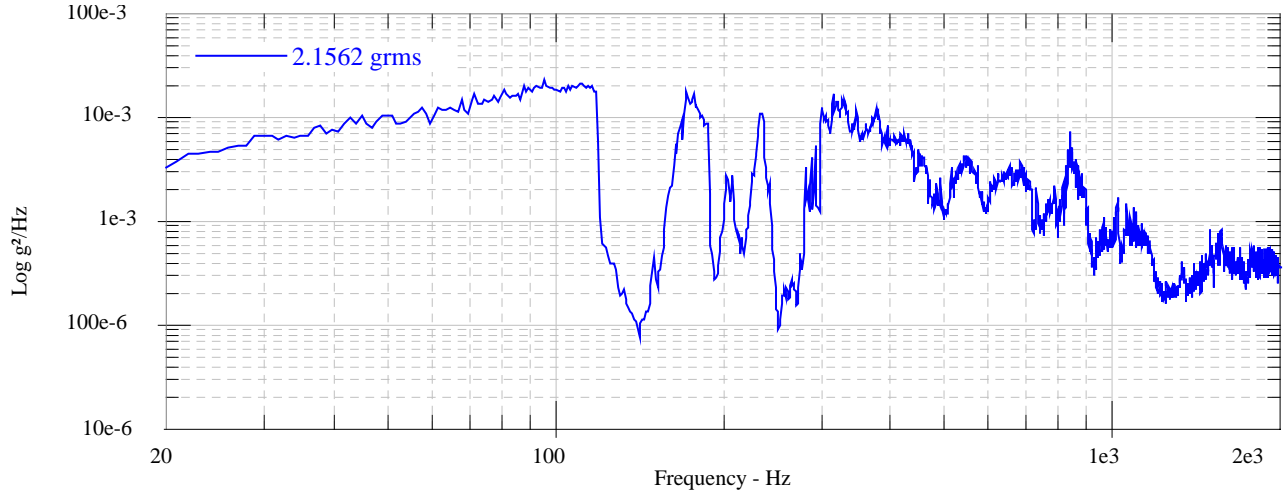
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

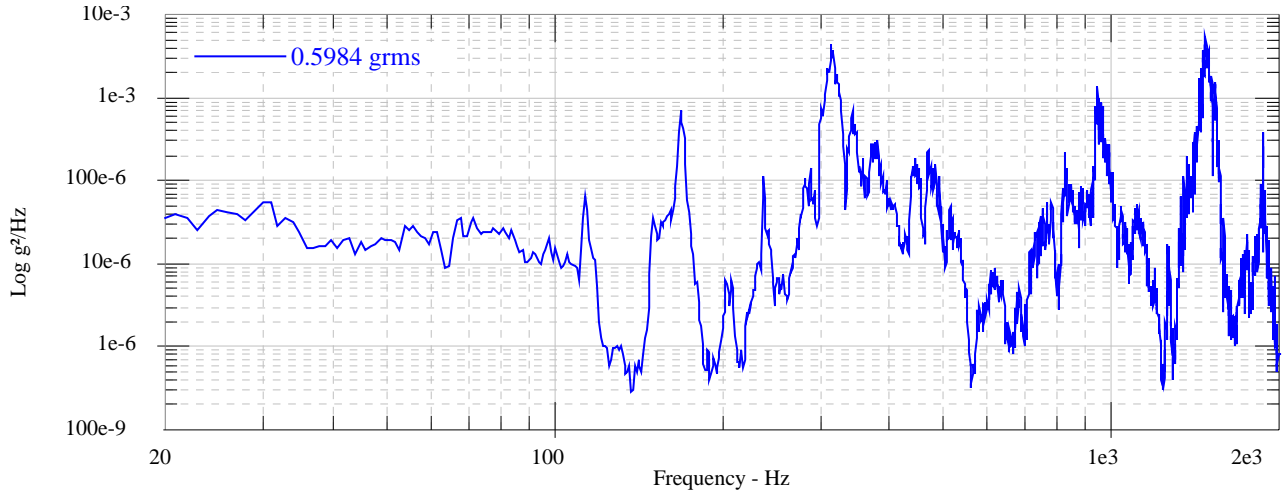


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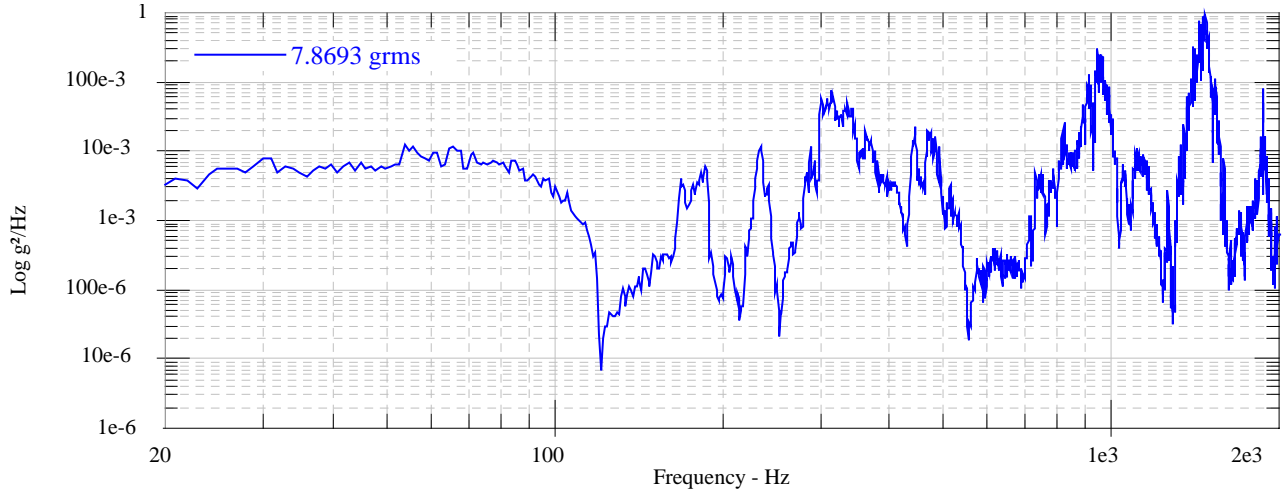
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Révision : 00
Date : 8-Apr-04
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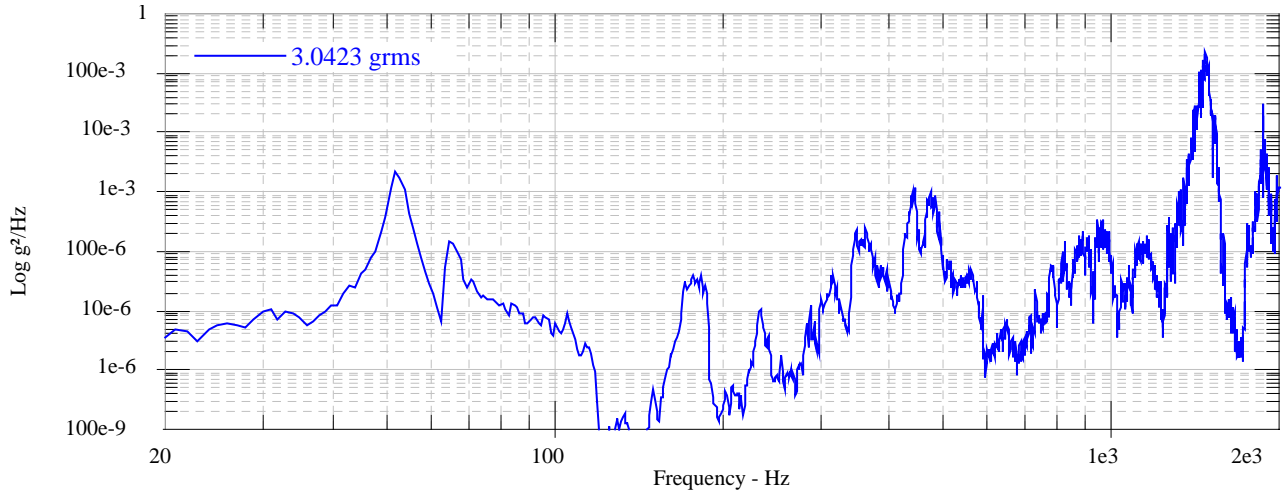
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

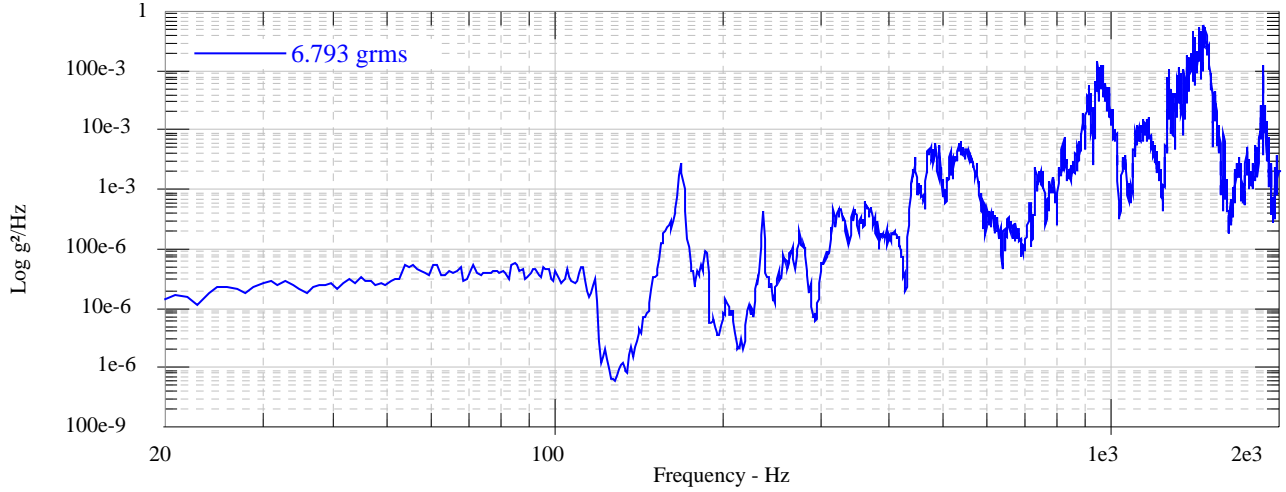


VIBRATION TEST REPORT
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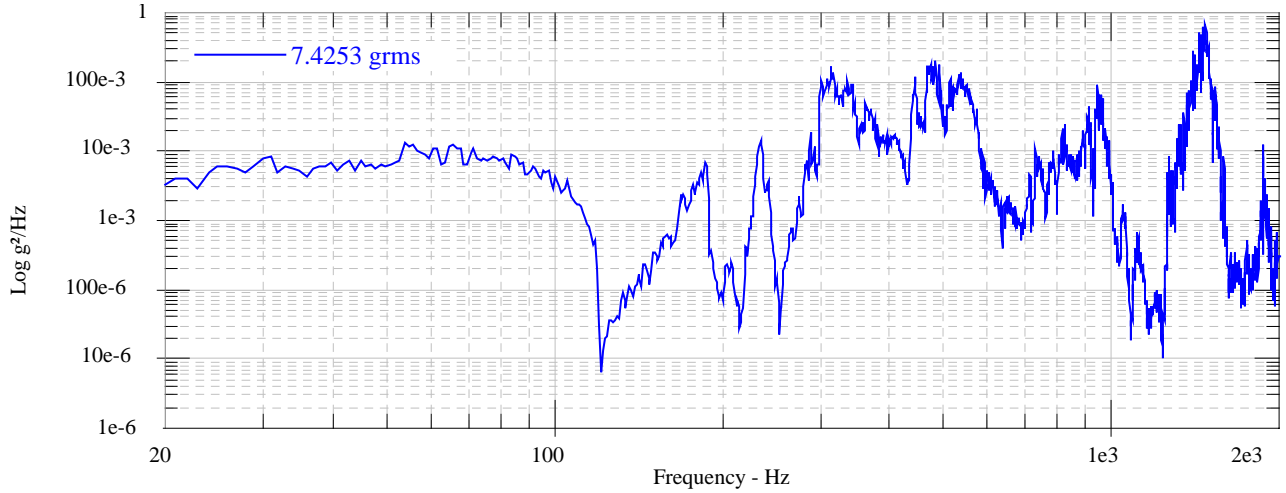
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Date : 8-Apr-04
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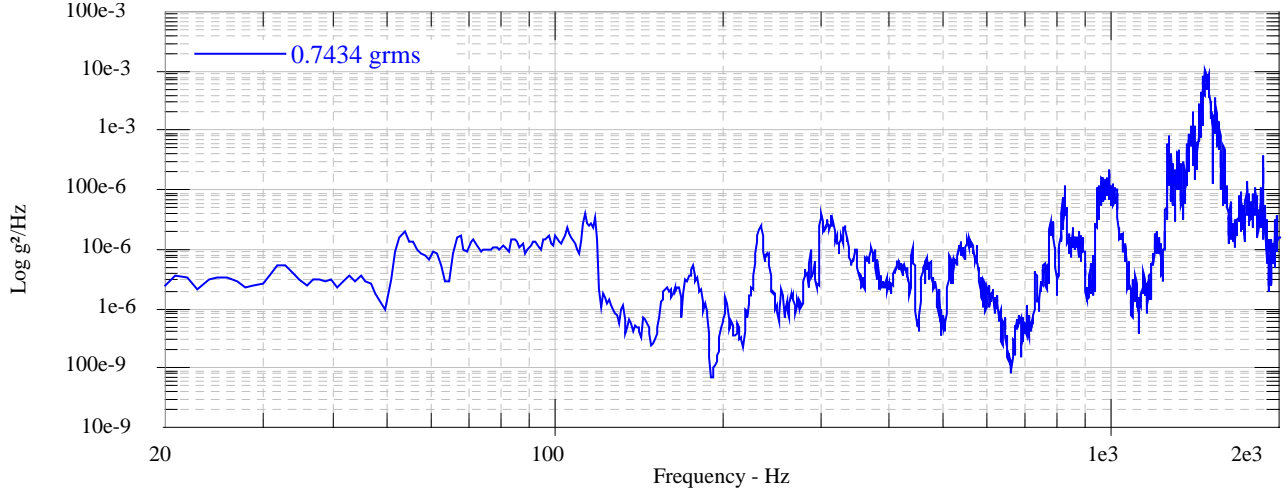
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

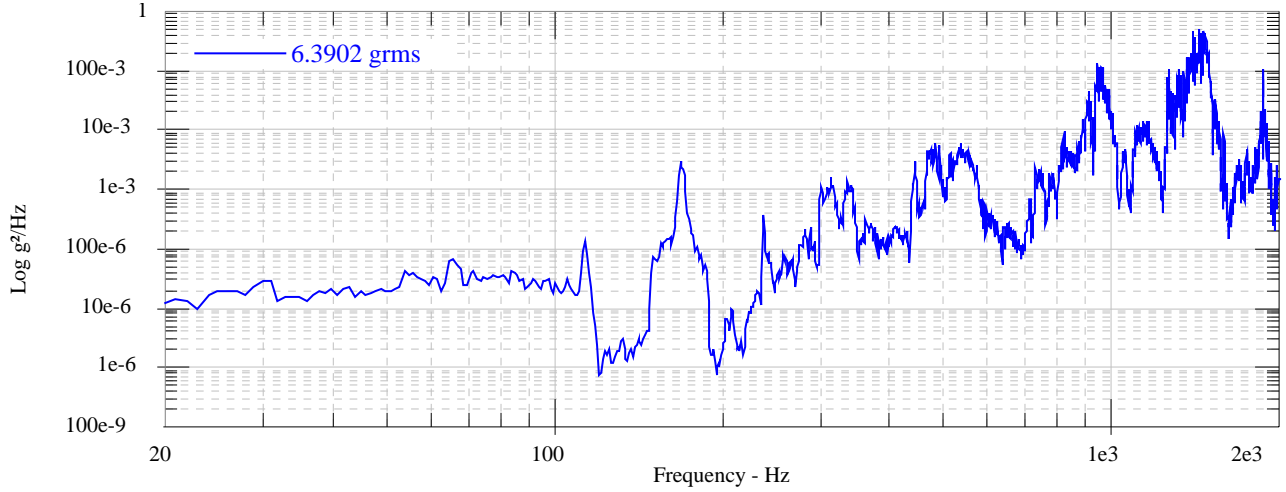


VIBRATION TEST REPORT
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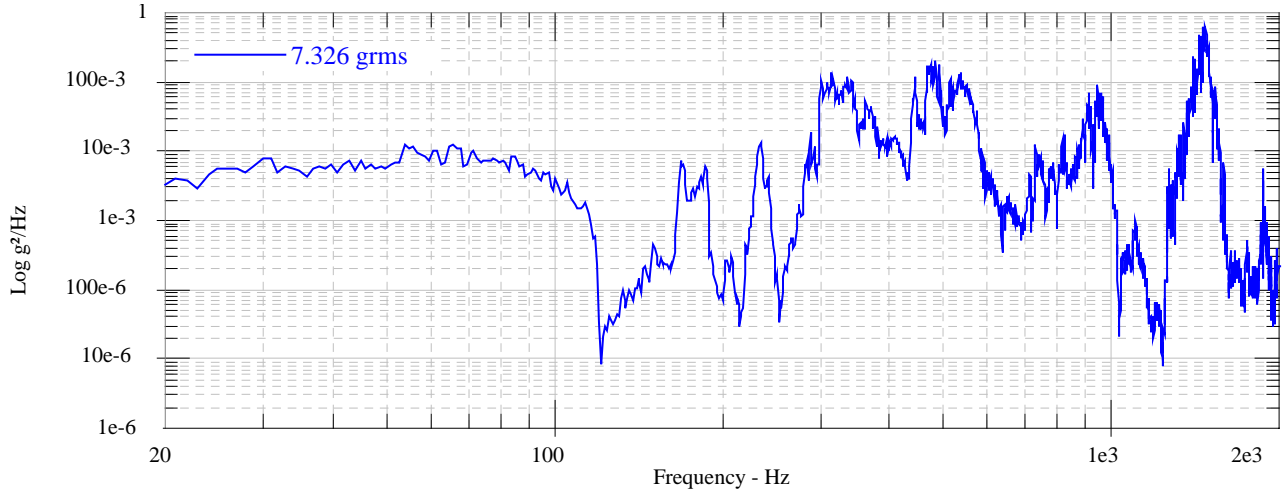
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Date : 8-Apr-04
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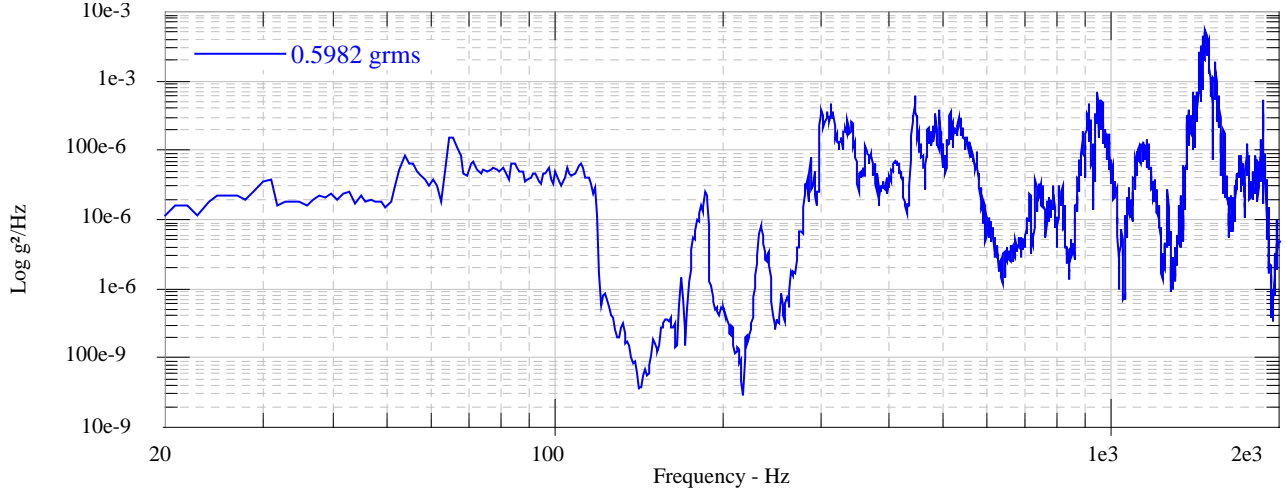
SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

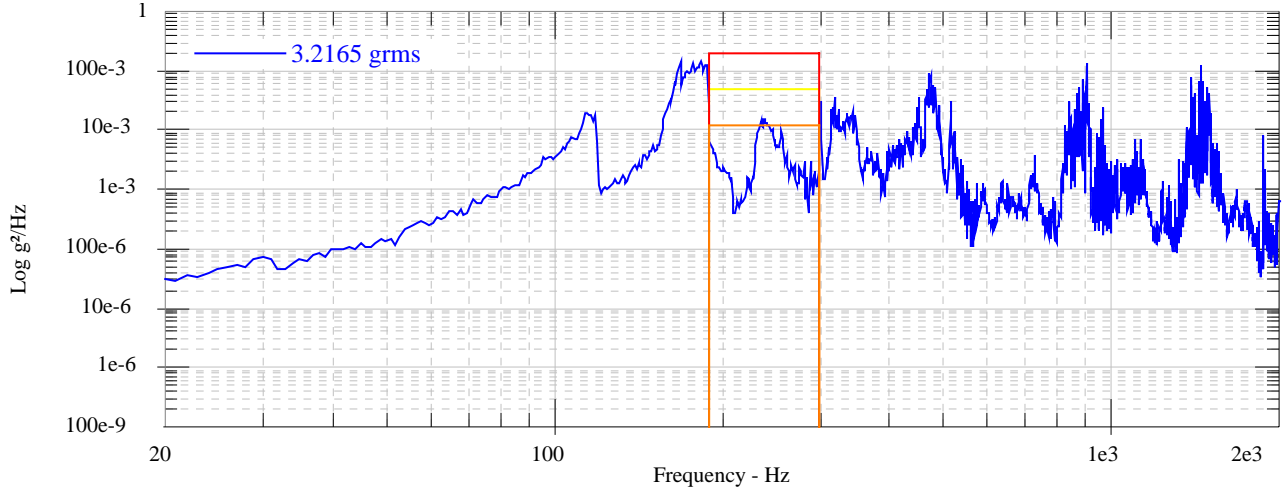


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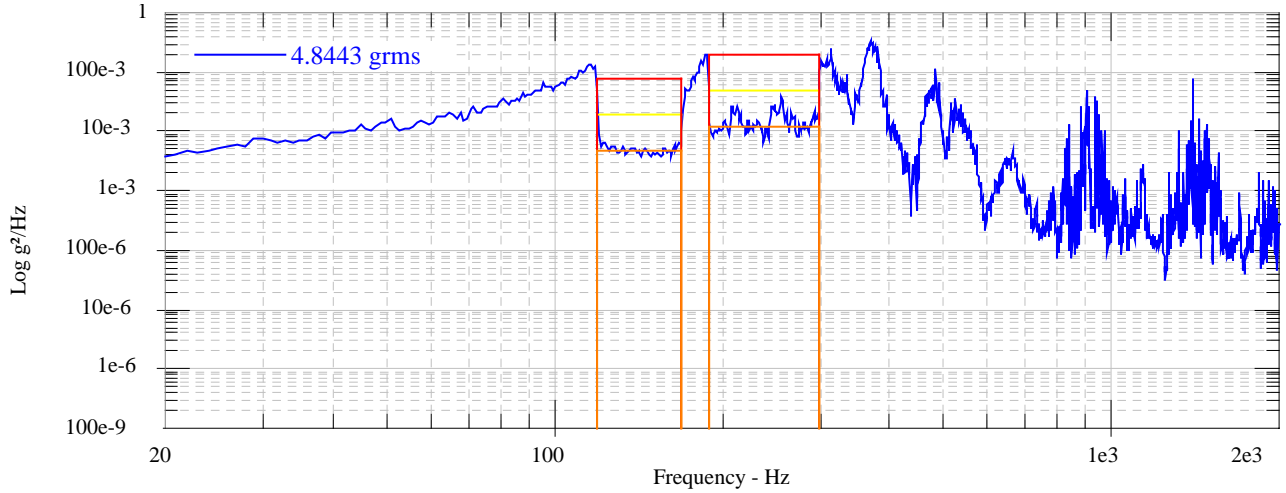
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Date : 8-Apr-04
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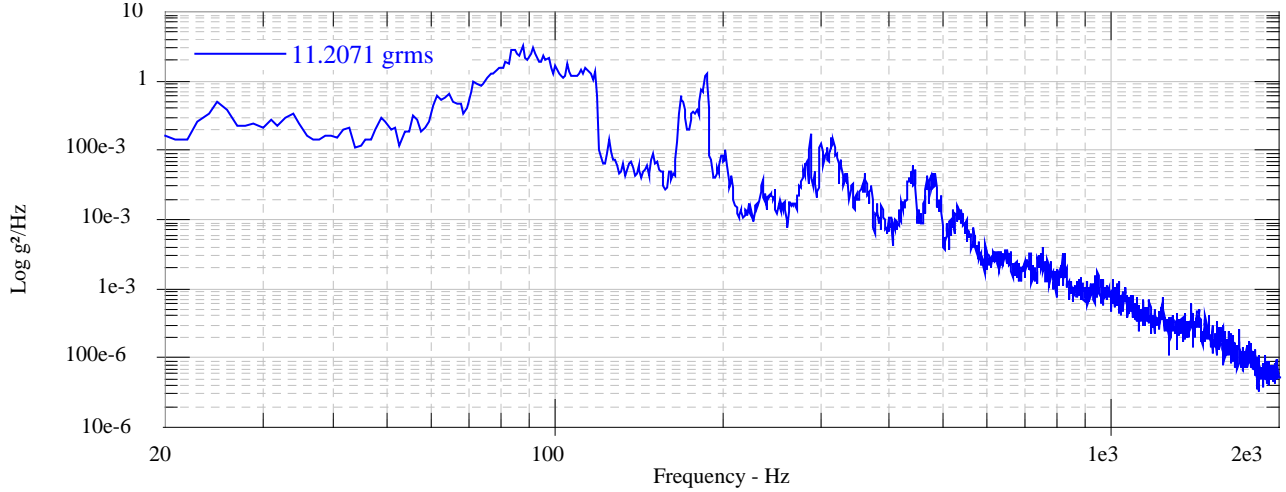
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

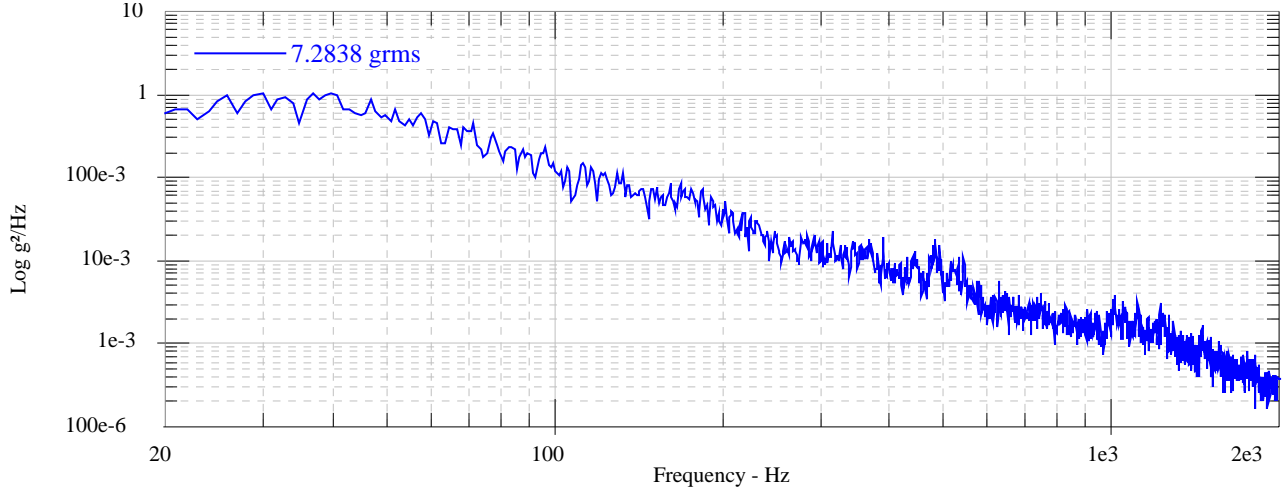


VIBRATION TEST REPORT
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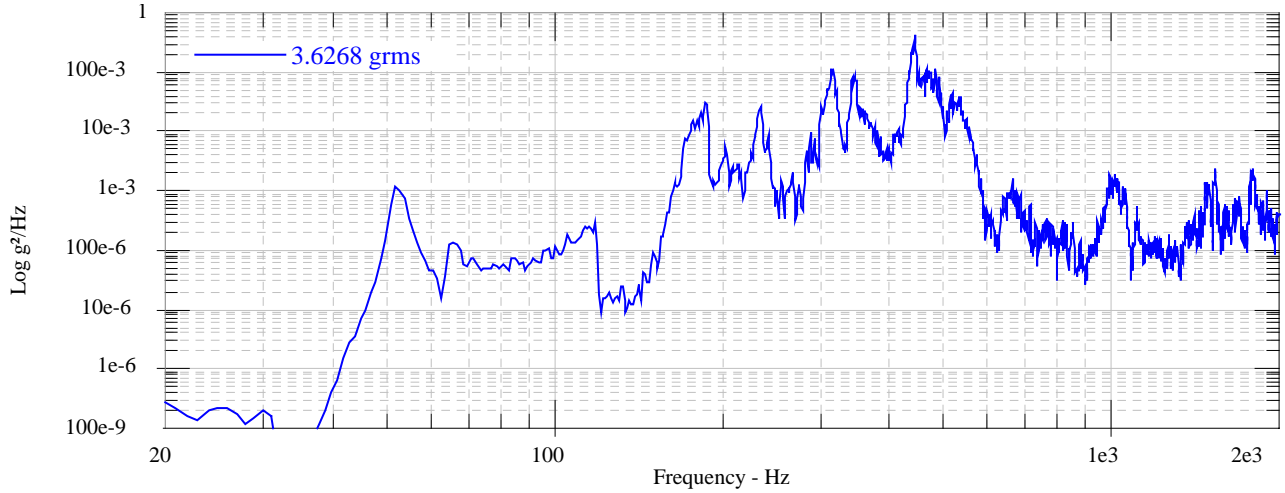
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Date : 8-Apr-04
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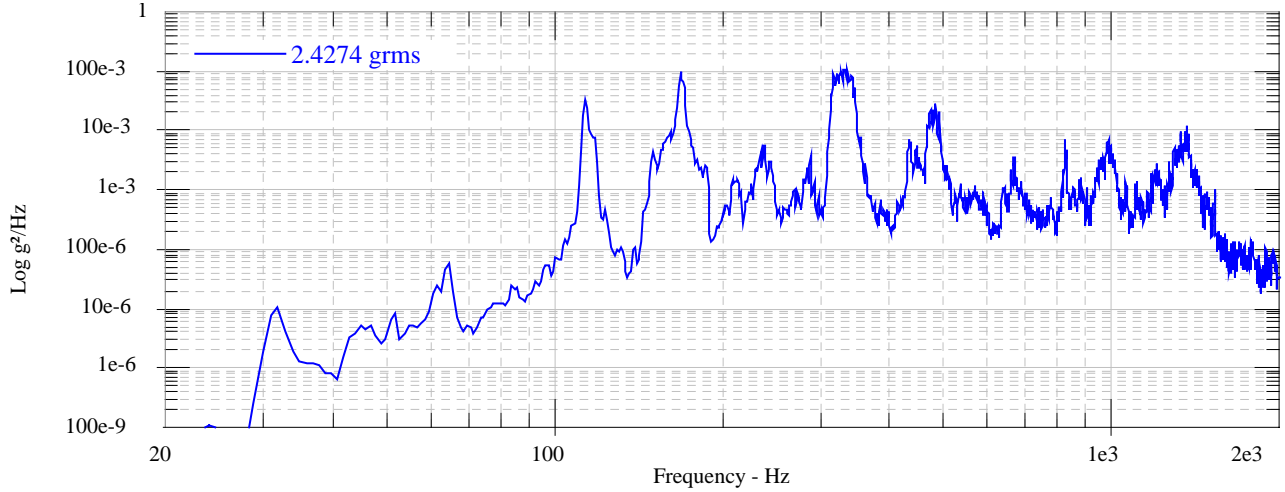
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

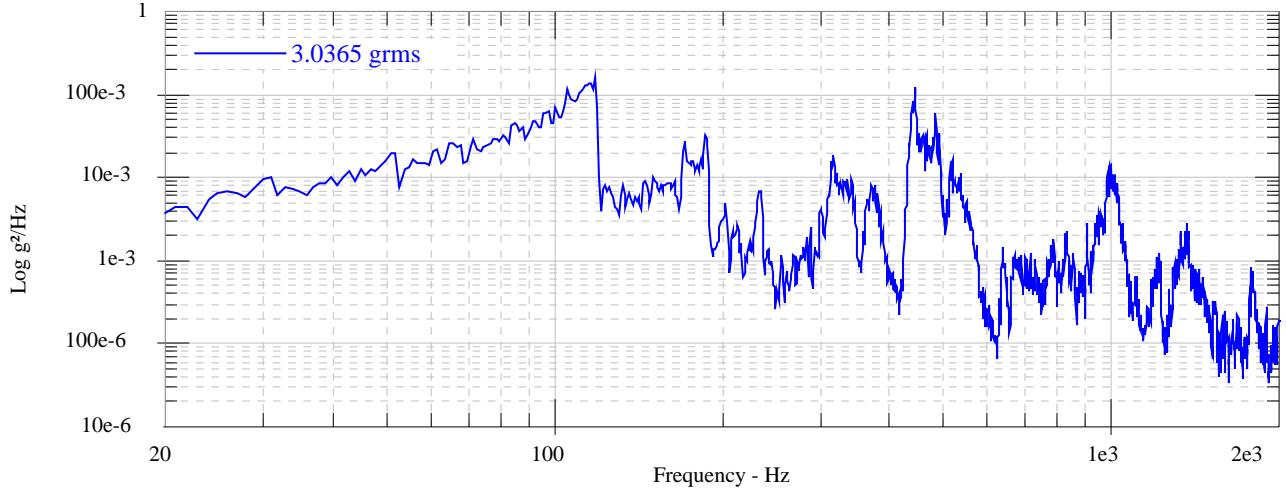


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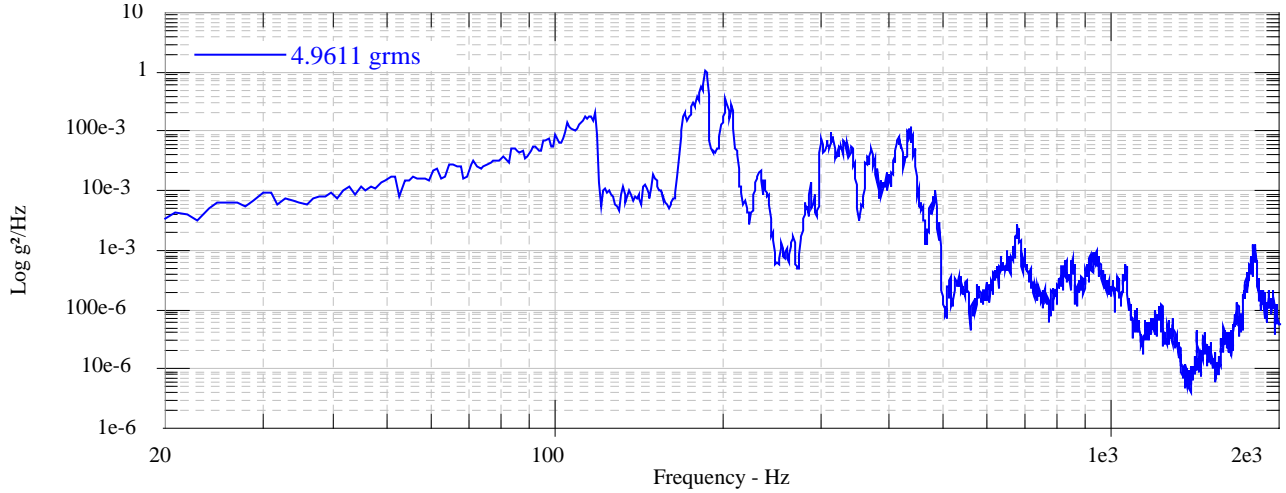
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Date : 8-Apr-04
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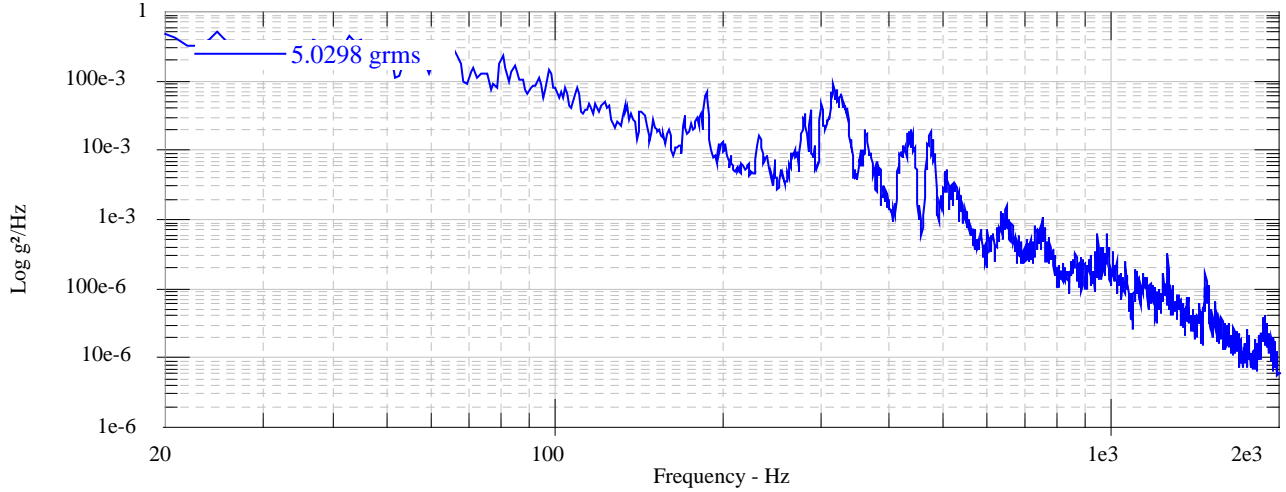
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

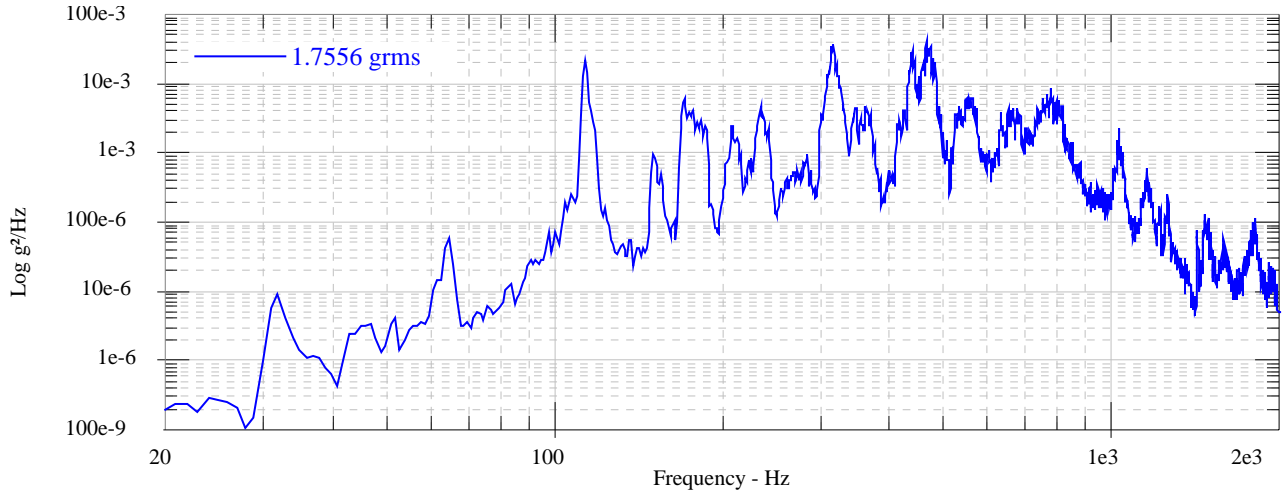


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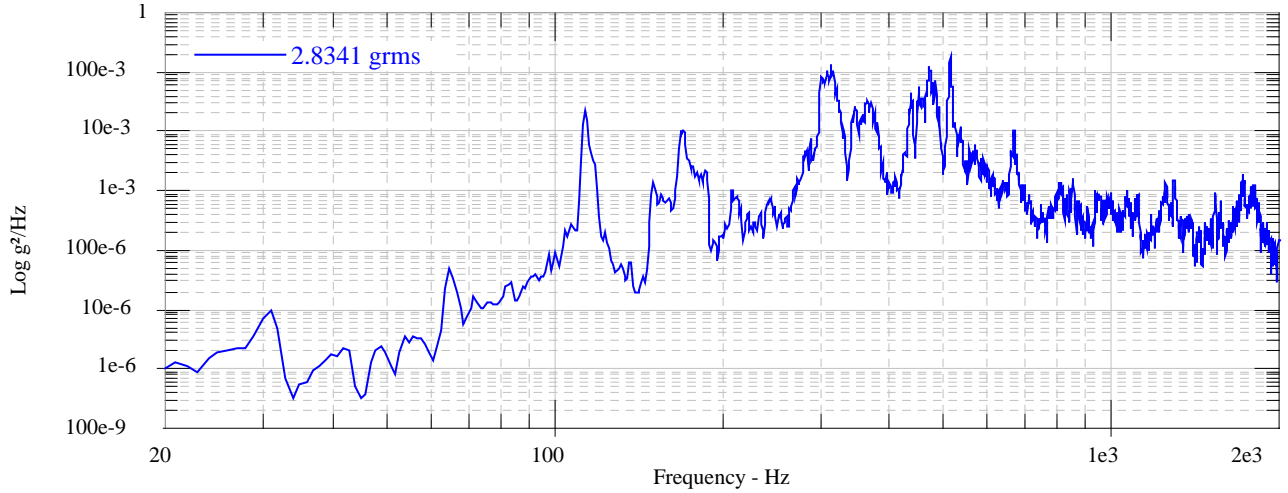
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Date : 8-Apr-04
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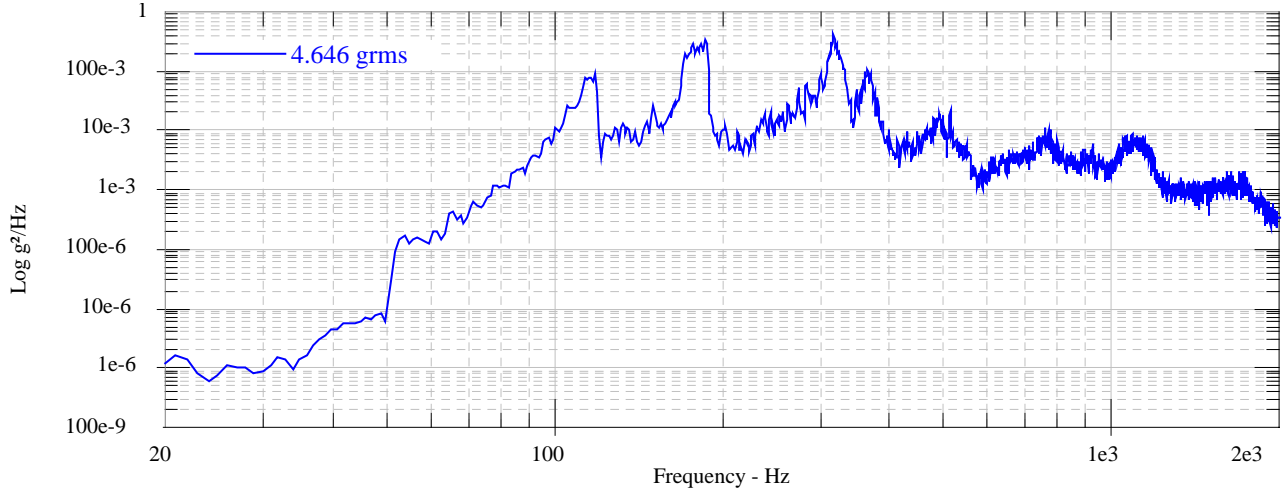
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

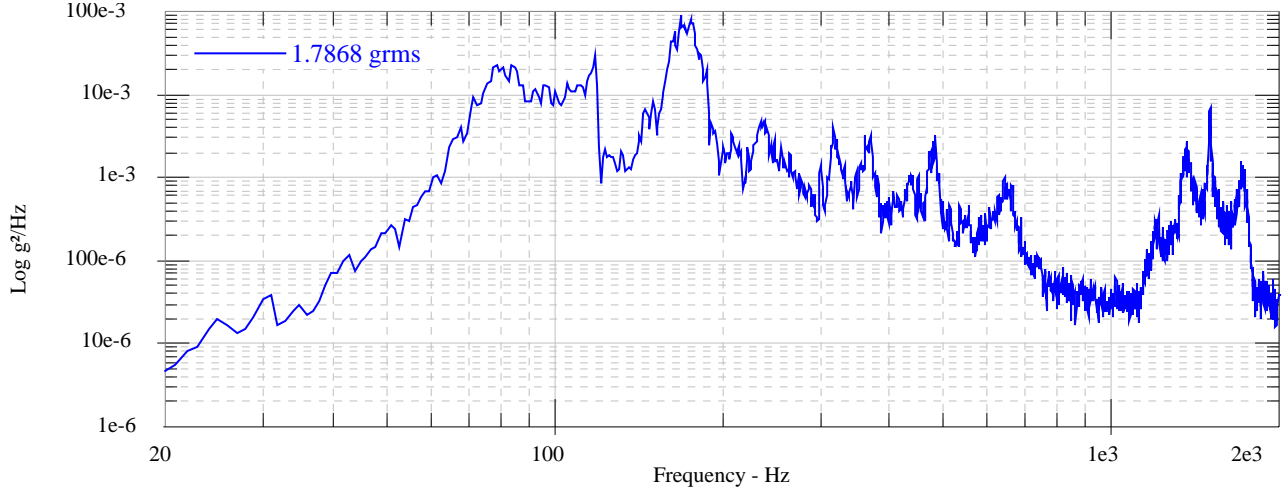


VIBRATION TEST REPORT
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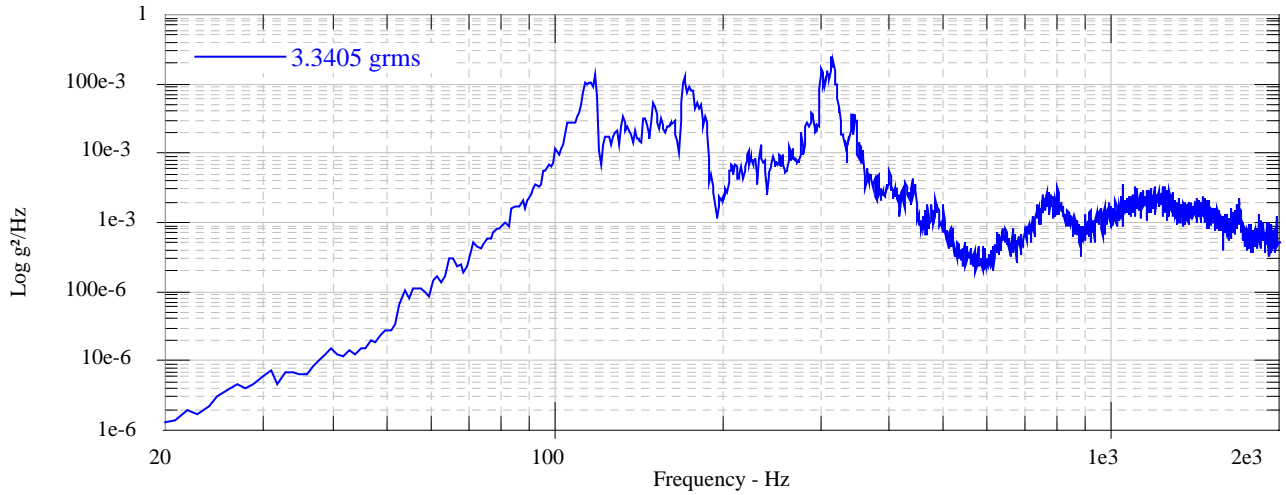
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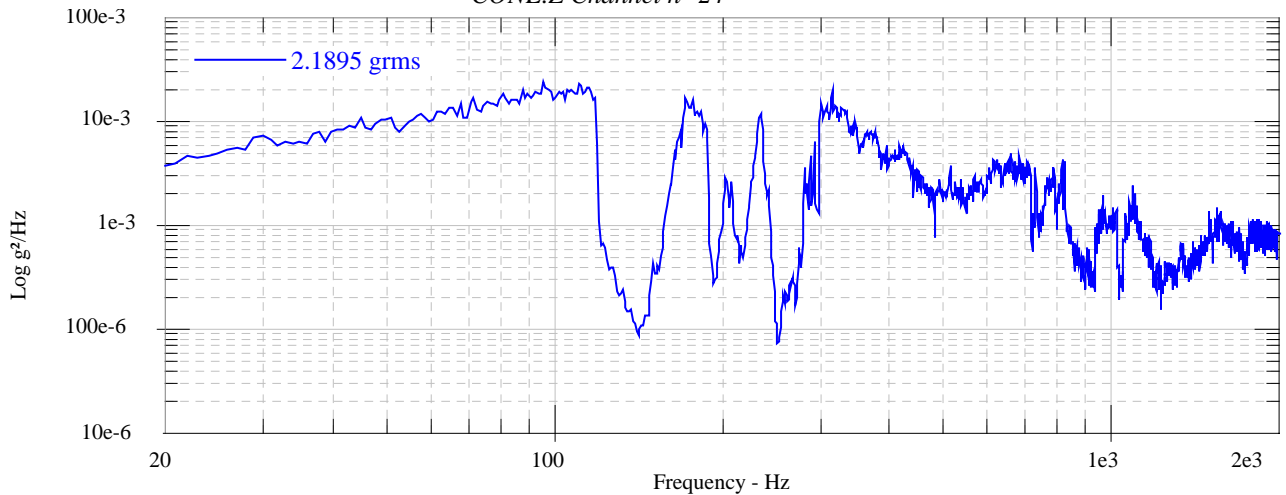
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

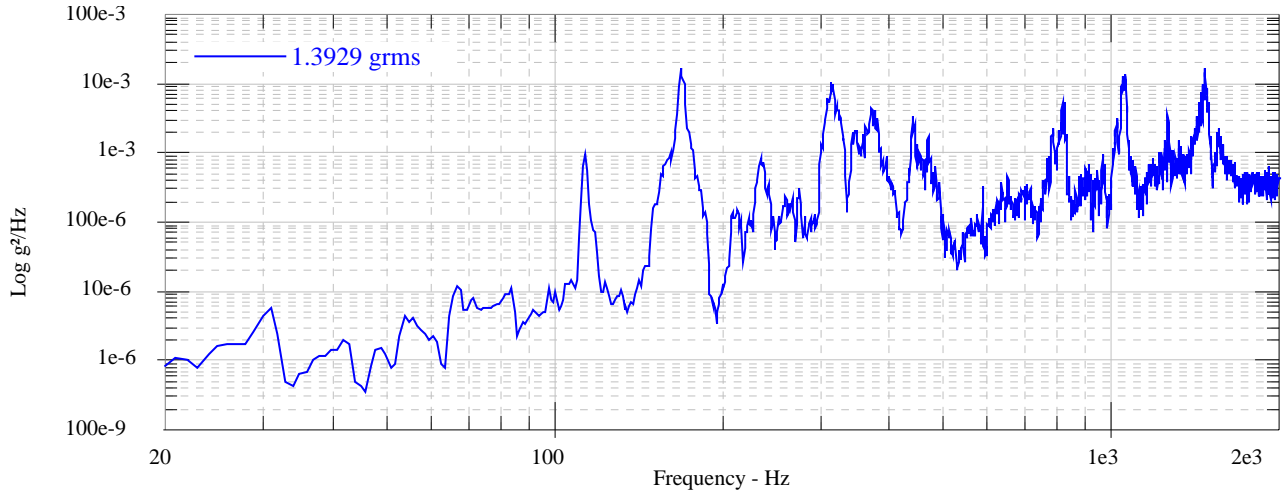


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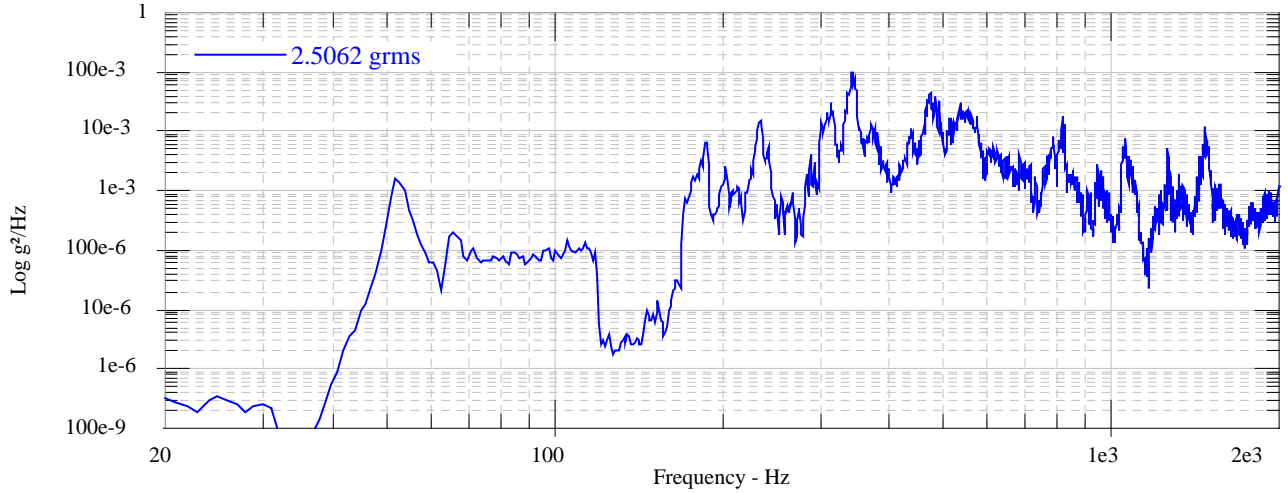
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Date : 8-Apr-04
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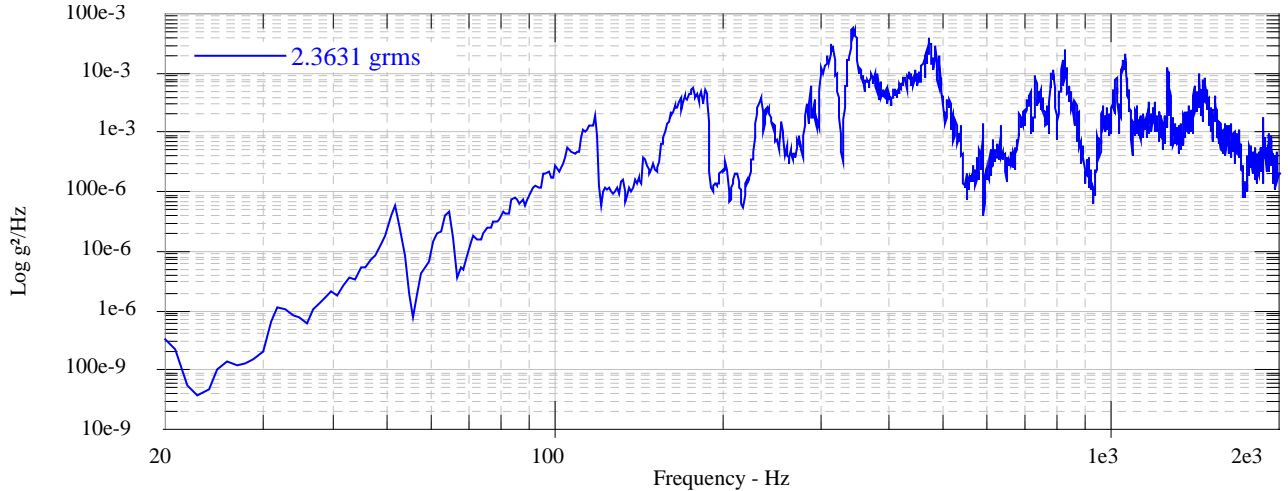
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

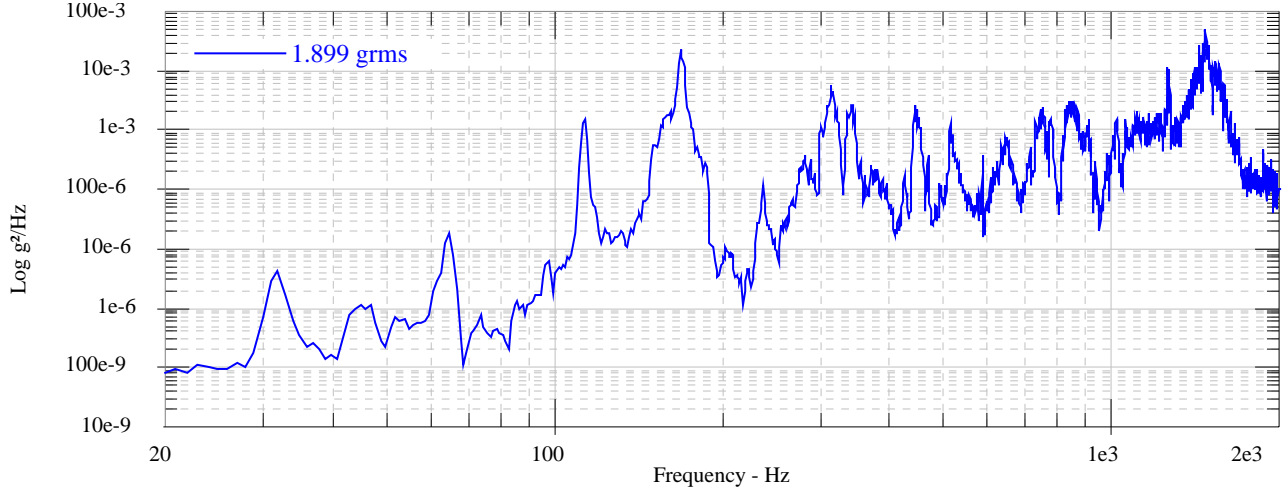


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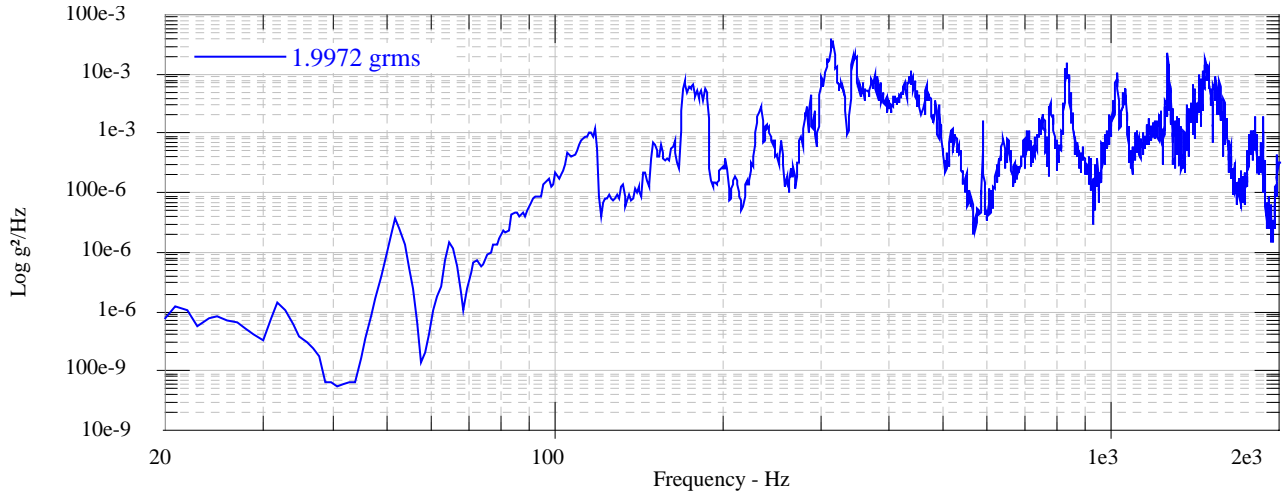
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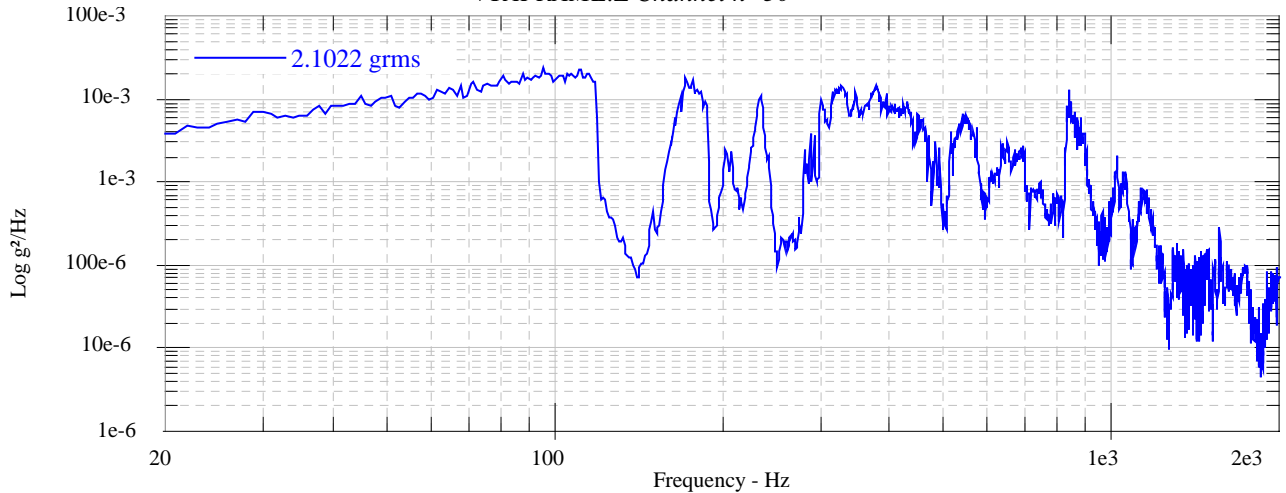
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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12.25 BNS9Z.

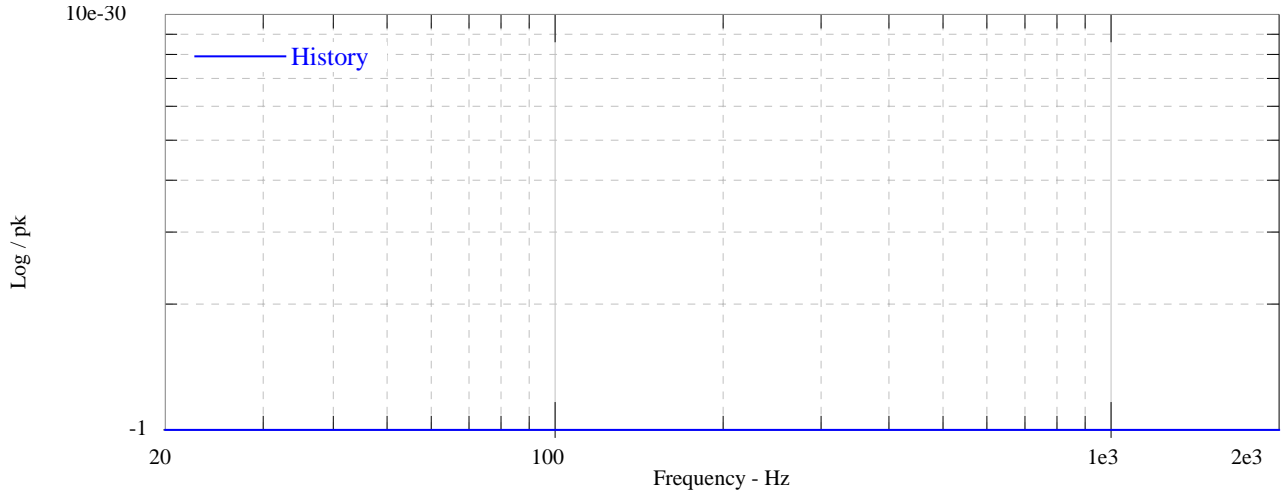
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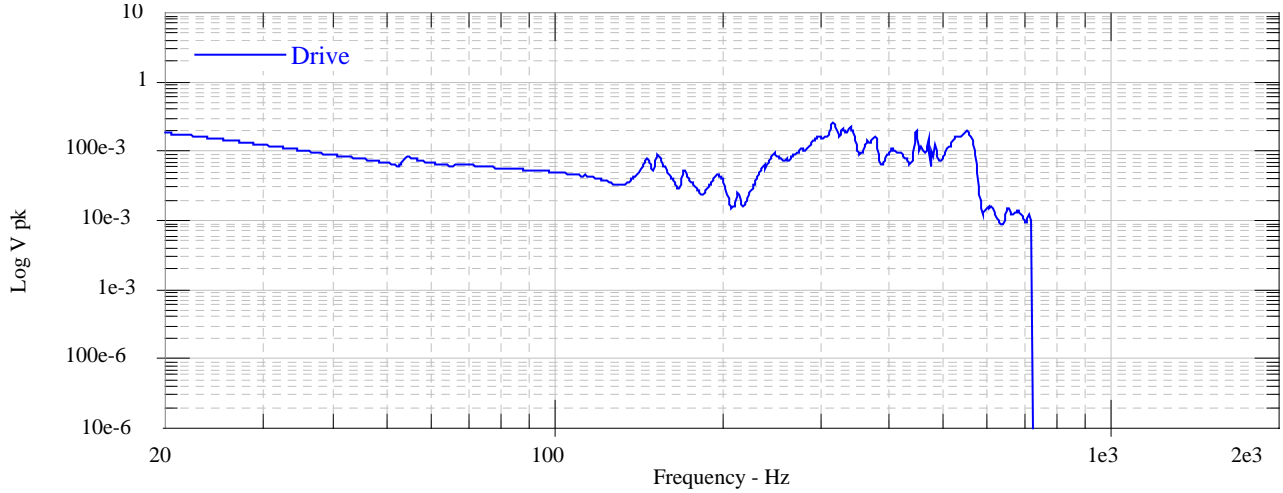
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Date : 8-Apr-04
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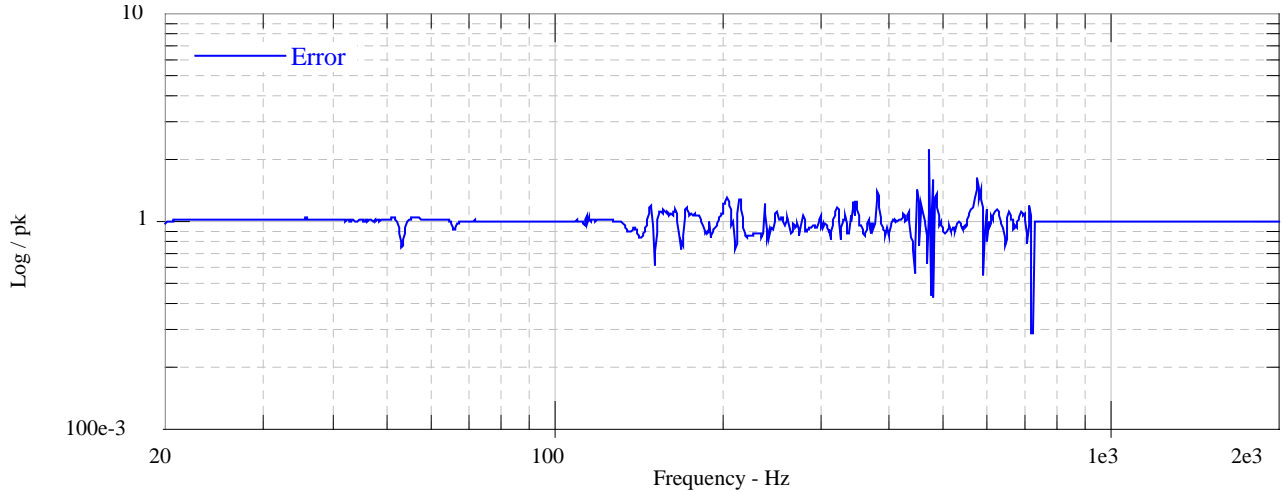
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

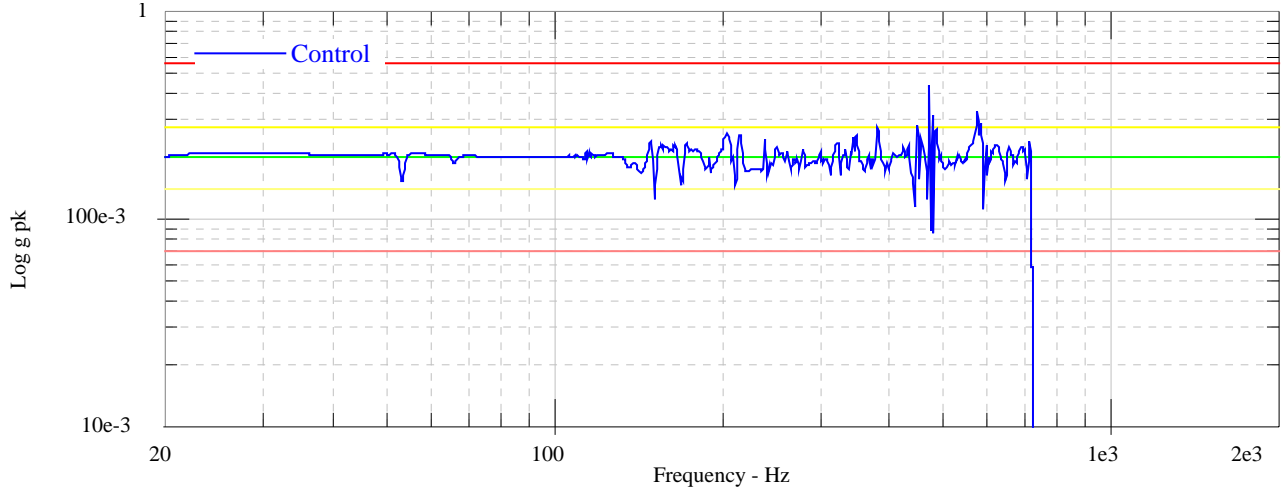


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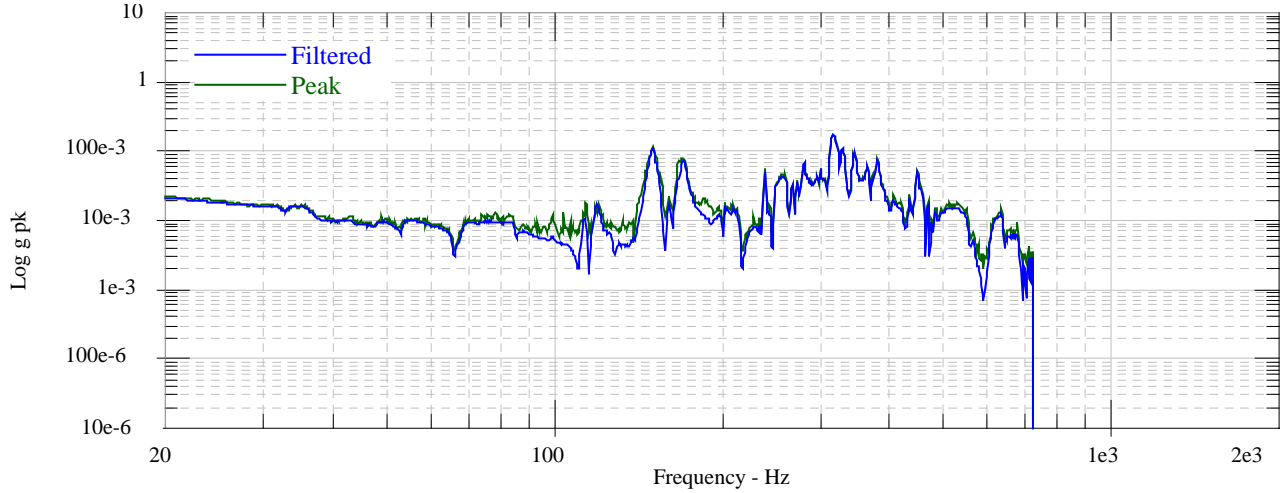
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Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

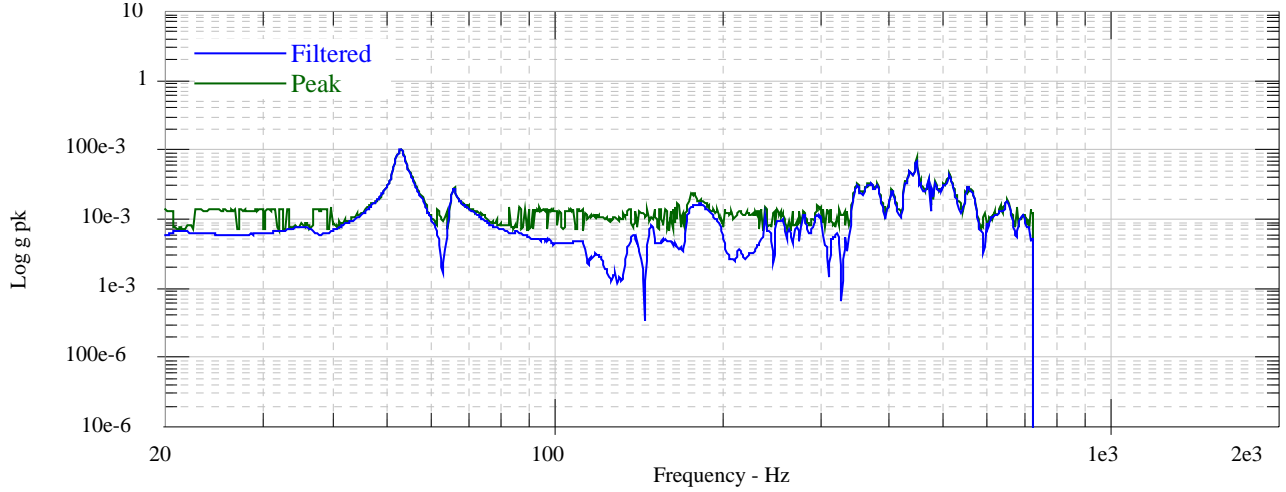


VIBRATION TEST REPORT
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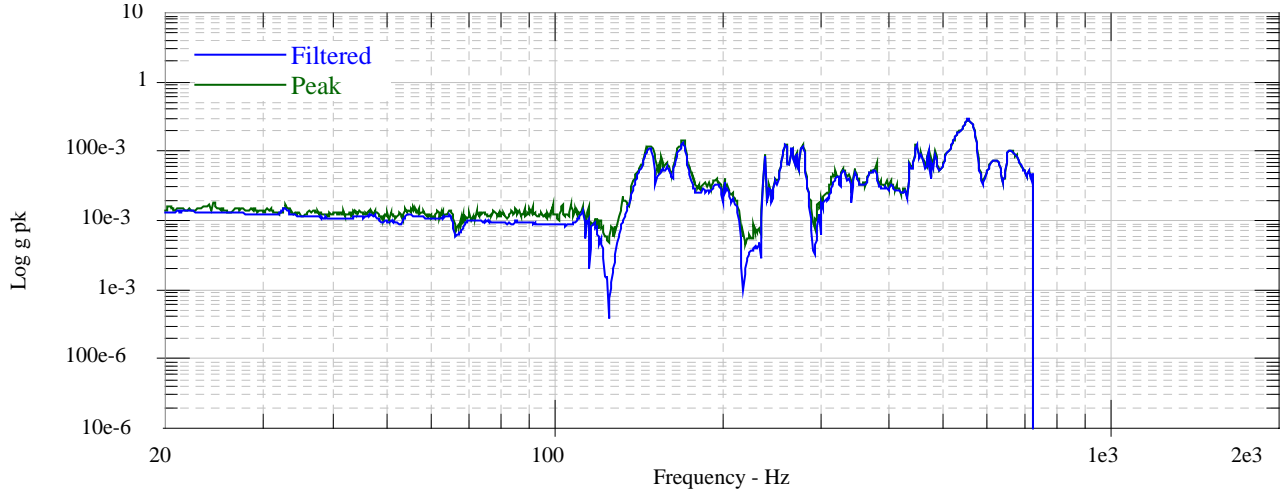
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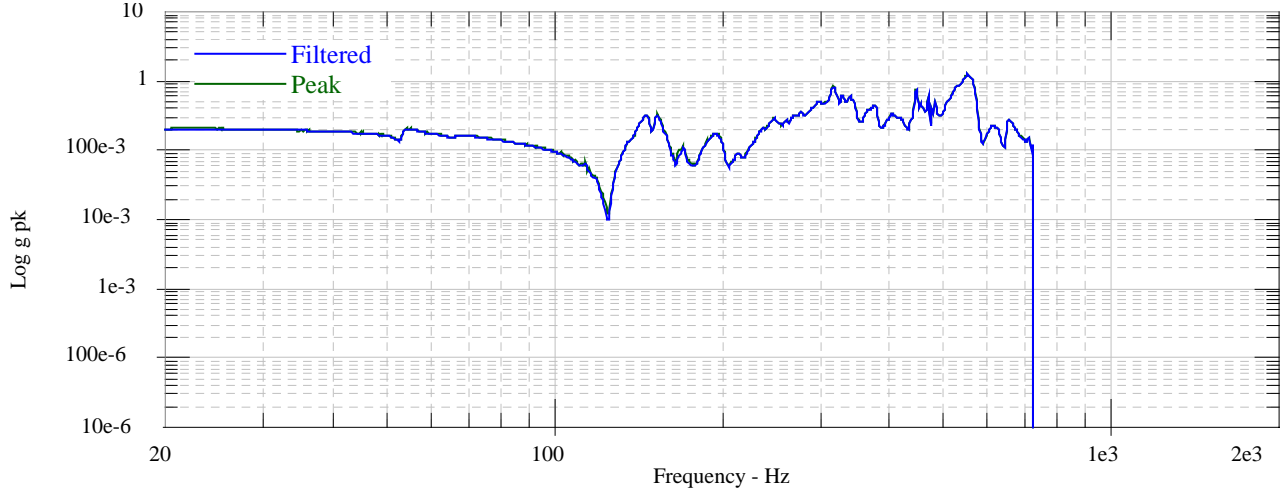
SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

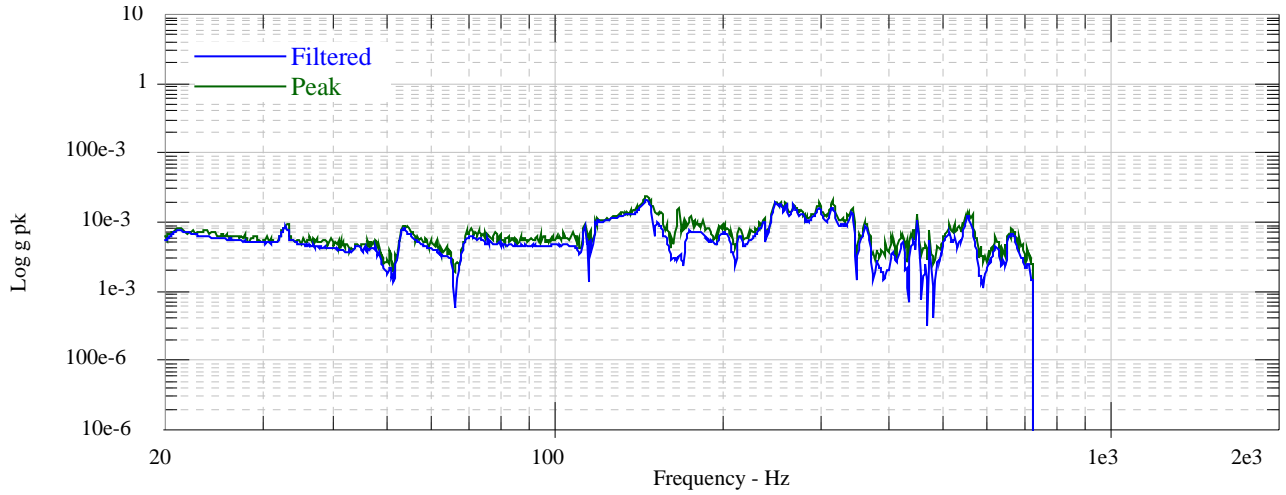


VIBRATION TEST REPORT
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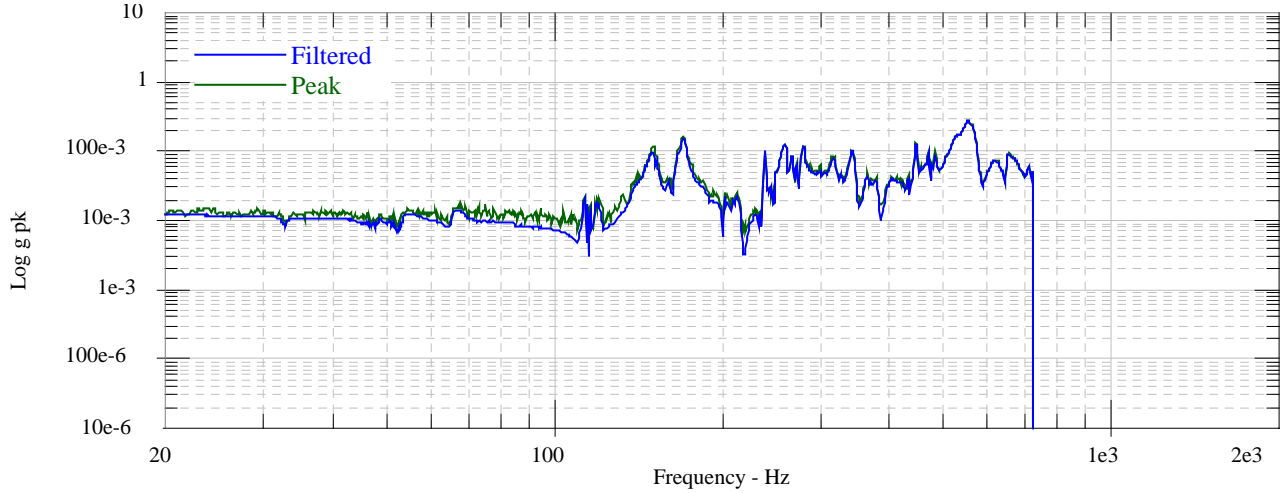
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Date : 8-Apr-04
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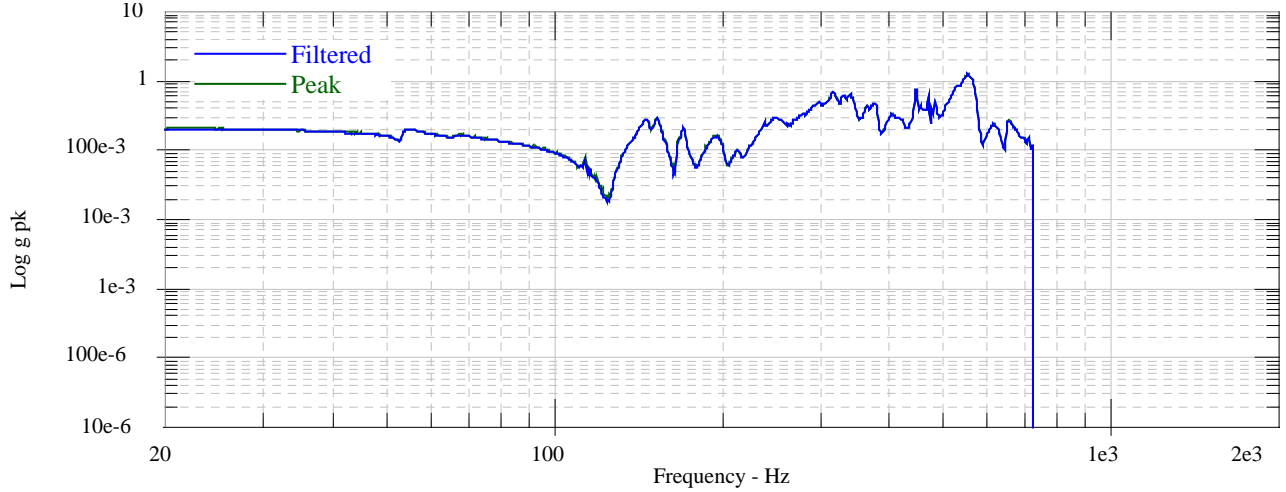
SHK.2.X Channel n° 6



SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

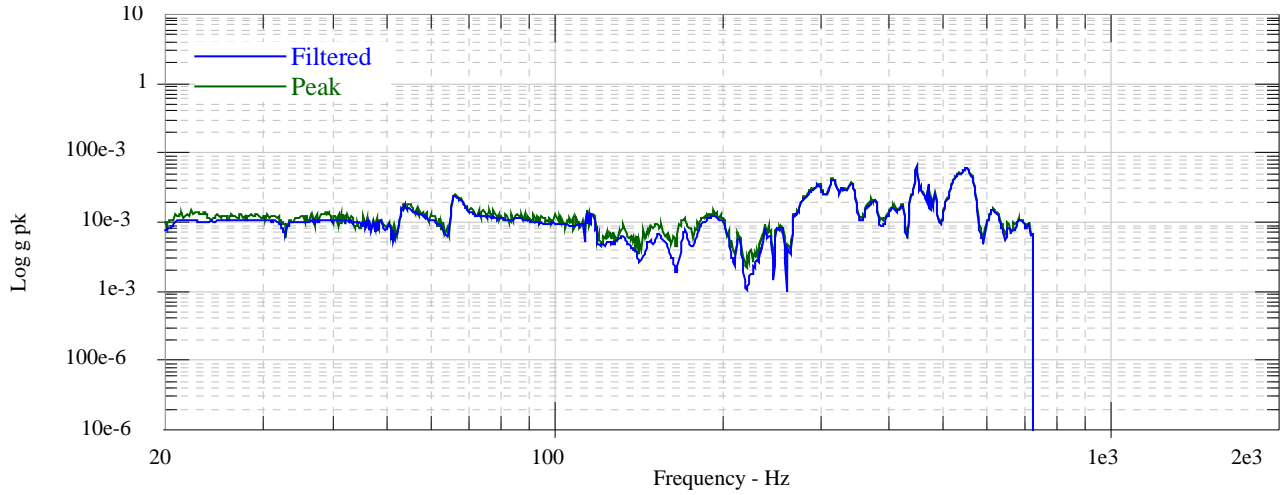


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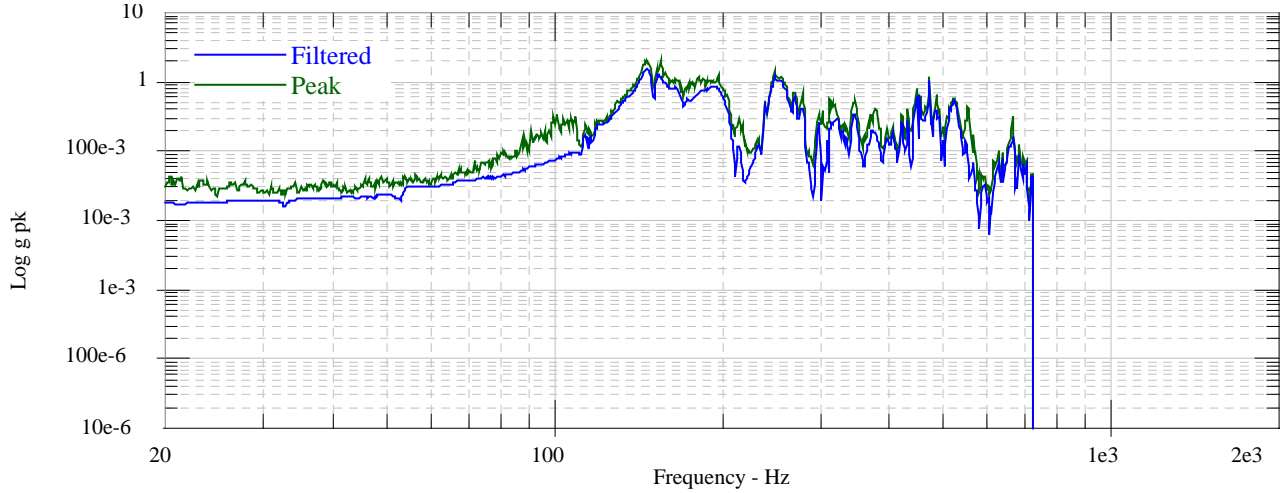
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Date : 8-Apr-04
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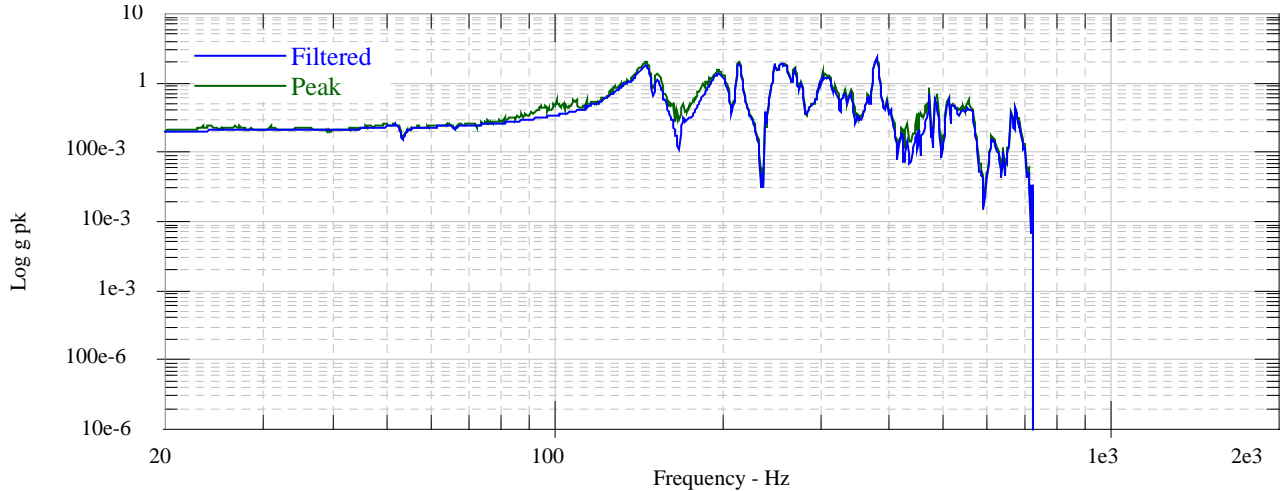
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

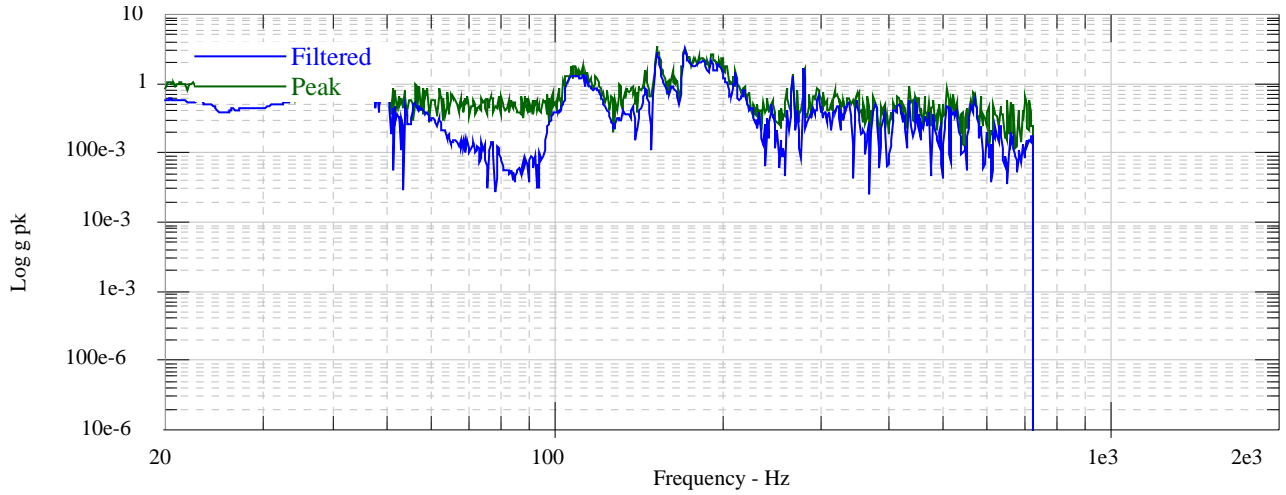


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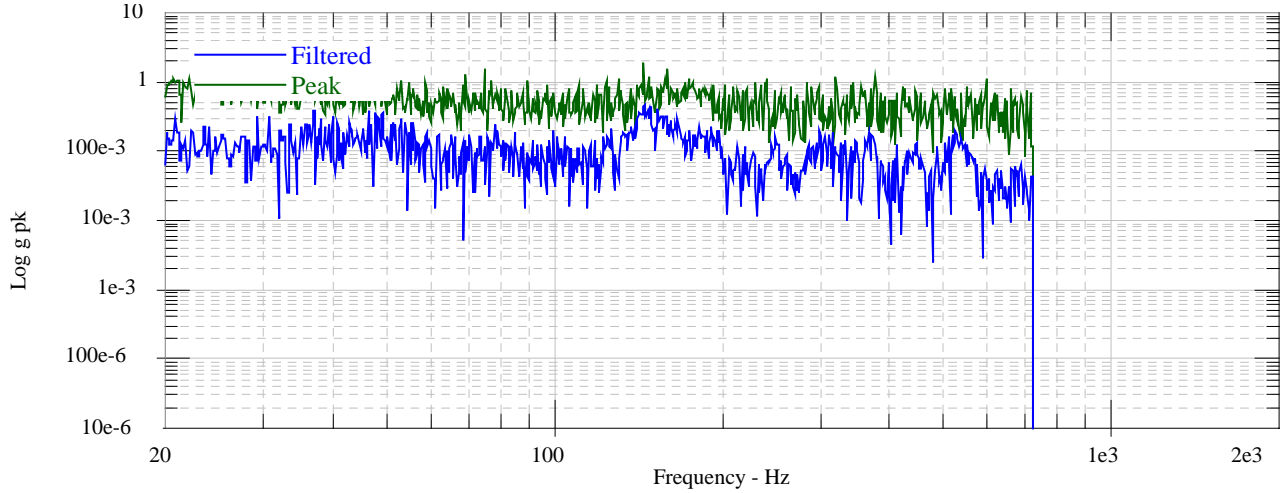
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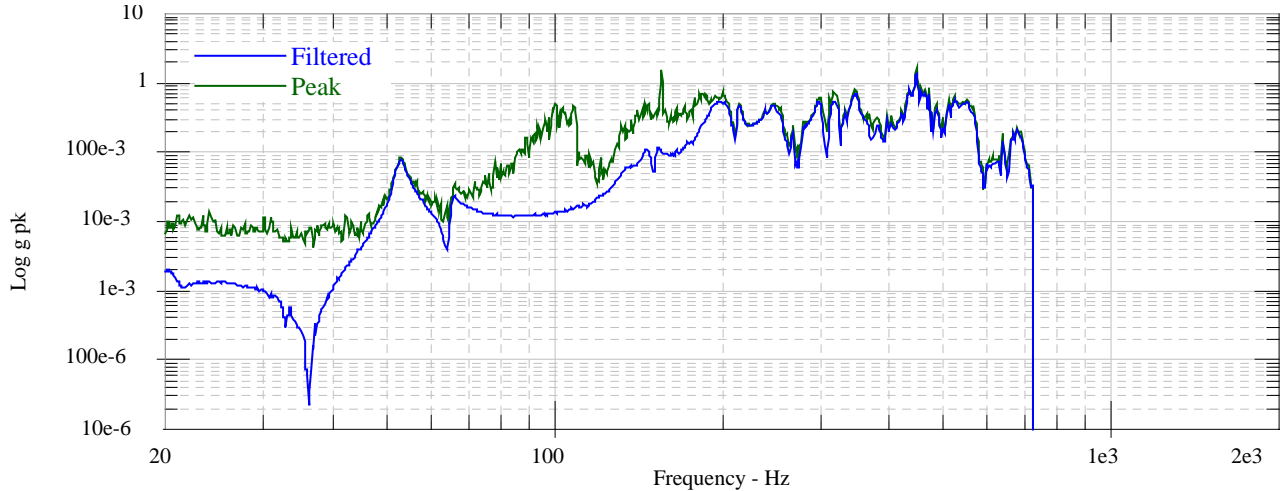
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

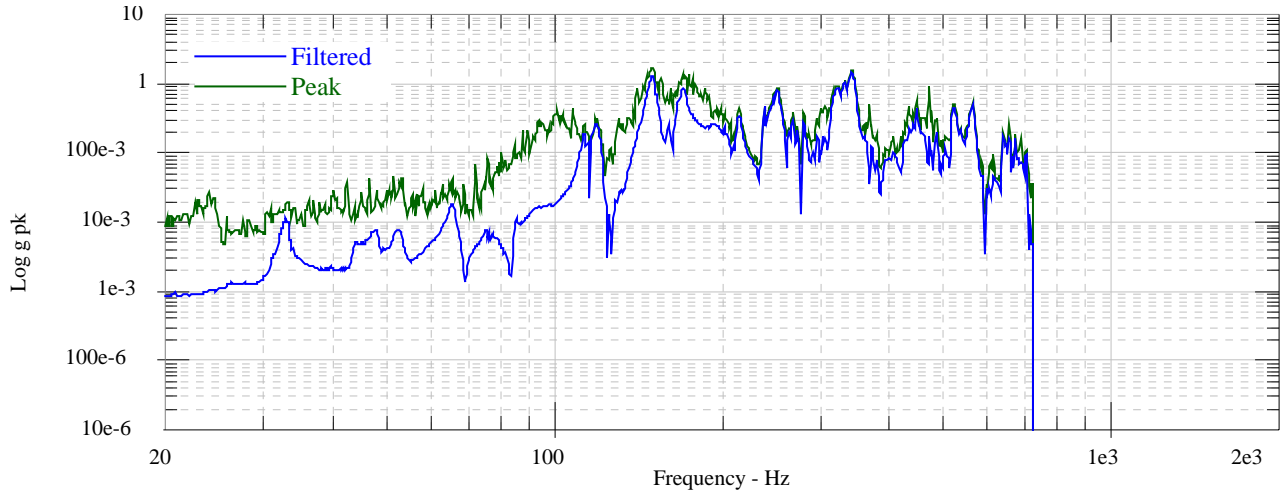


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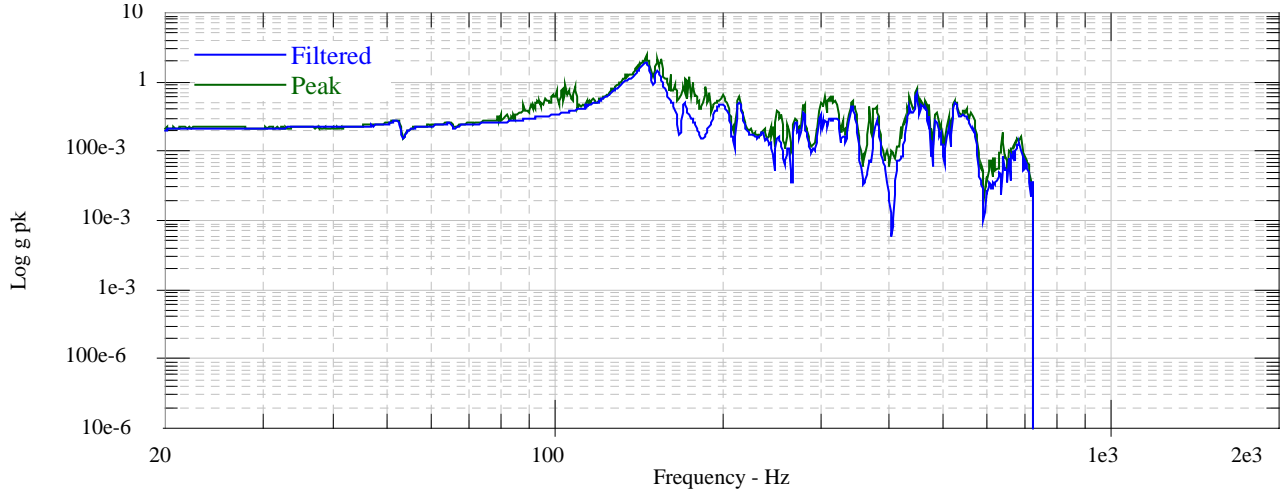
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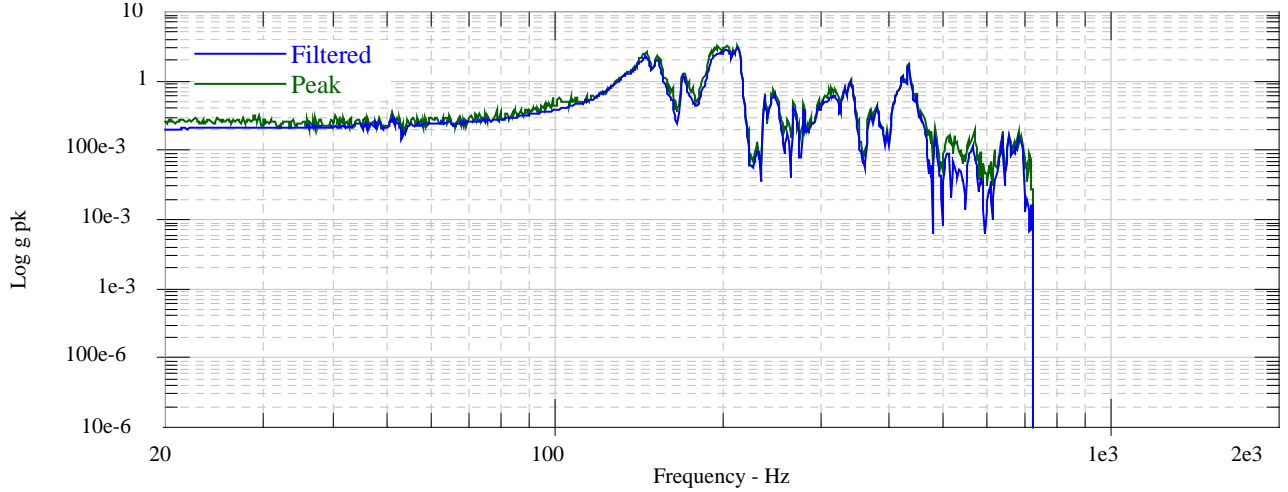
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

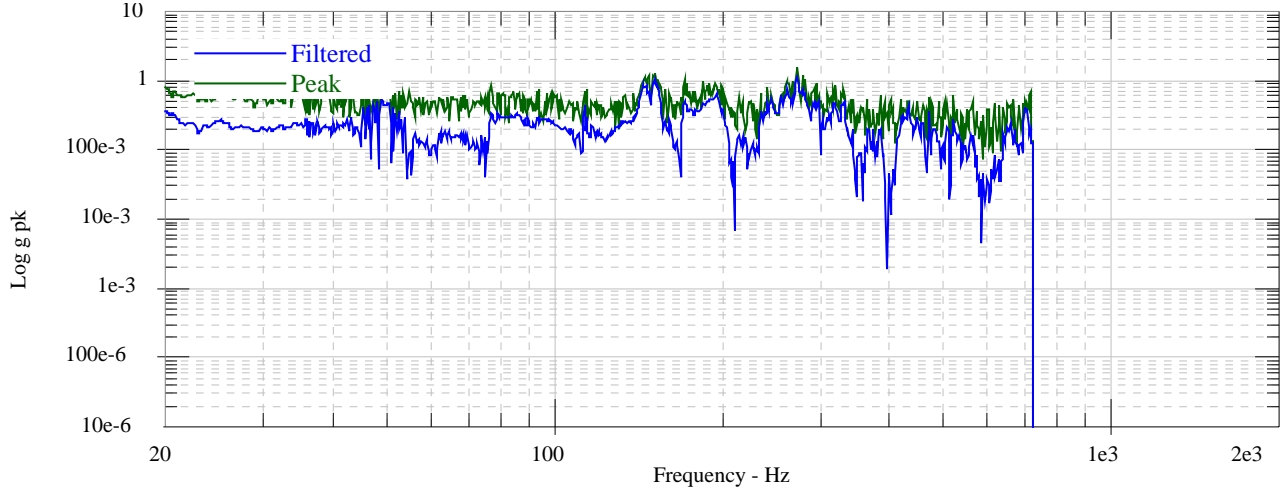


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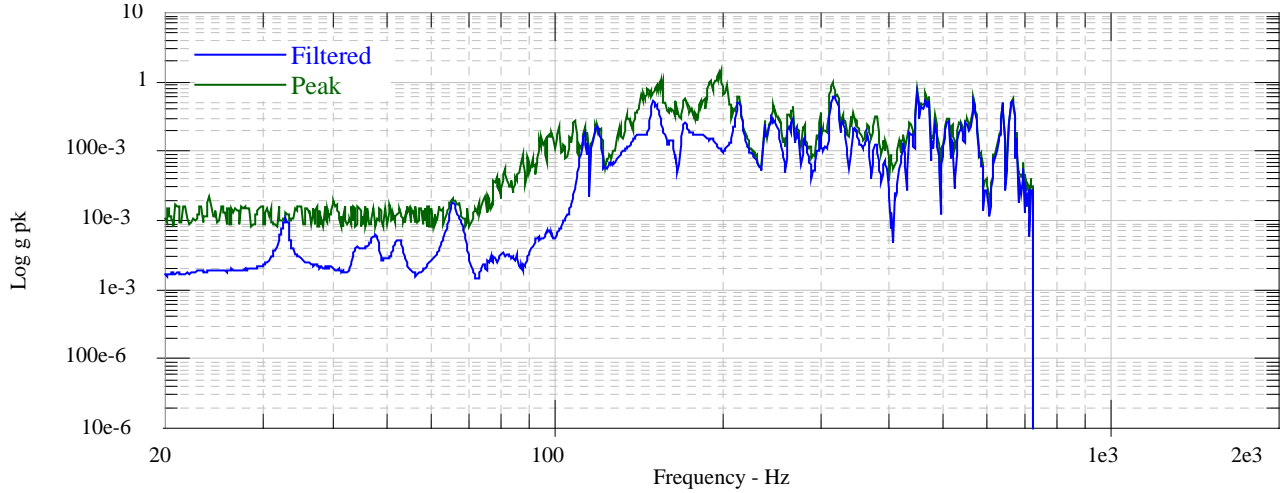
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Date : 8-Apr-04
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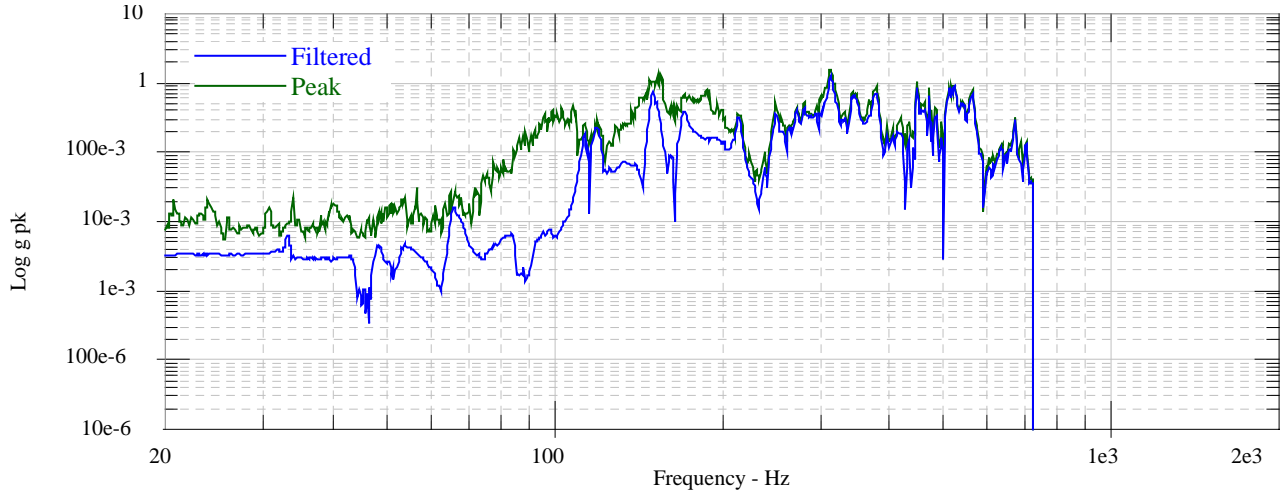
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

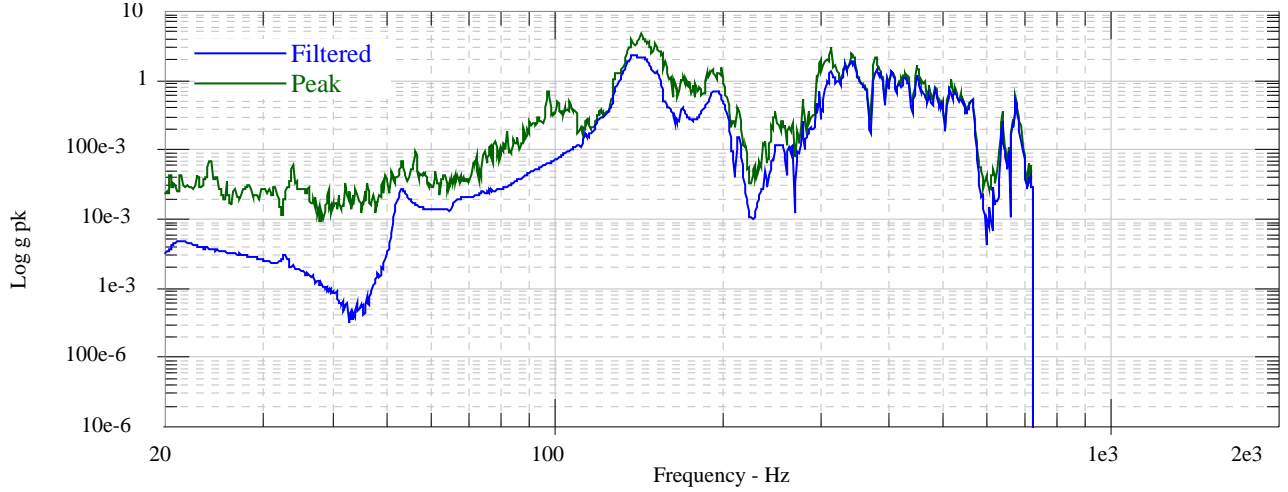


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SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

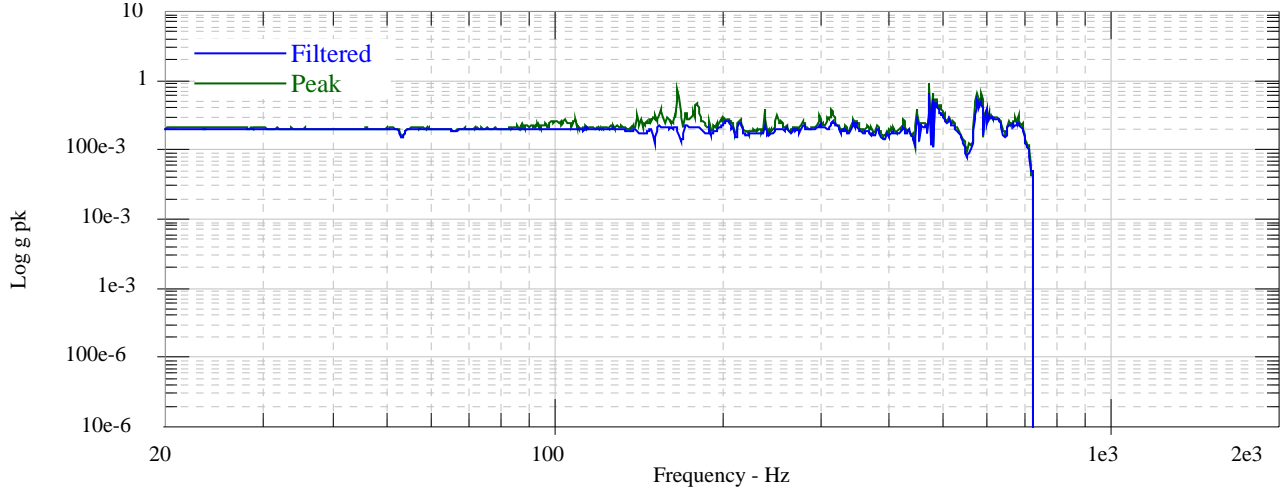


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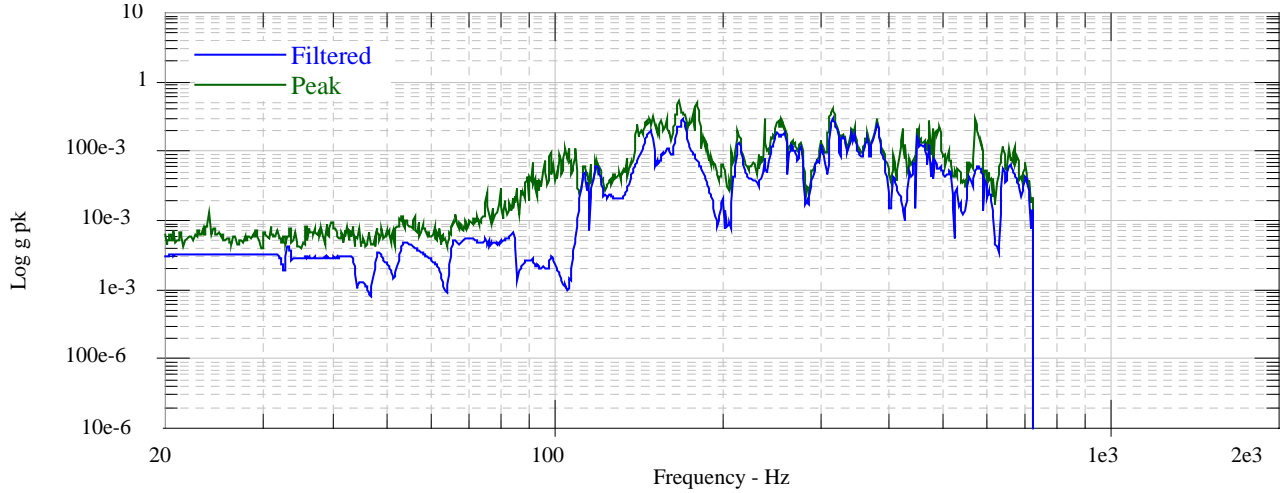
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Date : 8-Apr-04
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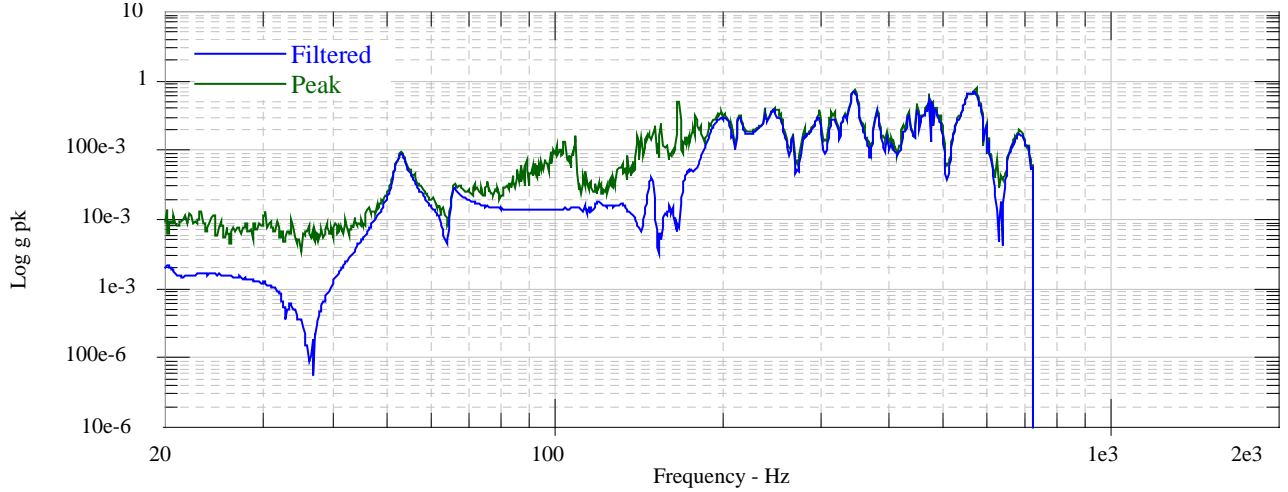
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26



VIBRATION TEST REPORT
SPIRE QM

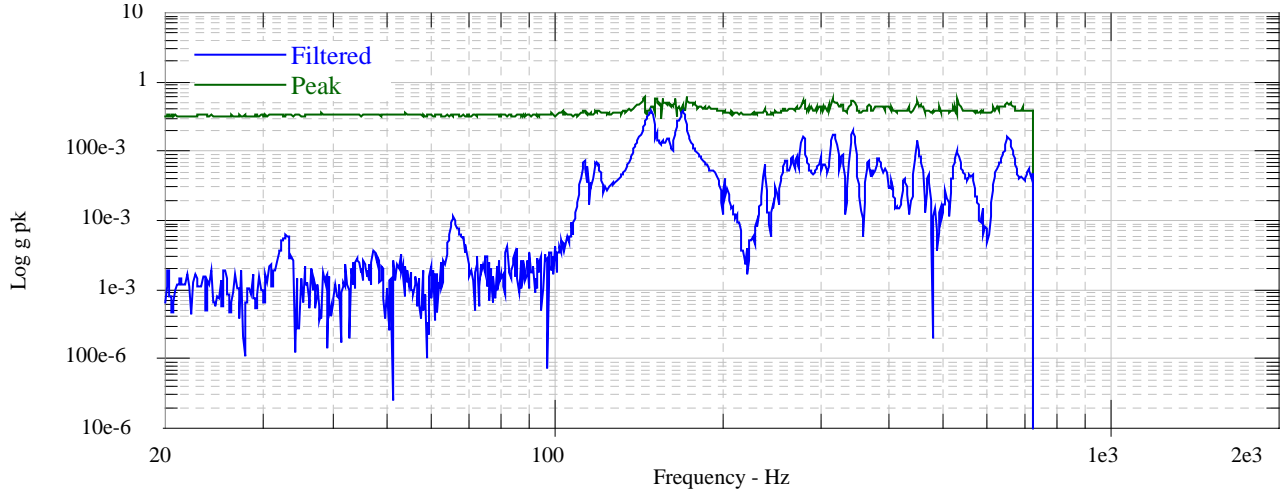
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Date : 8-Apr-04
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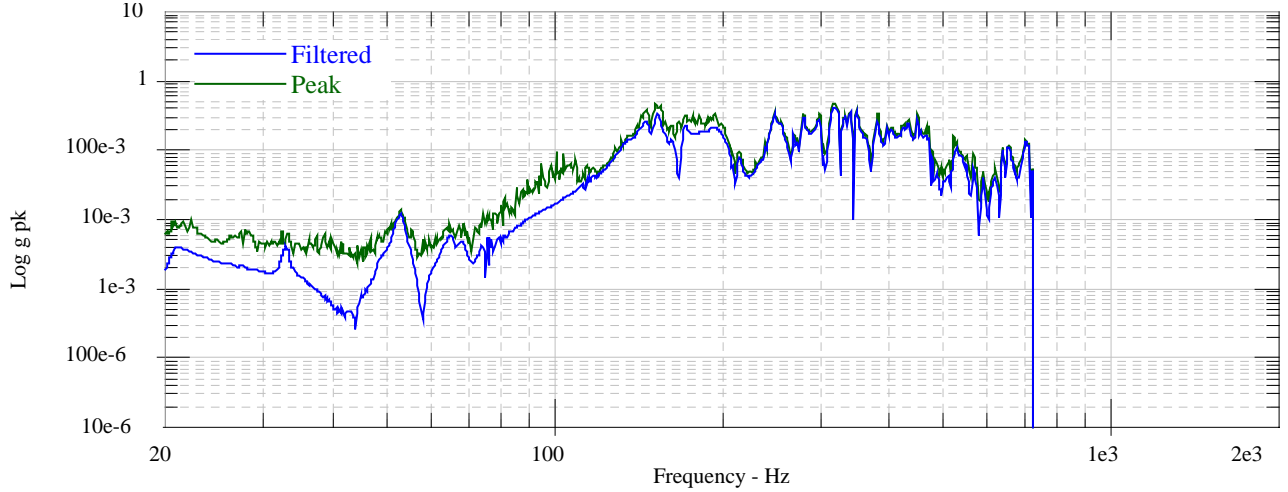
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

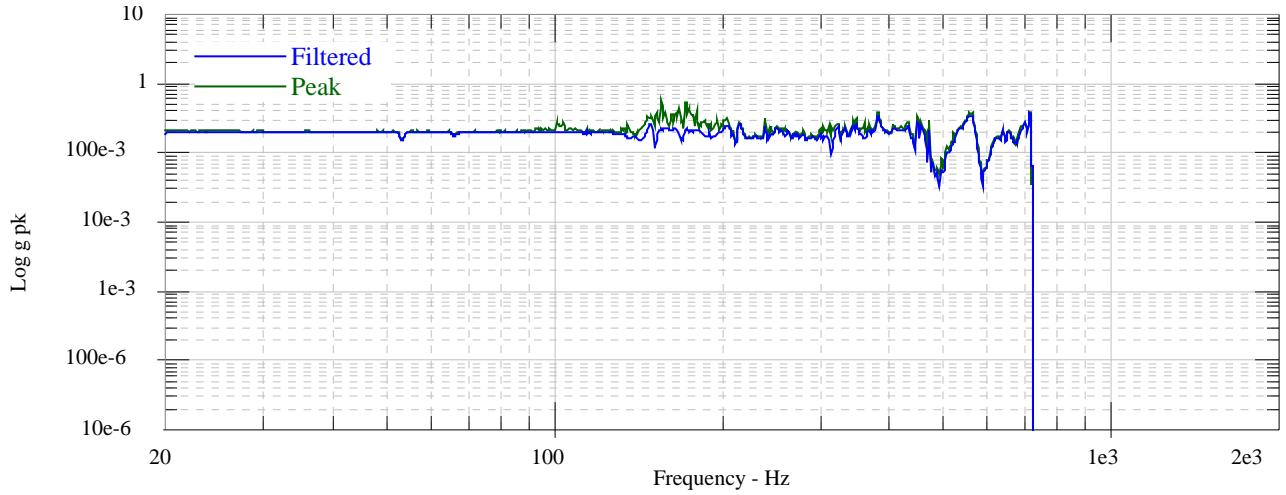


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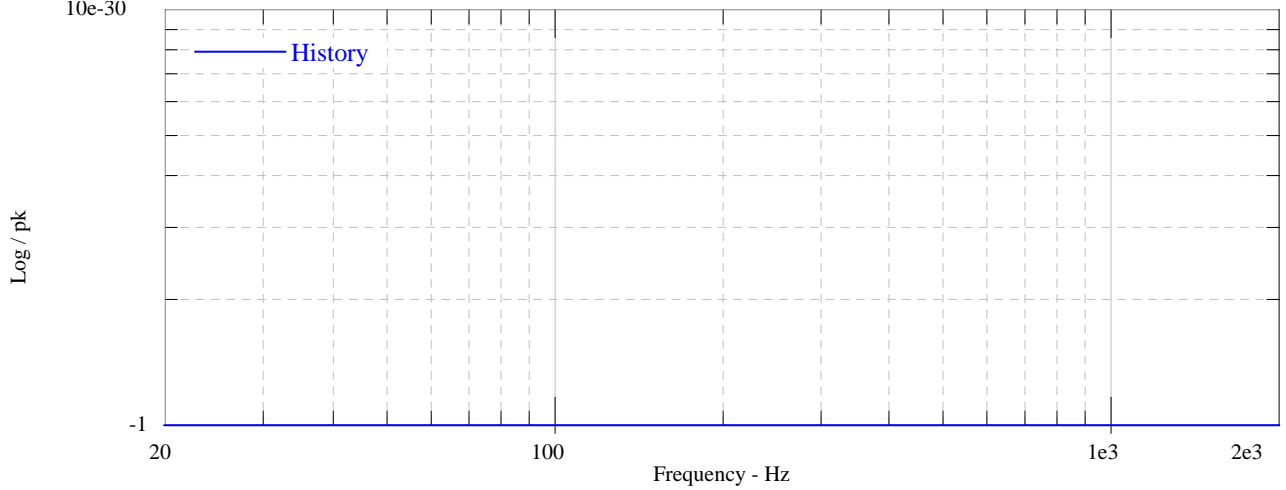
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+YAFRAME.Z Channel n° 30

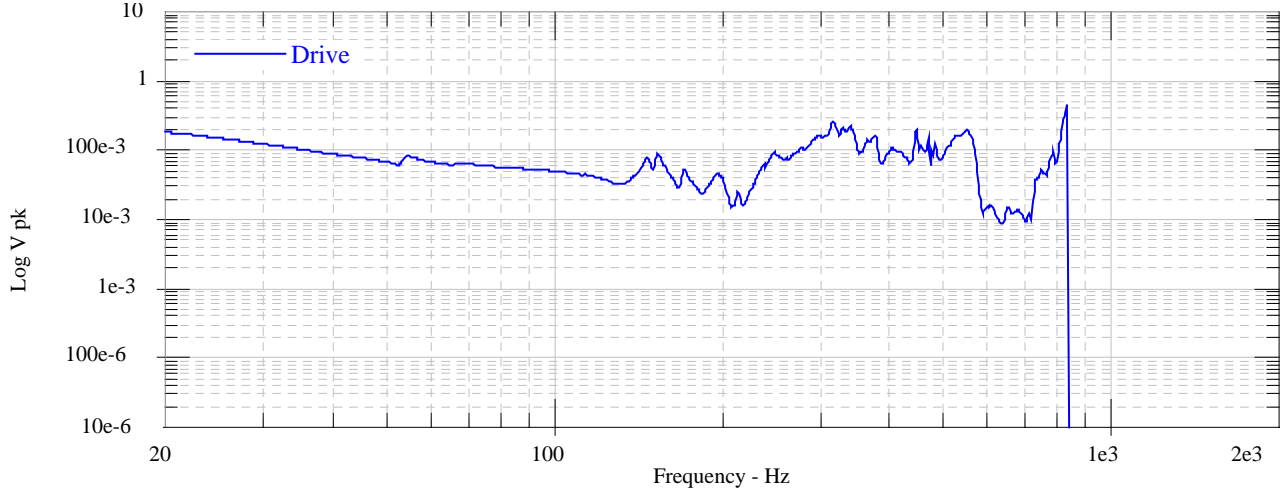


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History Channel n° -3



Drive Channel n° -2

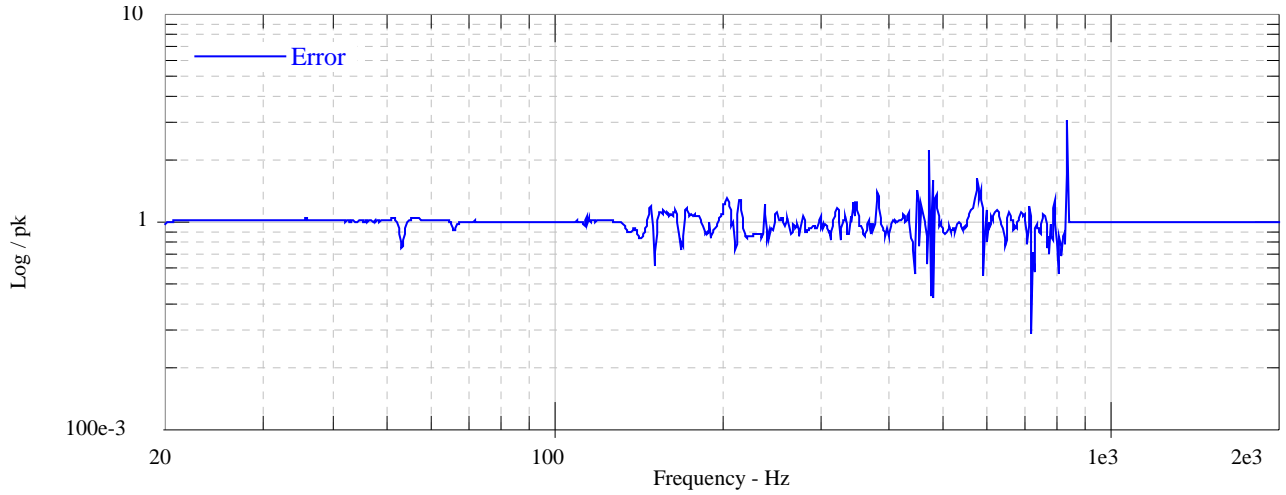


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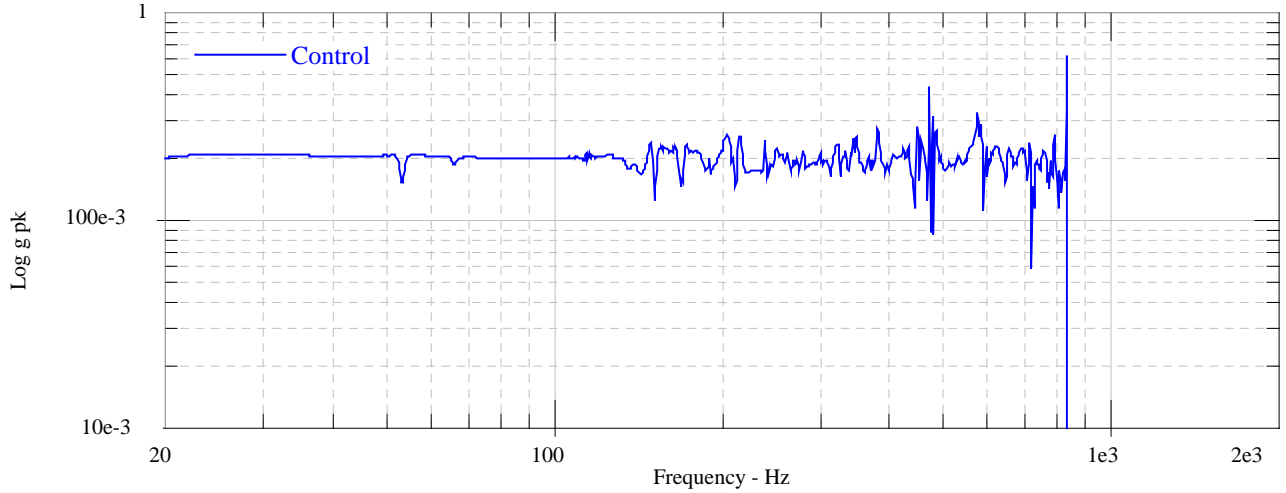
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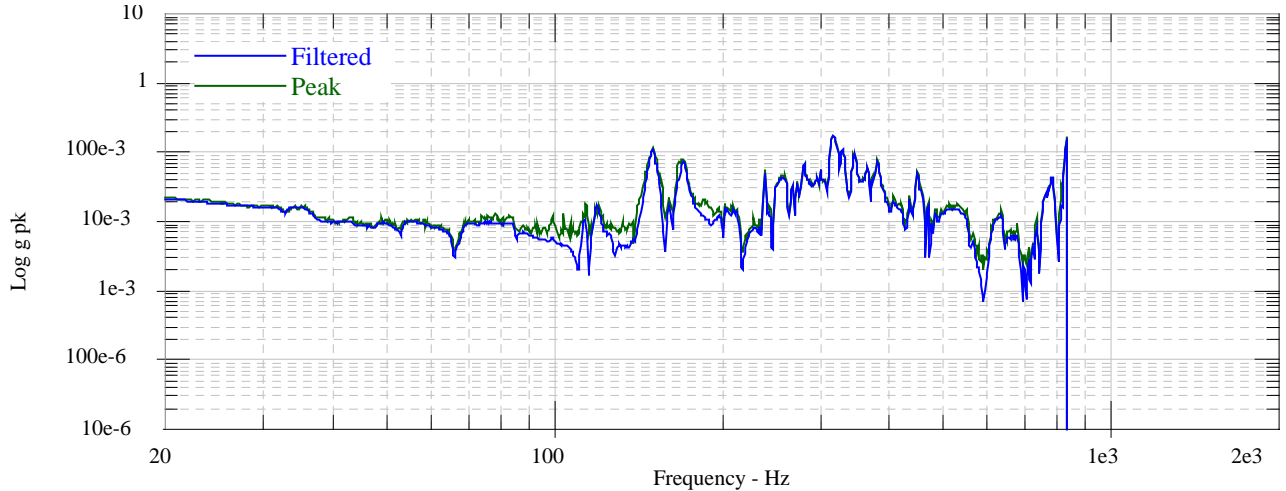
Error Channel n° -1



Control Channel n° 0



SHK.1.Y Channel n° 1

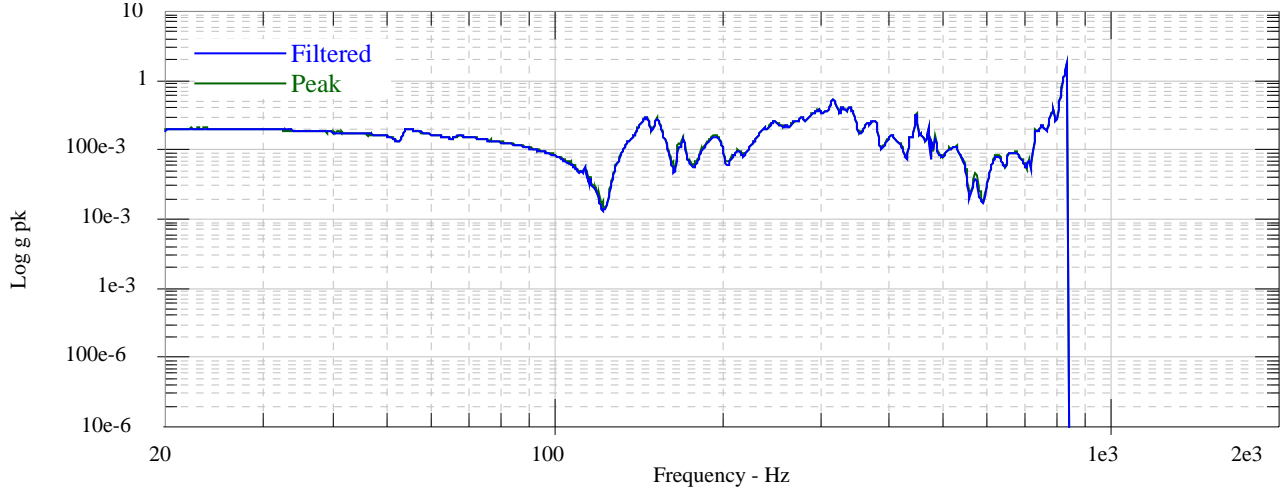


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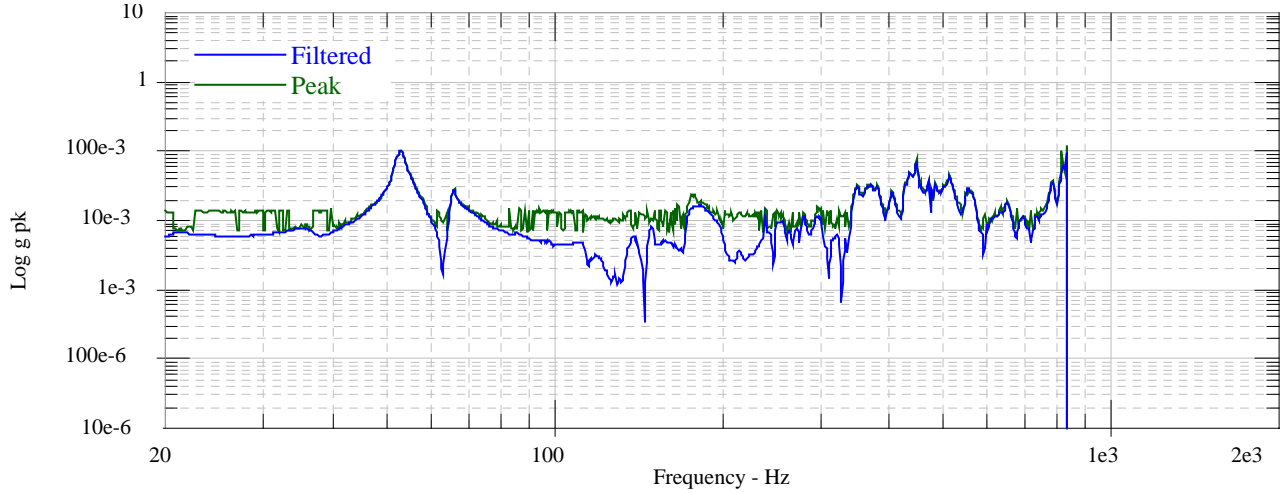
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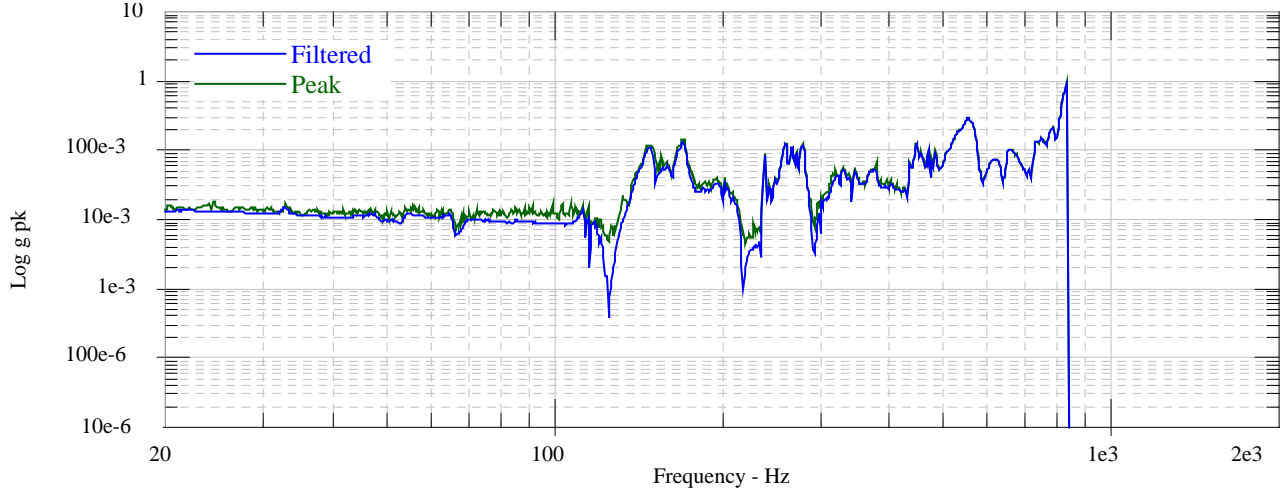
SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4

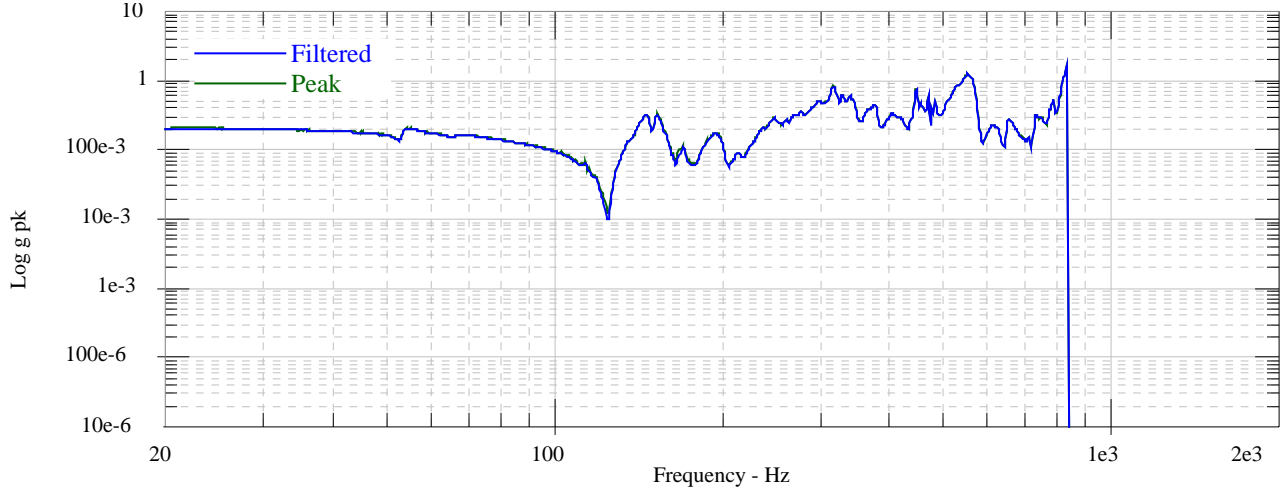


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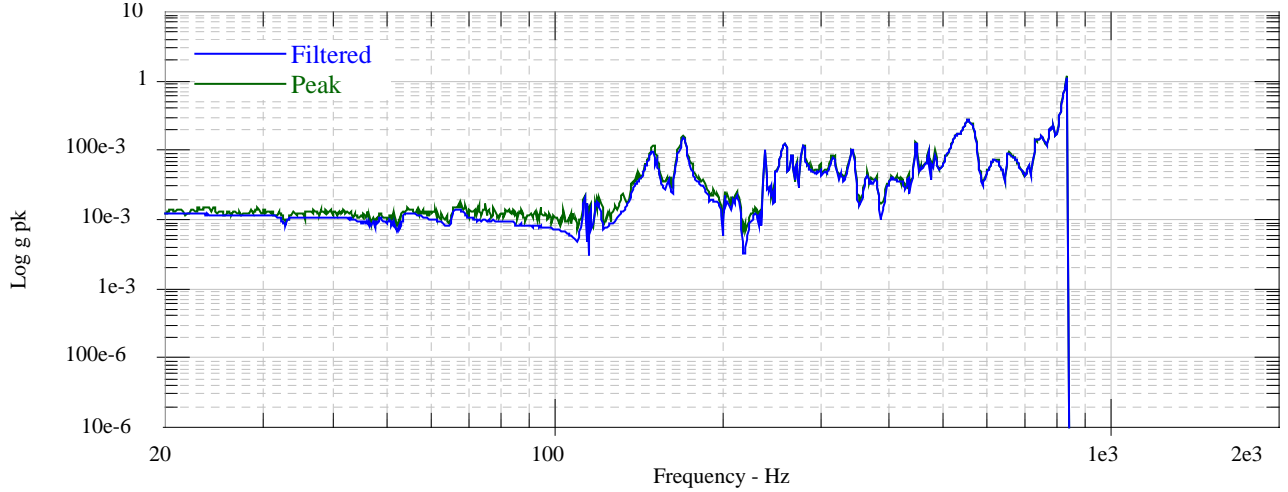
SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6



SHK.3.Y Channel n° 7

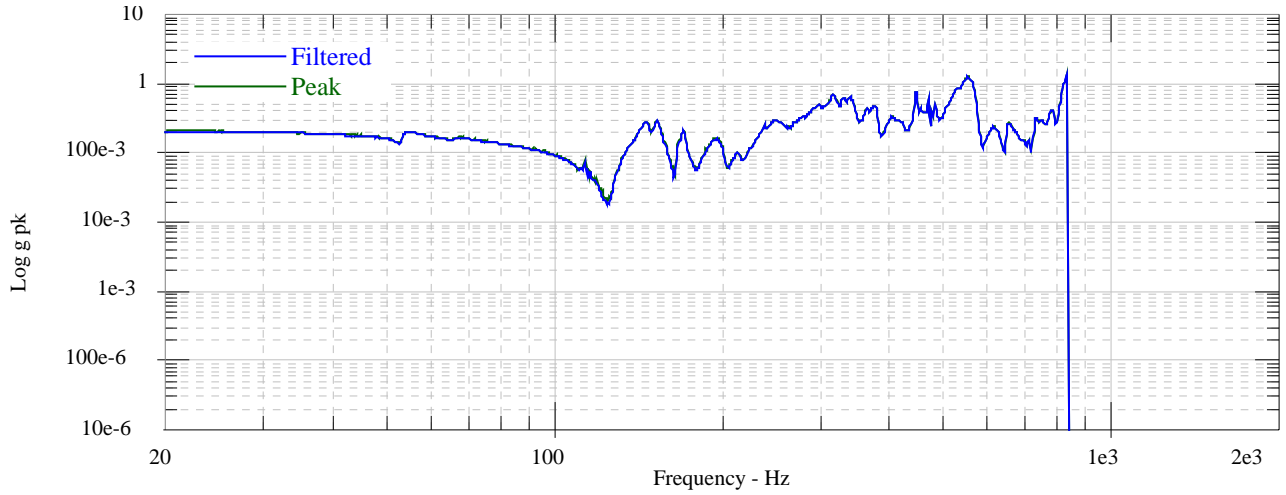


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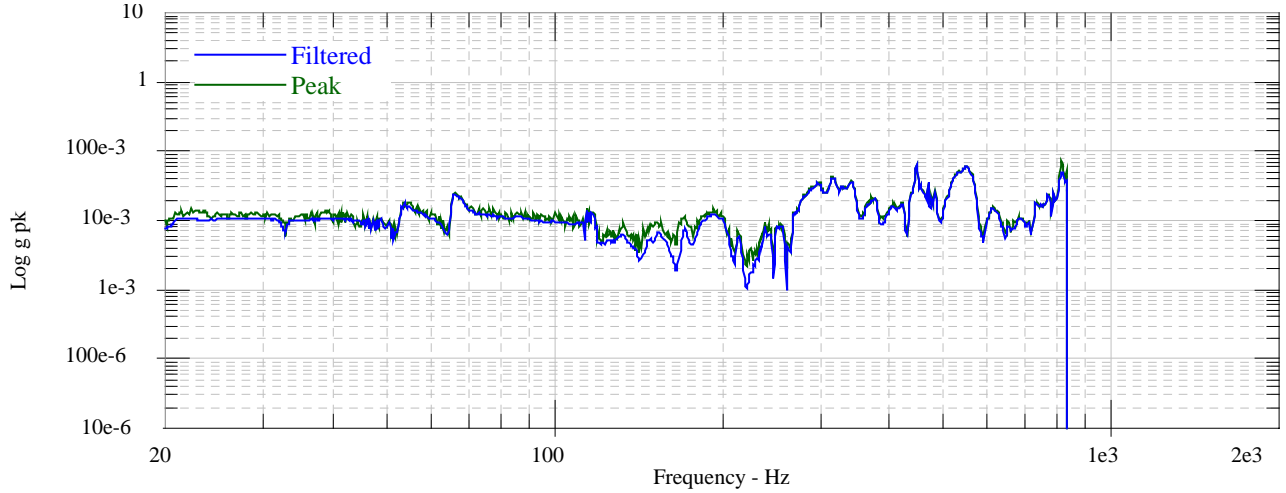
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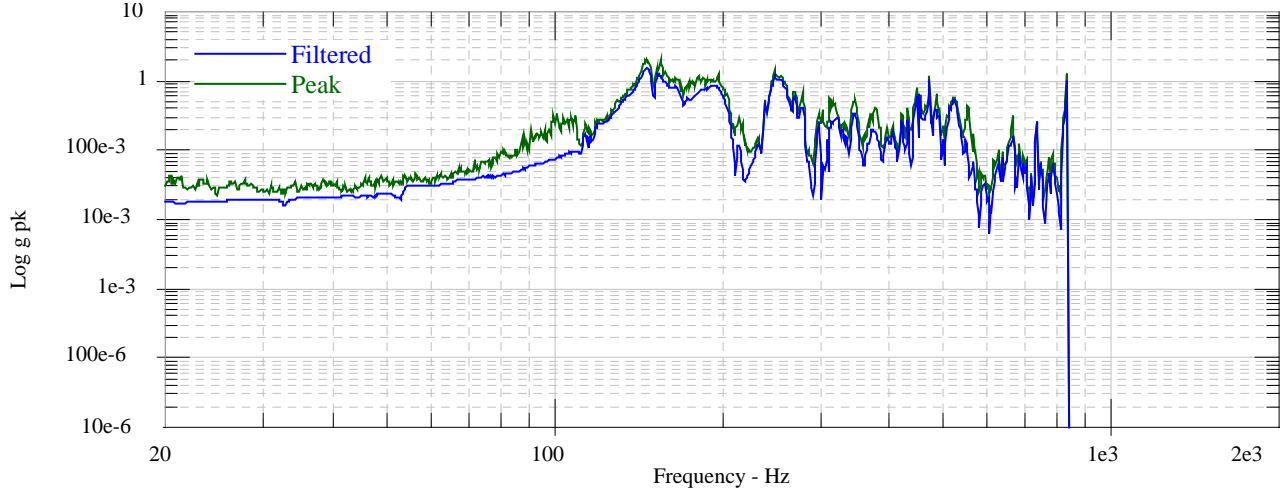
SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9



PHS.XY Channel n° 10

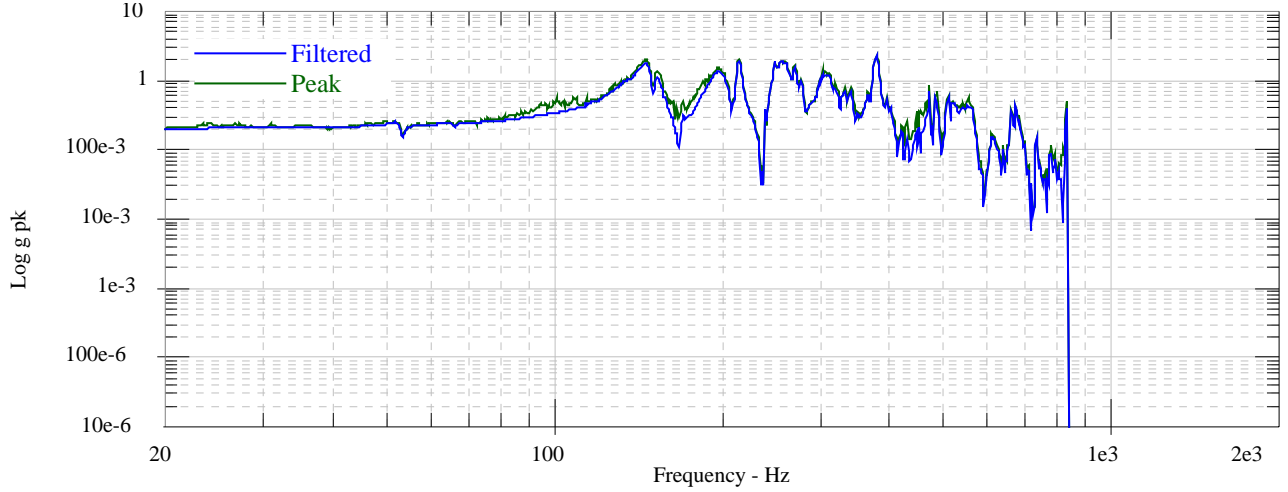


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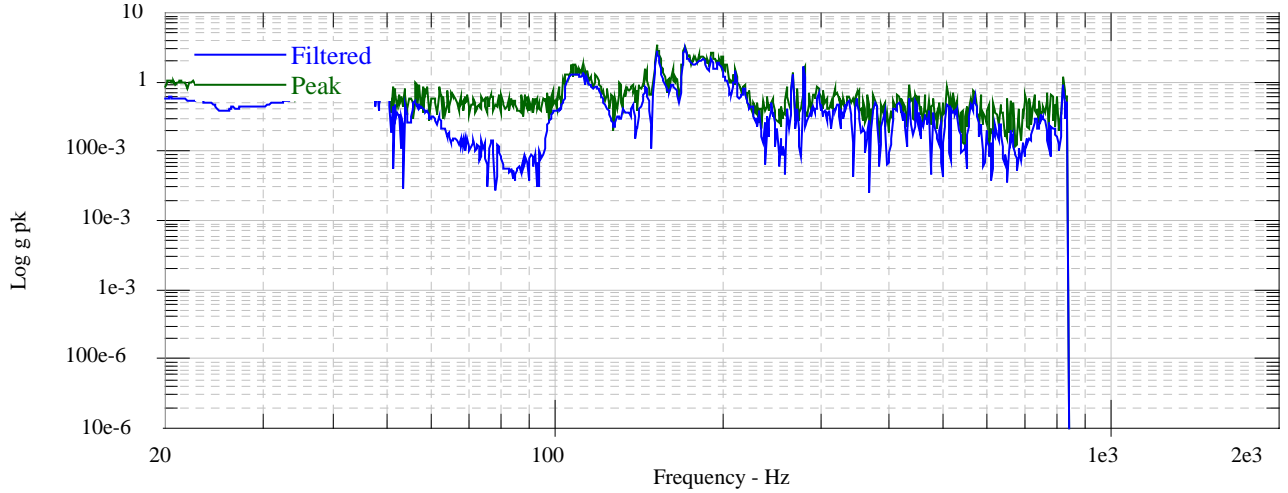
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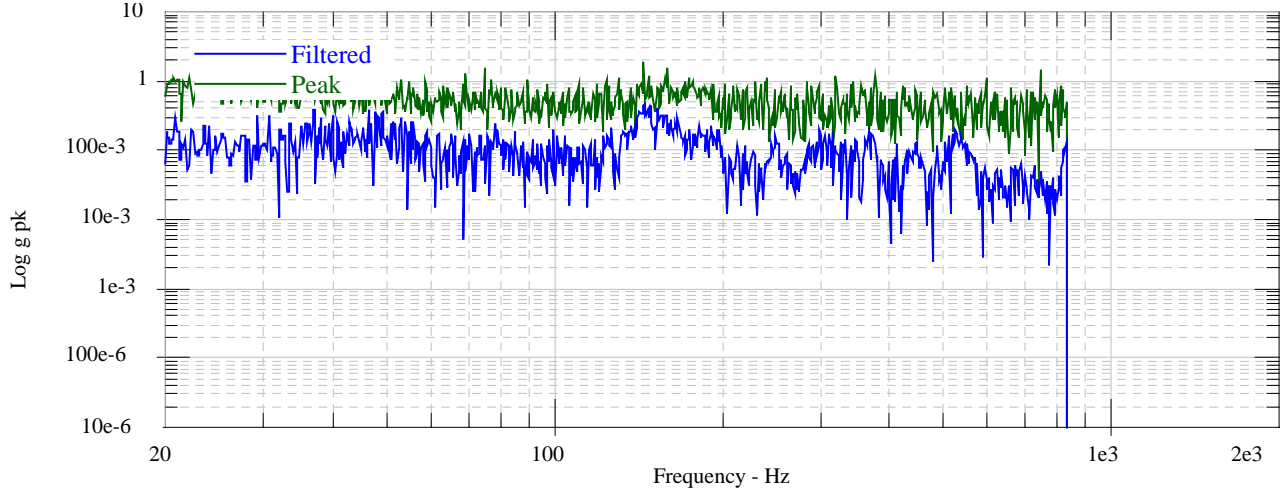
PHS.Z Channel n° 11



PHE.XY Channel n° 12



COOLX Channel n° 13



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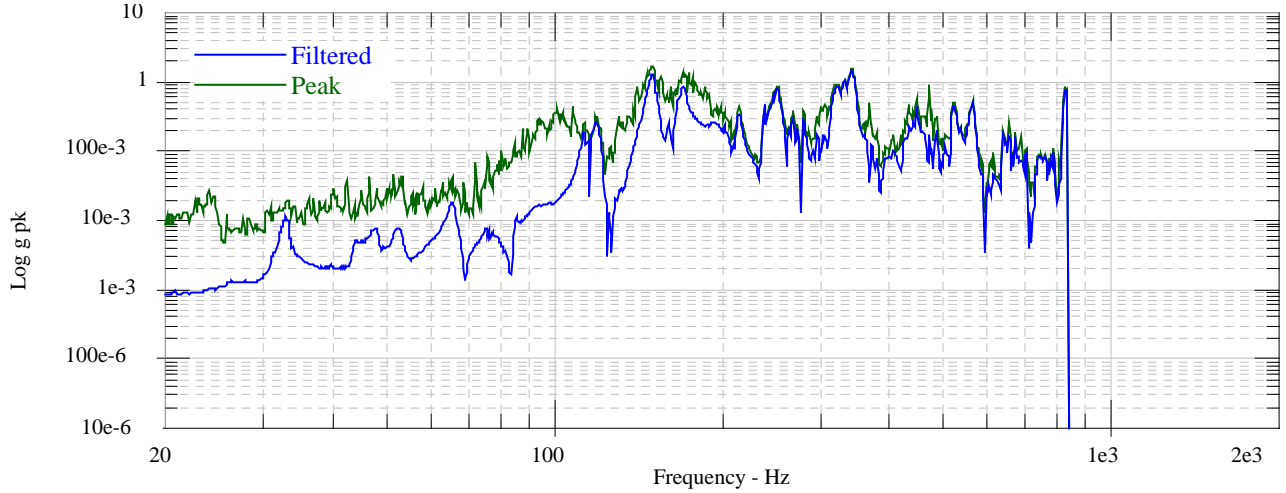
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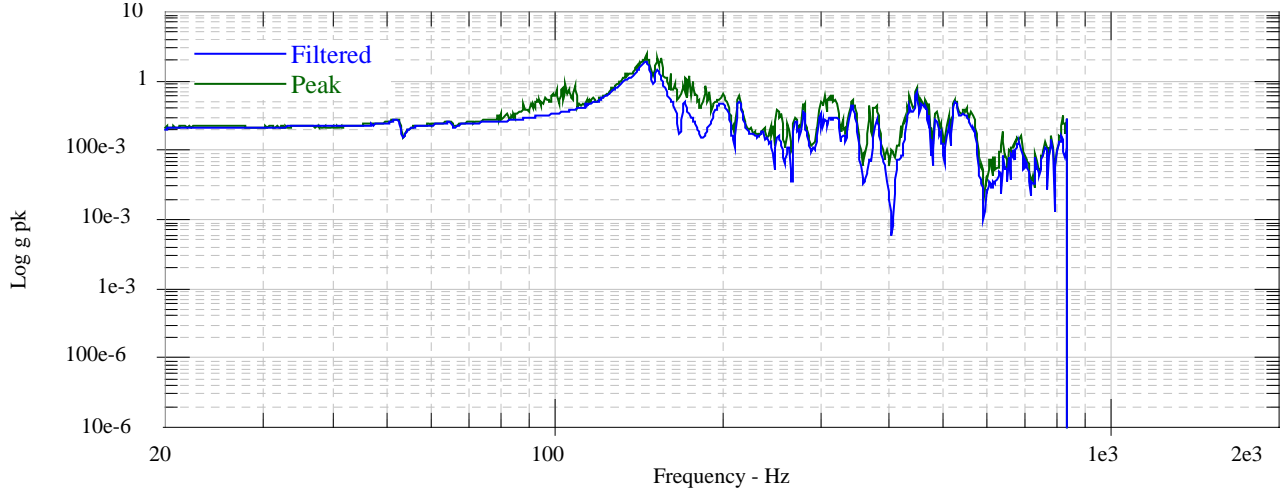
FPU.X Channel n° 14



FPU.Y Channel n° 15



FPU.Z Channel n° 16

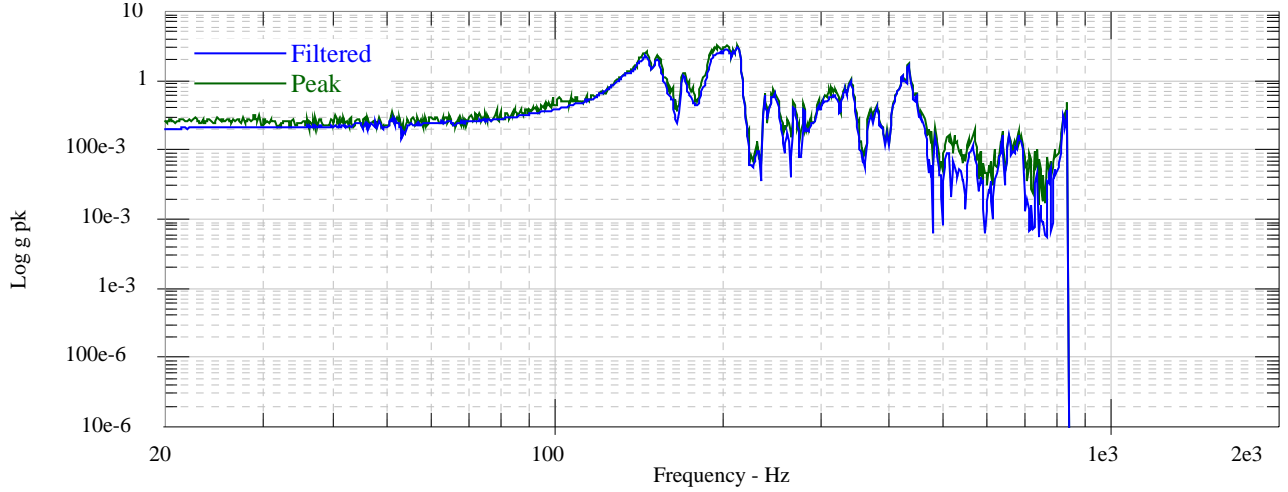


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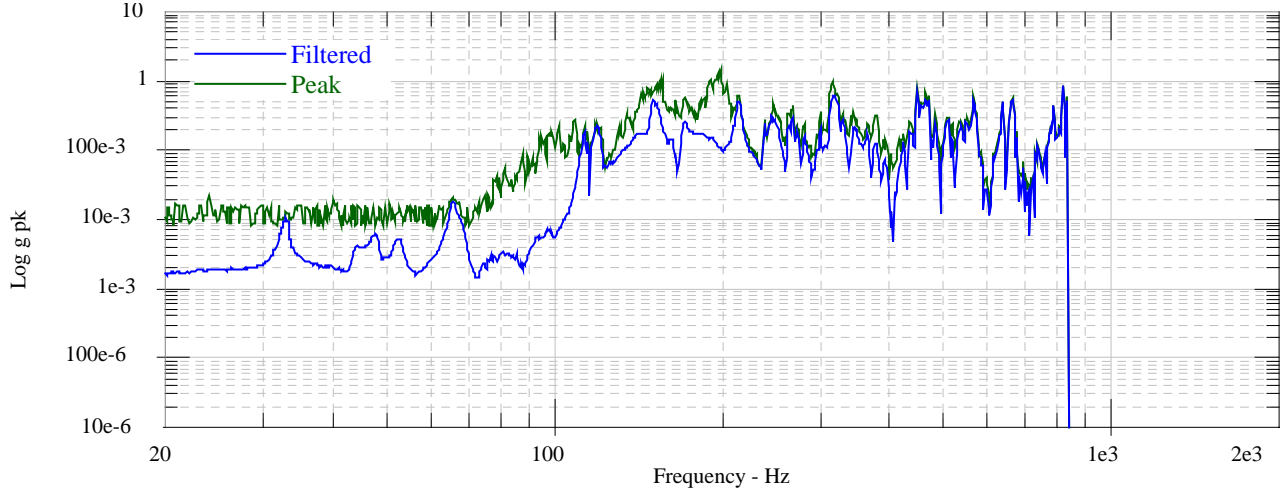
SPEC.X Channel n° 17



SPEC.Z Channel n° 18



SPEC.Y Channel n° 19

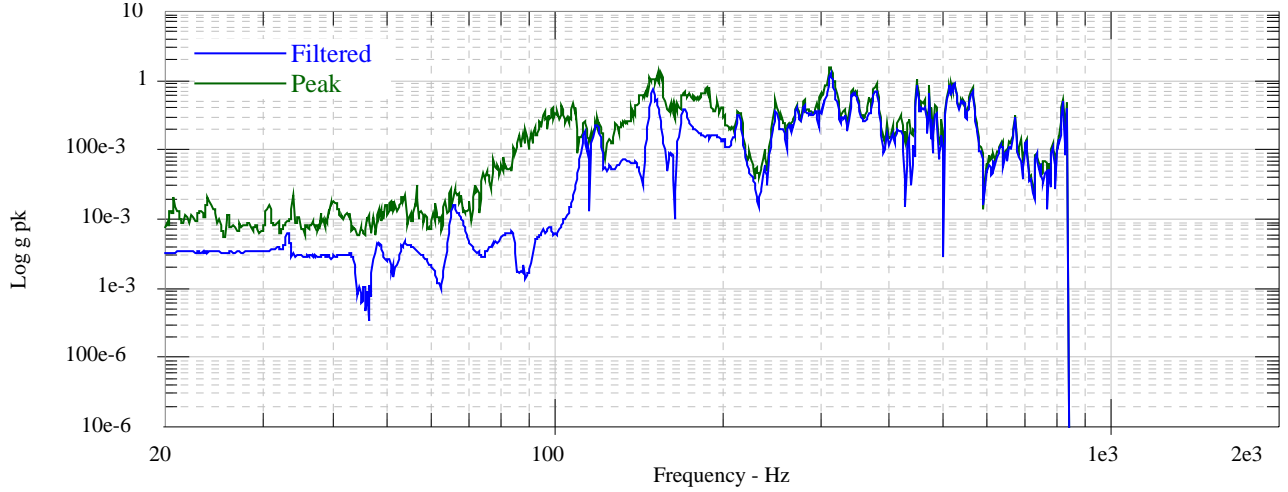


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OB.Y Channel n° 20



SMECL.X Channel n° 21



CTIP.Y Channel n° 22

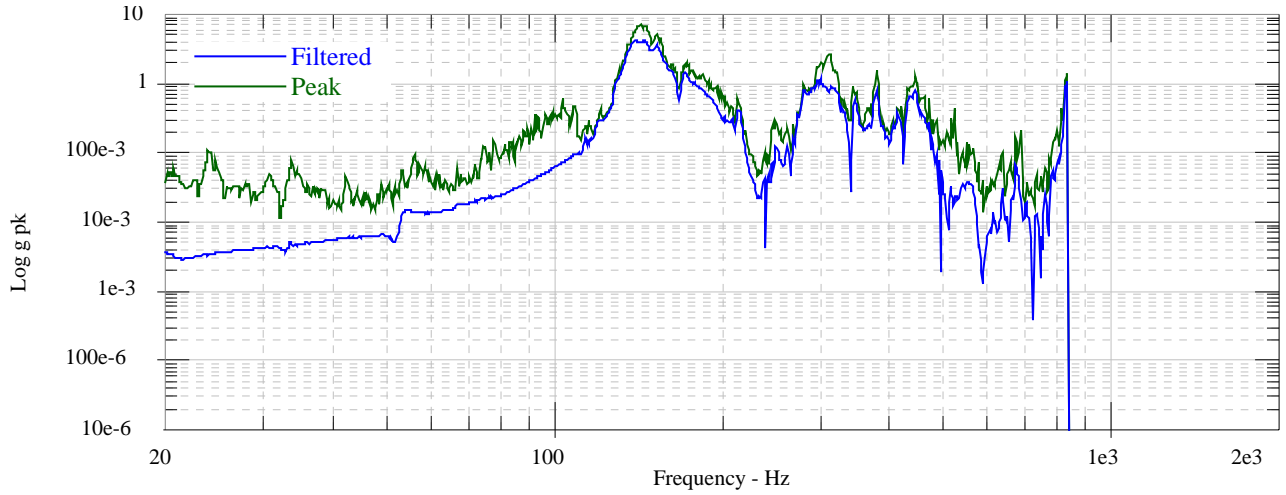


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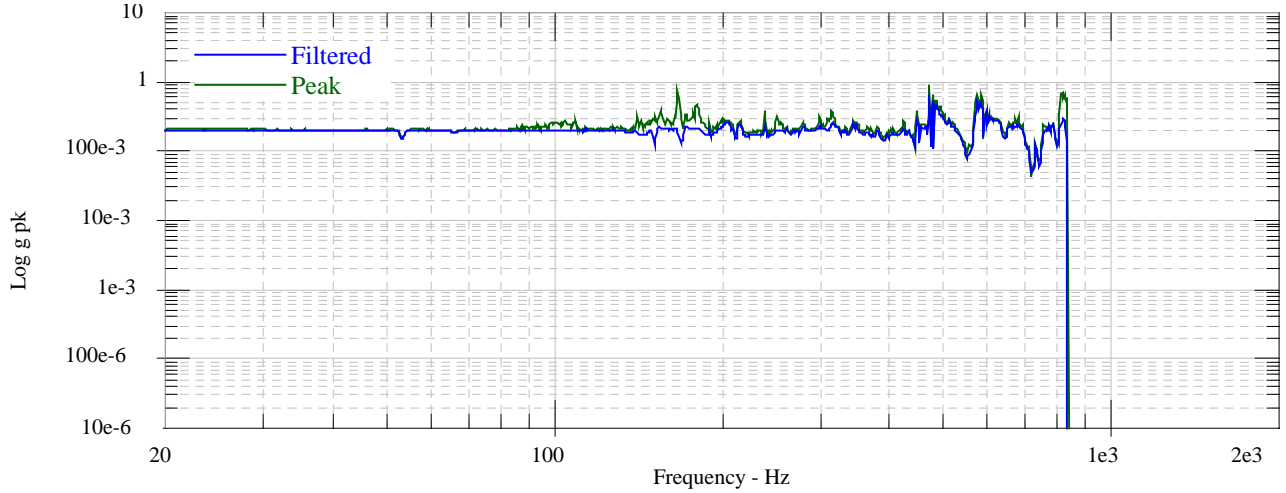
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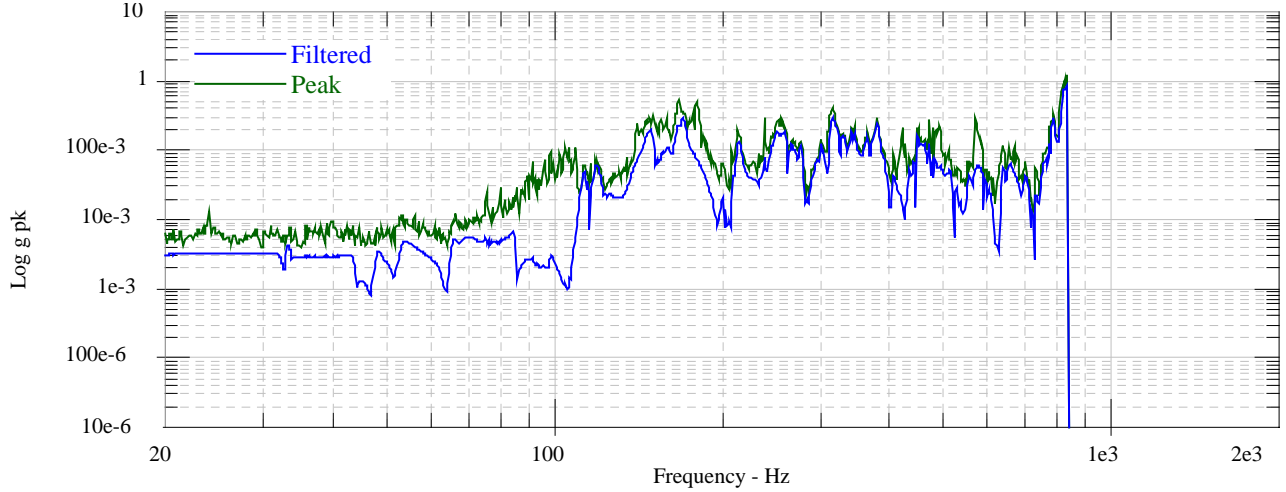
SMECU.X Channel n° 23



CONE.Z Channel n° 24



CONE.Y Channel n° 25

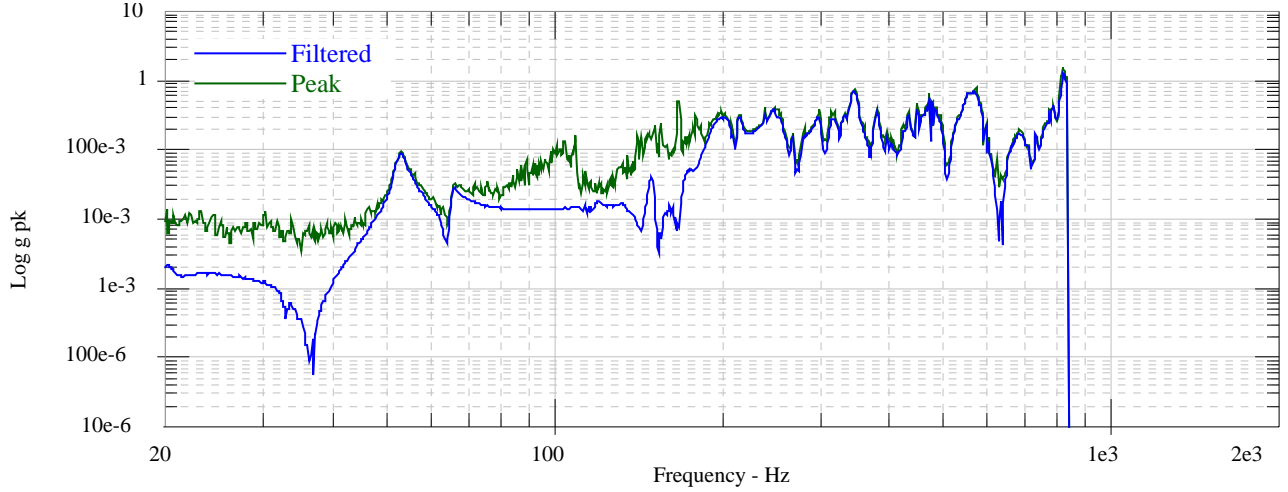


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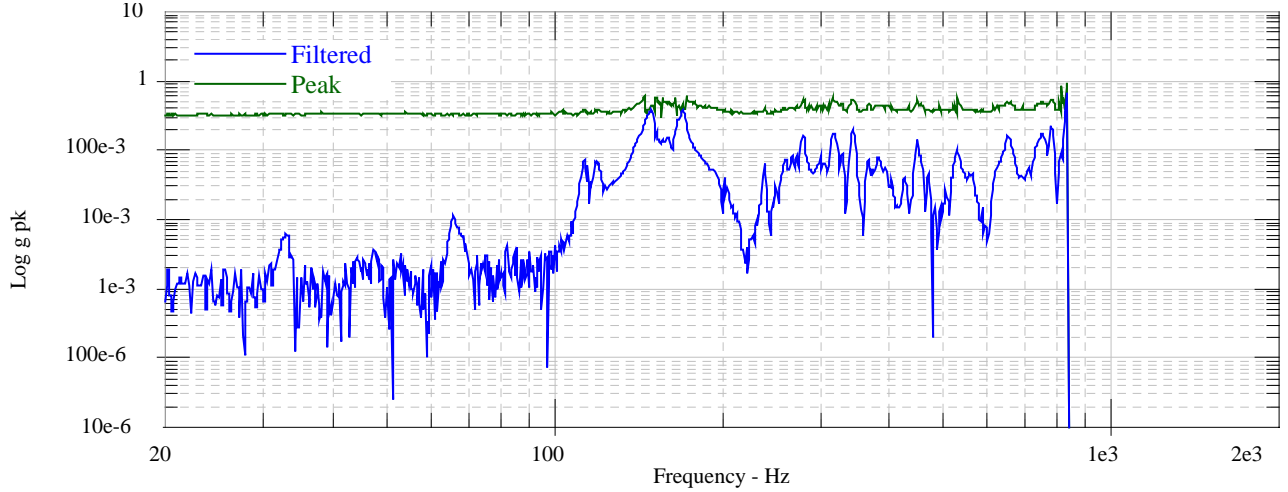
CONE.X Channel n° 26



-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28

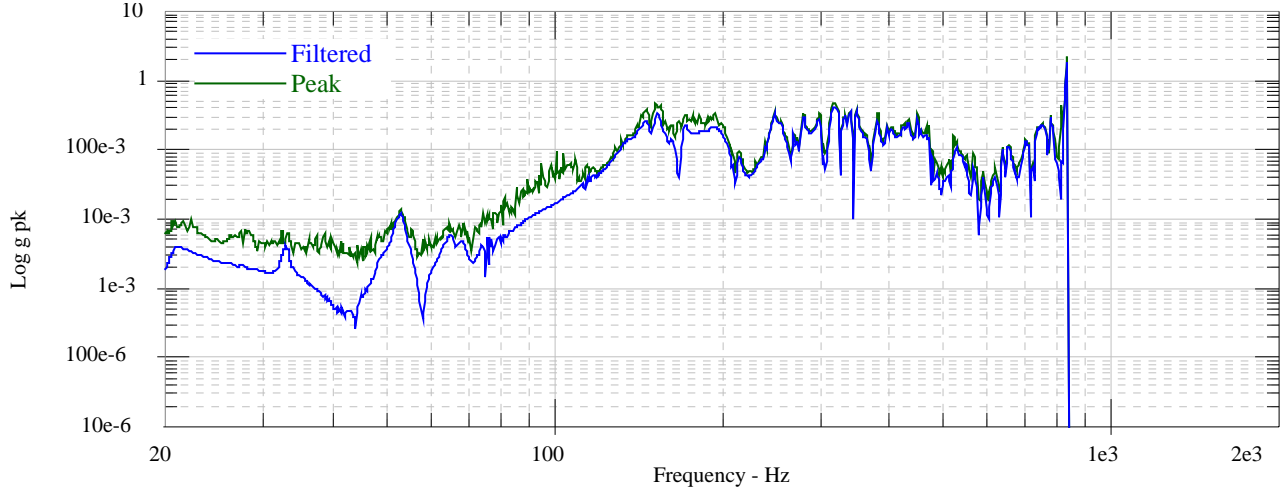


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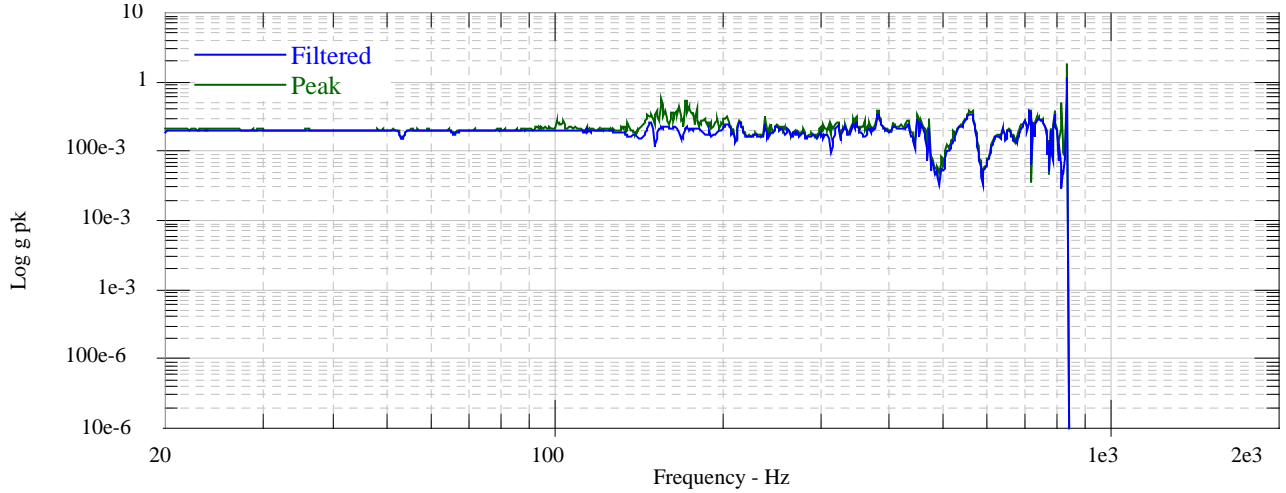
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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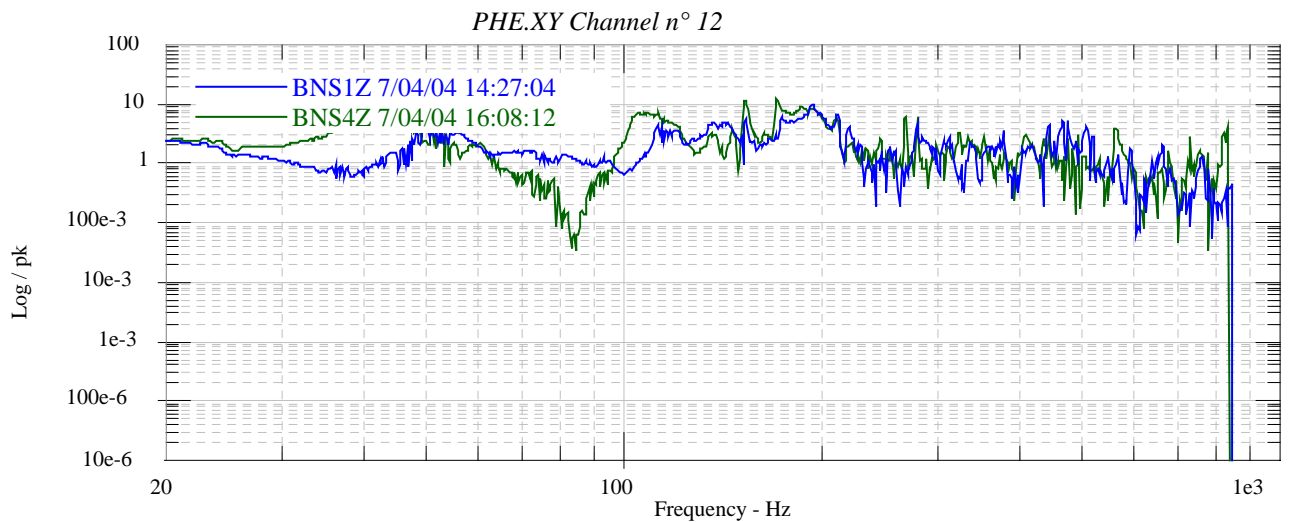
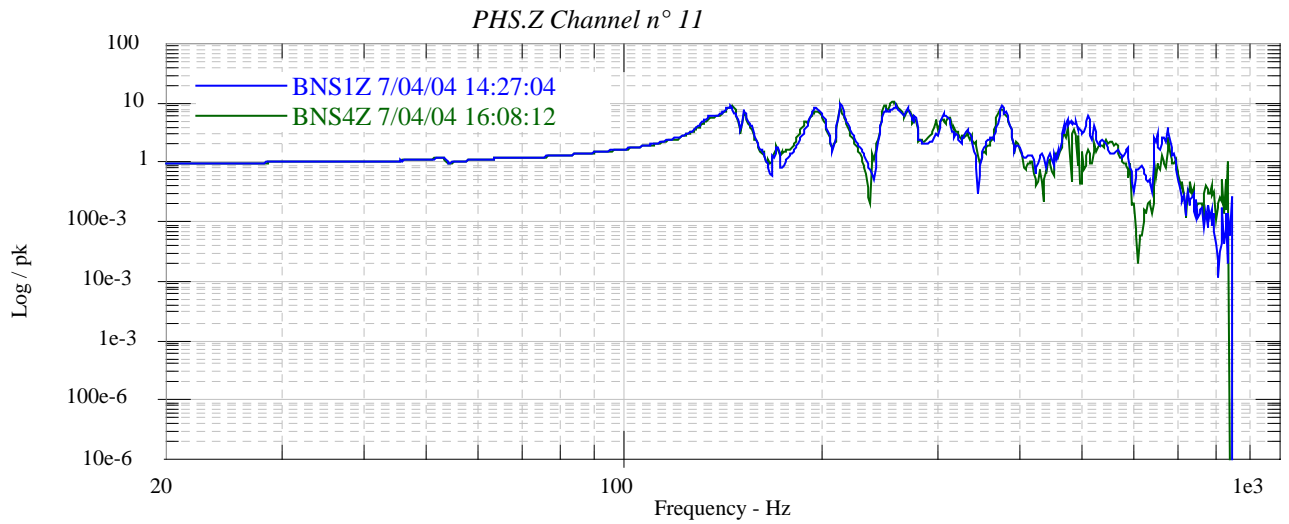
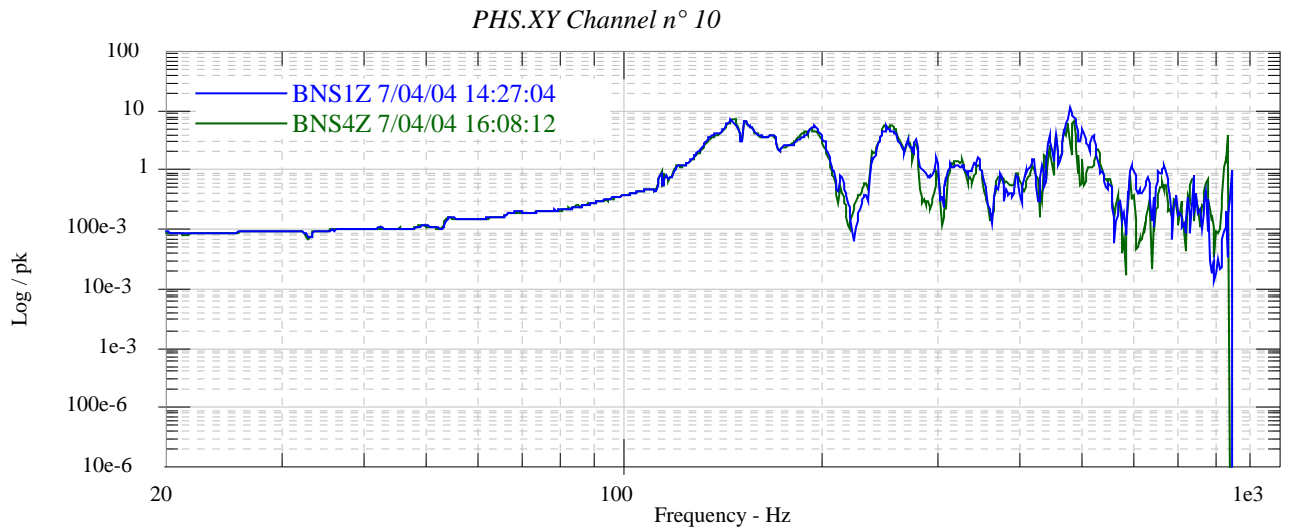
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12.26 Comparison BNS_Z transfer functions pre and post high level sine.

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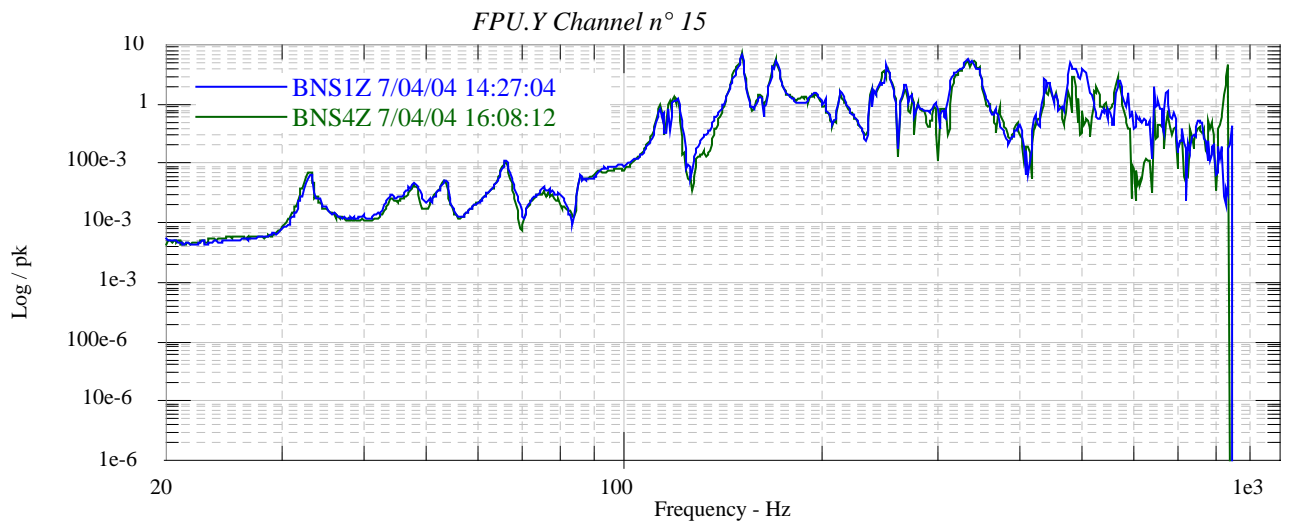
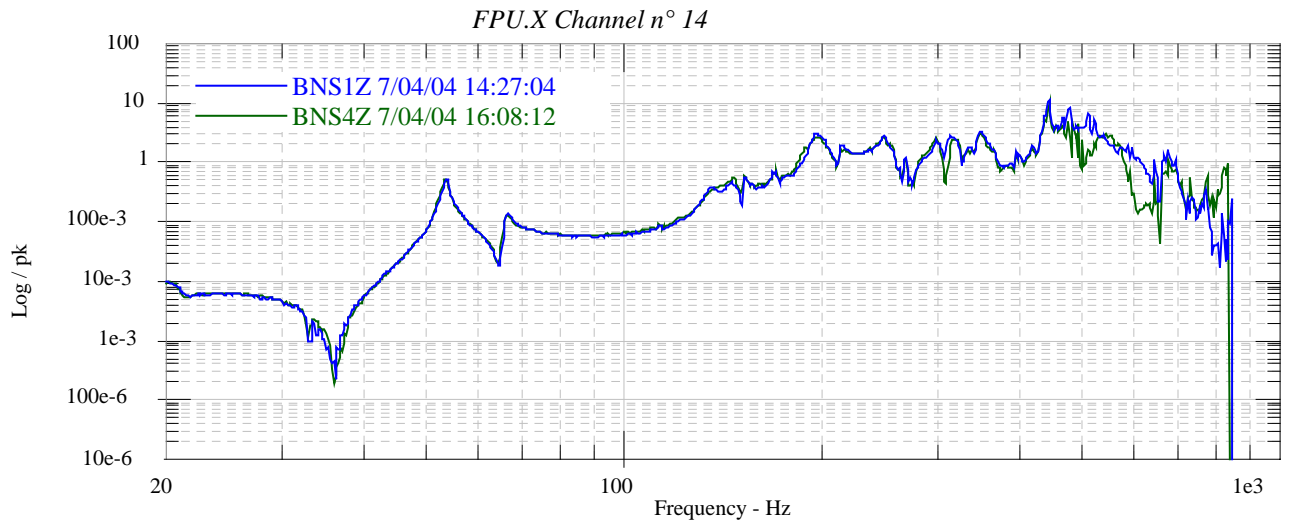
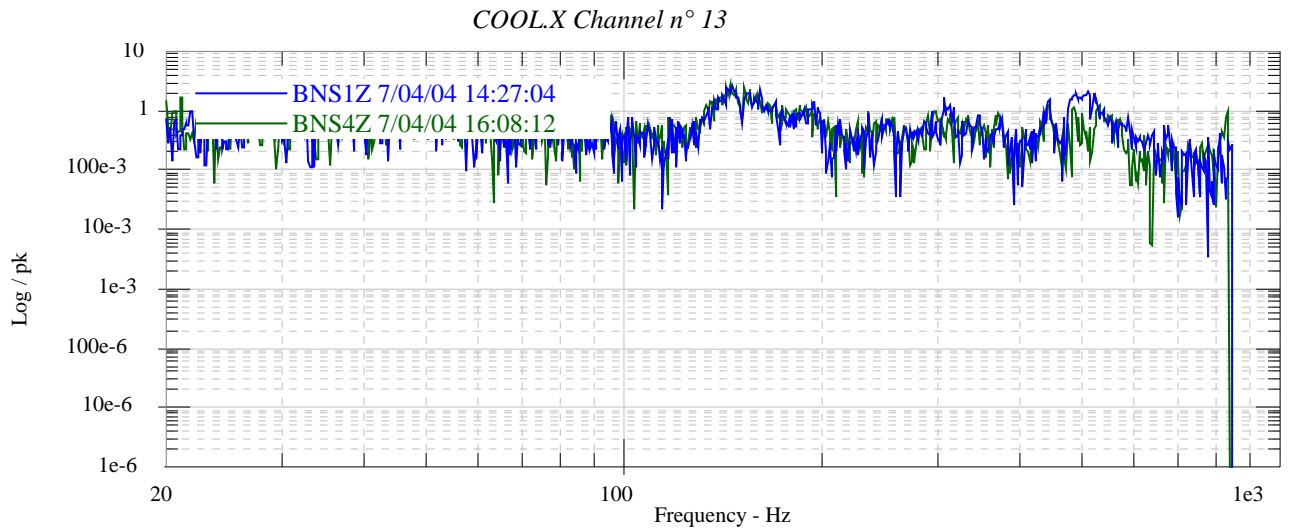
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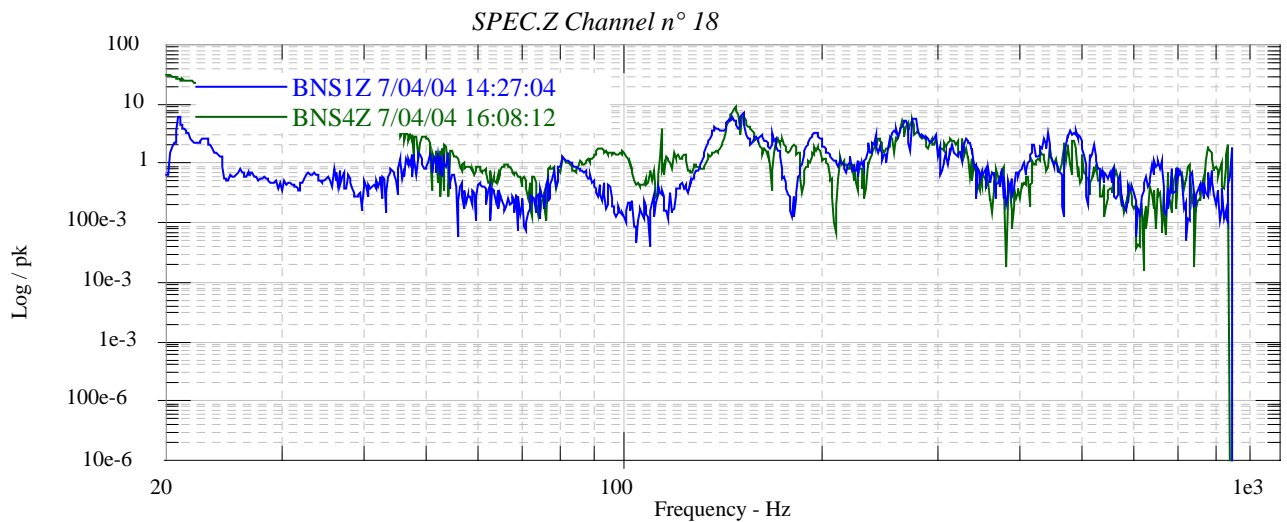
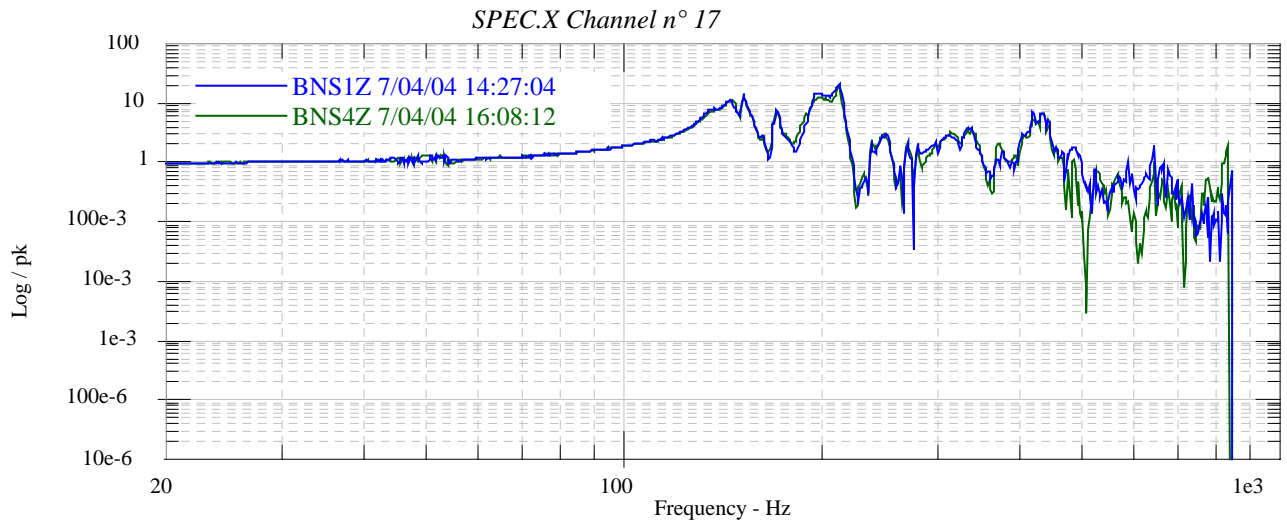
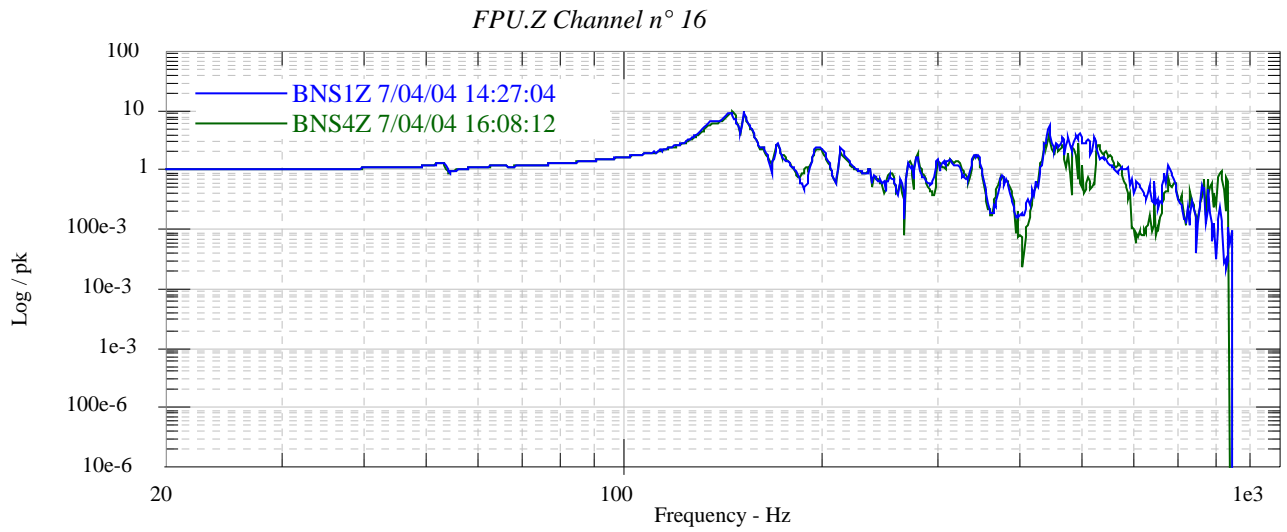
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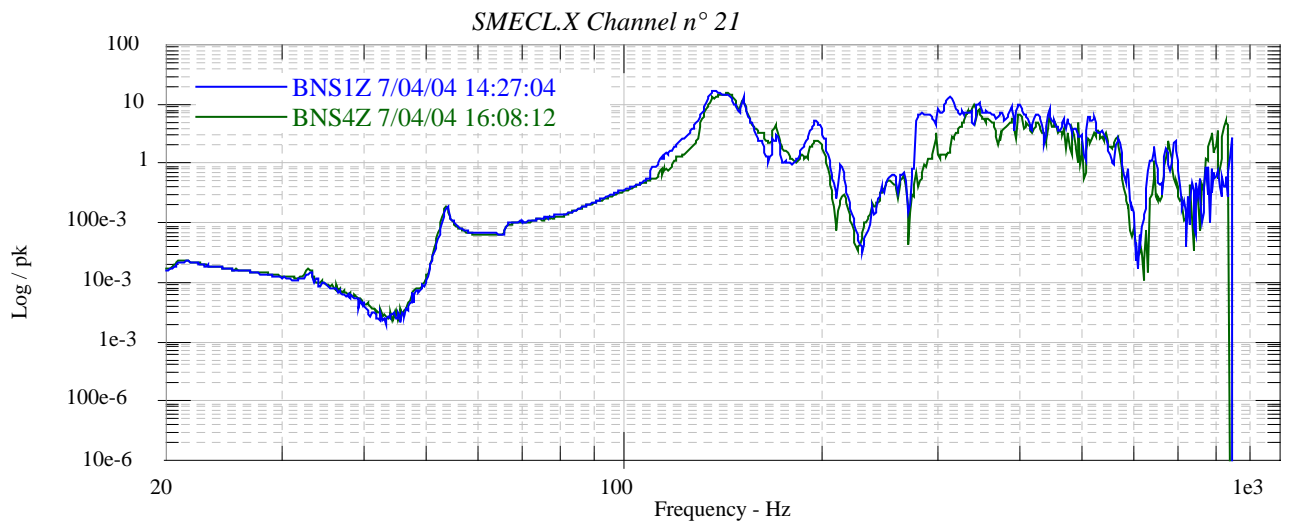
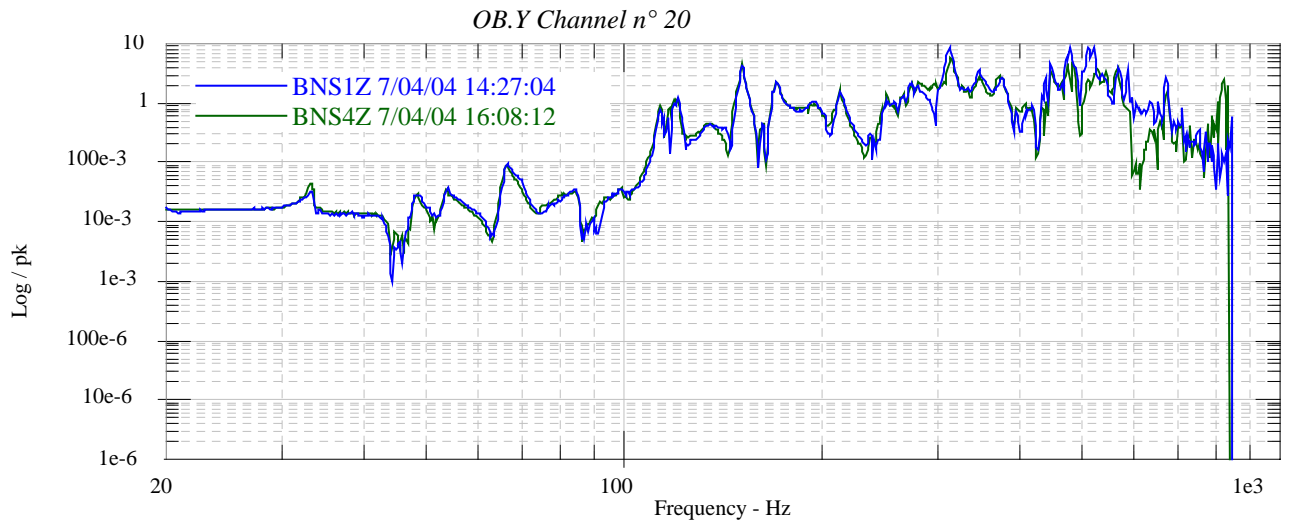
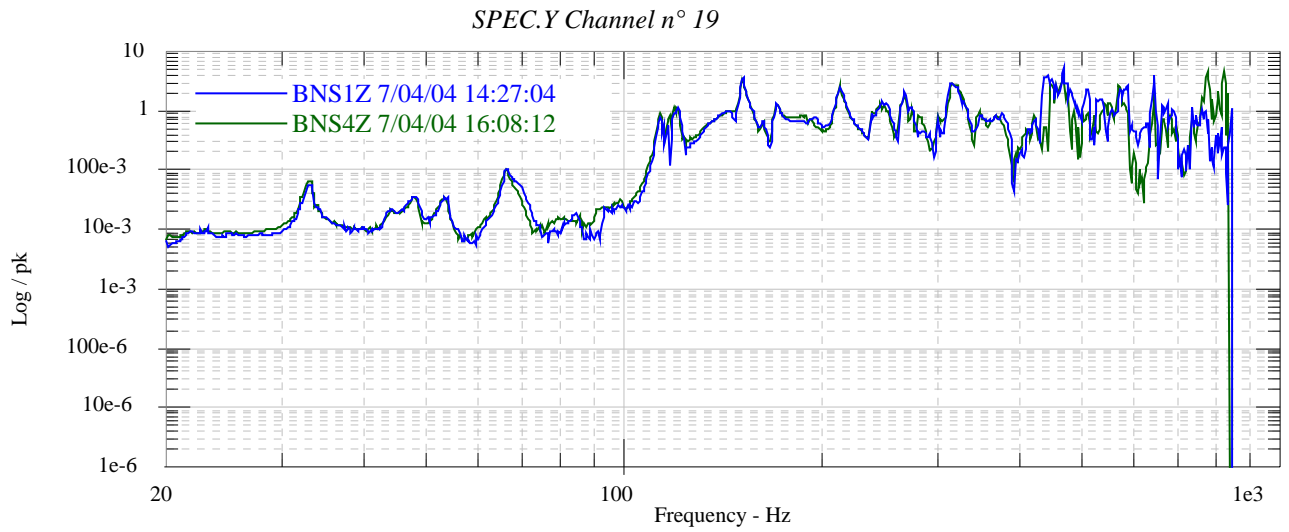
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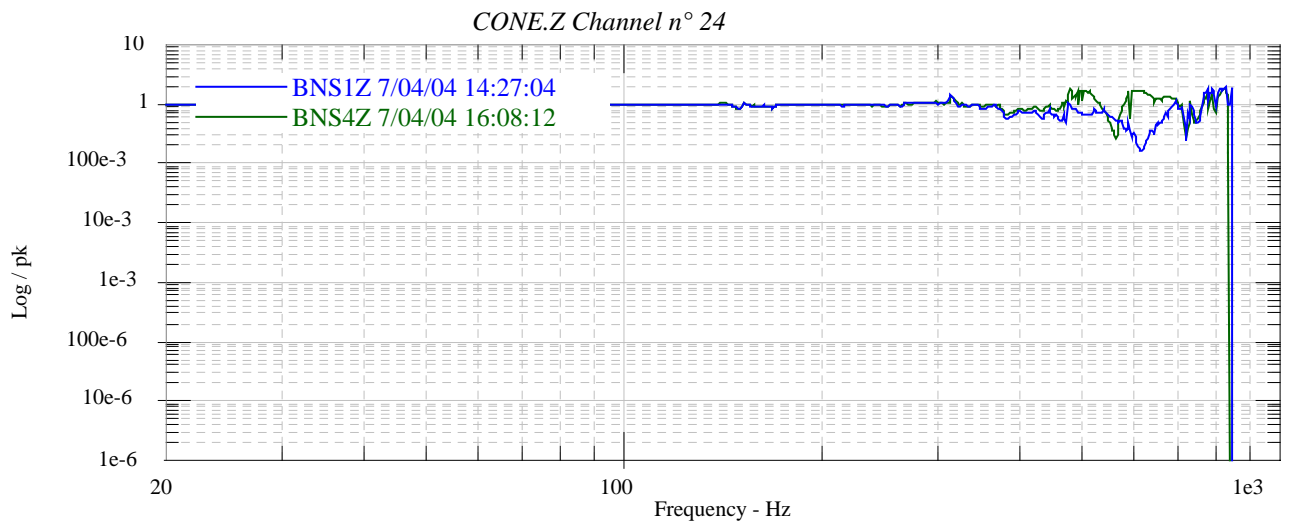
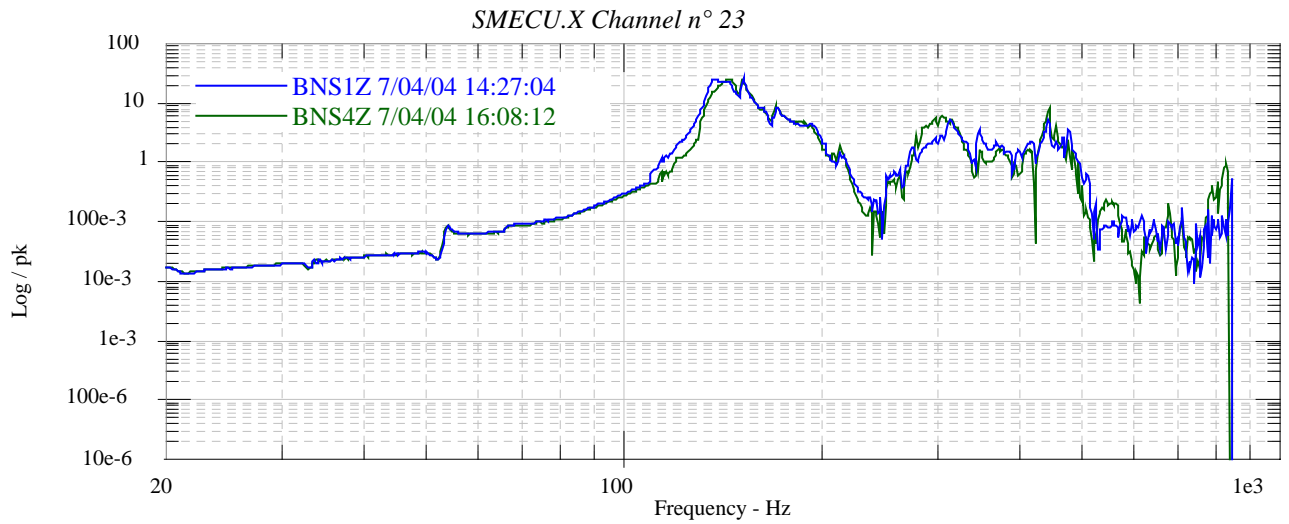
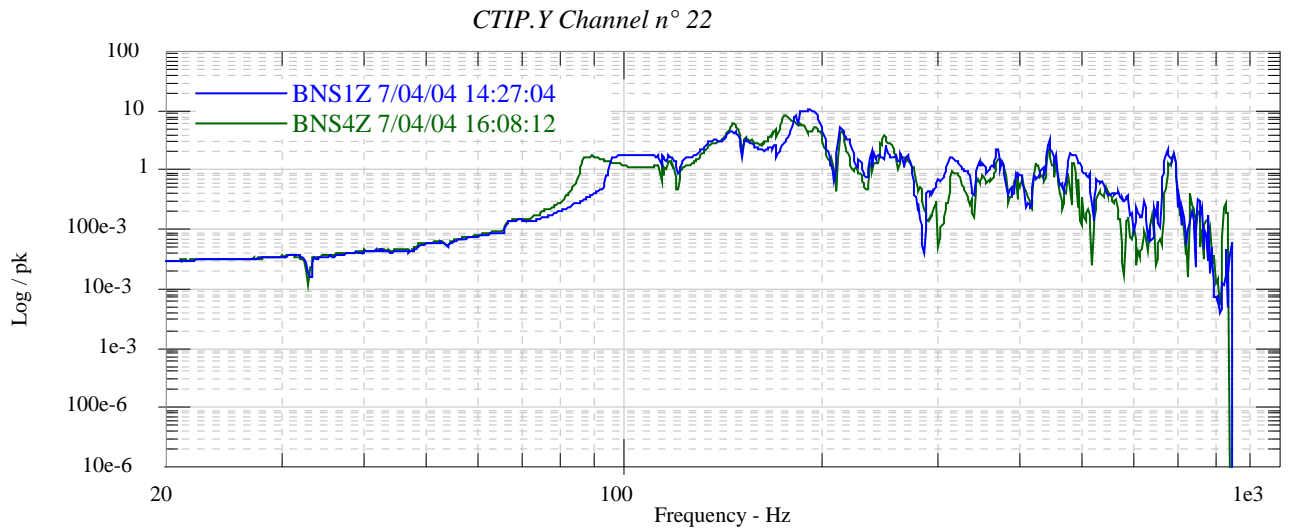
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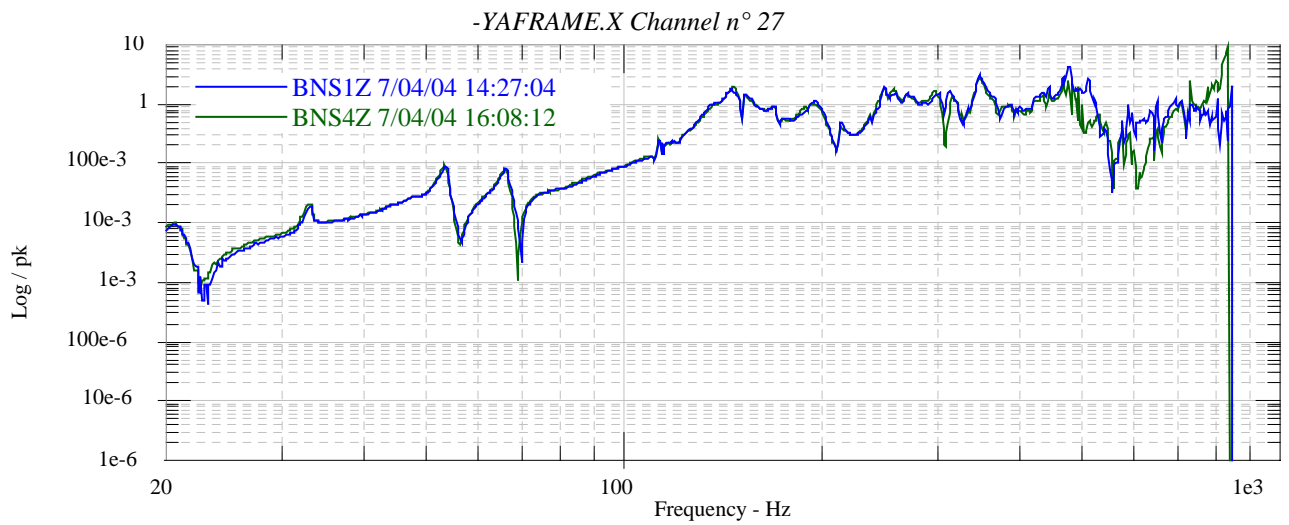
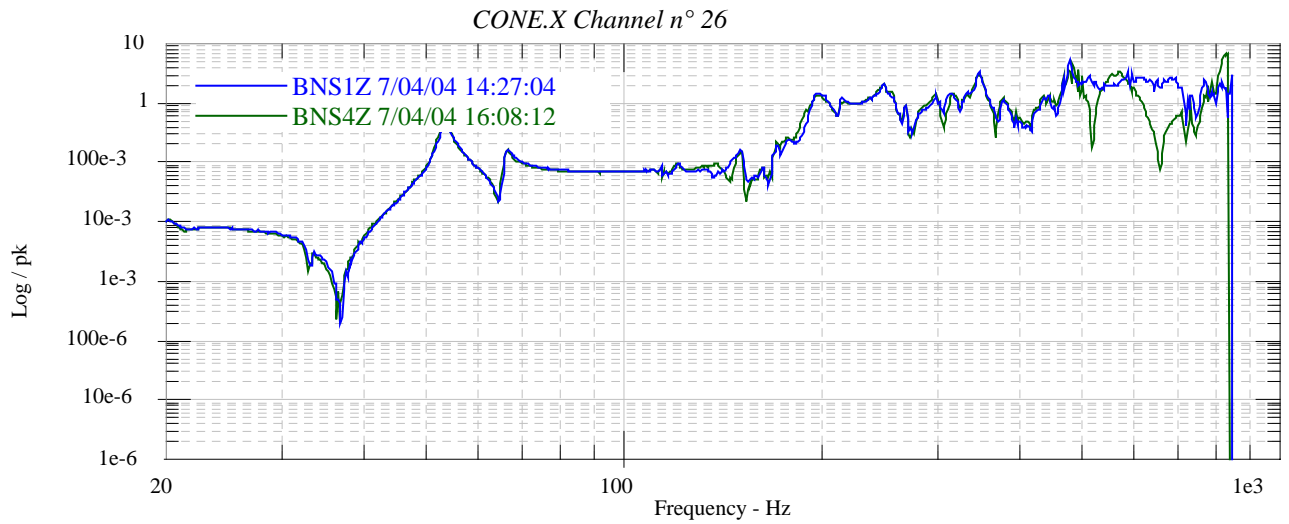
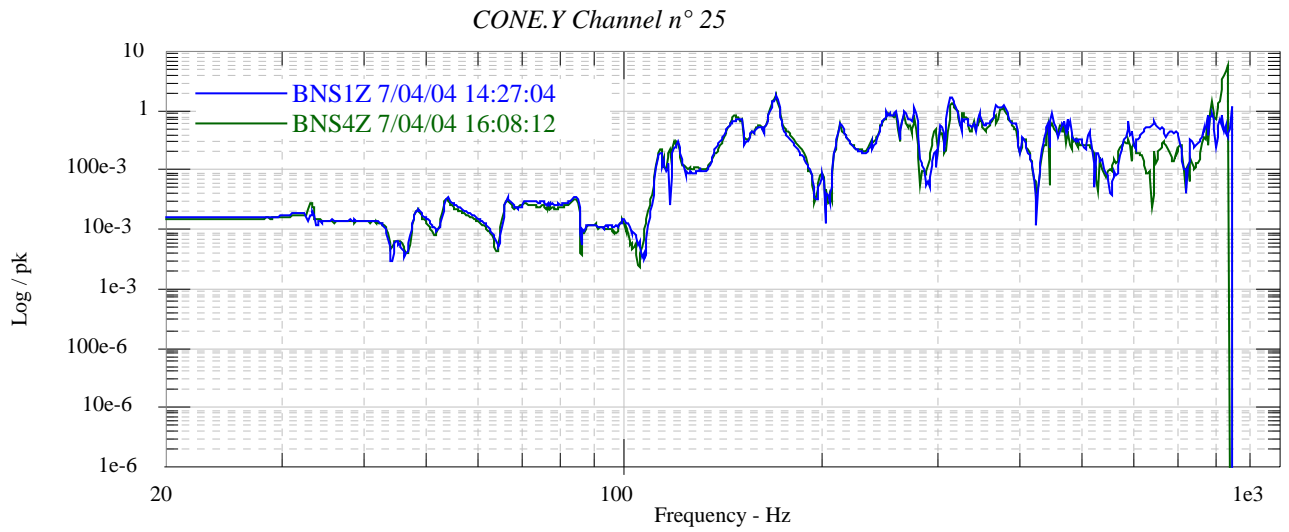
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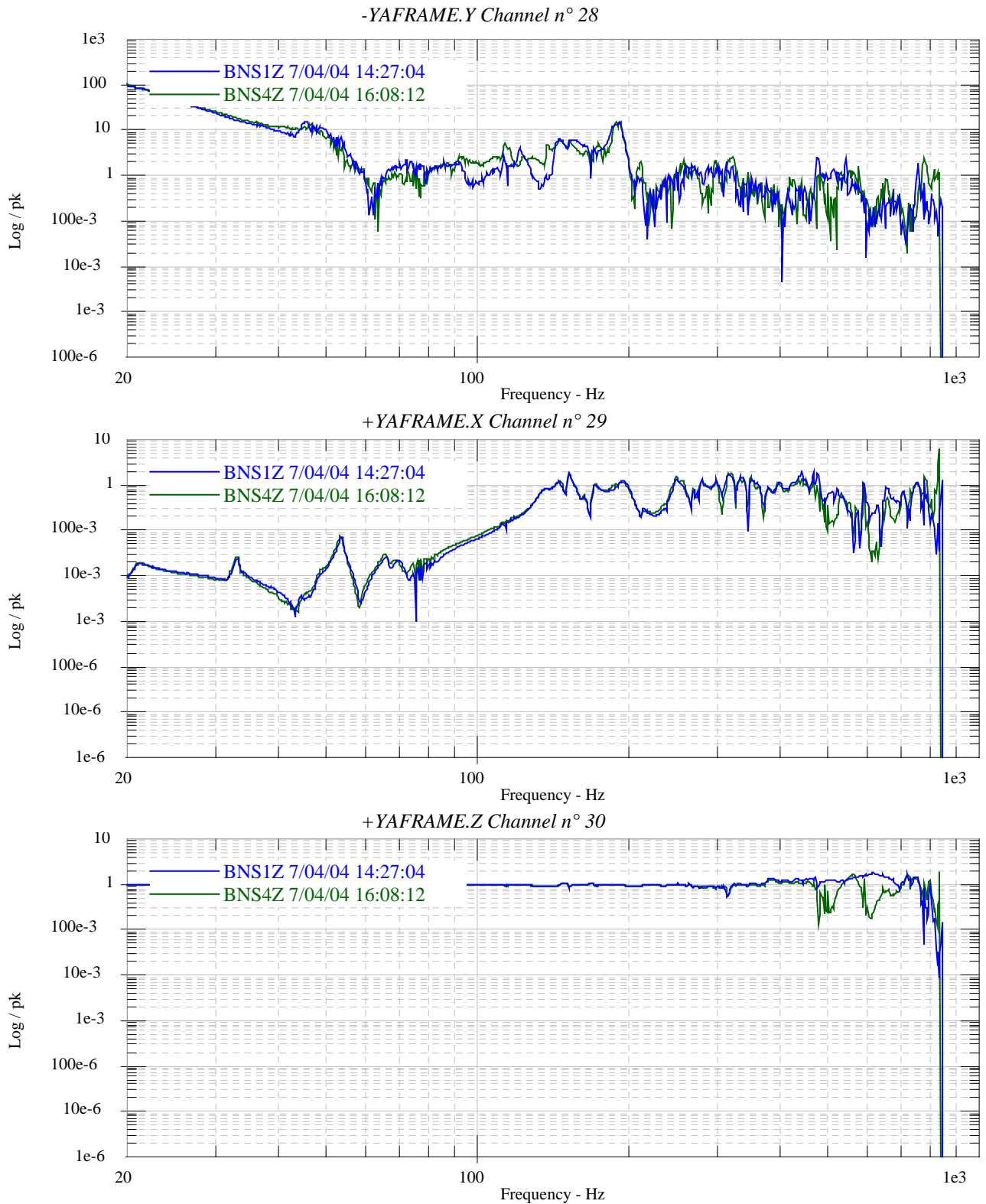
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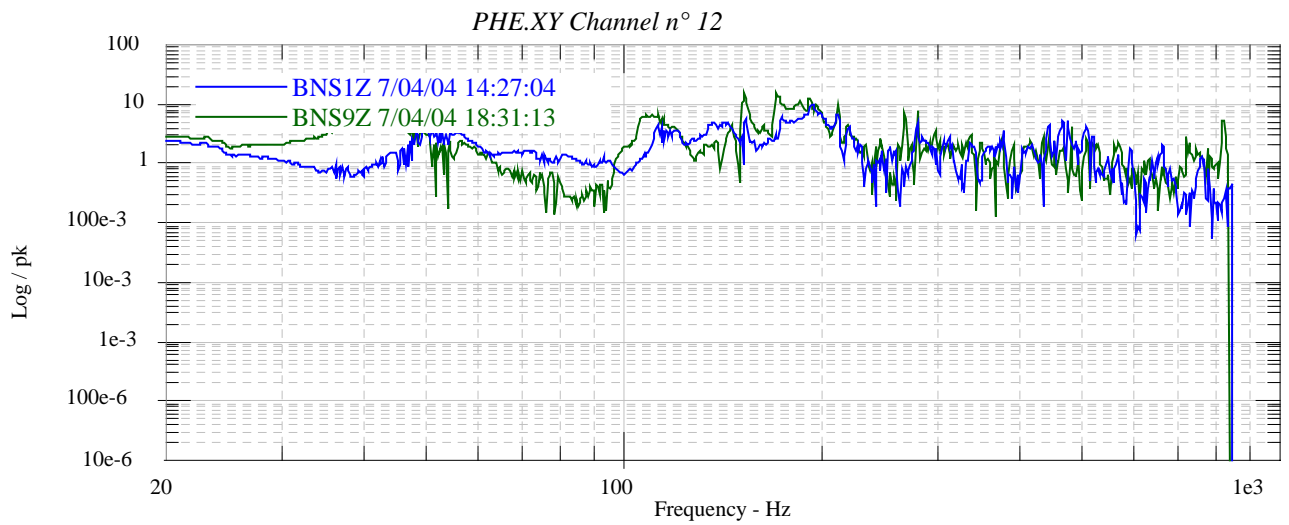
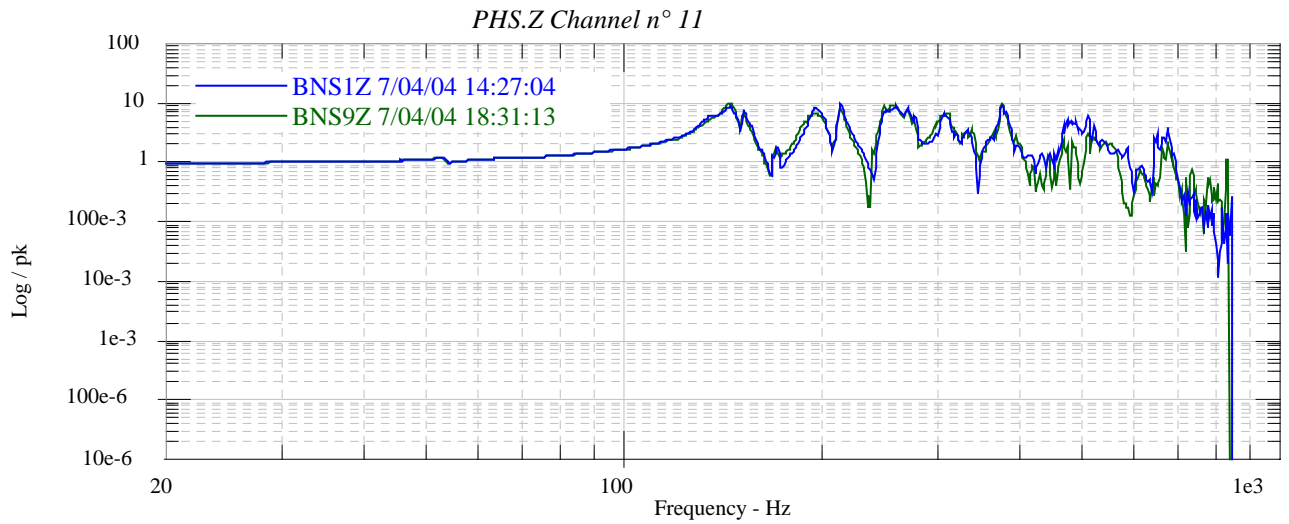
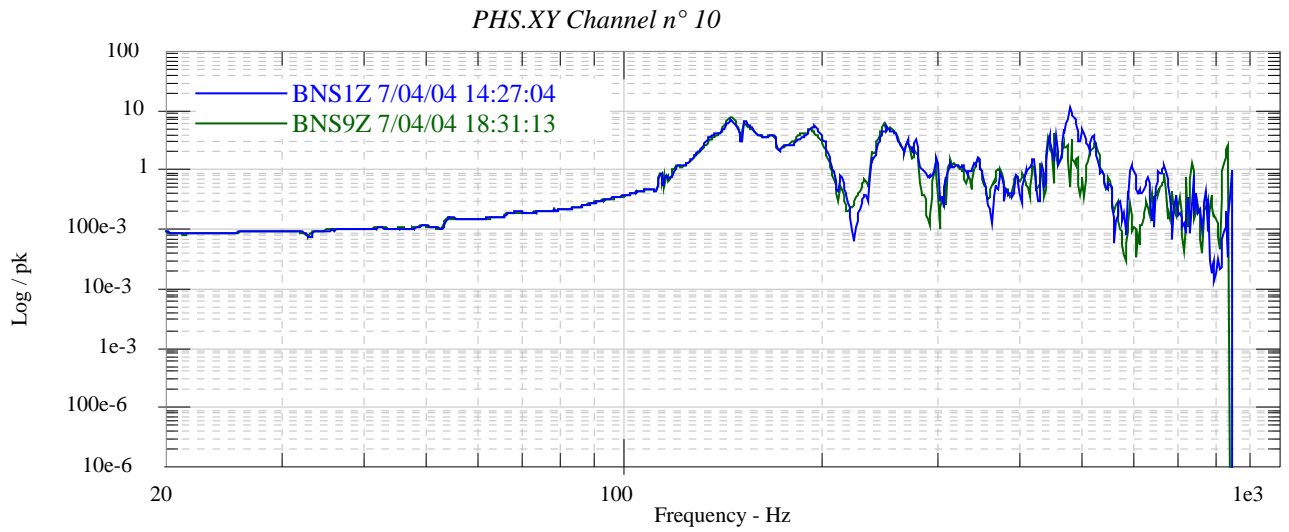
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12.27 Comparison BNS_Z transfer functions pre high level sine and post high level random.

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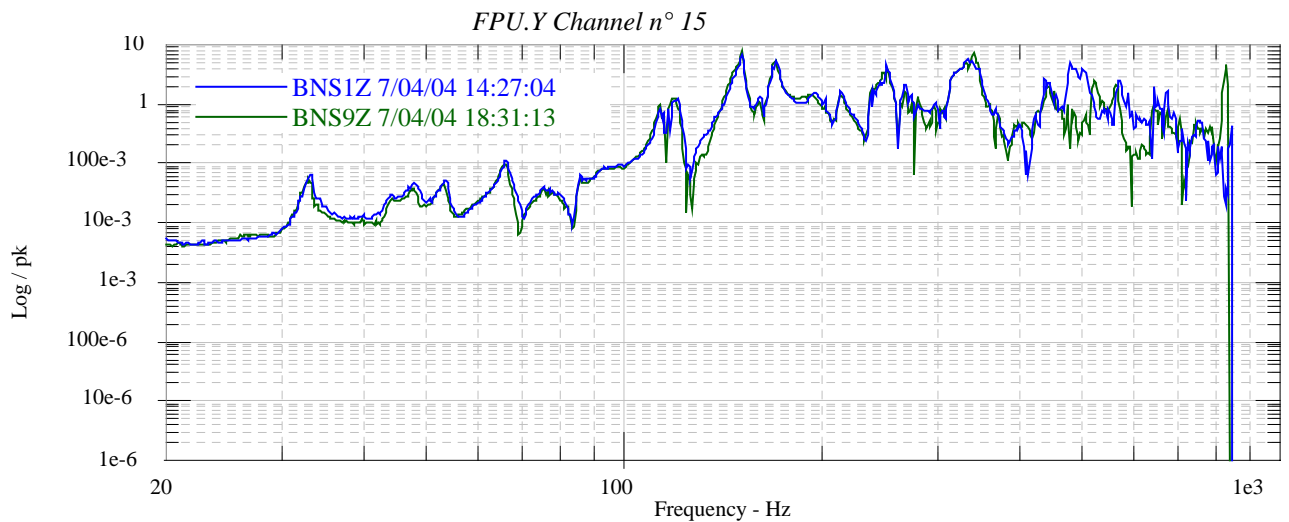
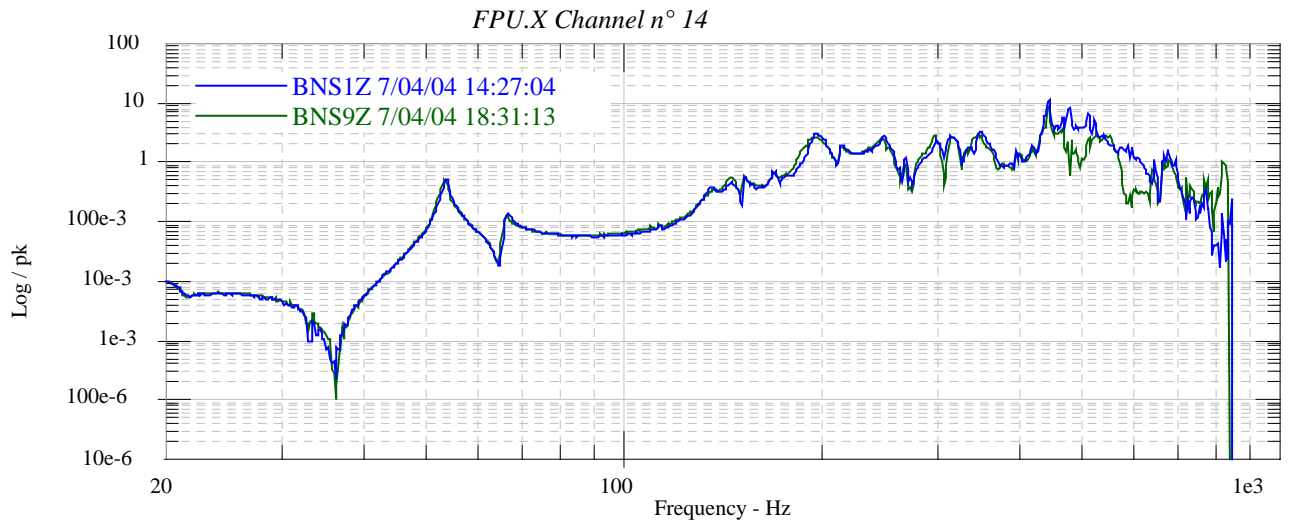
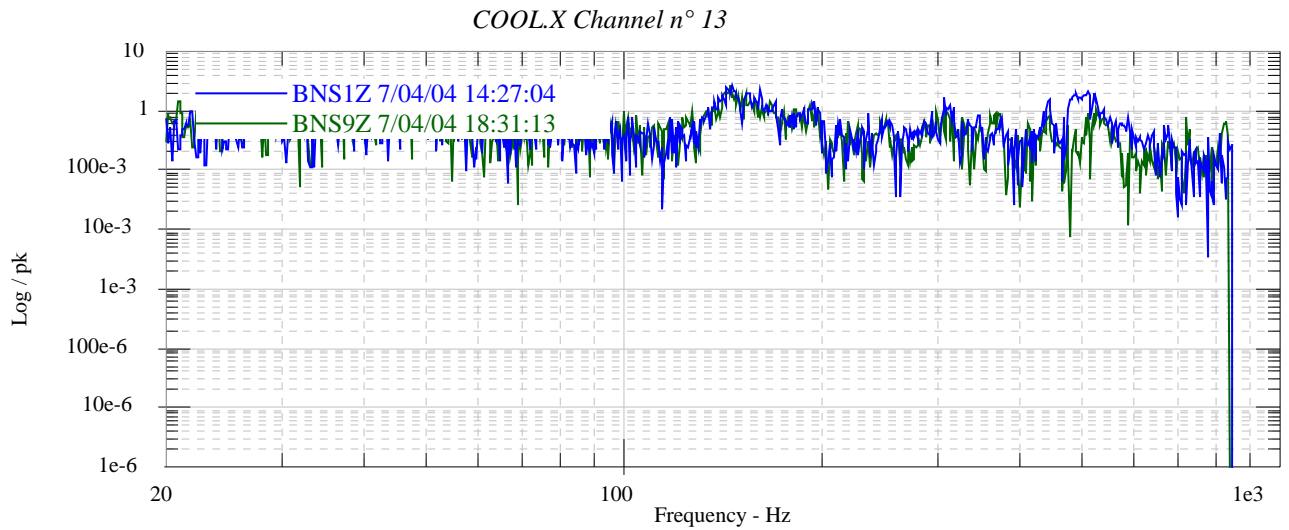
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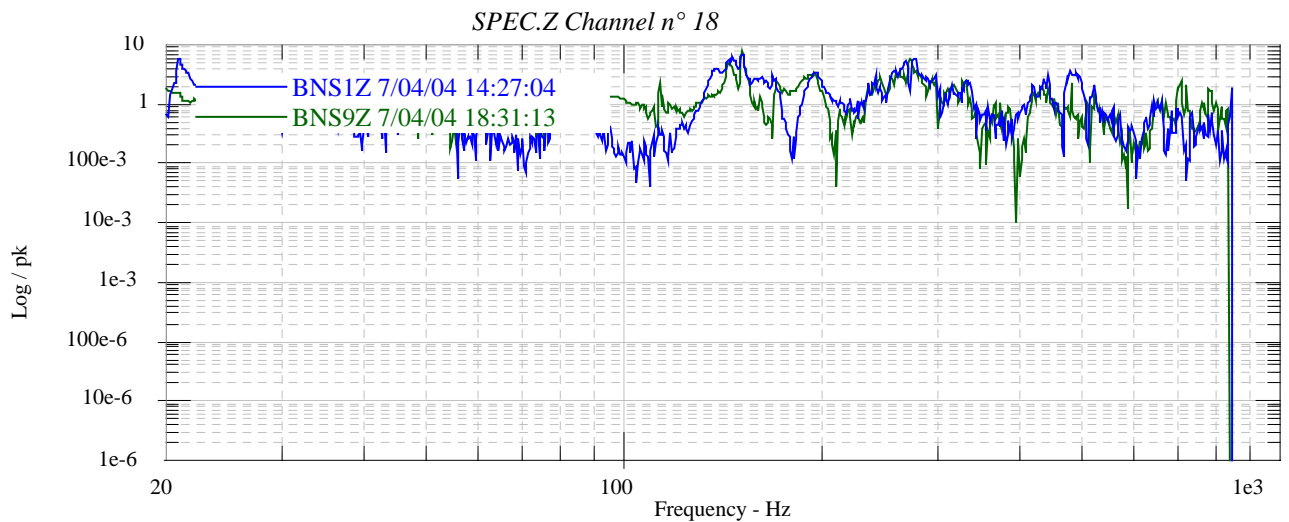
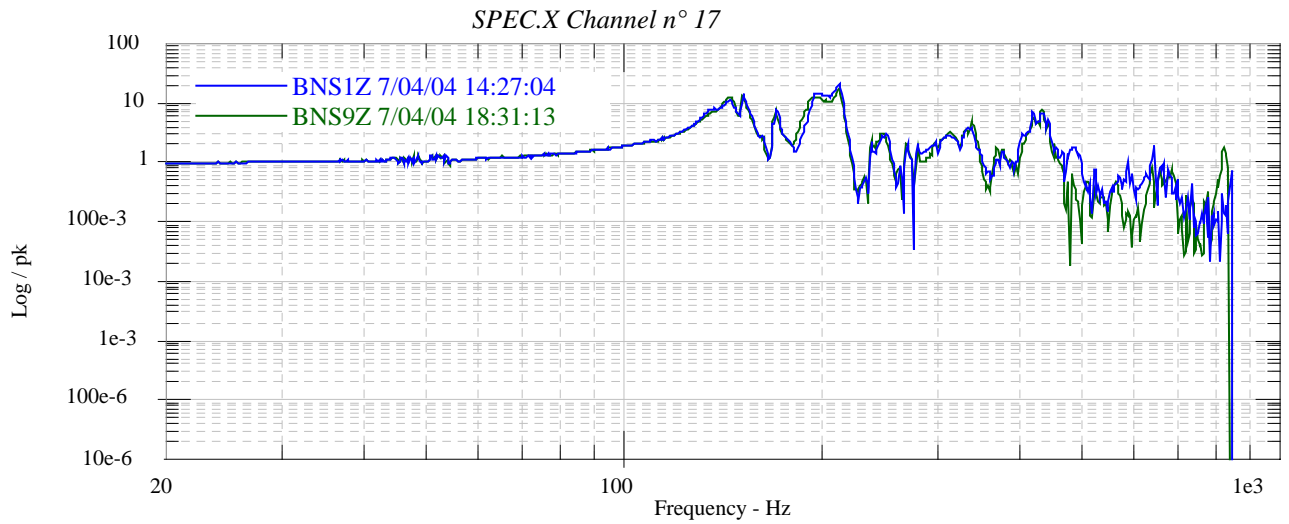
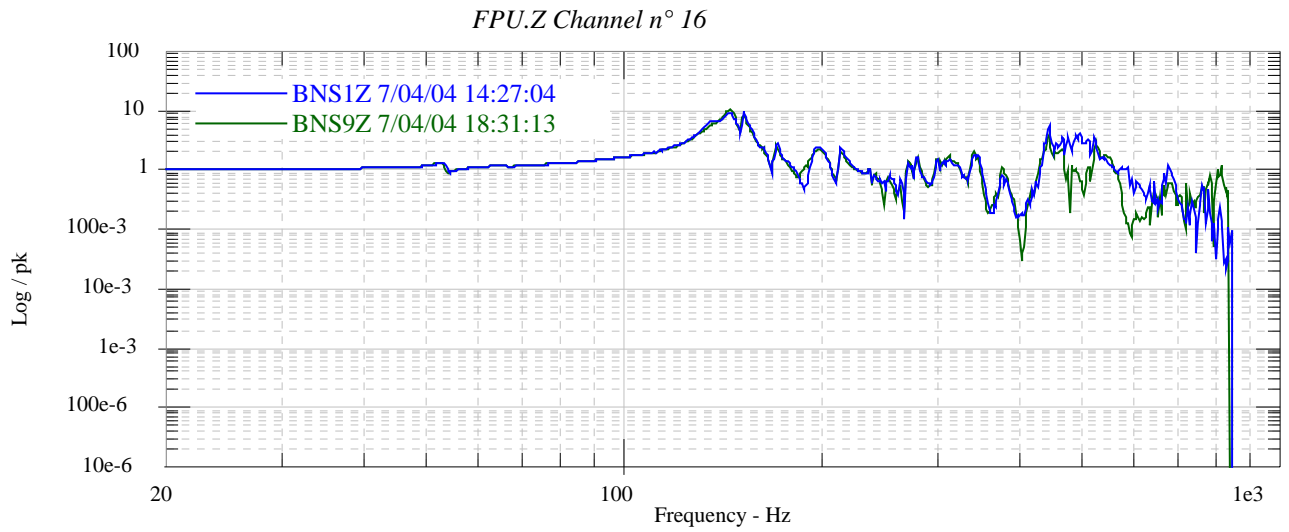
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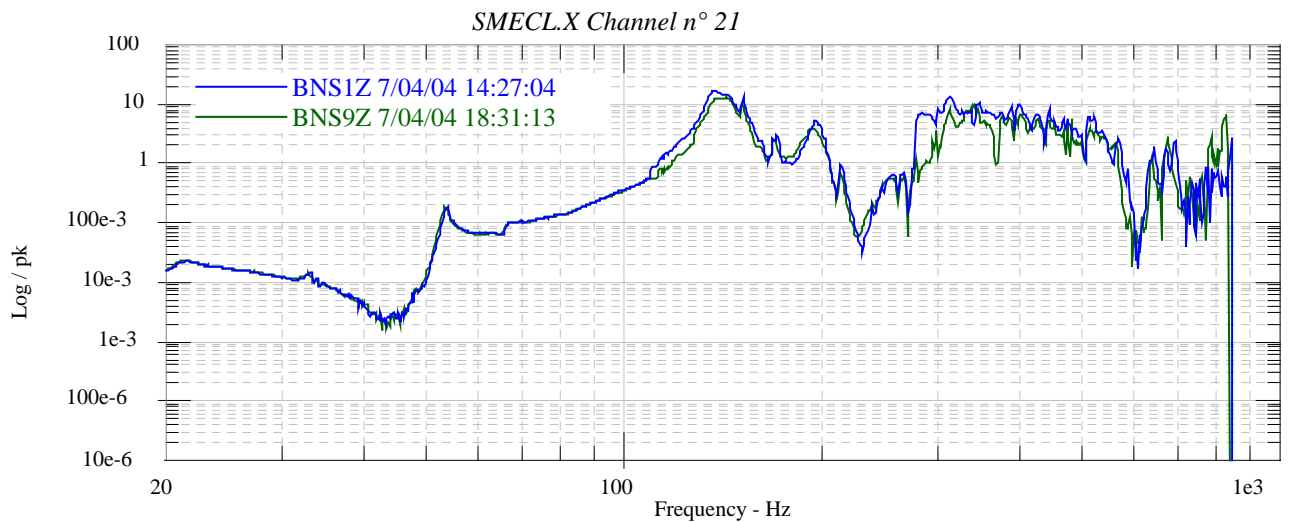
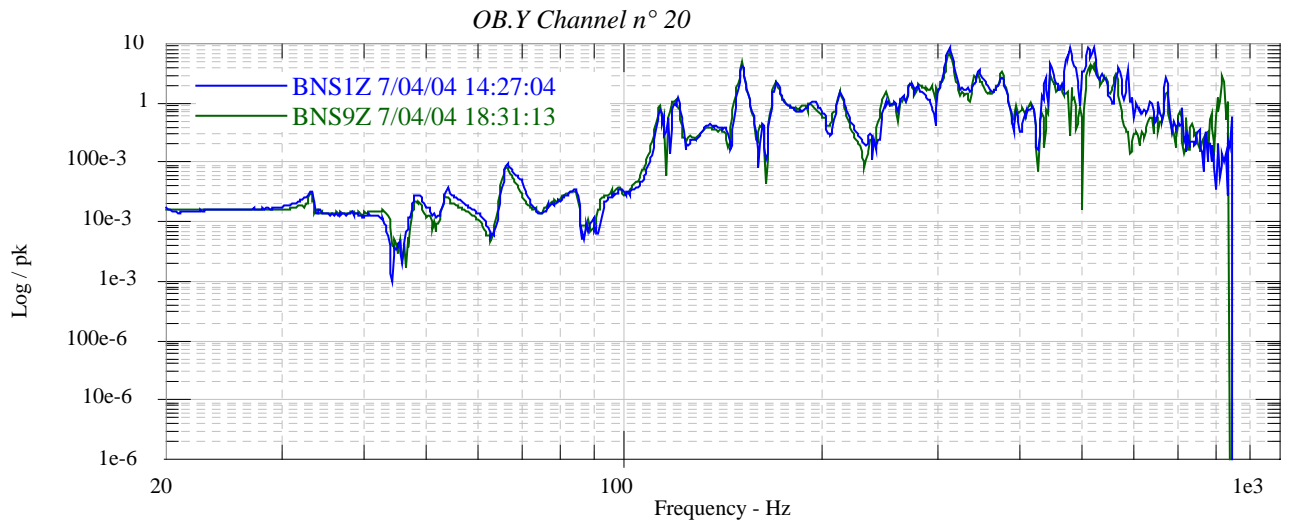
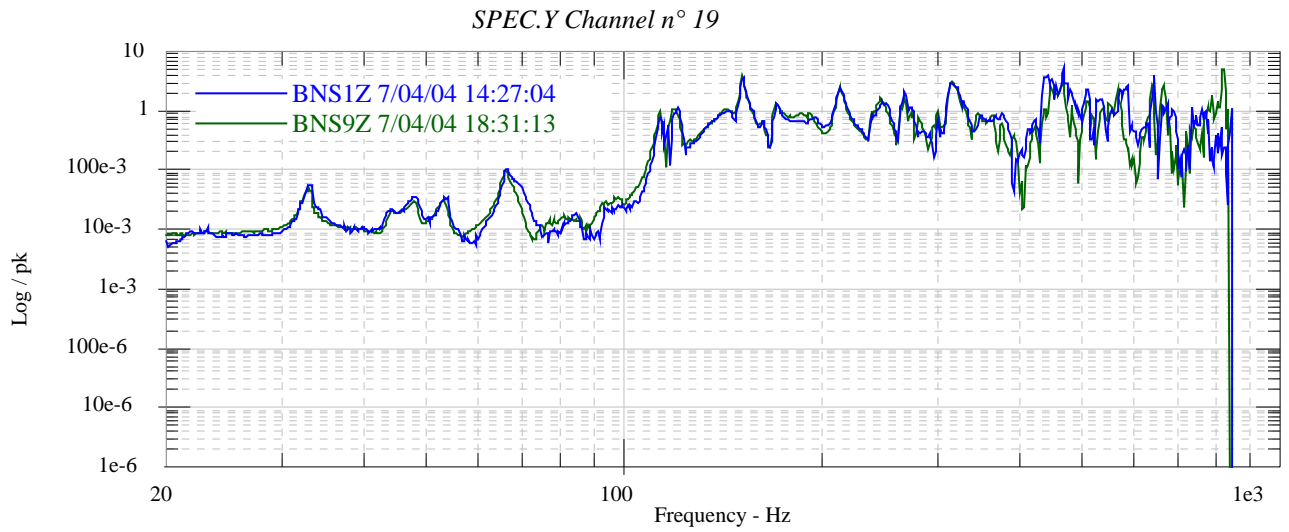
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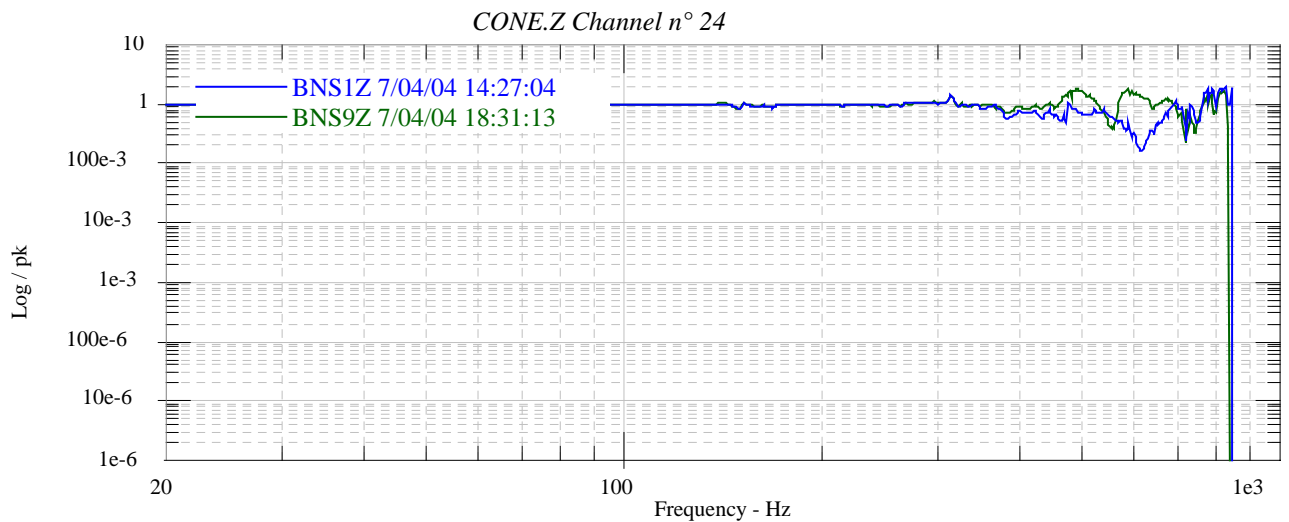
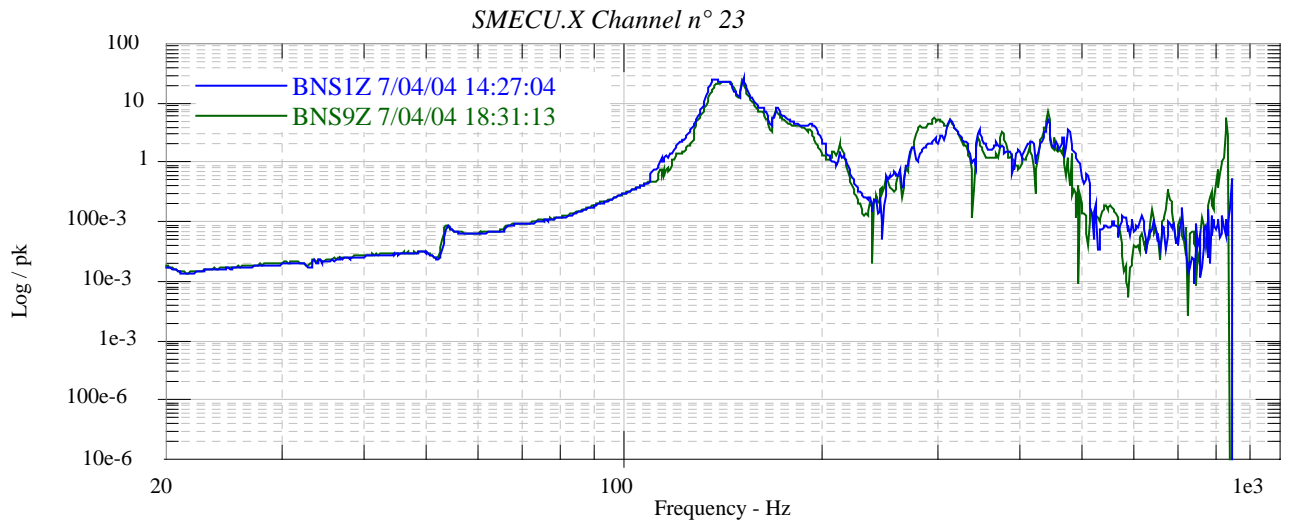
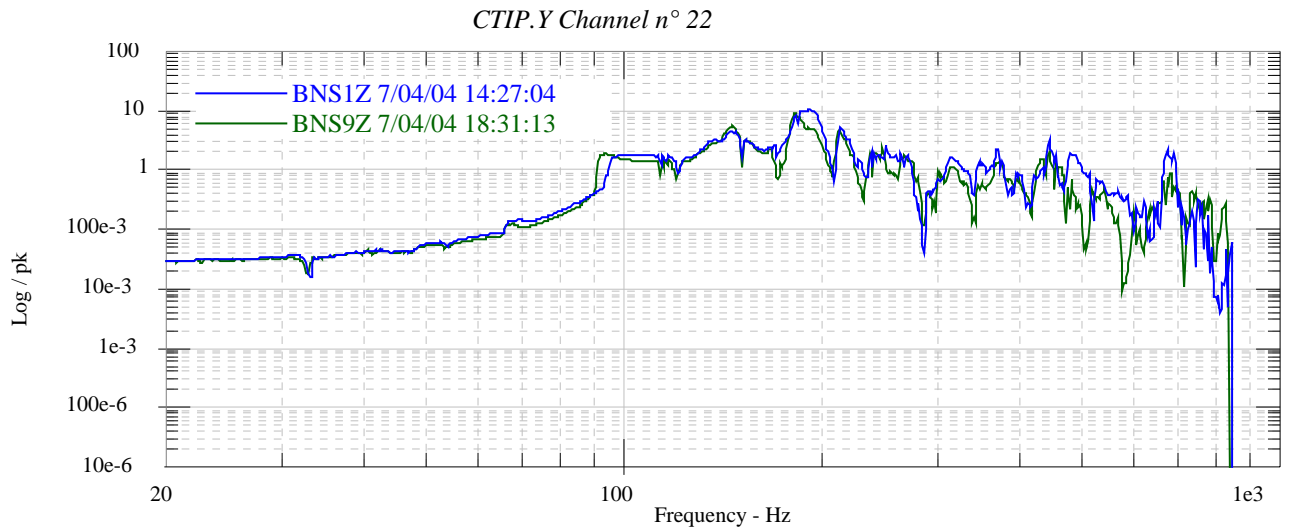
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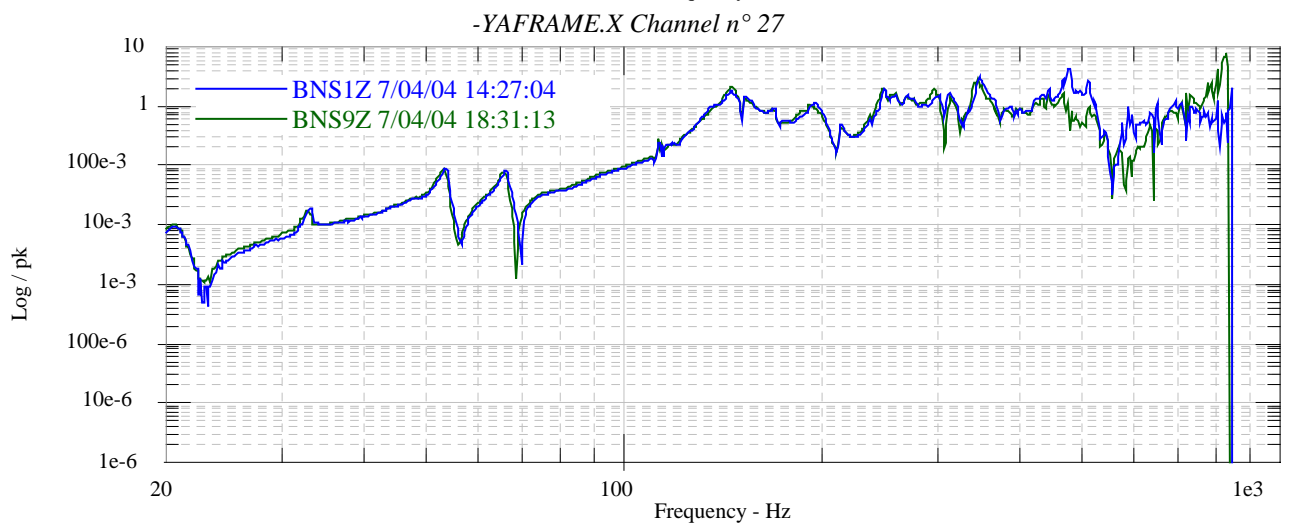
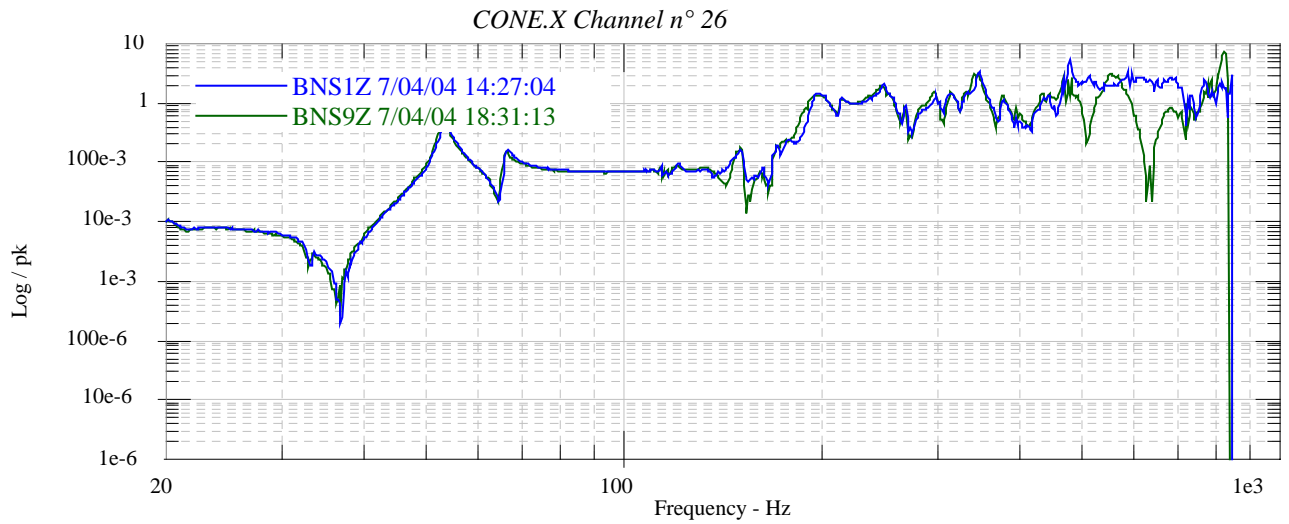
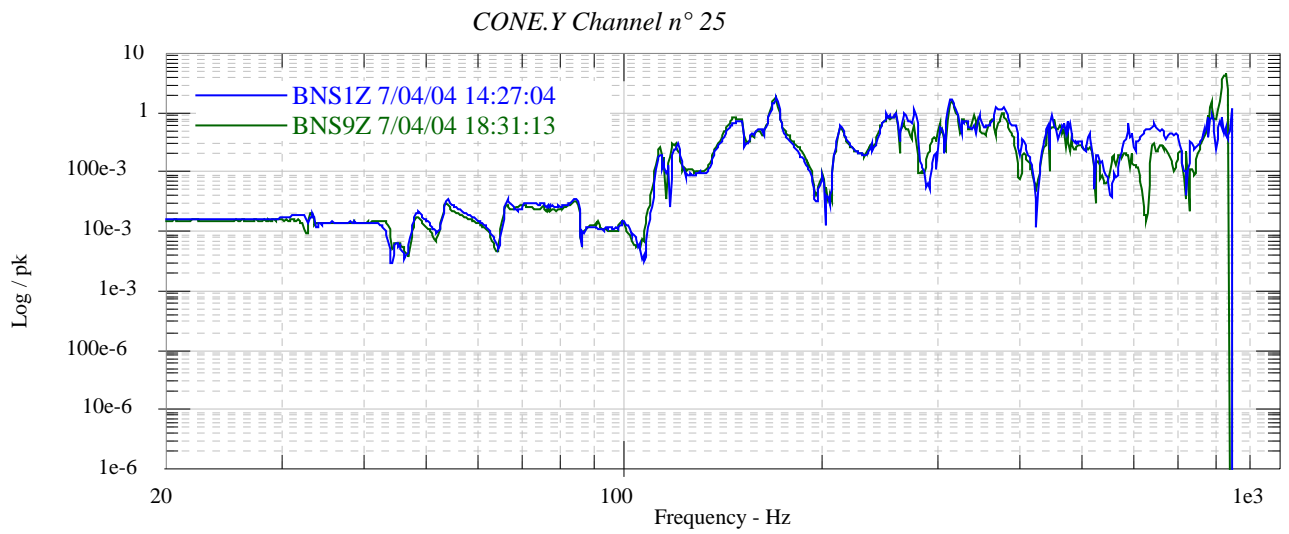
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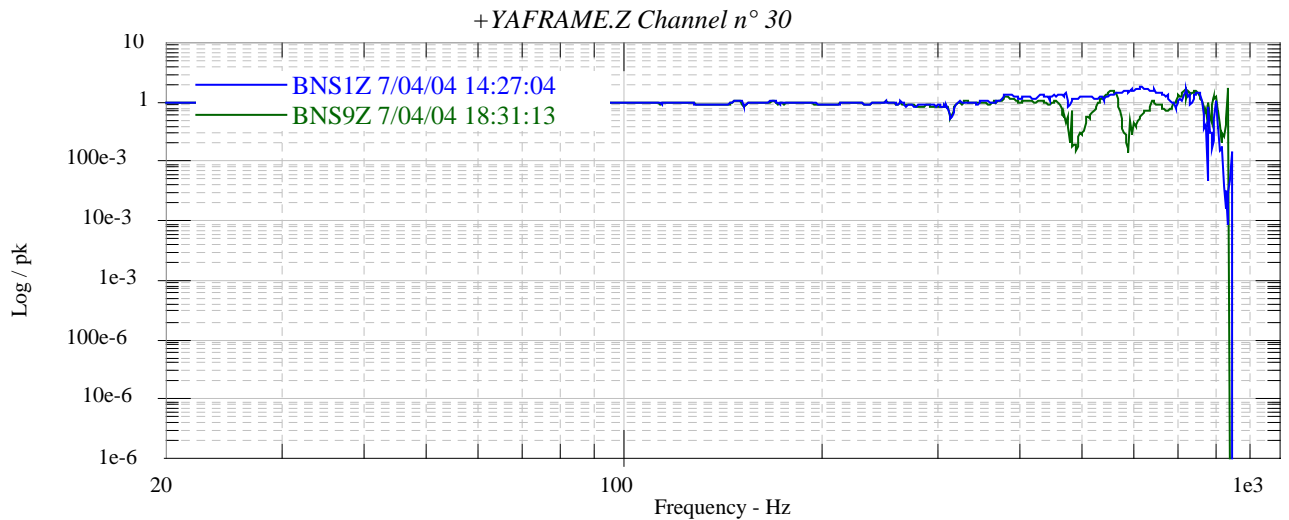
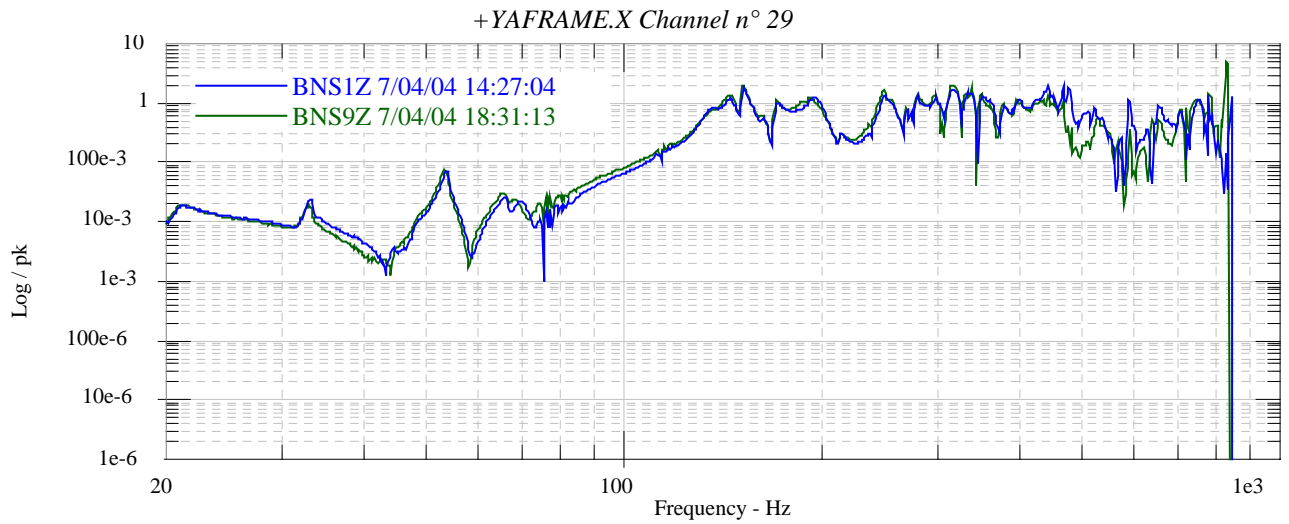
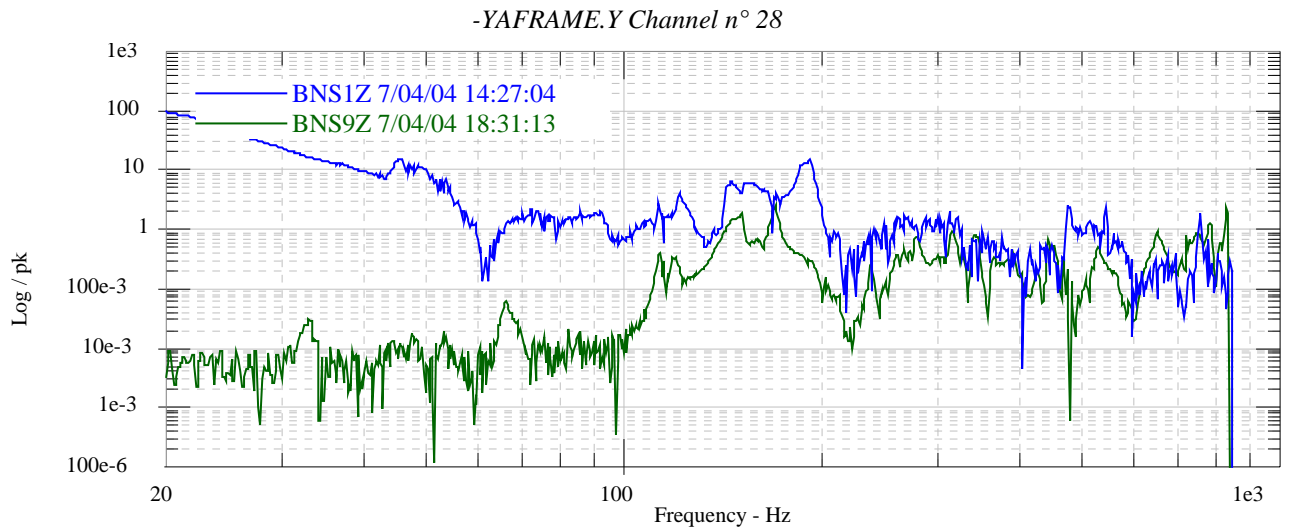
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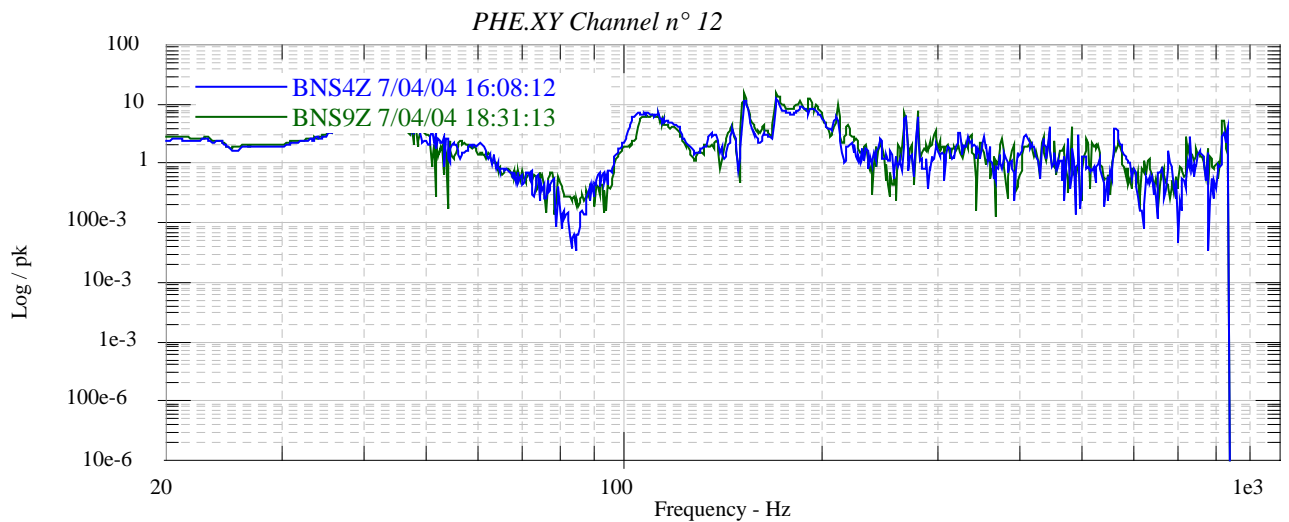
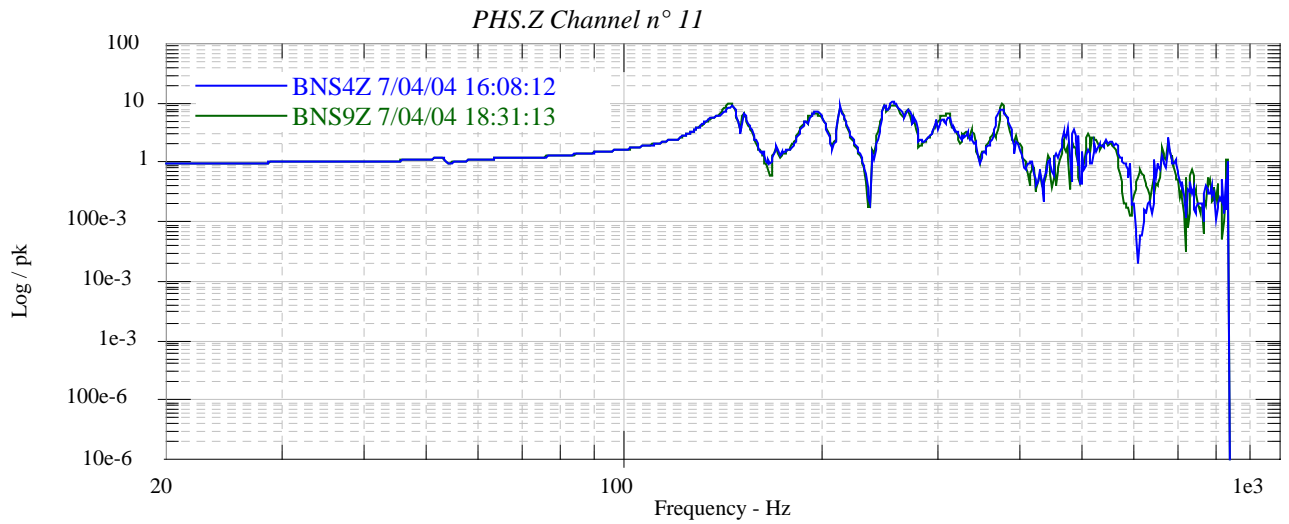
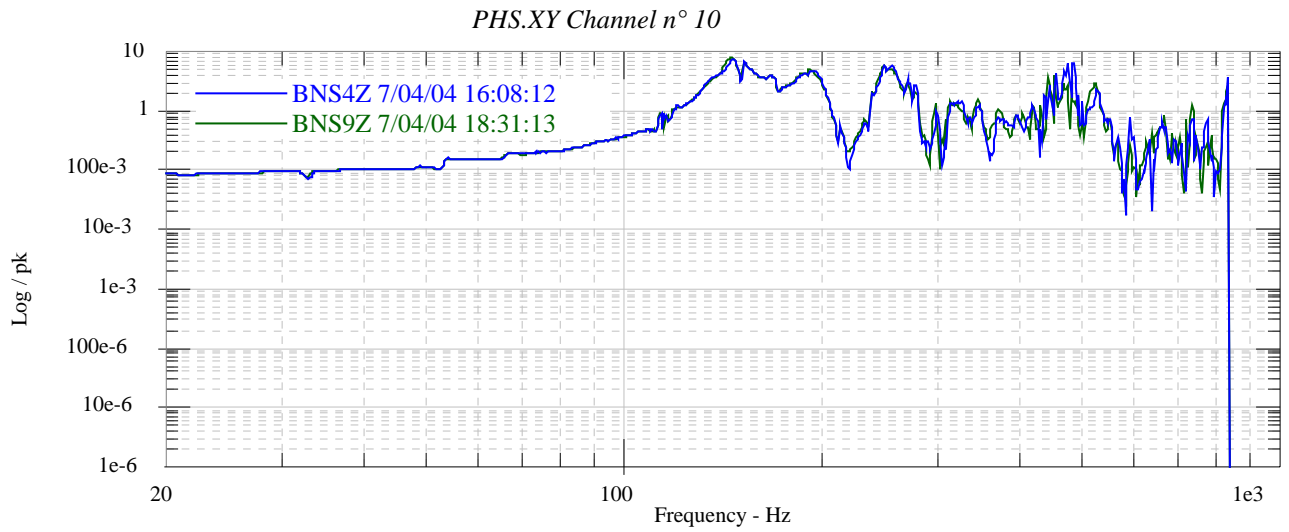
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12.28 Comparison BNS_Z transfer functions pre and post high level random.

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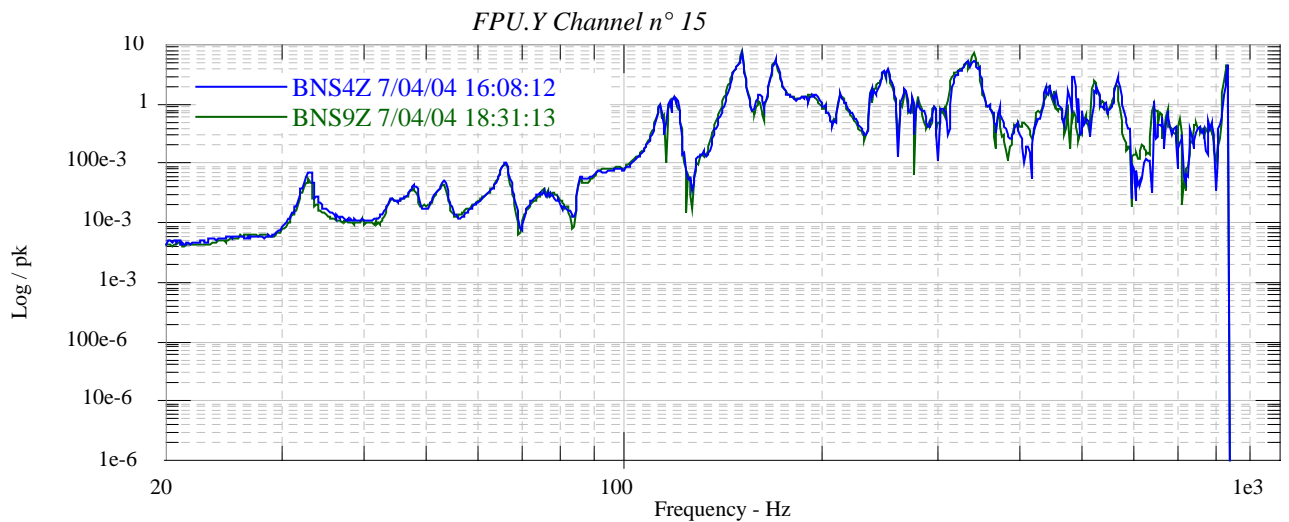
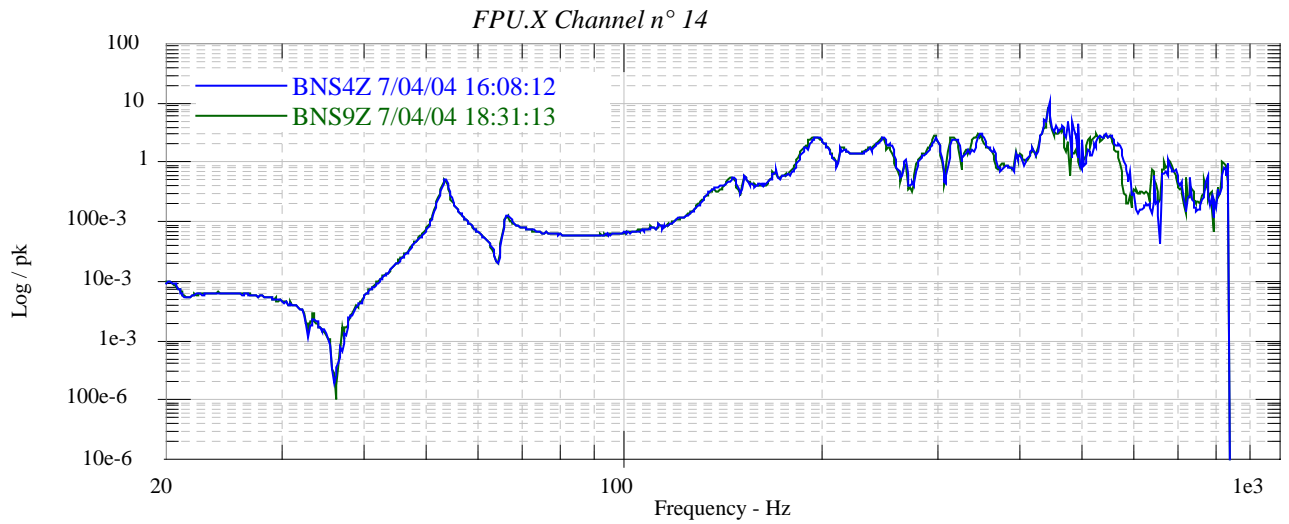
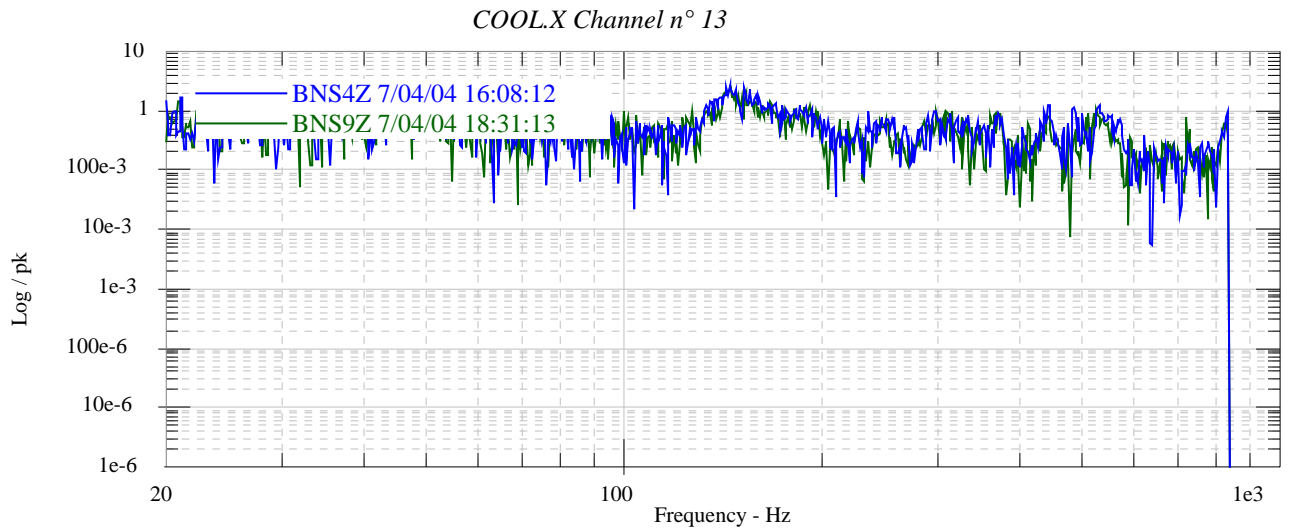
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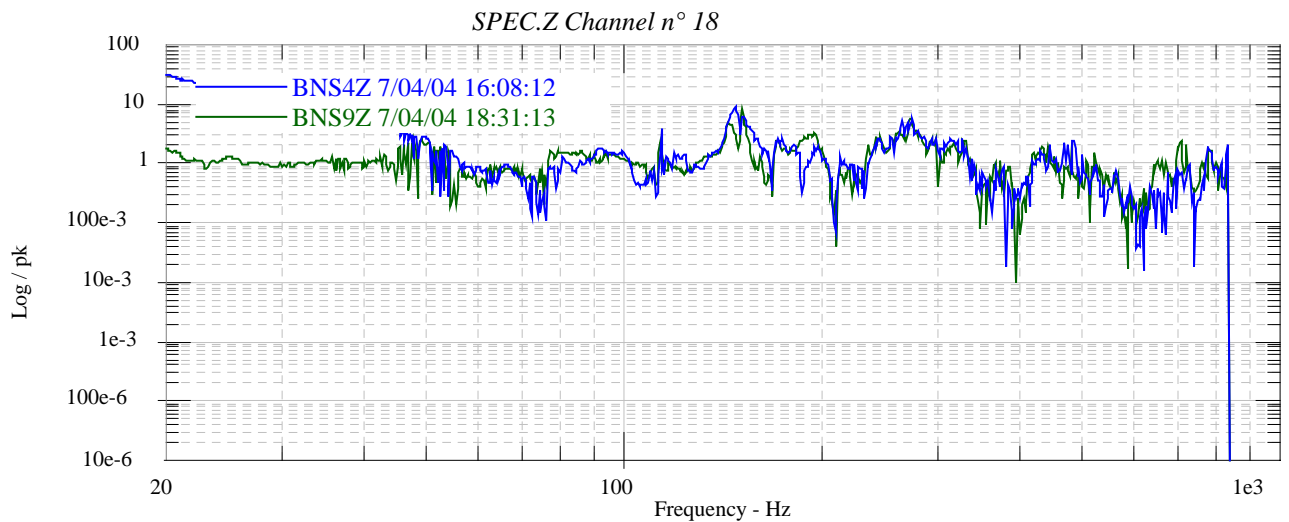
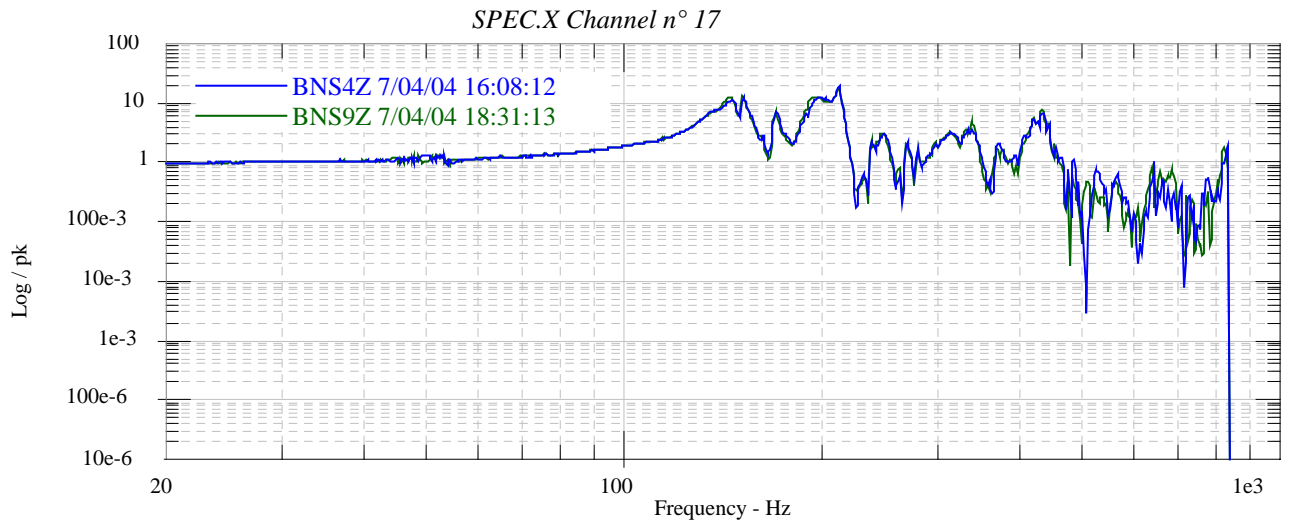
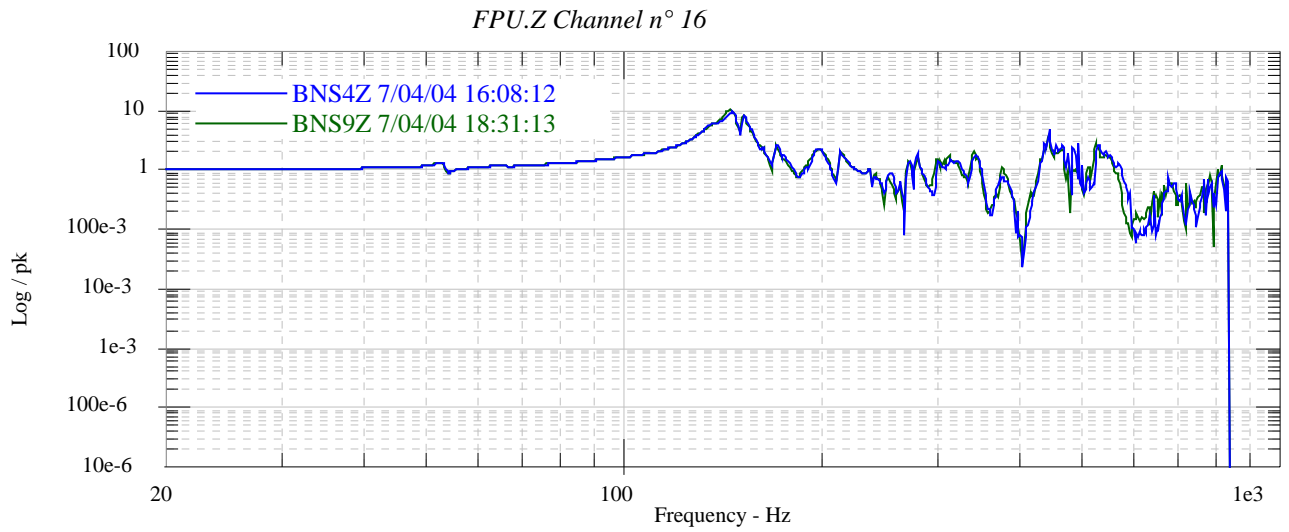
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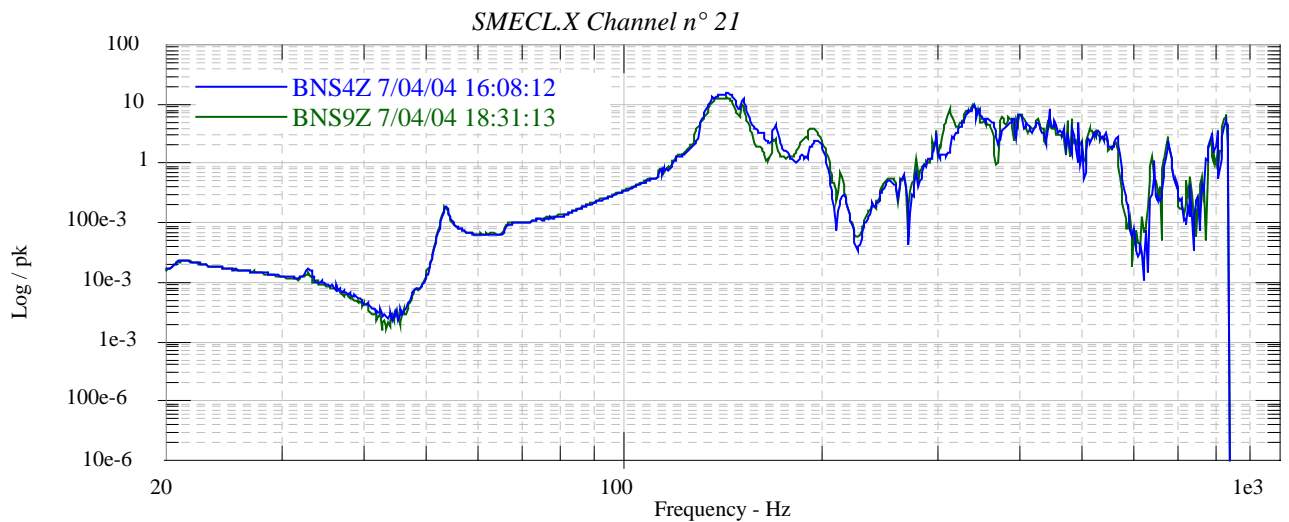
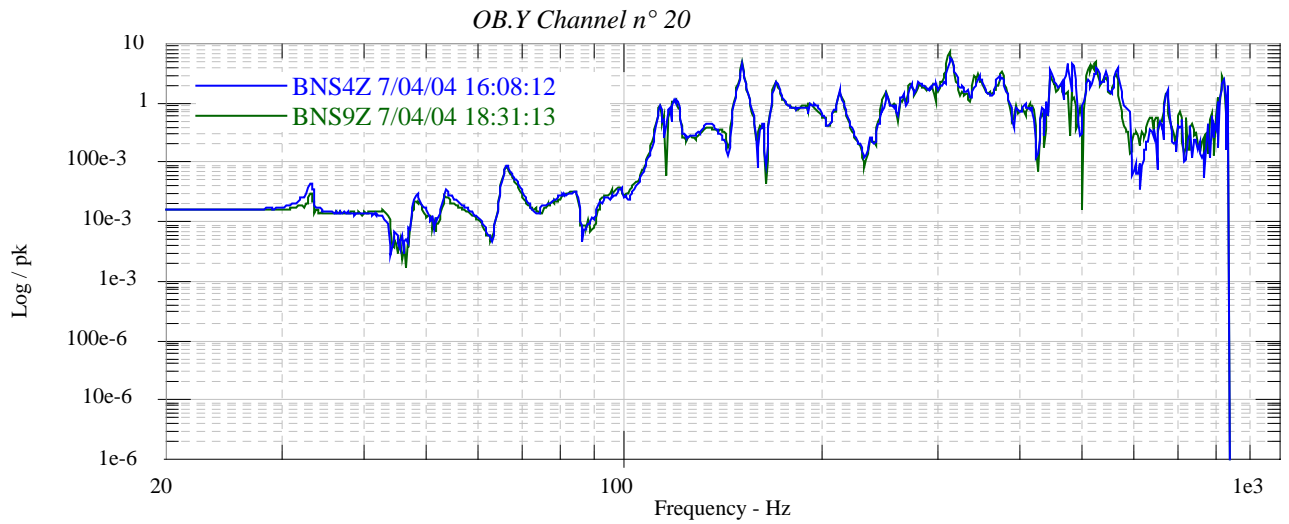
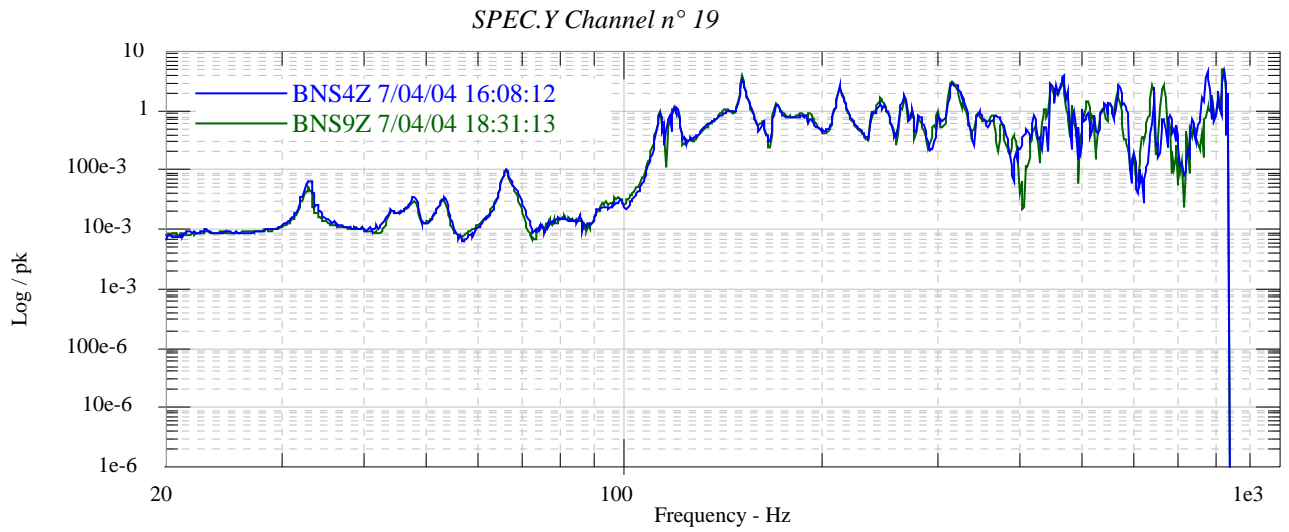
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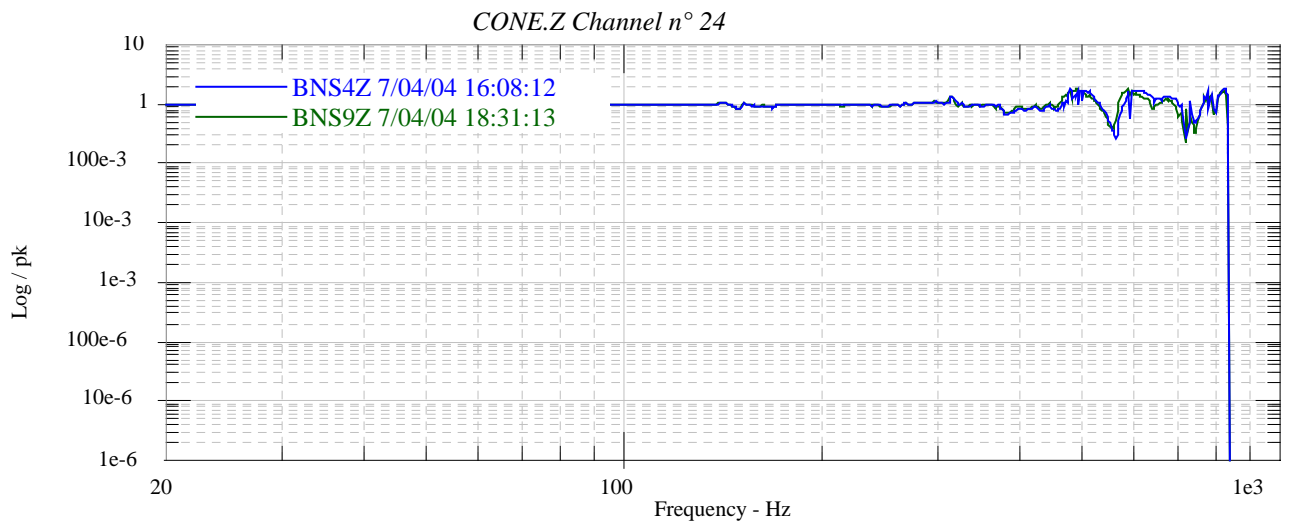
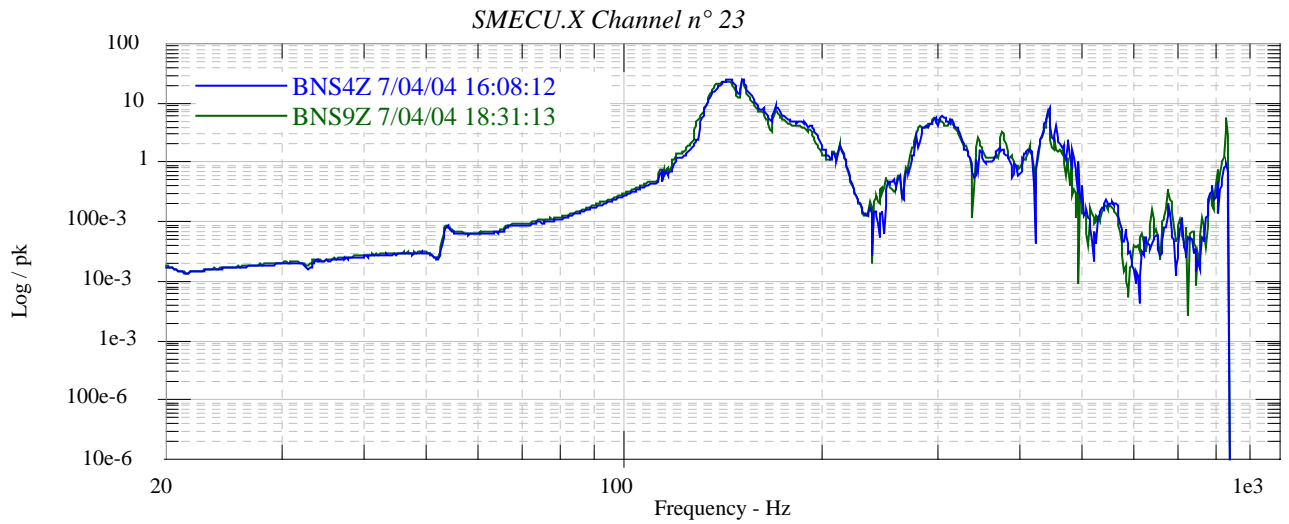
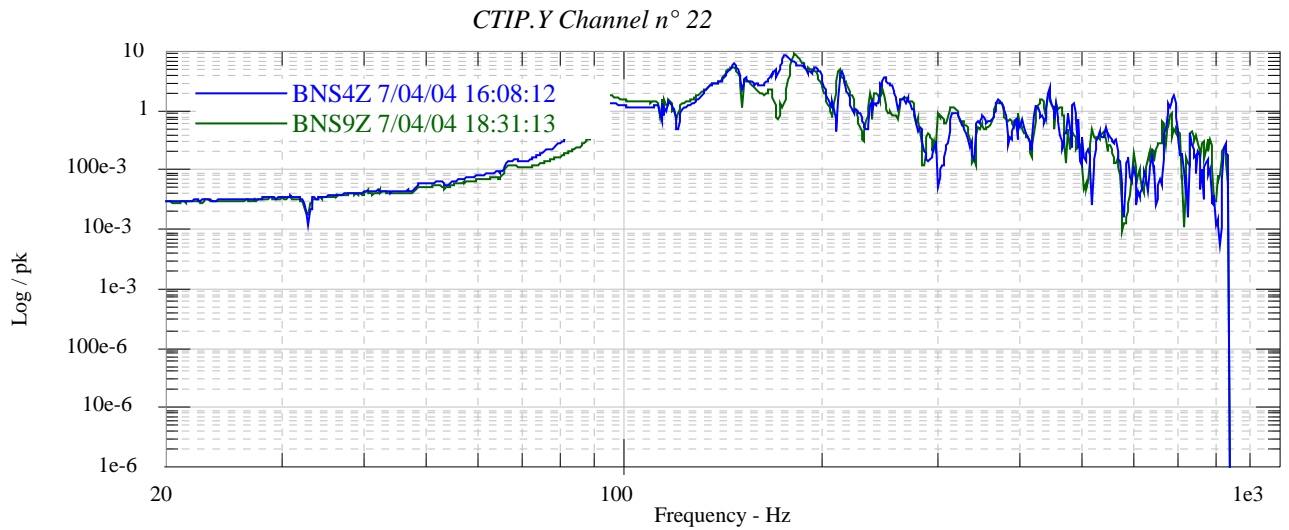
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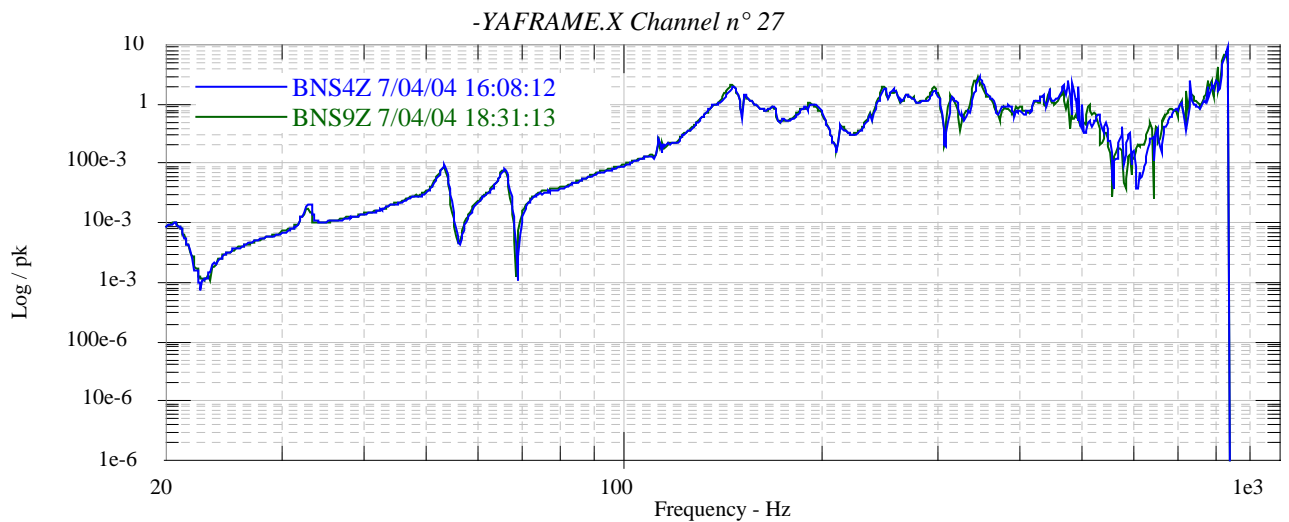
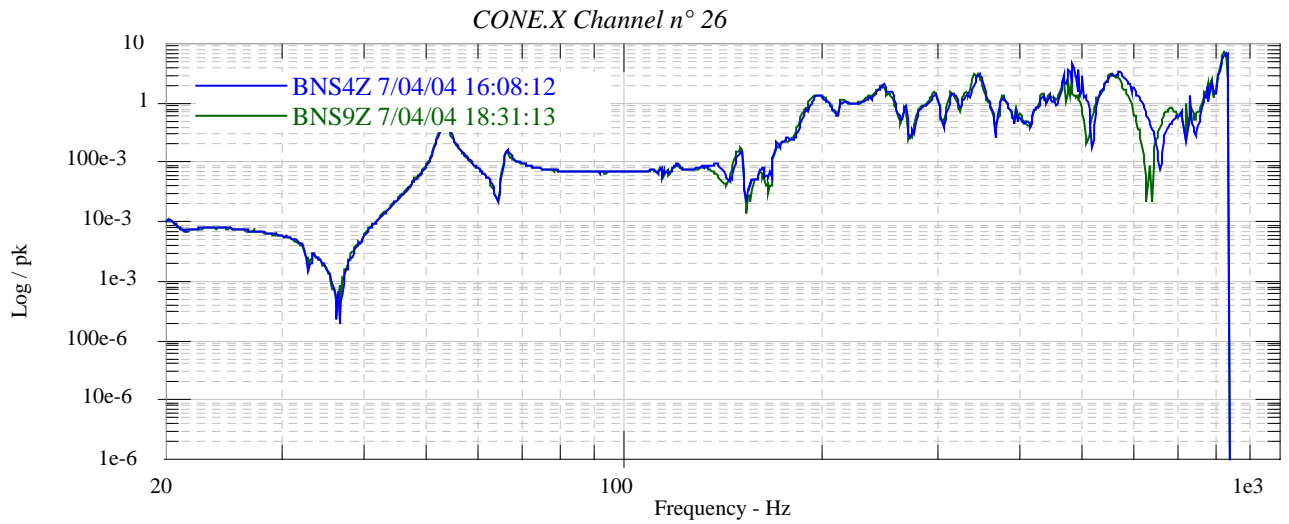
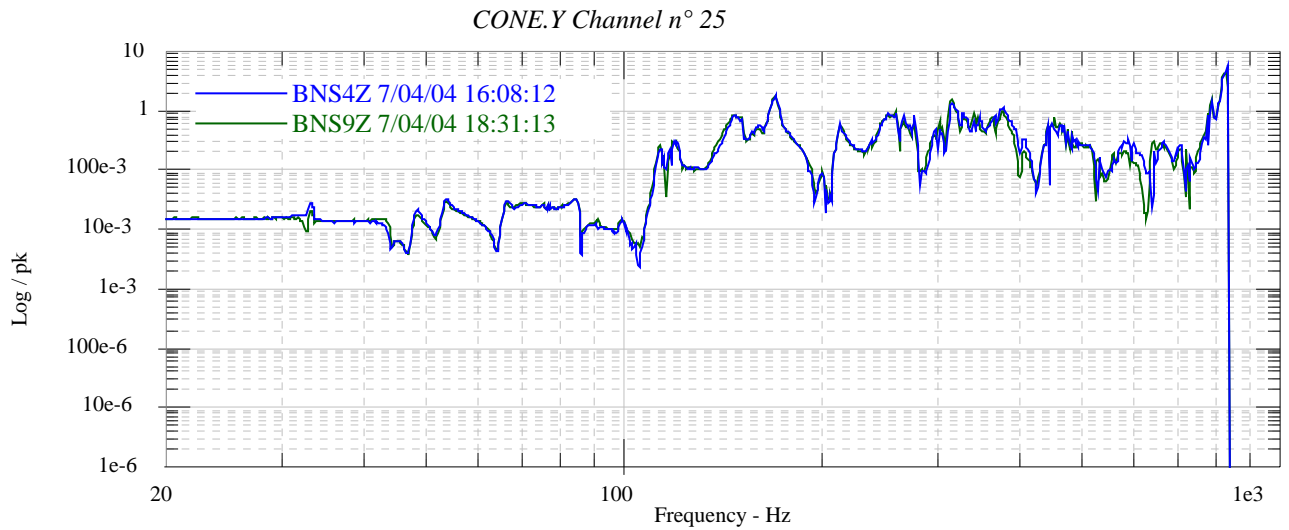
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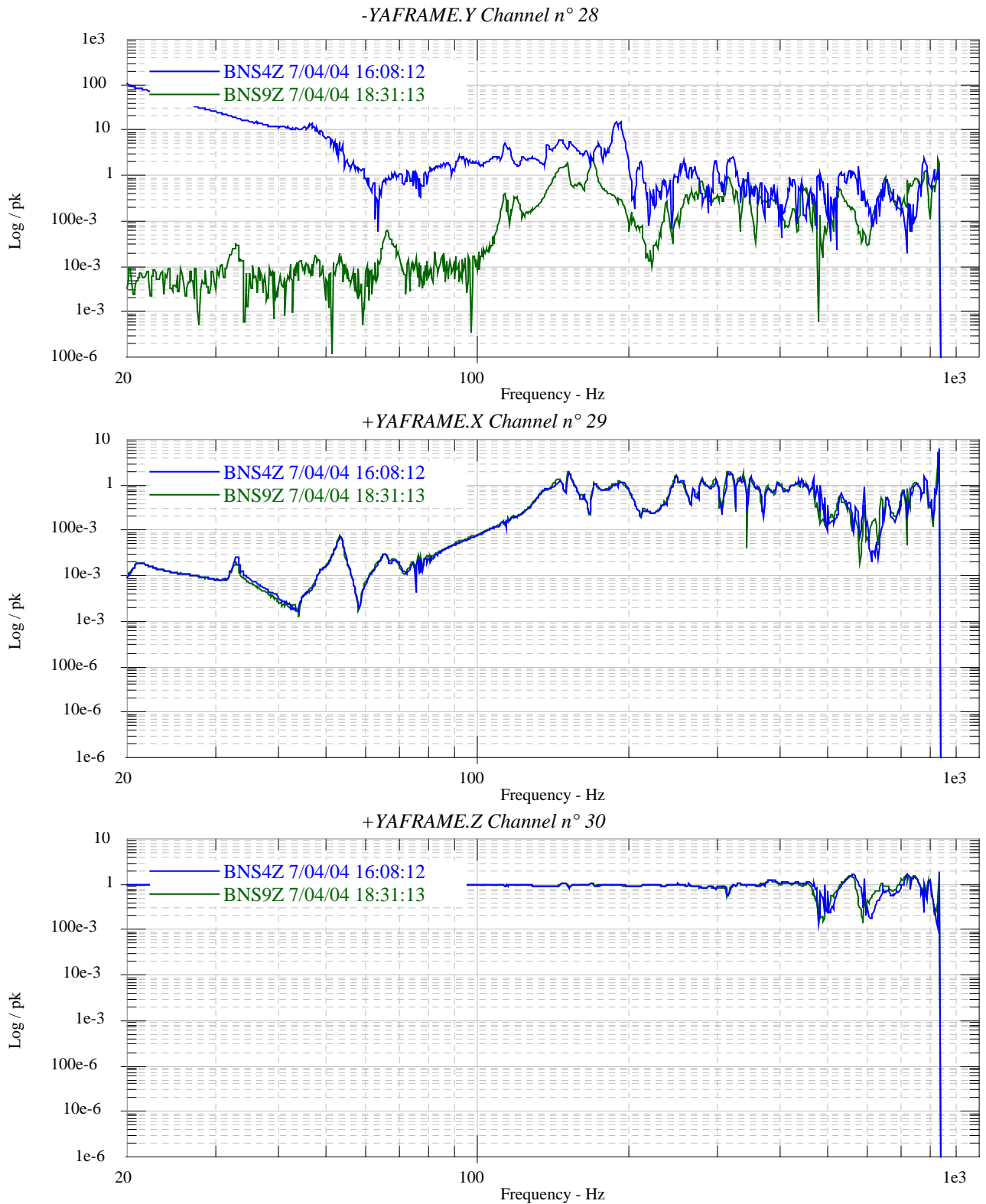
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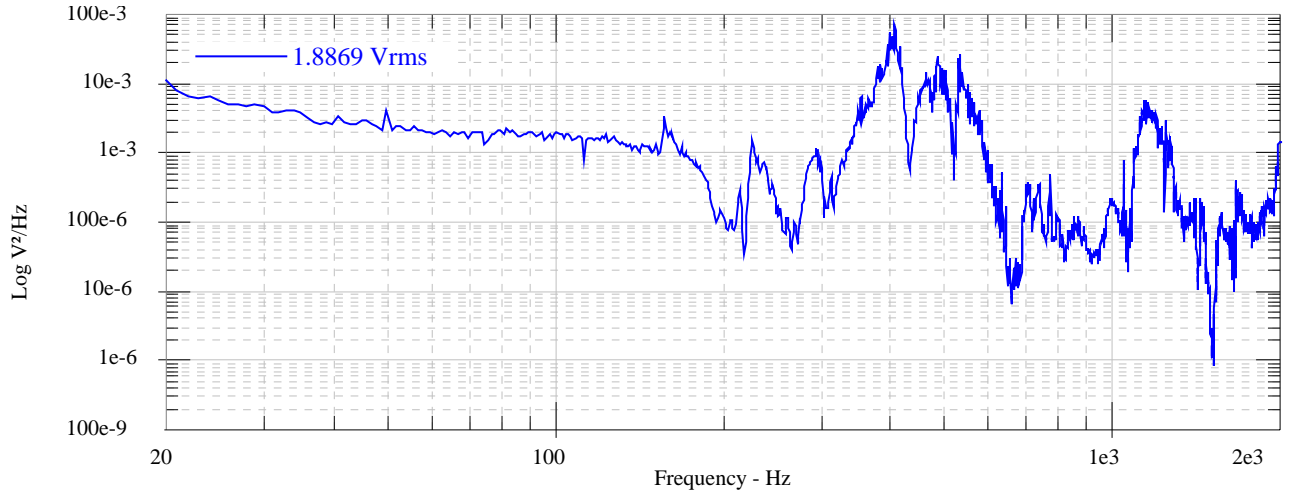
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SPIRE QM

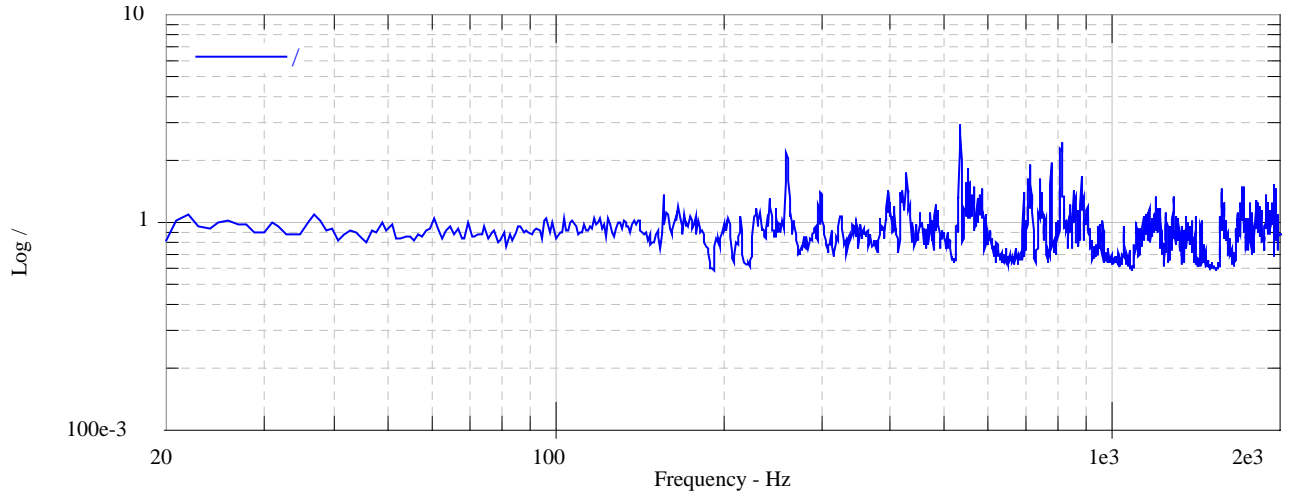
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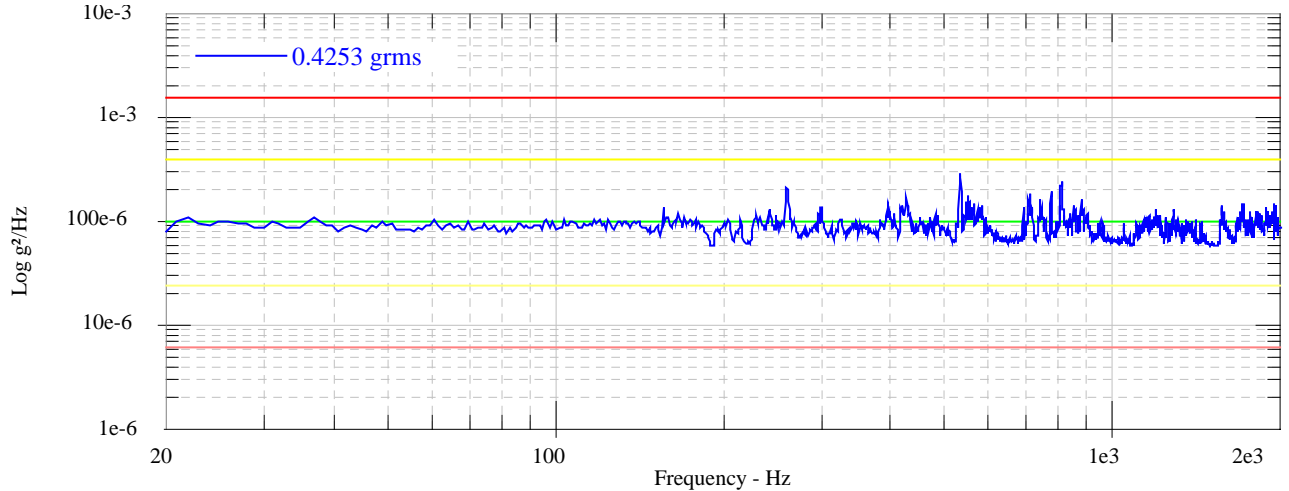
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

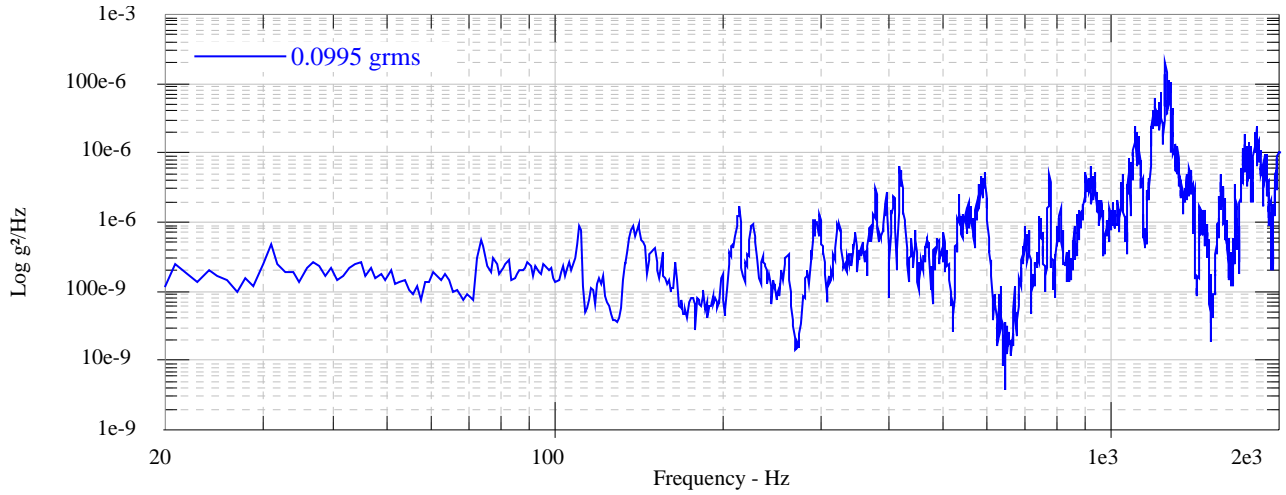


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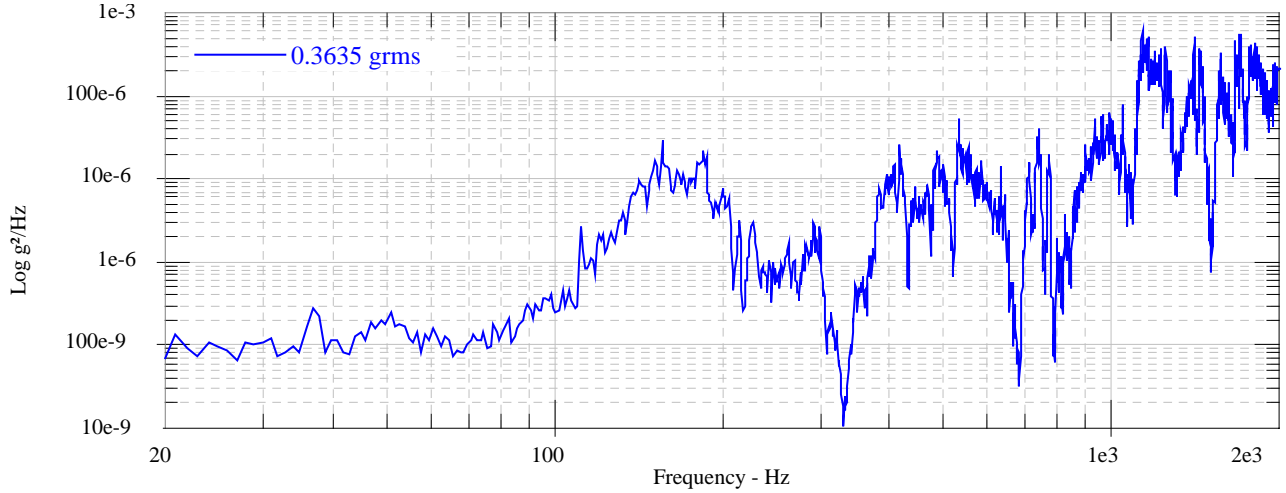
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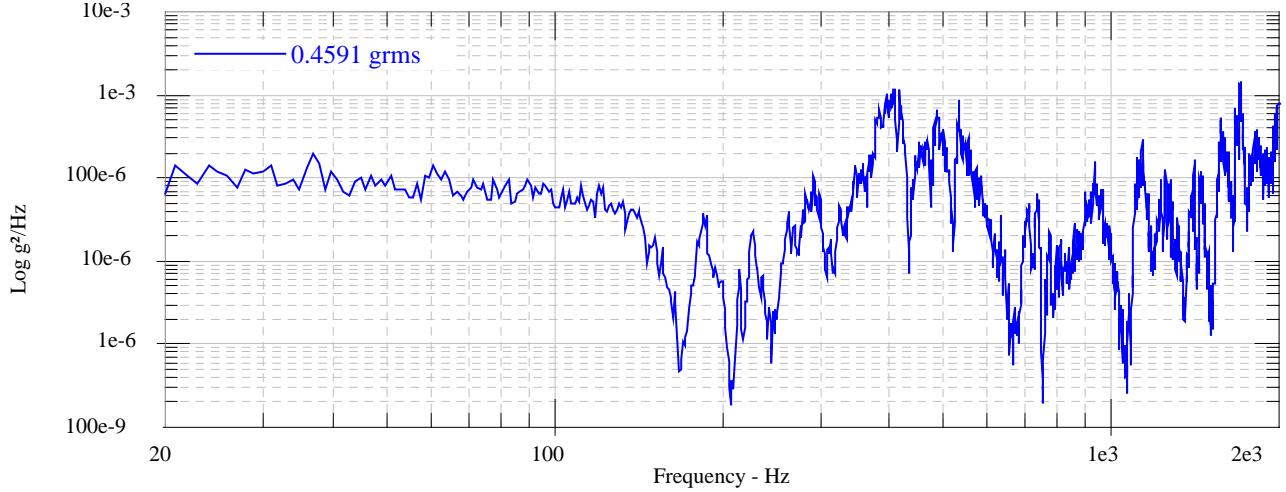
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

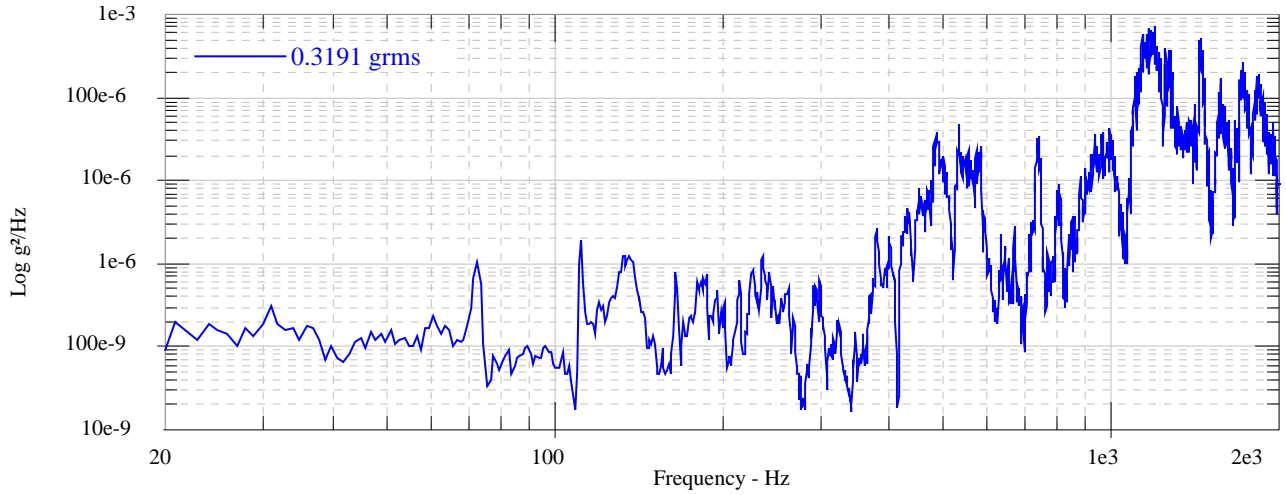


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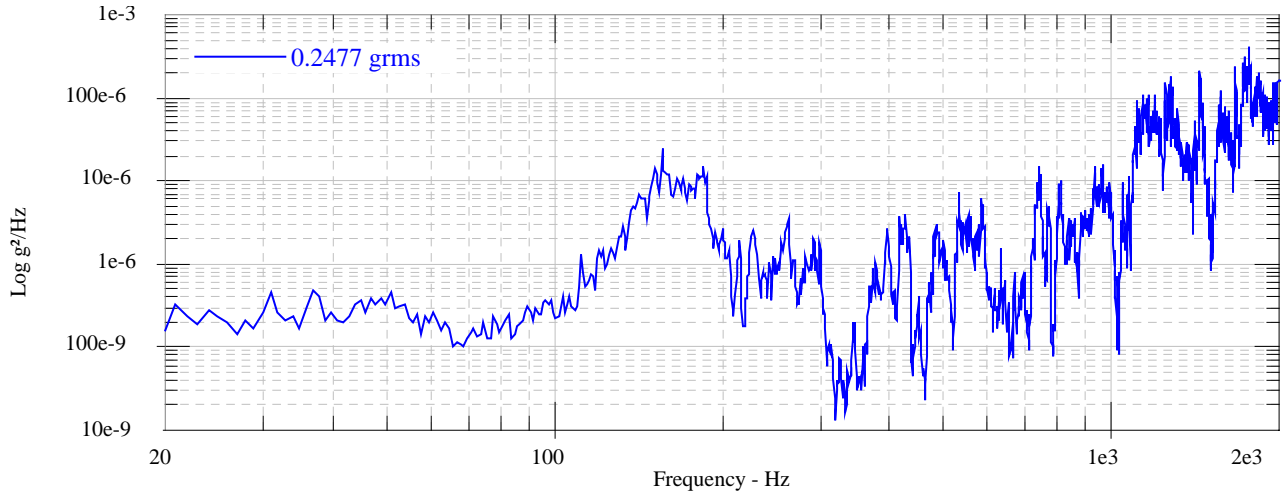
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Révision : 00
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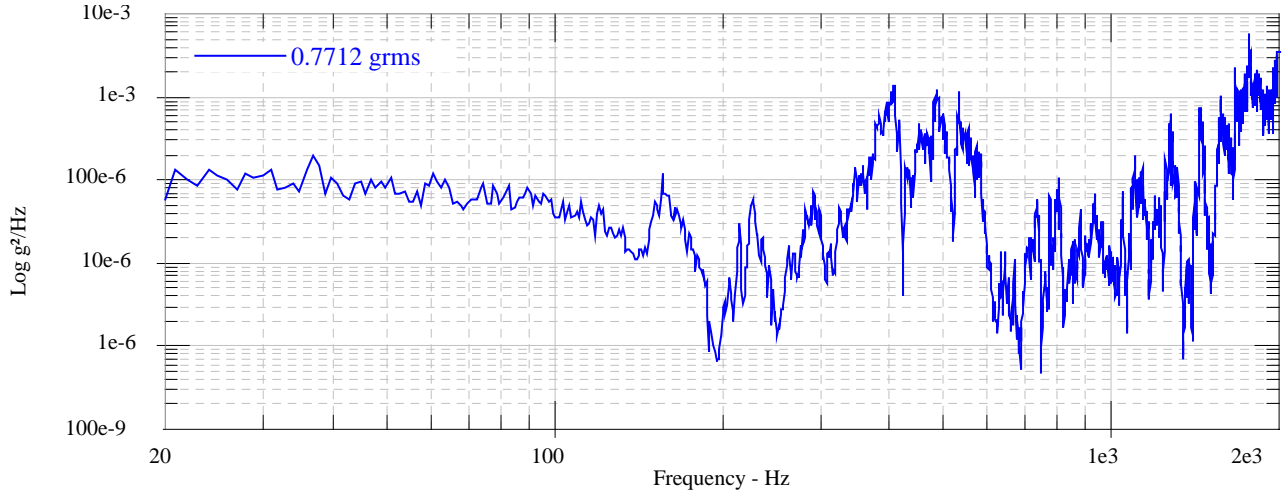
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

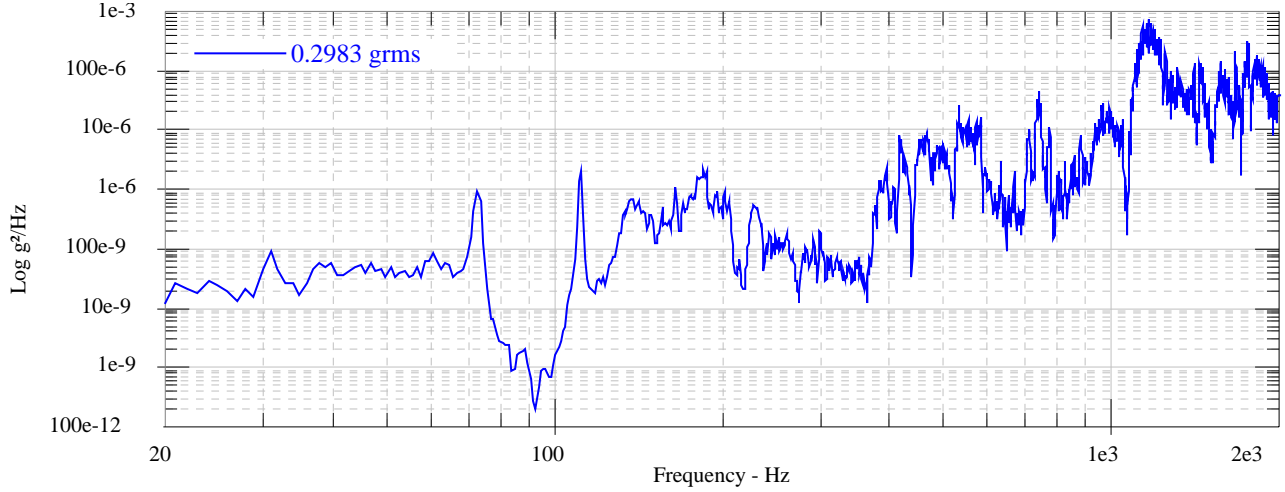


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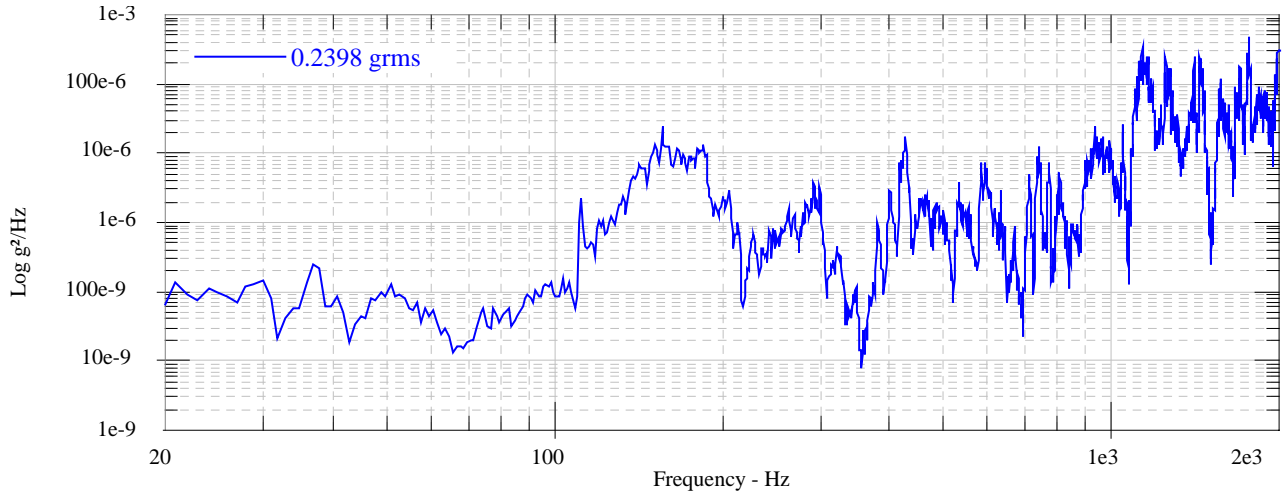
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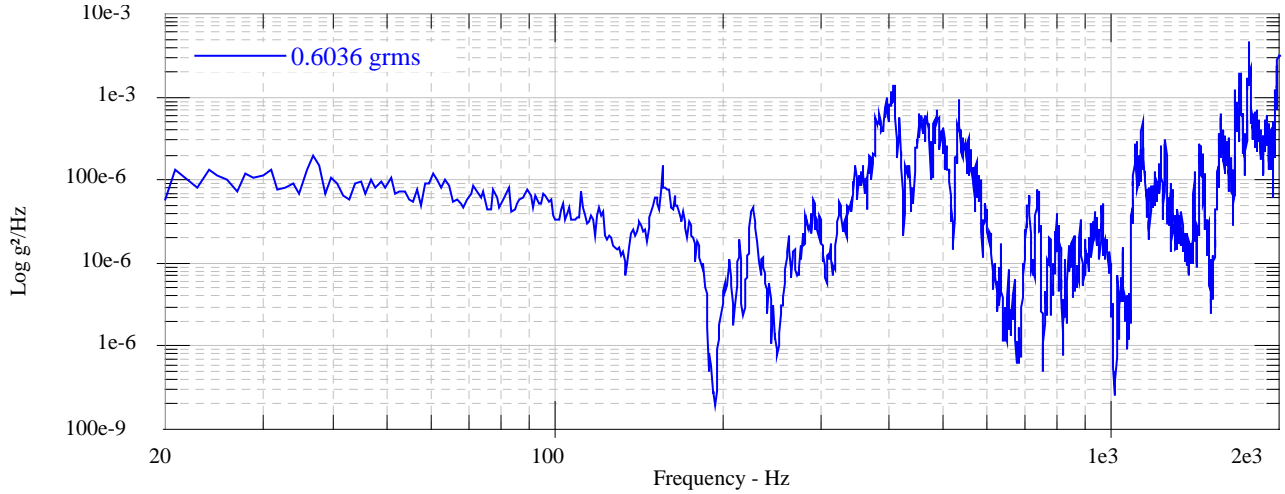
SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

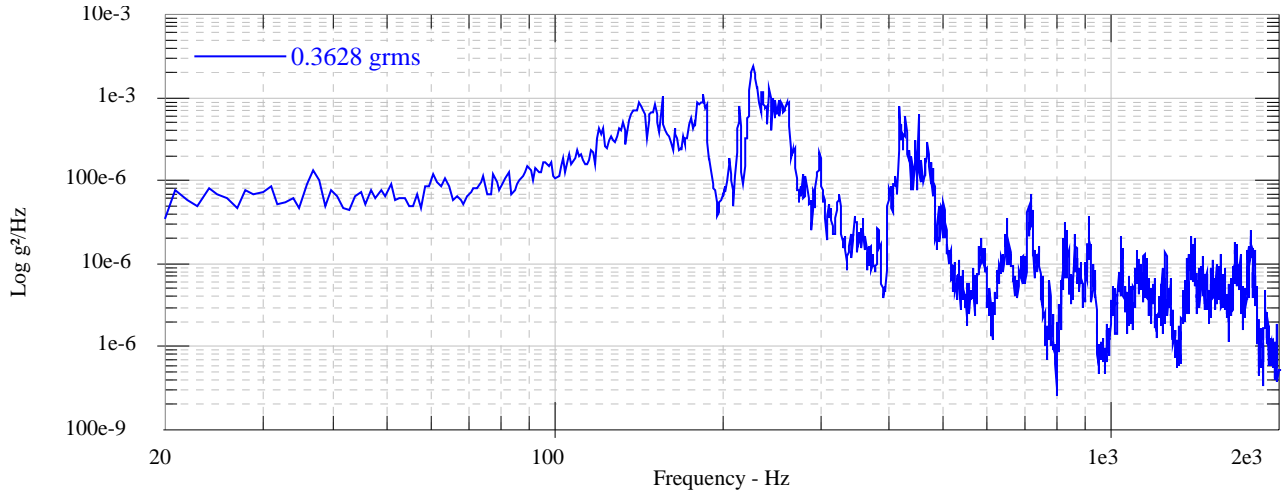


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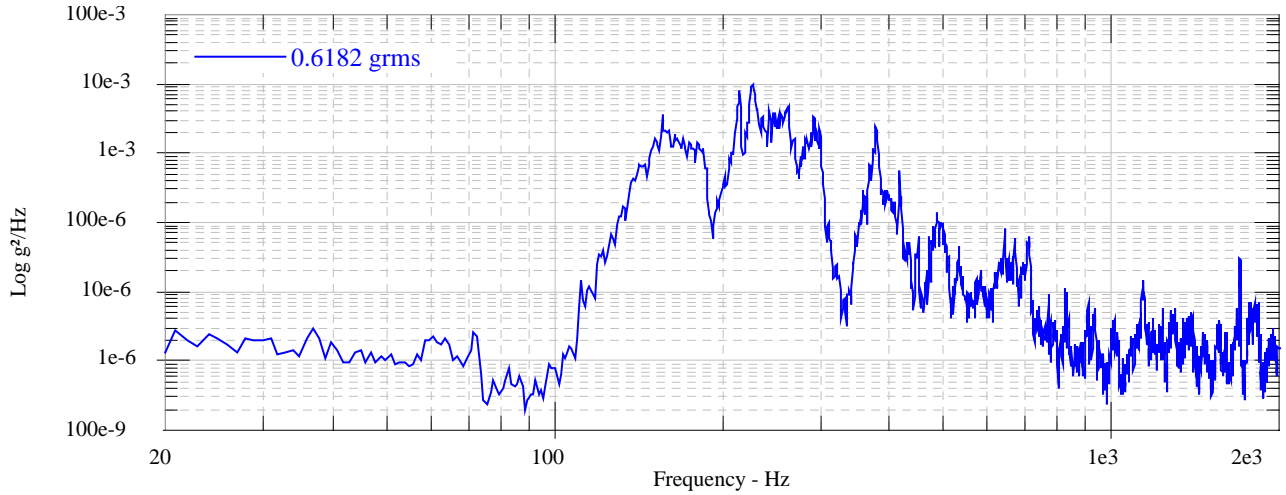
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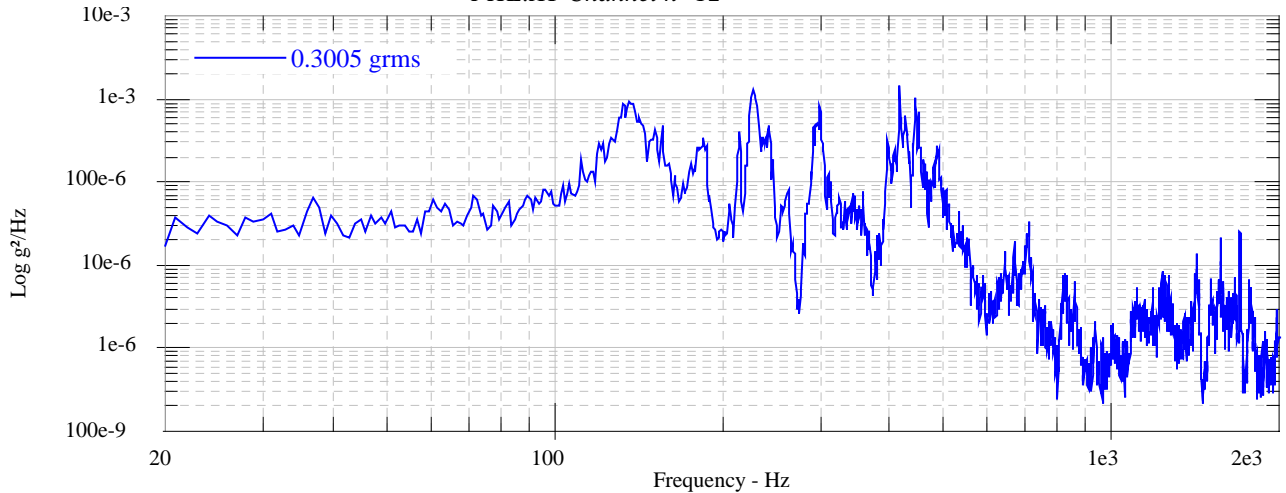
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

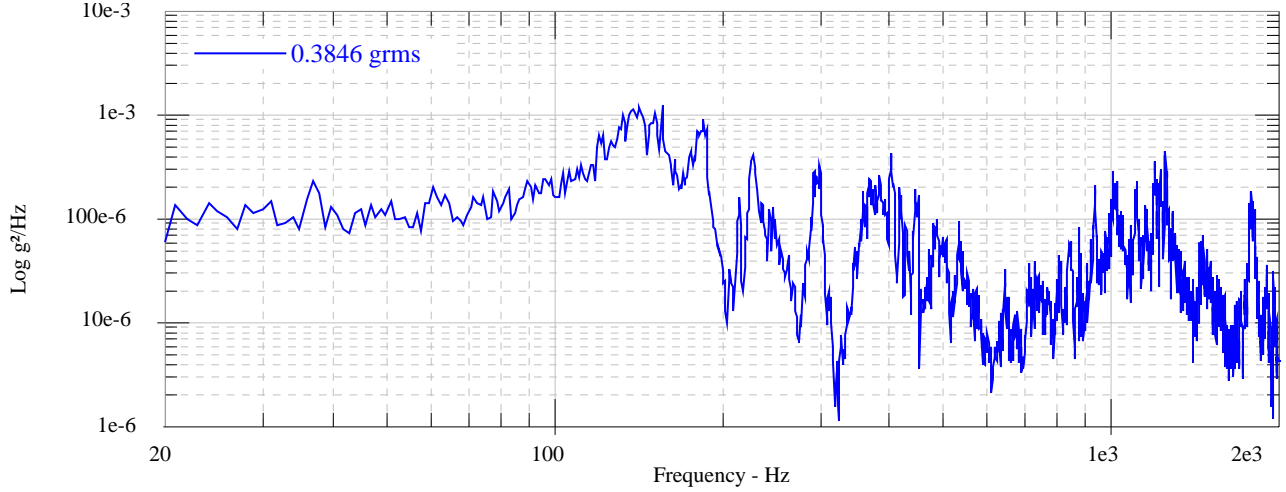


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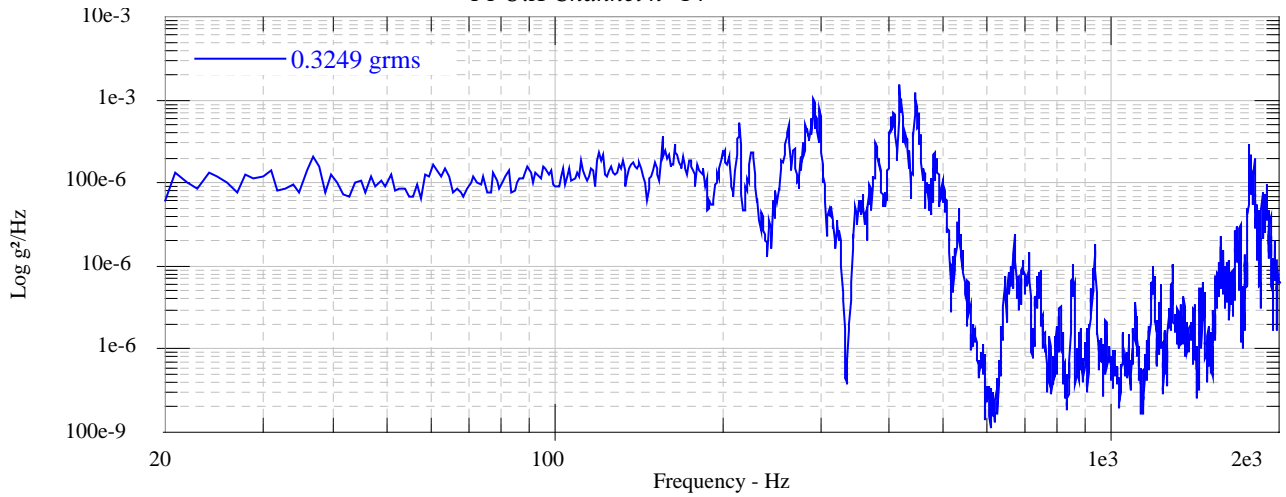
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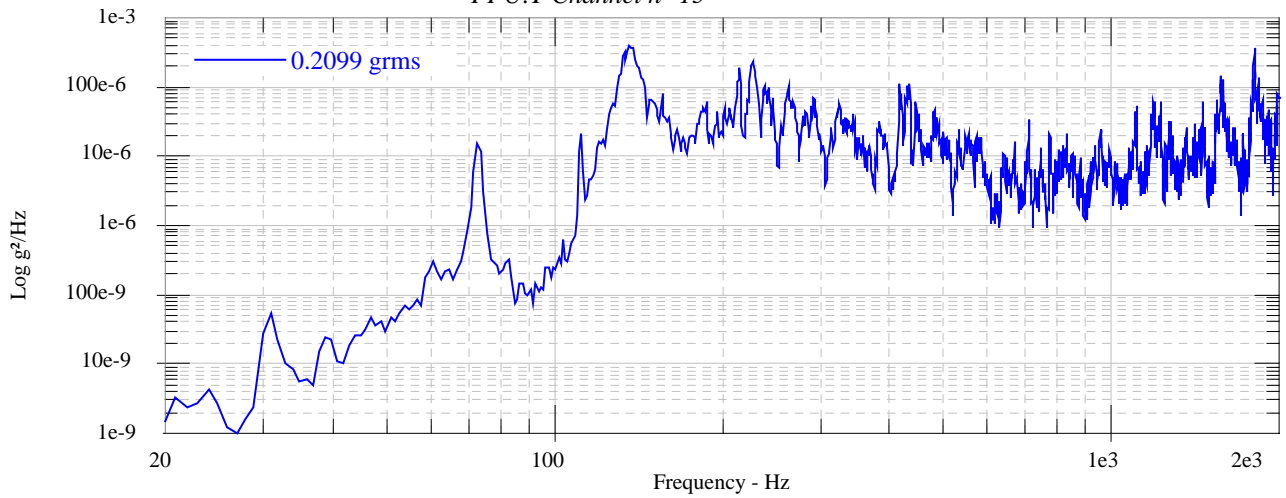
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

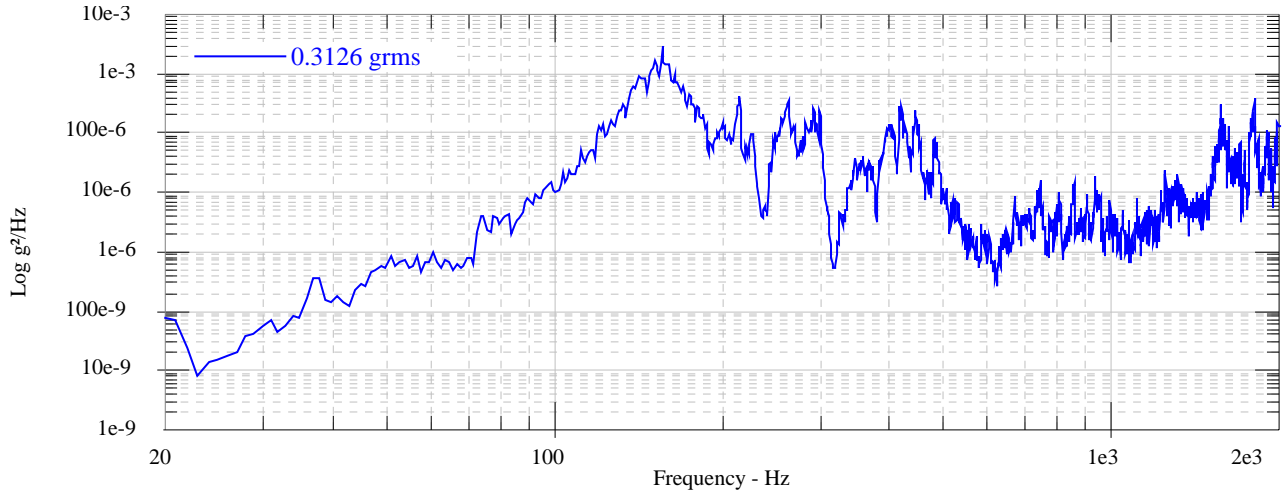


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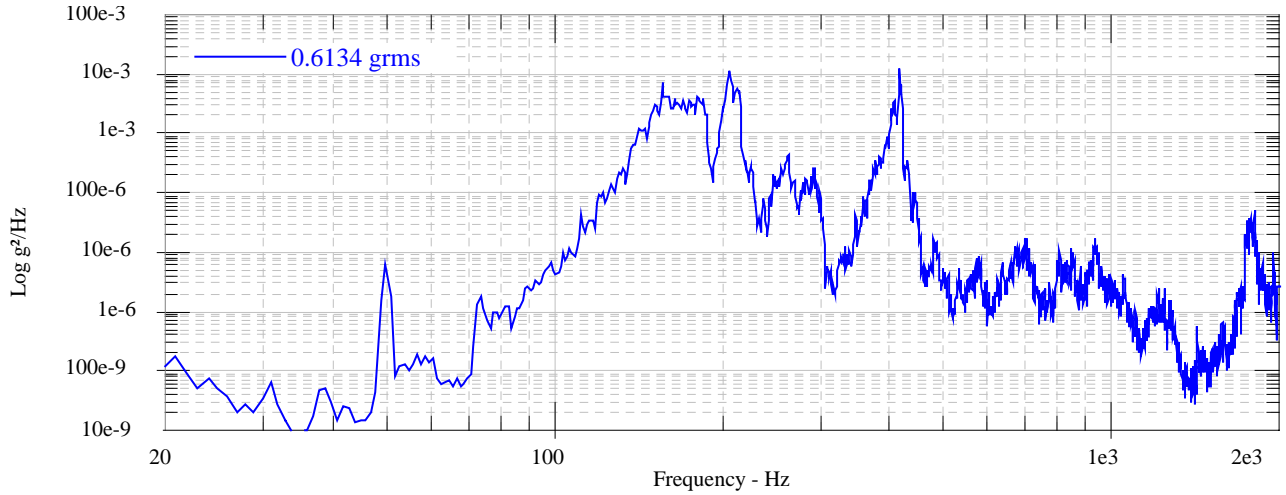
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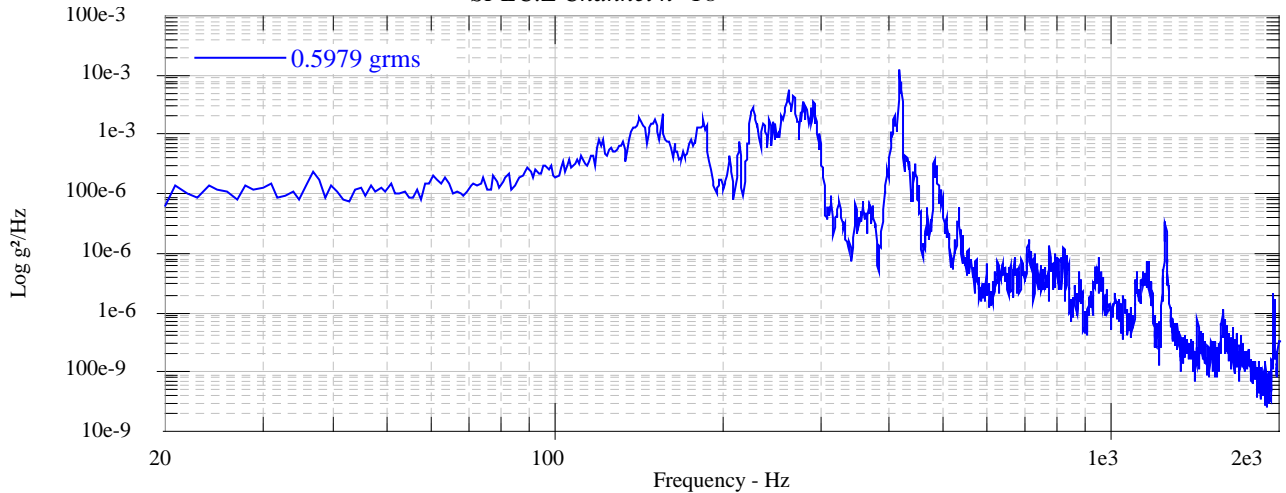
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

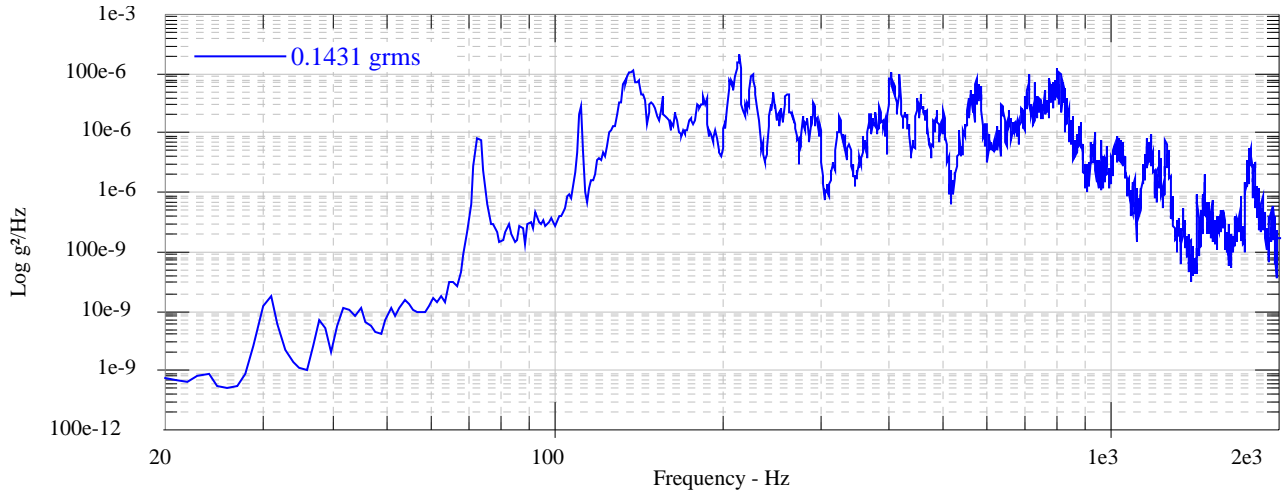


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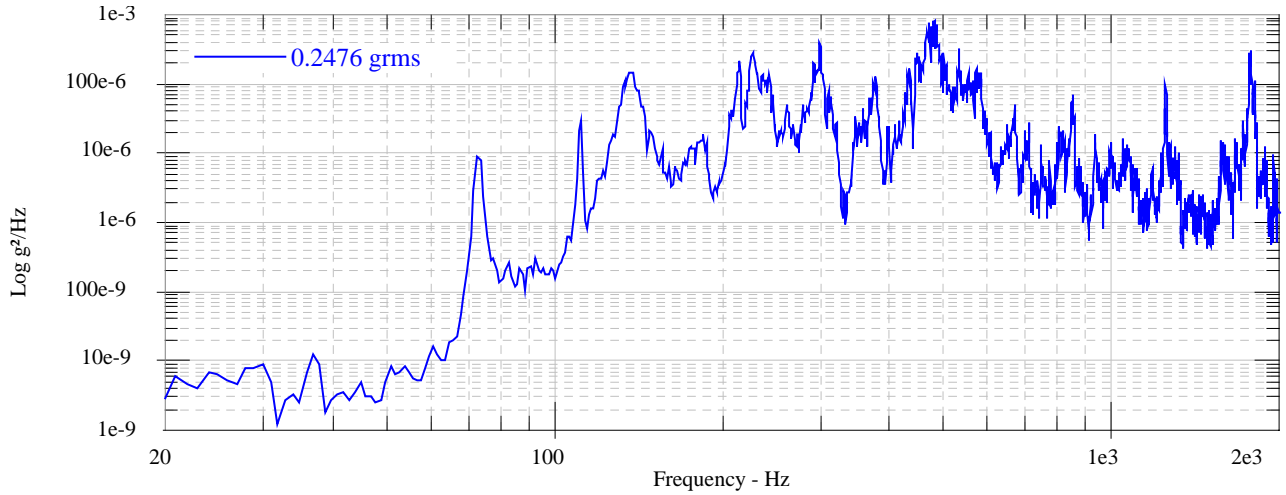
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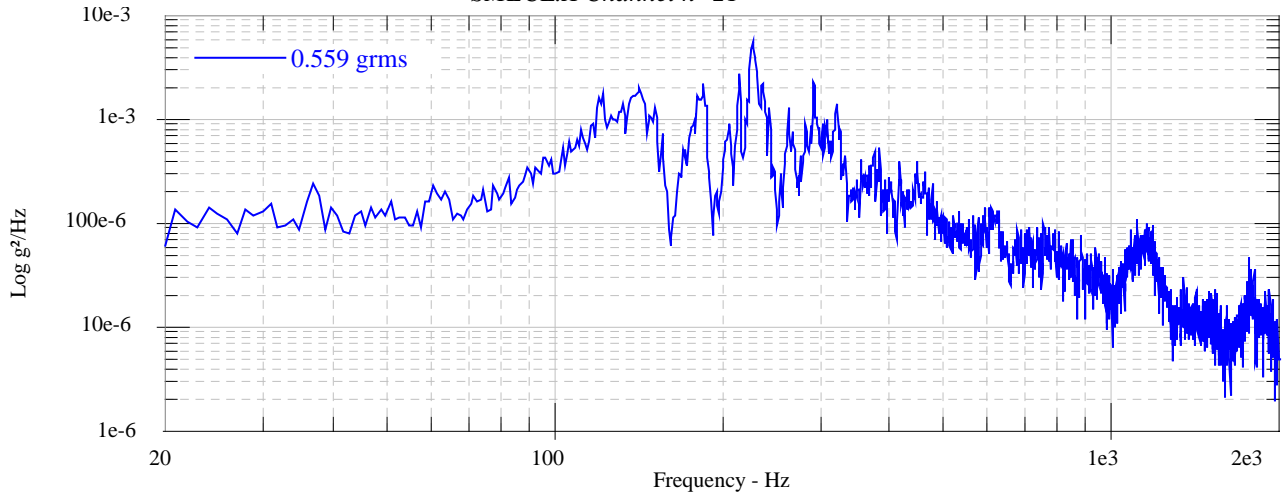
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

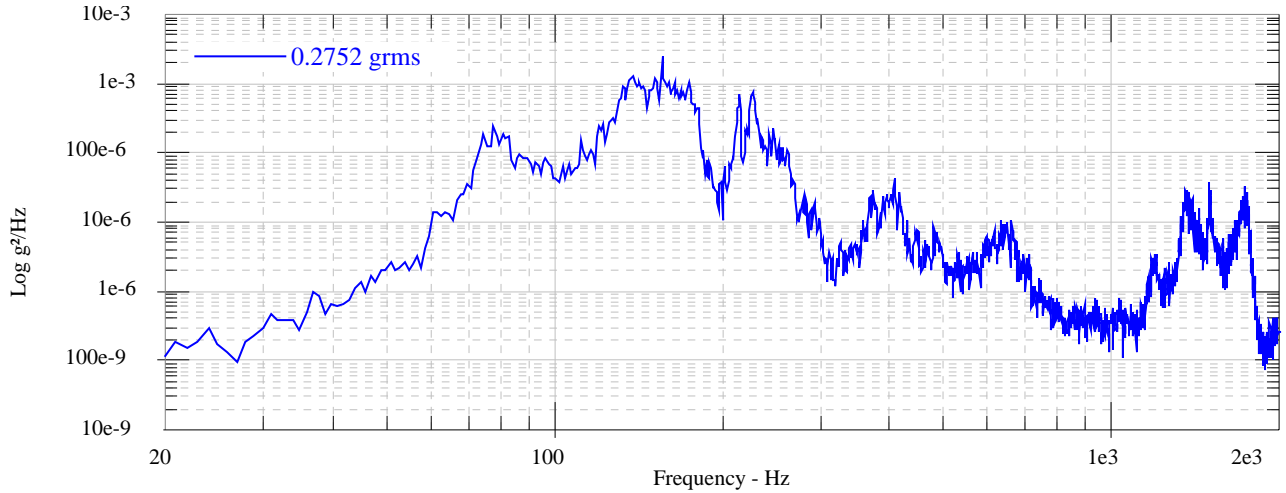


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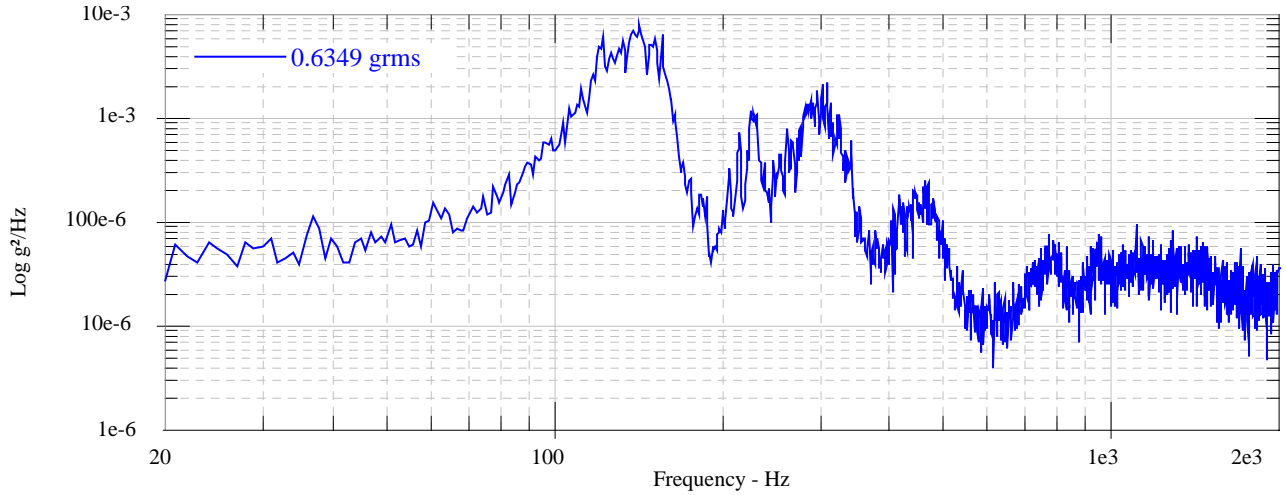
RP-CSL-CRYOV-04001
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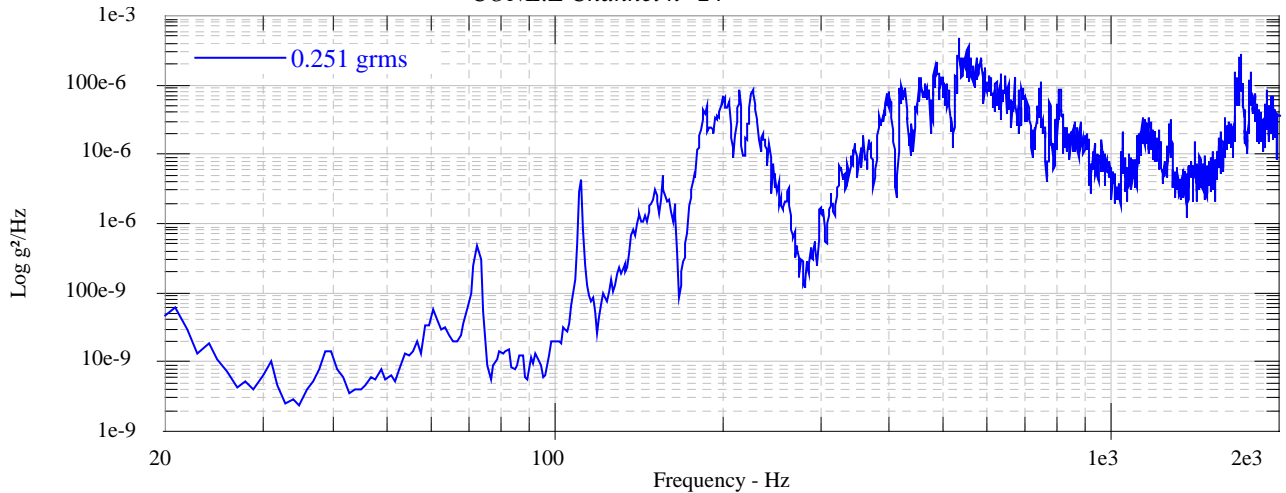
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SMECU.X Channel n° 23



CONE.Z Channel n° 24

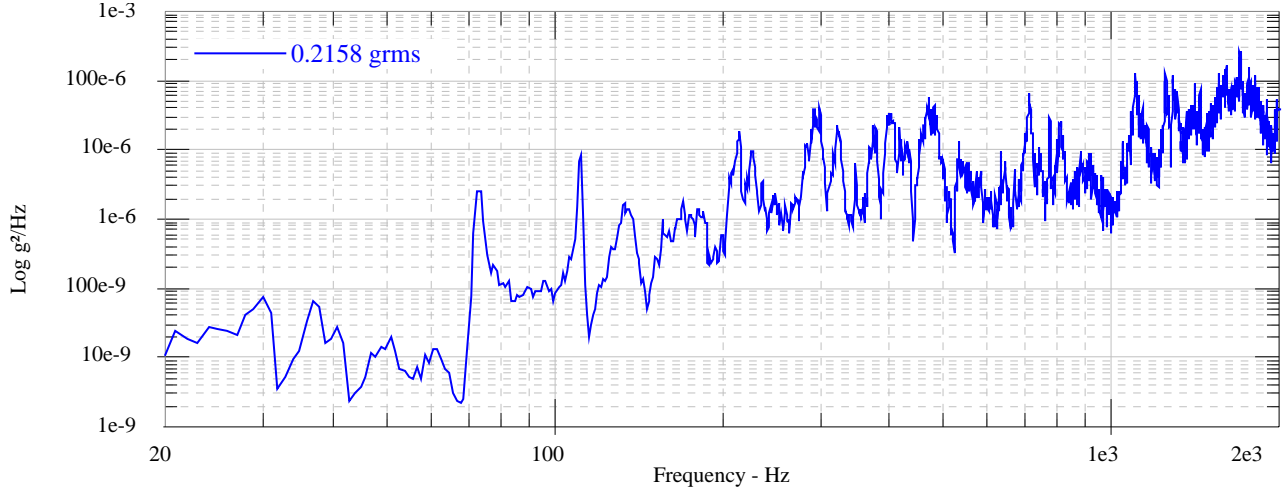


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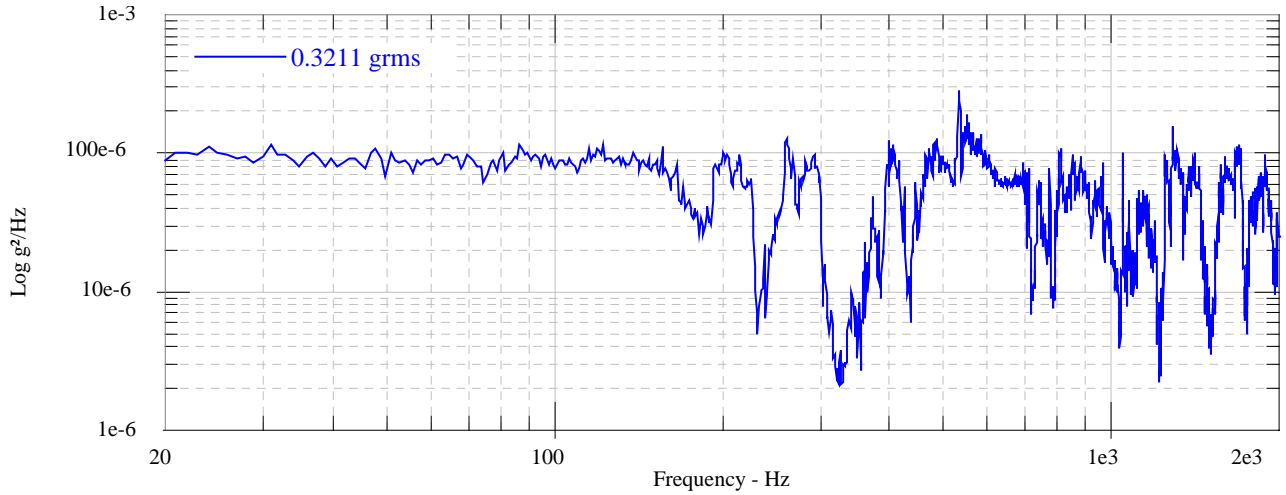
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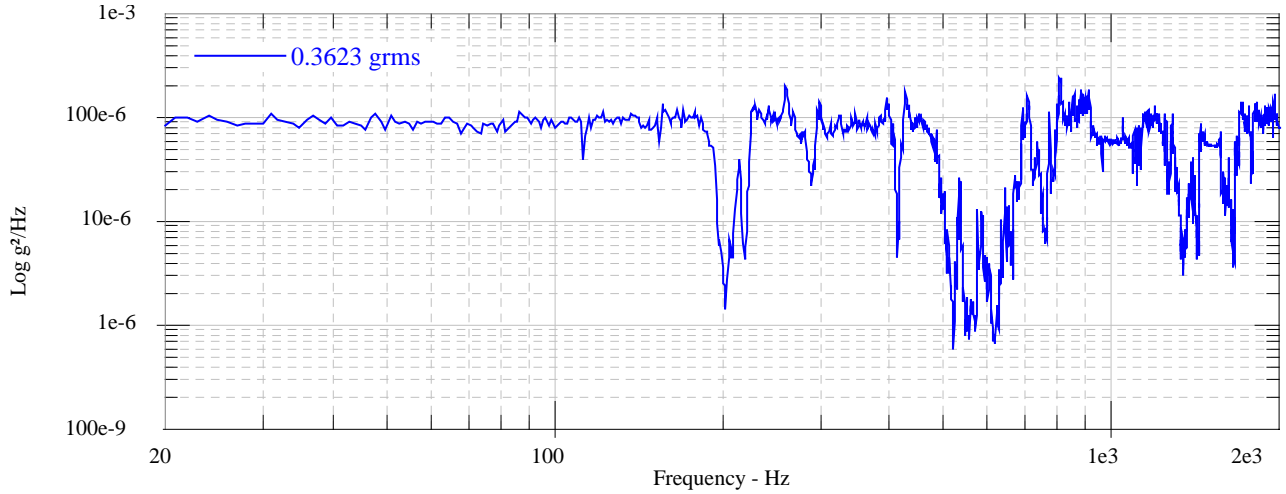
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

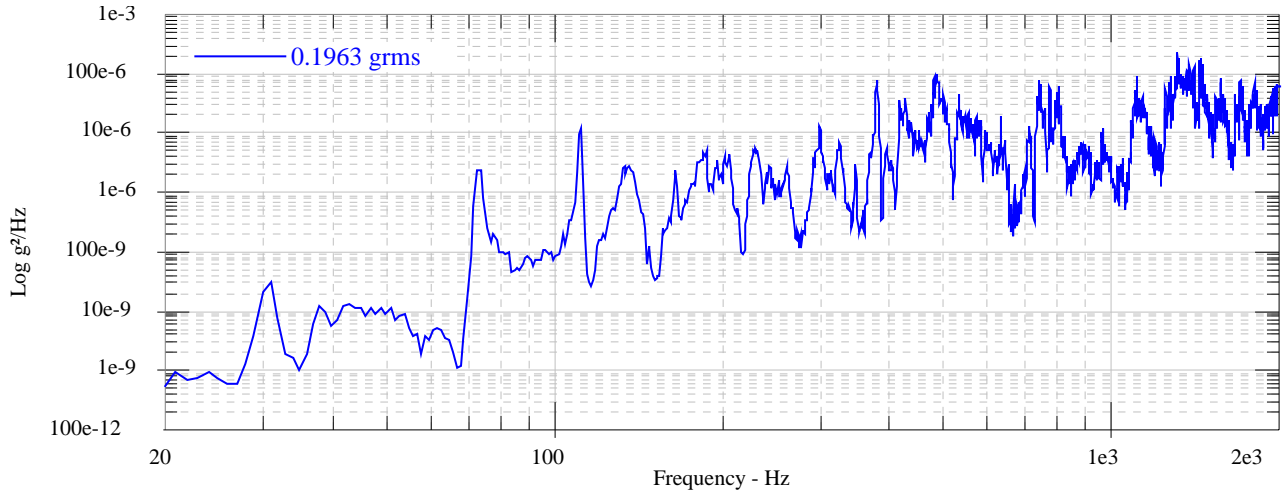


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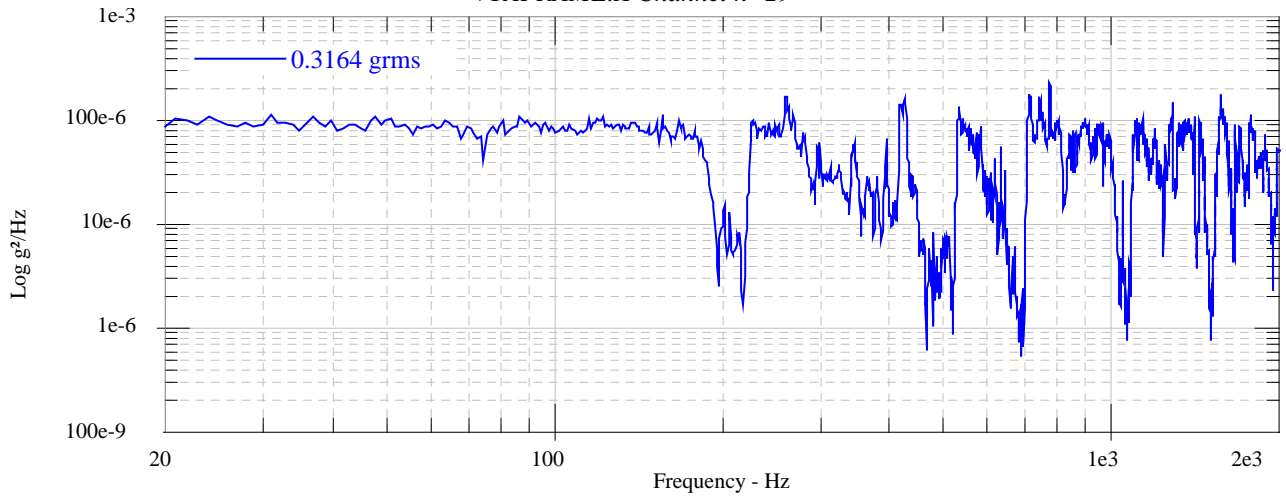
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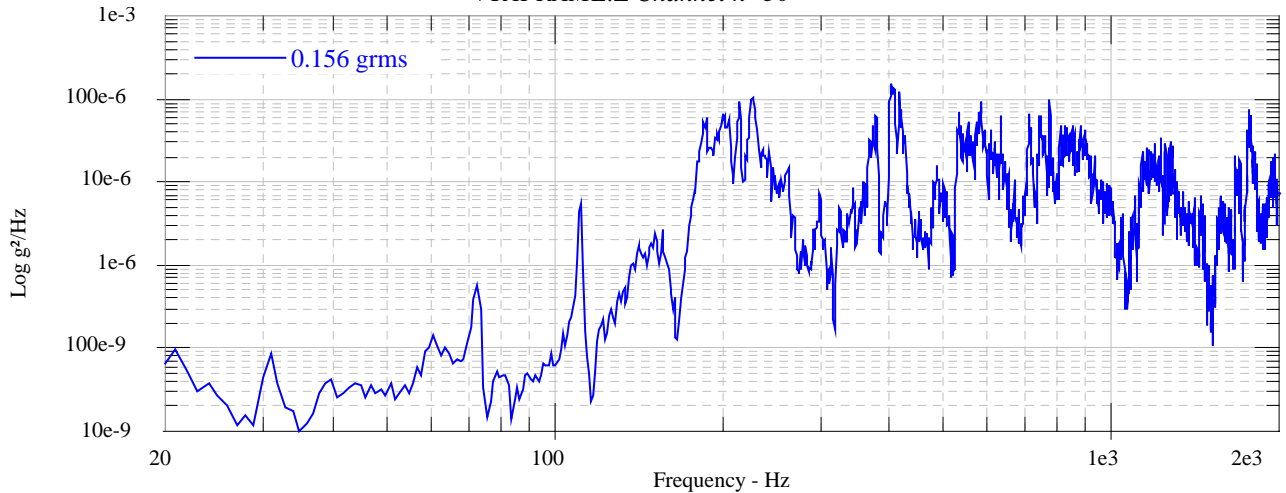
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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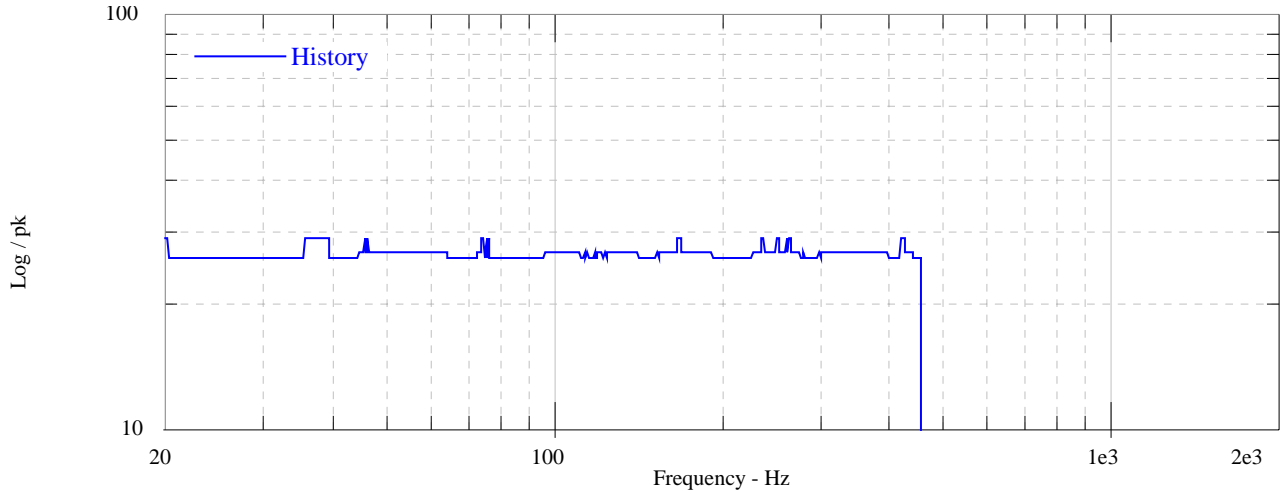
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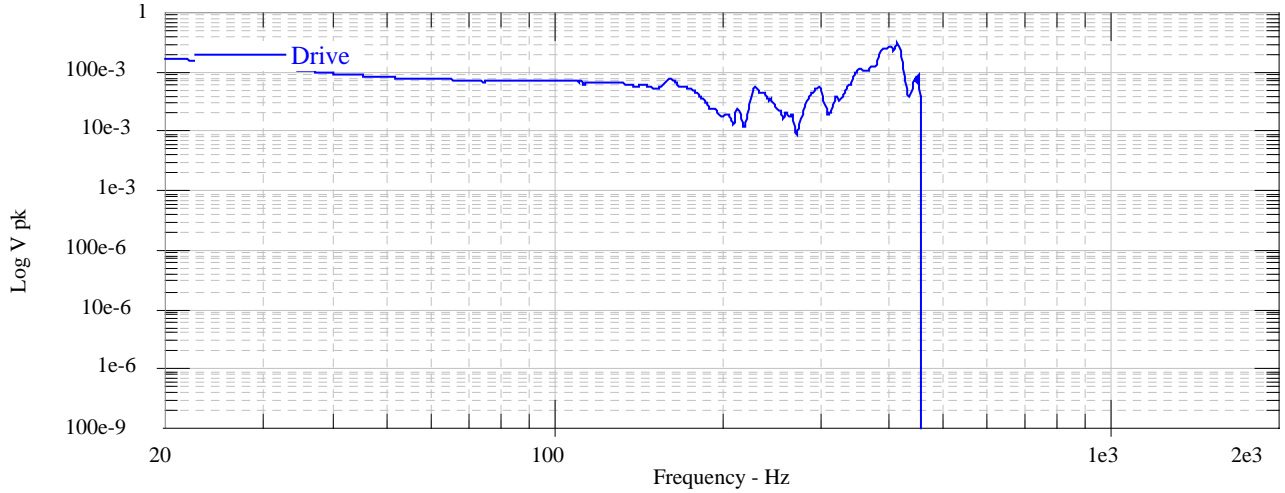
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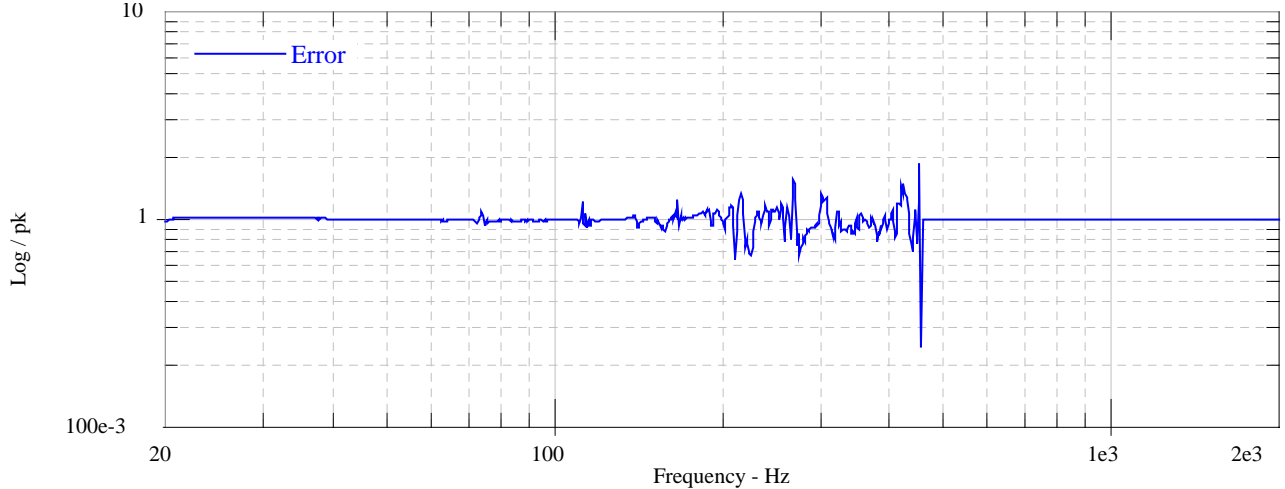
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Drive Channel n° -2



Error Channel n° -1

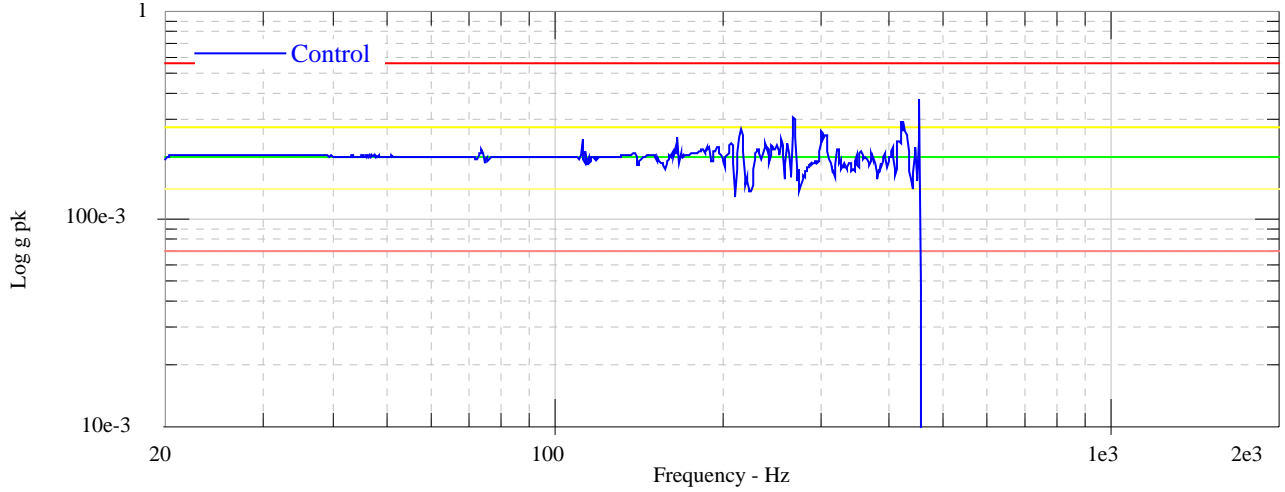


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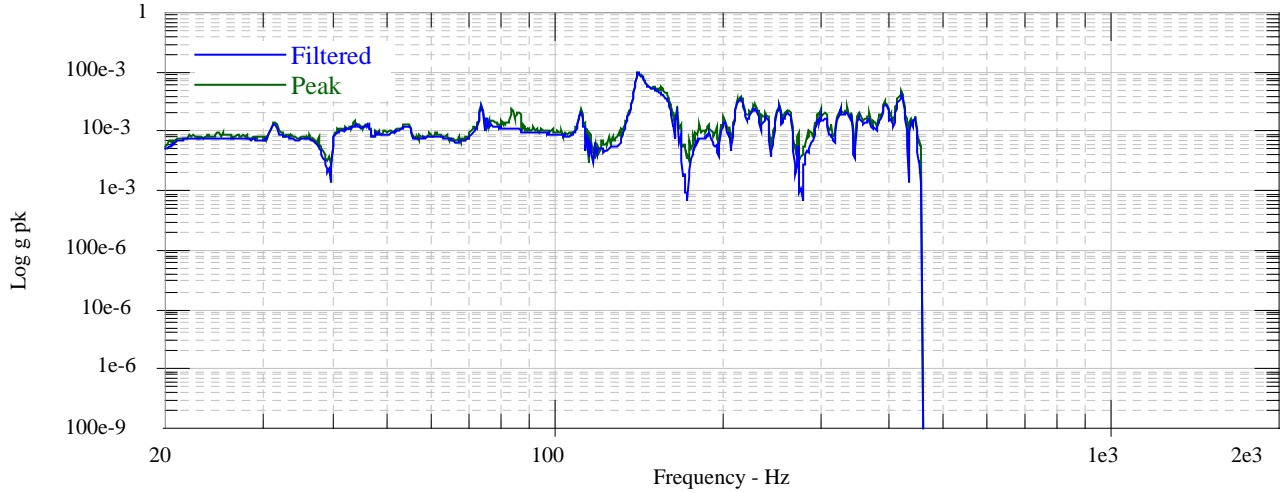
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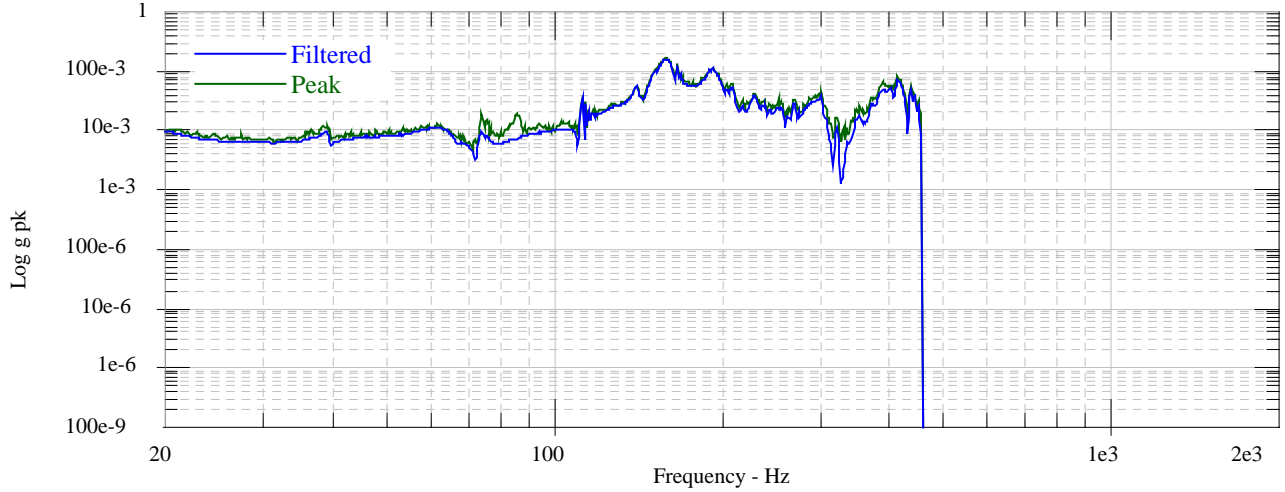
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

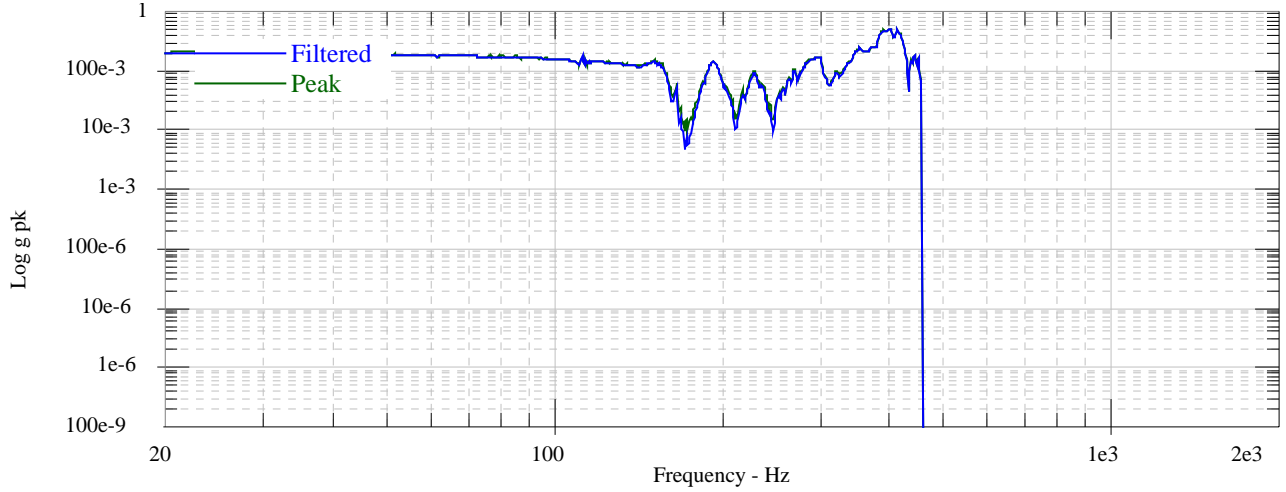


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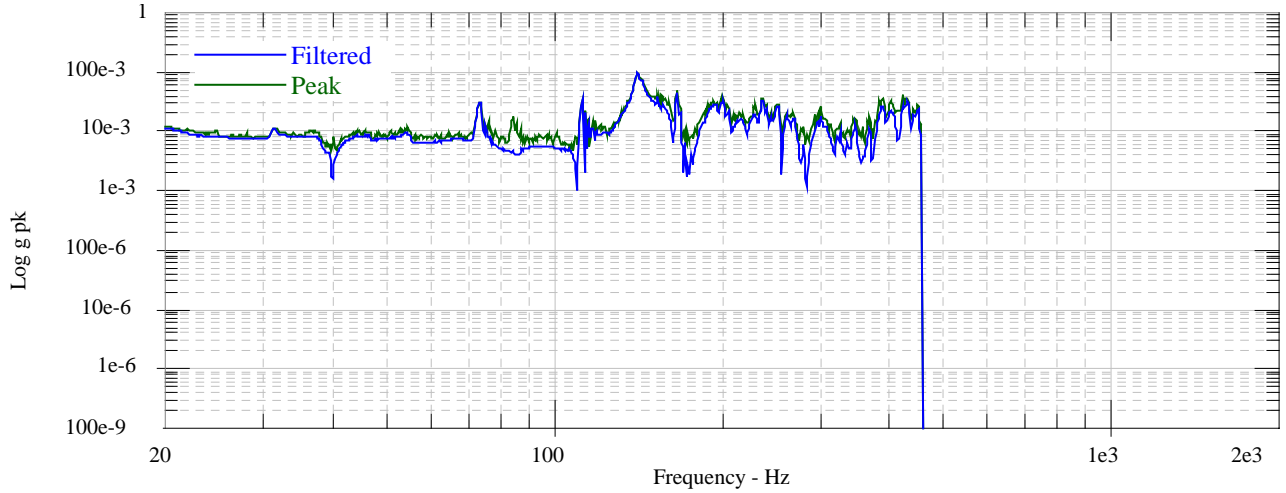
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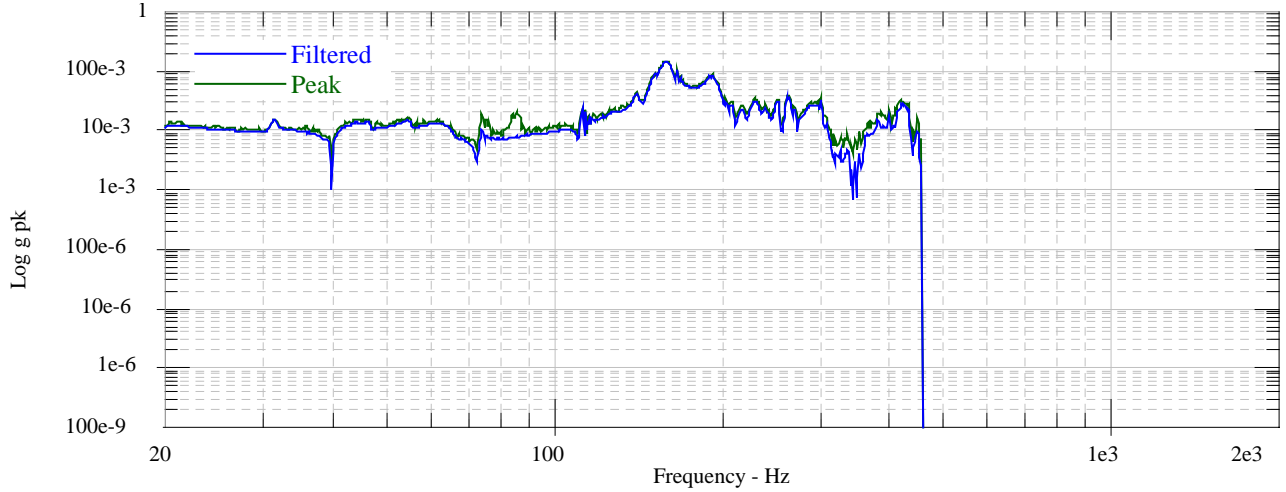
SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

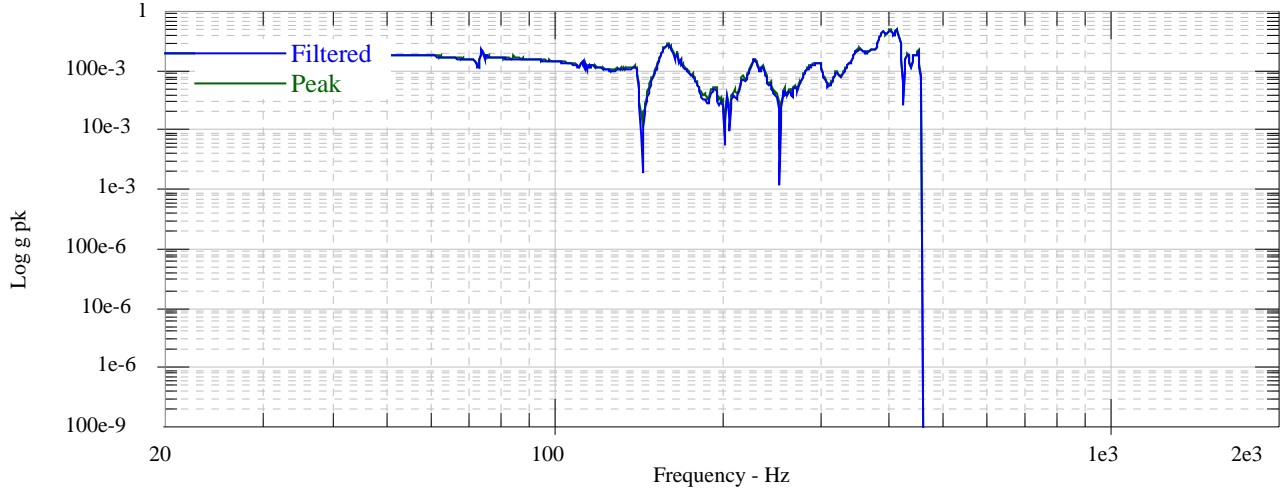


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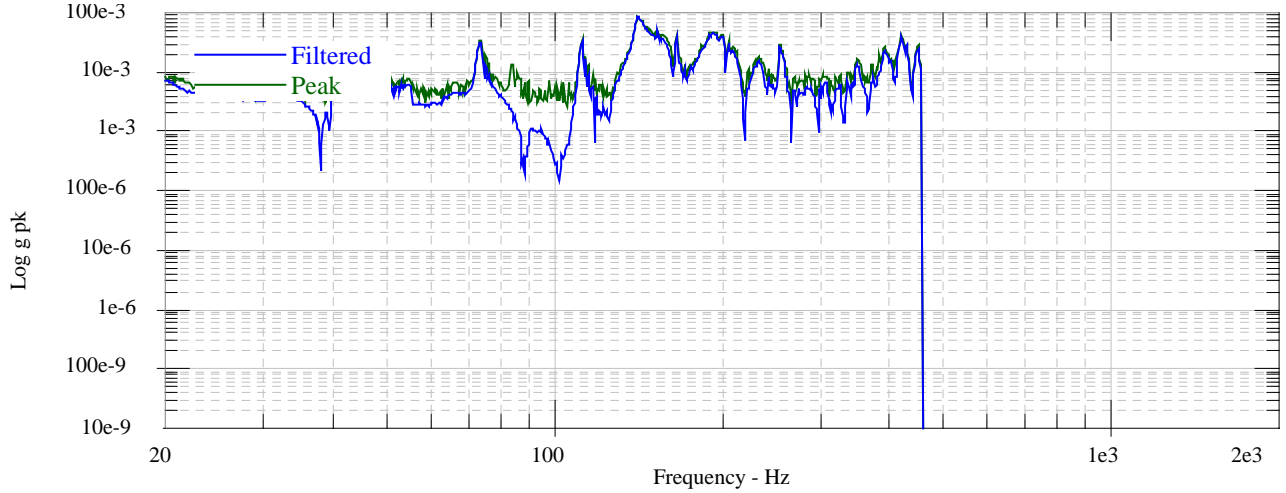
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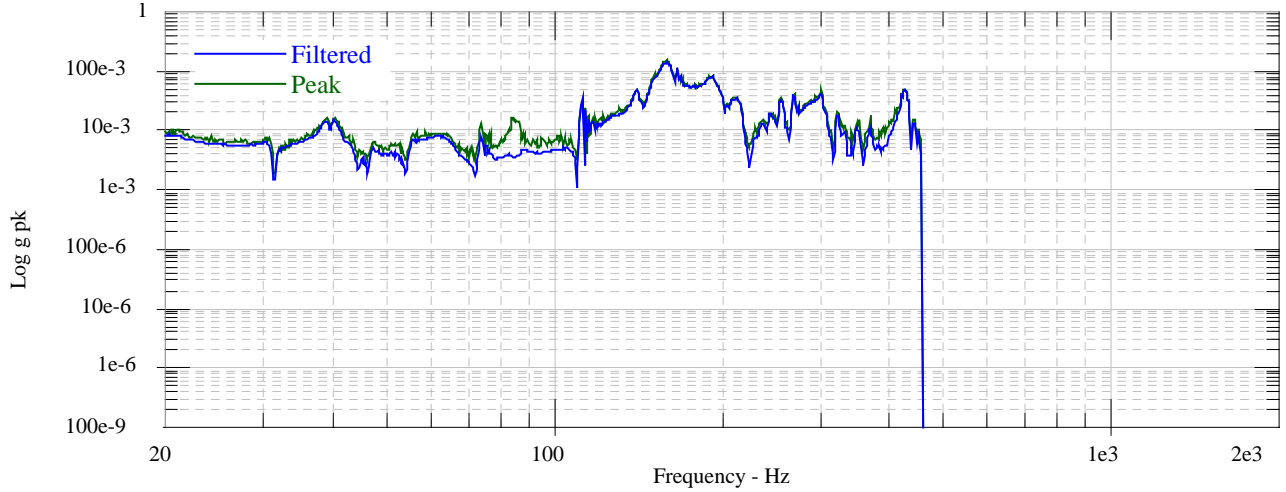
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

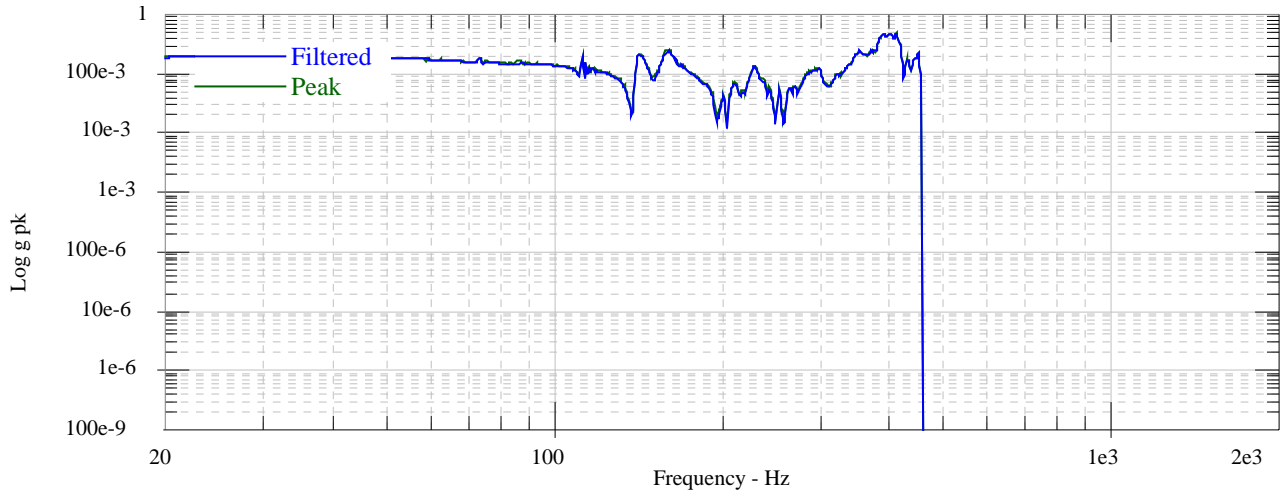


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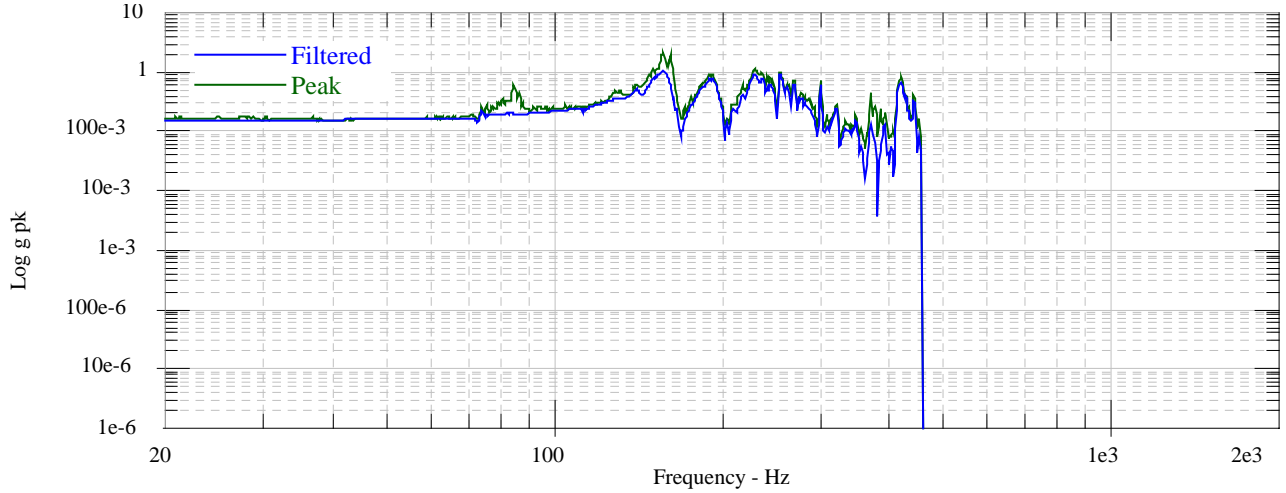
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SHK.3.X Channel n° 9



PHS.XY Channel n° 10



PHS.Z Channel n° 11

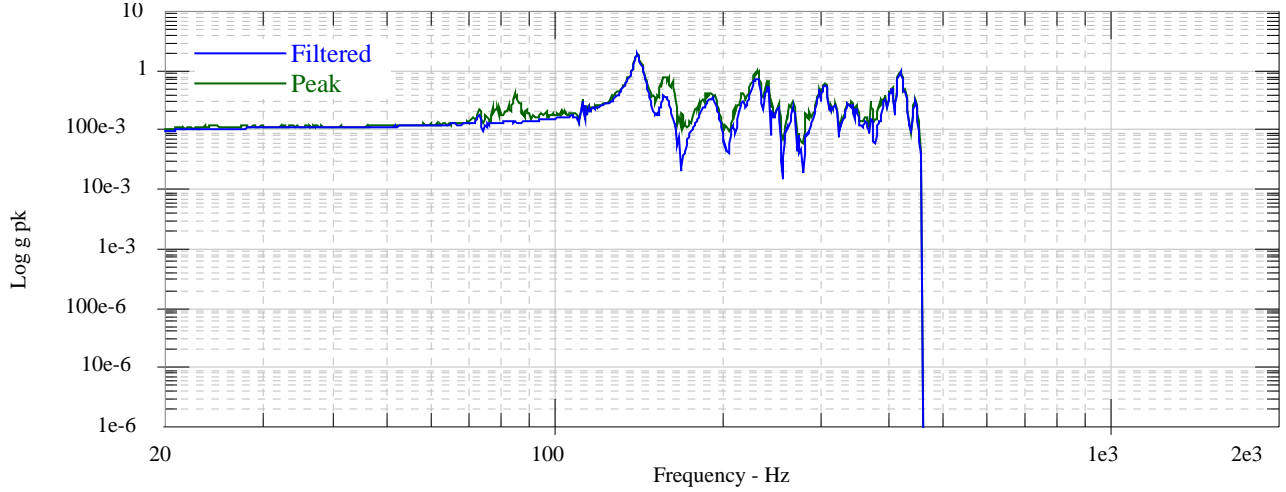


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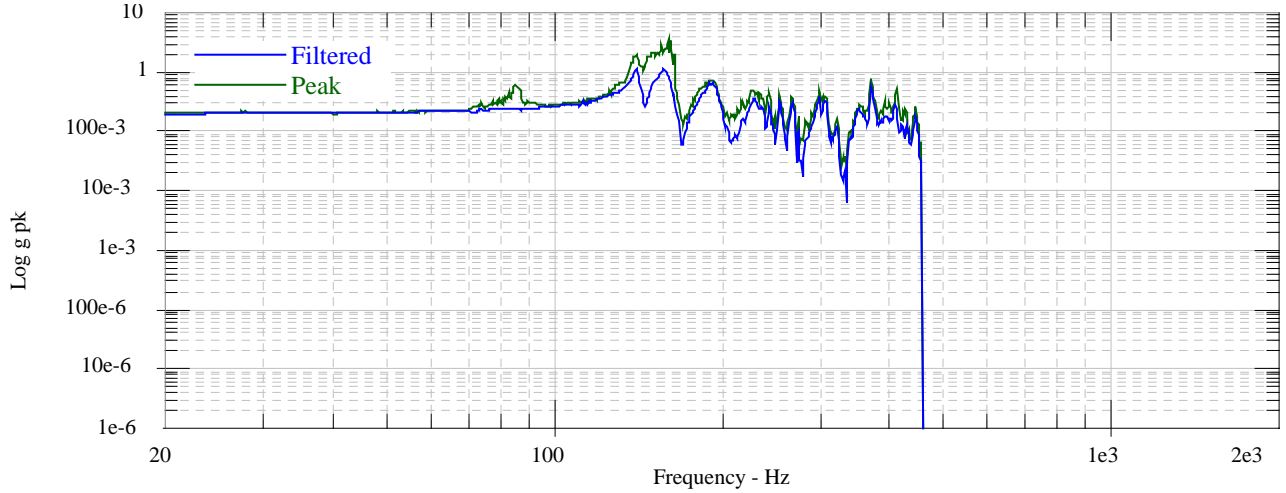
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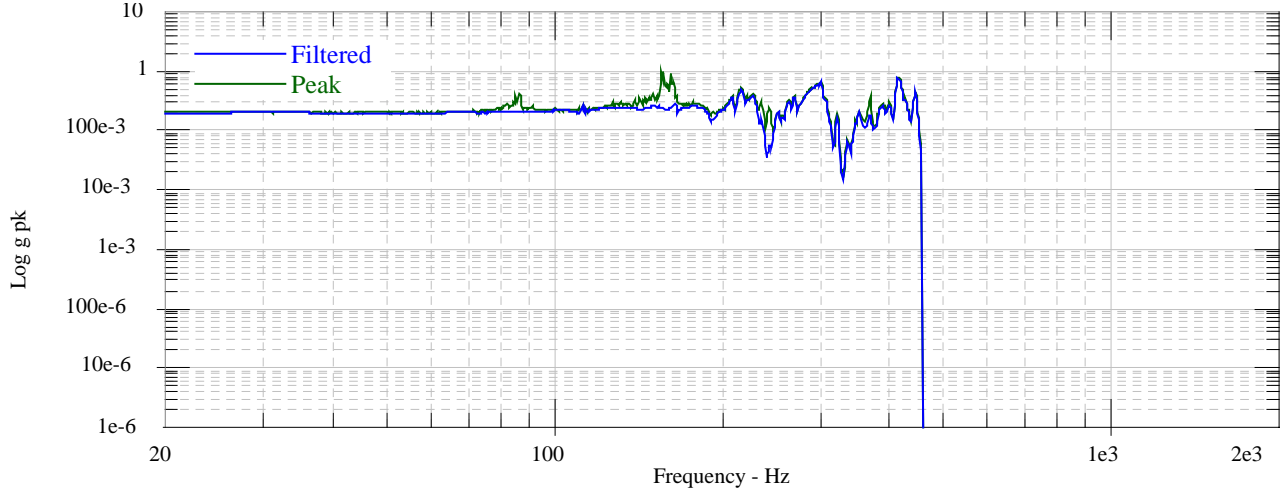
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

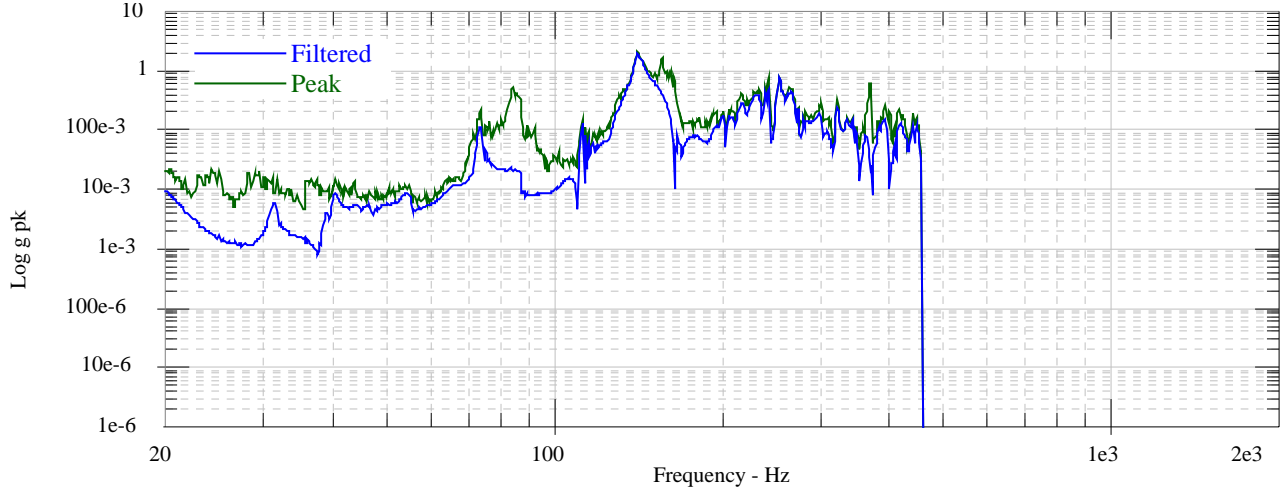


VIBRATION TEST REPORT
SPIRE QM

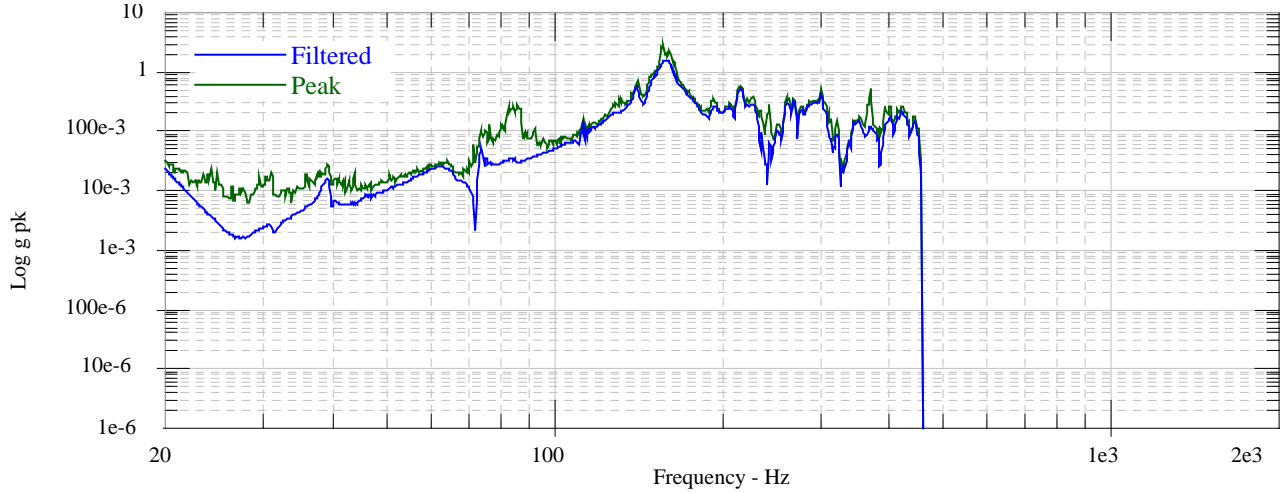
RP-CSL-CRYOV-04001
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FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

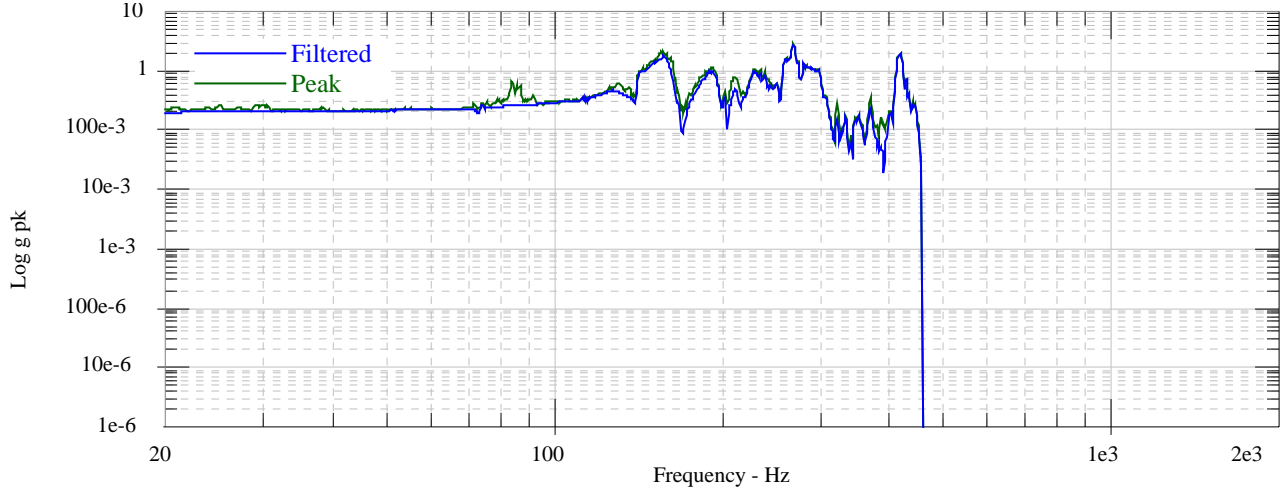


VIBRATION TEST REPORT
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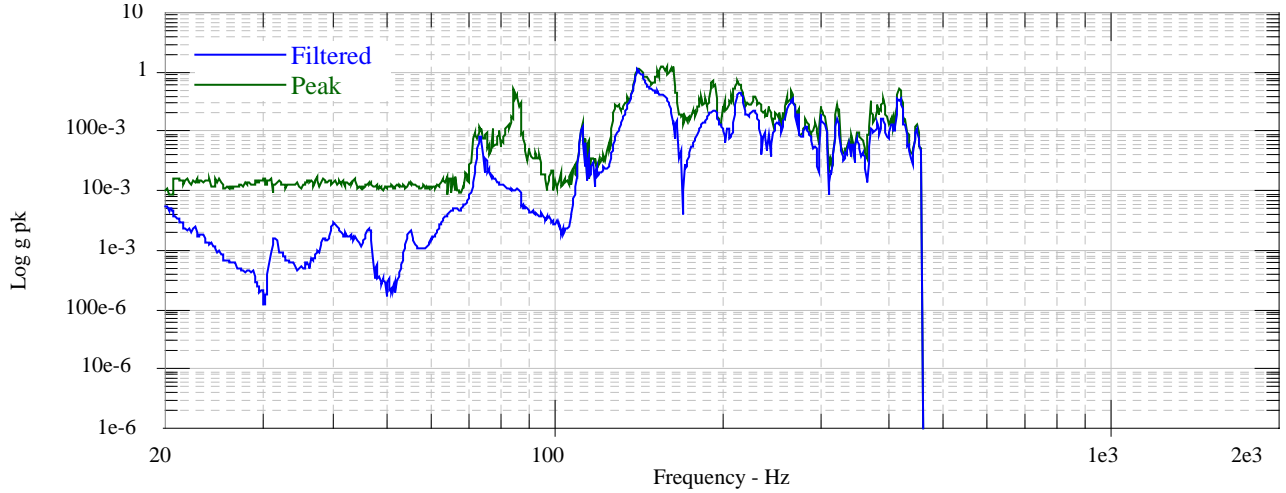
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Révision : 00
Date : 1-May-04
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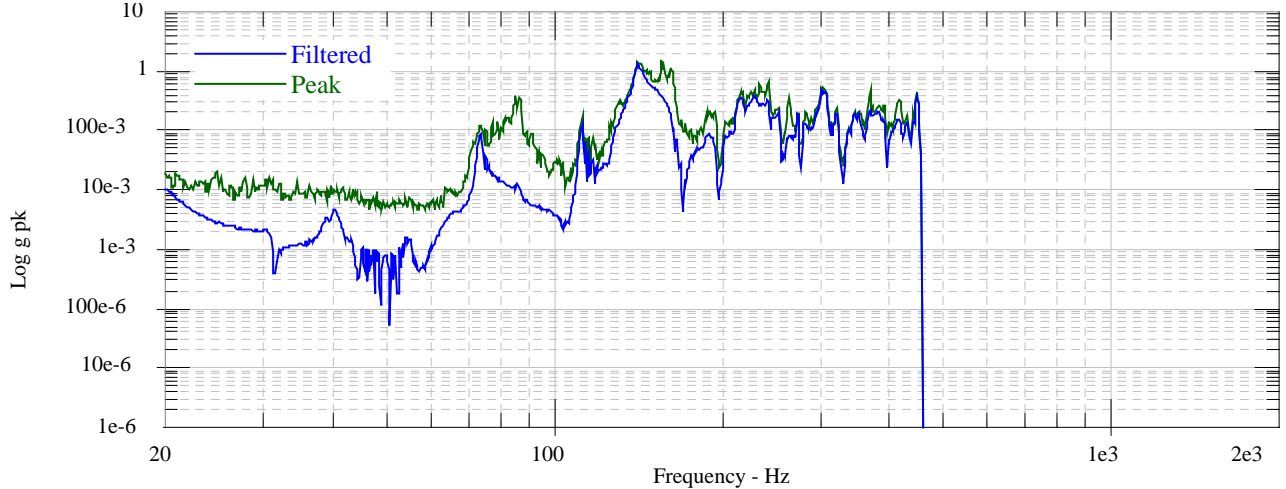
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

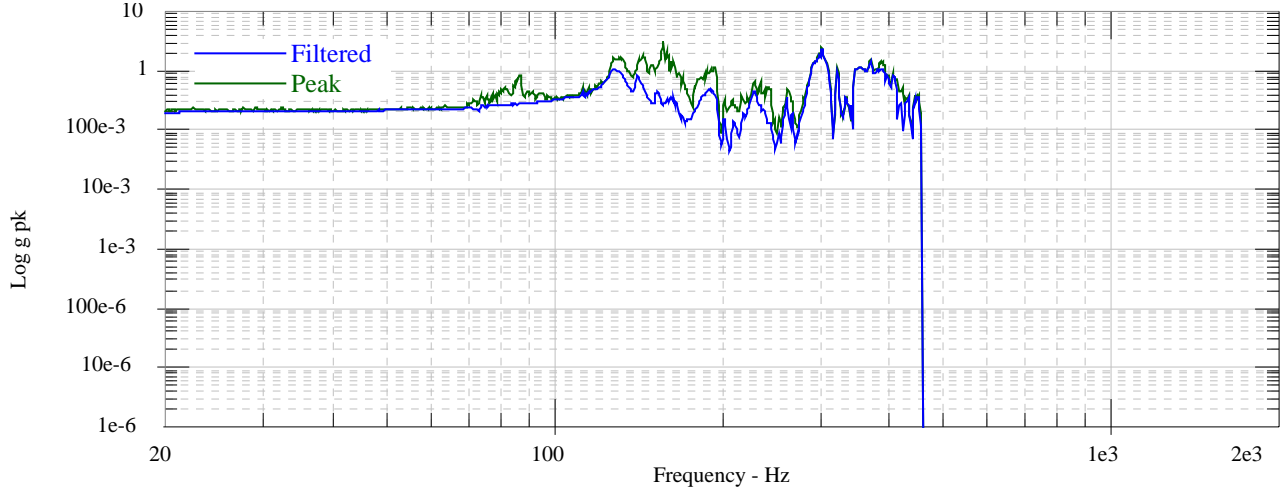


VIBRATION TEST REPORT
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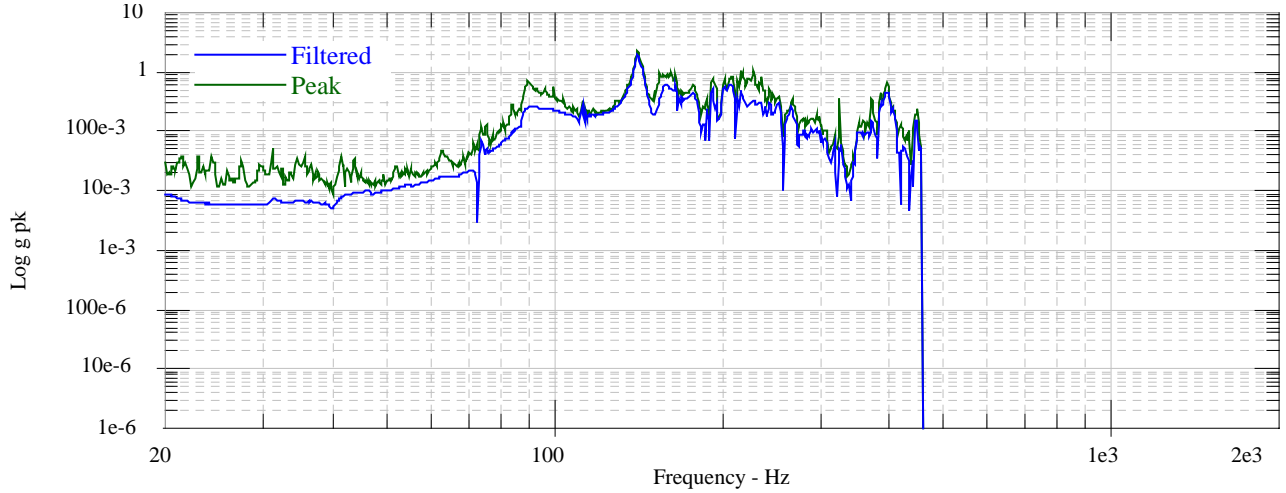
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Version : 01
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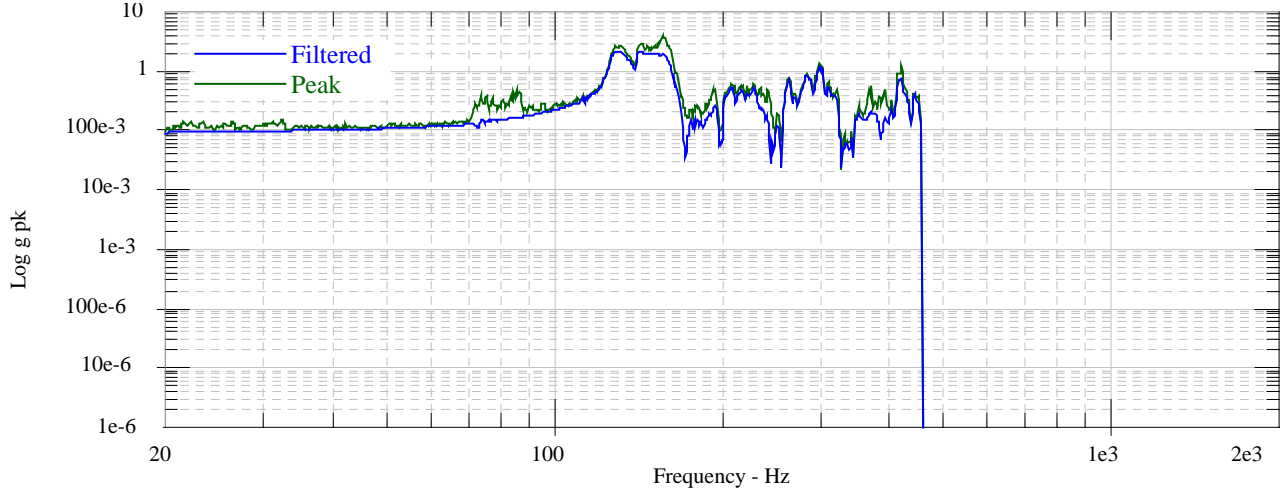
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

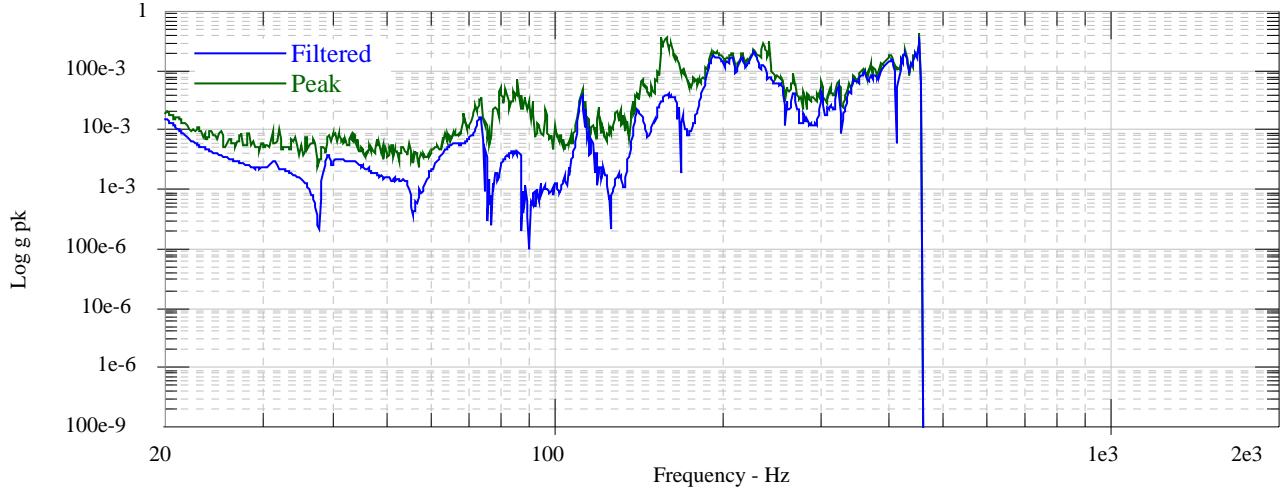


VIBRATION TEST REPORT
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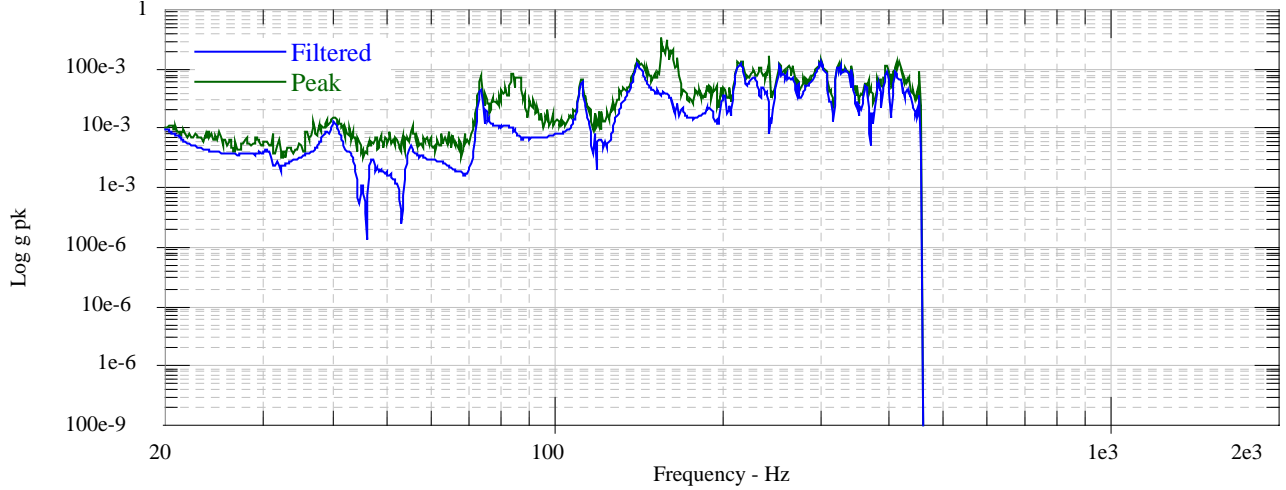
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Version : 01
Révision : 00
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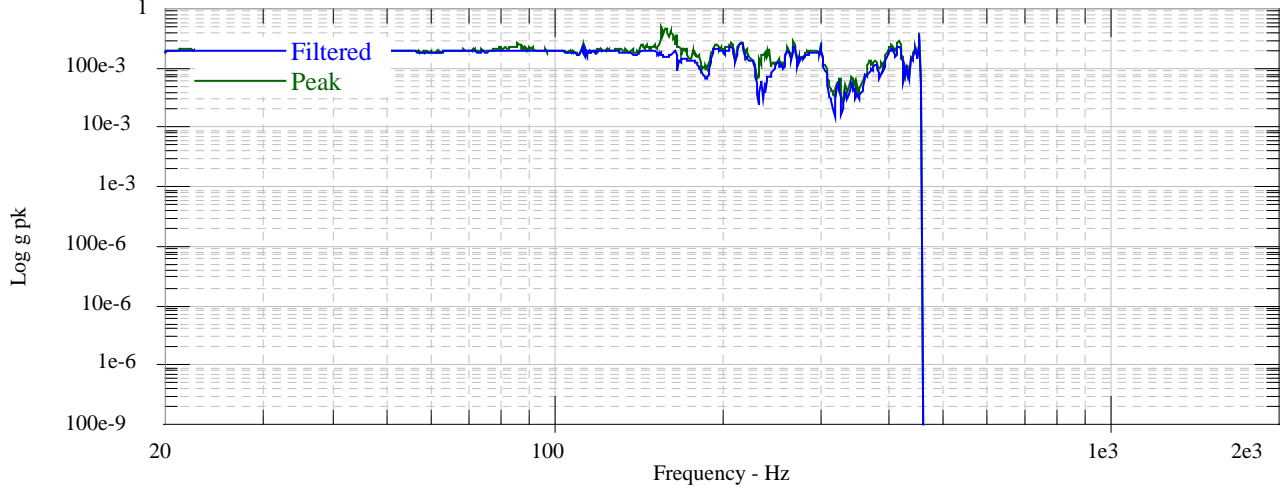
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

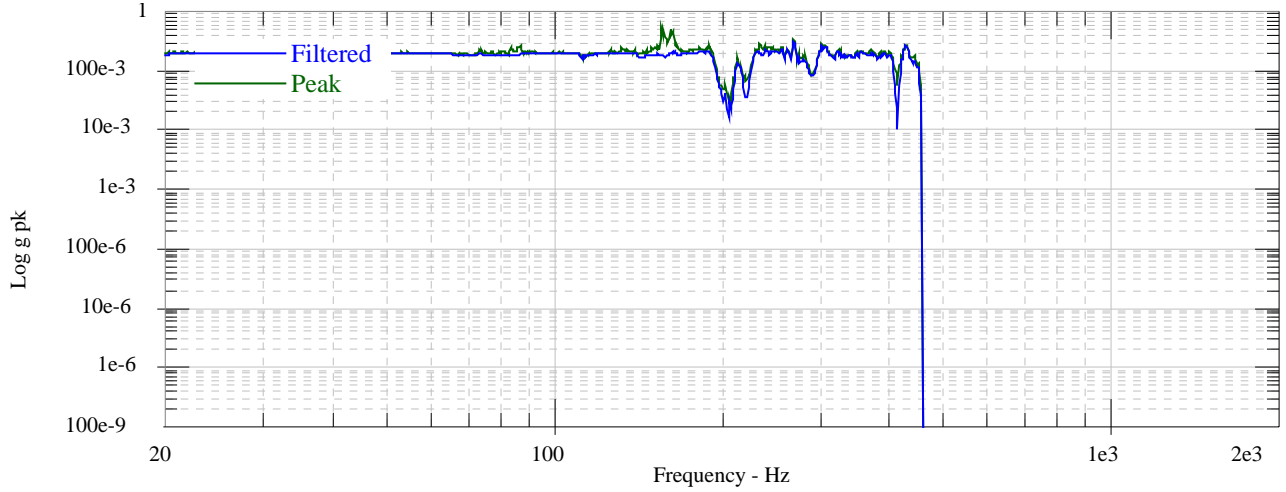


VIBRATION TEST REPORT
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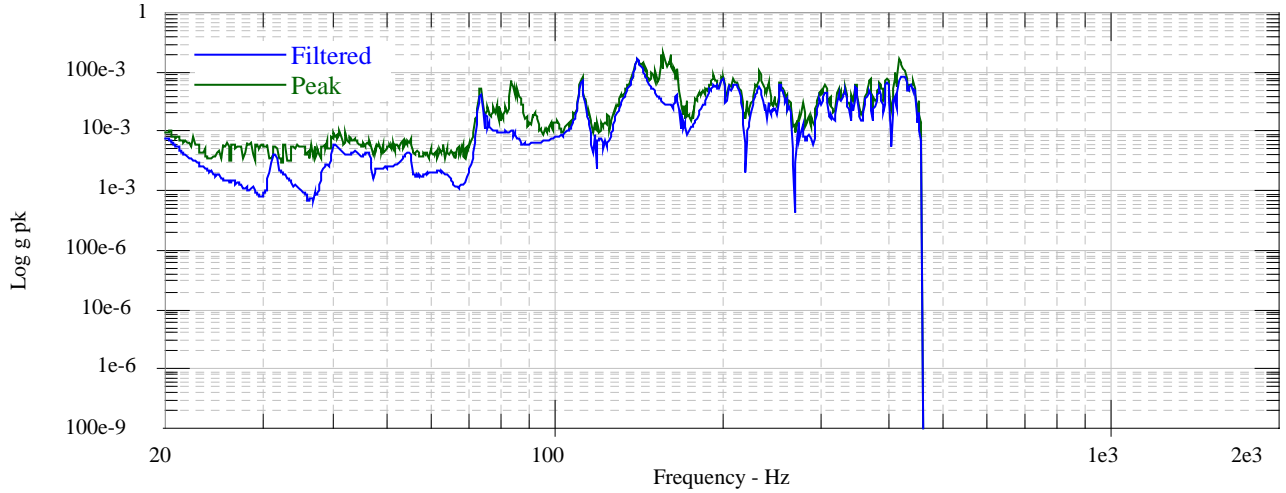
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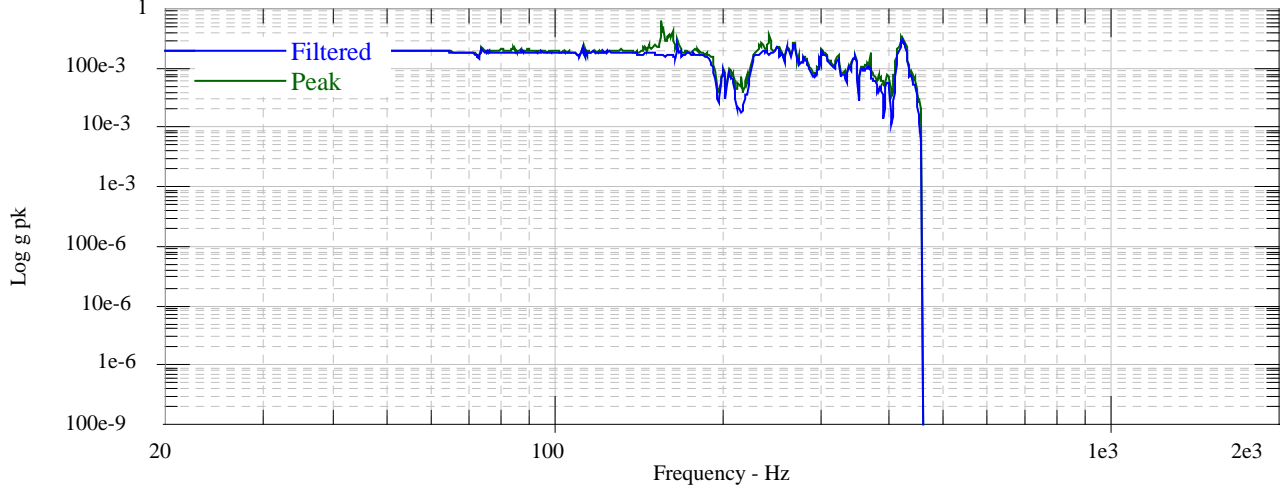
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

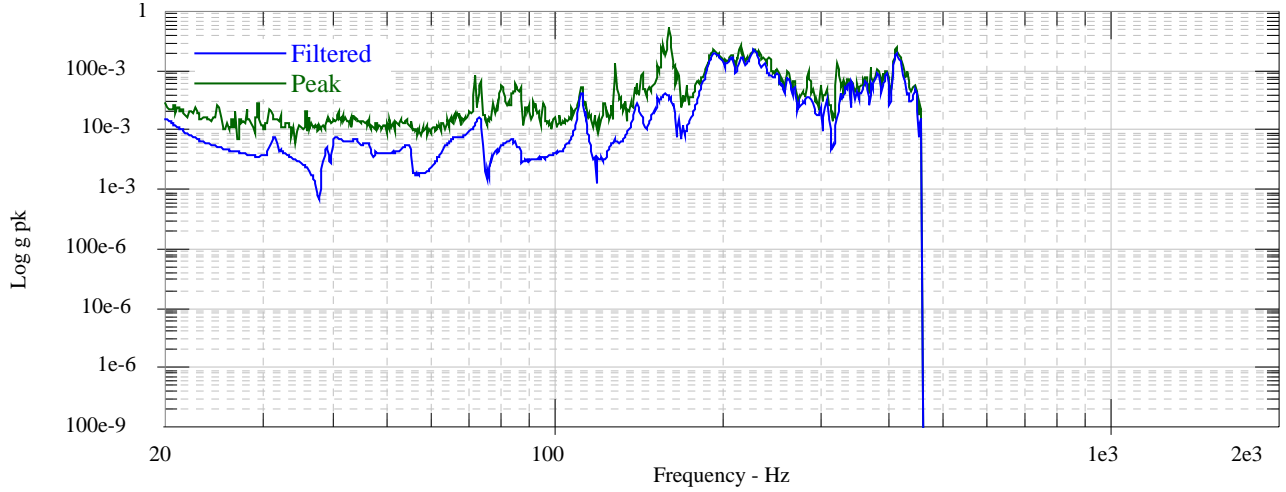


VIBRATION TEST REPORT
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Version : 01
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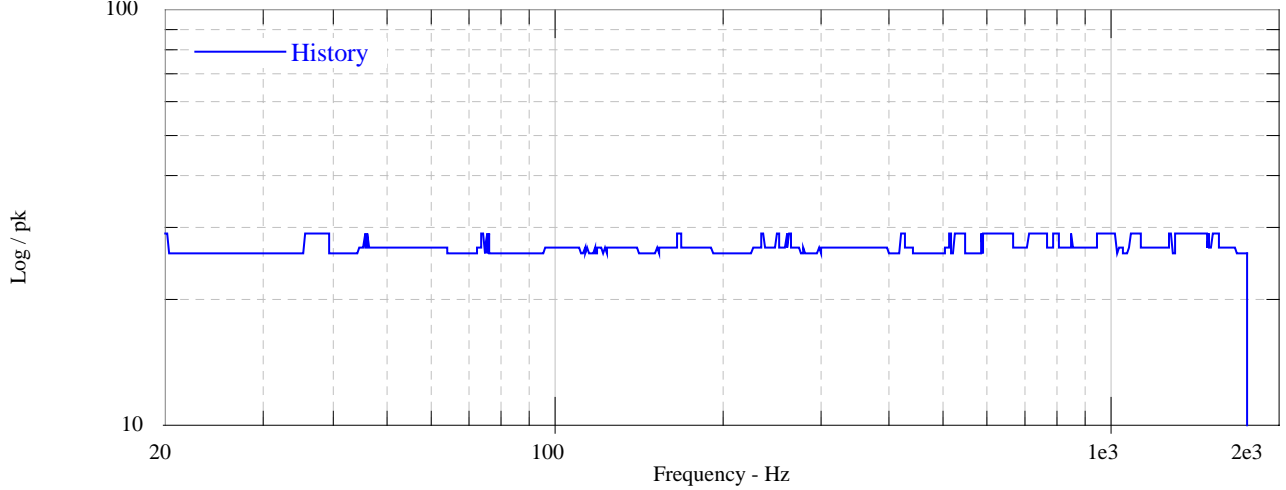
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+YAFRAME.Z Channel n° 30

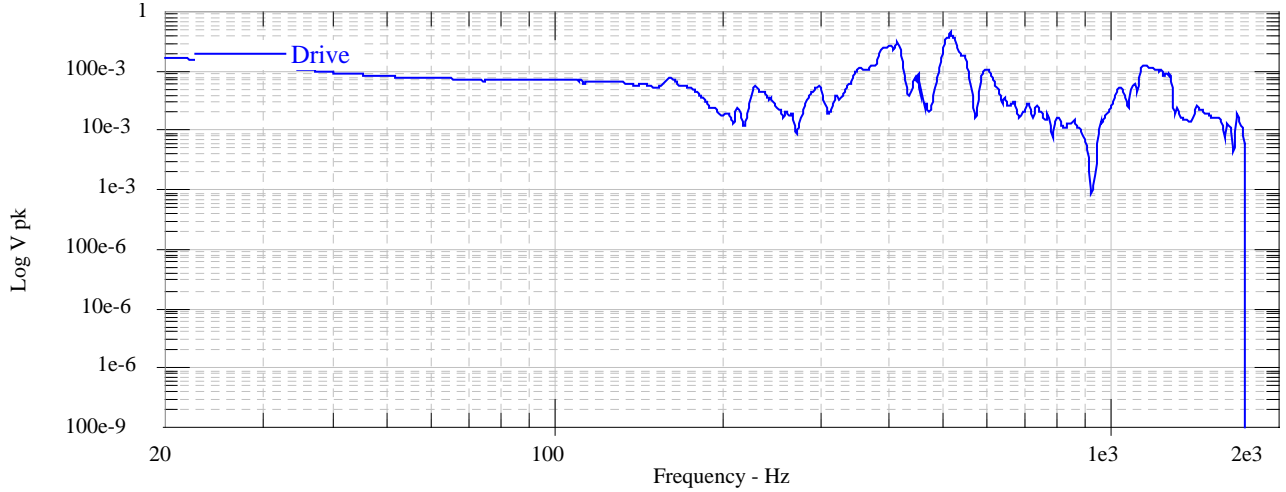


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History Channel n° -3



Drive Channel n° -2

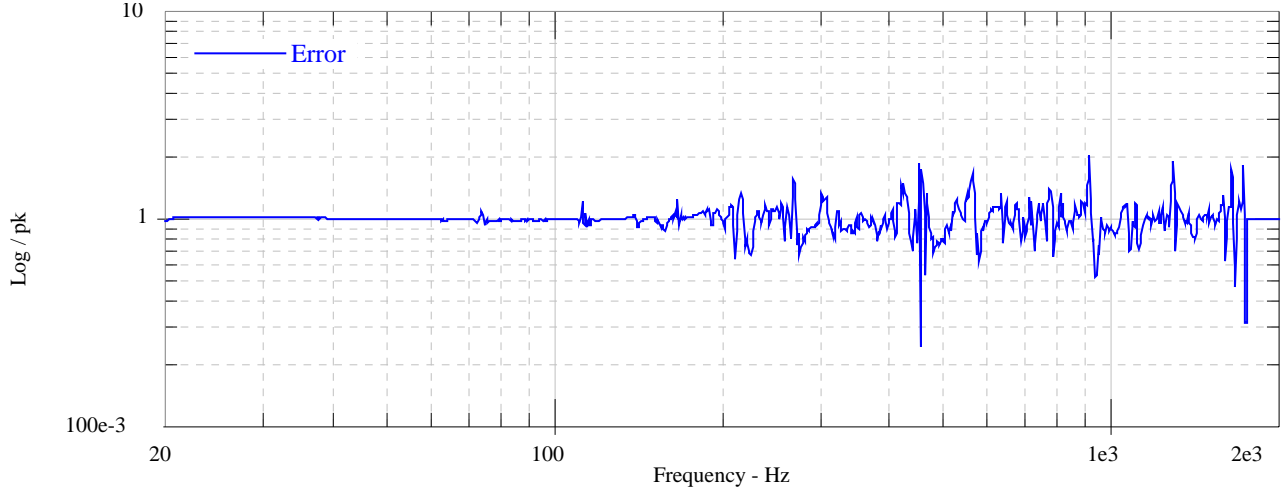


VIBRATION TEST REPORT
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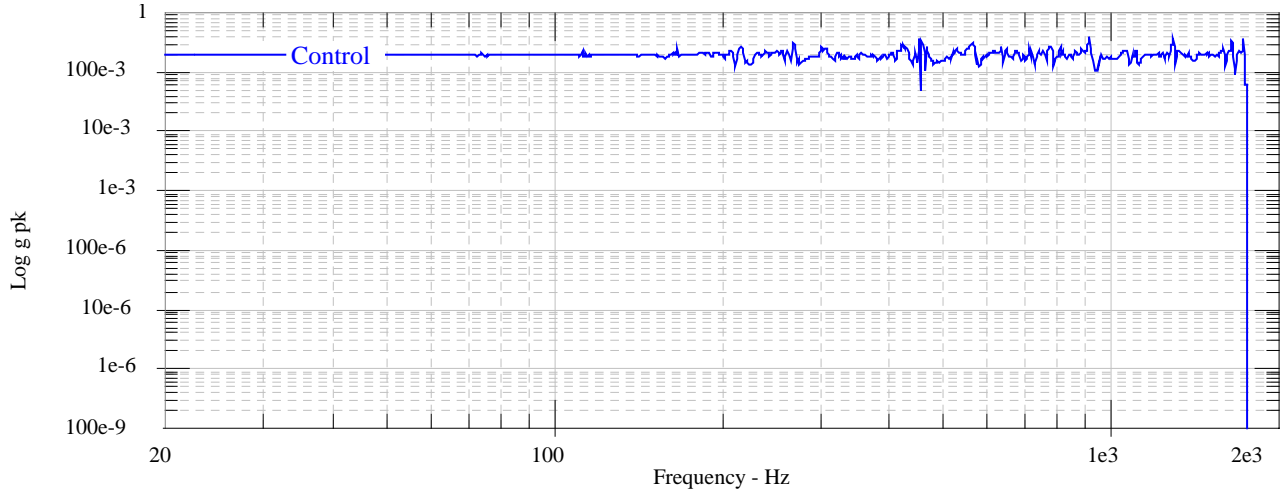
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 1-May-04
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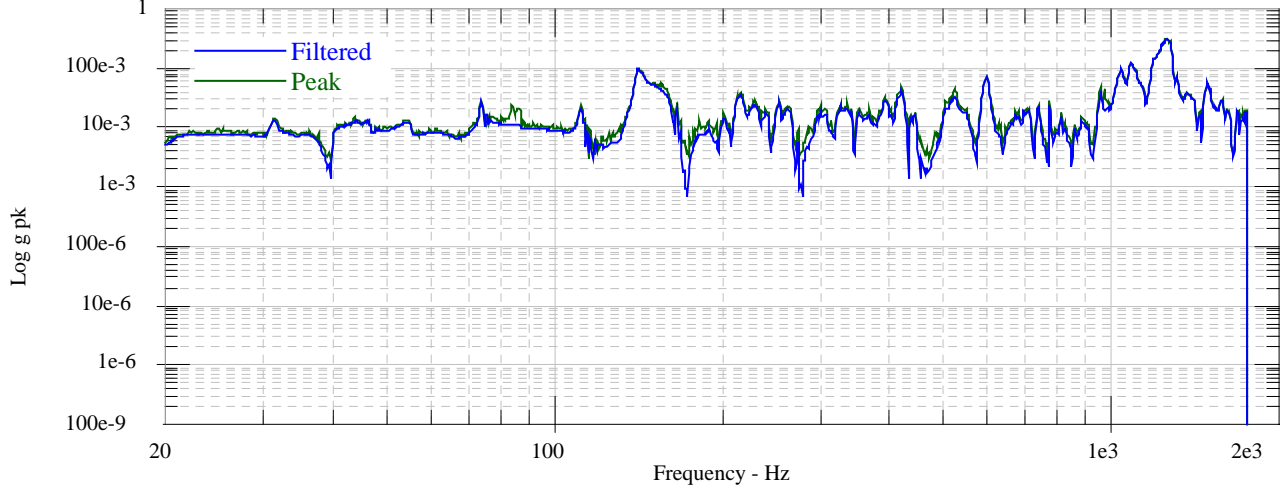
Error Channel n° -1



Control Channel n° 0



SHK.1.Y Channel n° 1



VIBRATION TEST REPORT
SPIRE QM

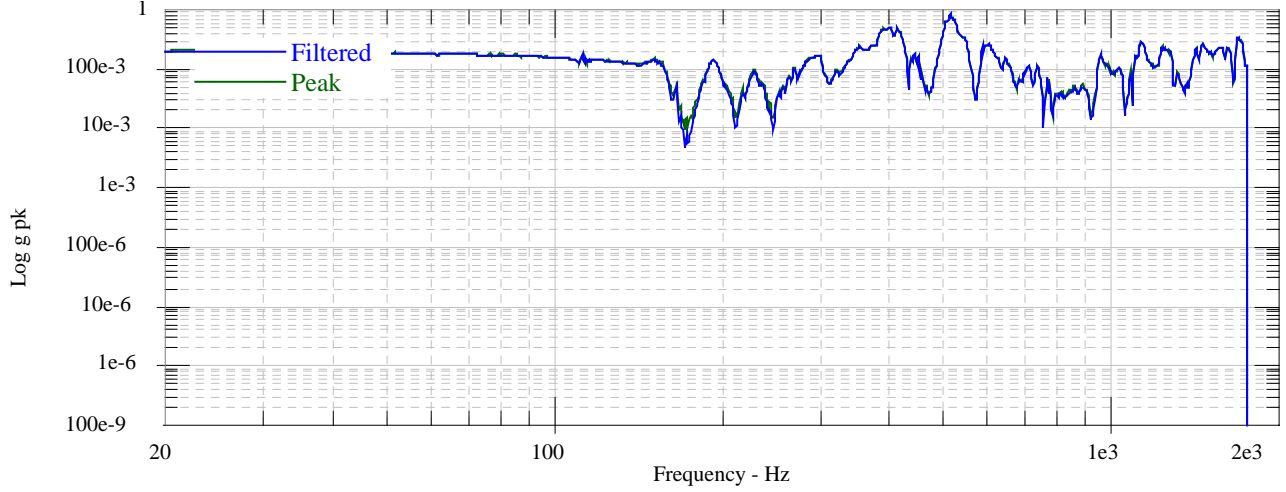
RP-CSL-CRYOV-04001
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Révision : 00
Date : 1-May-04
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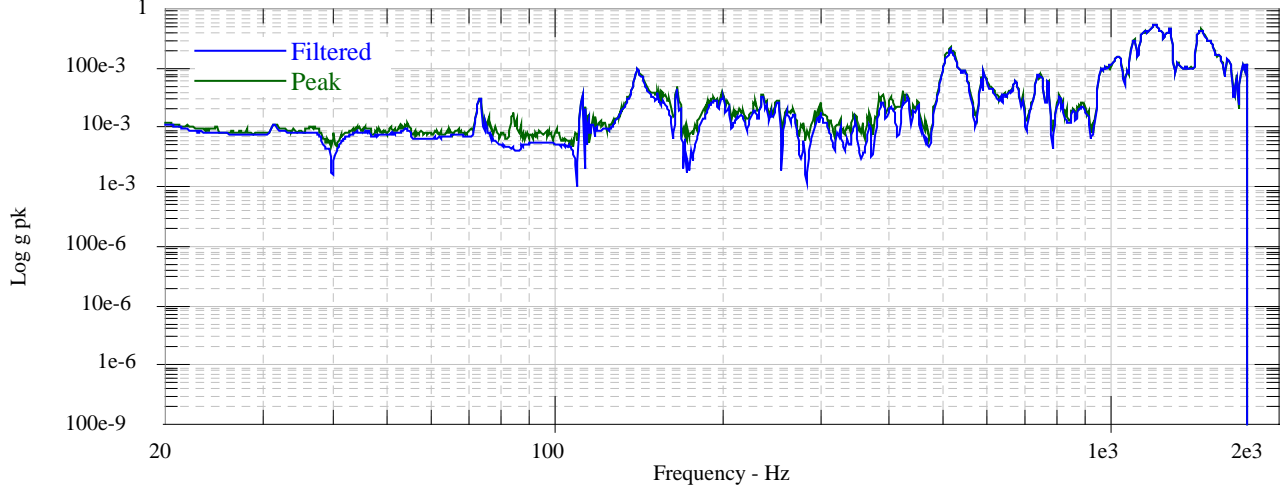
SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4

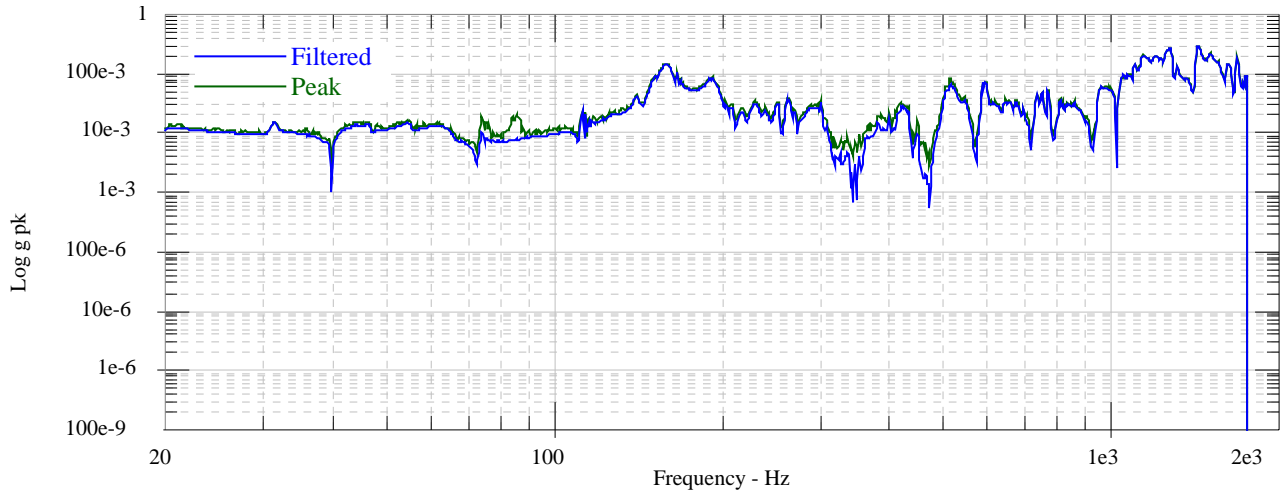


VIBRATION TEST REPORT
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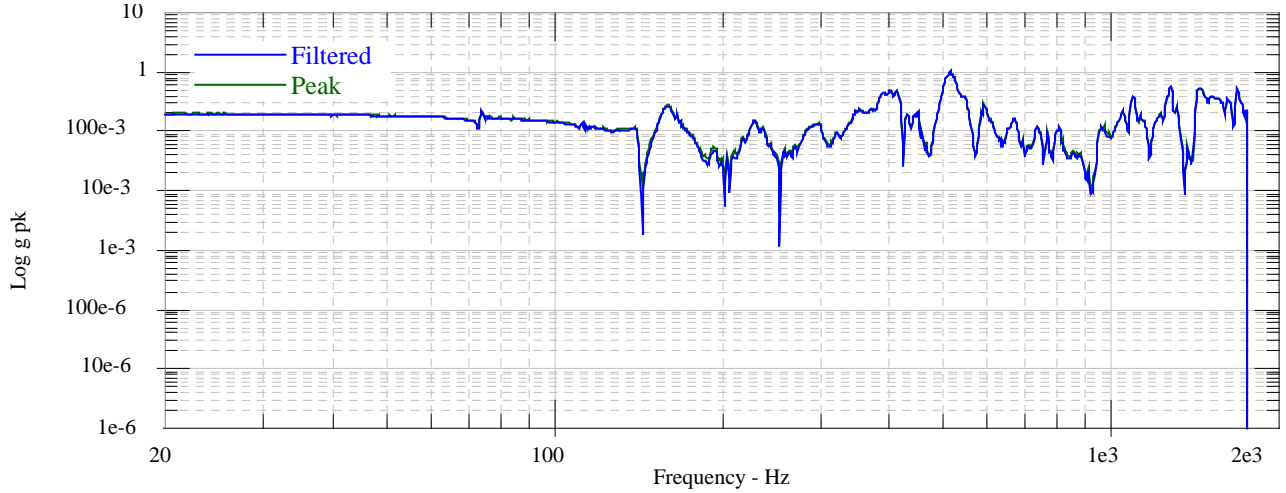
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Date : 1-May-04
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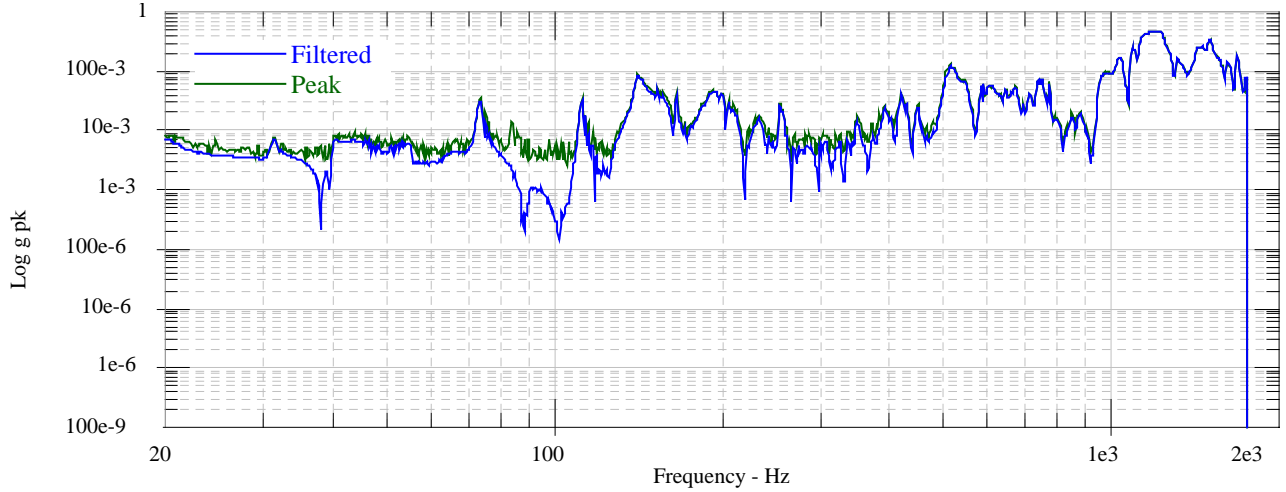
SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6



SHK.3.Y Channel n° 7

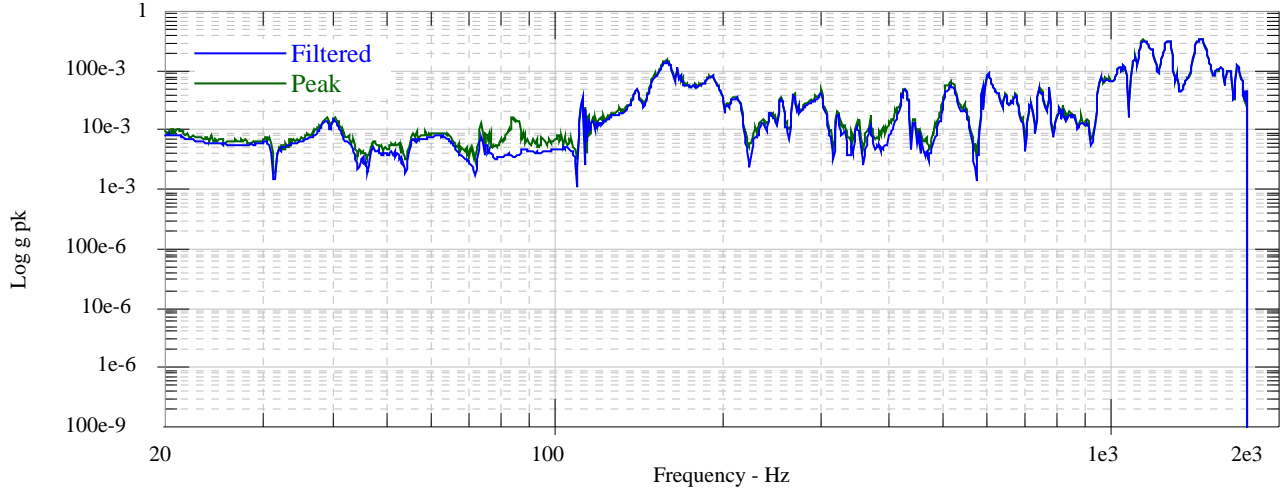


VIBRATION TEST REPORT
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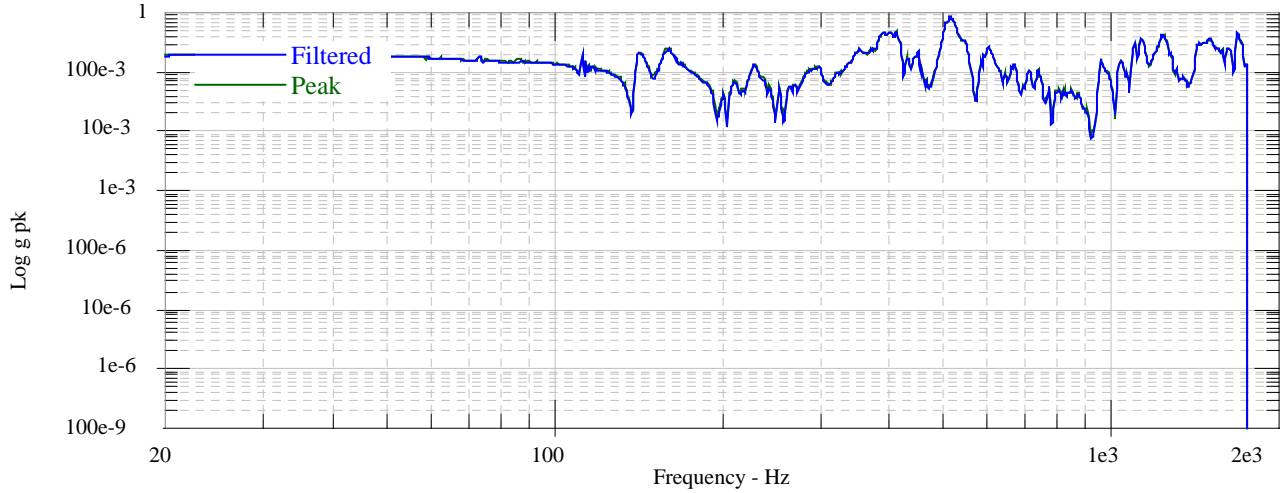
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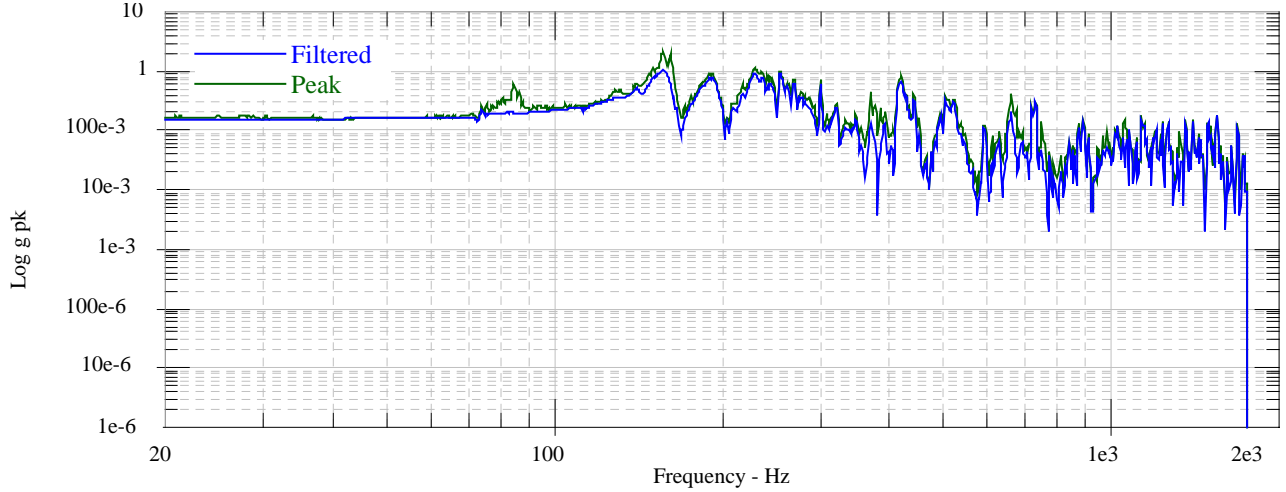
SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9



PHS.XY Channel n° 10



VIBRATION TEST REPORT
SPIRE QM

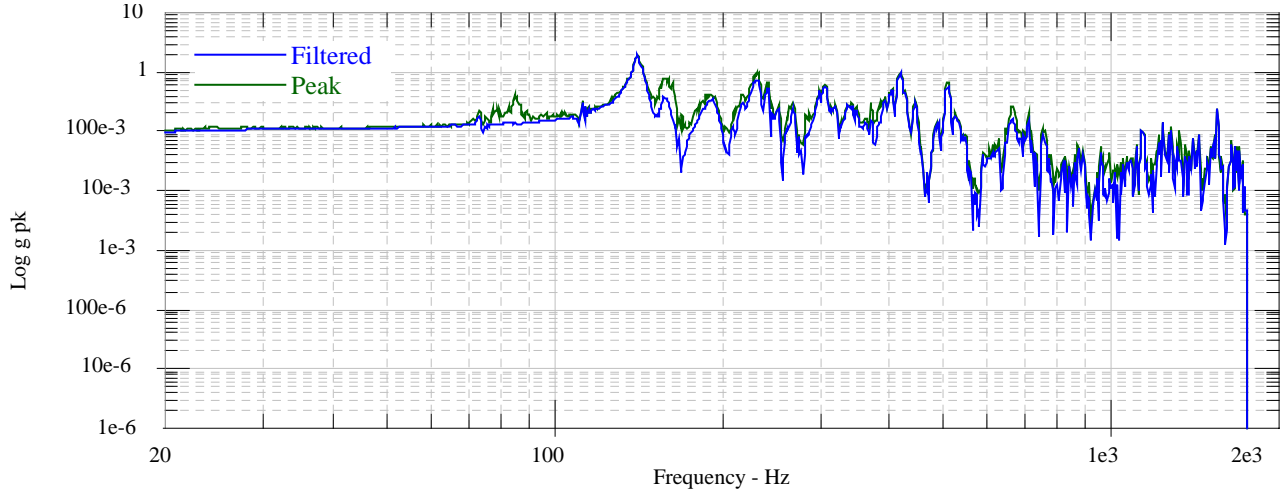
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Date : 1-May-04
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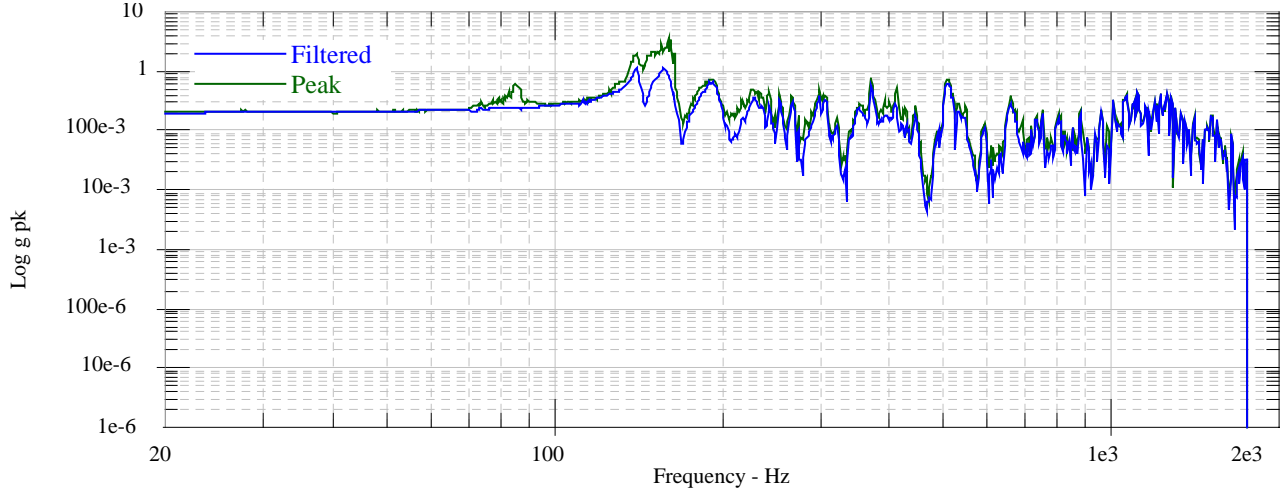
PHS.Z Channel n° 11



PHE.XY Channel n° 12



COOLX Channel n° 13

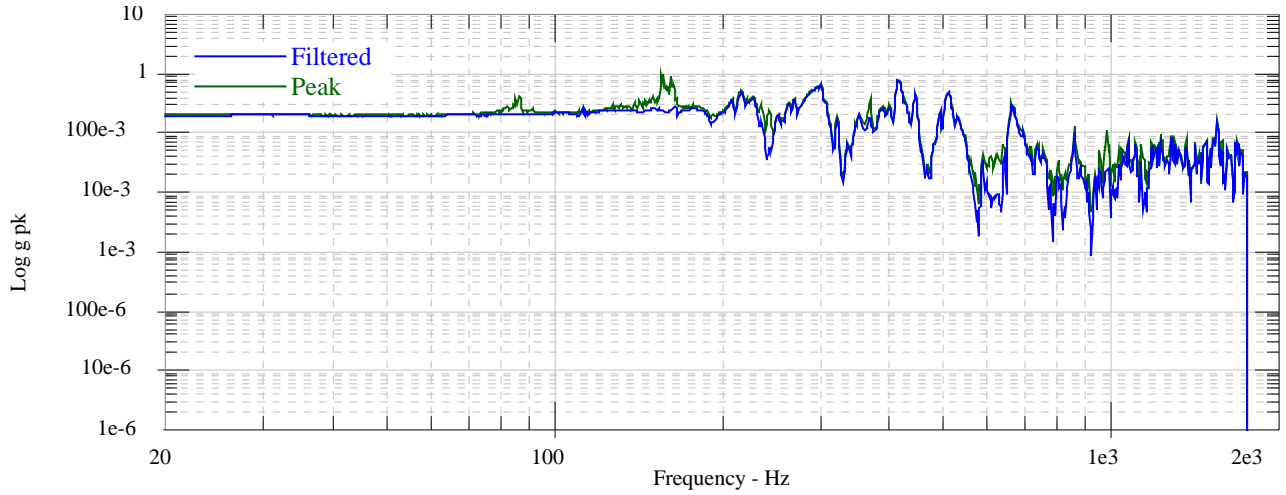


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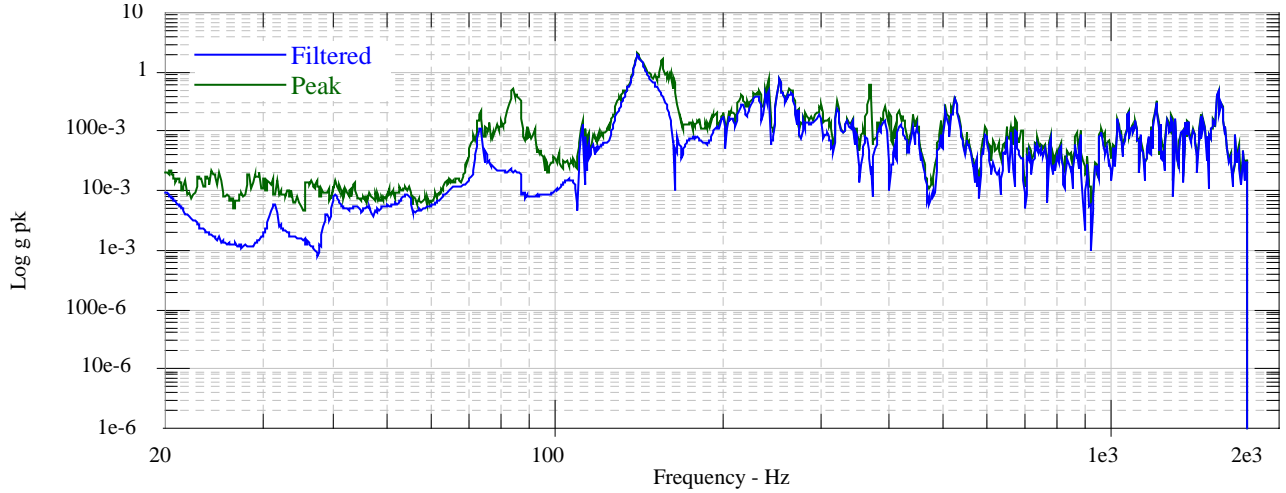
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Date : 1-May-04
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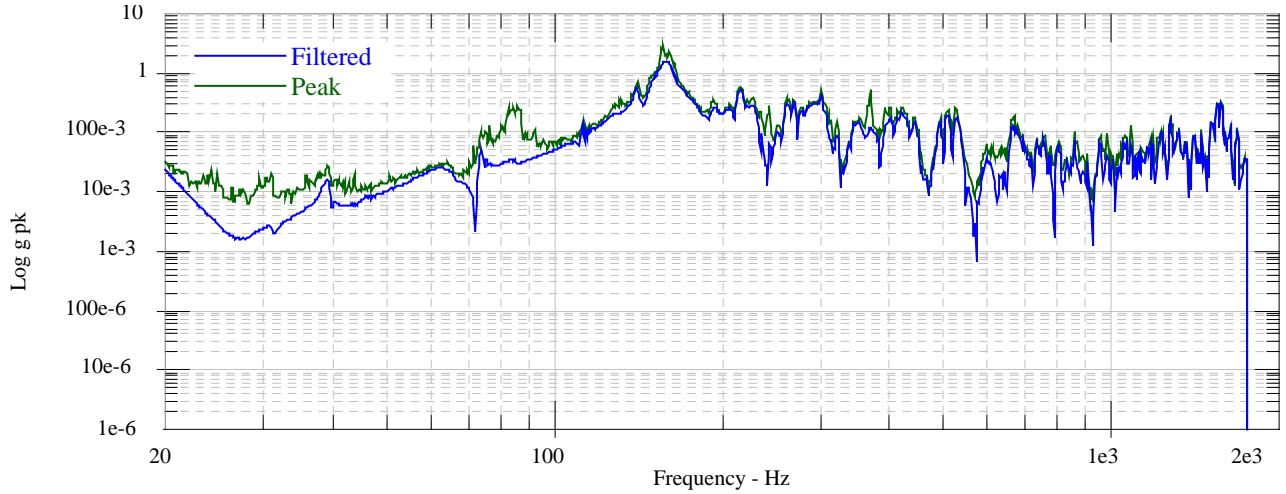
FPU.X Channel n° 14



FPU.Y Channel n° 15



FPU.Z Channel n° 16

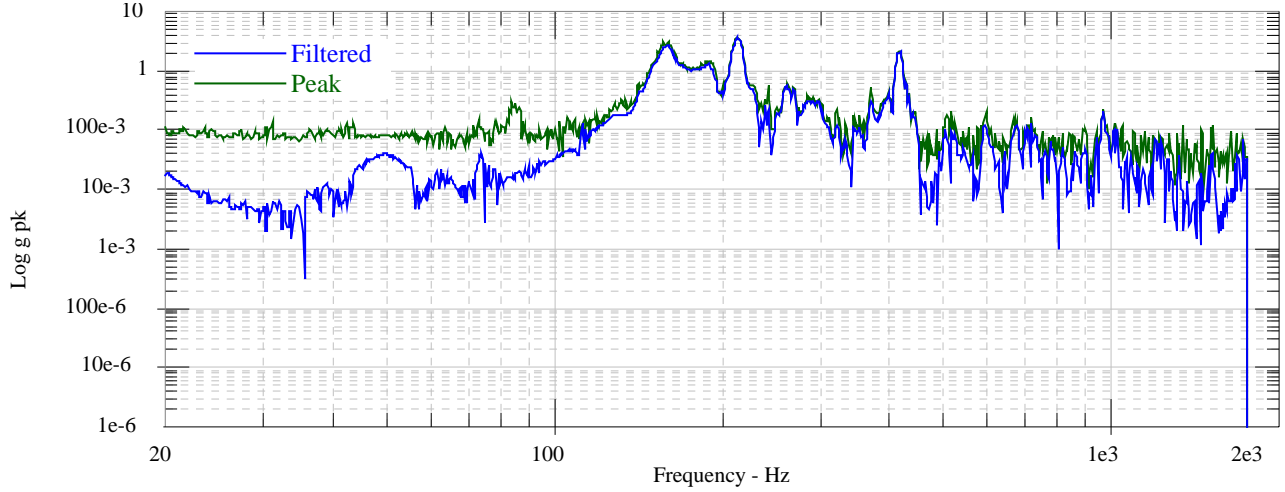


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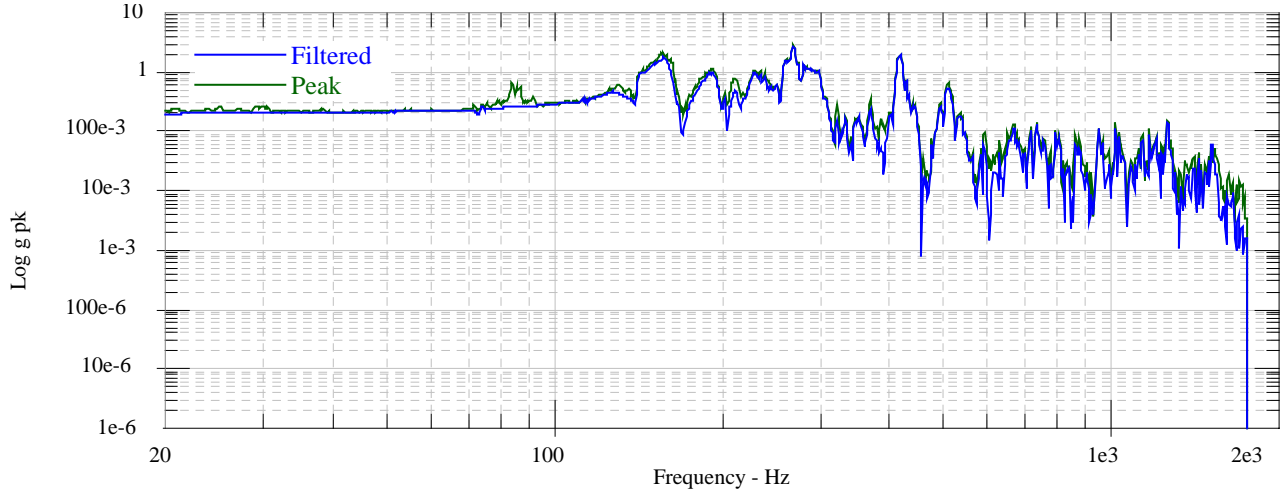
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Date : 1-May-04
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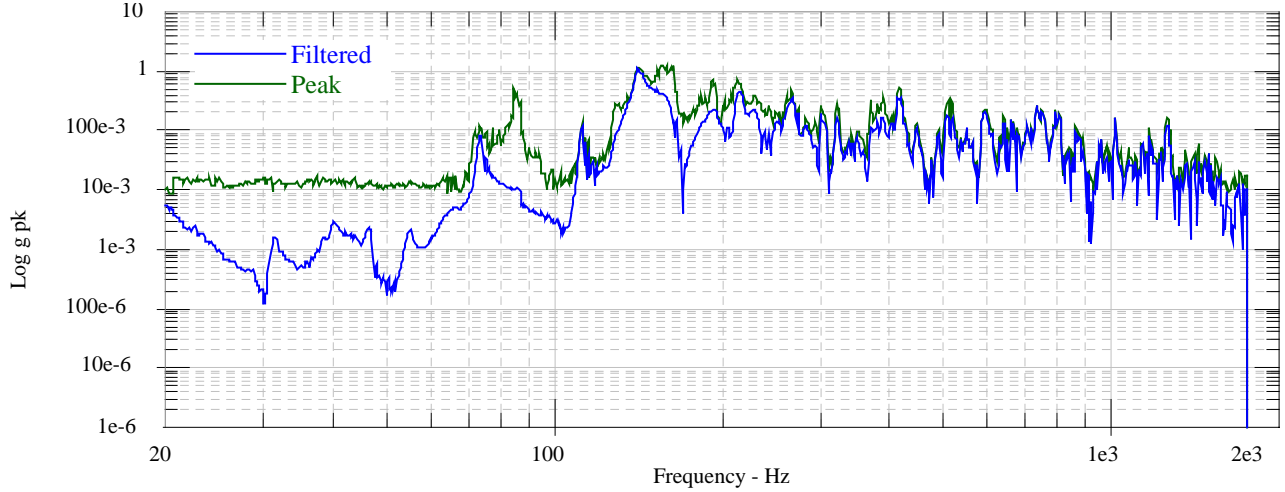
SPEC.X Channel n° 17



SPEC.Z Channel n° 18



SPEC.Y Channel n° 19

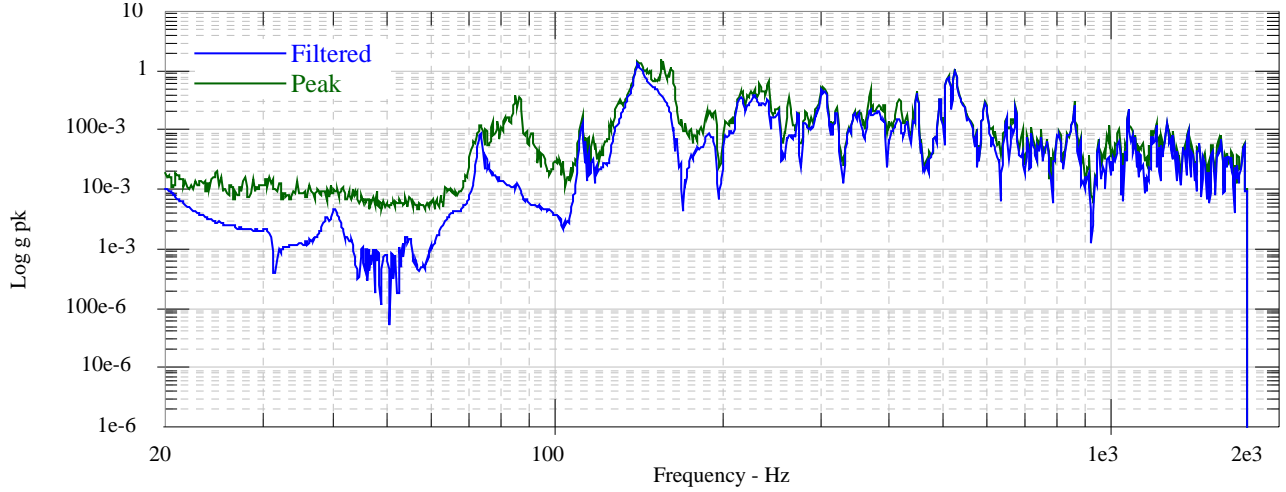


VIBRATION TEST REPORT
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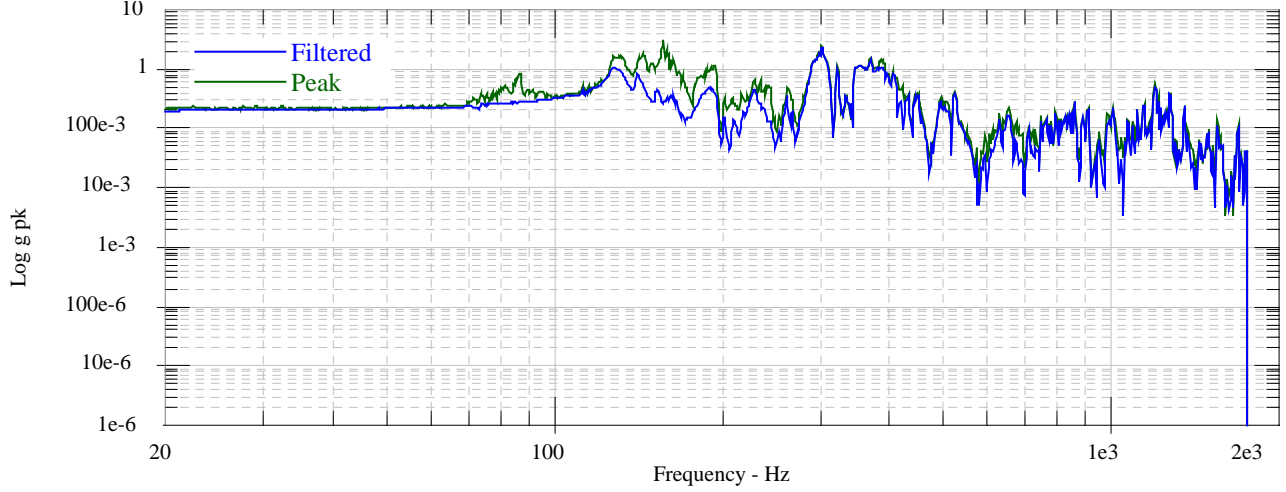
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Révision : 00
Date : 1-May-04
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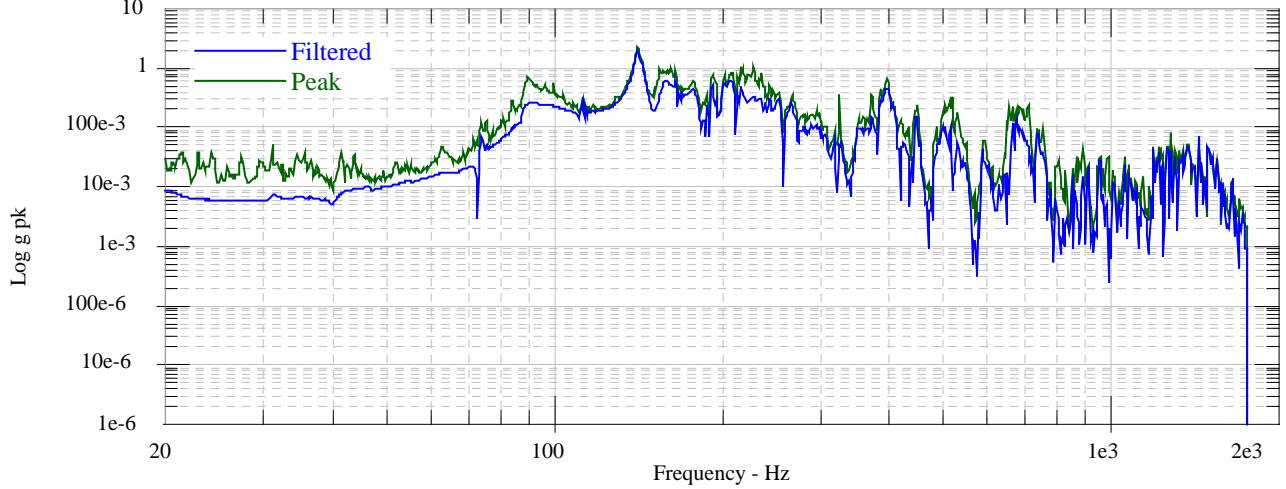
OB.Y Channel n° 20



SMECL.X Channel n° 21



CTIP.Y Channel n° 22

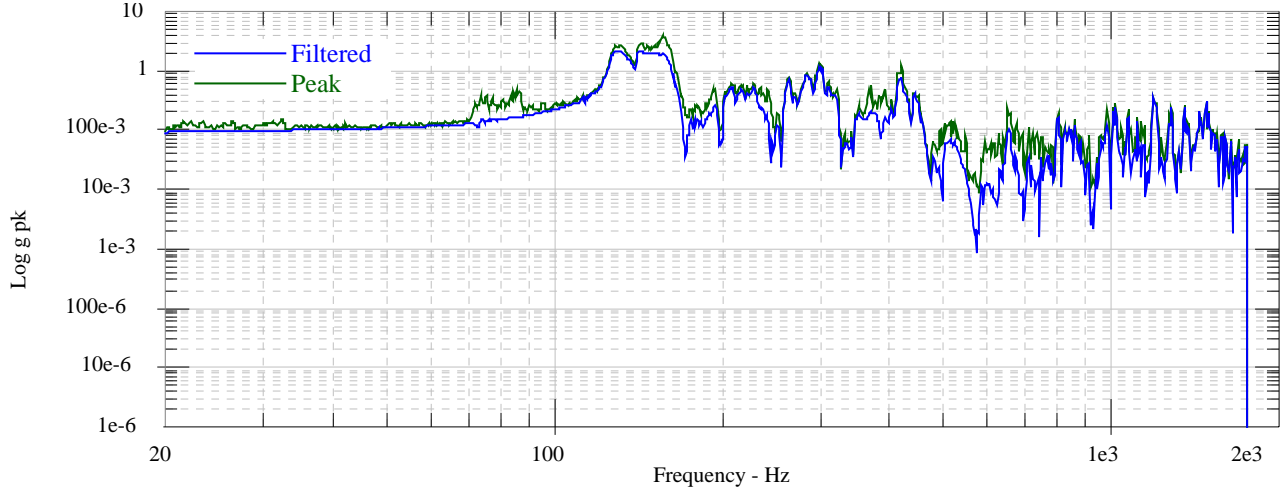


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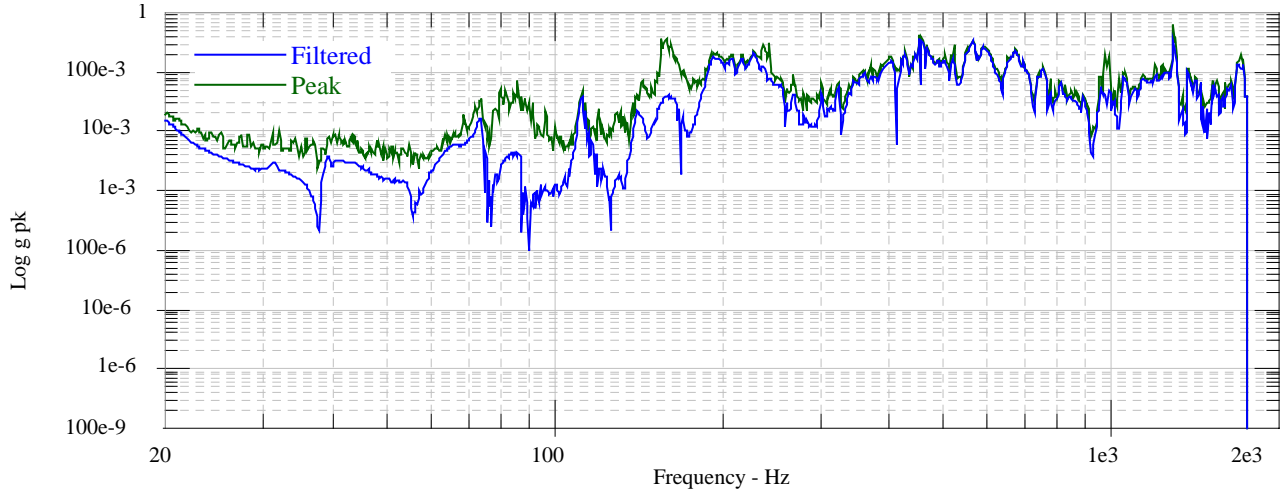
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Date : 1-May-04
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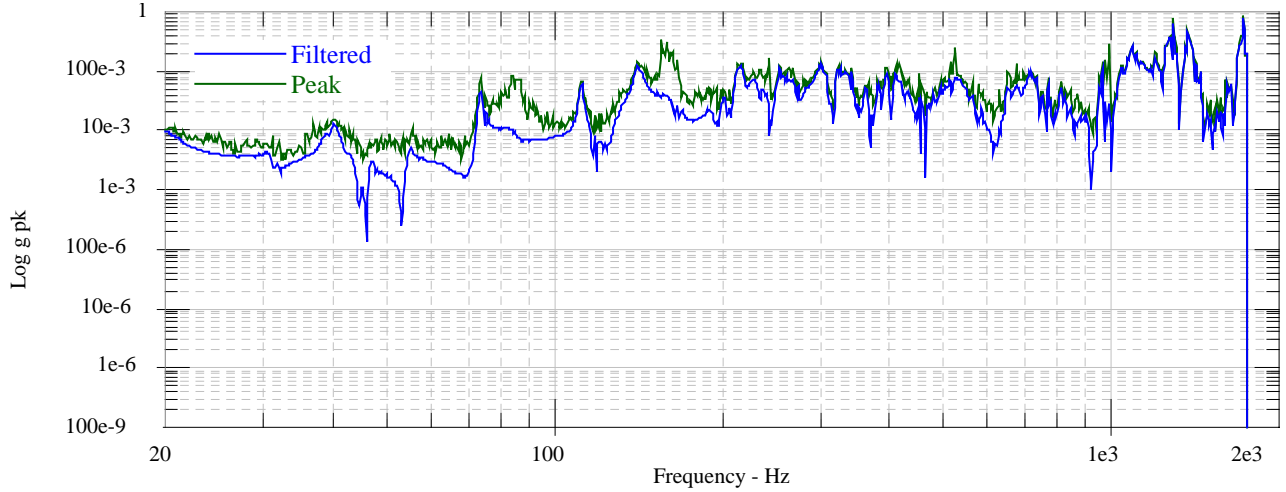
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CONE.Z Channel n° 24



CONE.Y Channel n° 25

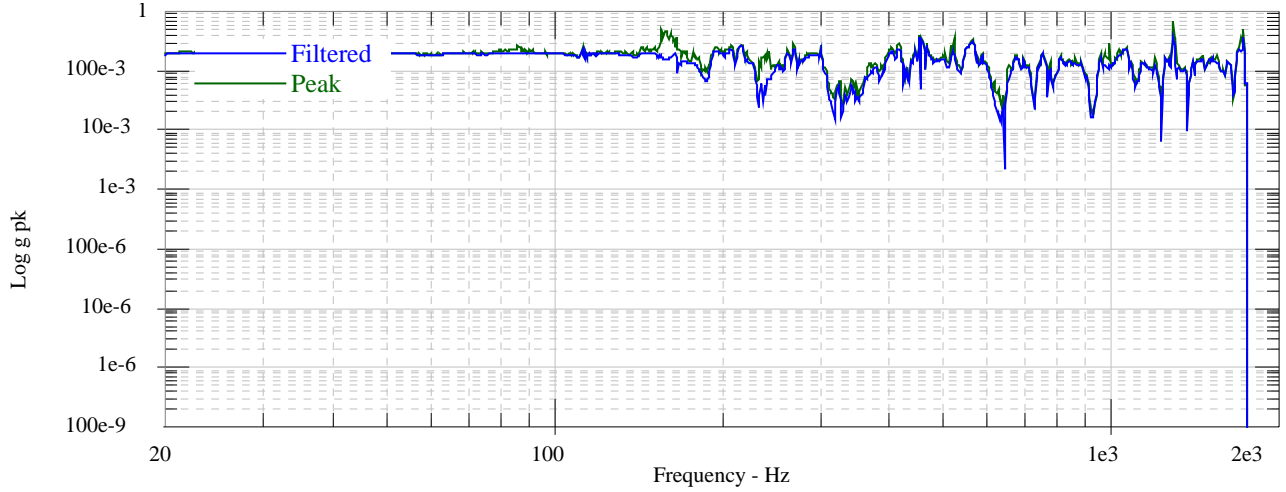


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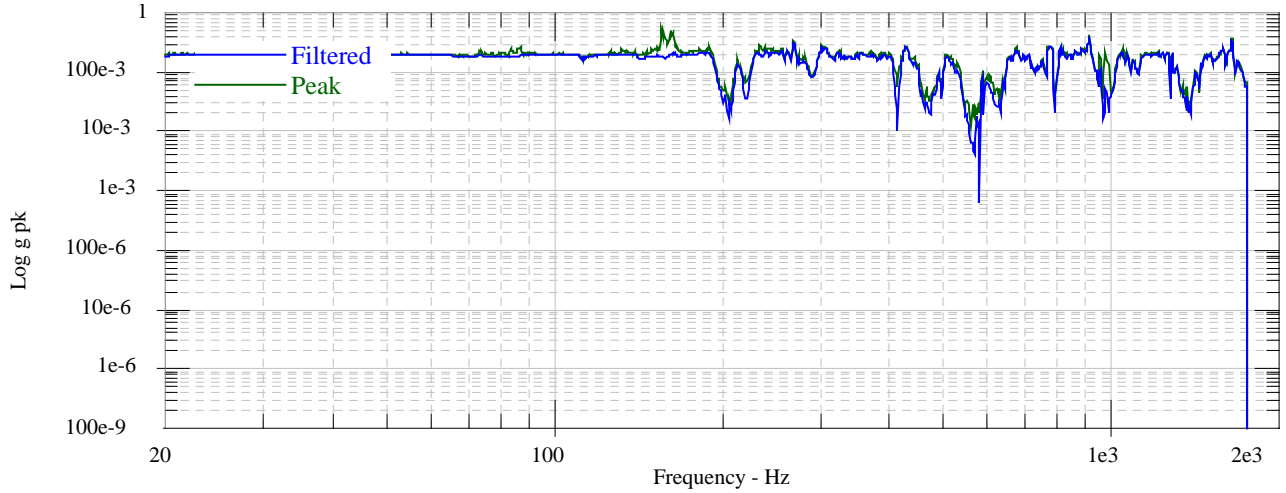
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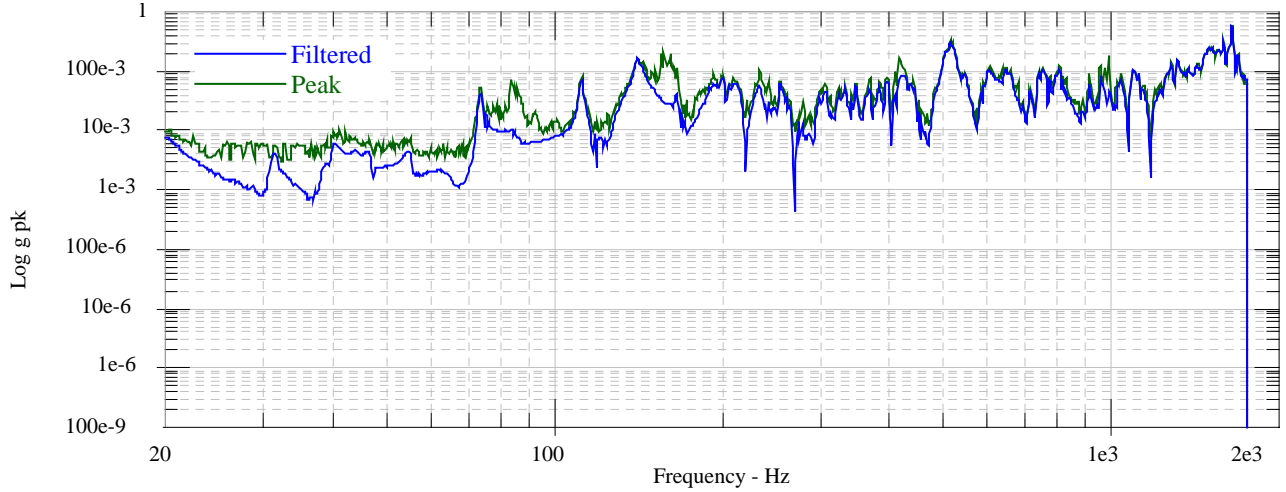
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-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28

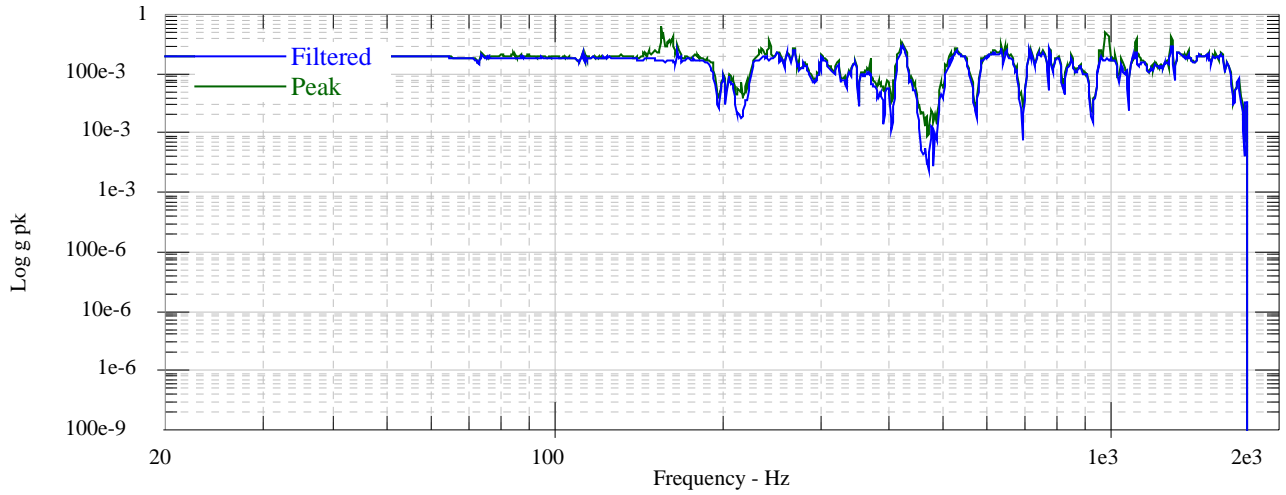


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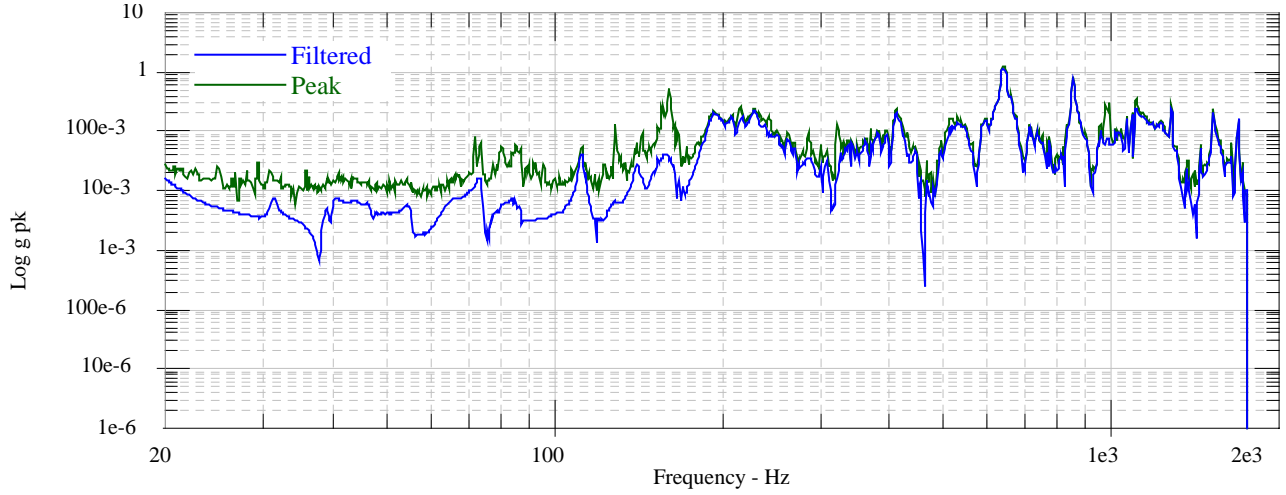
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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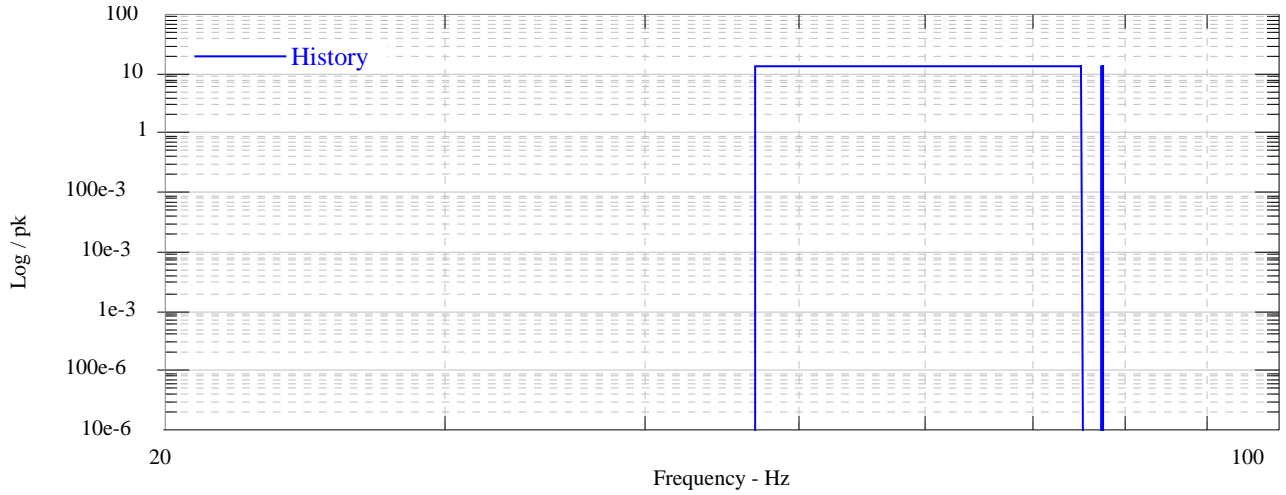
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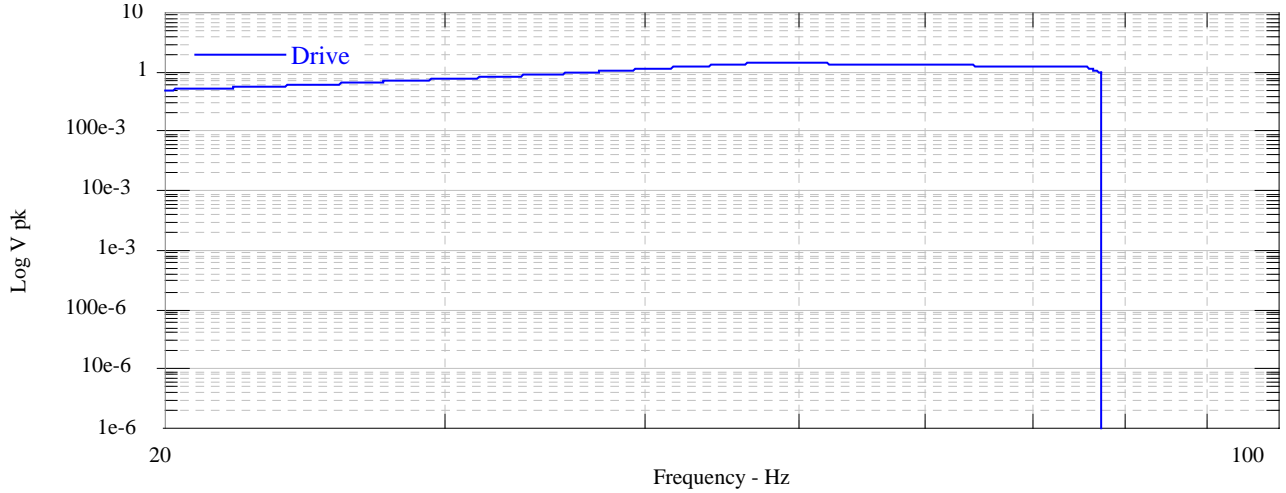
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Révision : 00
Date : 1-May-04
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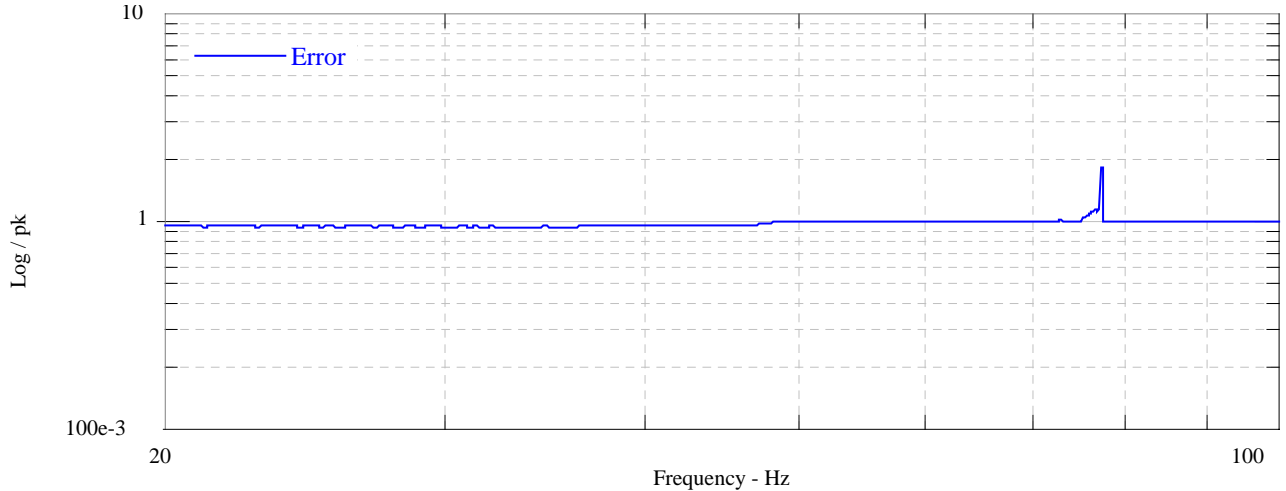
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

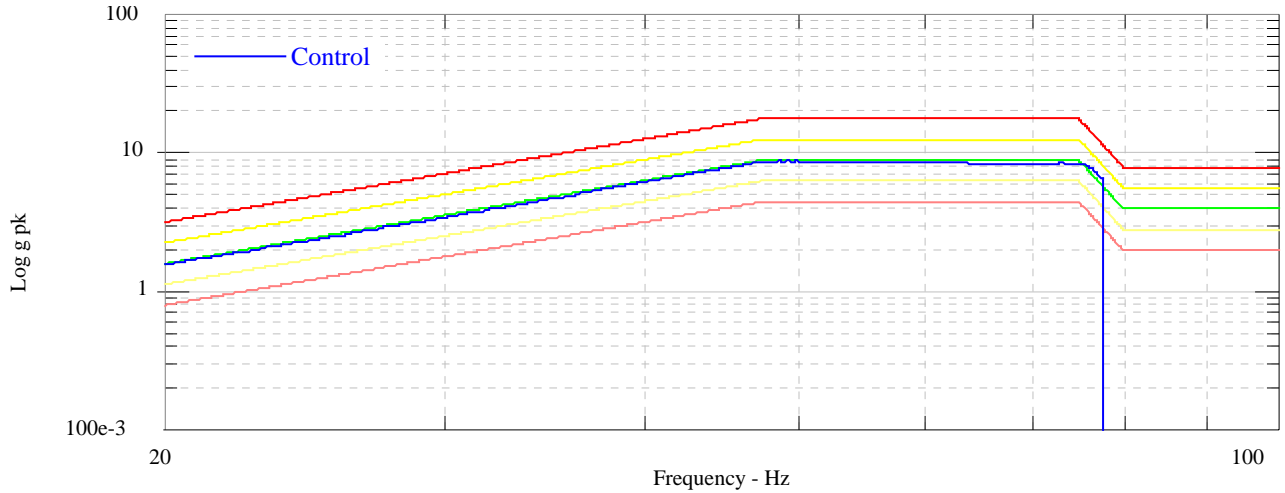


VIBRATION TEST REPORT
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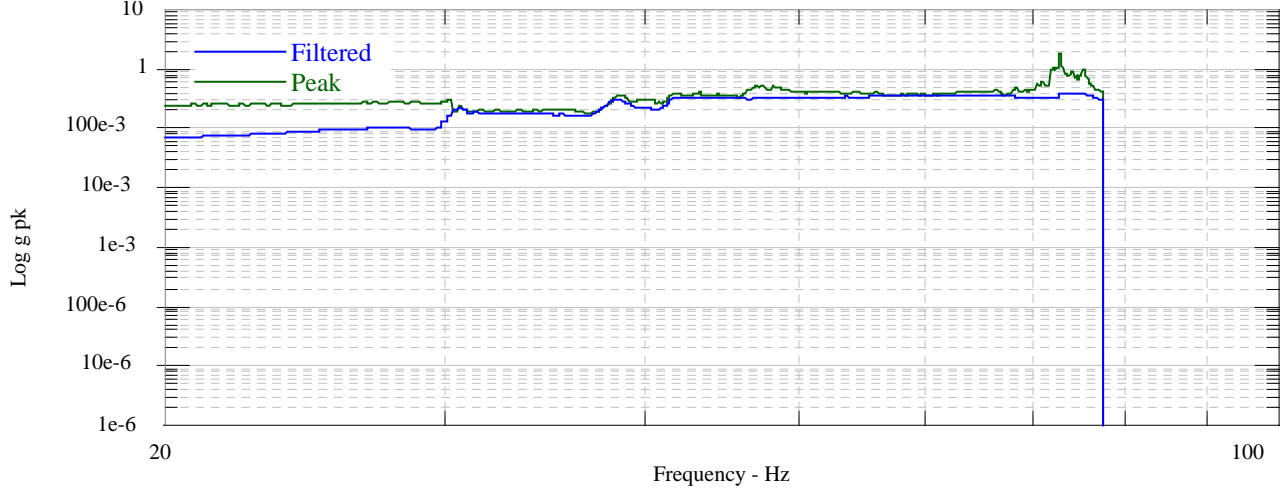
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Date : 1-May-04
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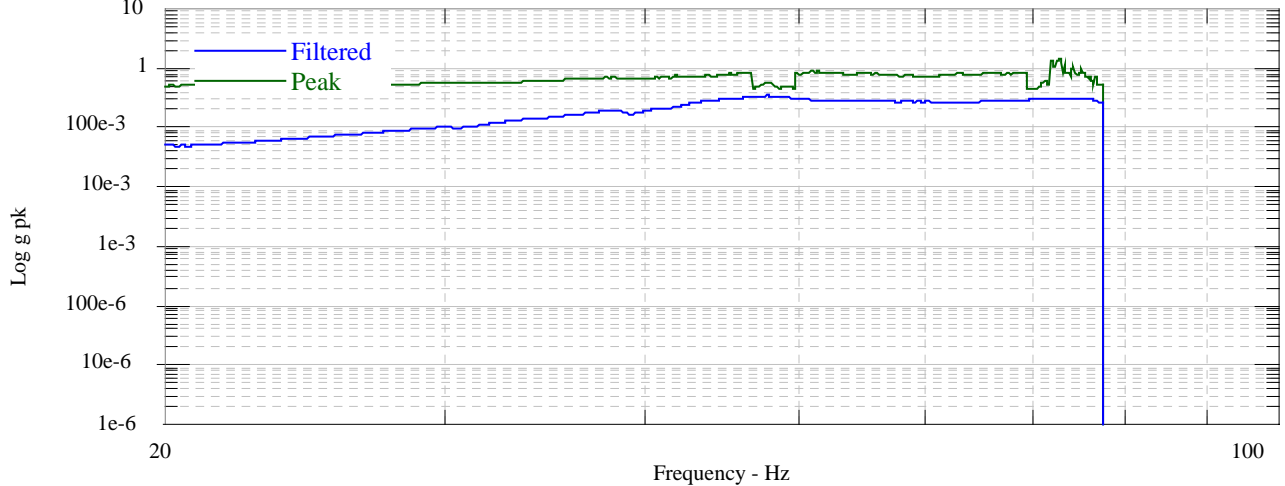
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

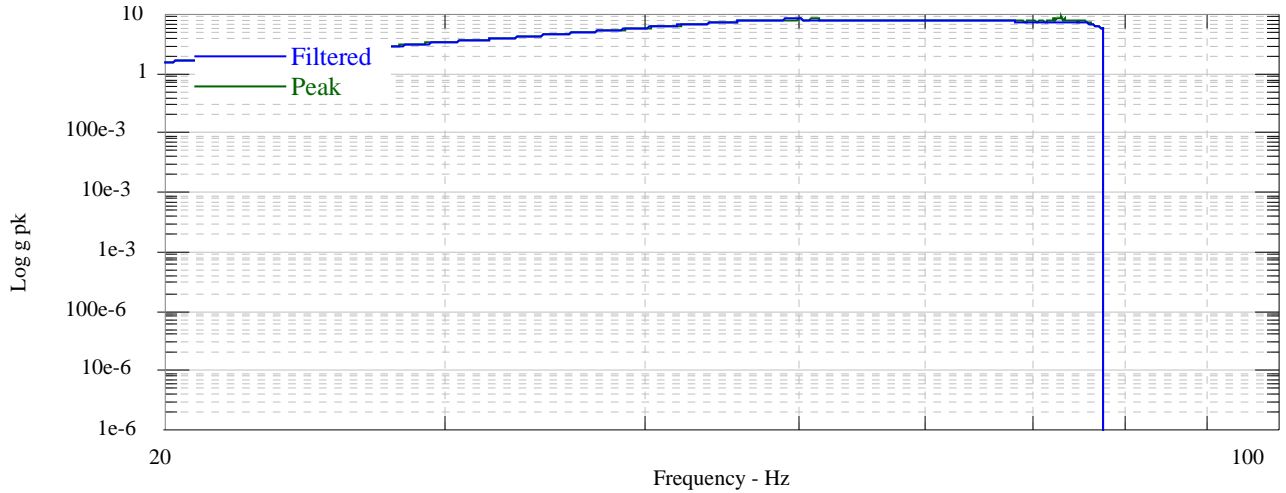


VIBRATION TEST REPORT
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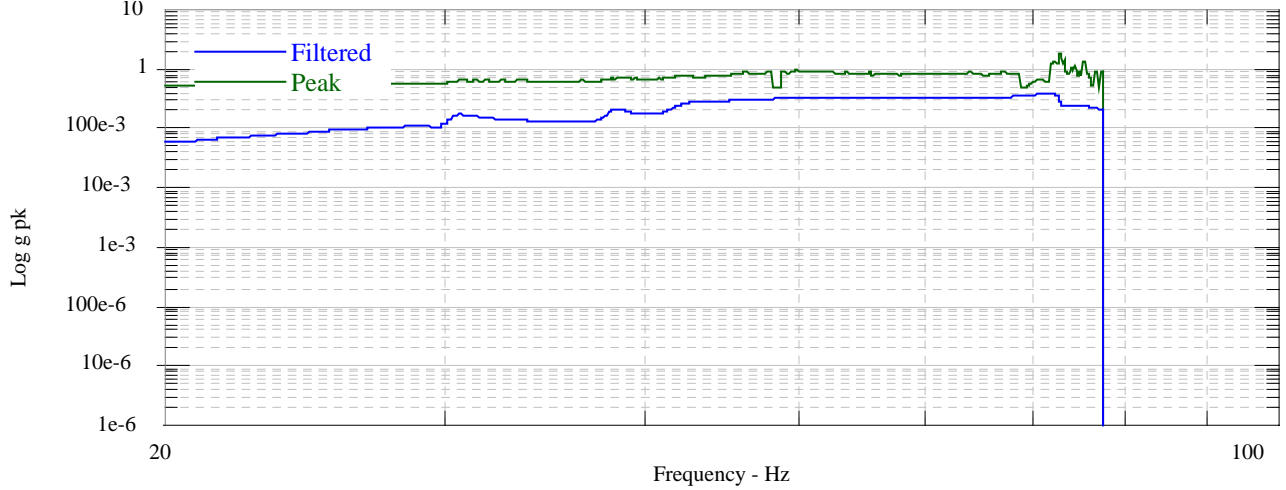
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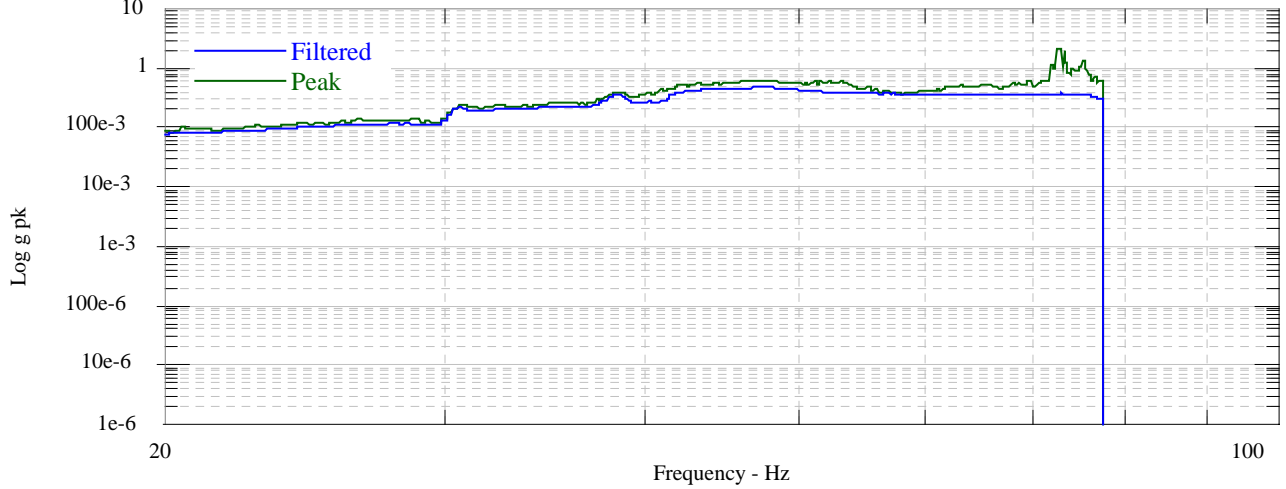
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SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

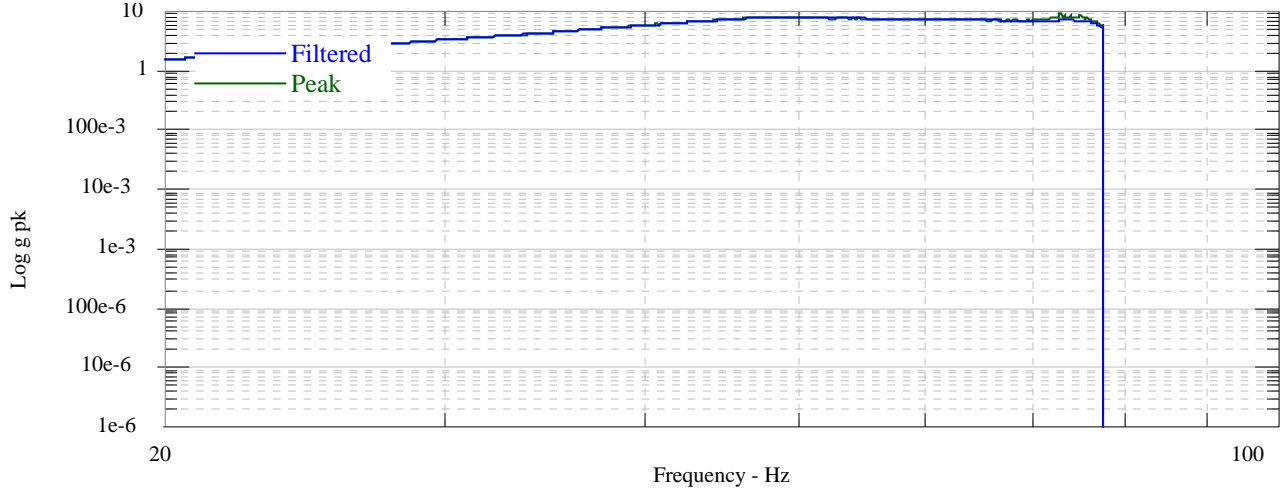


VIBRATION TEST REPORT
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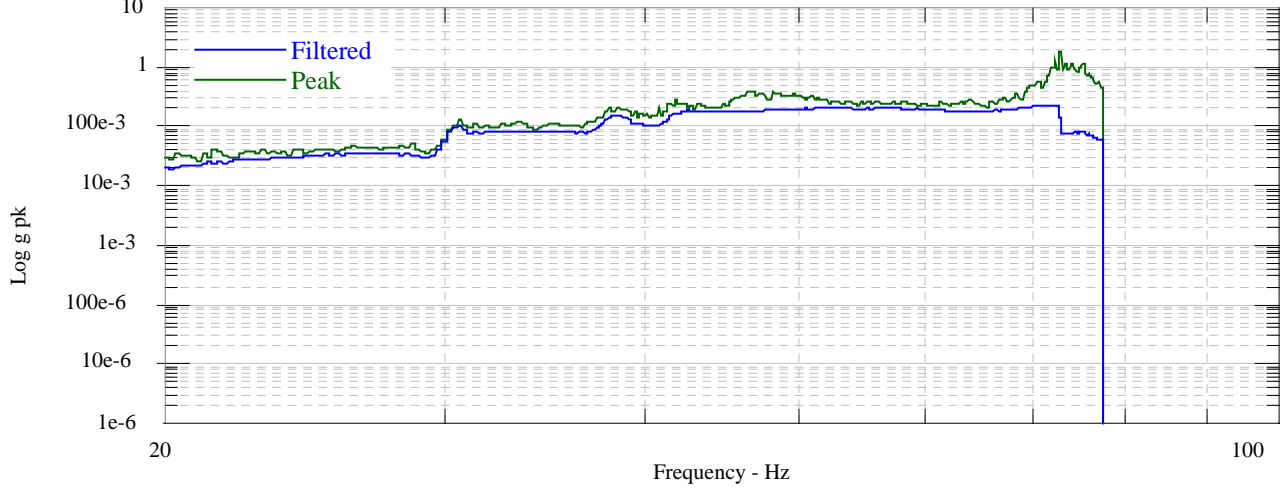
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Version : 01
Révision : 00
Date : 1-May-04
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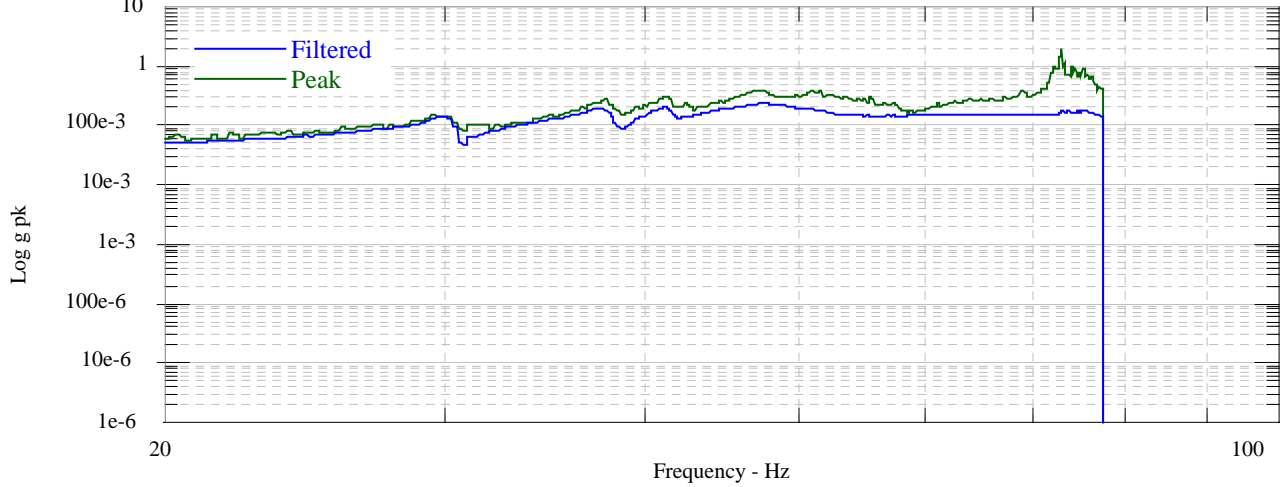
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

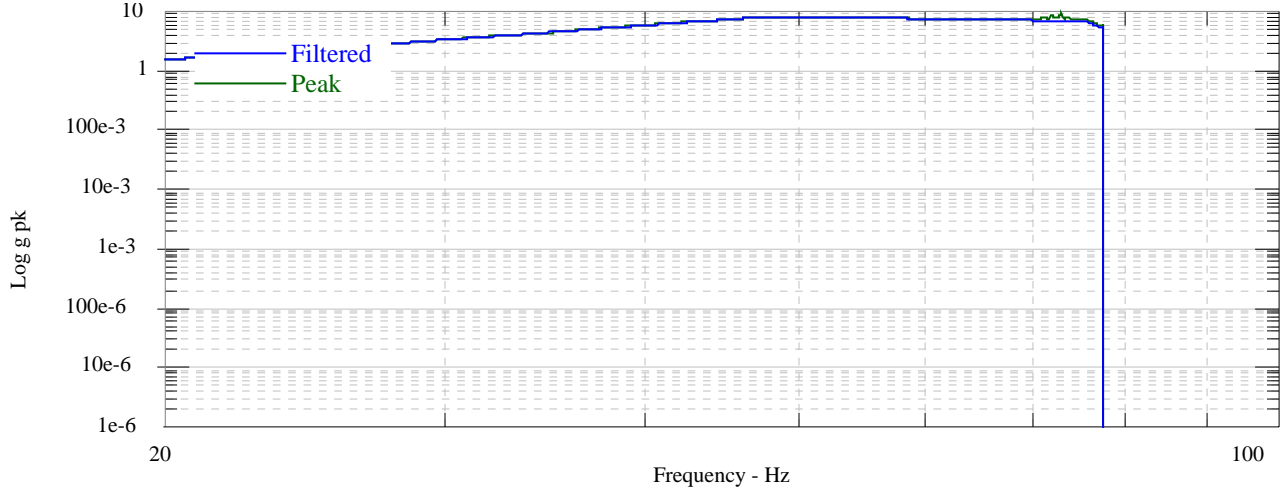


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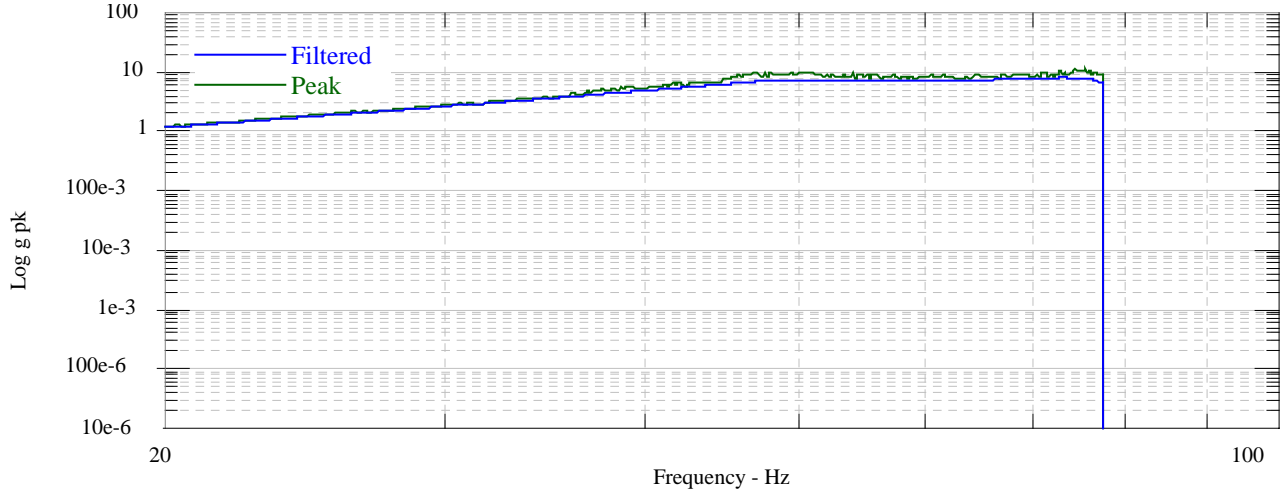
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Date : 1-May-04
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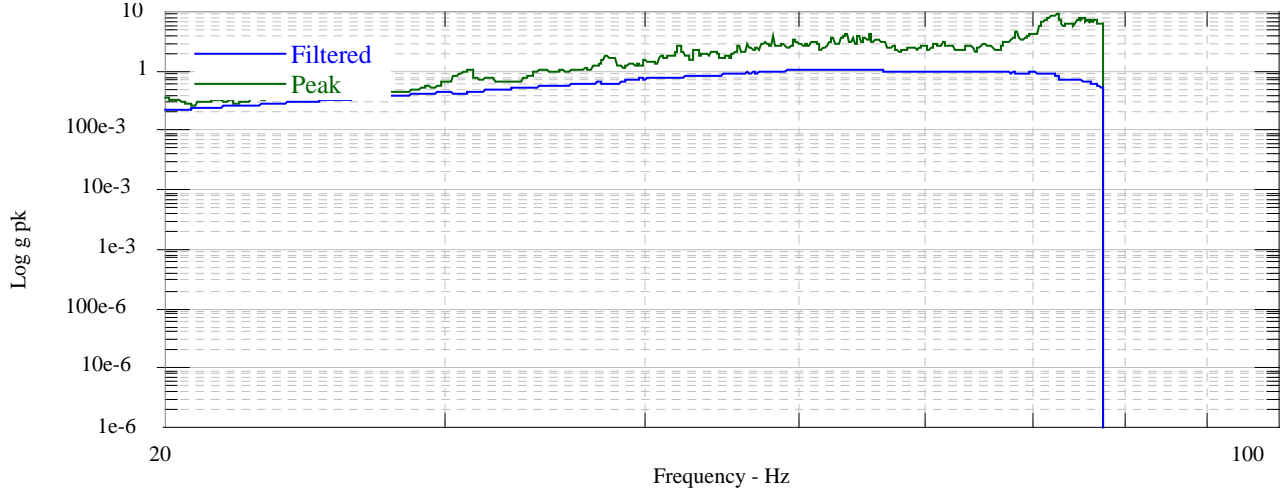
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

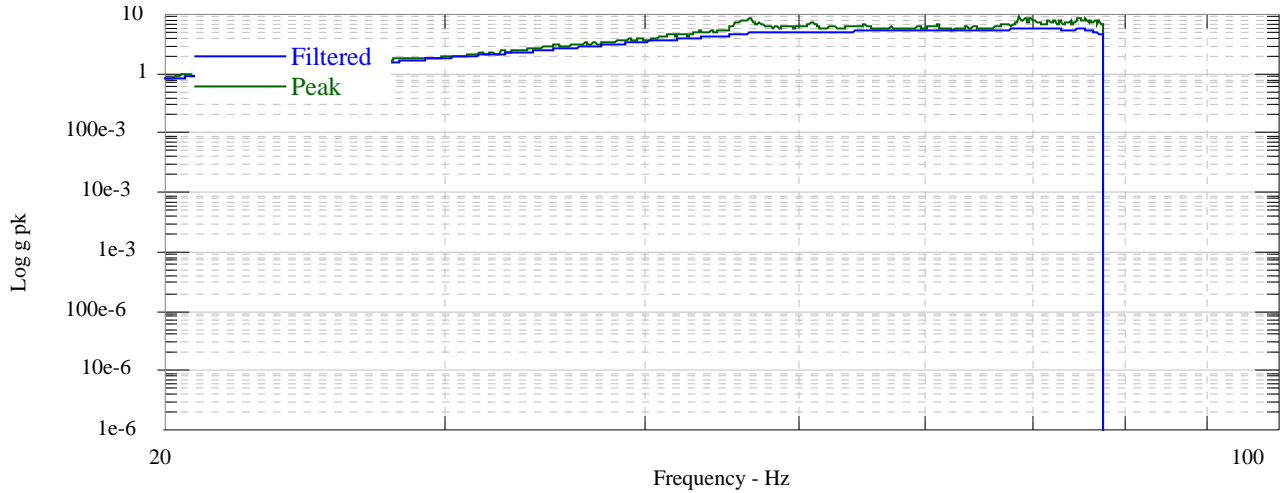


VIBRATION TEST REPORT
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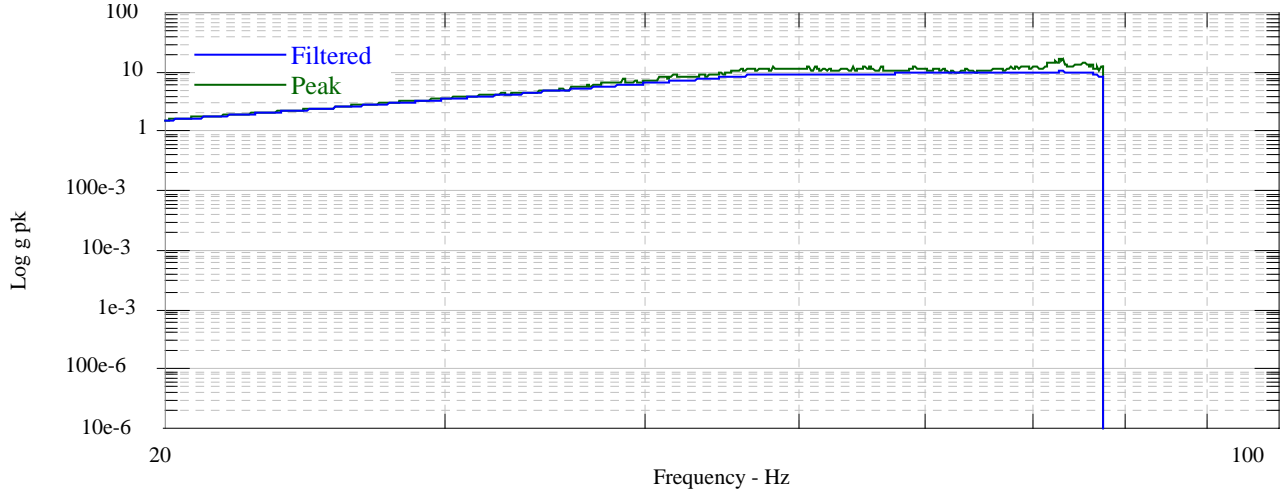
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Date : 1-May-04
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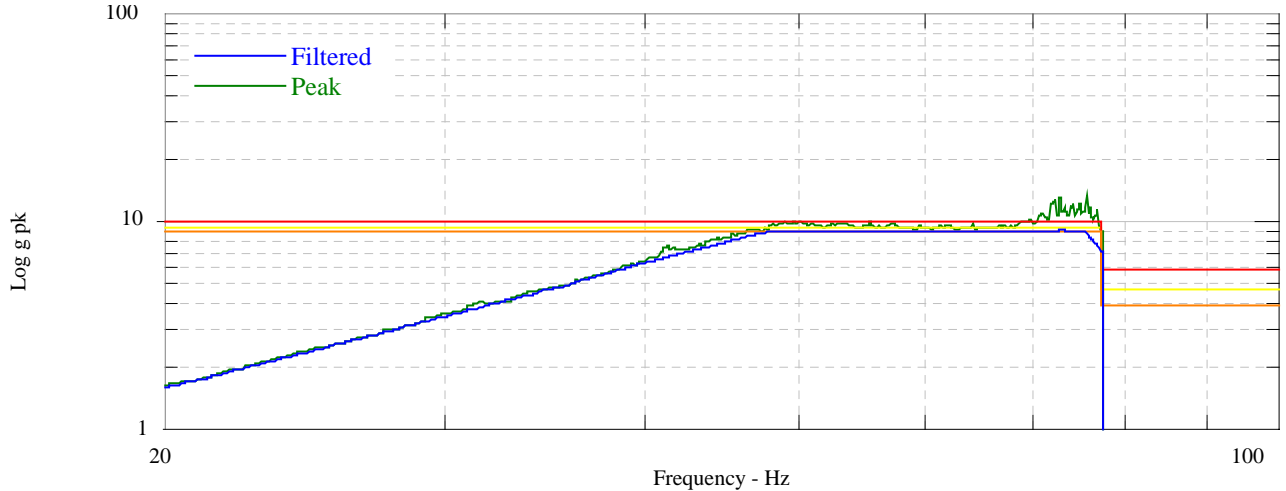
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

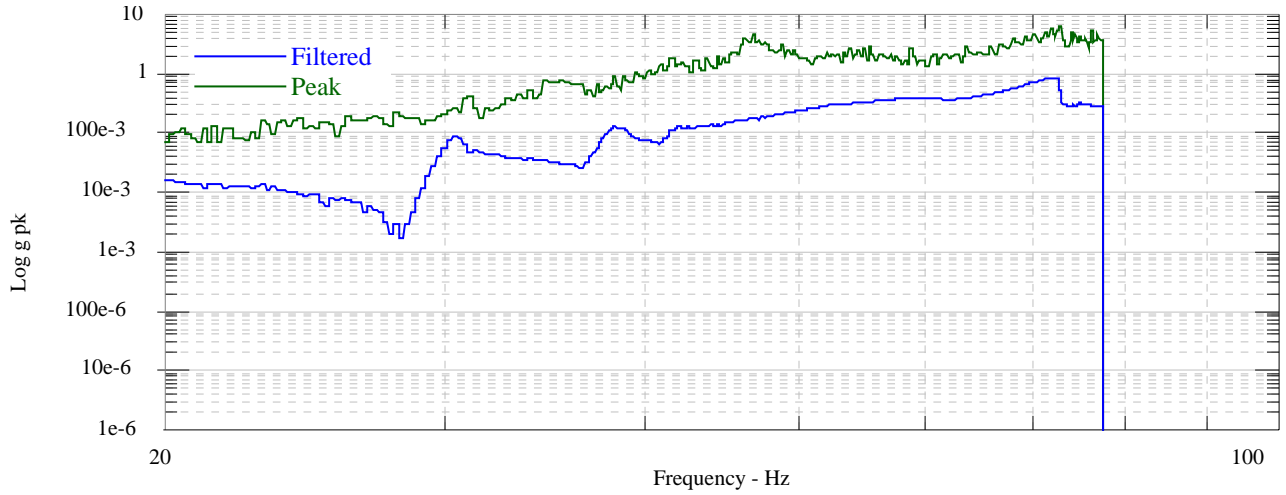


VIBRATION TEST REPORT
SPIRE QM

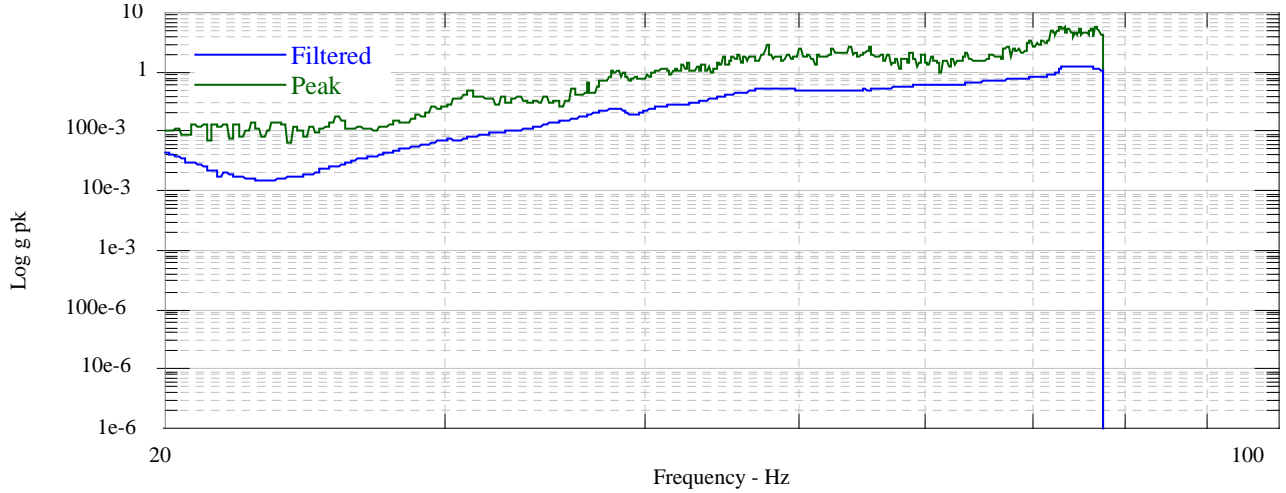
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Version : 01
Révision : 00
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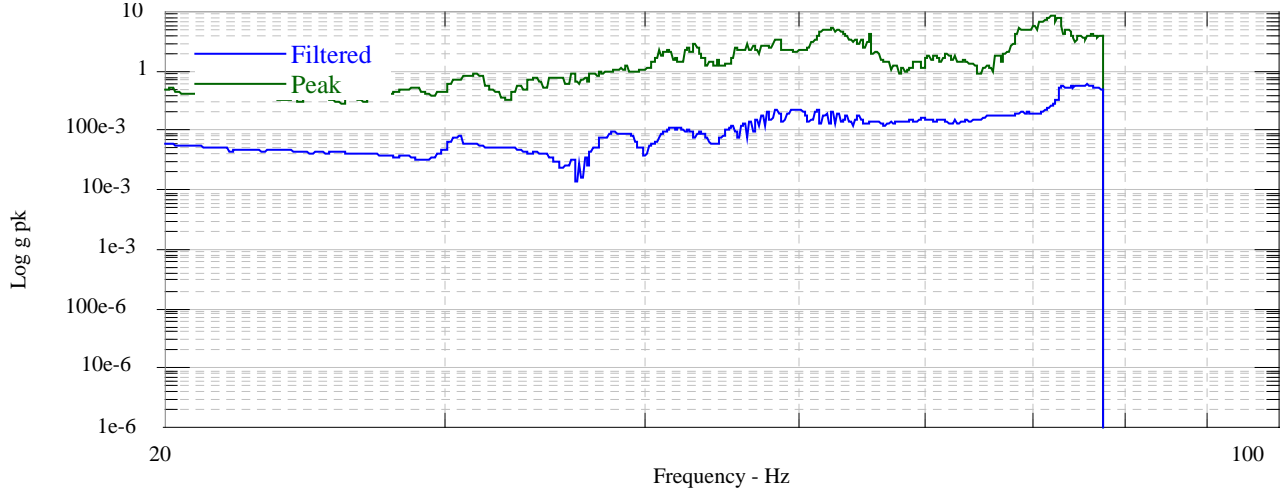
FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

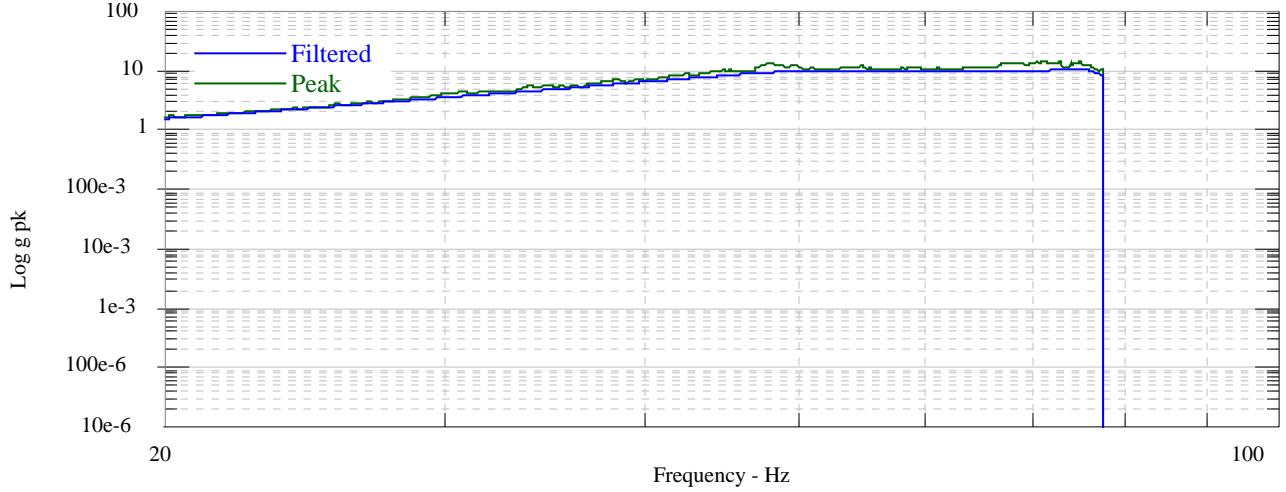


VIBRATION TEST REPORT
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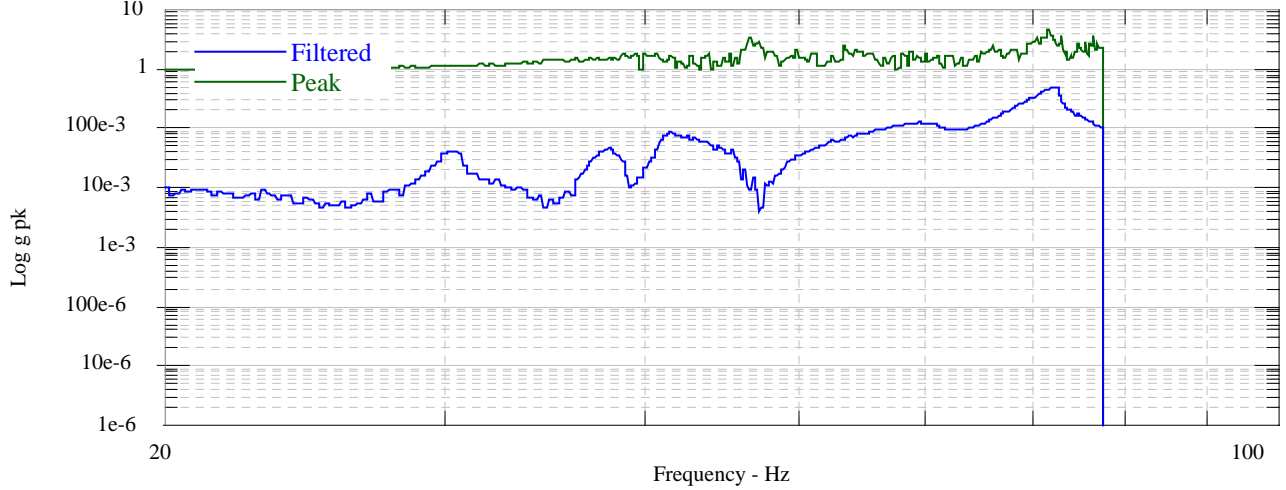
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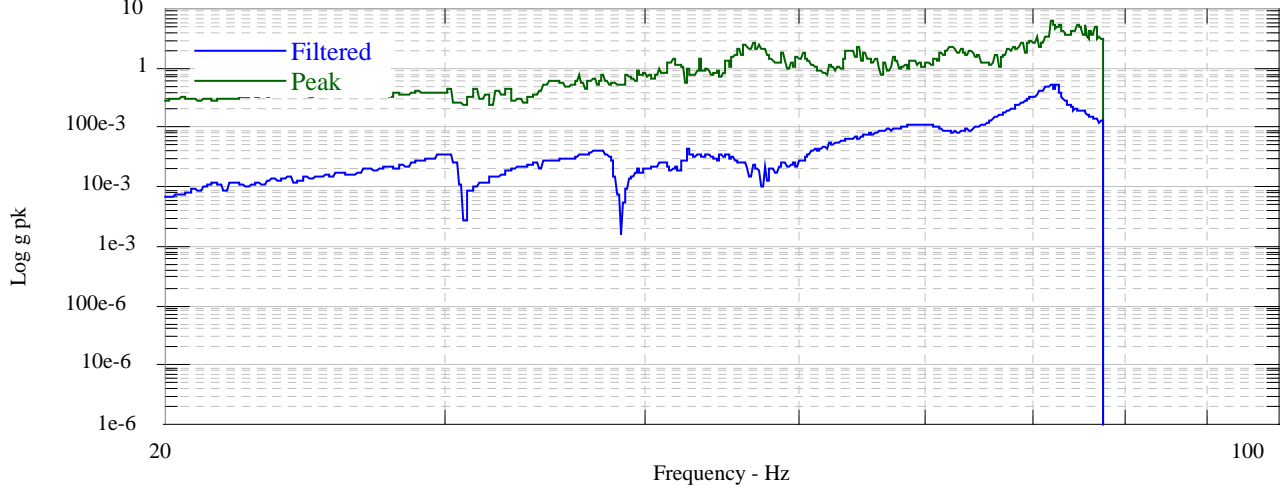
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

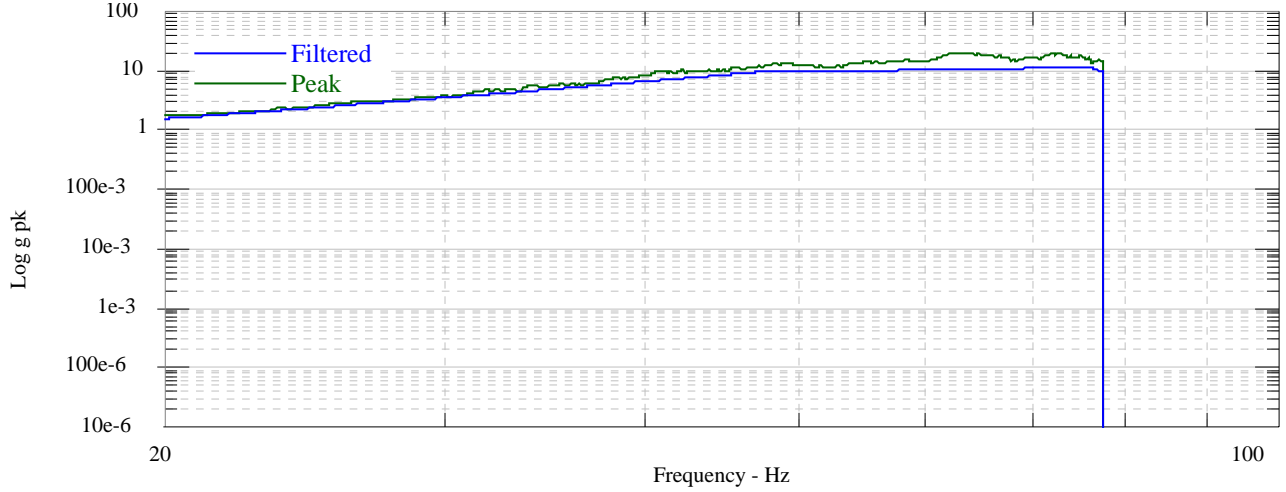


VIBRATION TEST REPORT
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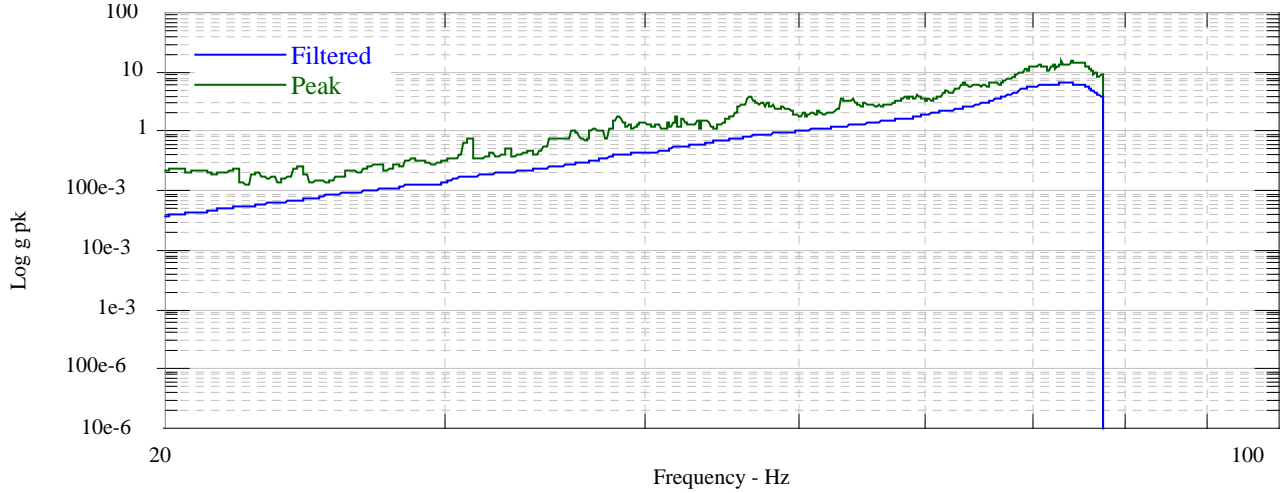
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Date : 1-May-04
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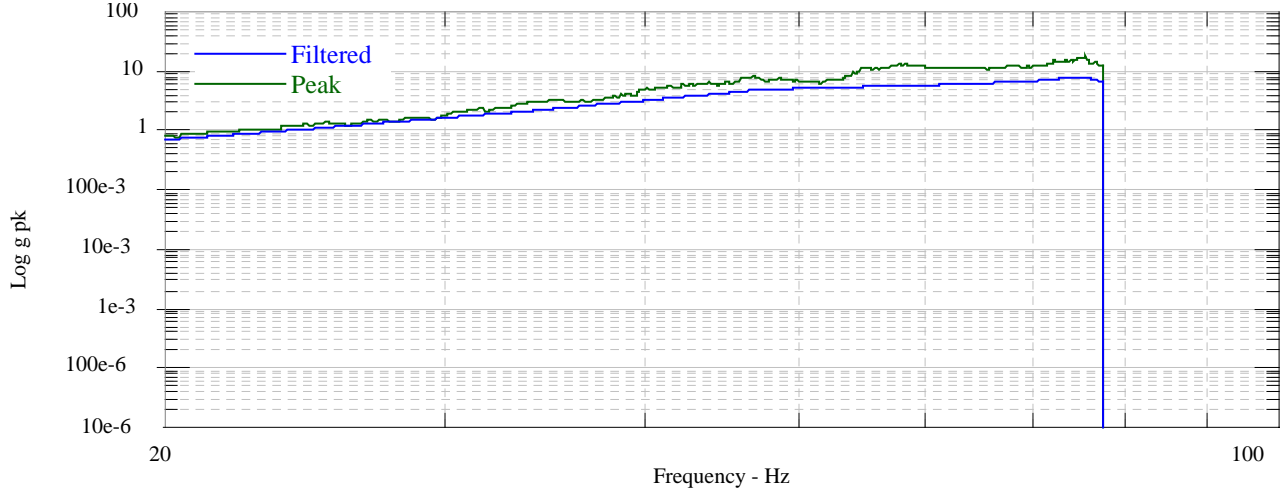
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

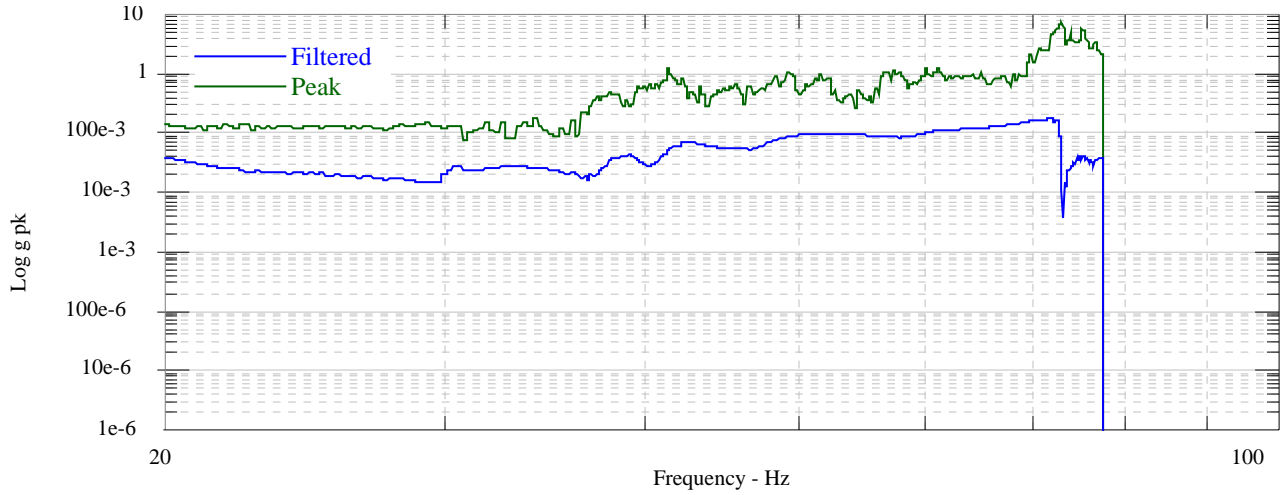


VIBRATION TEST REPORT
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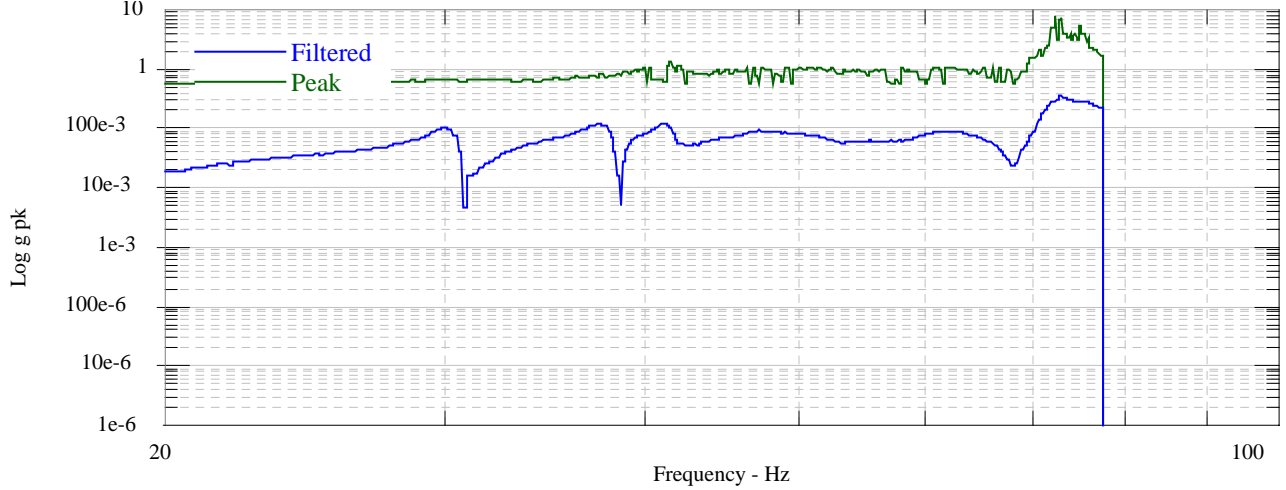
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Date : 1-May-04
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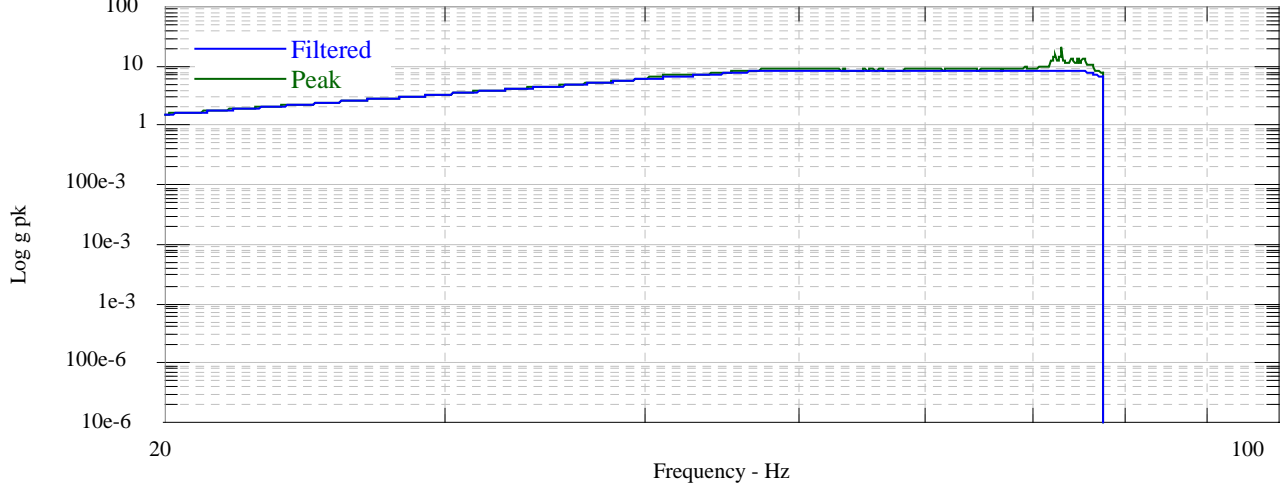
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

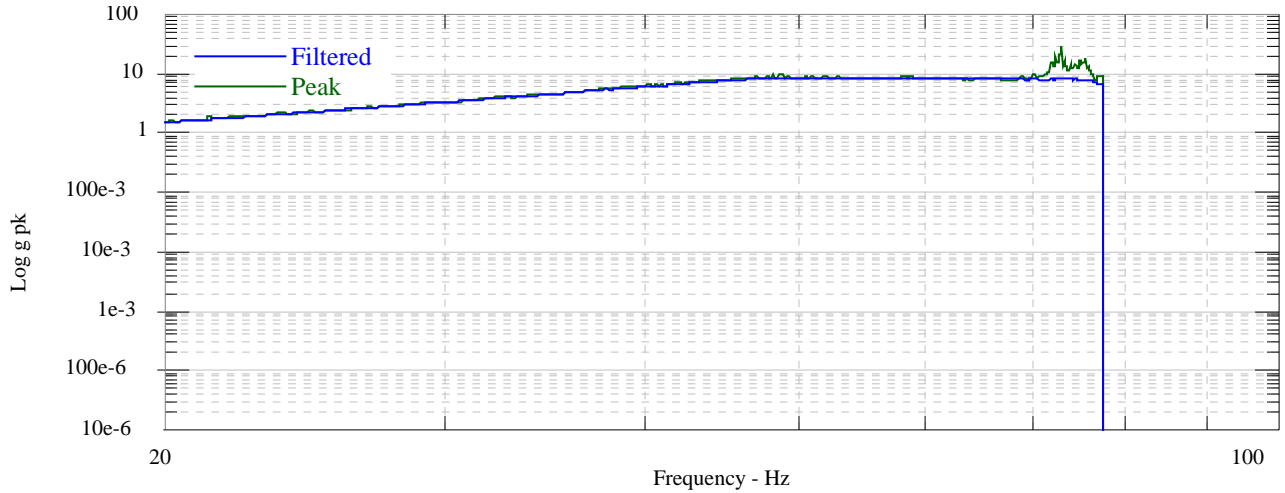


VIBRATION TEST REPORT
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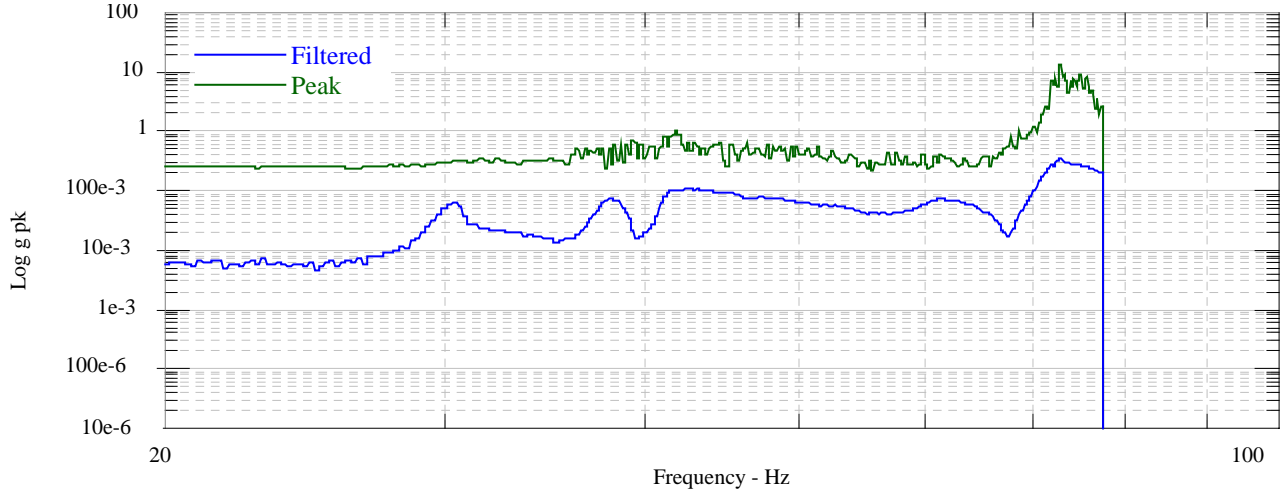
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Date : 1-May-04
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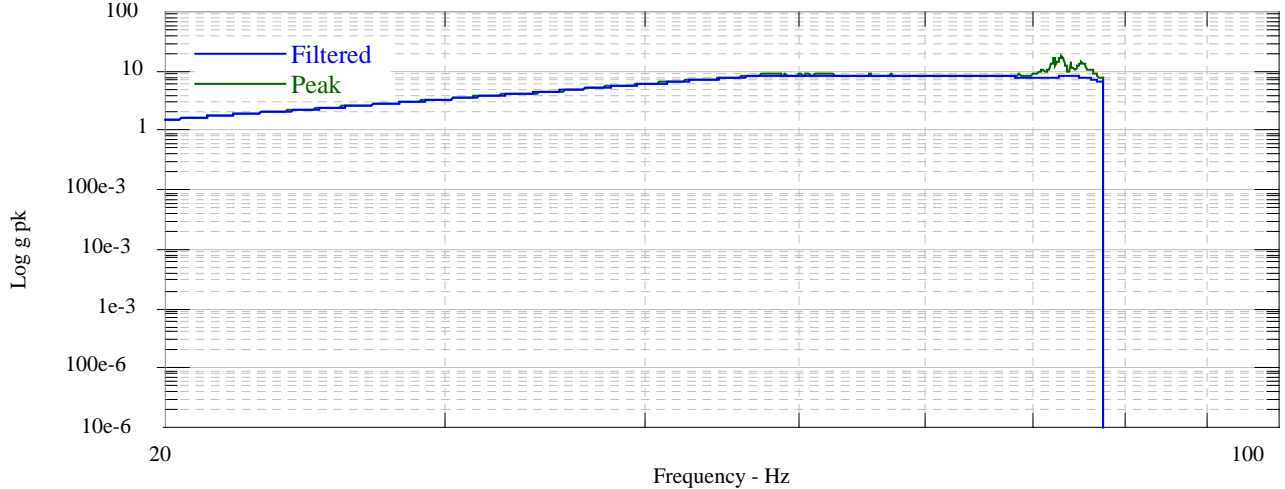
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

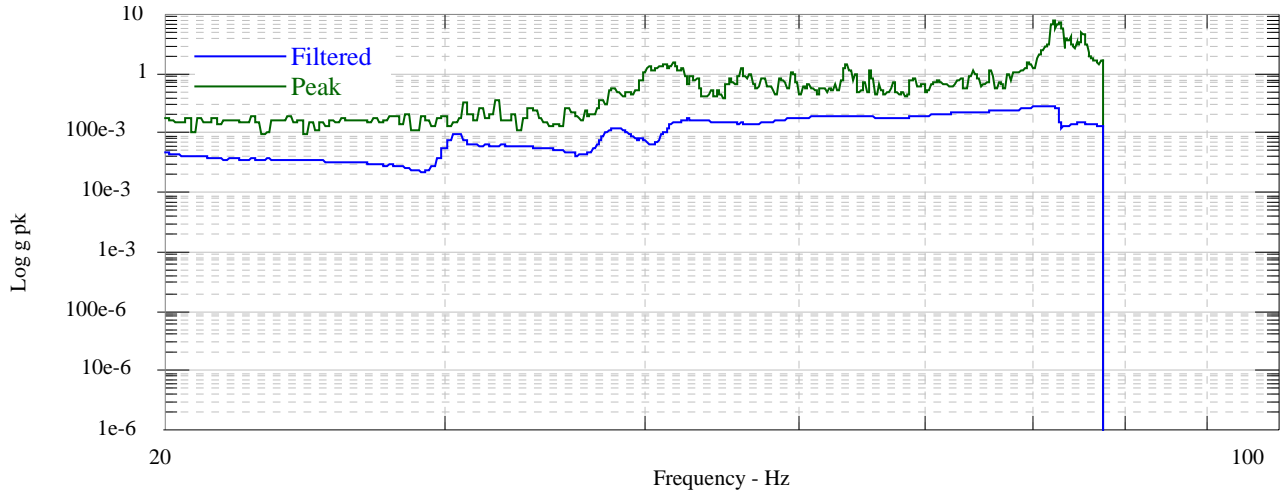


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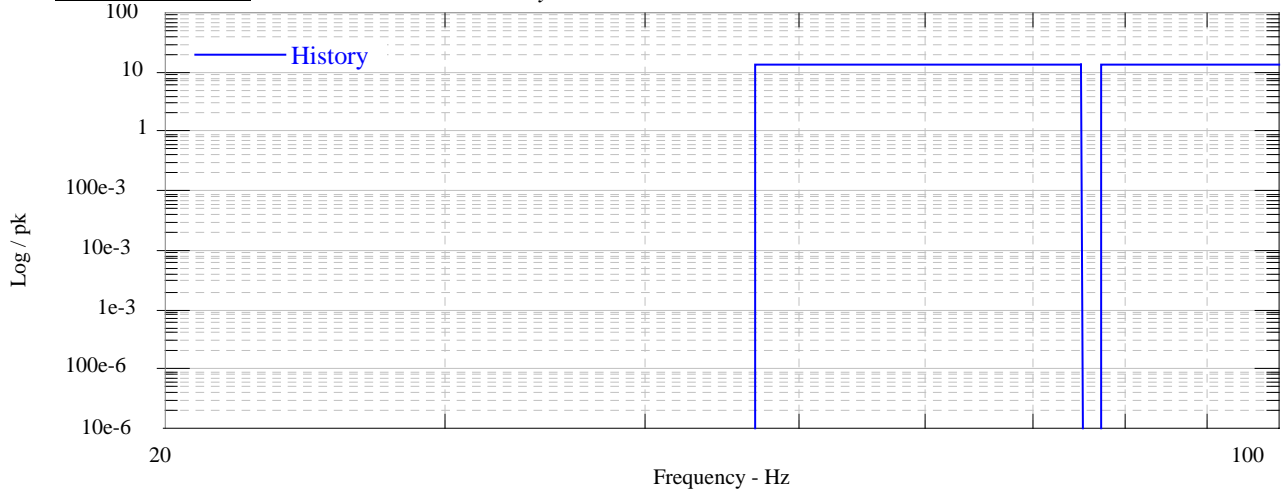
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+YAFRAME.Z Channel n° 30

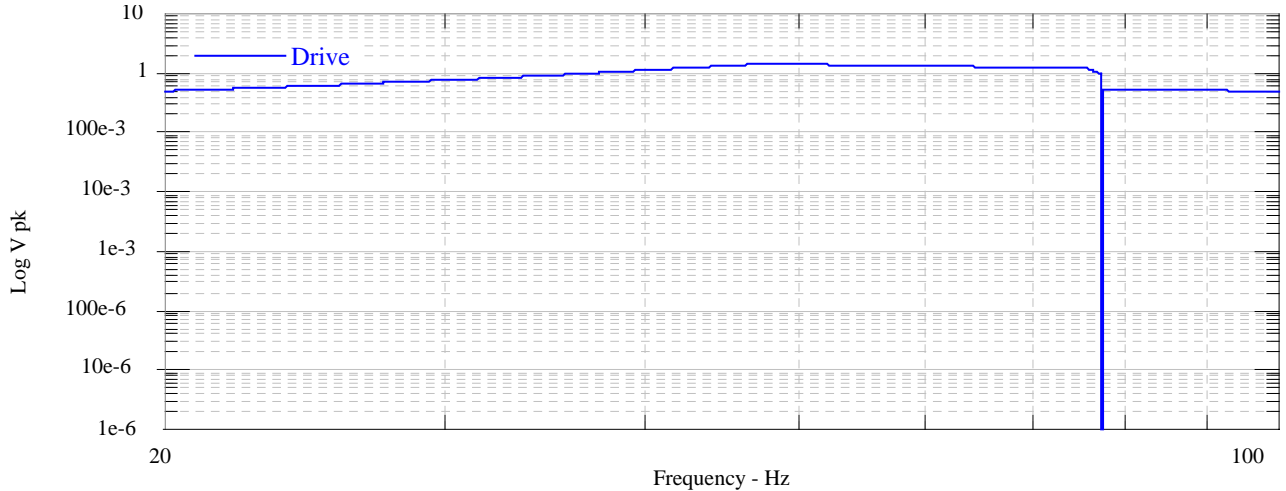


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History Channel n° -3



Drive Channel n° -2

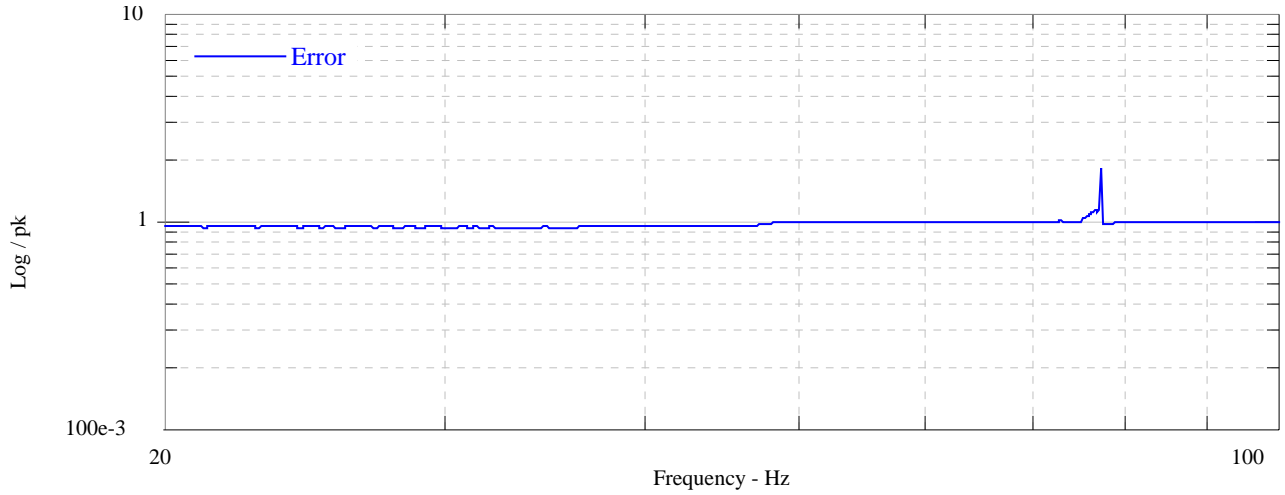


VIBRATION TEST REPORT
SPIRE QM

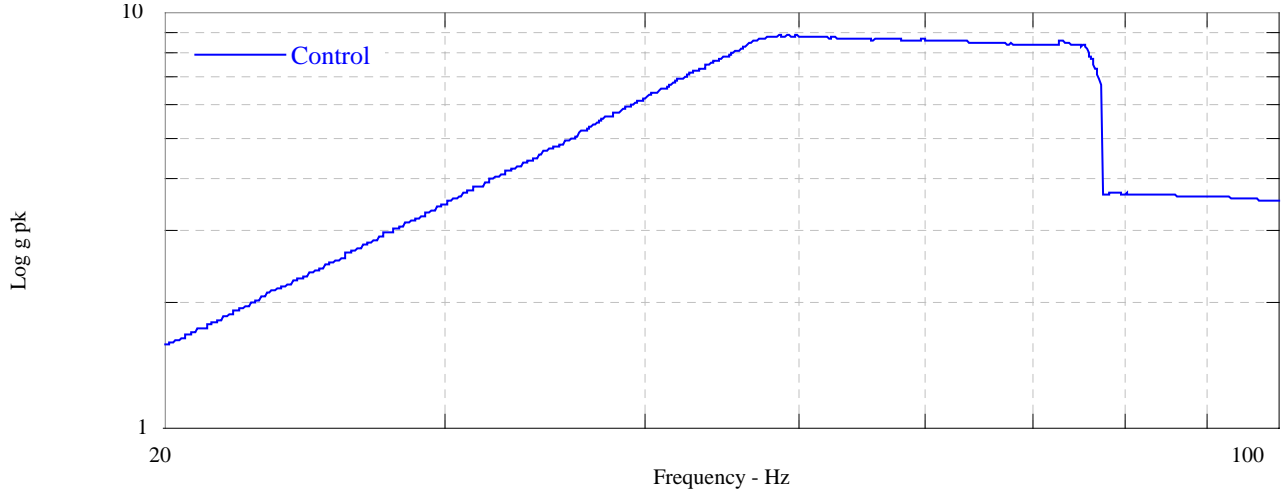
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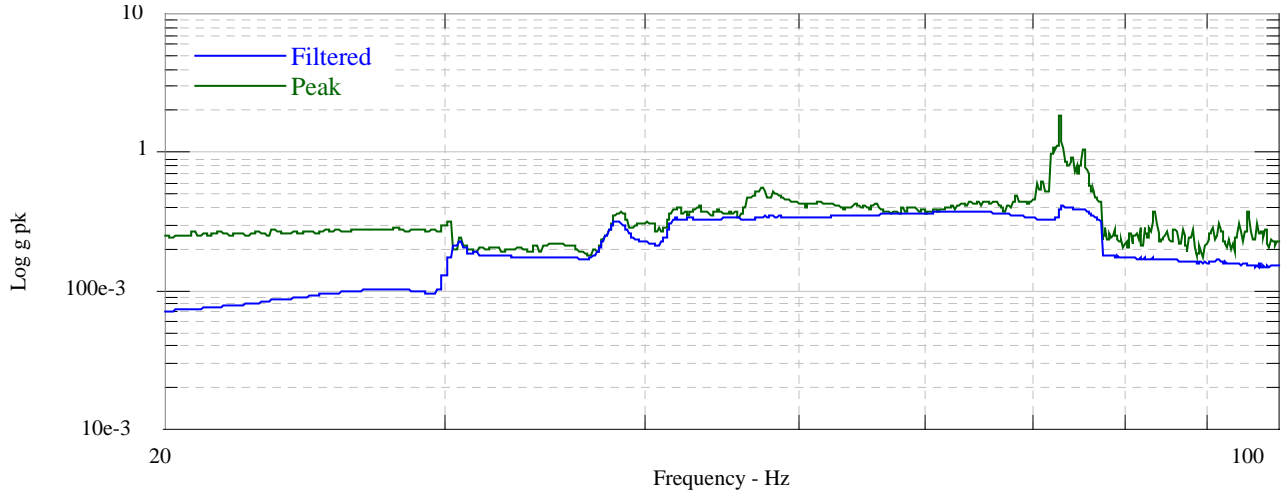
Error Channel n° -1



Control Channel n° 0



SHK.1.Y Channel n° 1

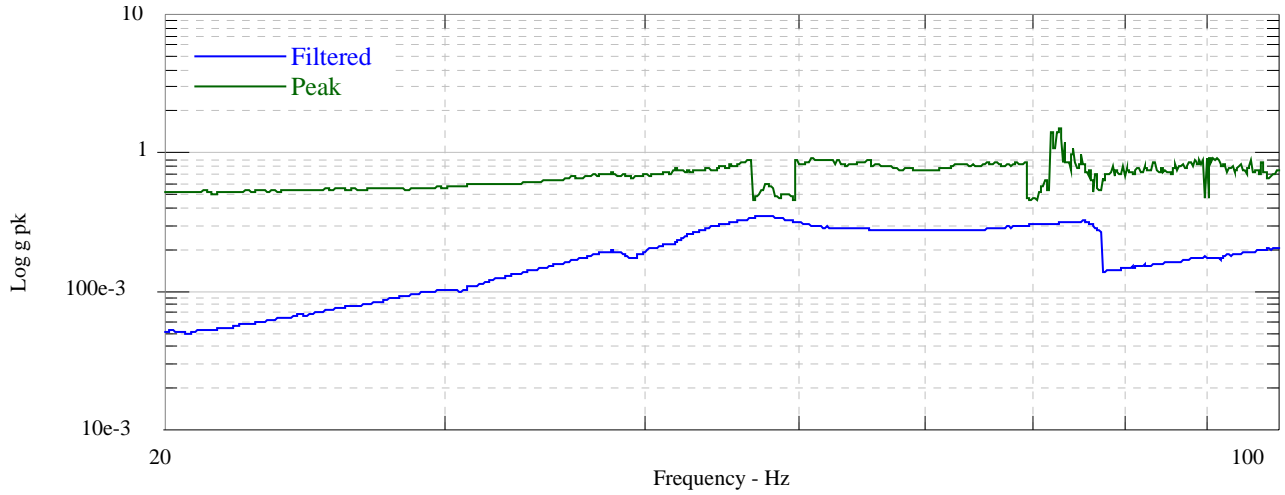


VIBRATION TEST REPORT
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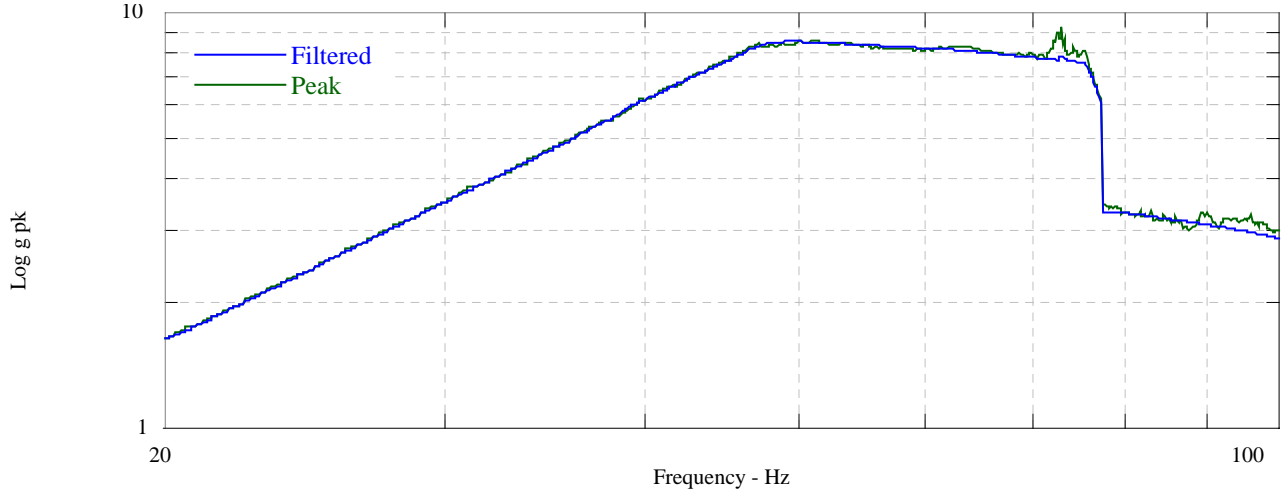
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Date : 1-May-04
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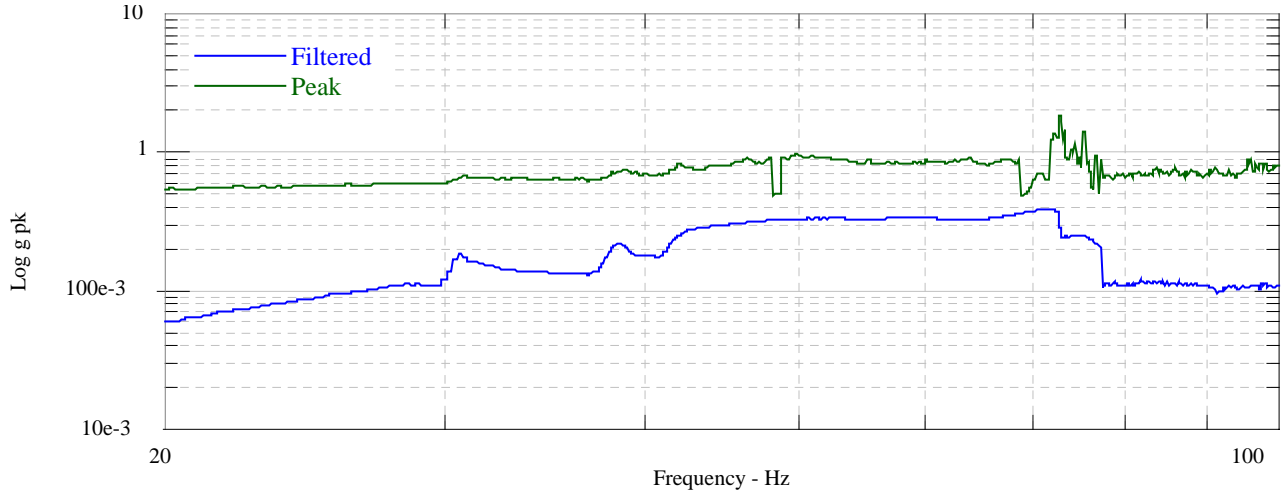
SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4

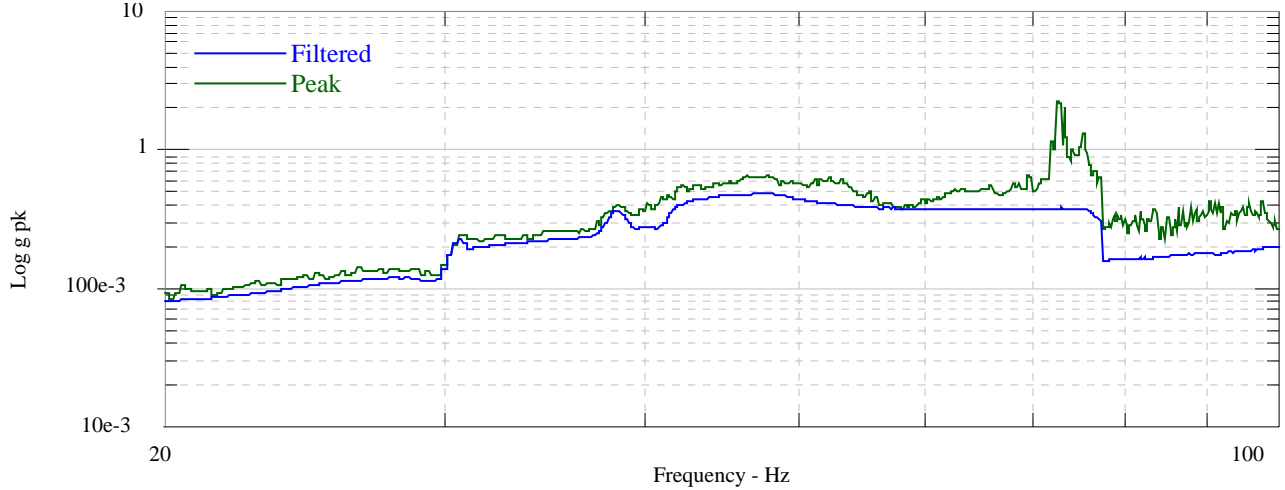


VIBRATION TEST REPORT
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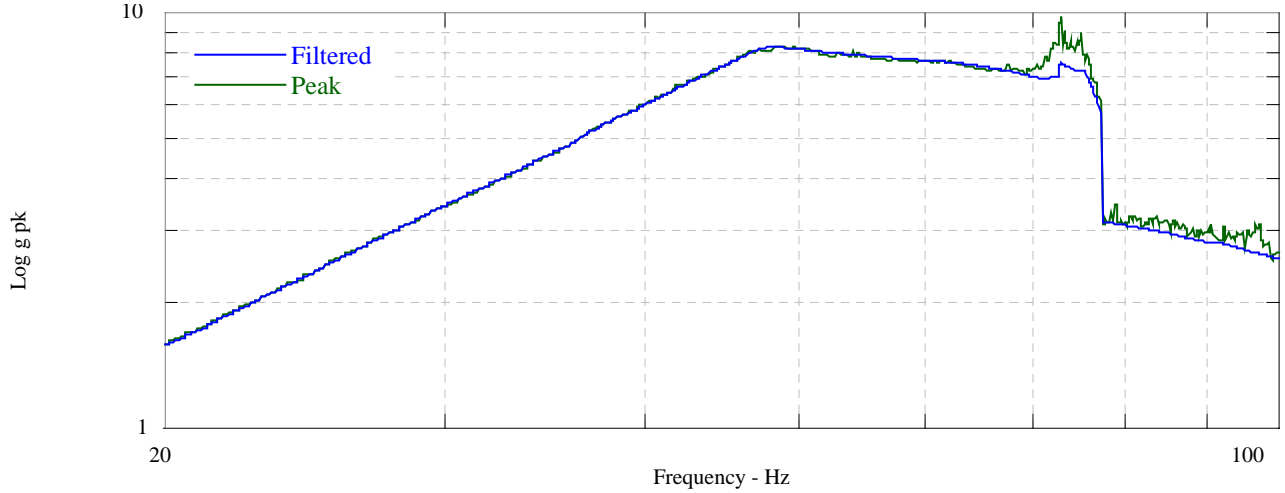
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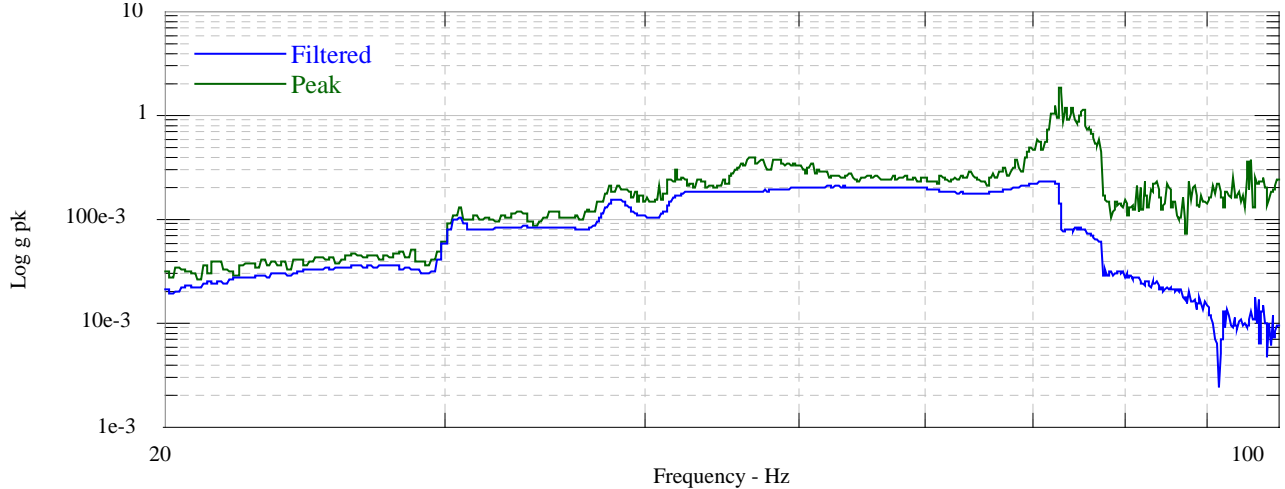
SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6



SHK.3.Y Channel n° 7

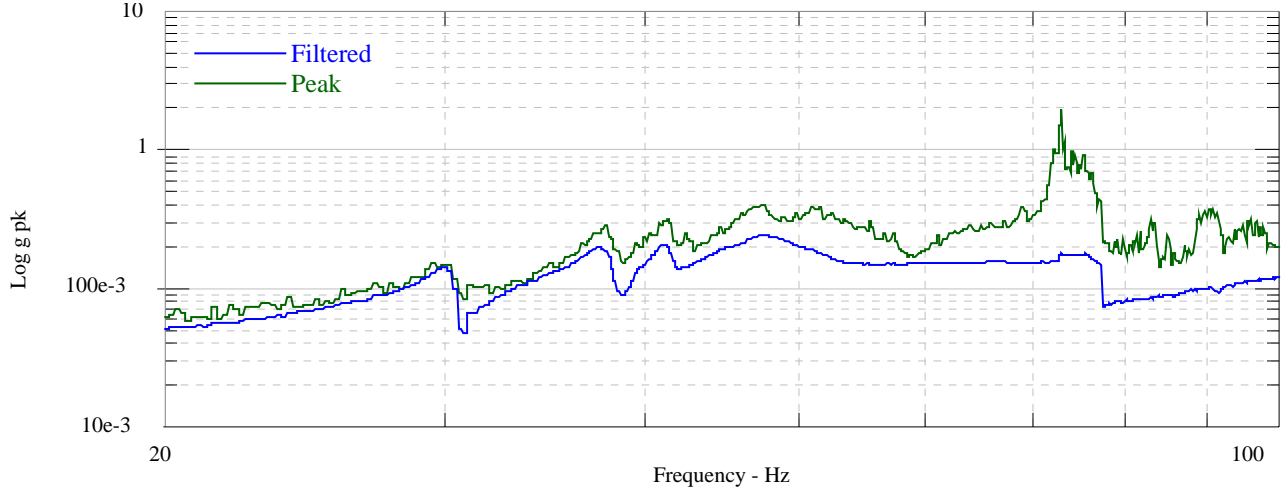


VIBRATION TEST REPORT
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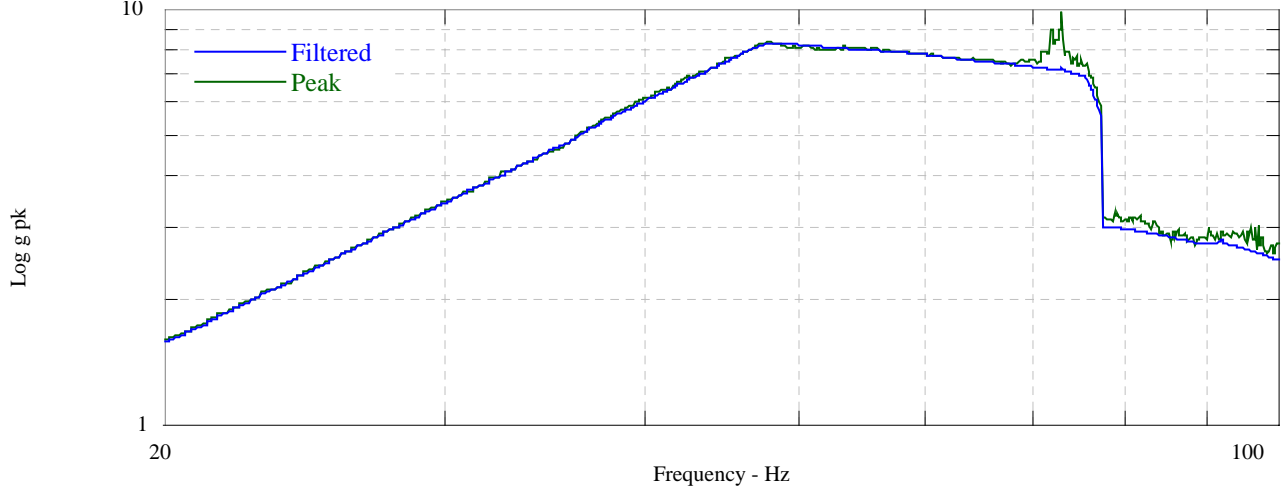
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Date : 1-May-04
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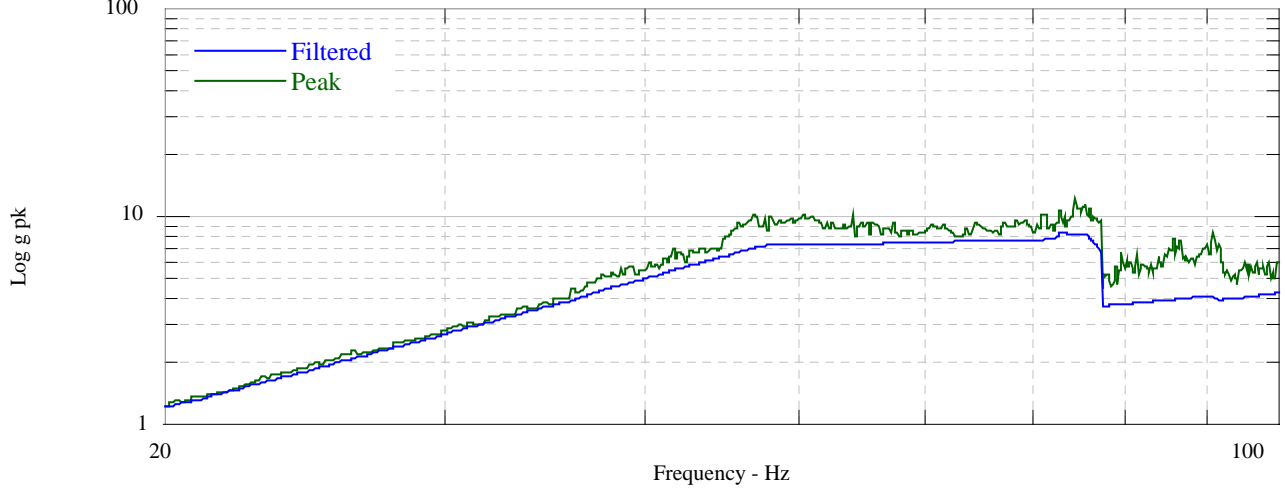
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SHK.3.X Channel n° 9



PHS.XY Channel n° 10

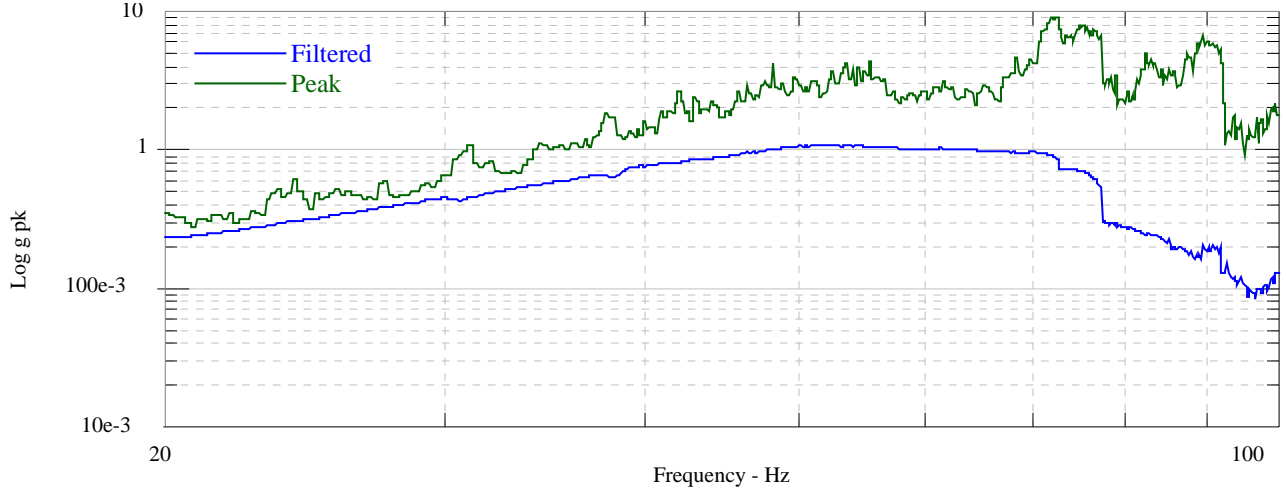


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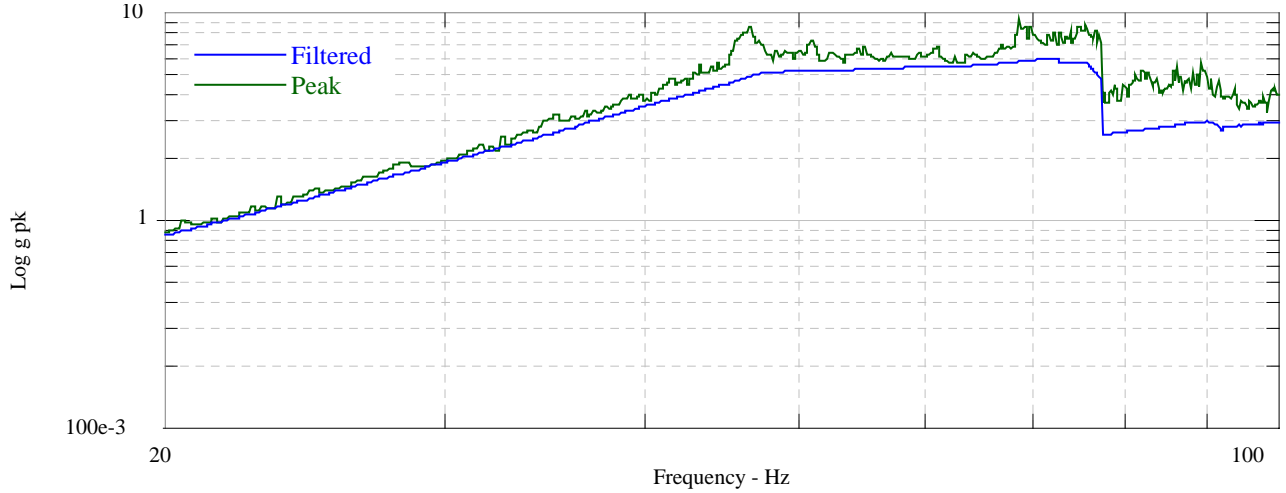
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Date : 1-May-04
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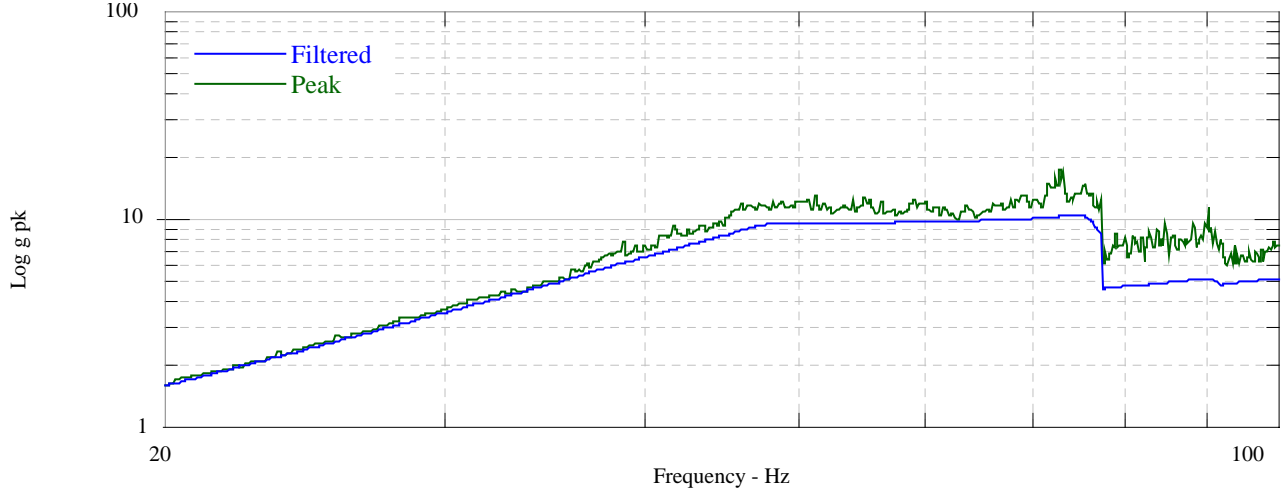
PHS.Z Channel n° 11



PHE.XY Channel n° 12



COOL.X Channel n° 13

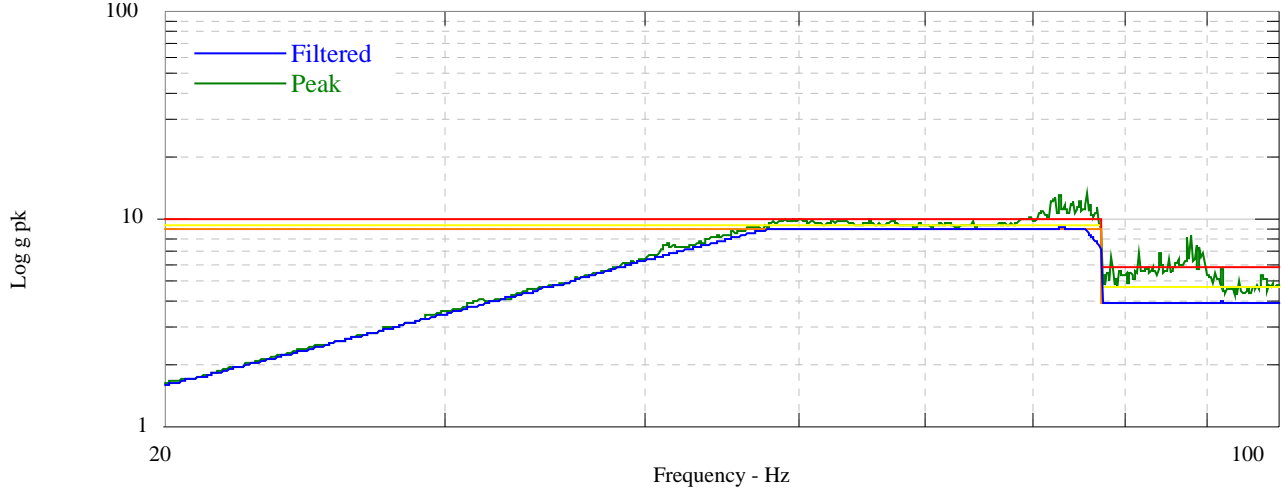


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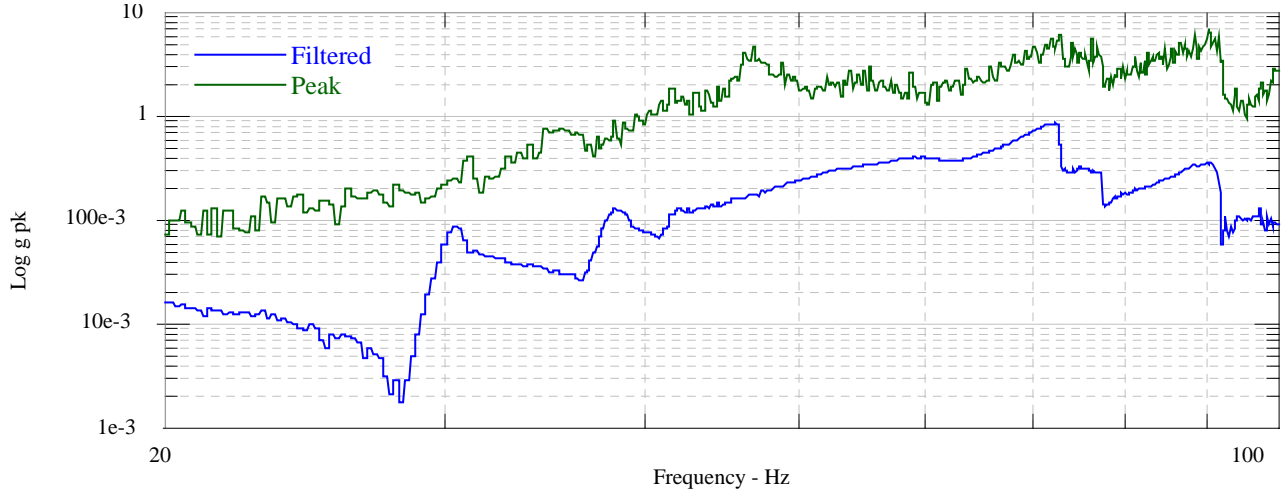
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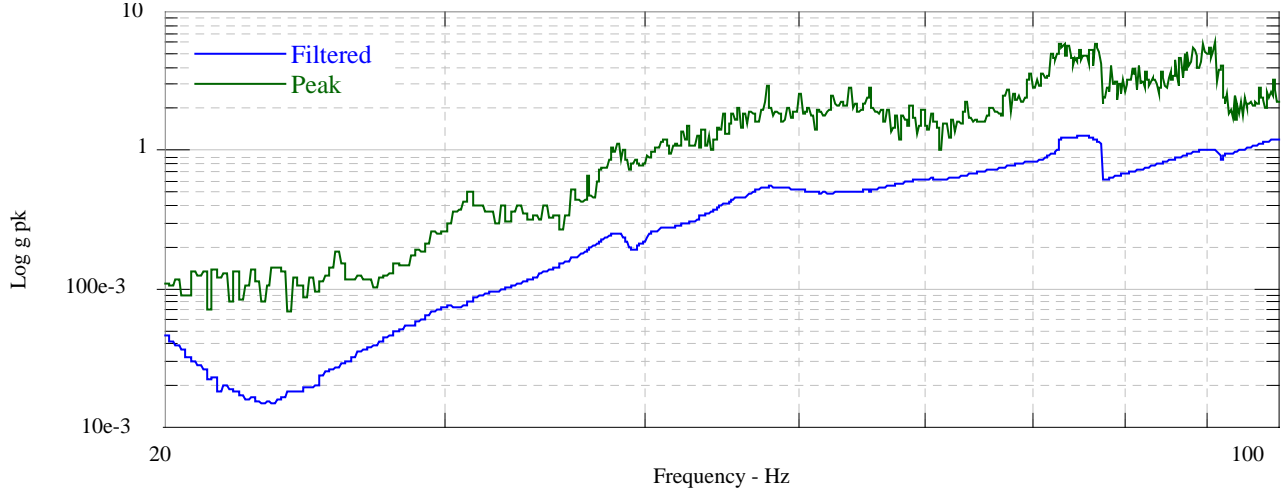
FPU.X Channel n° 14



FPU.Y Channel n° 15



FPU.Z Channel n° 16

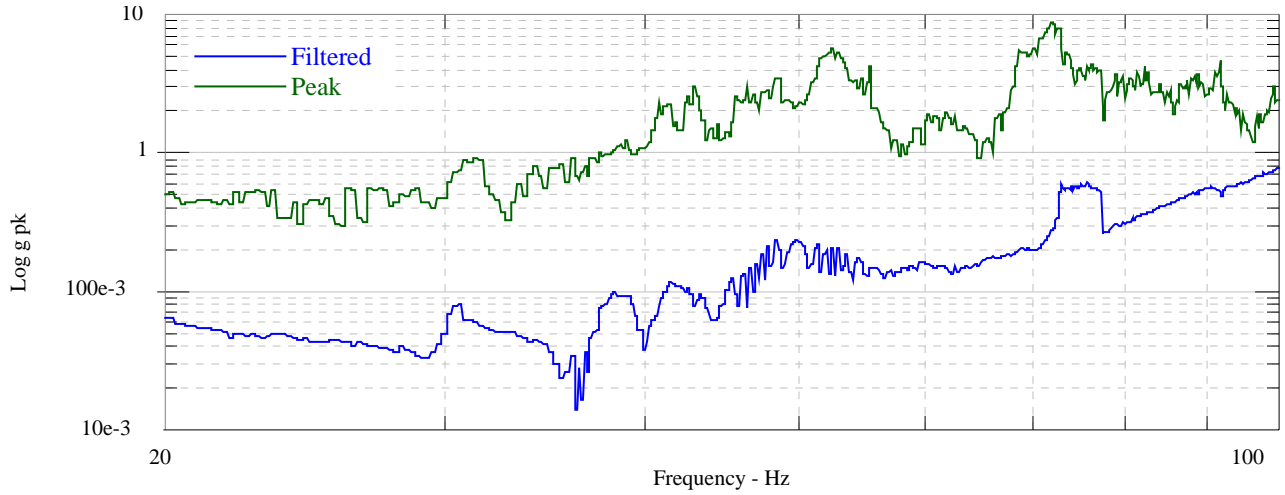


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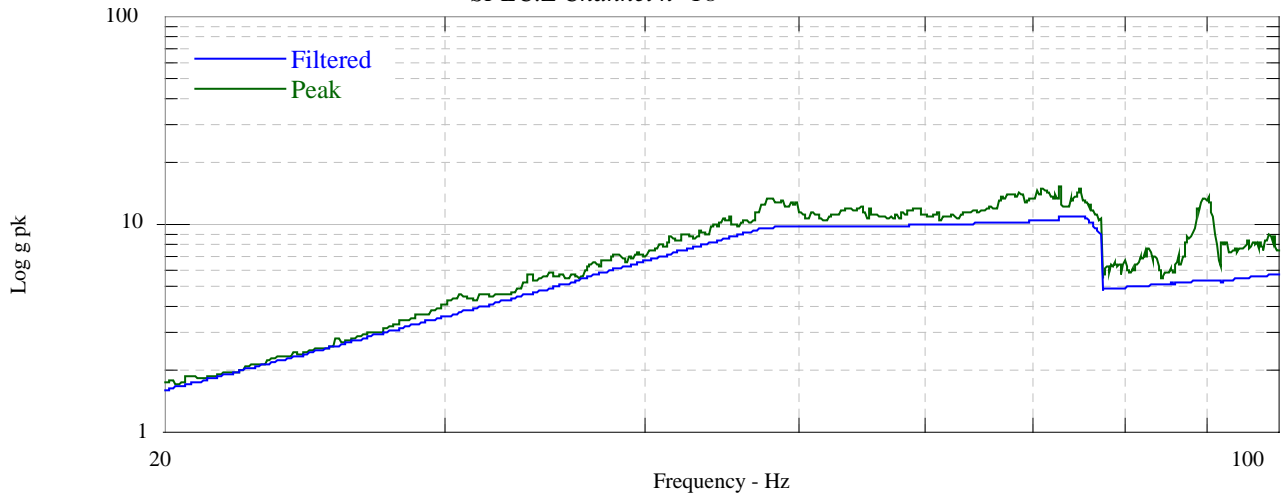
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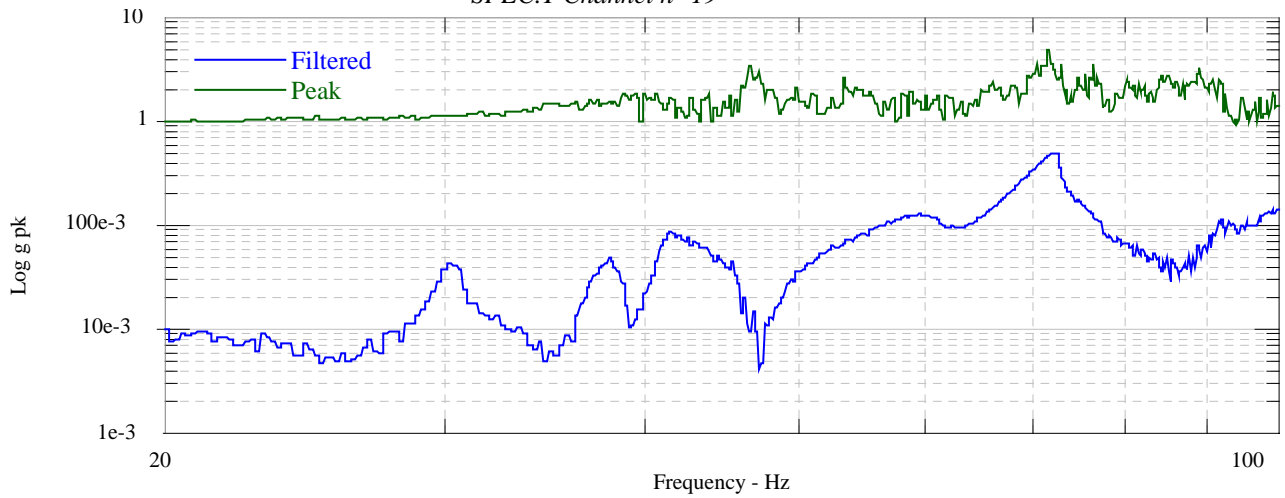
SPEC.X Channel n° 17



SPEC.Z Channel n° 18



SPEC.Y Channel n° 19

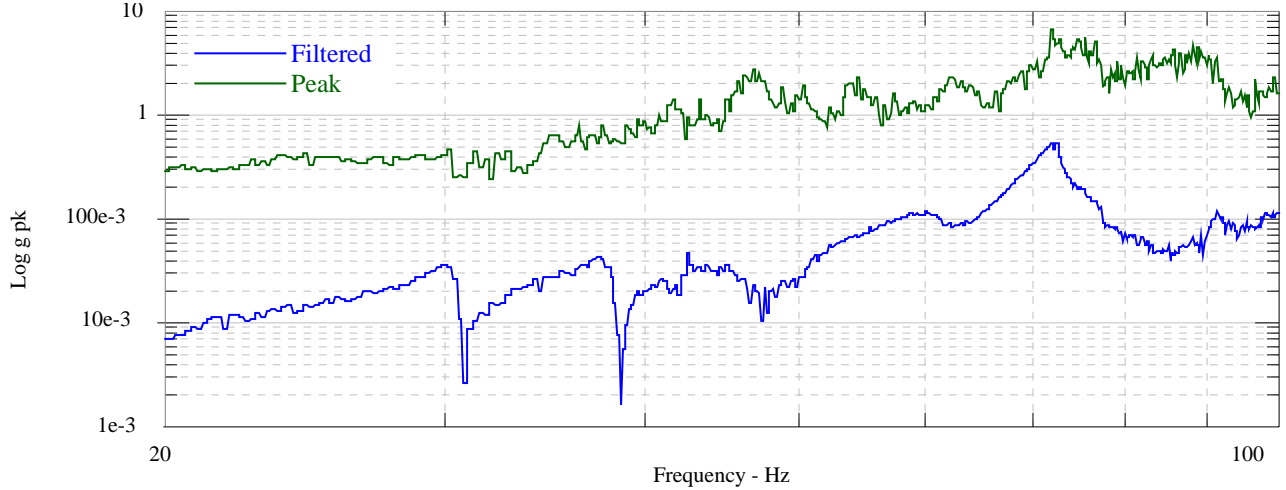


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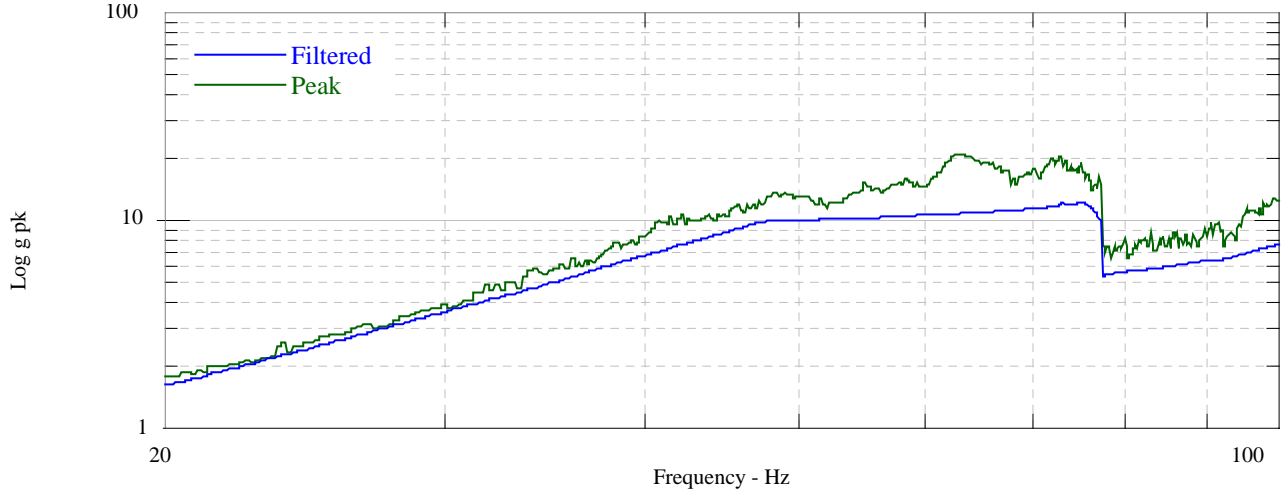
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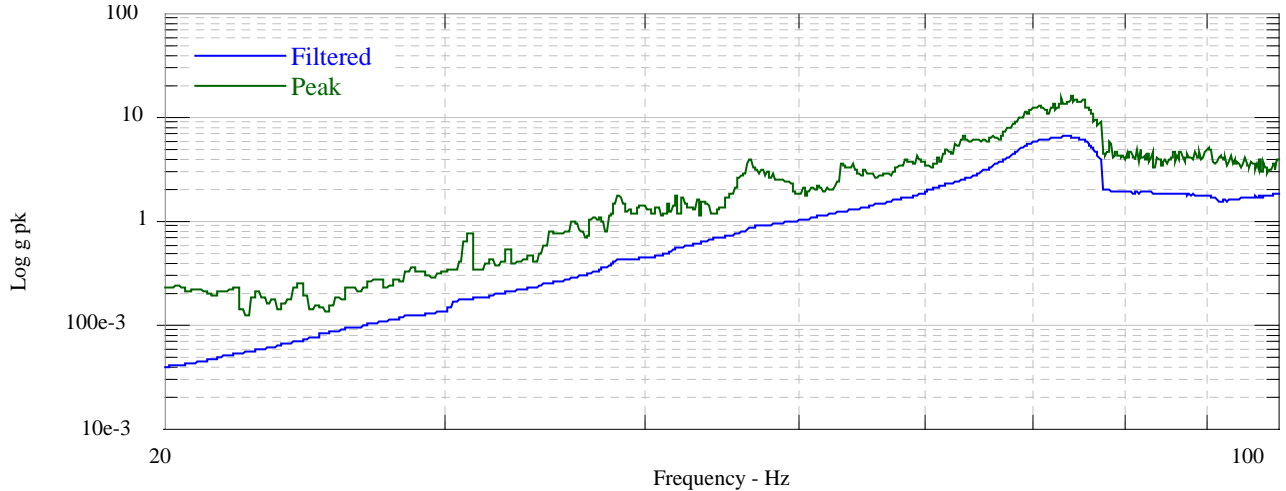
OB.Y Channel n° 20



SMECL.X Channel n° 21



CTIP.Y Channel n° 22

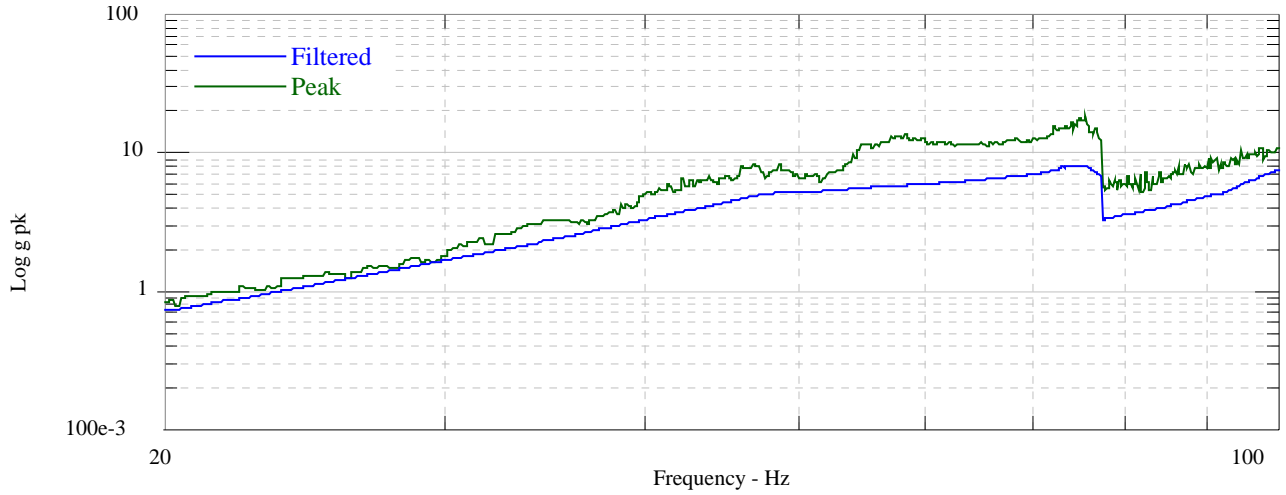


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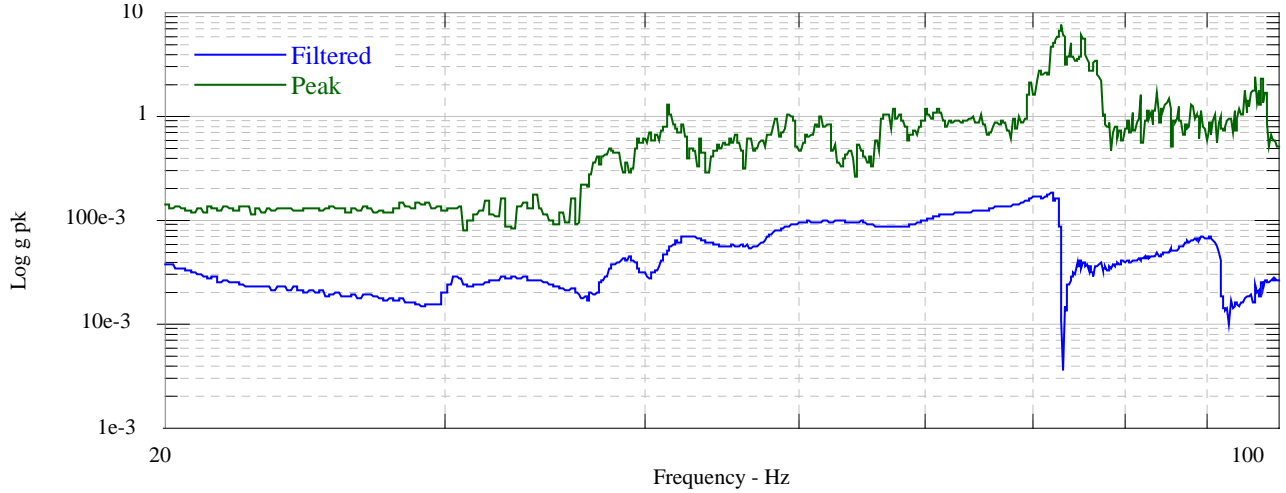
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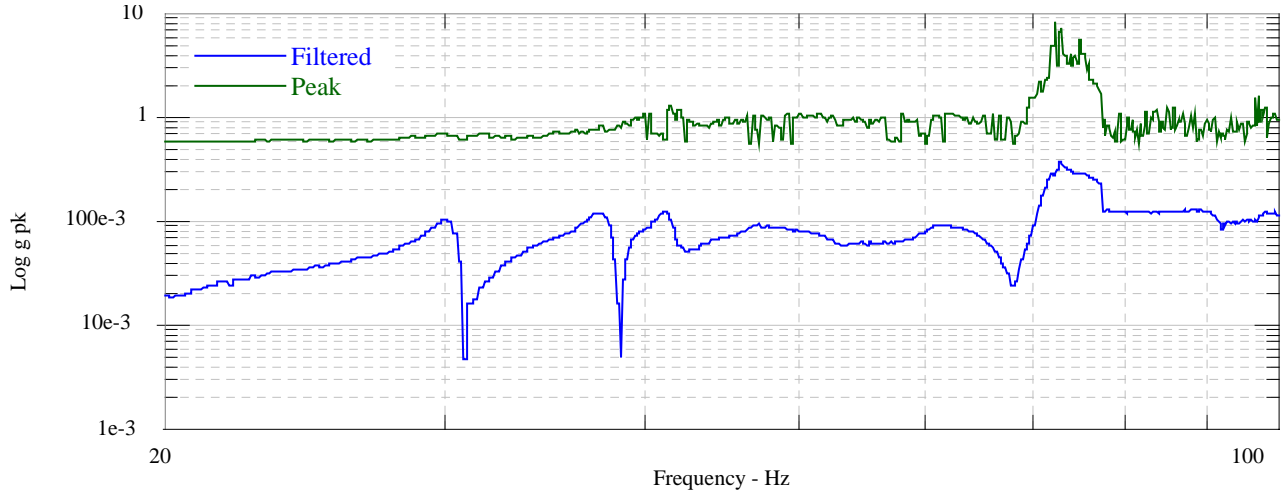
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CONE.Z Channel n° 24



CONE.Y Channel n° 25

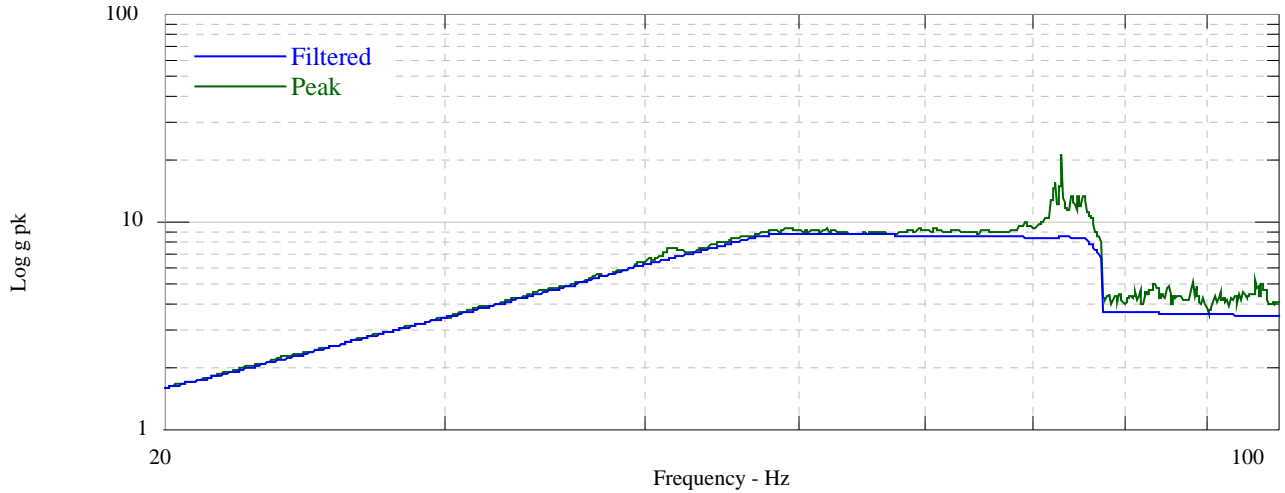


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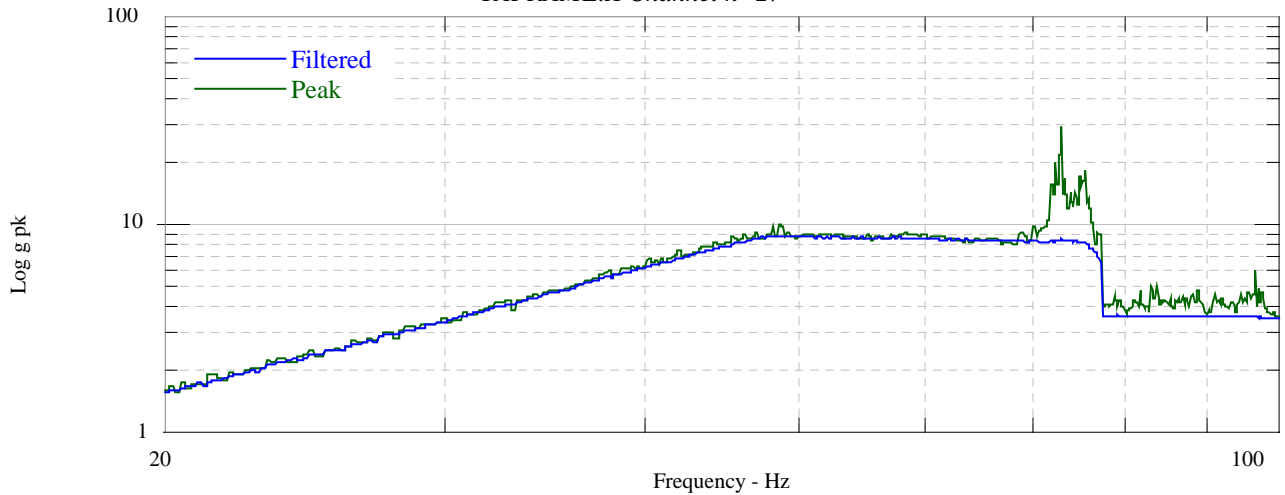
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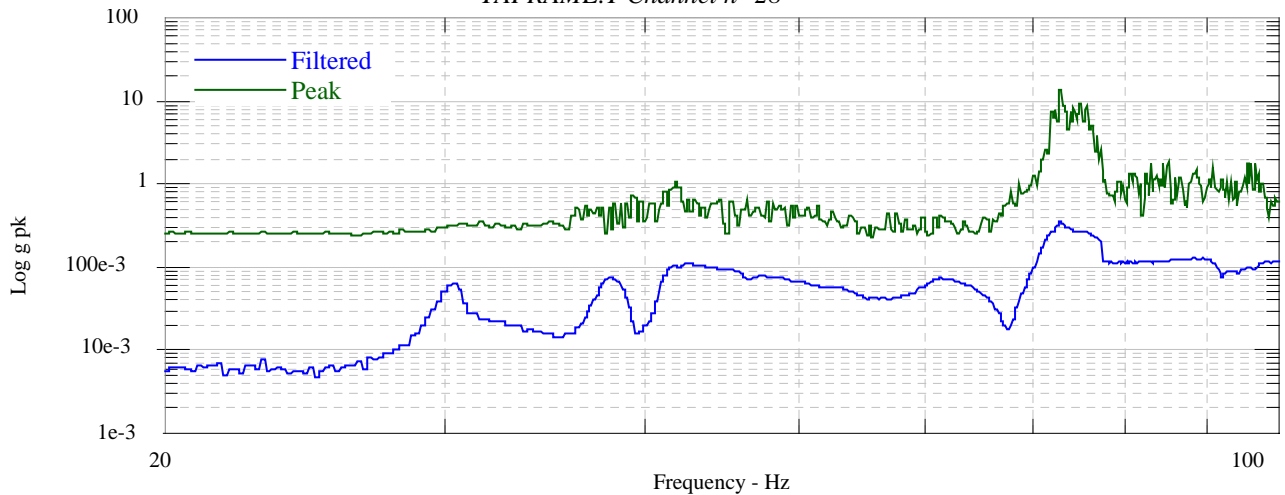
CONE.X Channel n° 26



-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28

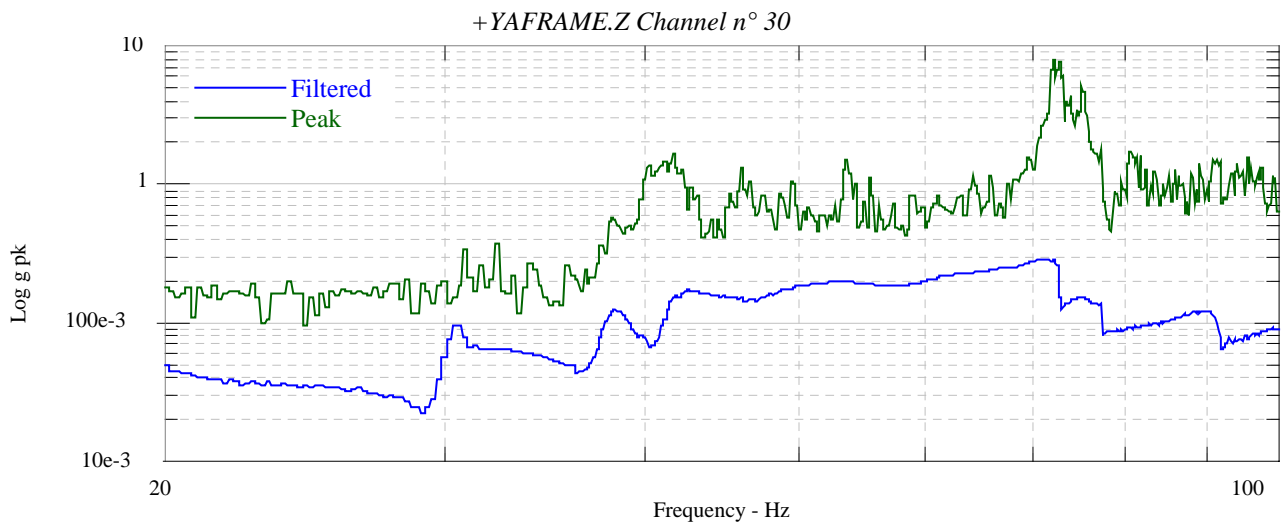
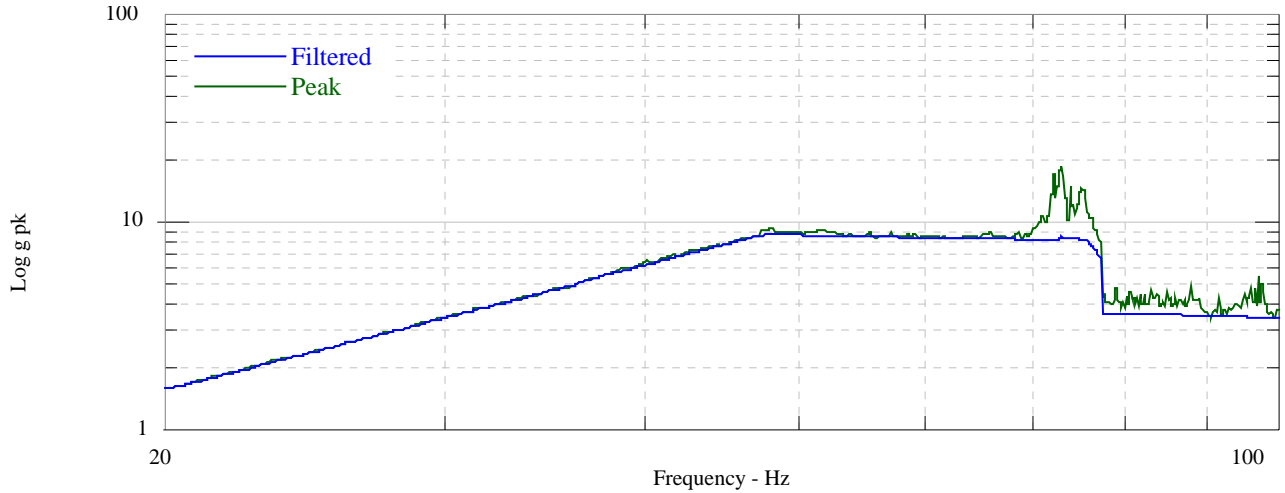


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+YAFRAME.X Channel n° 29



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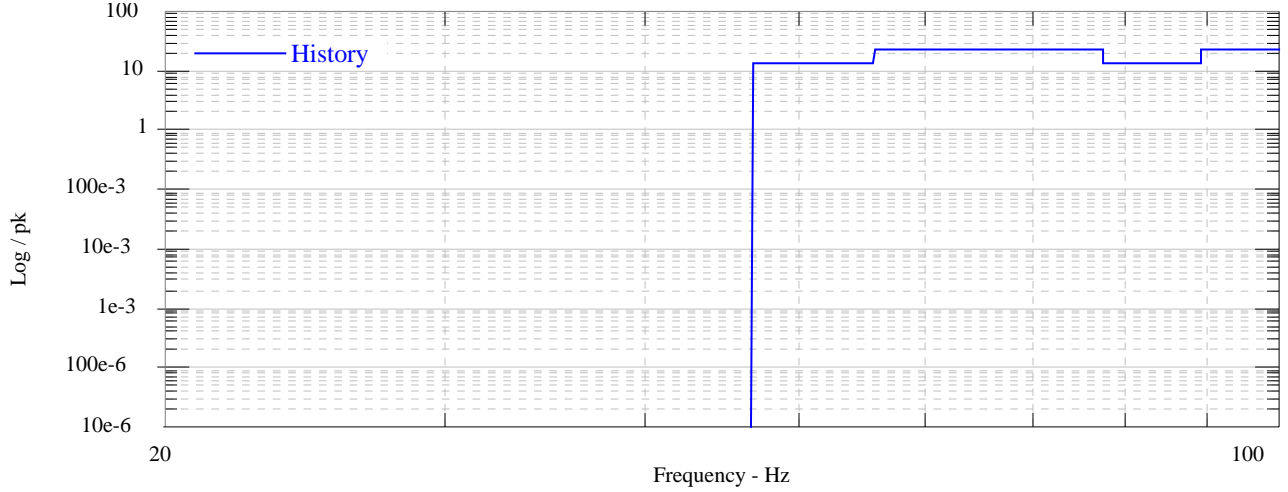
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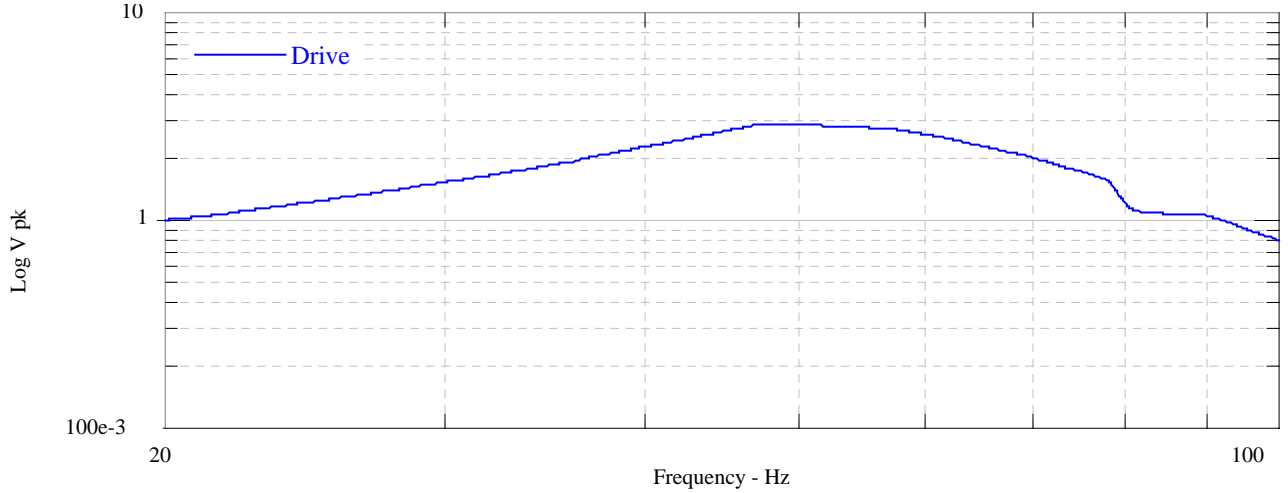
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Date : 1-May-04
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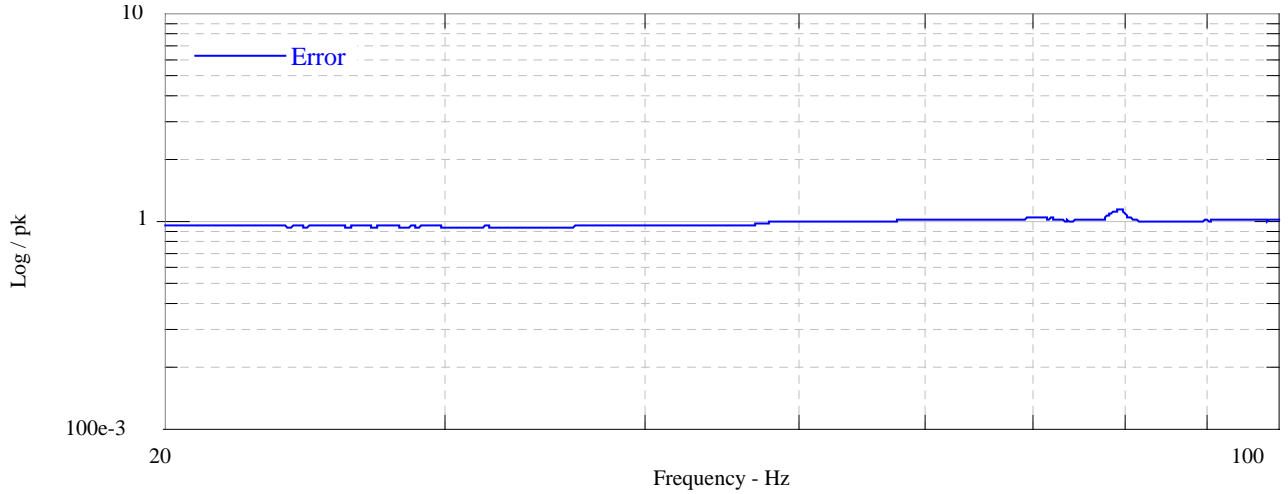
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

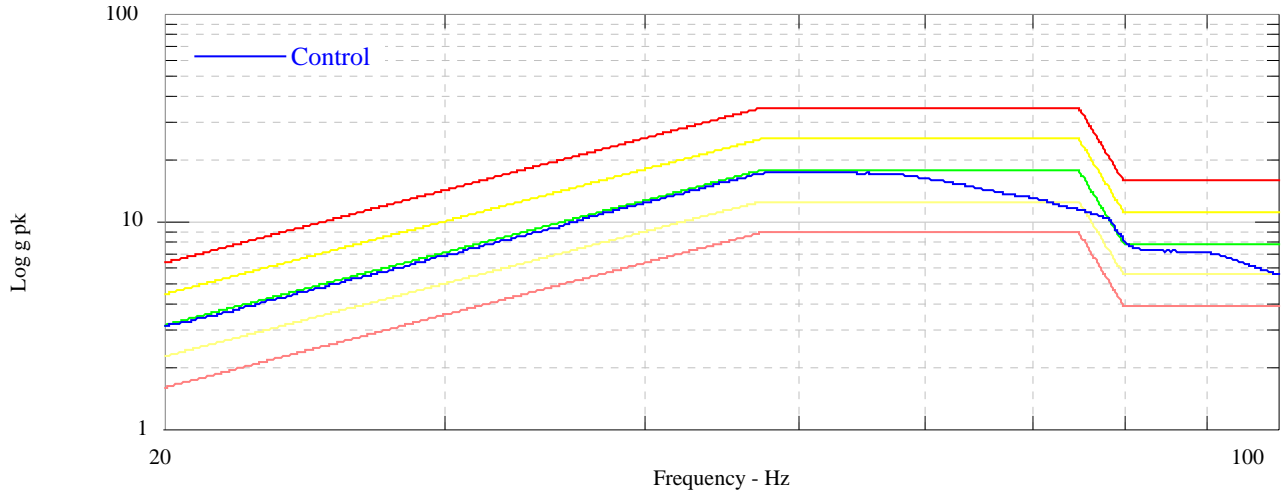


VIBRATION TEST REPORT
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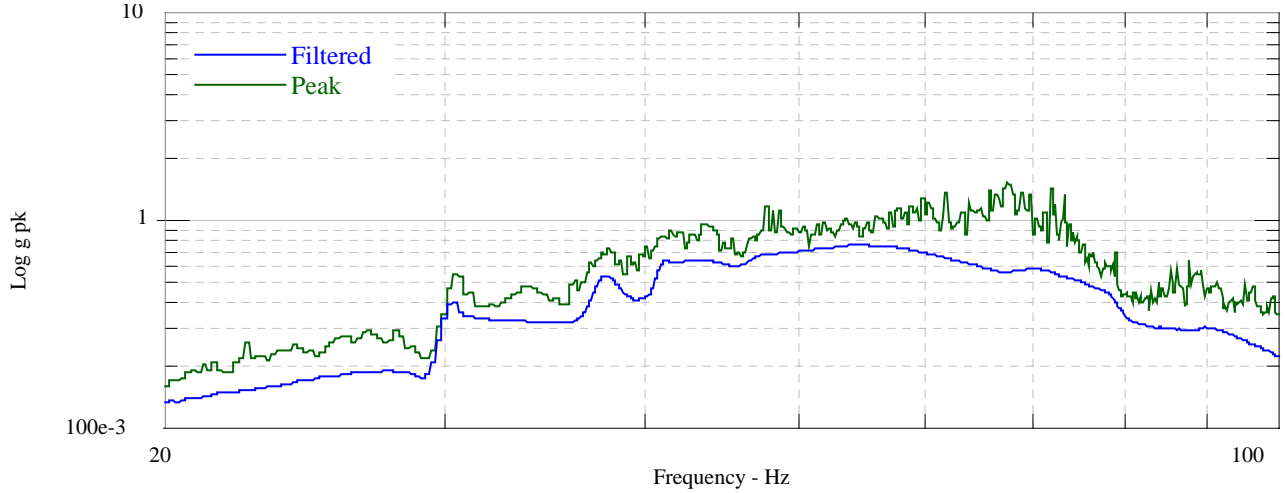
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Date : 1-May-04
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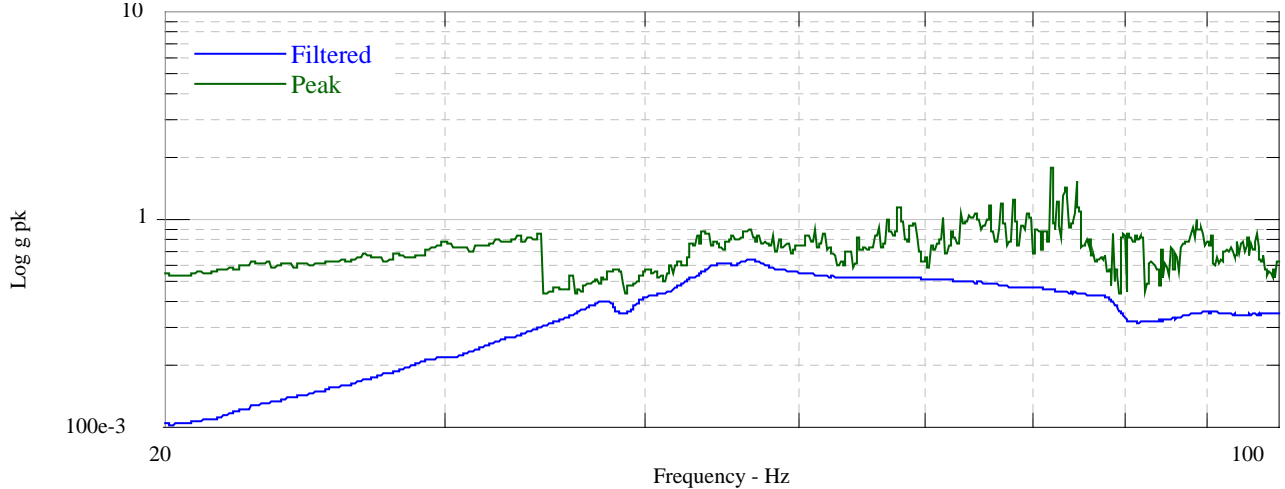
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

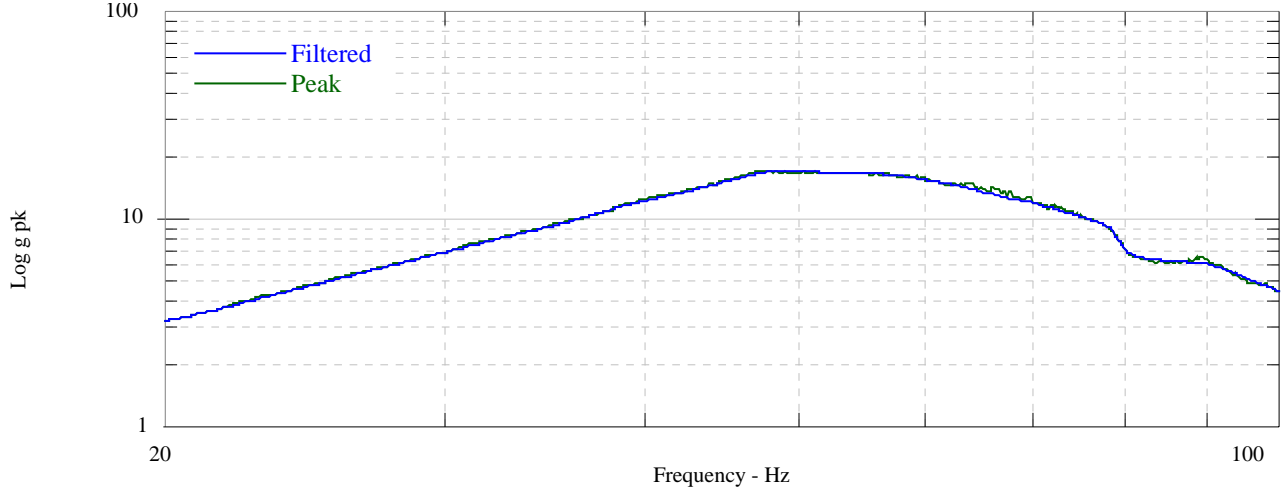


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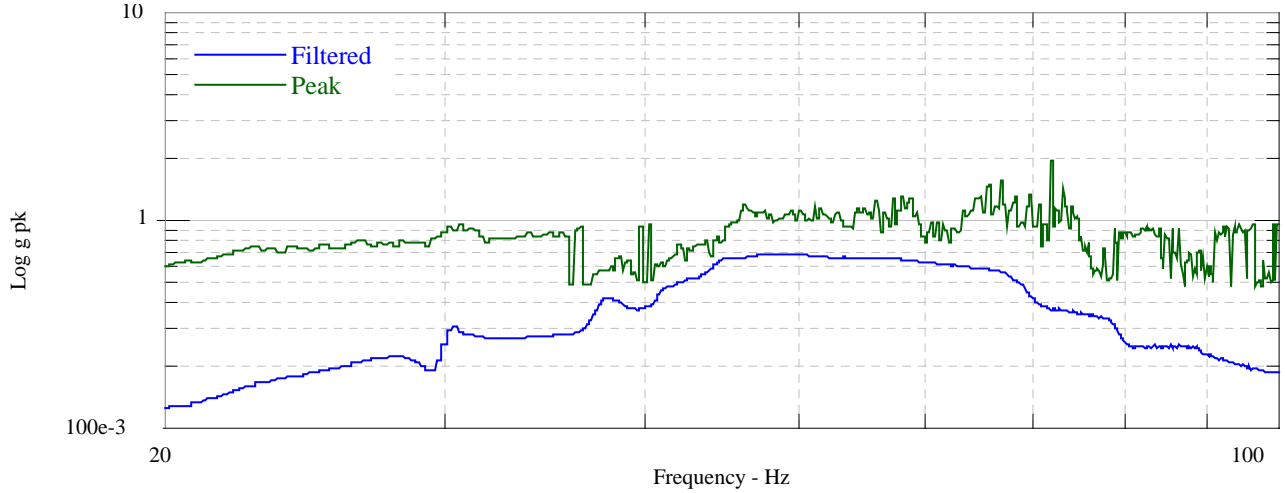
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Date : 1-May-04
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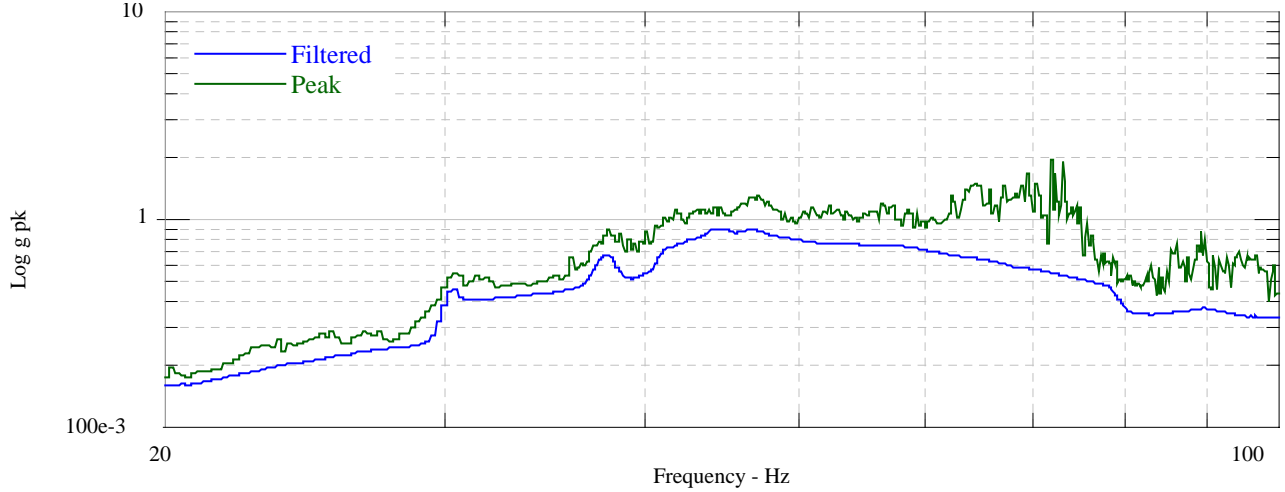
SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

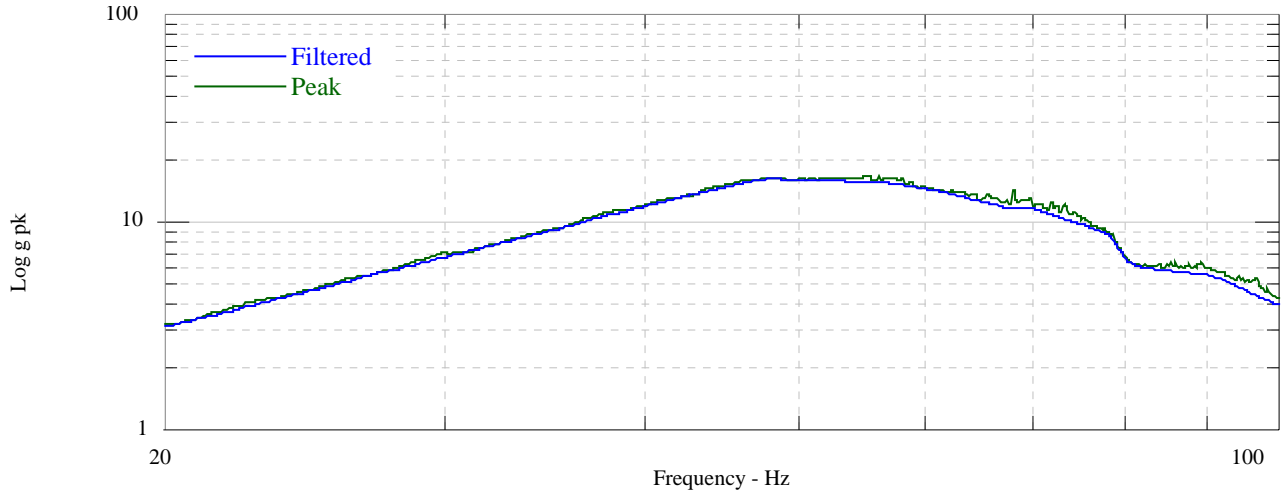


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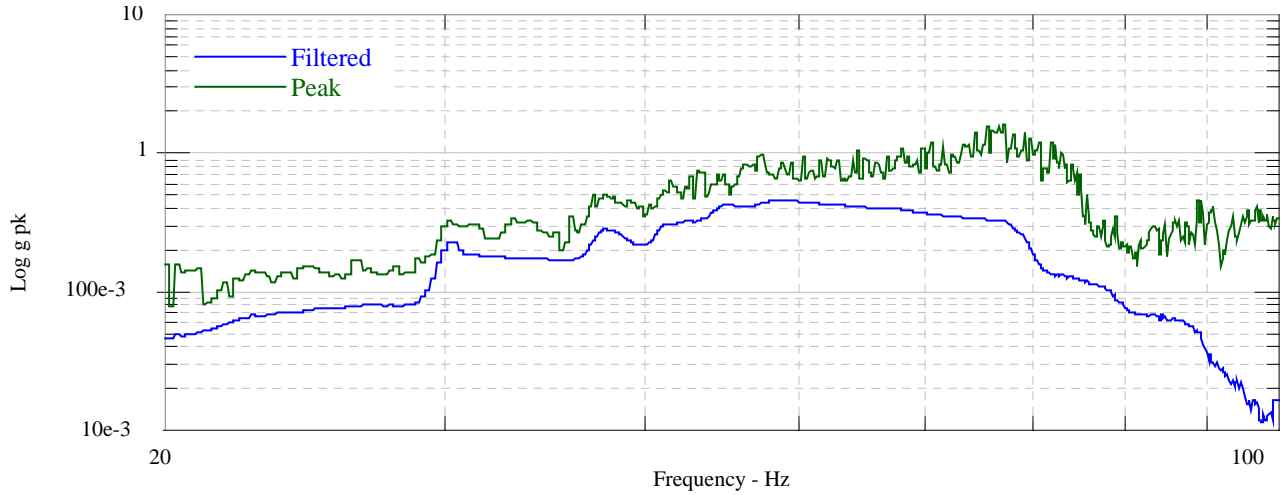
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Date : 1-May-04
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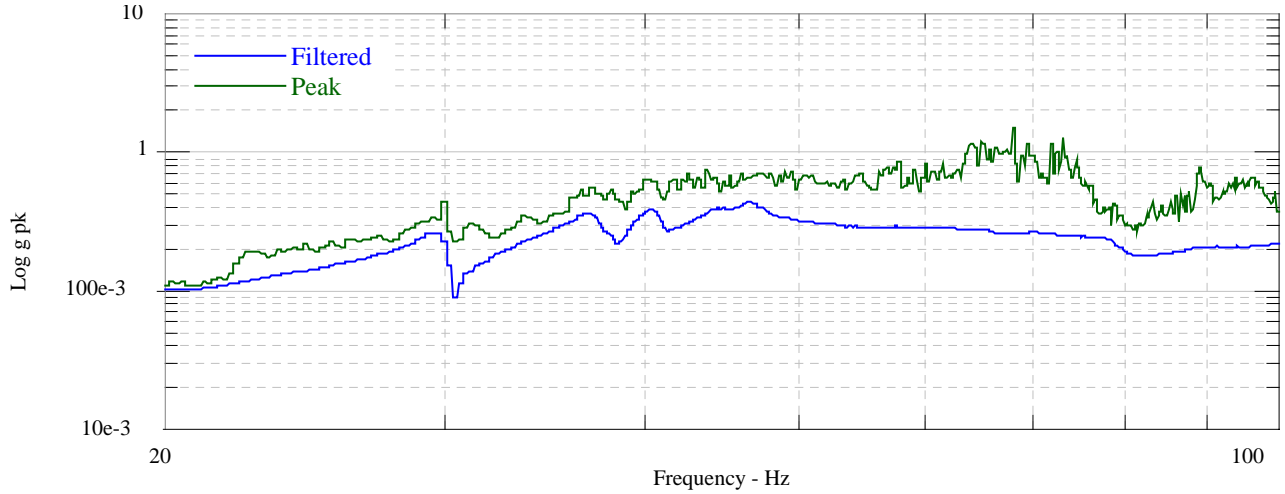
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

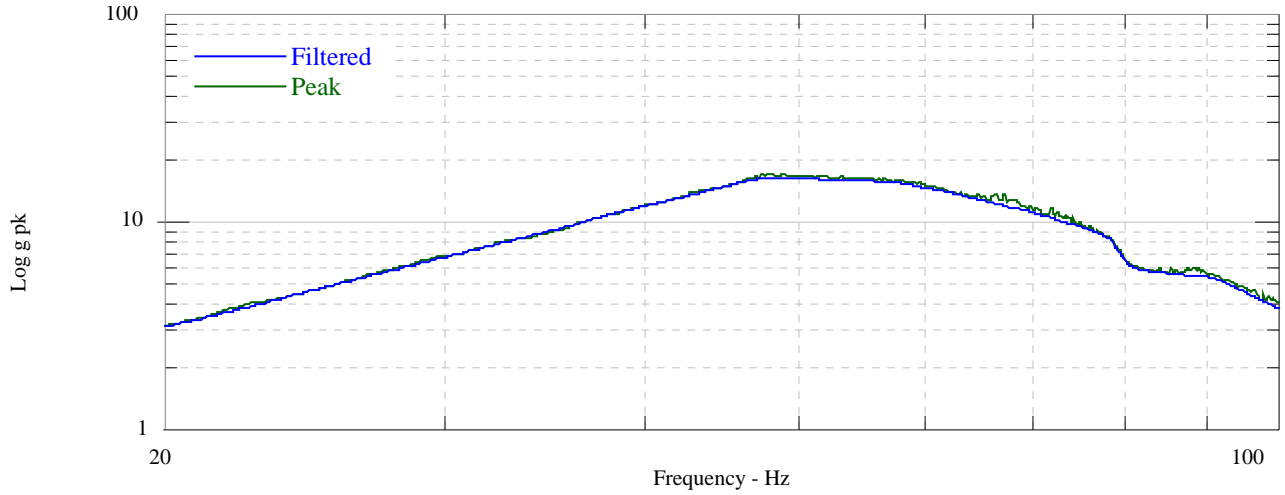


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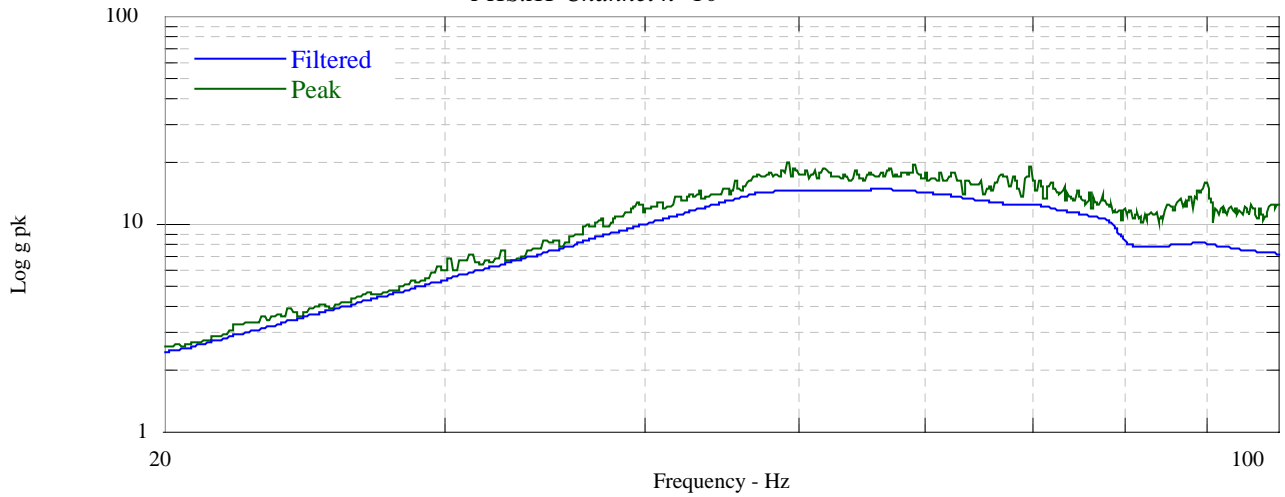
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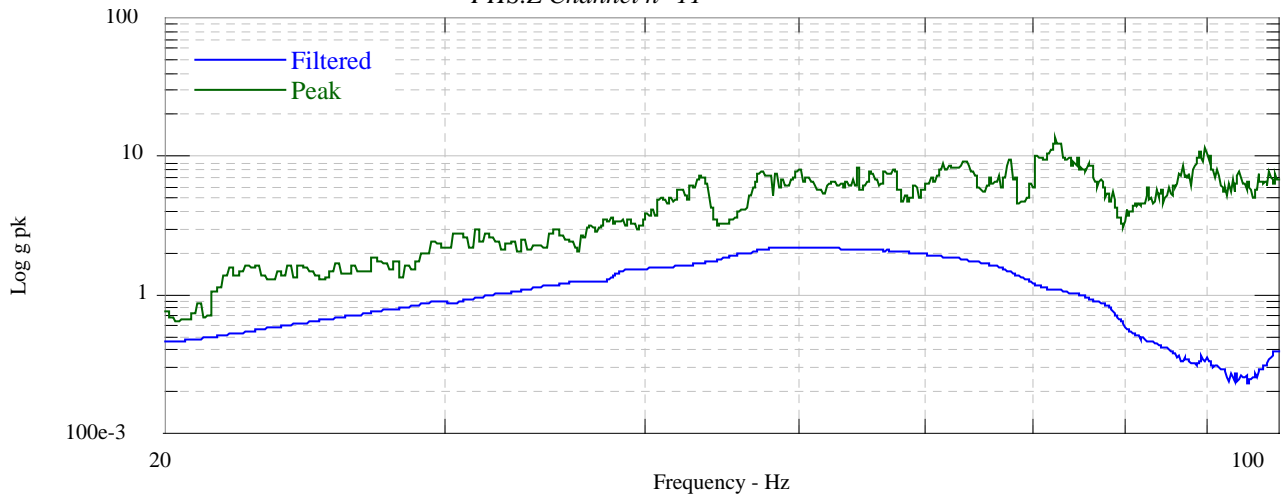
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

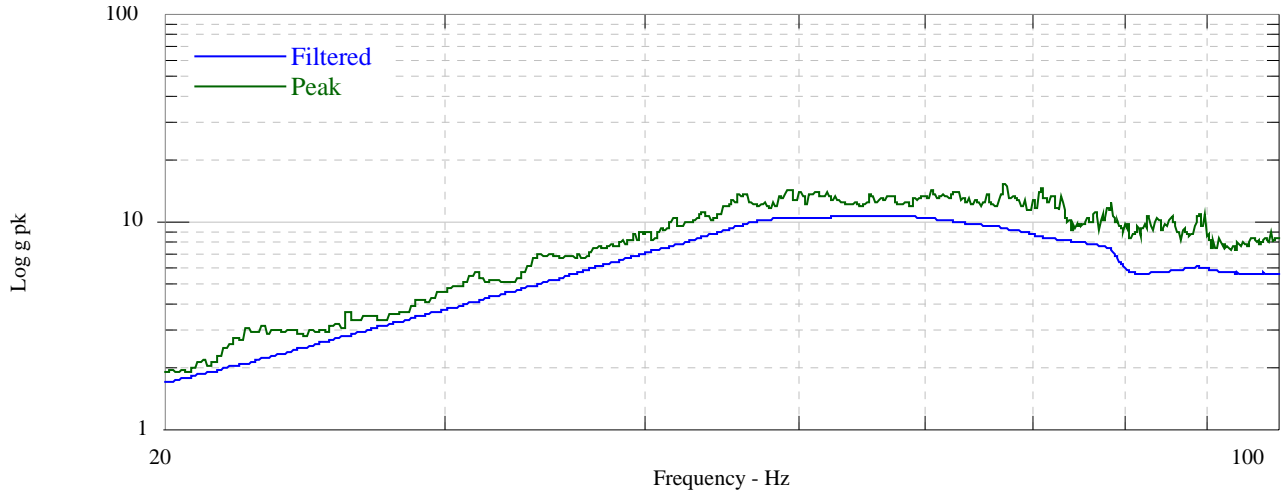


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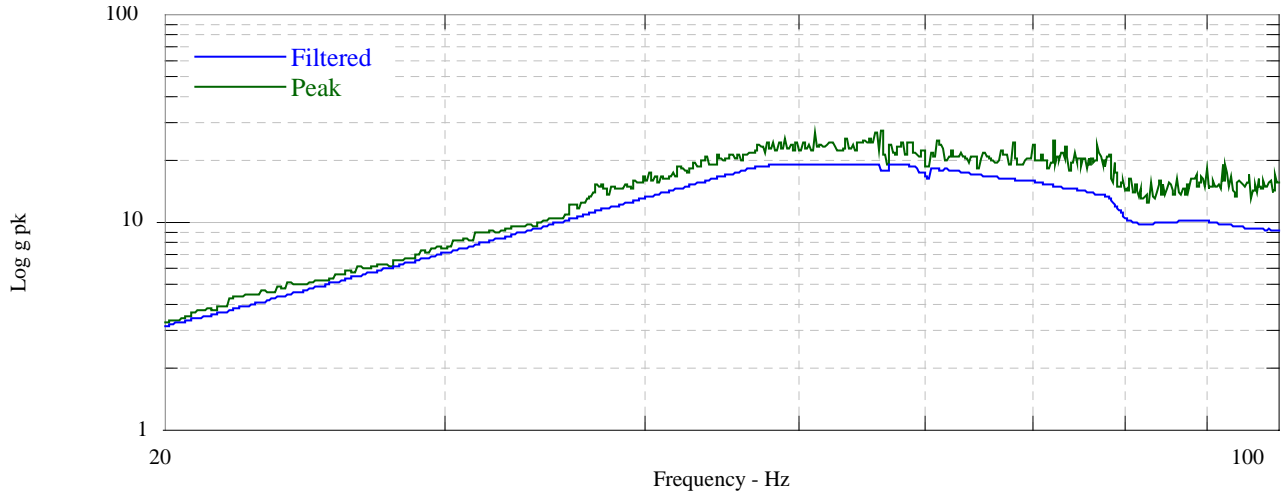
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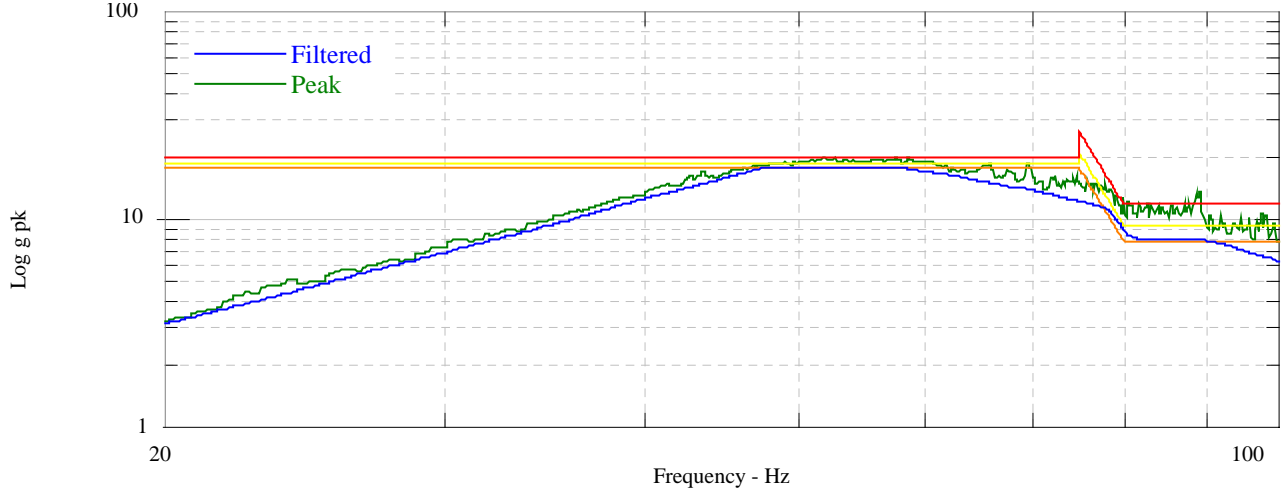
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COOL.X Channel n° 13



FPU.X Channel n° 14

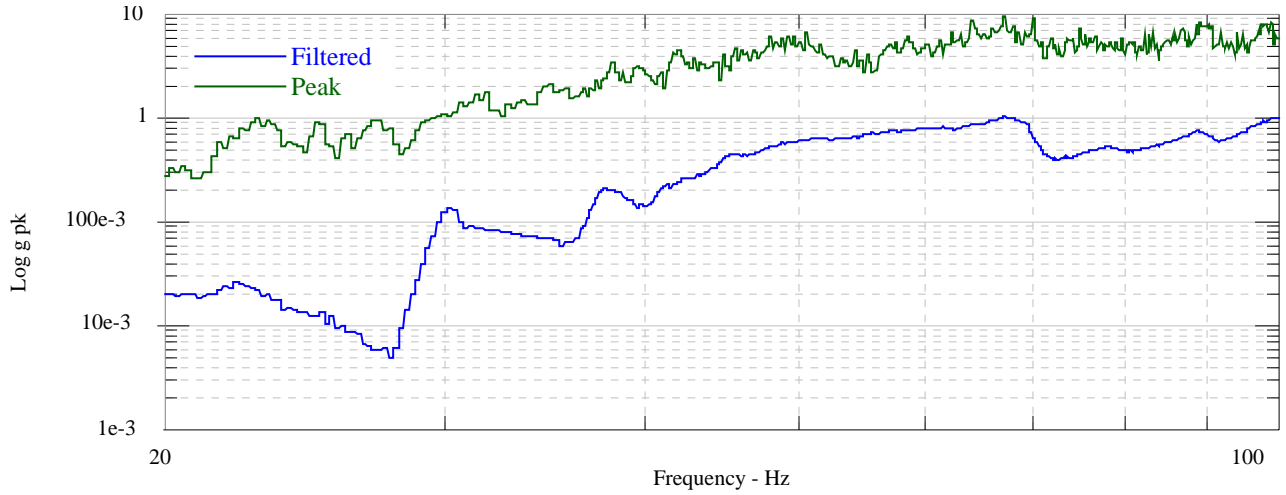


VIBRATION TEST REPORT
SPIRE QM

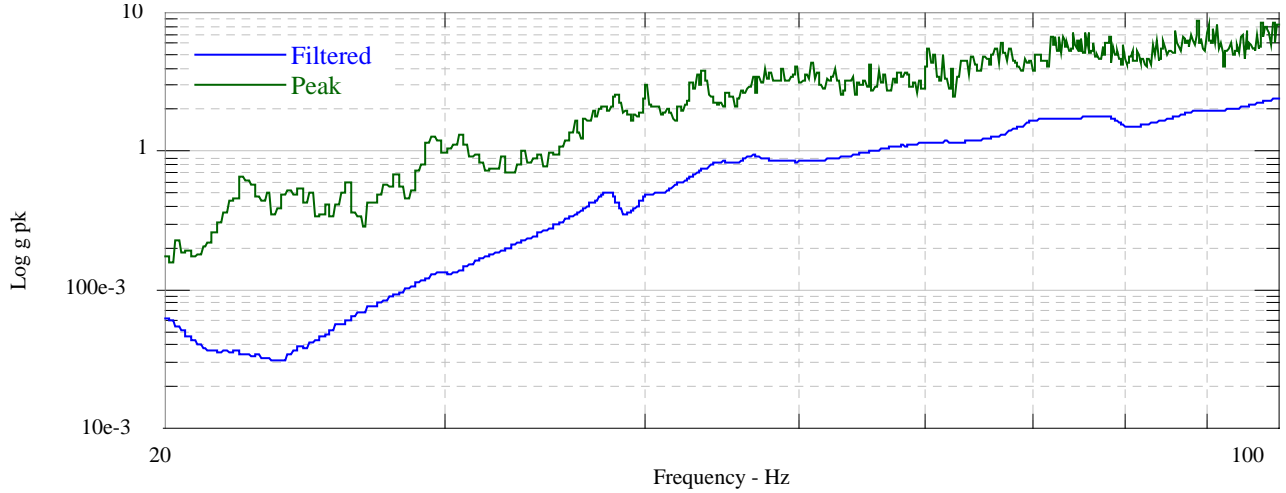
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Version : 01
Révision : 00
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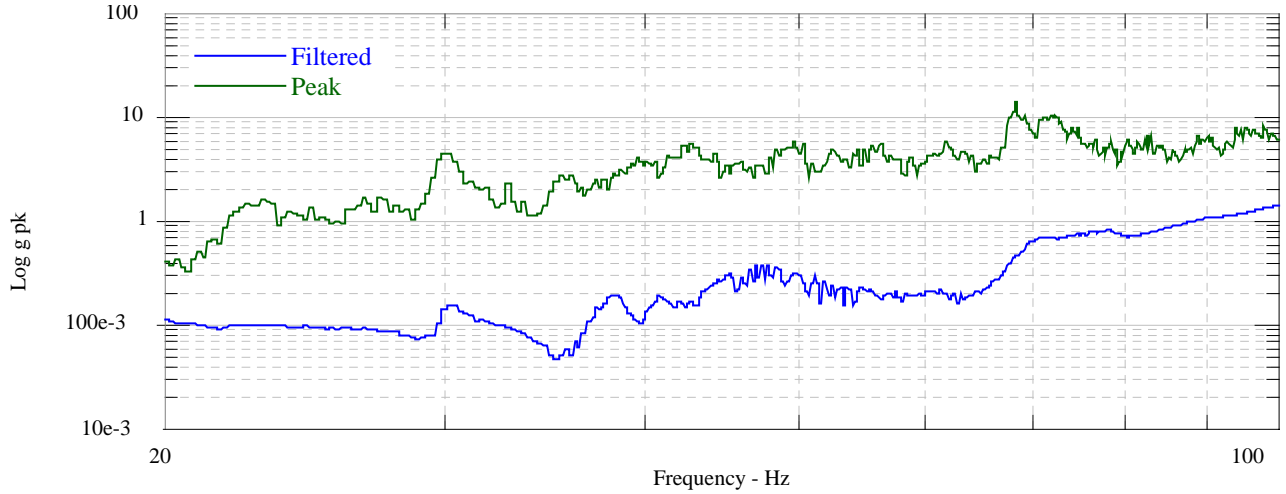
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FPU.Z Channel n° 16



SPEC.X Channel n° 17

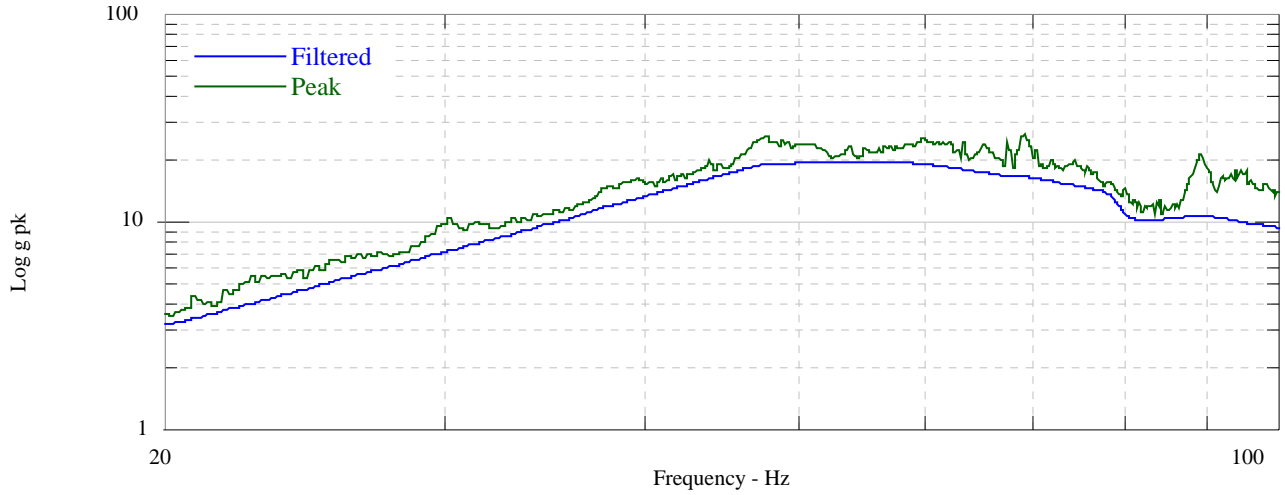


VIBRATION TEST REPORT
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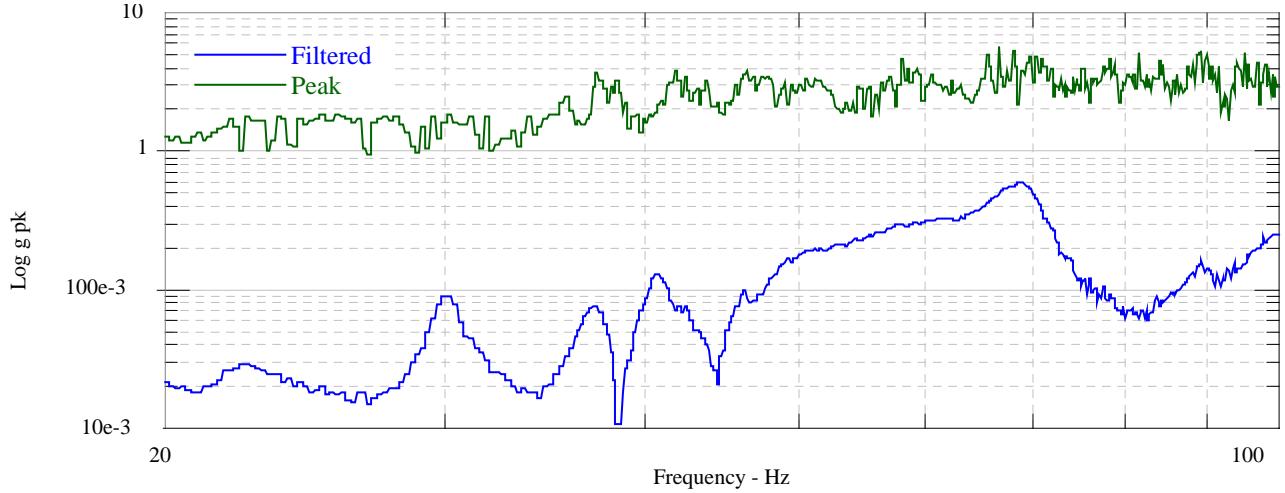
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Révision : 00
Date : 1-May-04
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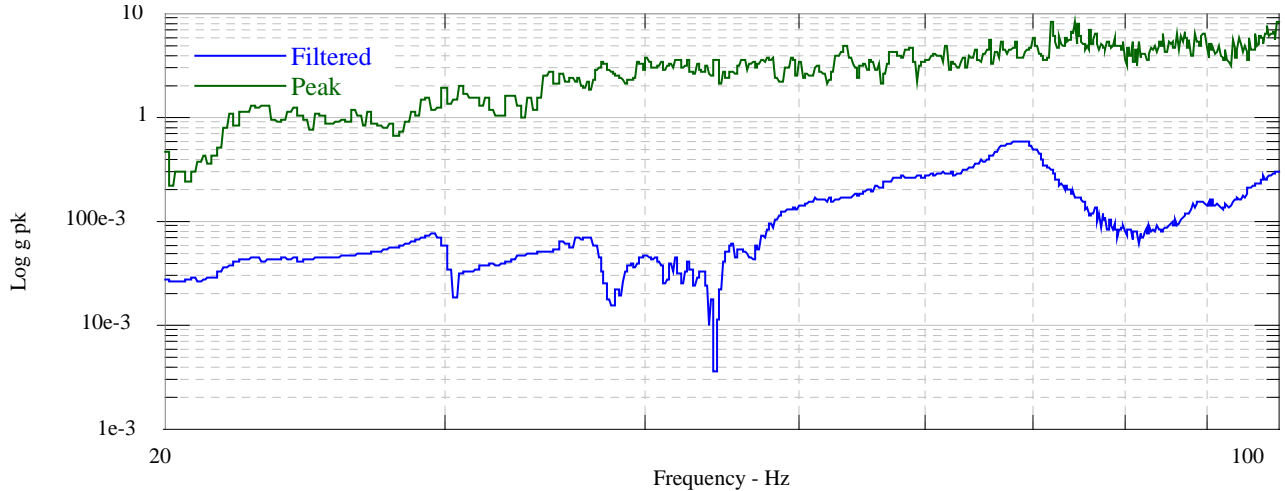
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

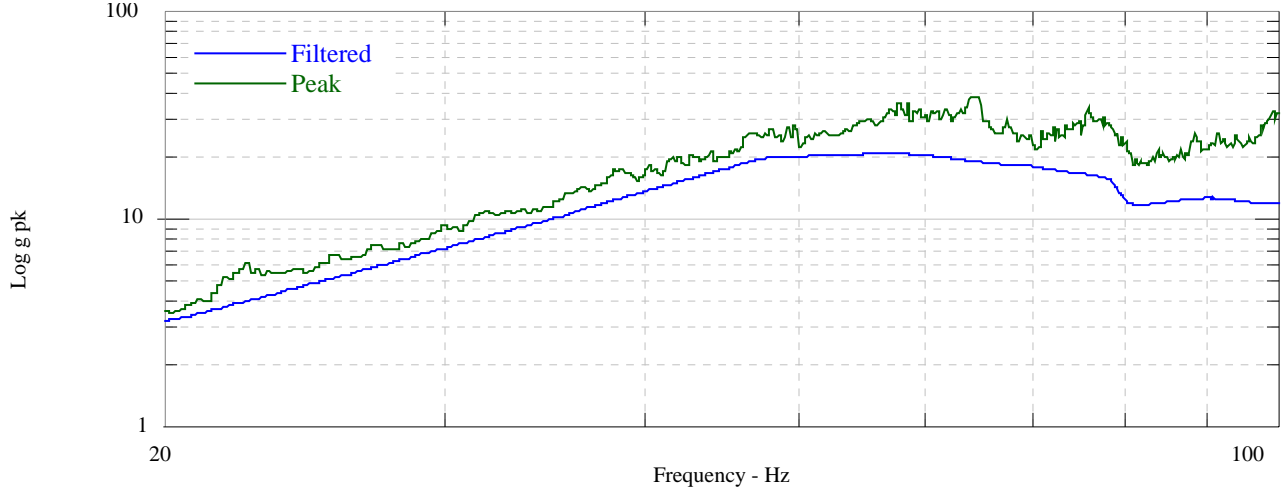


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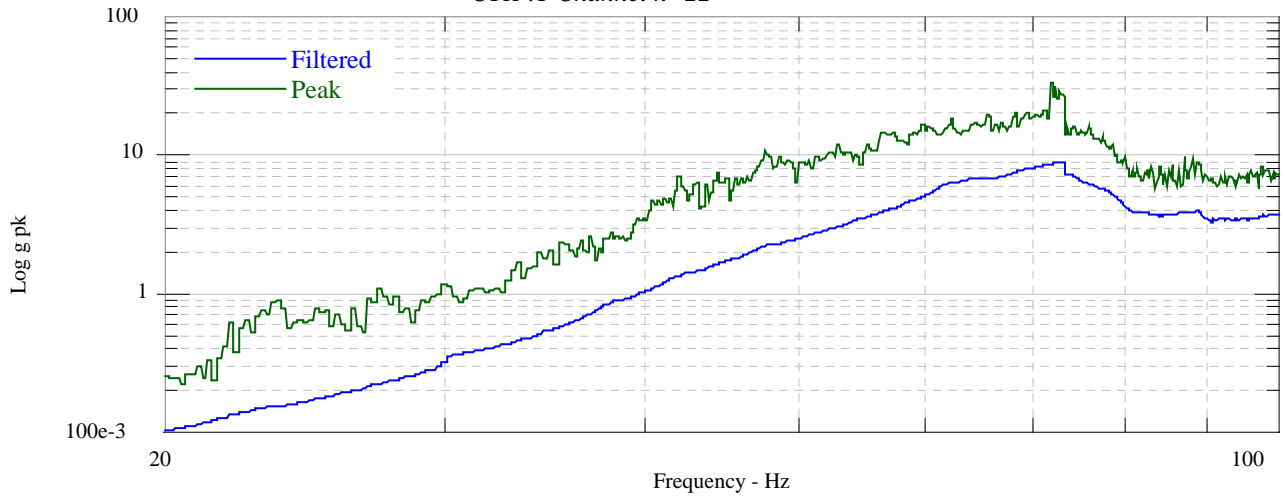
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Version : 01
Révision : 00
Date : 1-May-04
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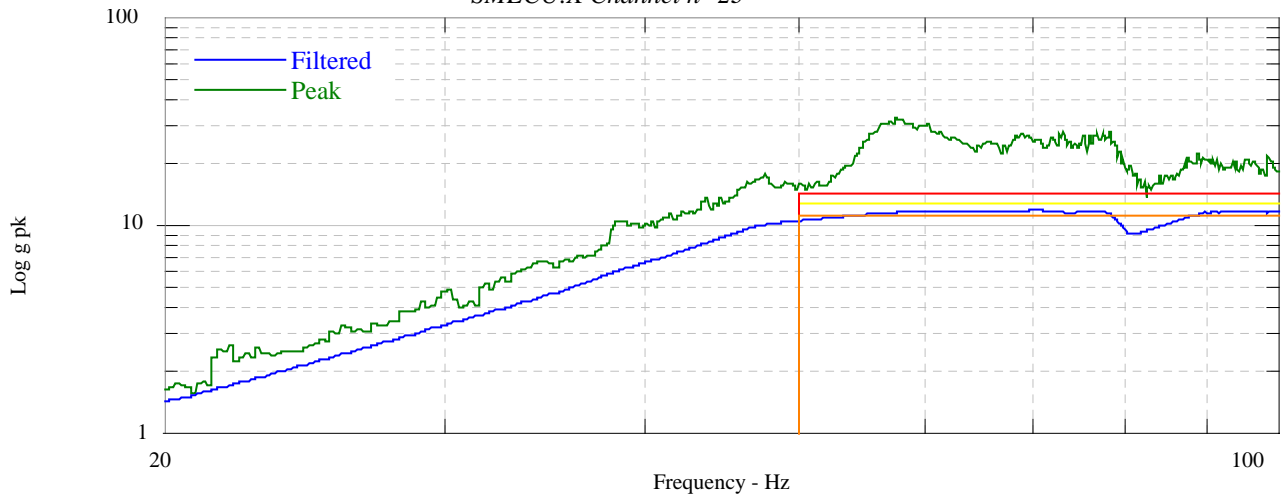
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CTIP.Y Channel n° 22



SMECU.X Channel n° 23

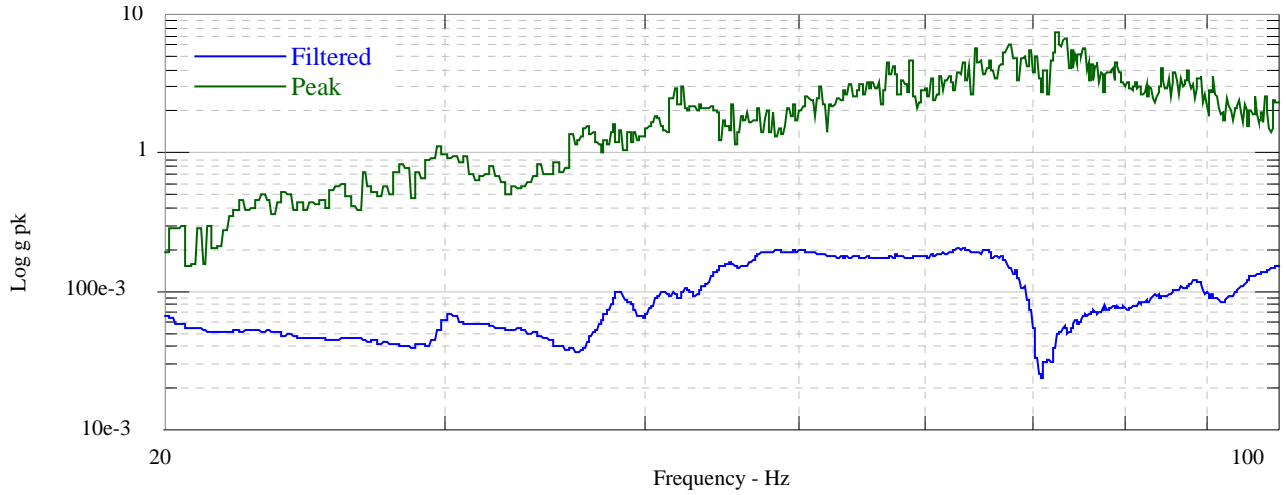


VIBRATION TEST REPORT
SPIRE QM

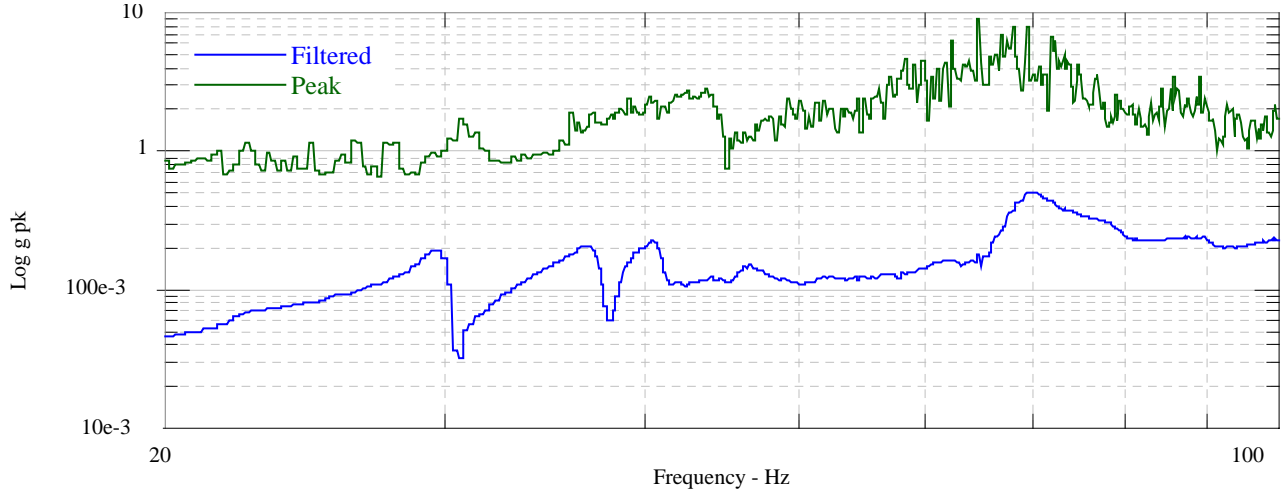
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Version : 01
Révision : 00
Date : 1-May-04
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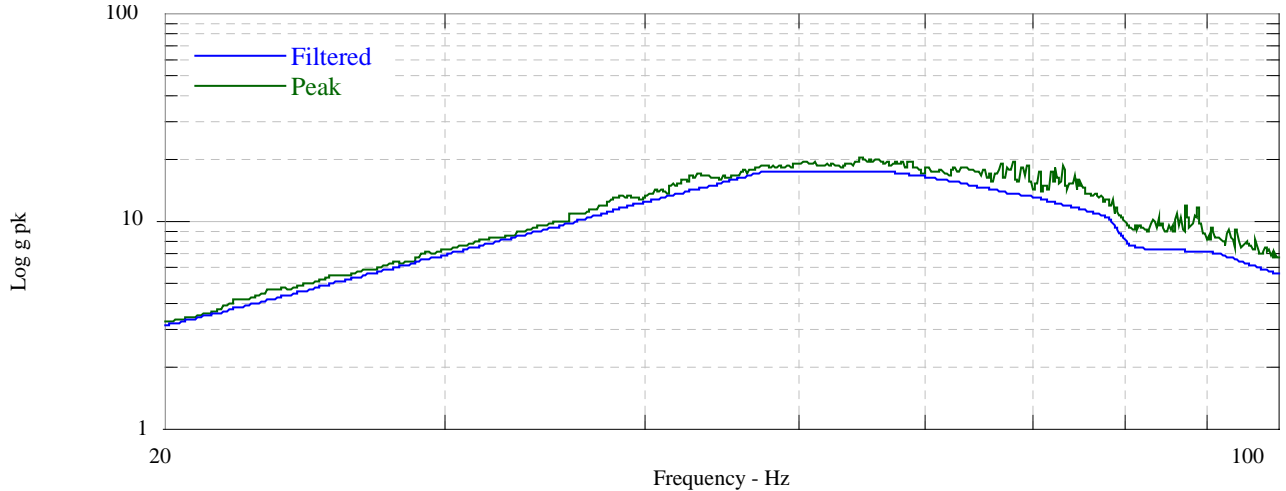
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

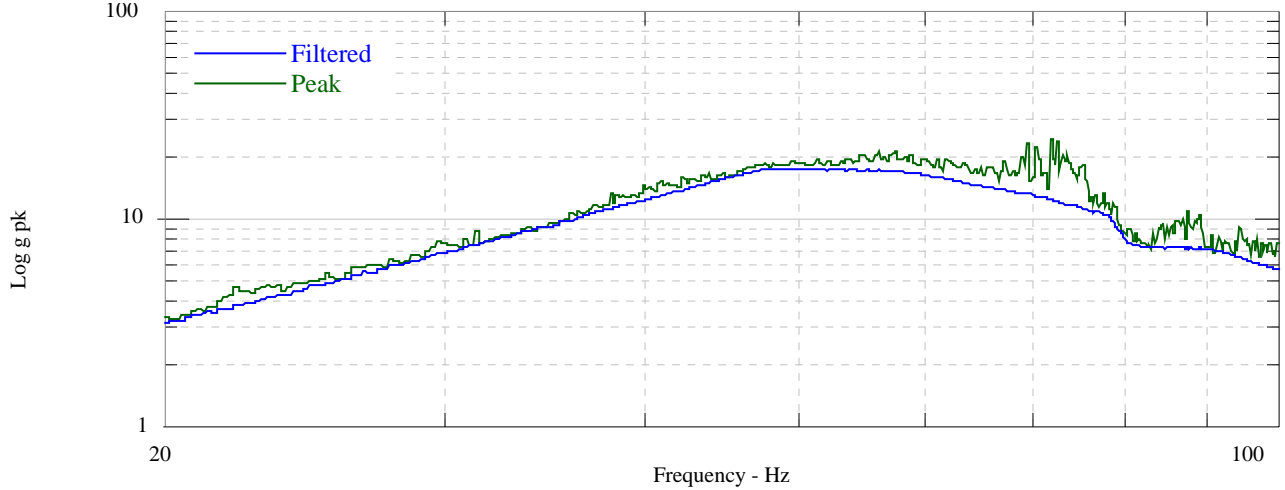


VIBRATION TEST REPORT
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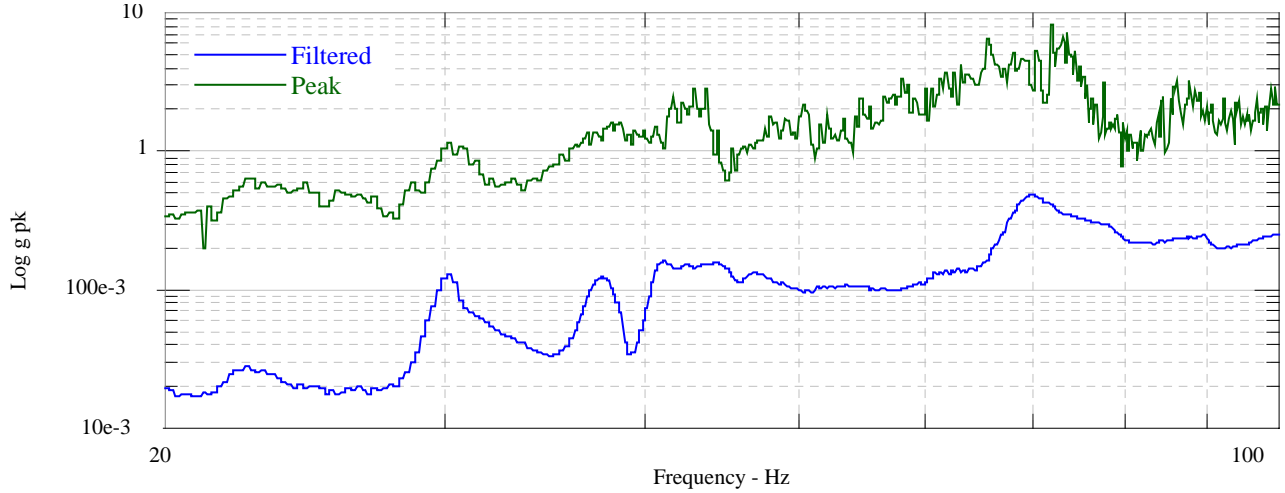
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Révision : 00
Date : 1-May-04
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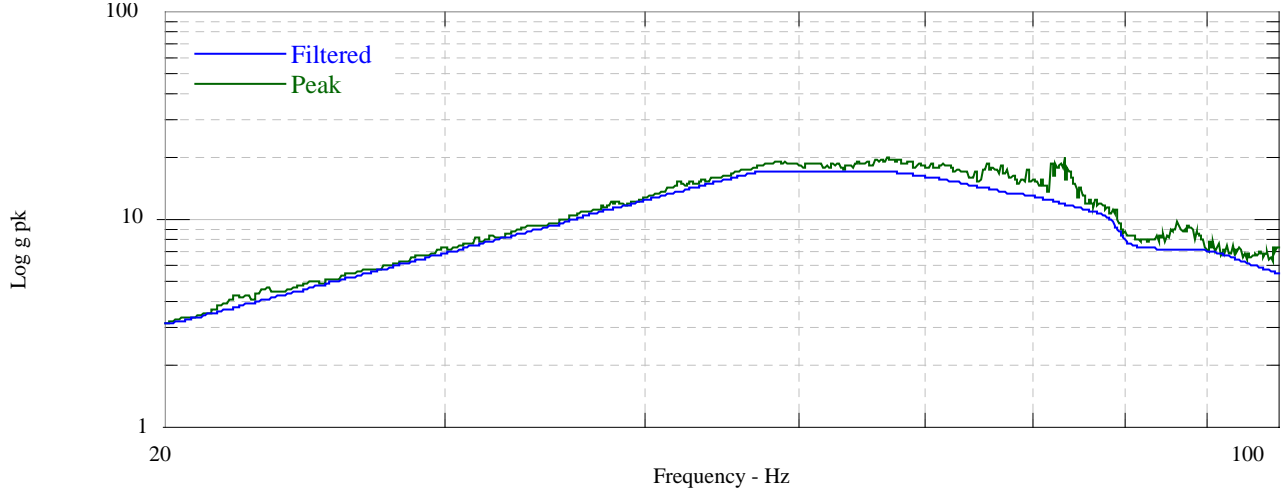
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28

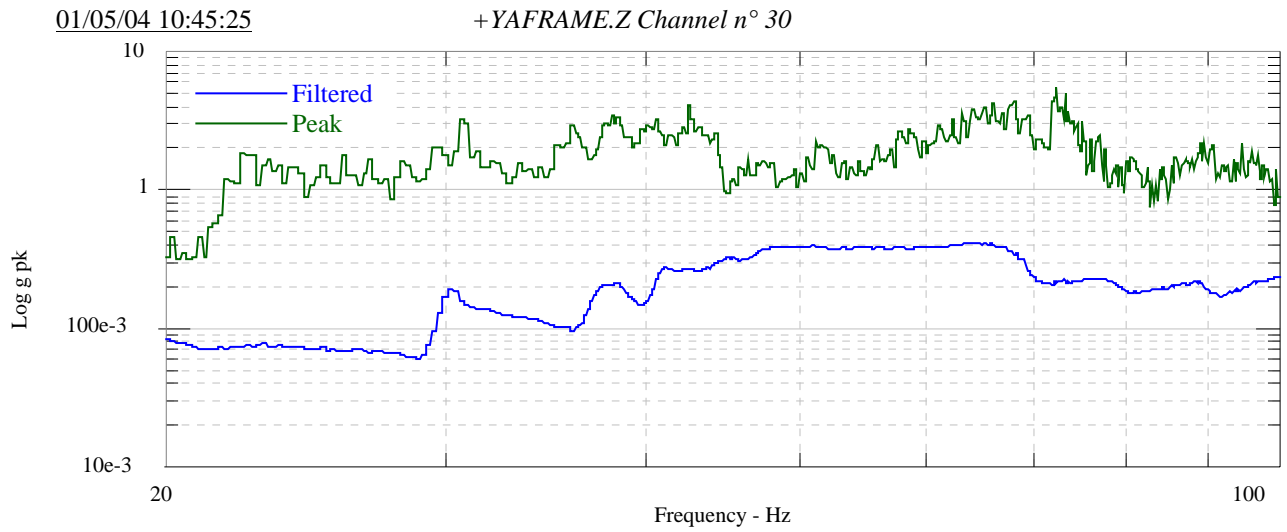


+YAFRAME.X Channel n° 29



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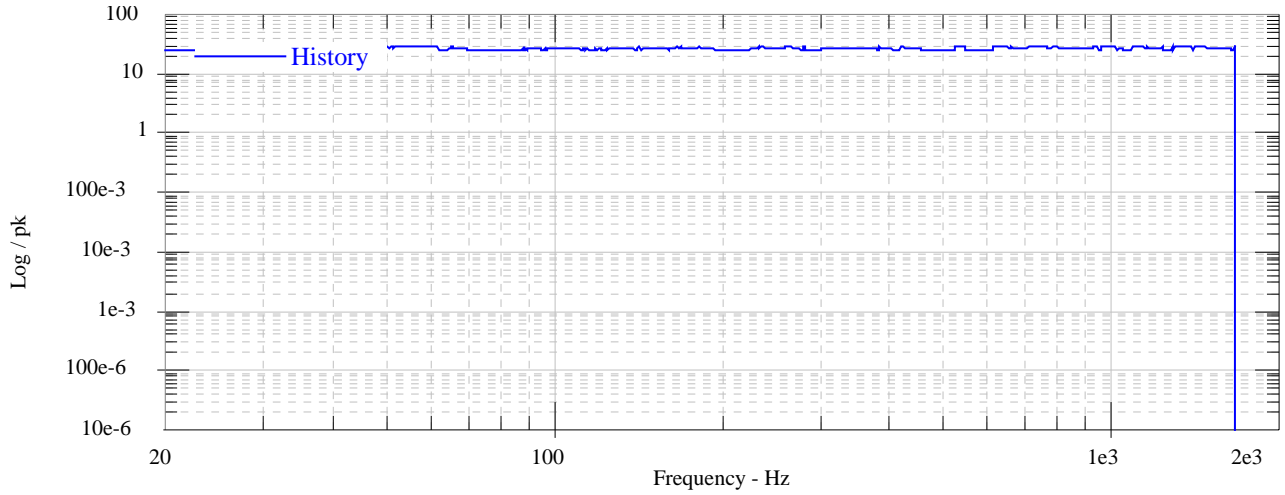
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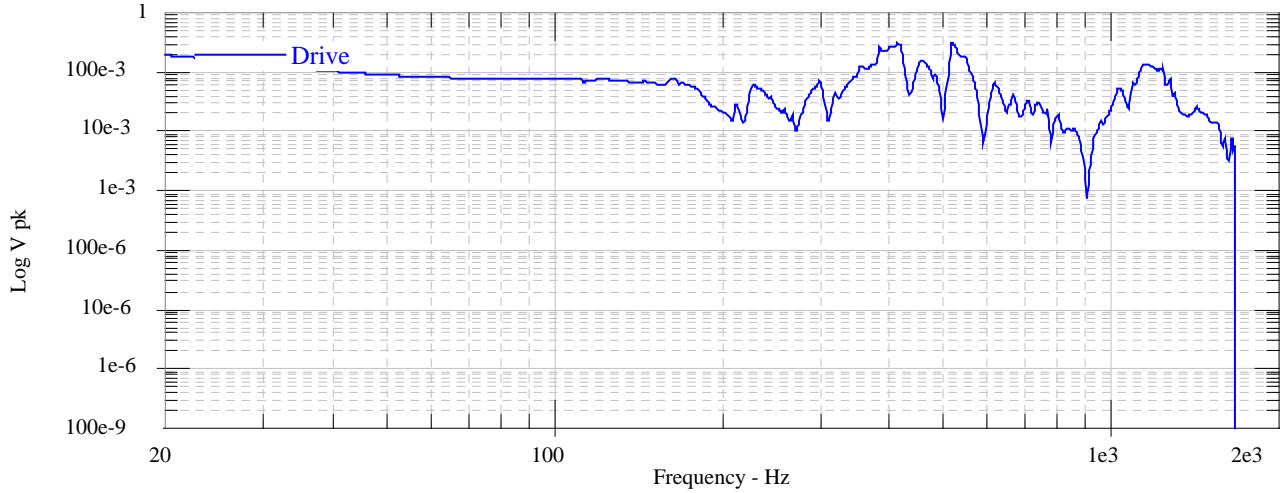
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Révision : 00
Date : 1-May-04
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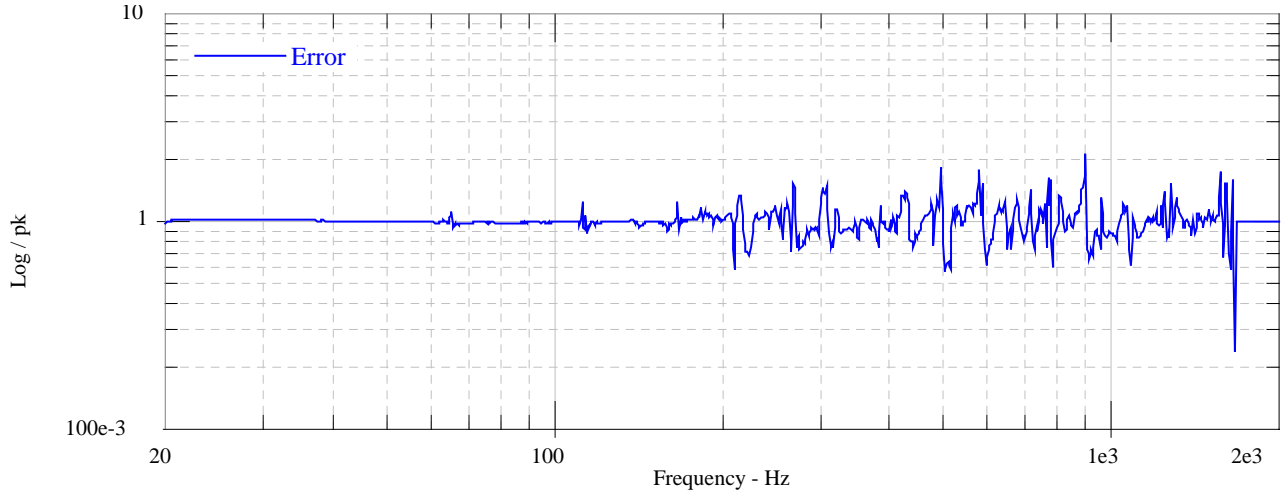
History Channel n° -3



Drive Channel n° -2



Error Channel n° -1

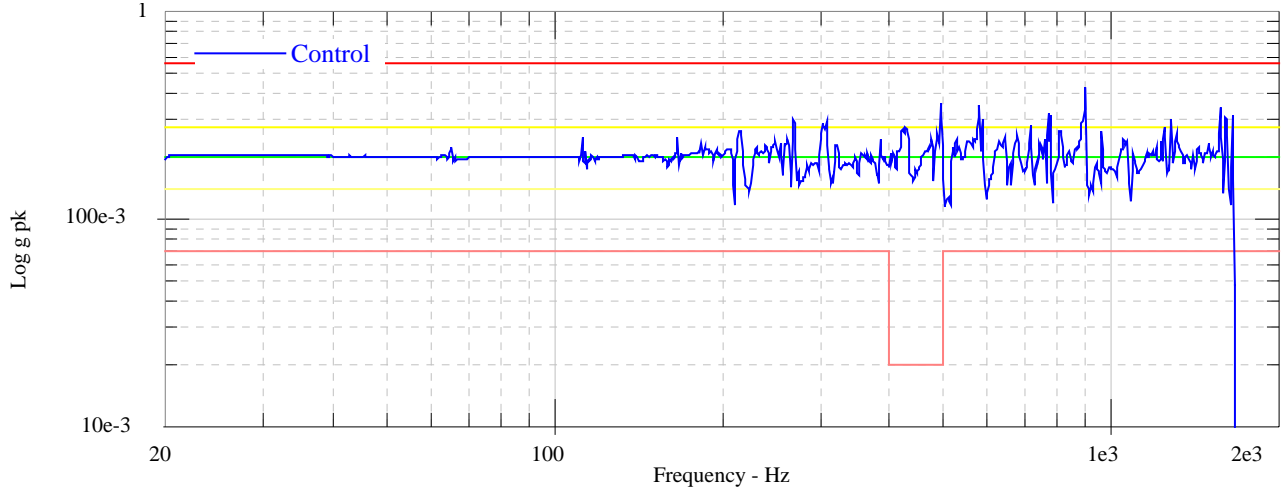


VIBRATION TEST REPORT
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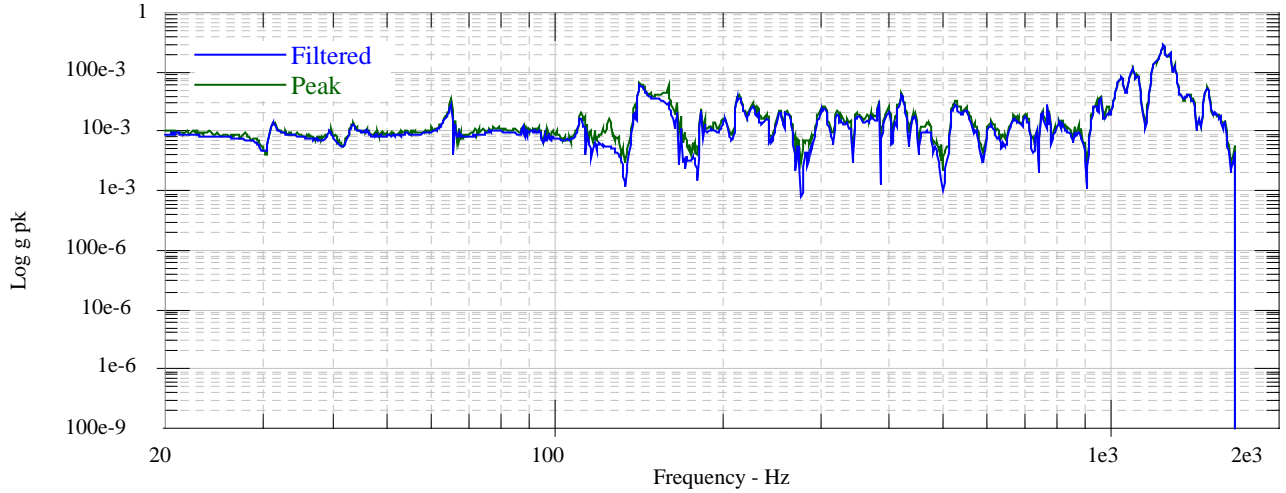
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Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

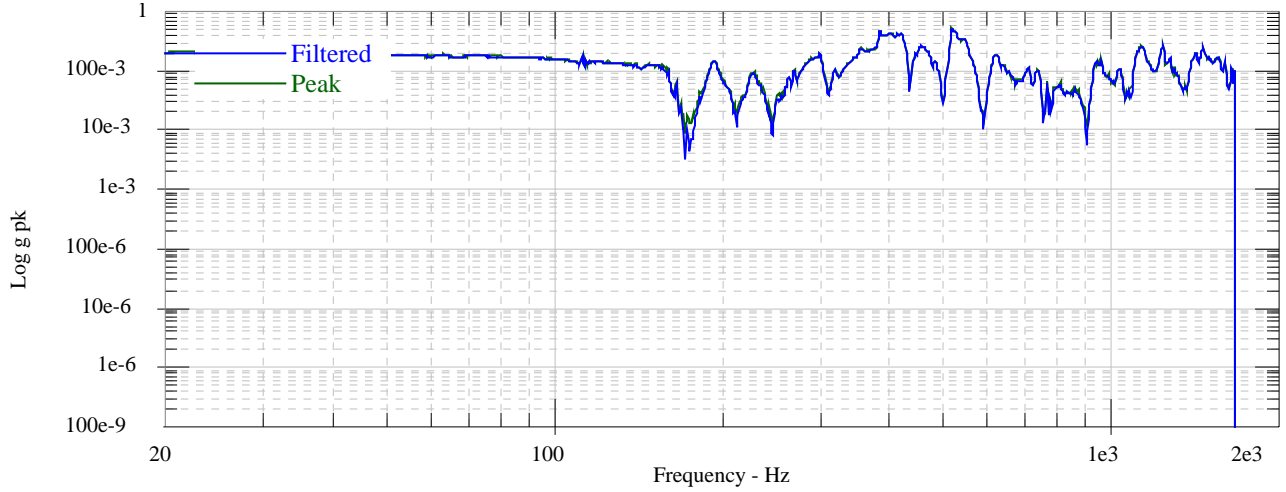


VIBRATION TEST REPORT
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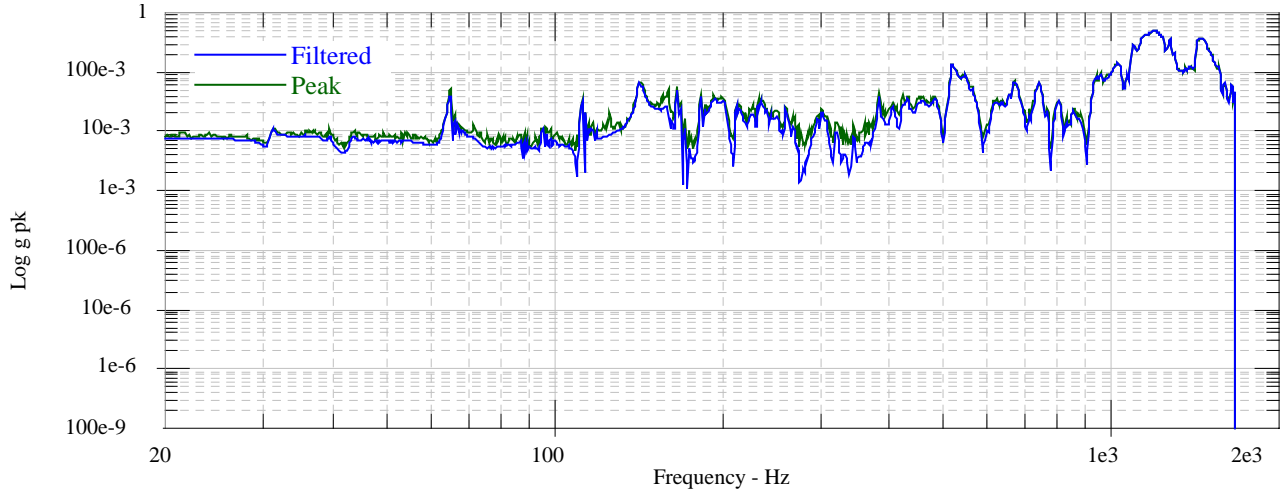
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SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5

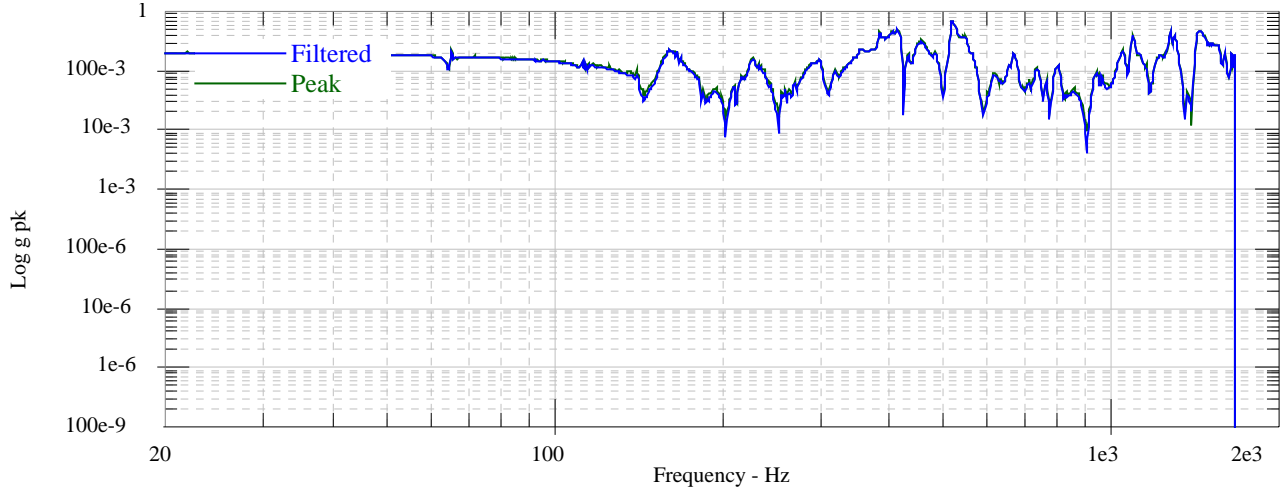


VIBRATION TEST REPORT
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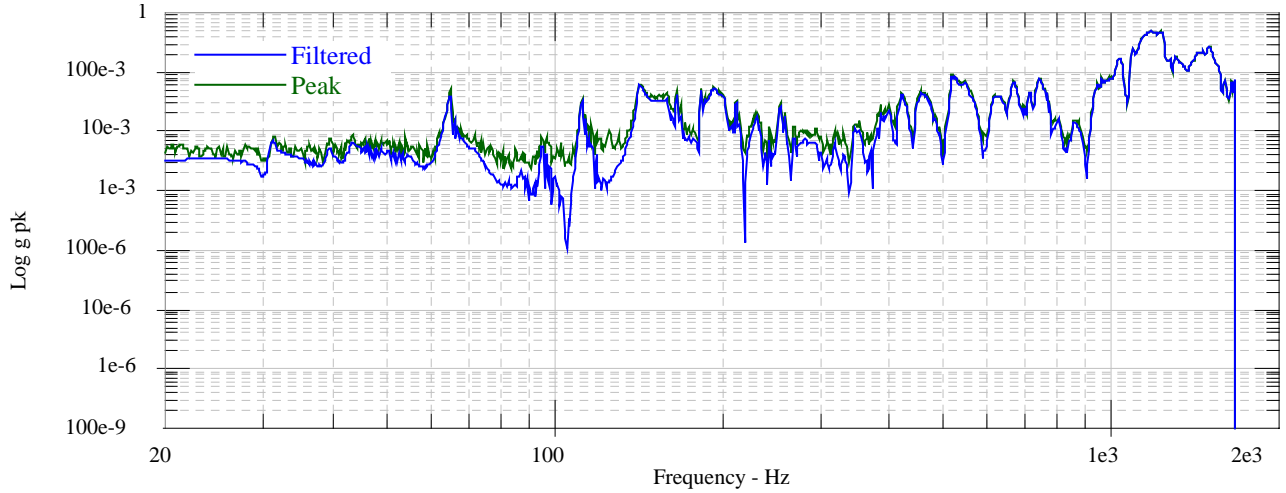
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Révision : 00
Date : 1-May-04
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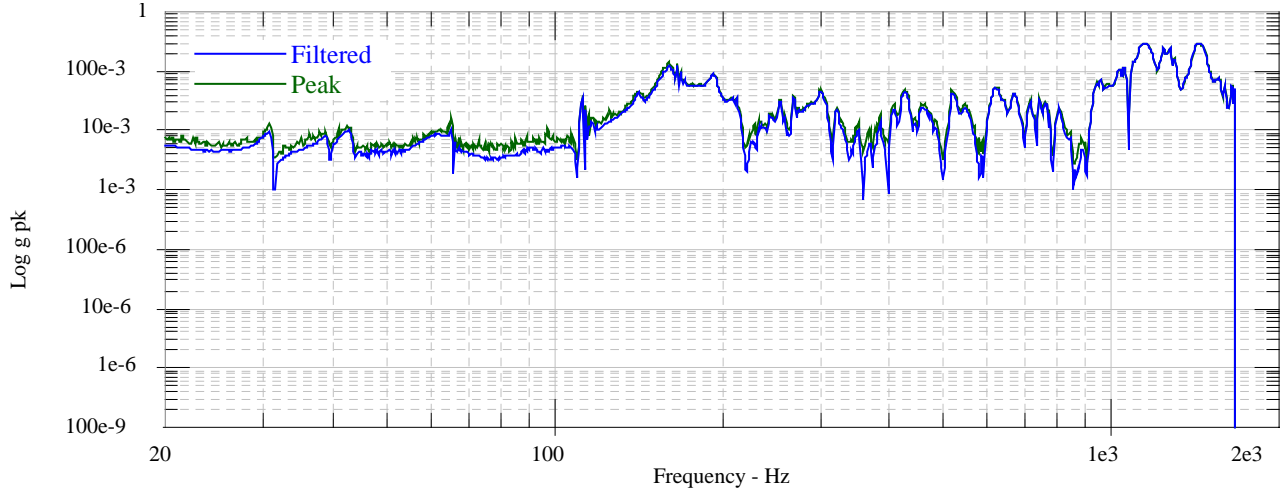
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

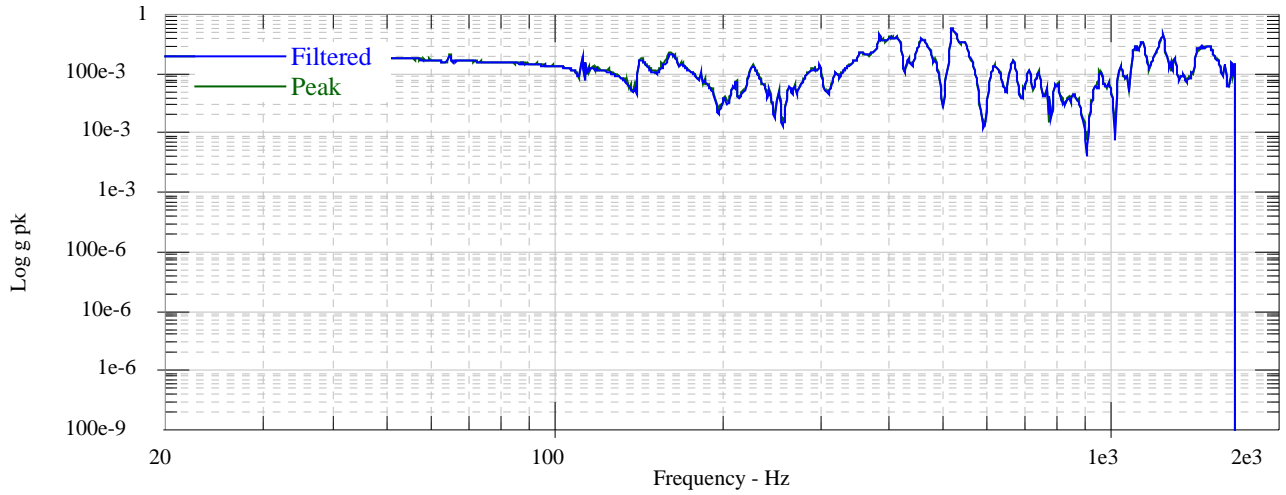


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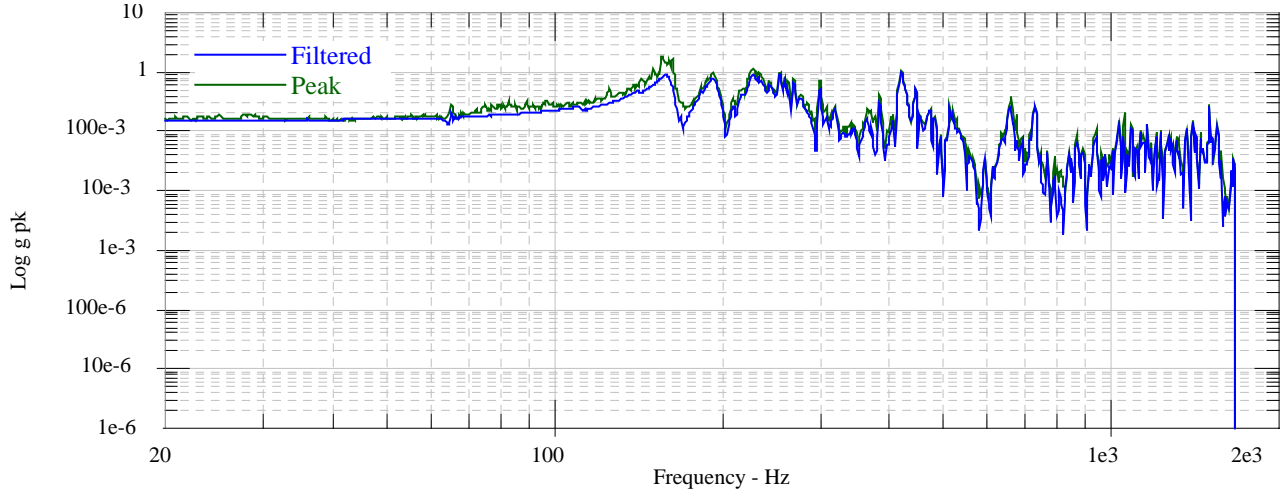
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SHK.3.X Channel n° 9



PHS.XY Channel n° 10



PHS.Z Channel n° 11

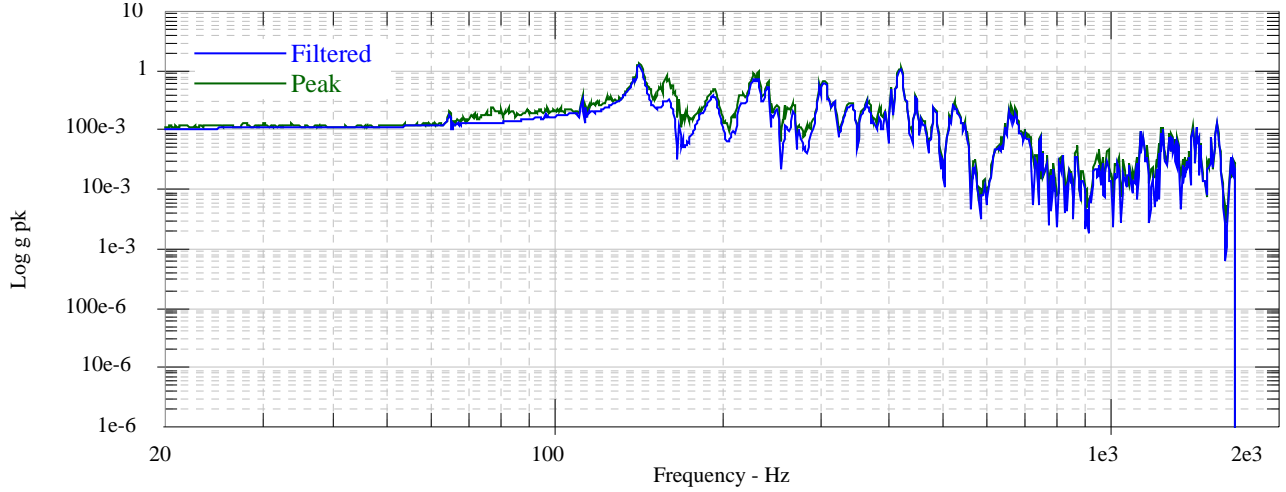


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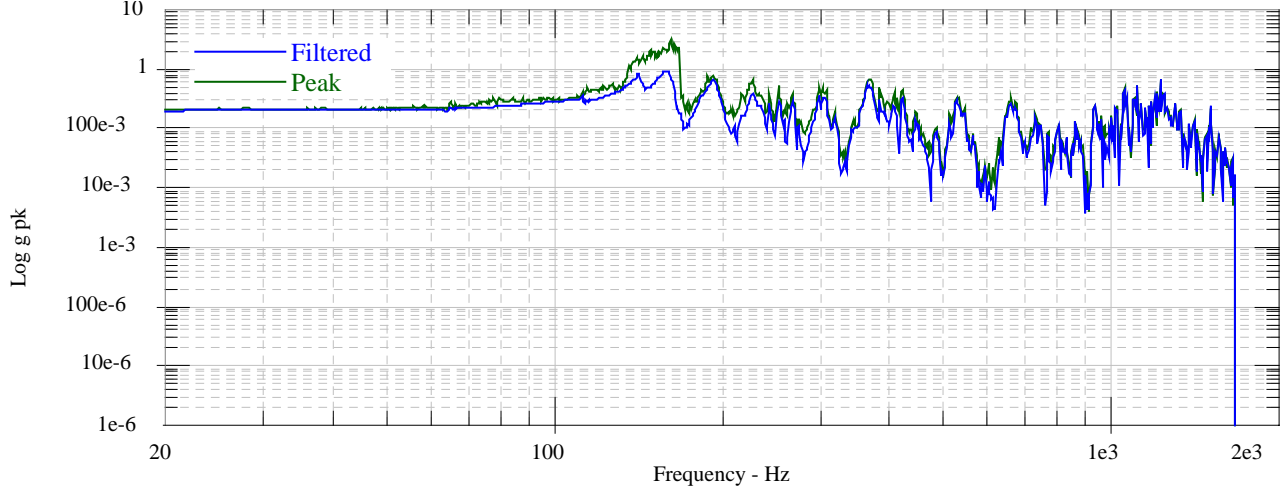
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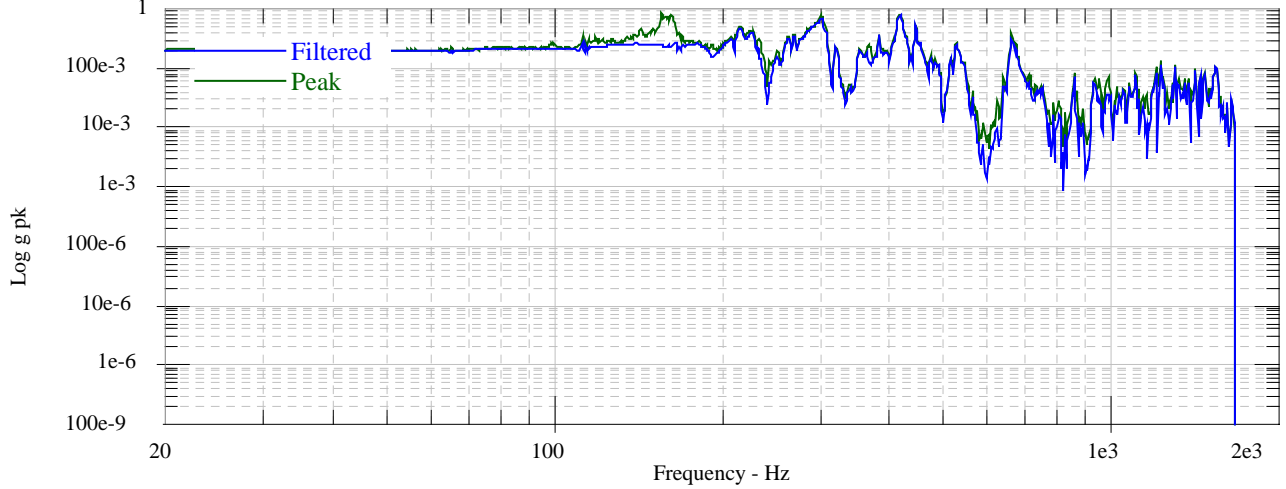
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COOL.X Channel n° 13



FPU.X Channel n° 14

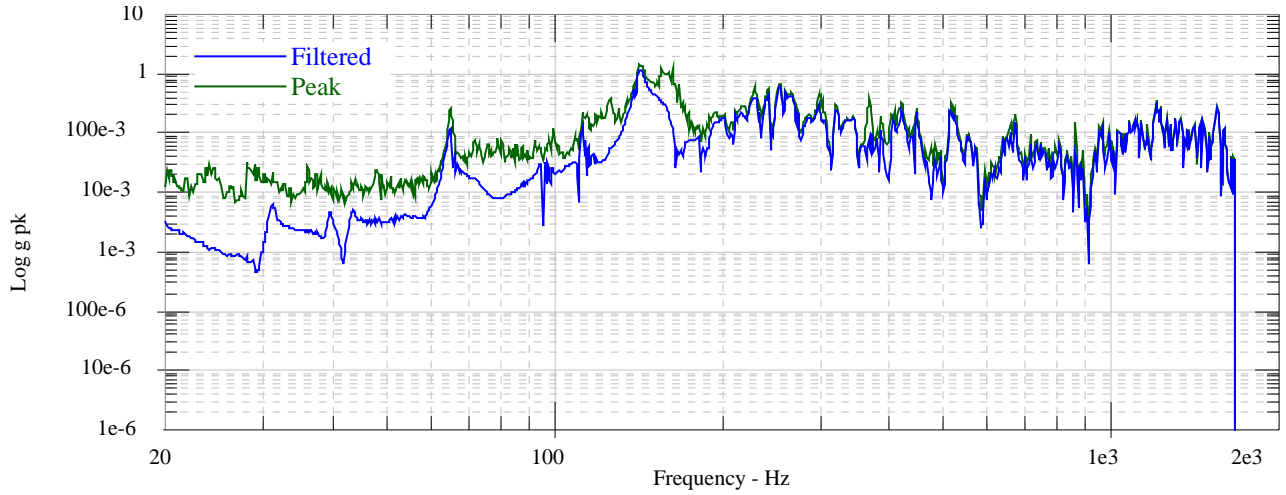


VIBRATION TEST REPORT
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Révision : 00
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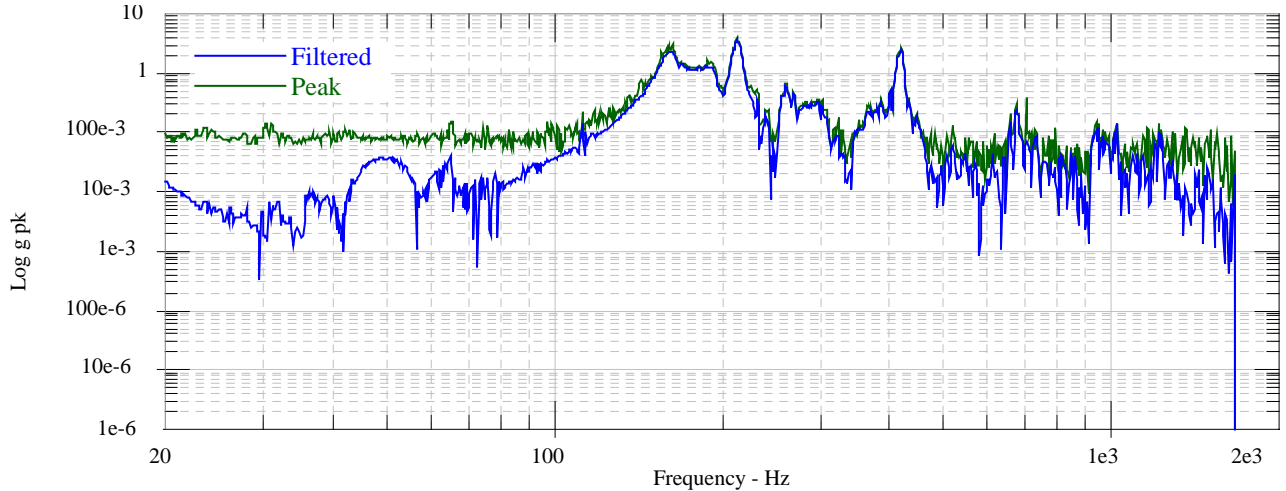
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FPU.Z Channel n° 16



SPEC.X Channel n° 17

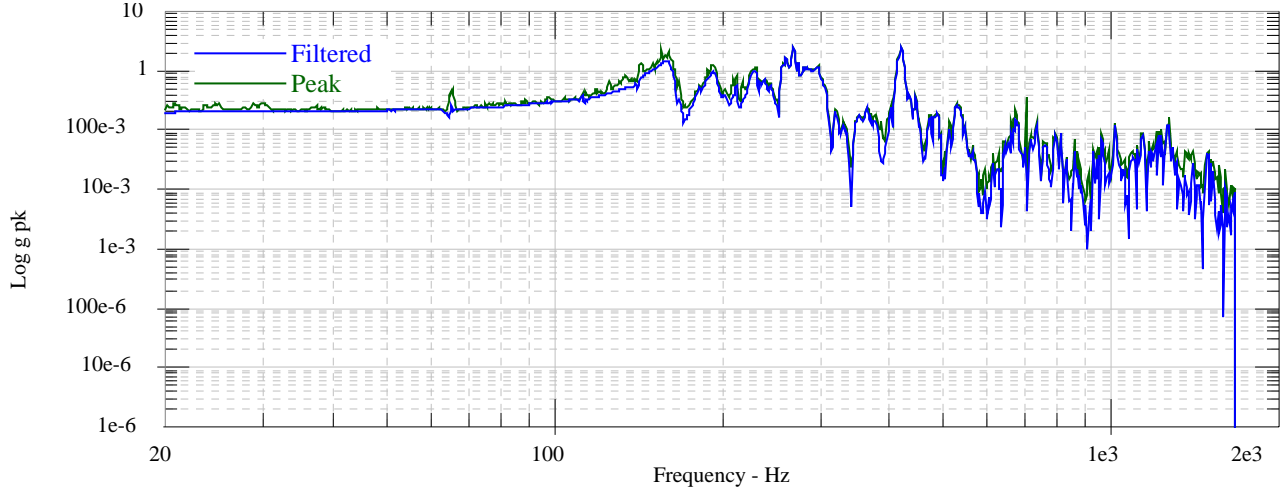


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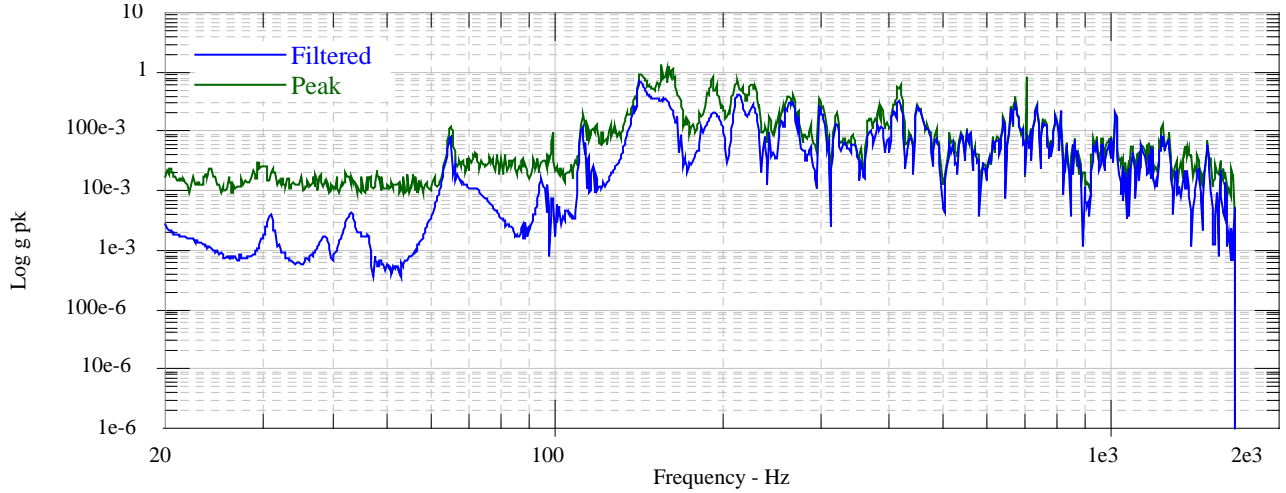
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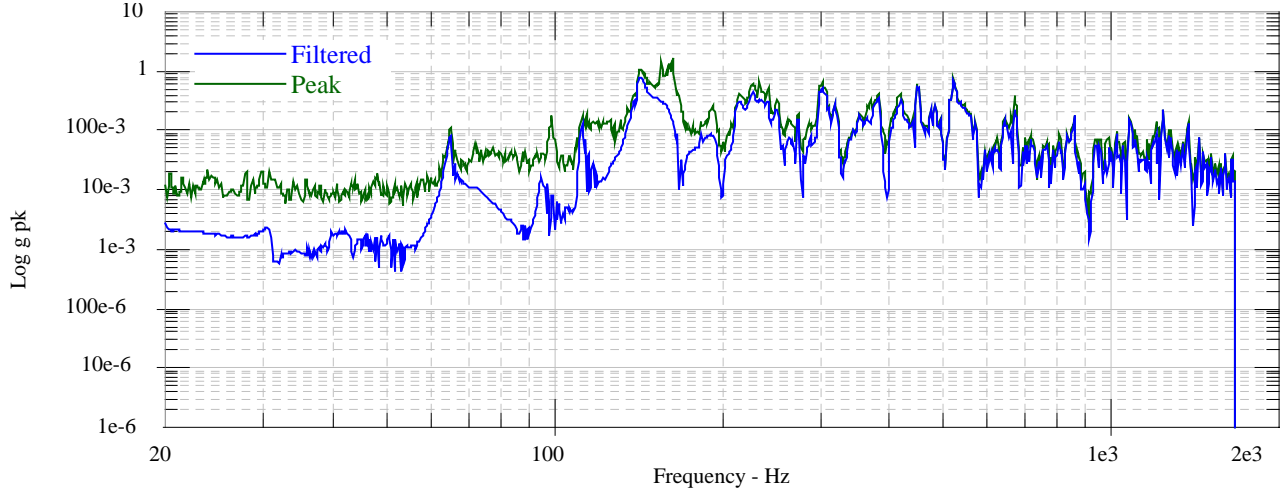
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

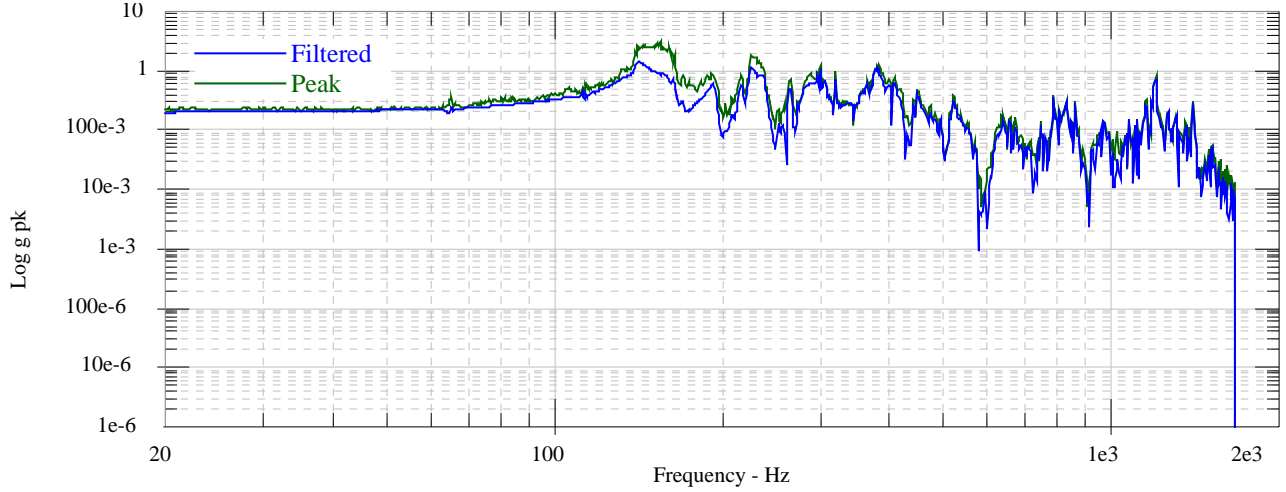


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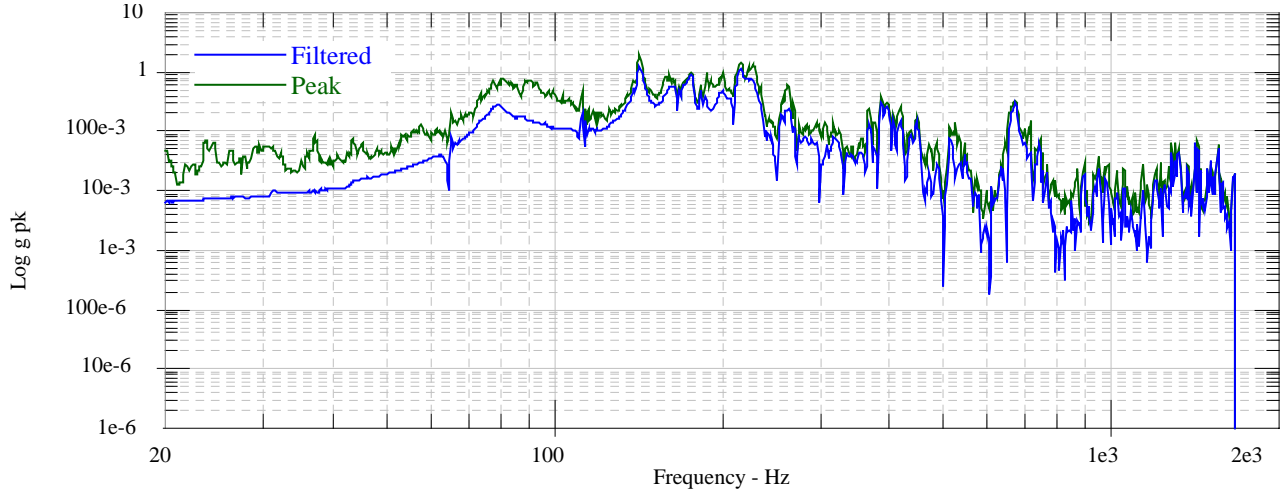
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Version : 01
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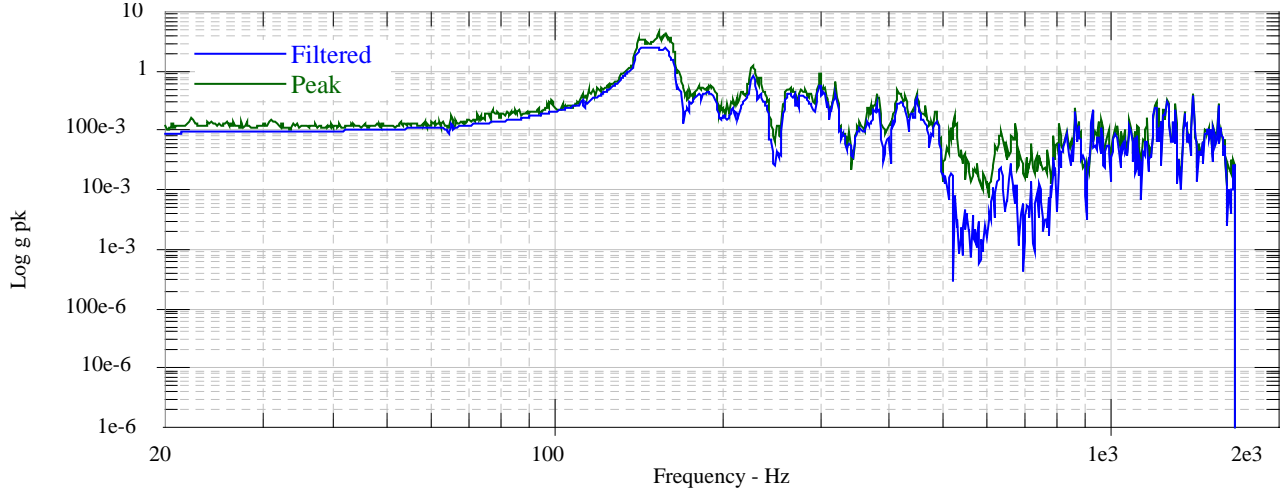
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CTIP.Y Channel n° 22



SMECU.X Channel n° 23

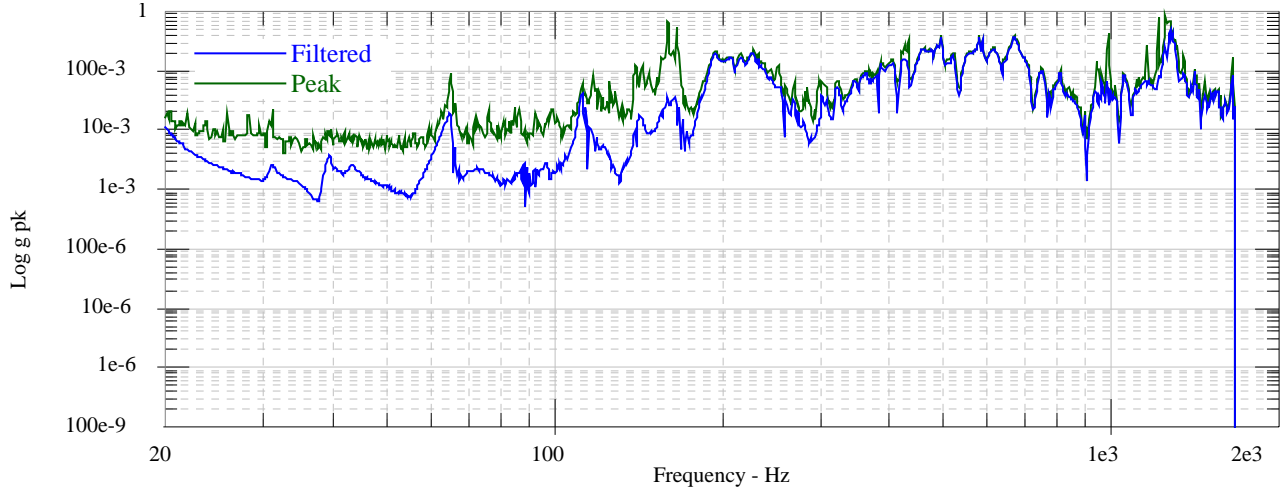


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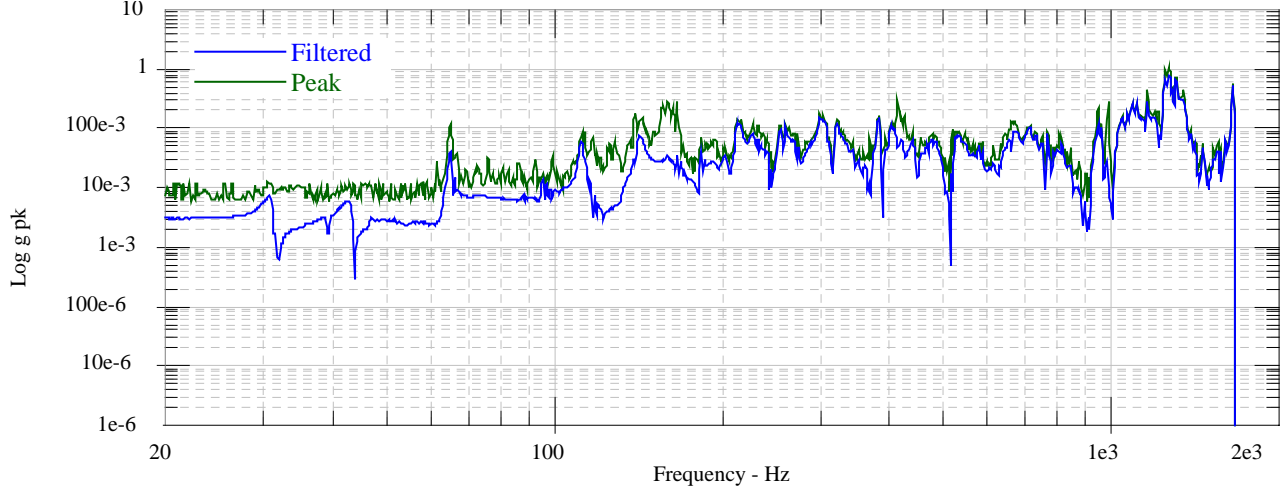
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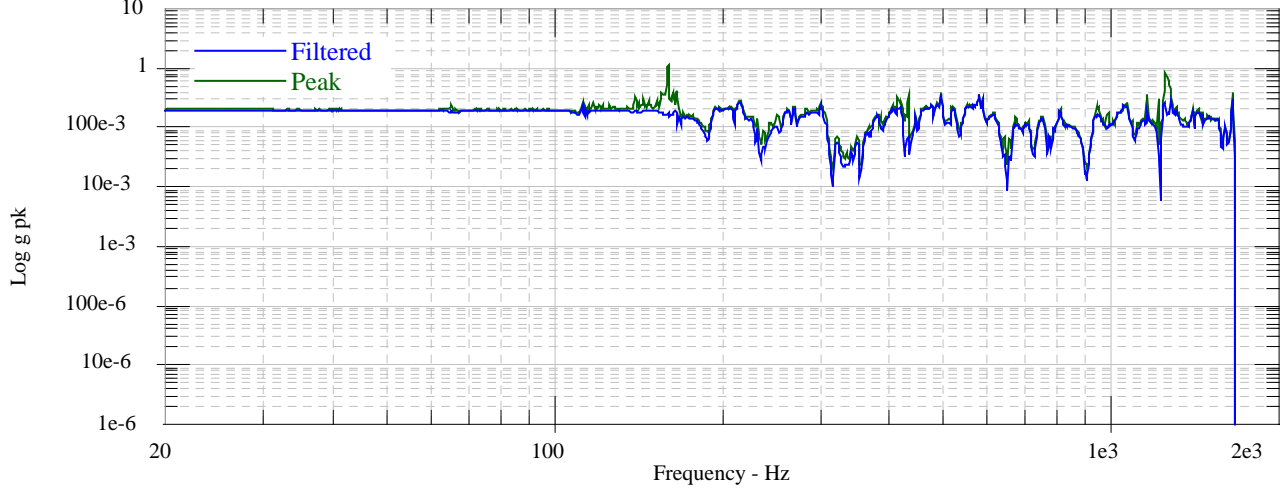
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CONE.X Channel n° 26

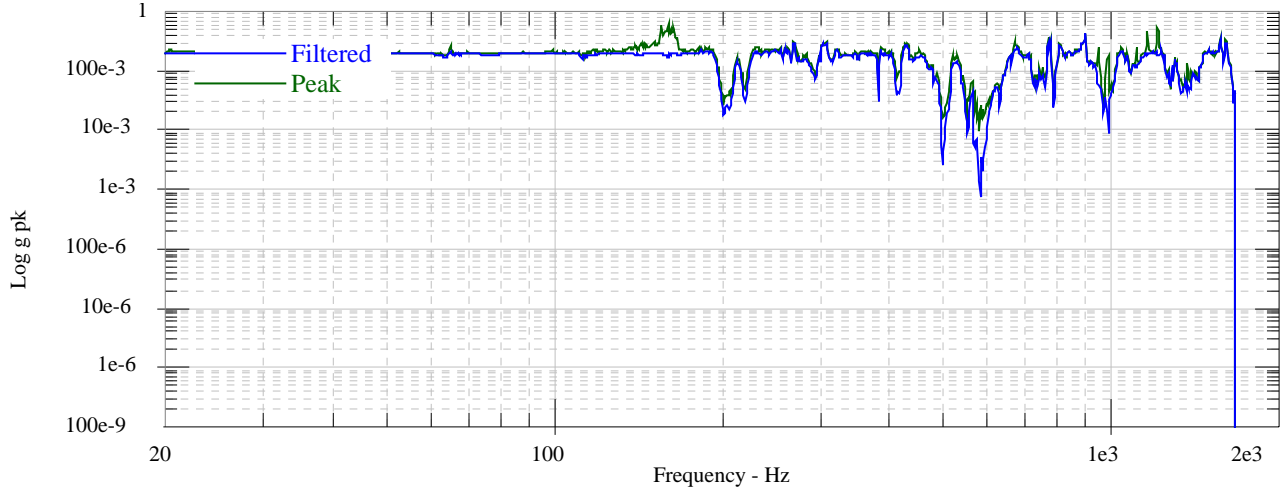


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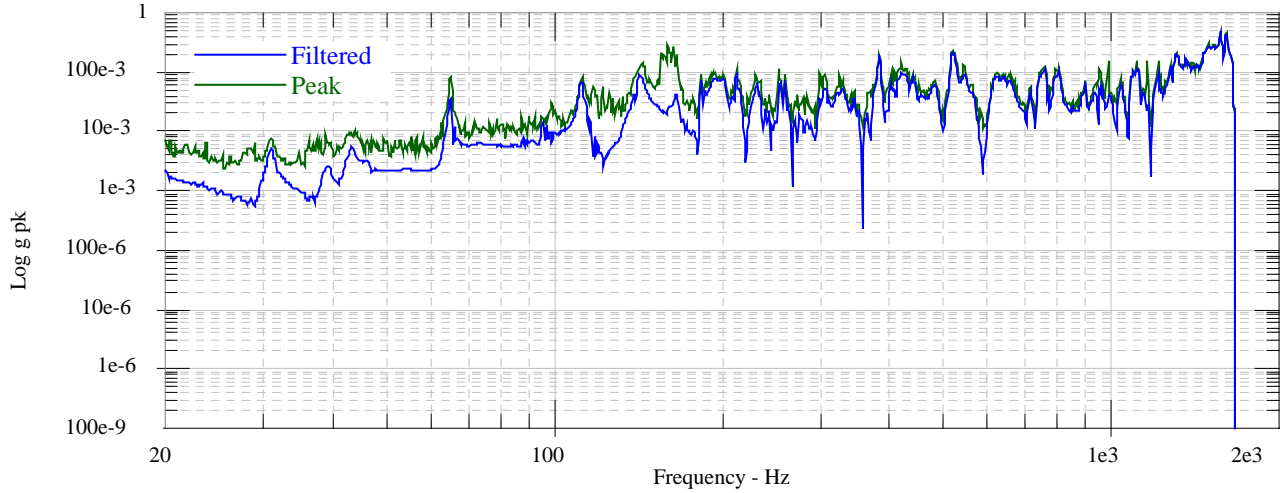
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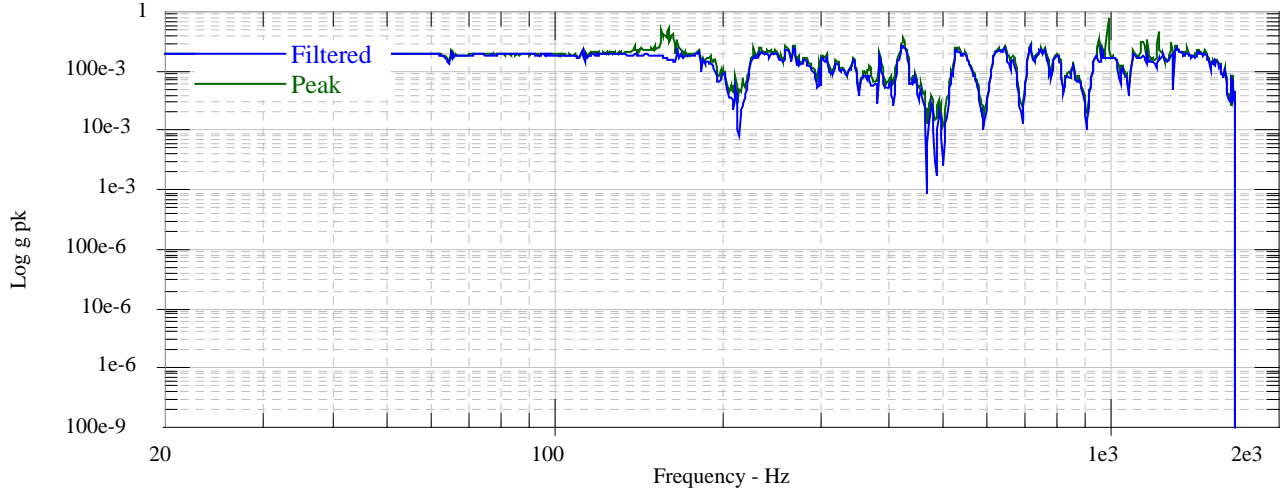
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-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

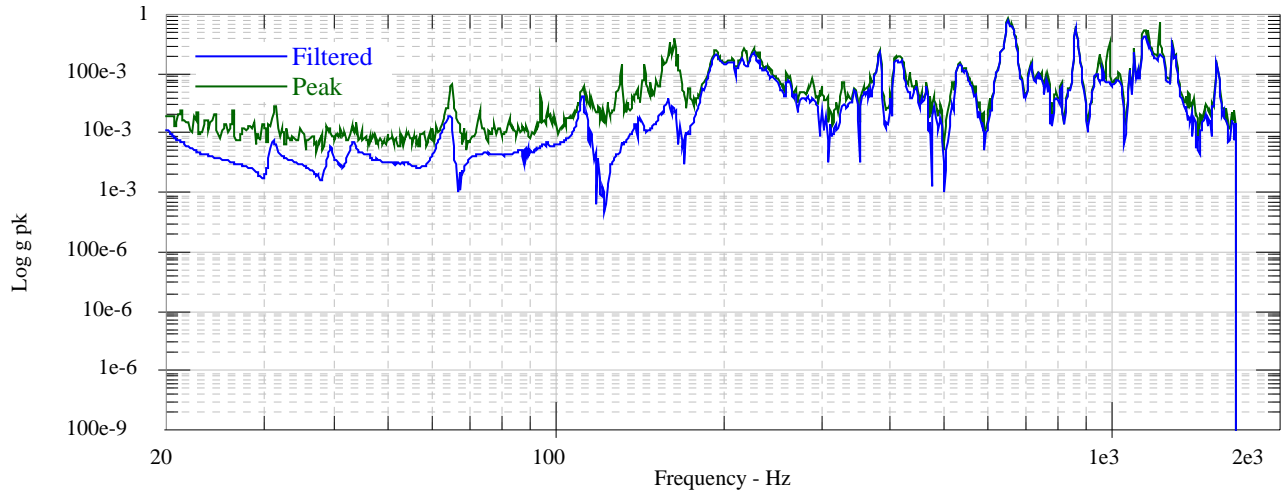


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+YAFRAME.Z Channel n° 30



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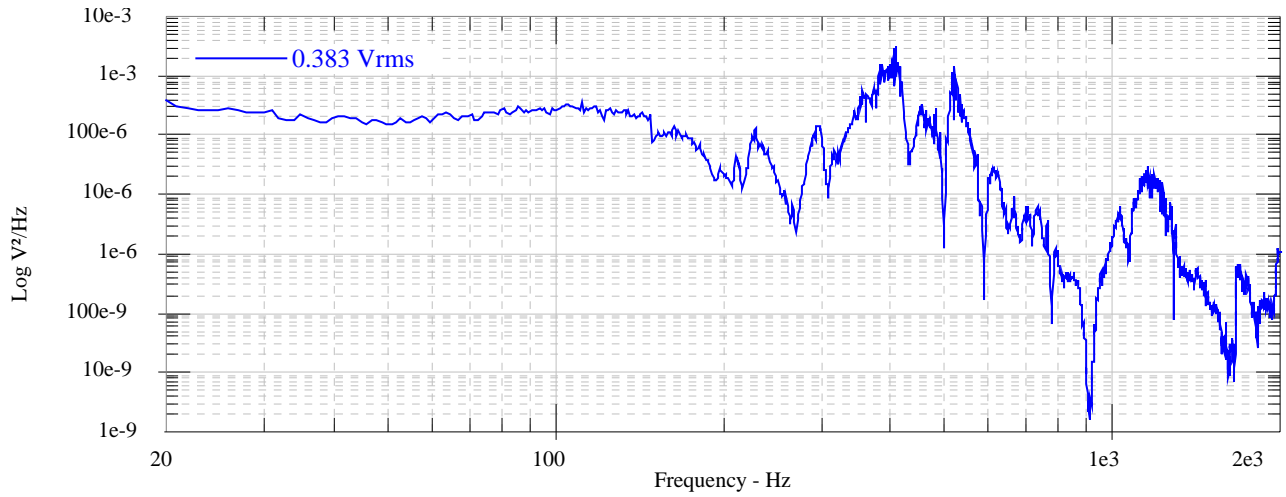
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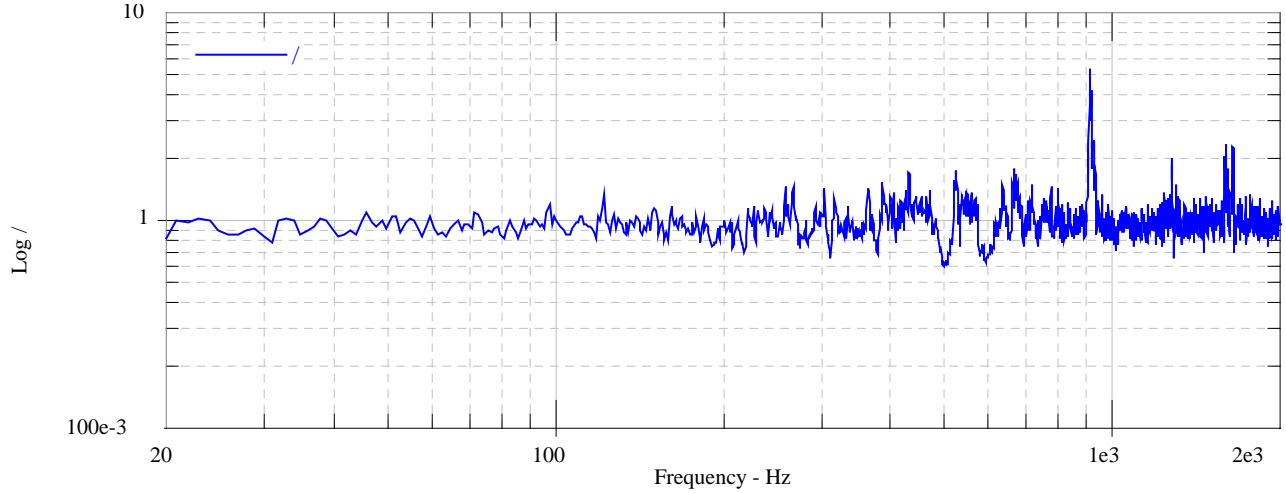
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Révision : 00
Date : 1-May-04
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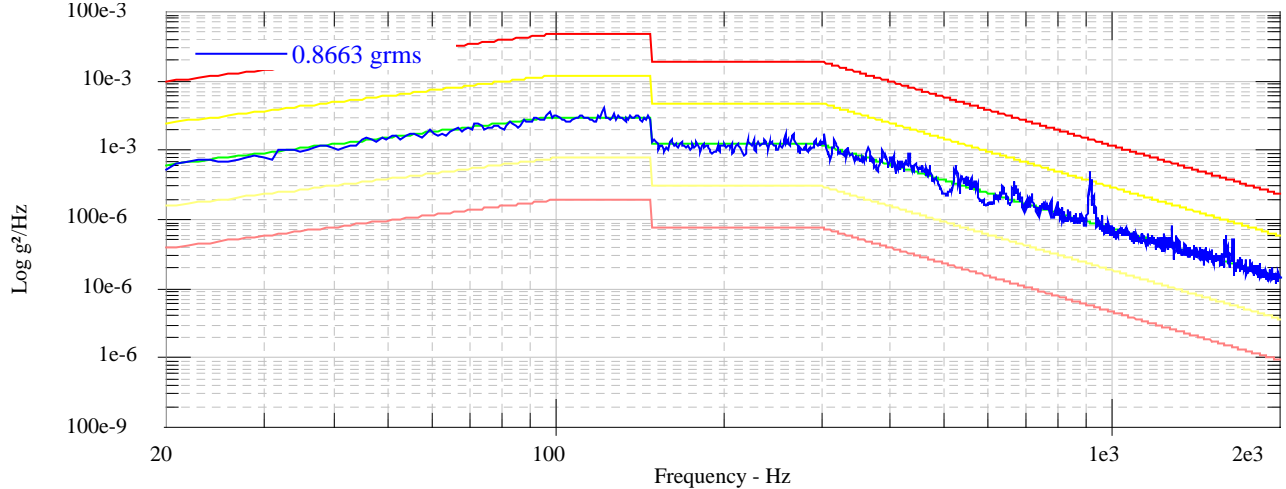
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

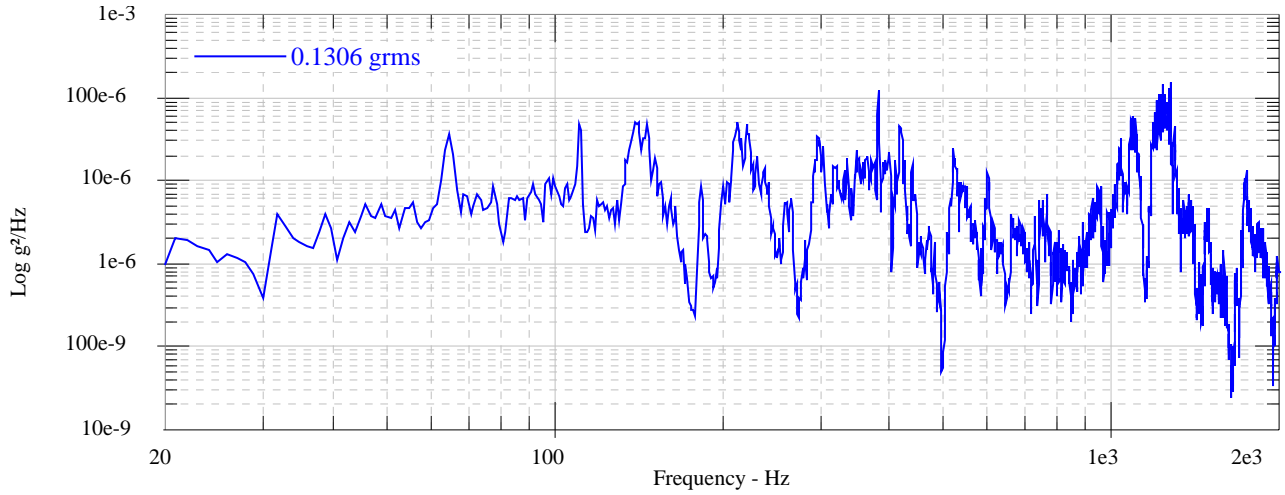


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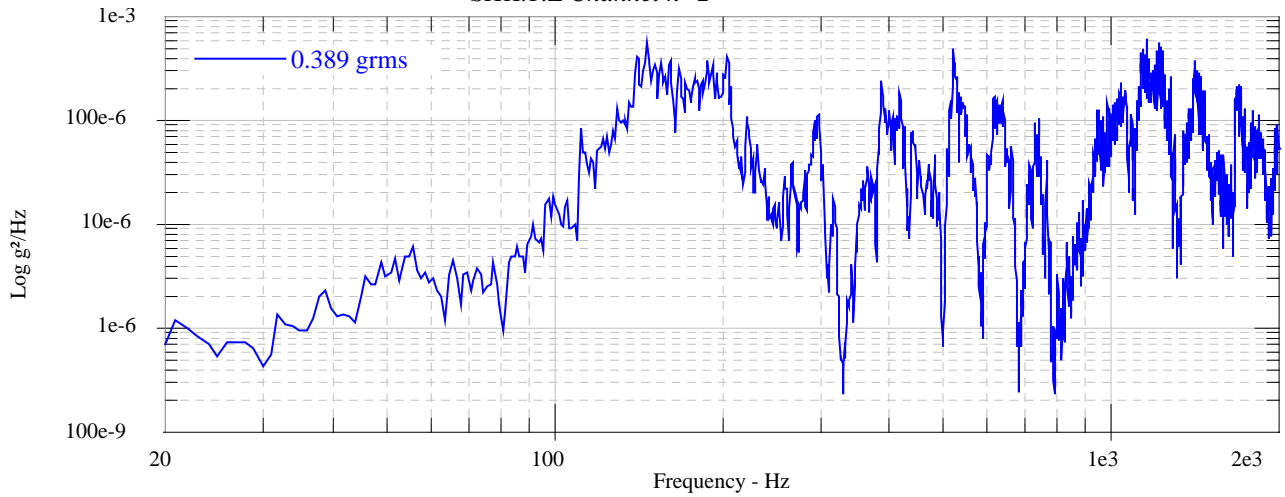
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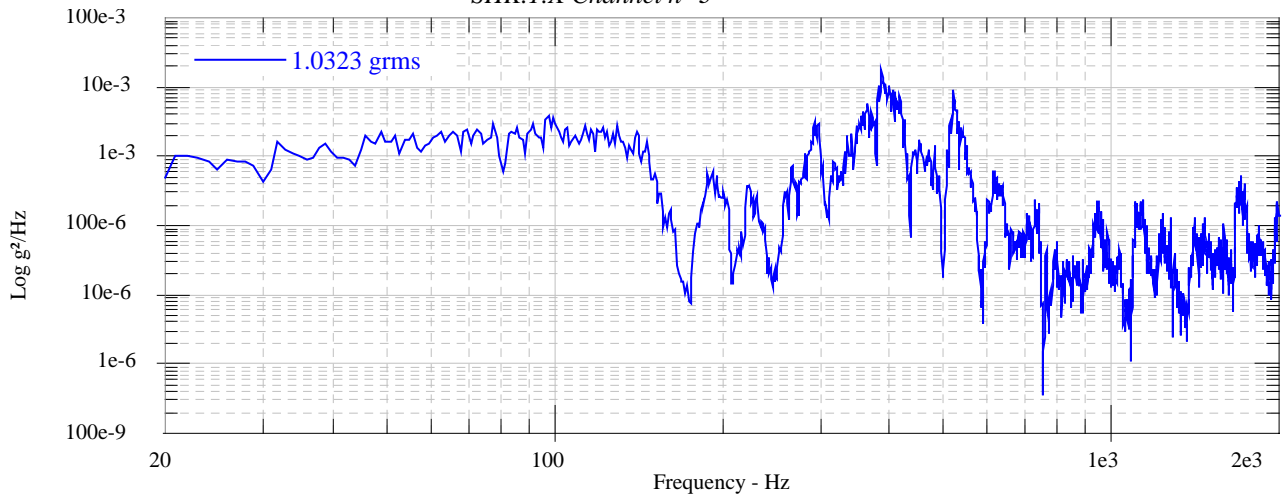
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

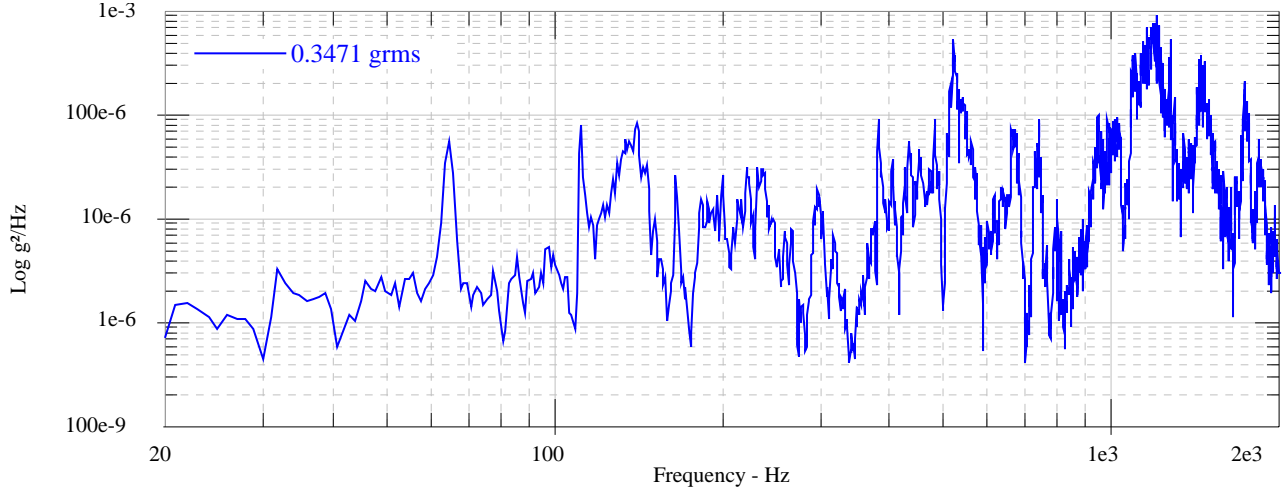


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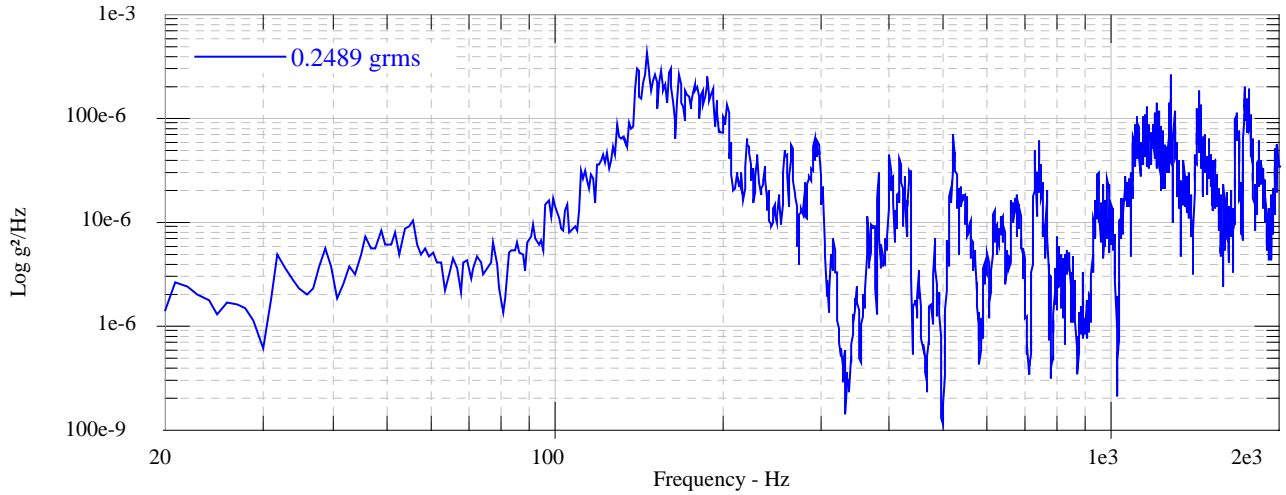
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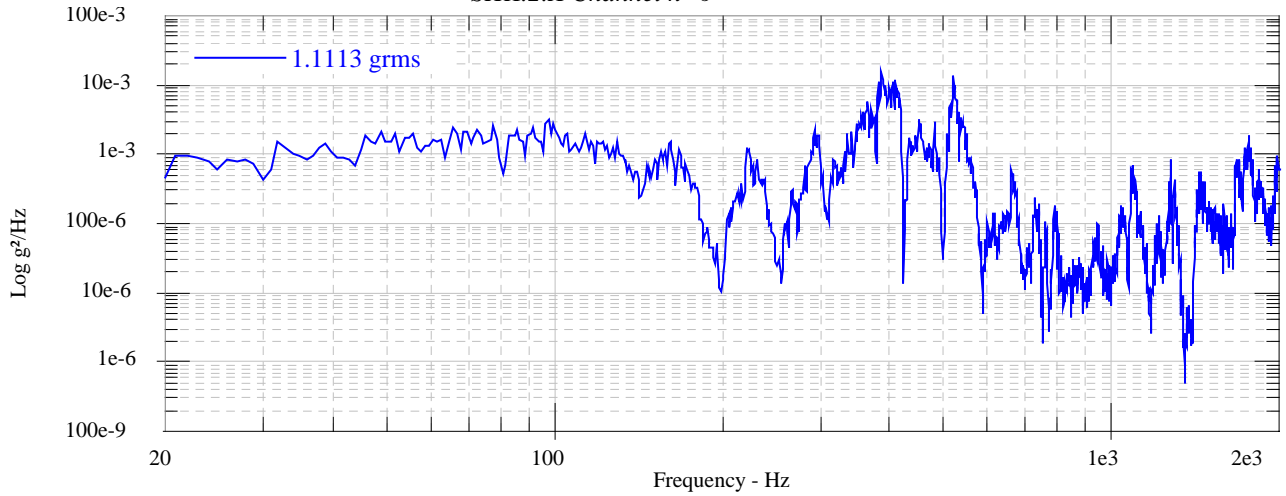
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

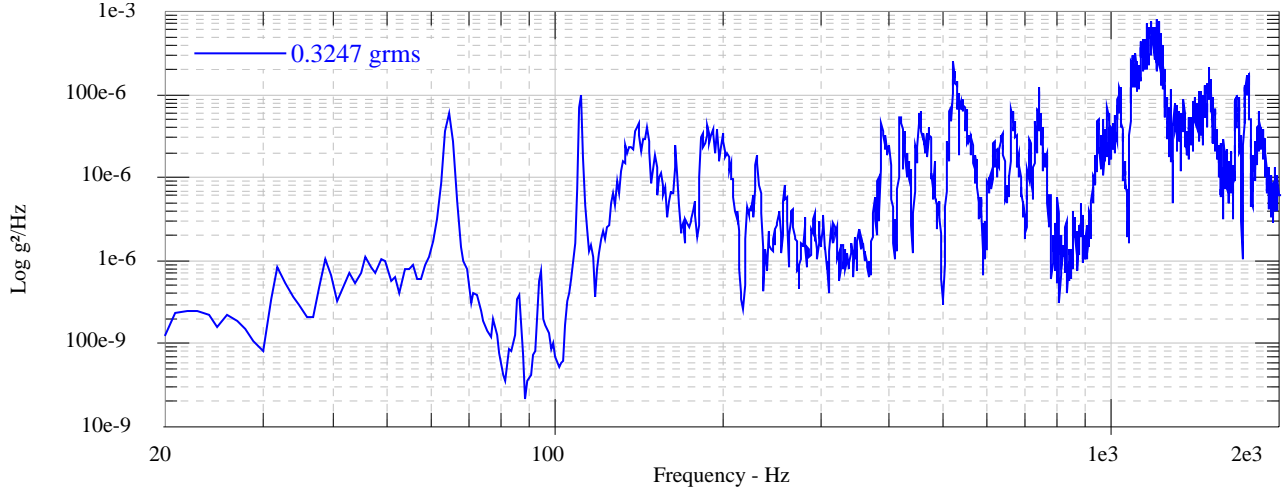


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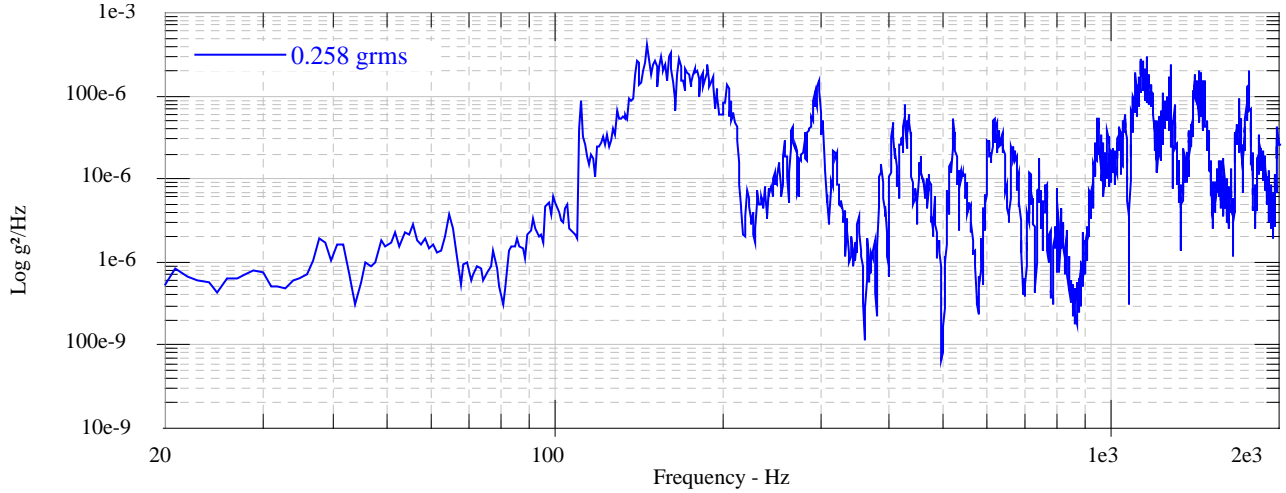
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Date : 1-May-04
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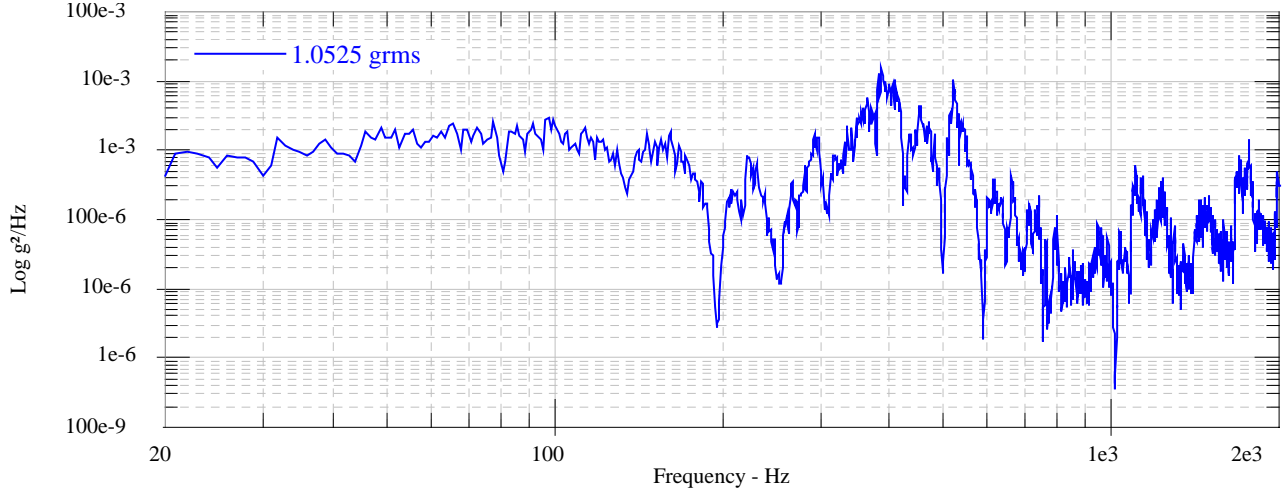
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

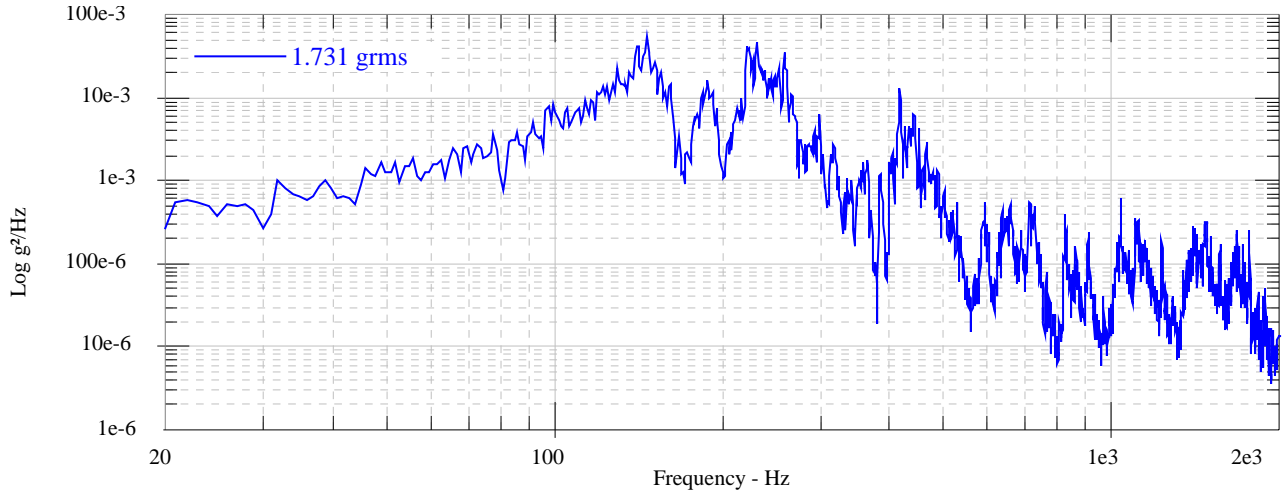


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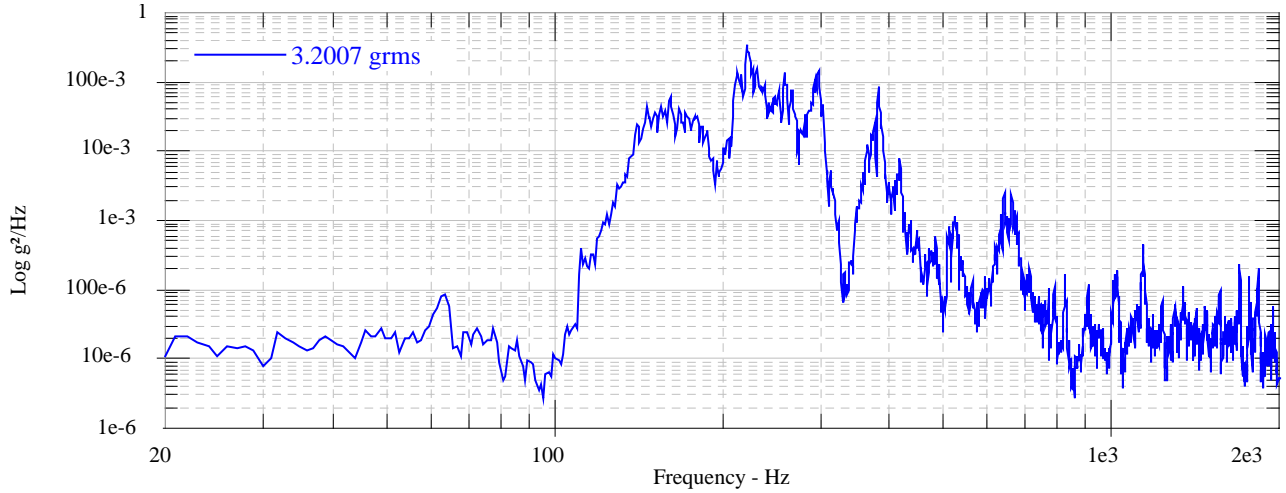
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Date : 1-May-04
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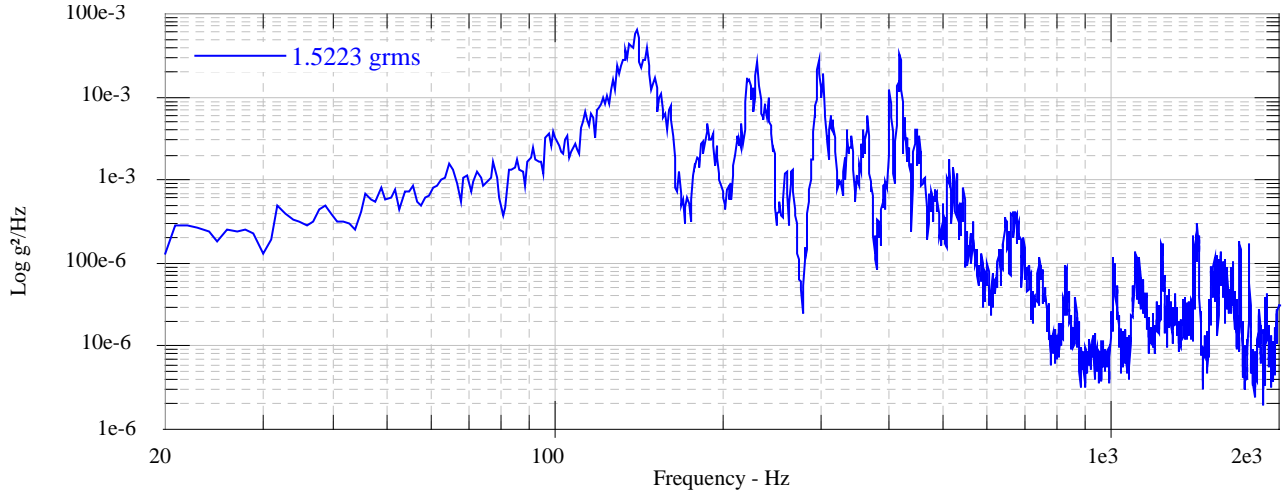
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

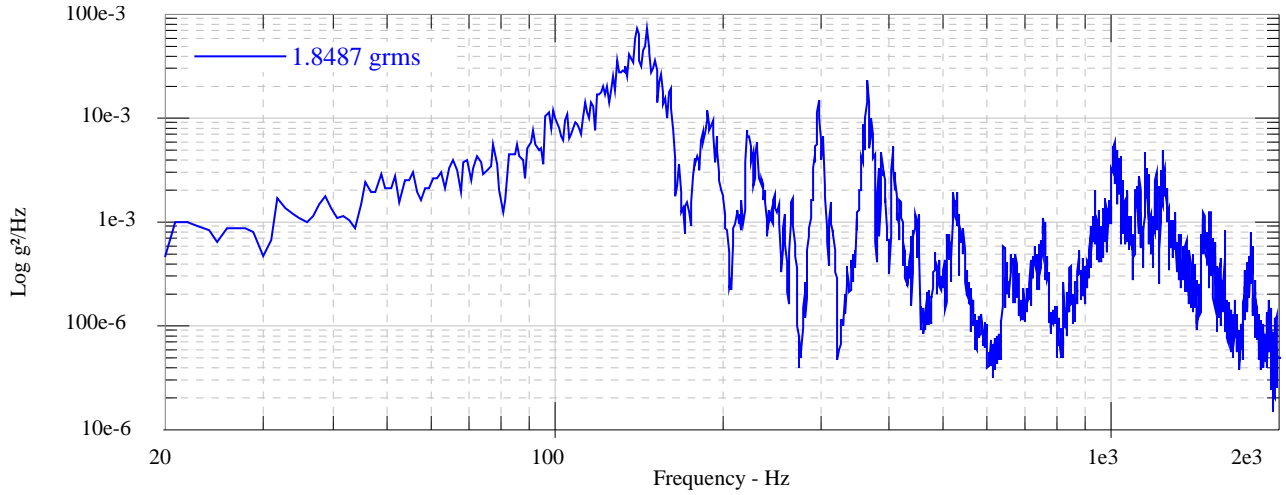


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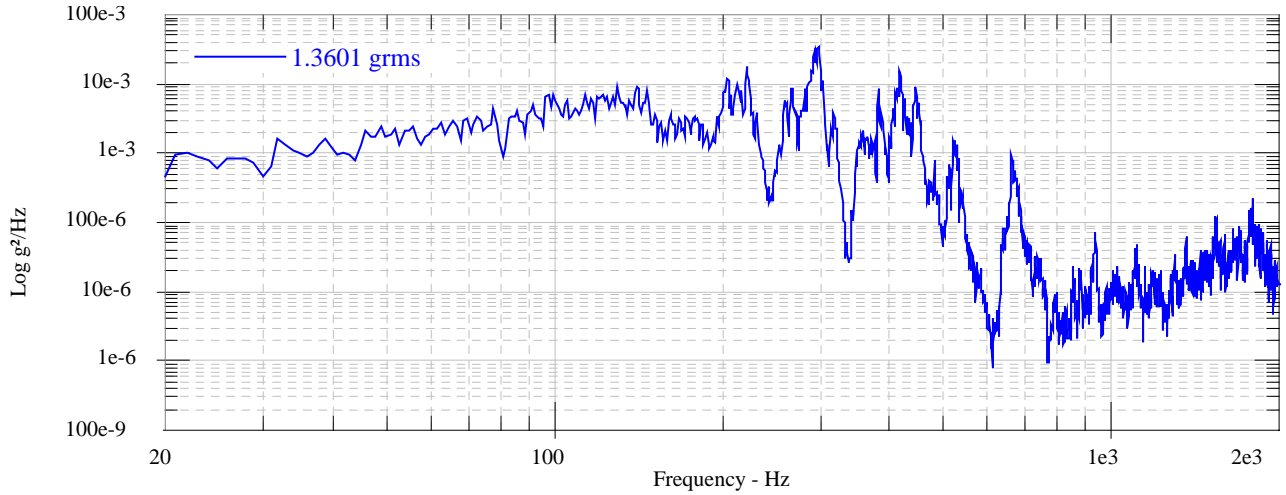
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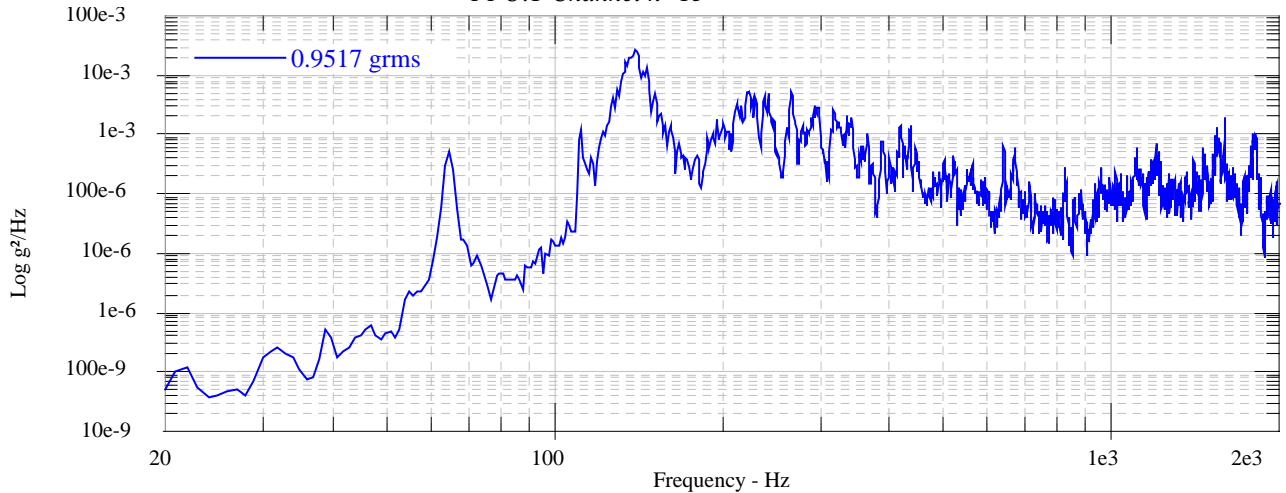
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

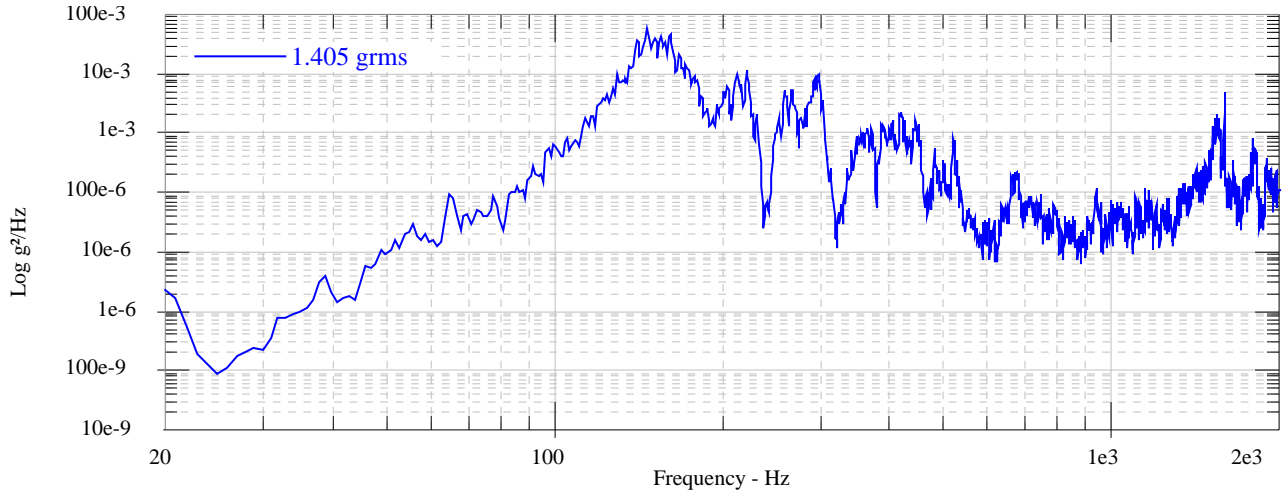


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SPIRE QM

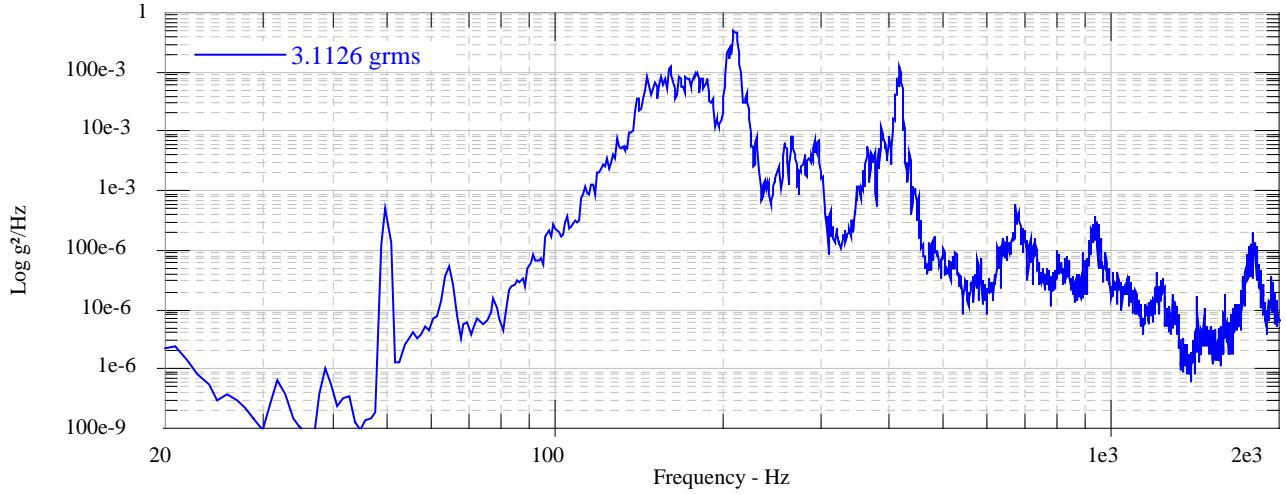
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Version : 01
Révision : 00
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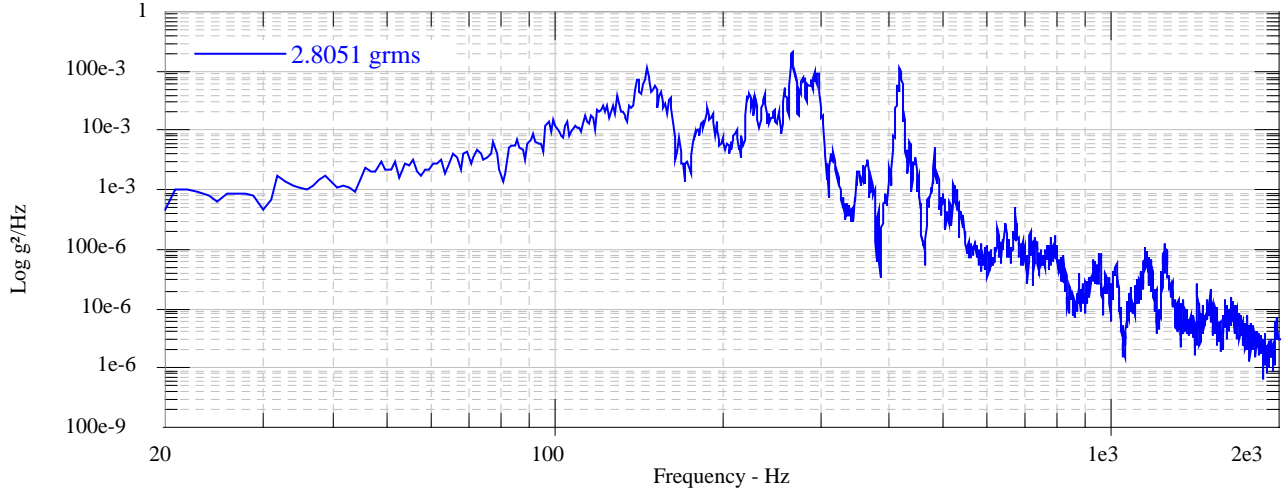
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

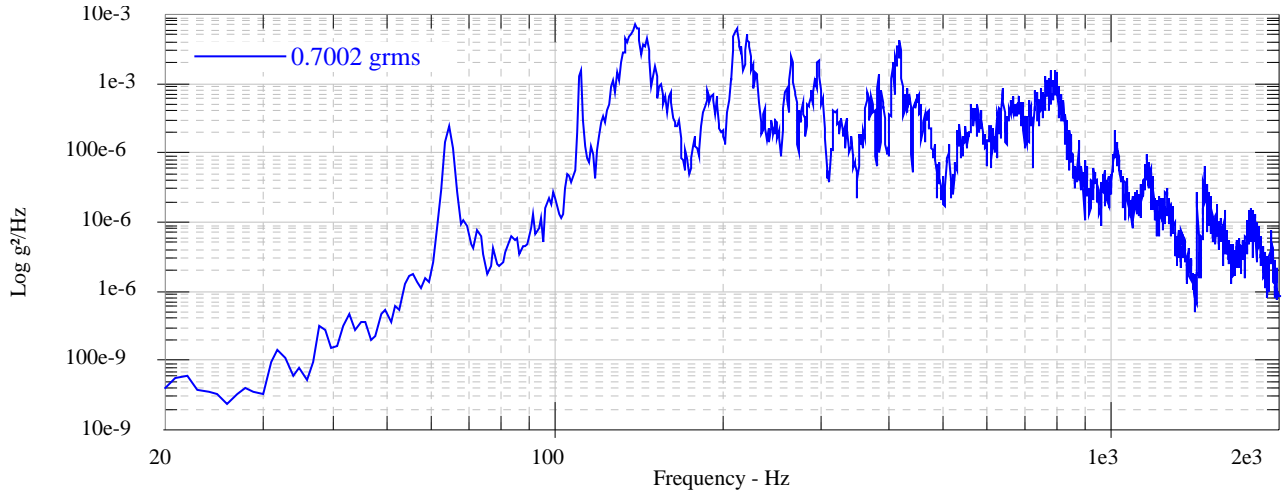


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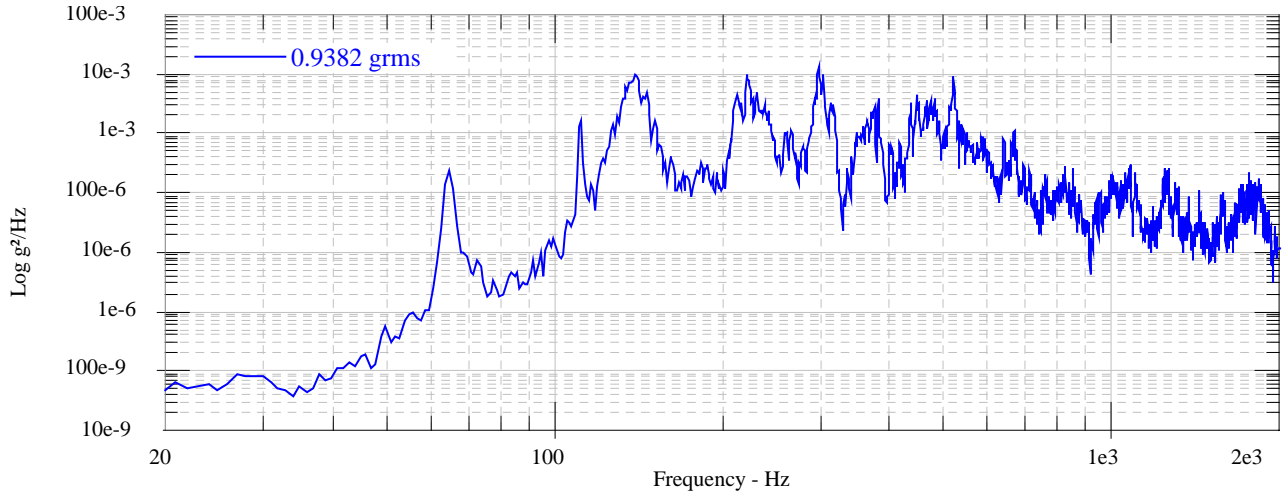
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Date : 1-May-04
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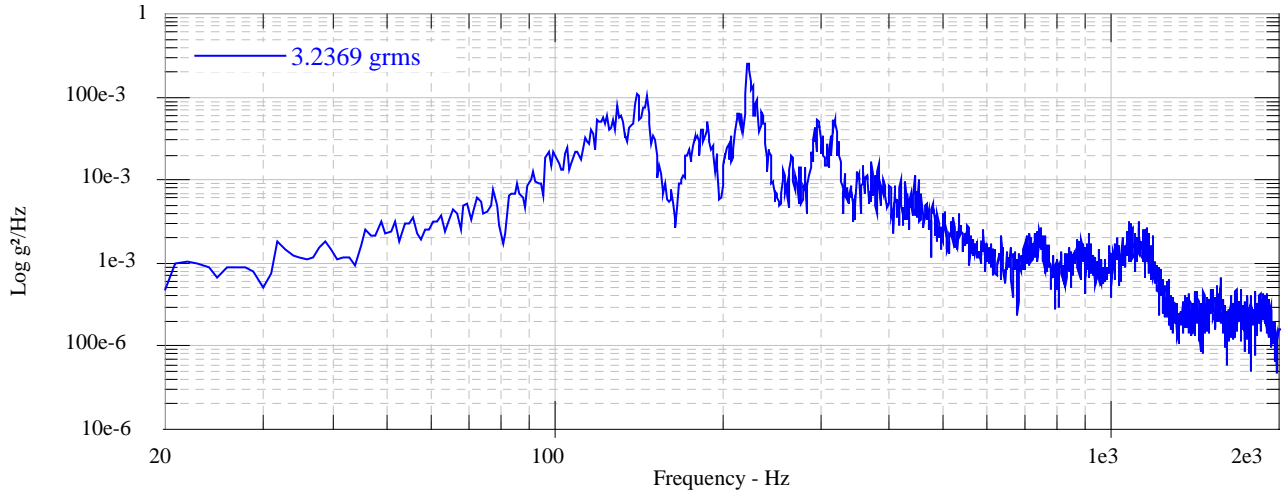
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OB.Y Channel n° 20



SMECL.X Channel n° 21

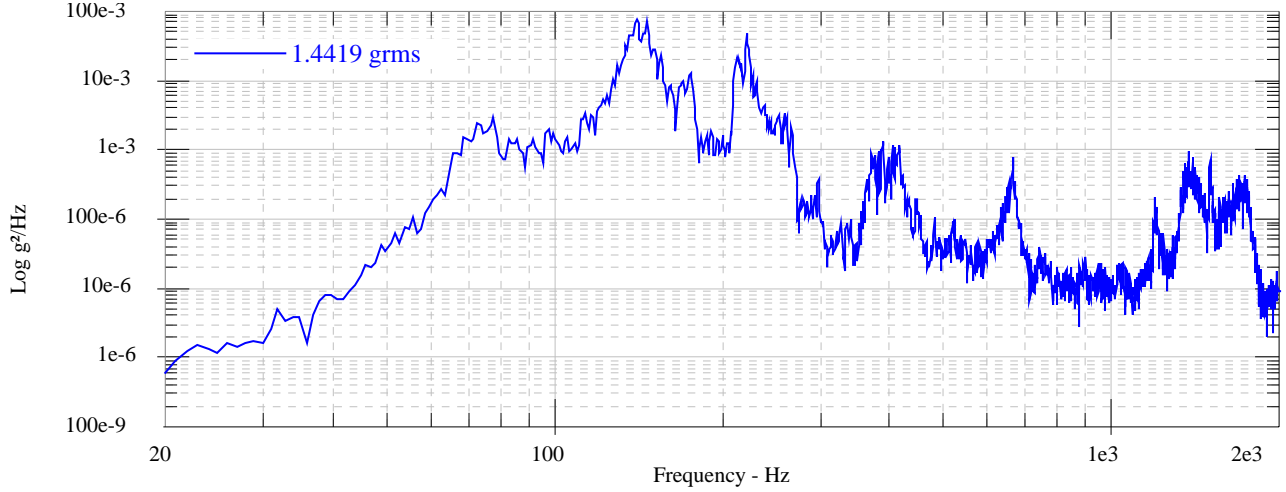


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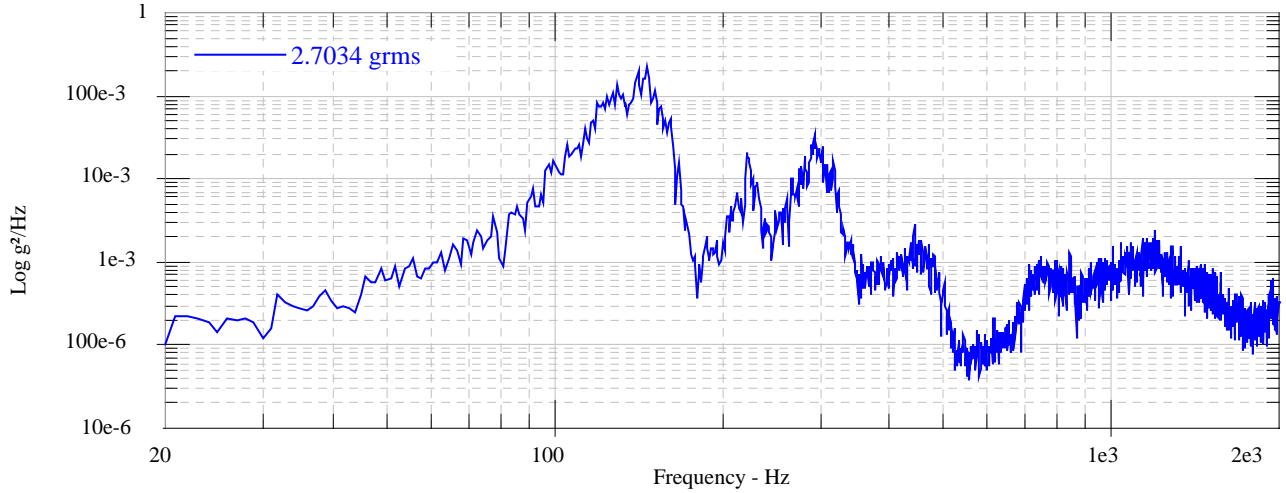
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Date : 1-May-04
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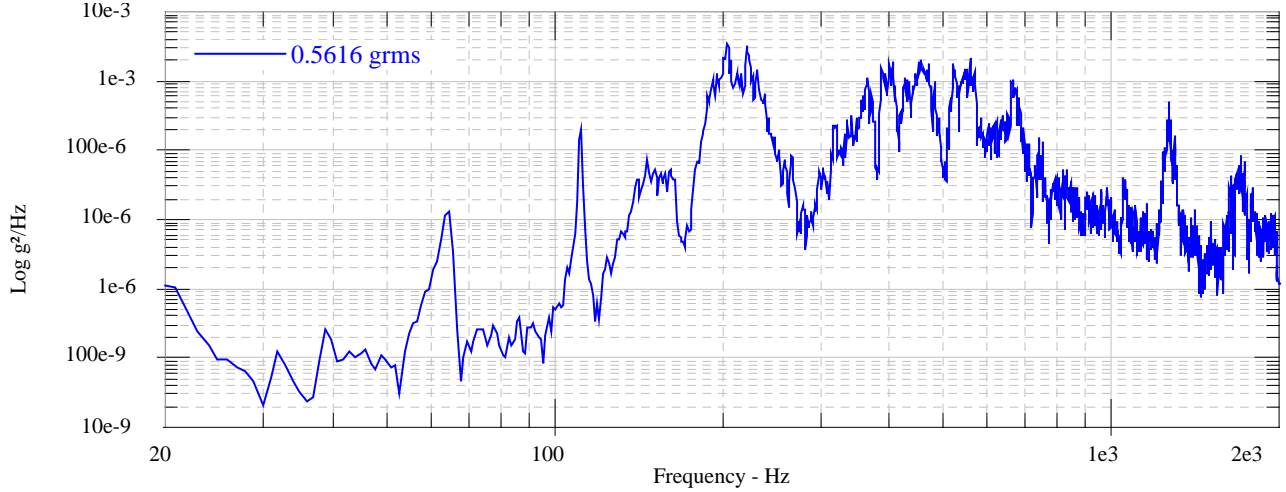
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

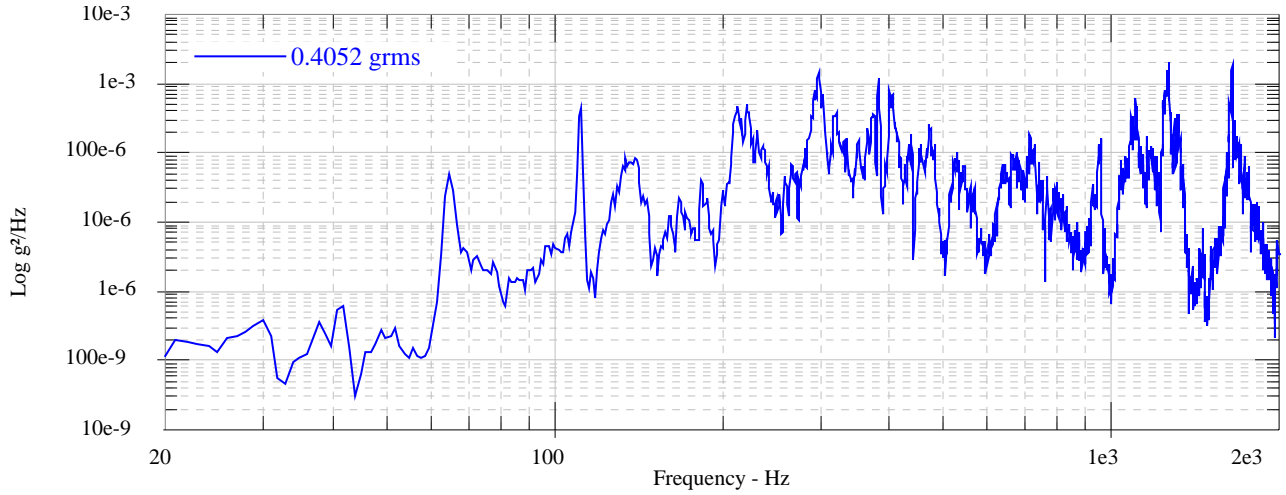


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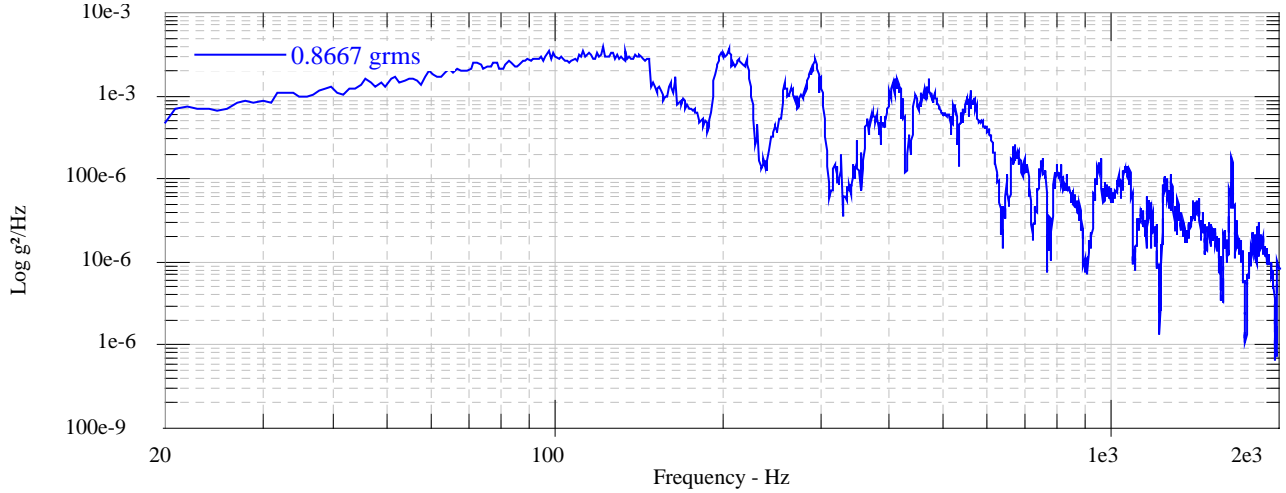
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Date : 1-May-04
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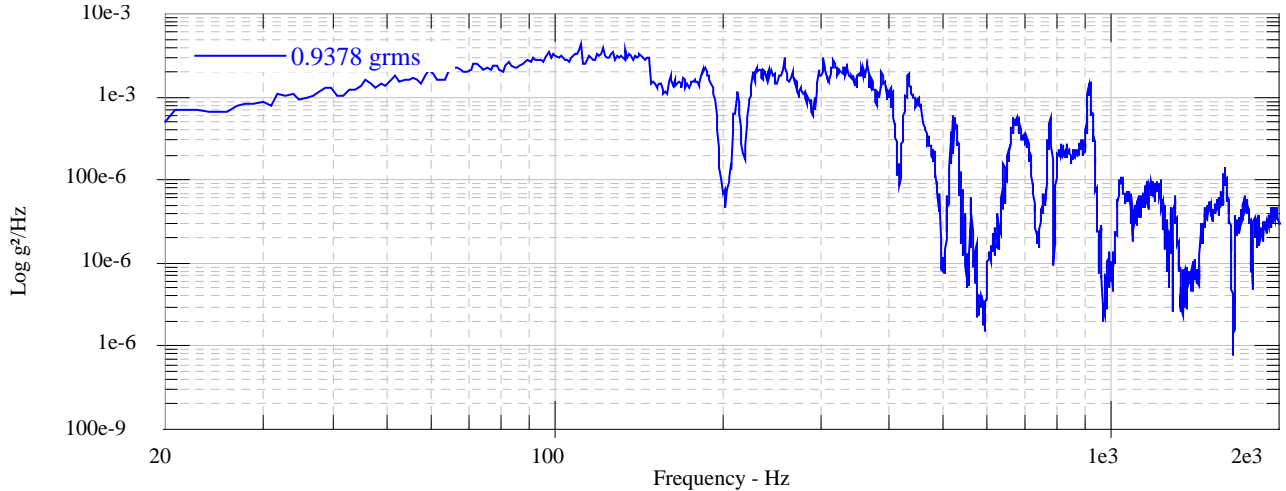
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

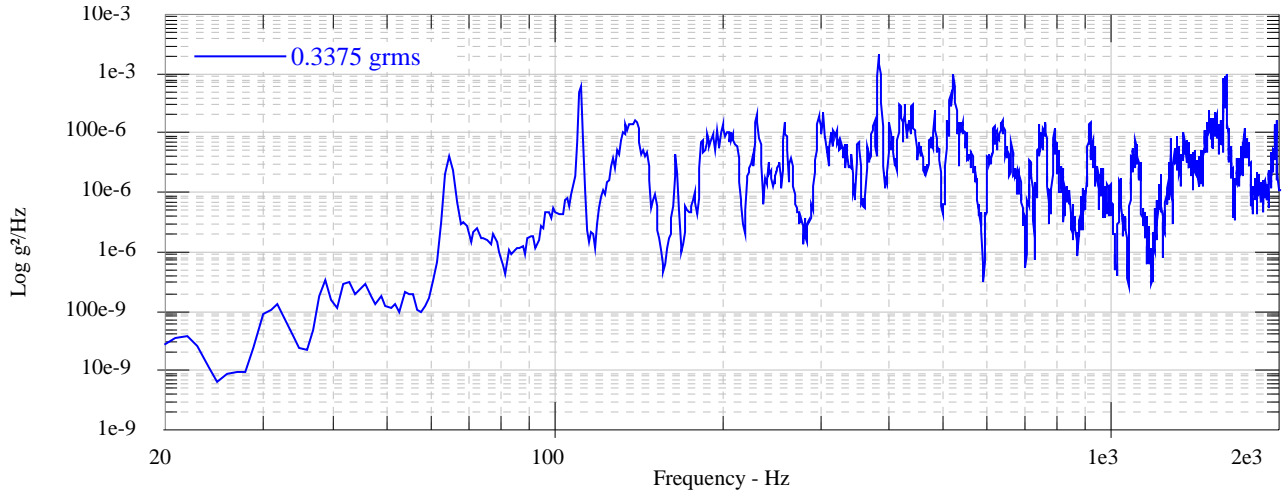


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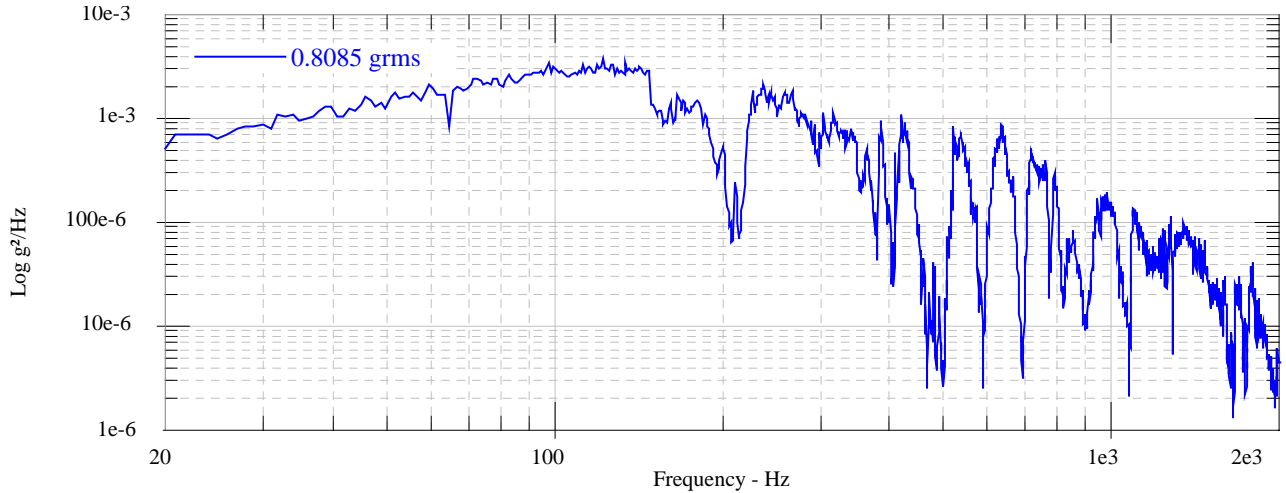
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Date : 1-May-04
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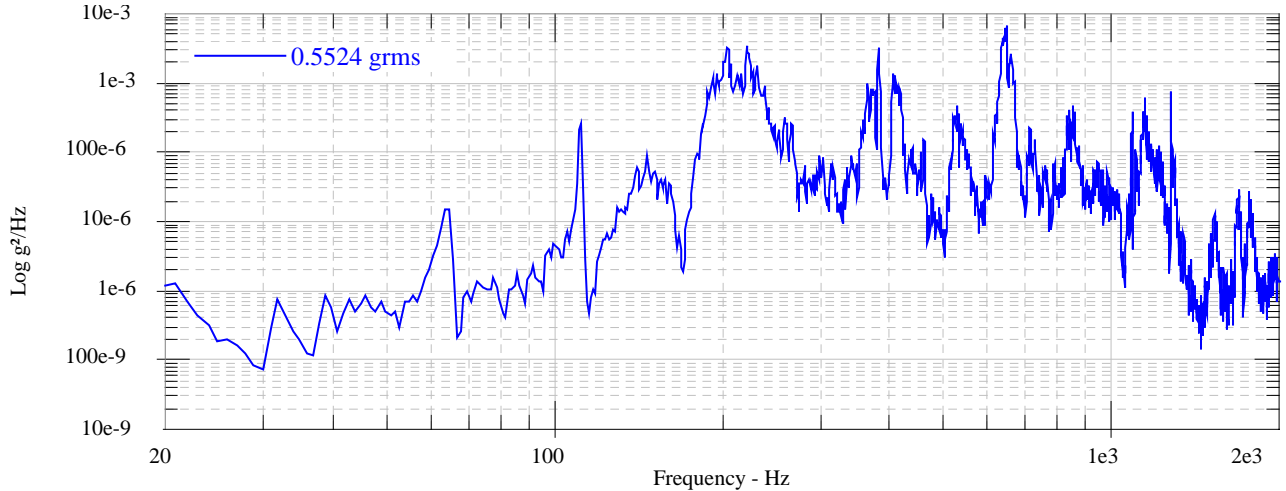
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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12.35 NIA10X.

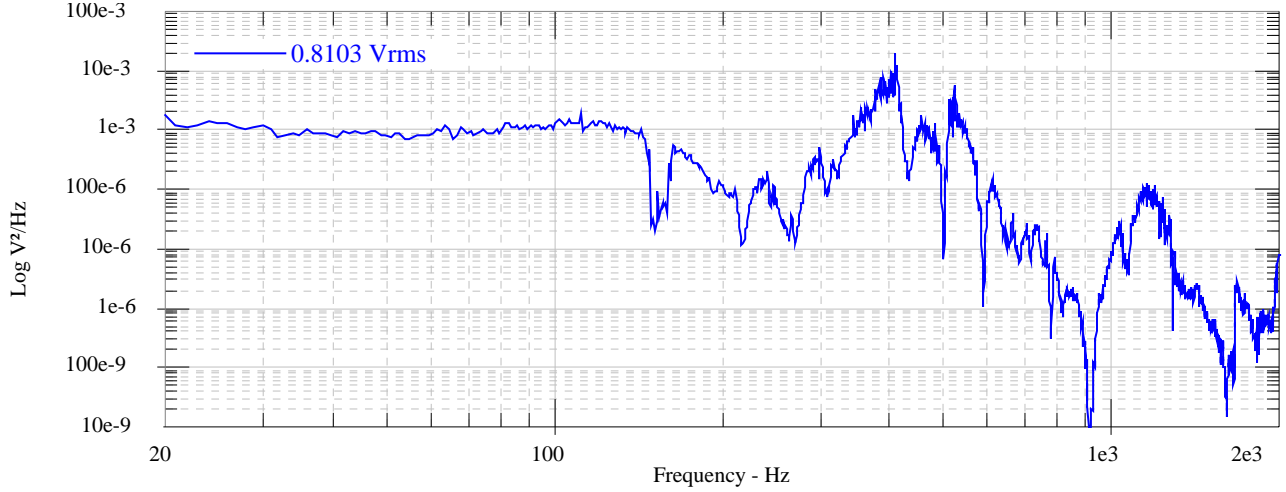
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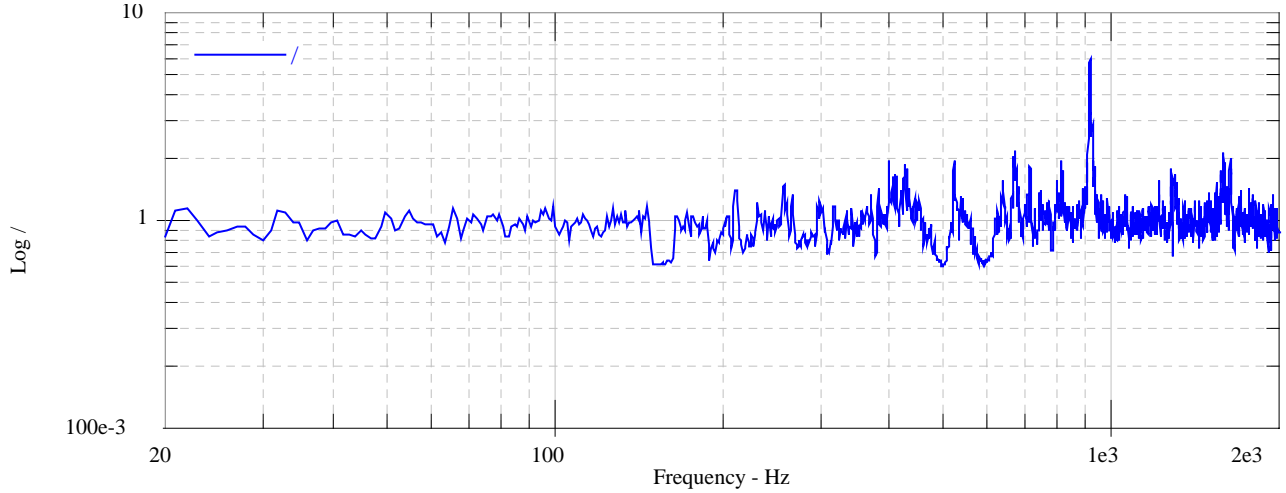
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Date : 1-May-04
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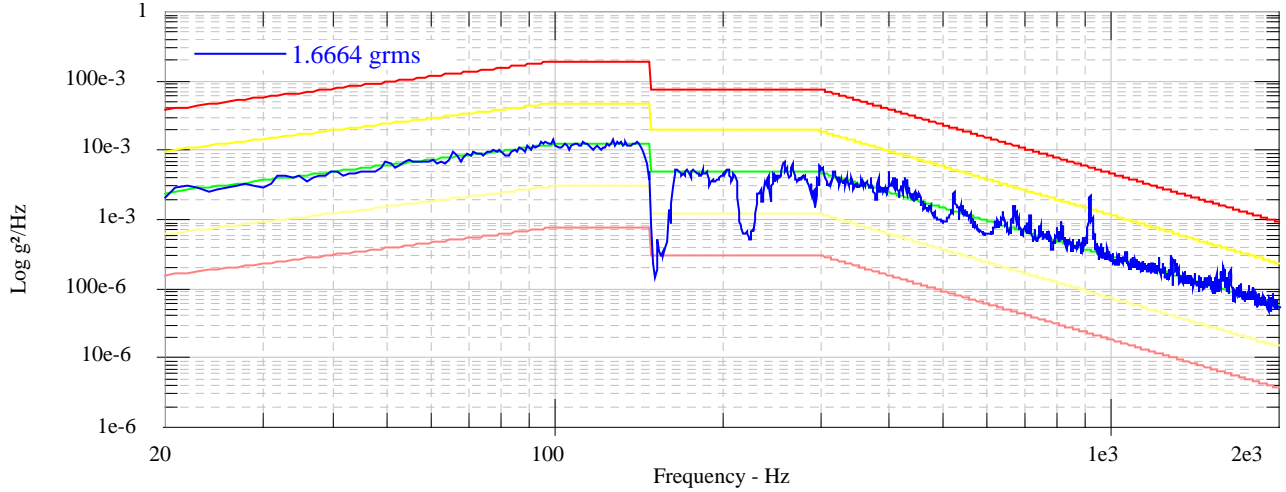
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

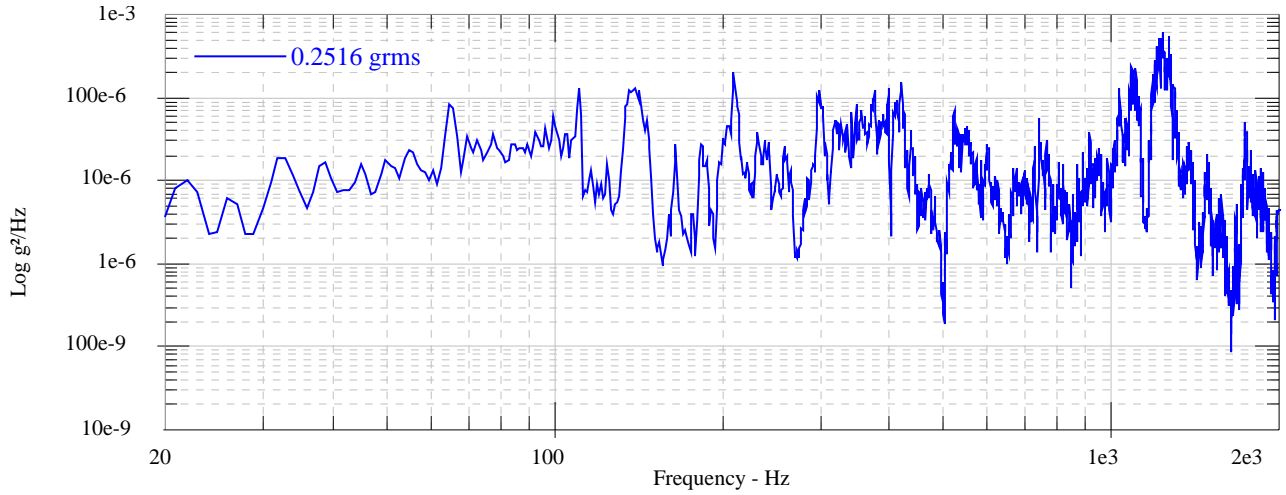


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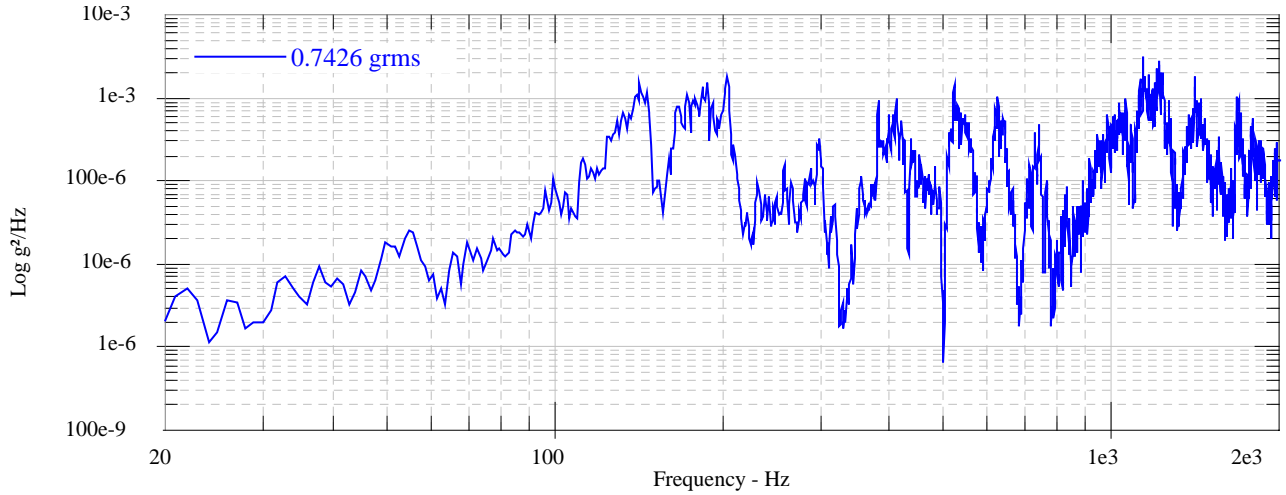
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Date : 1-May-04
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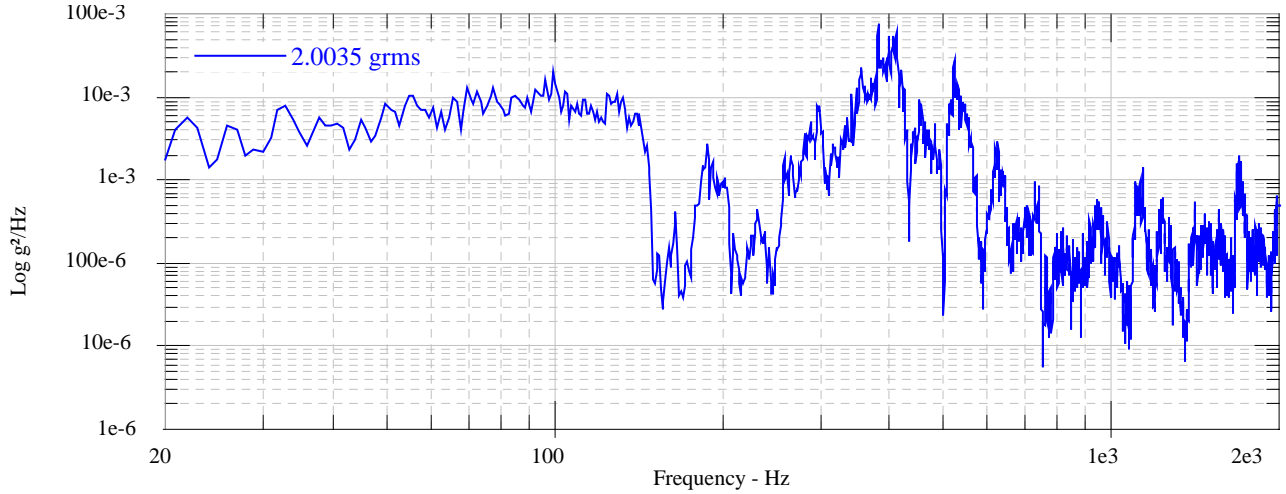
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

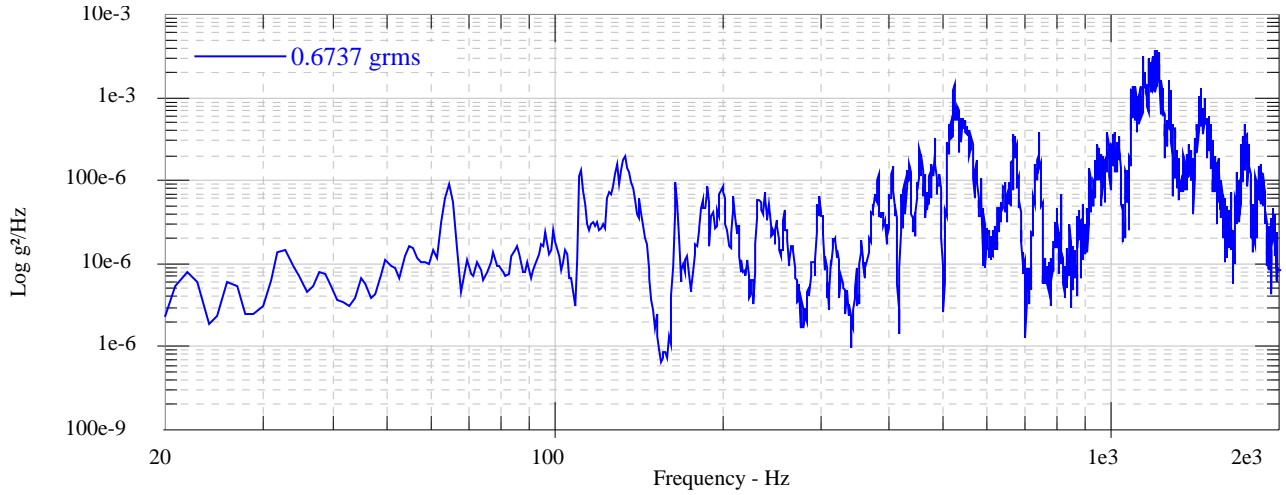


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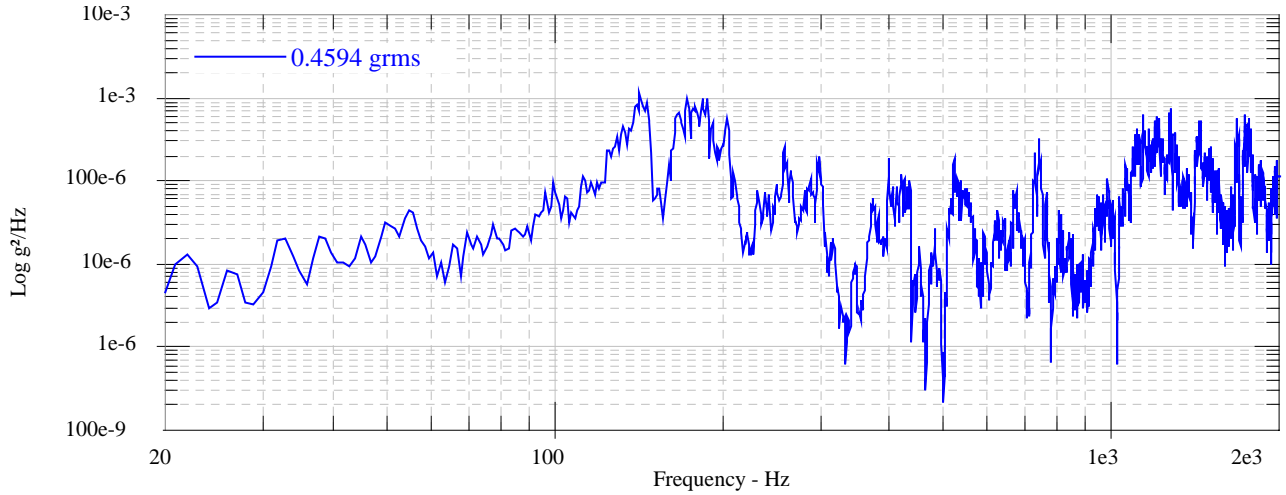
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Date : 1-May-04
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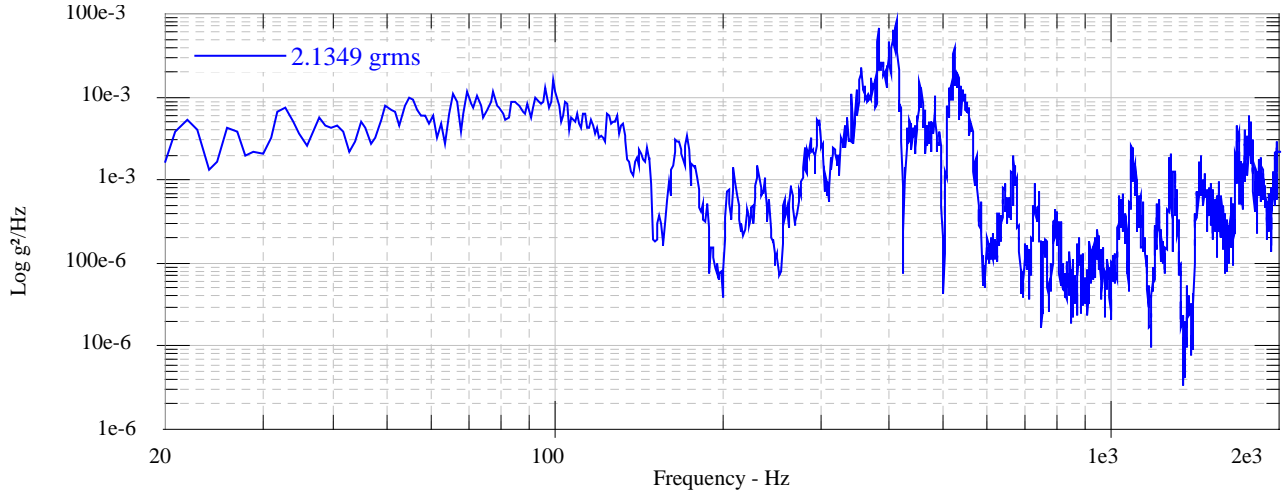
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

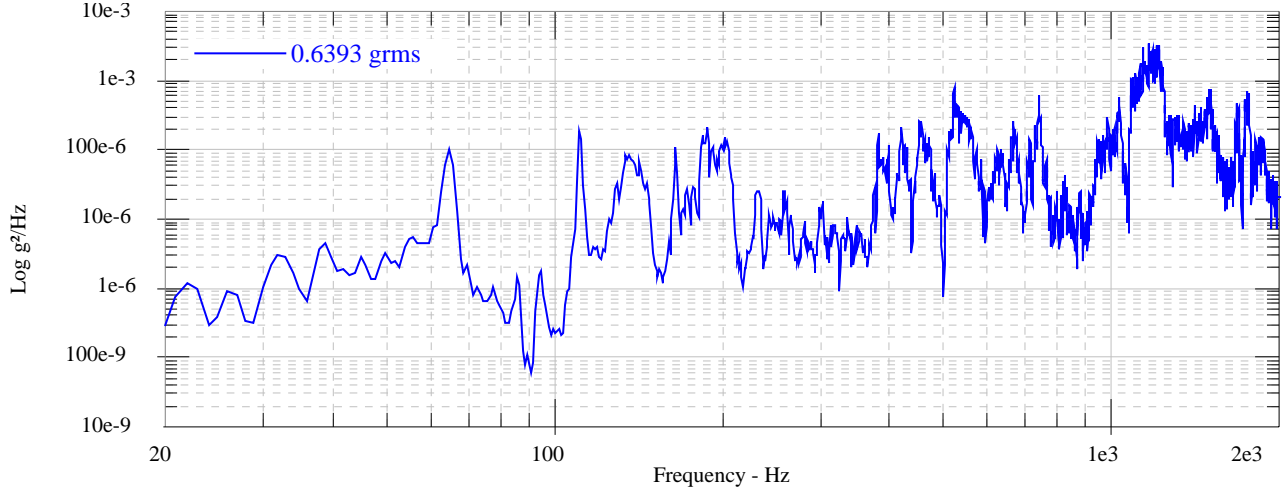


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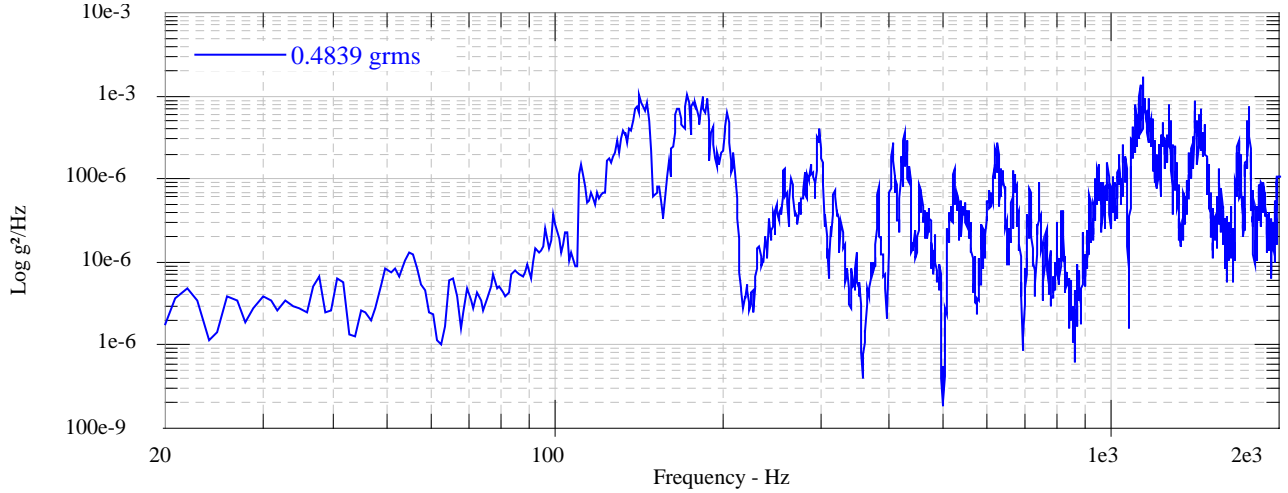
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Date : 1-May-04
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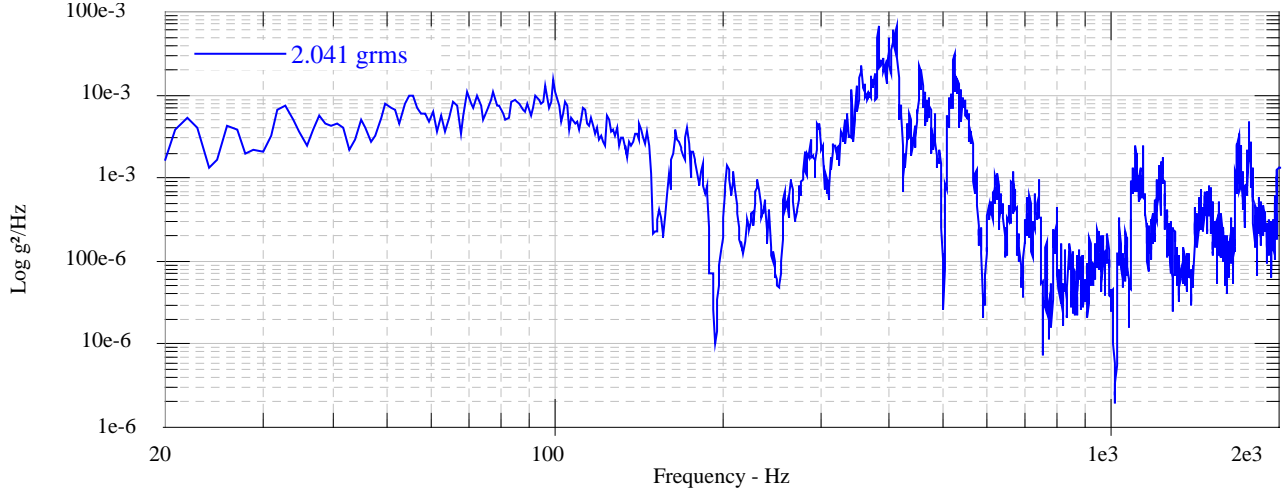
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

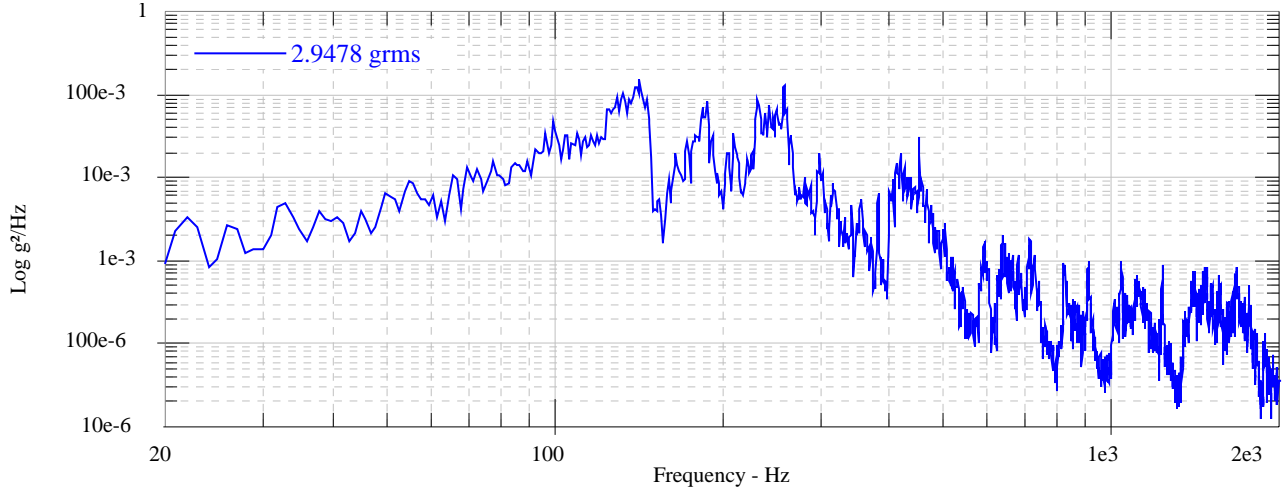


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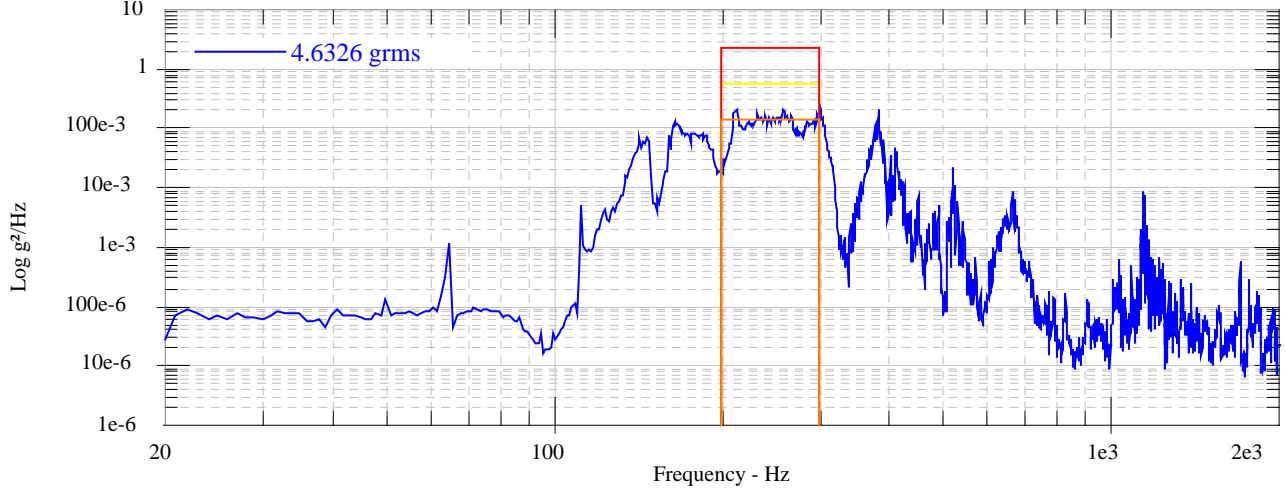
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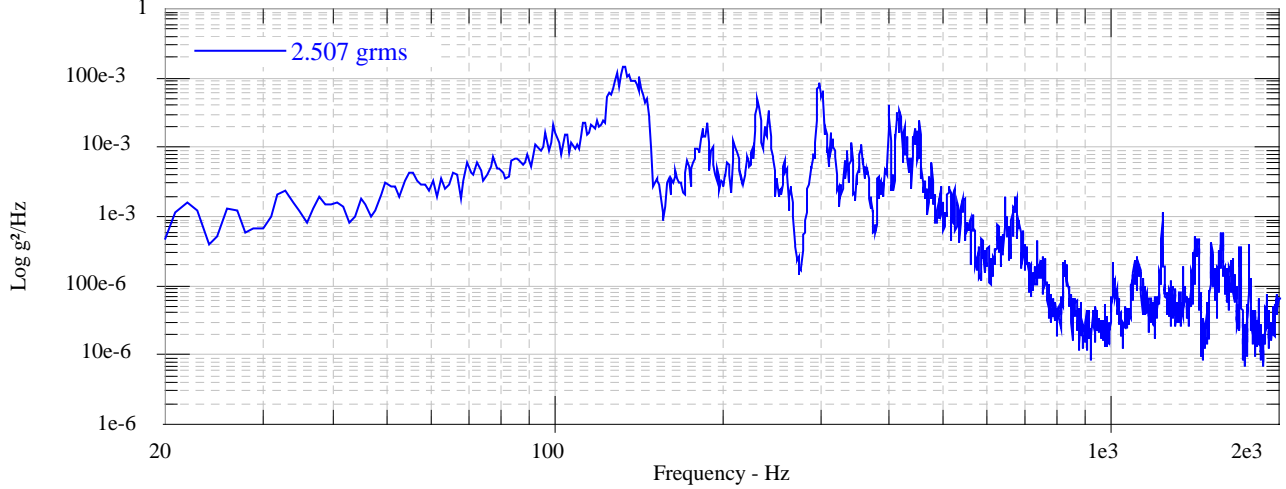
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PHS.Z Channel n° 11



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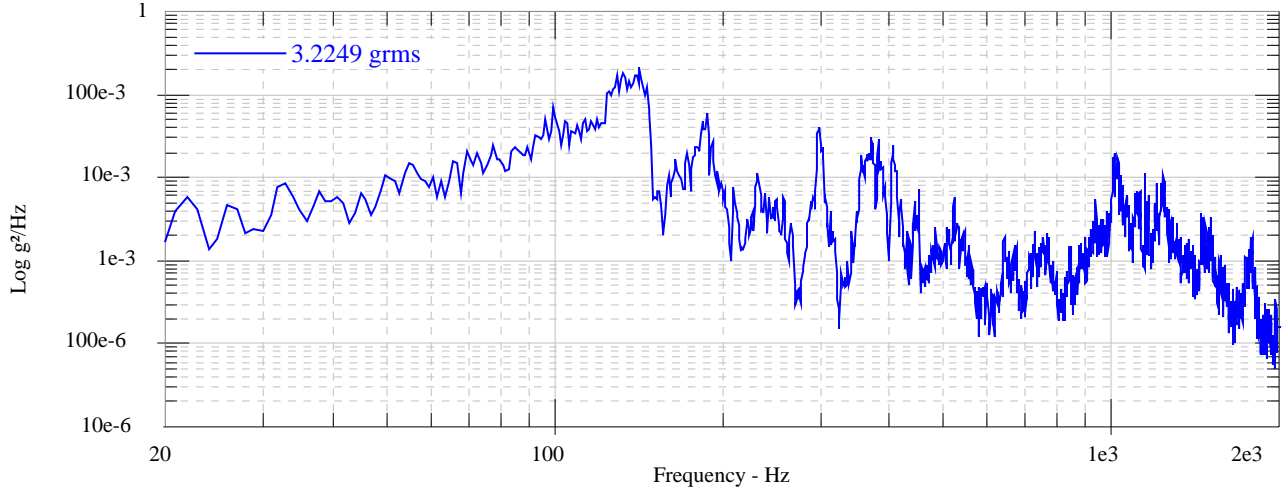


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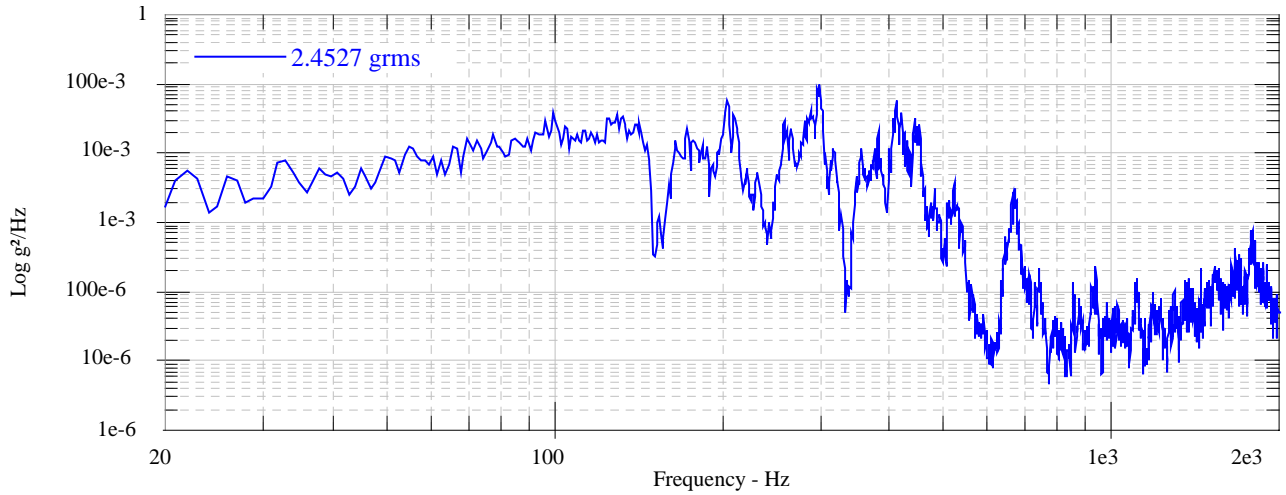
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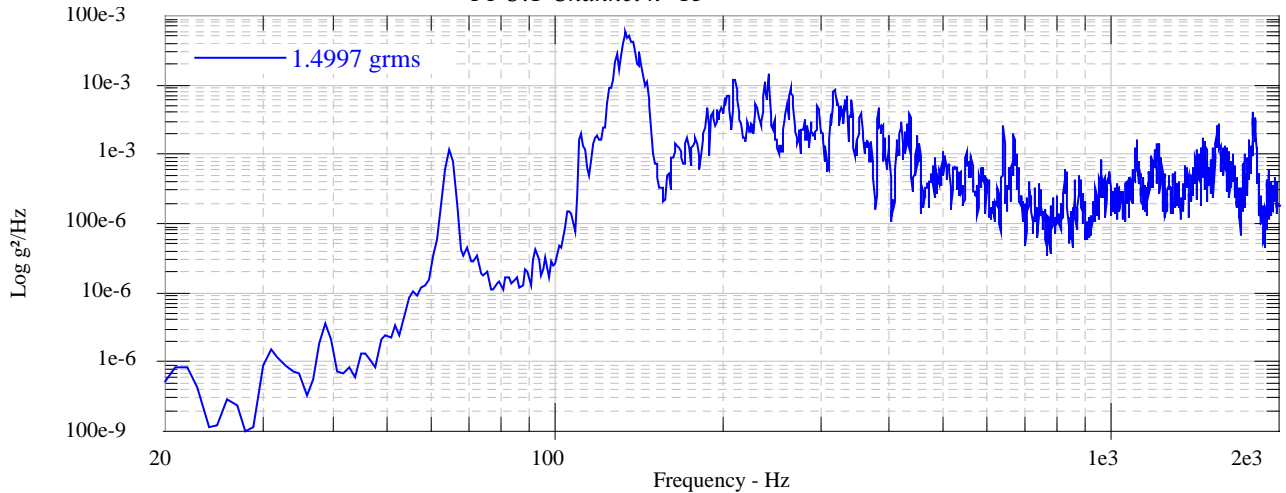
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FPU.X Channel n° 14



FPU.Y Channel n° 15

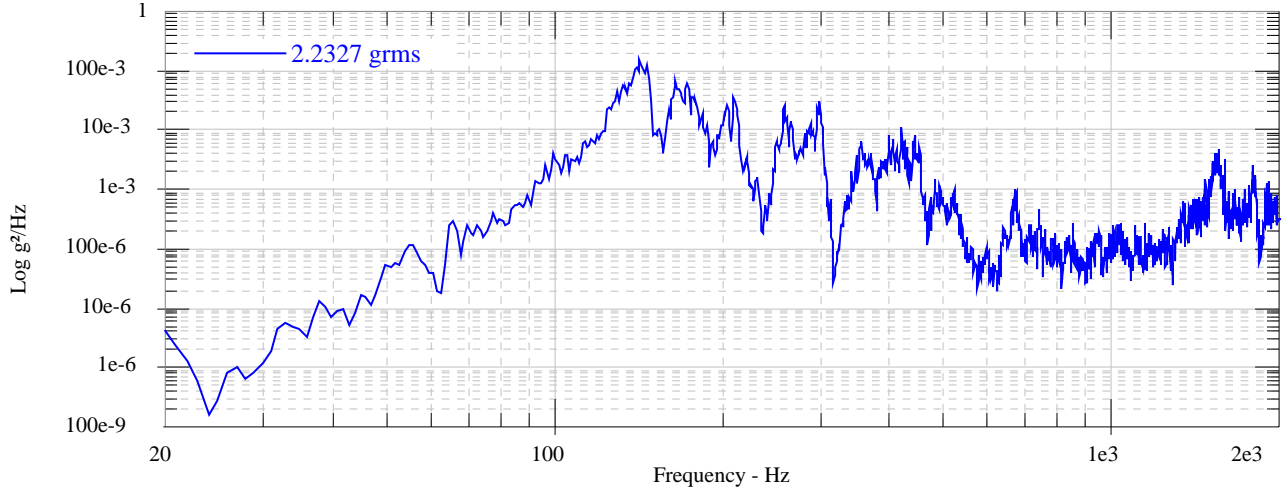


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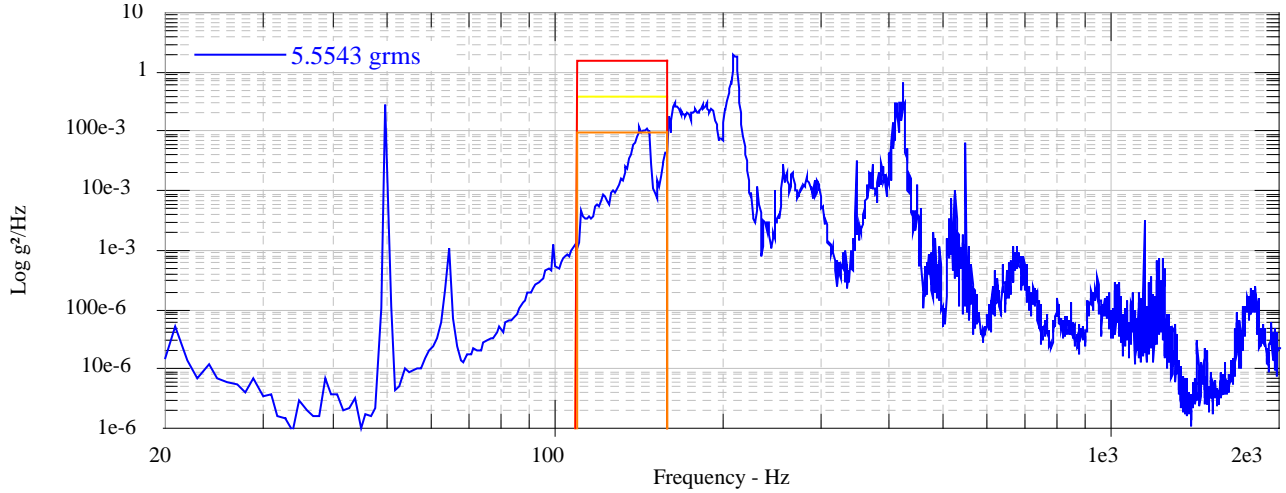
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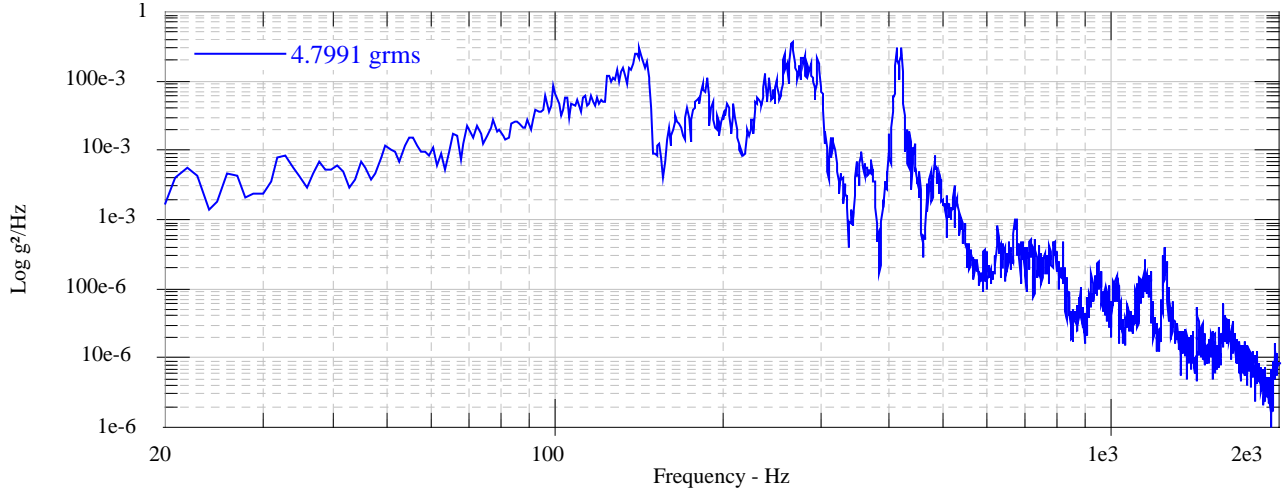
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

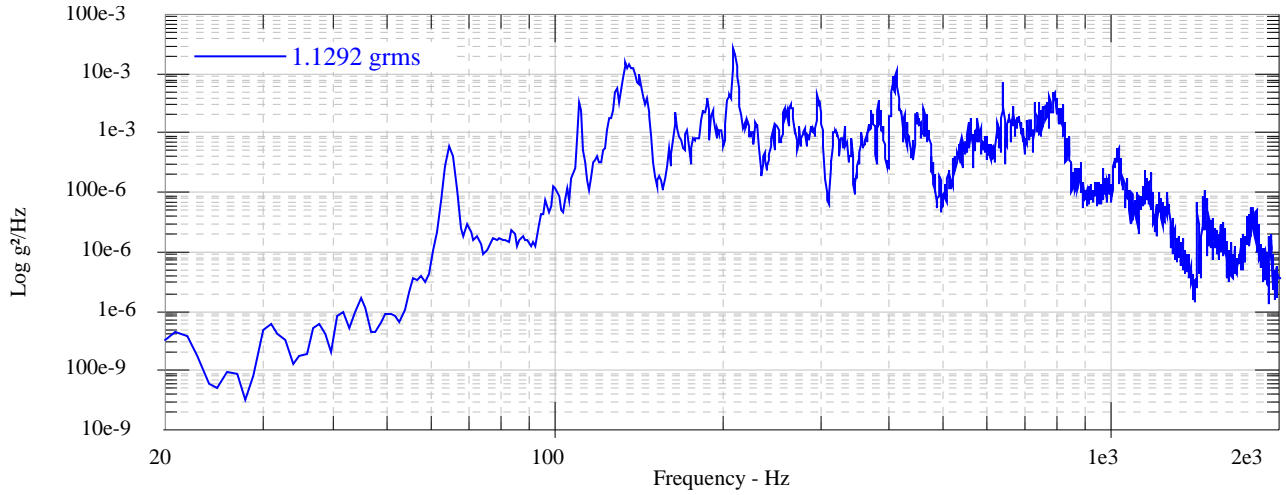


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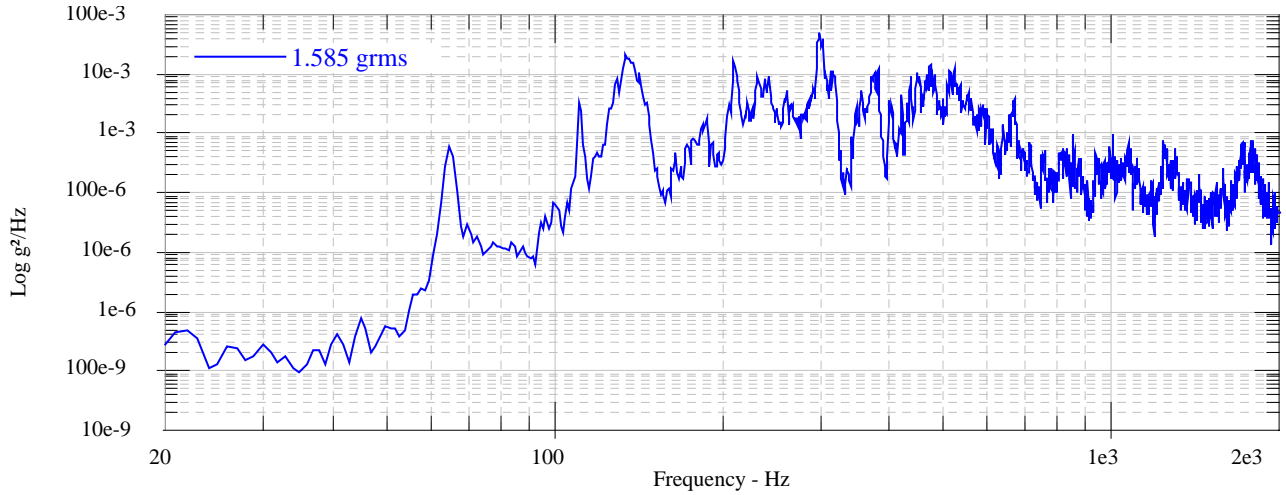
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Date : 1-May-04
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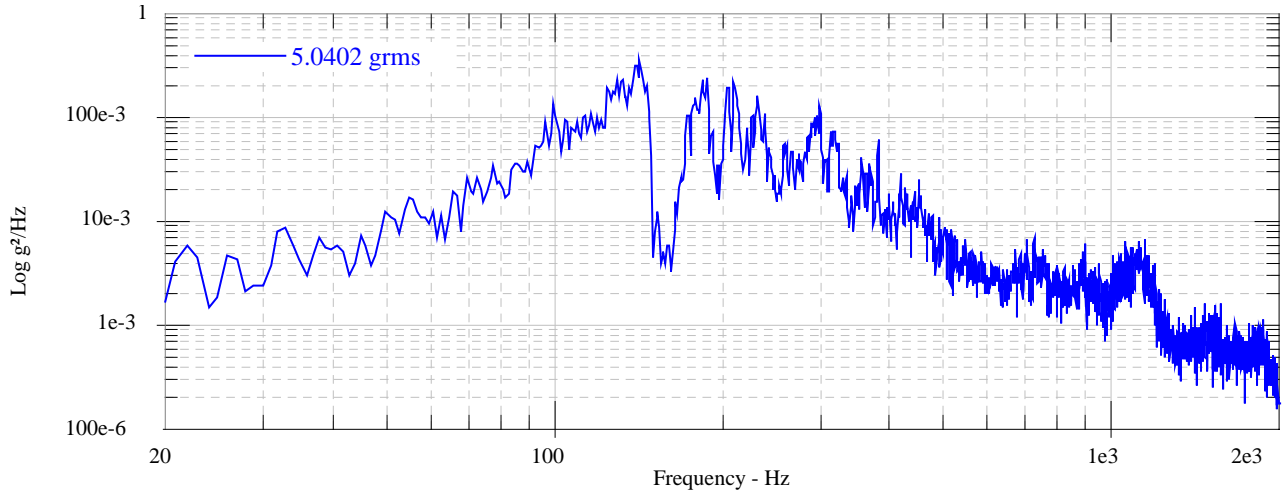
SPEC.Y Channel n° 19



OB.Y Channel n° 20



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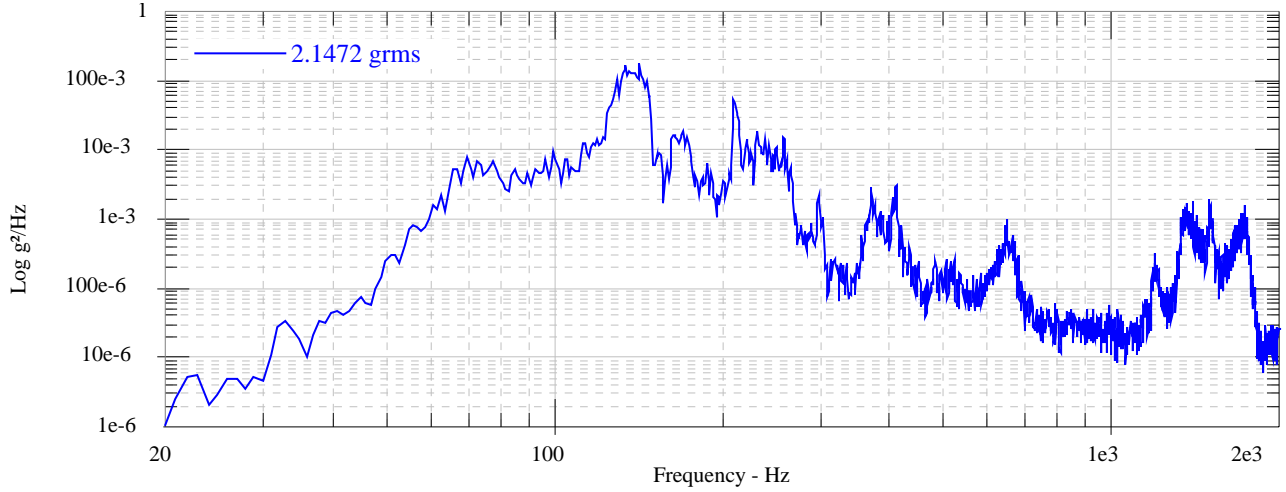


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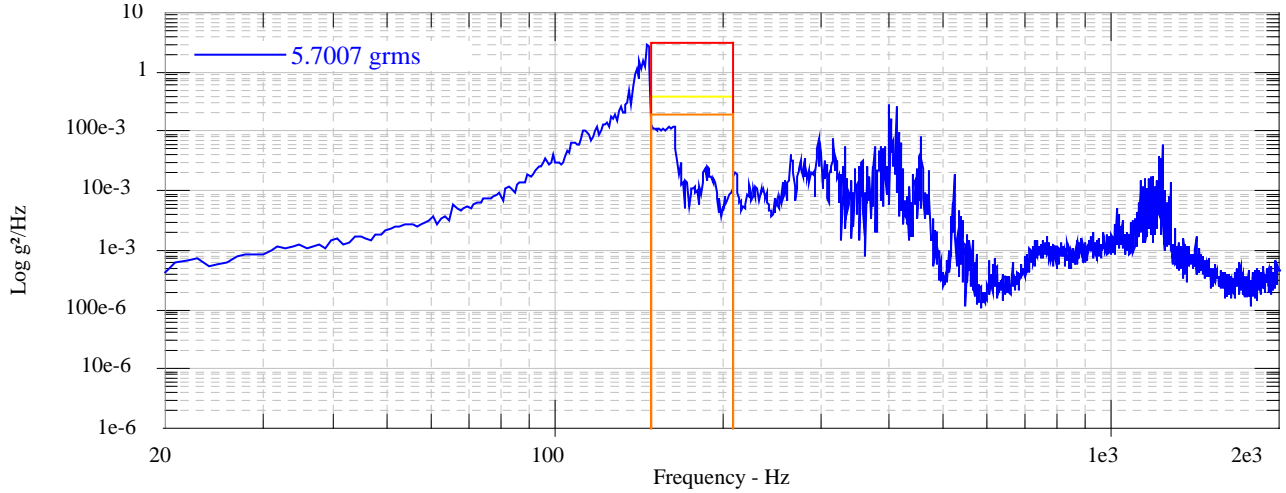
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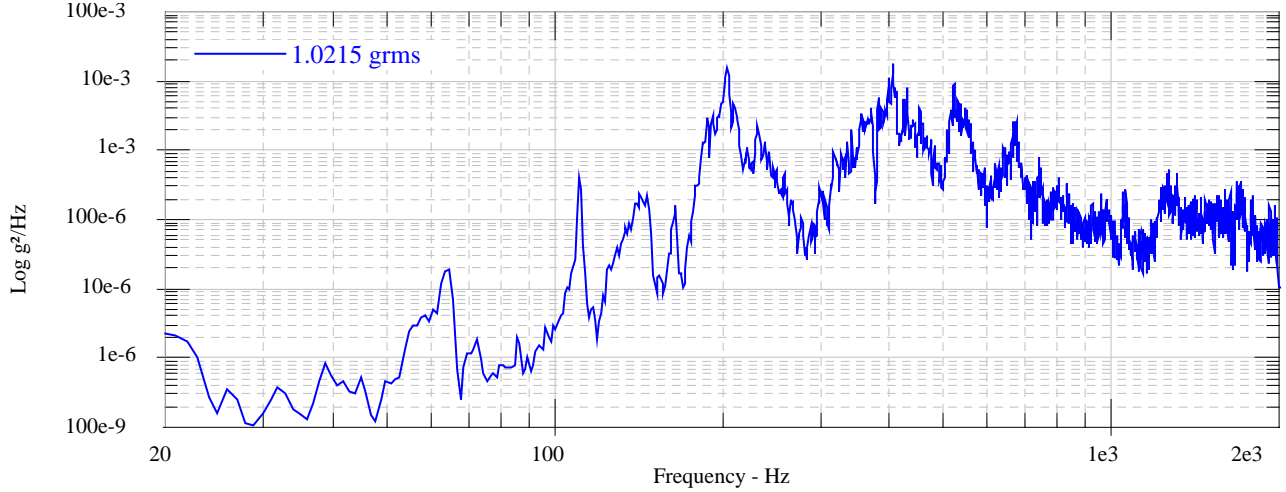
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SMECU.X Channel n° 23



CONE.Z Channel n° 24

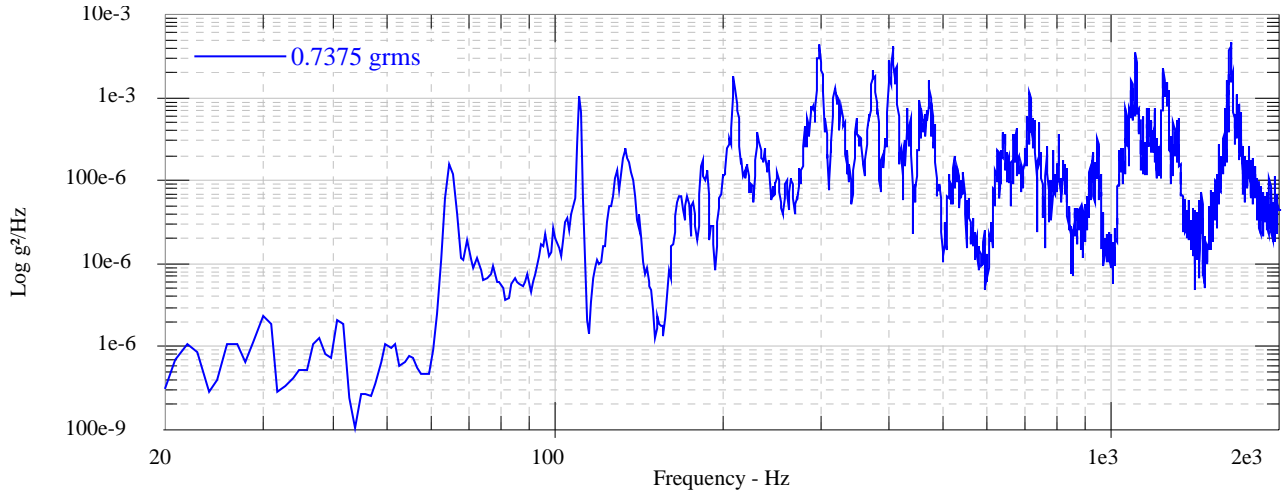


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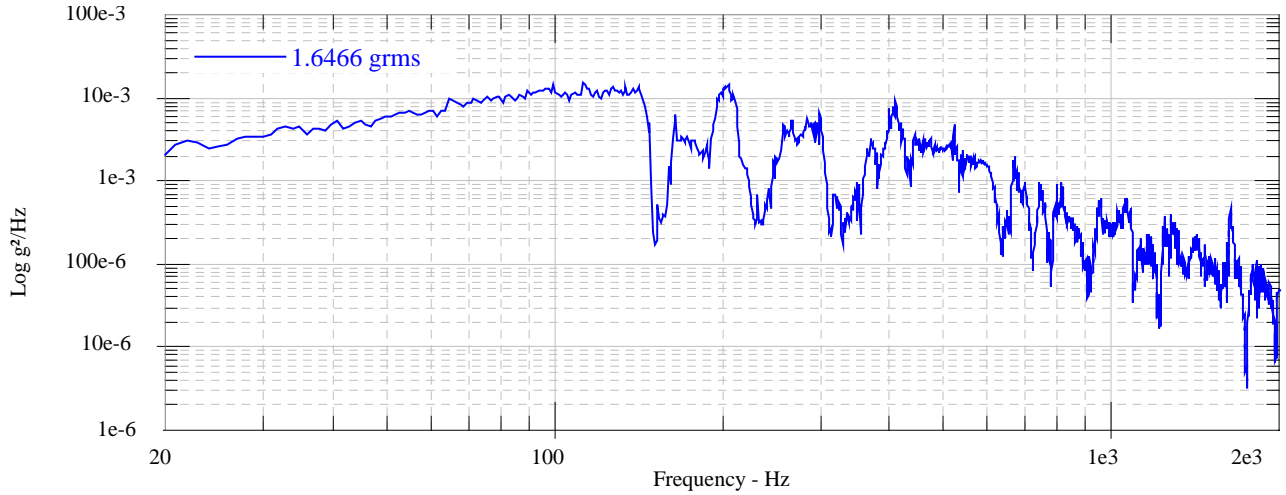
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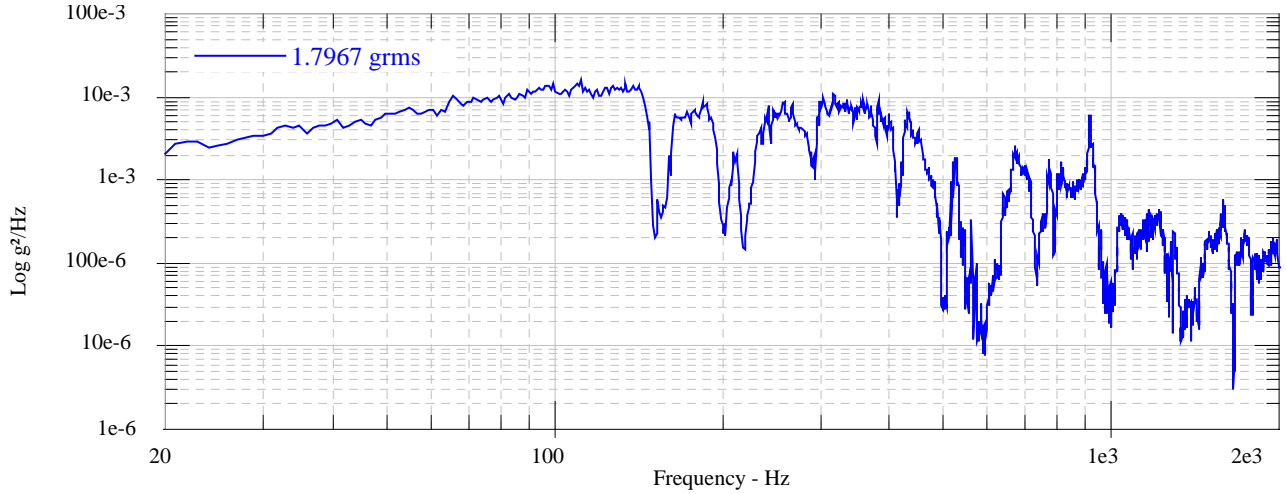
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

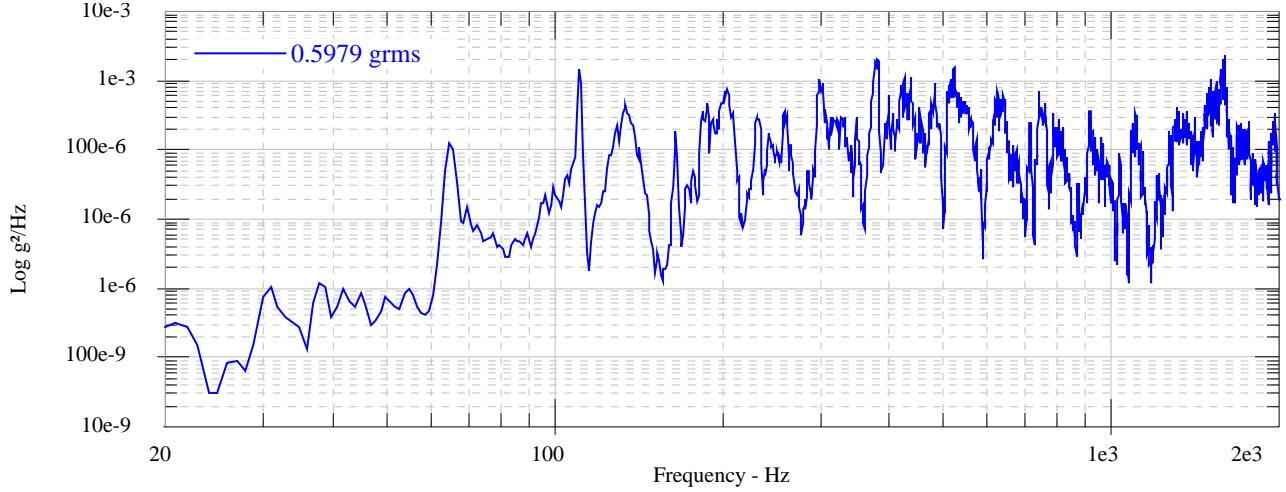


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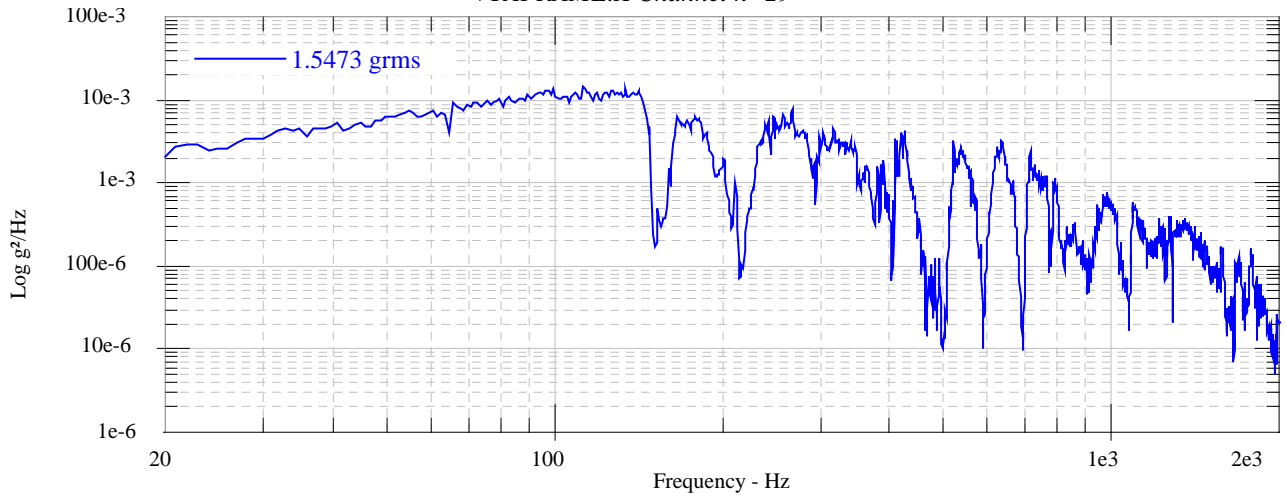
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Date : 1-May-04
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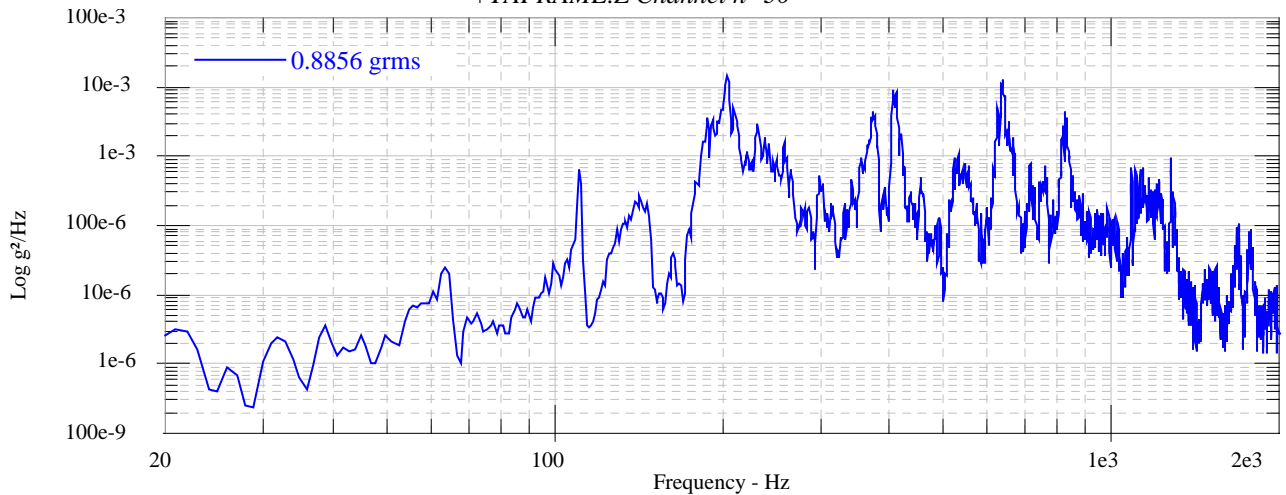
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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SPIRE QM

RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
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12.36 NIA11X.

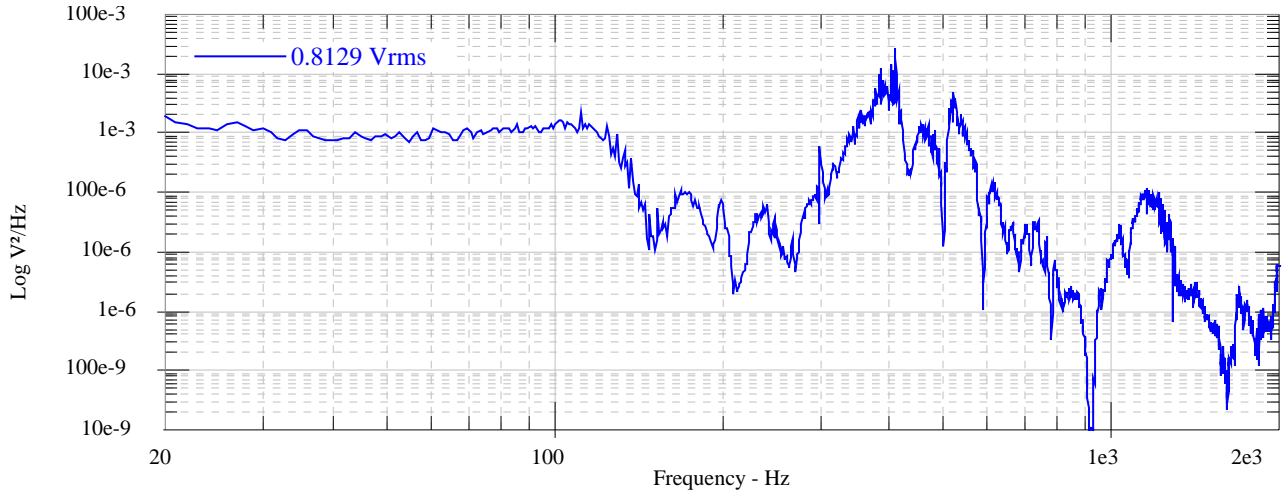
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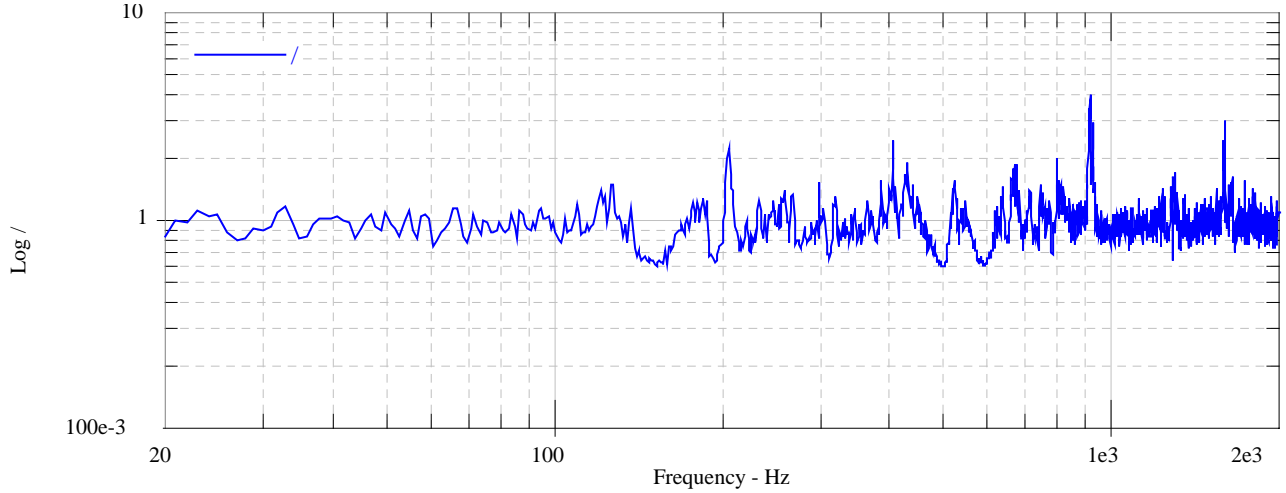
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Date : 1-May-04
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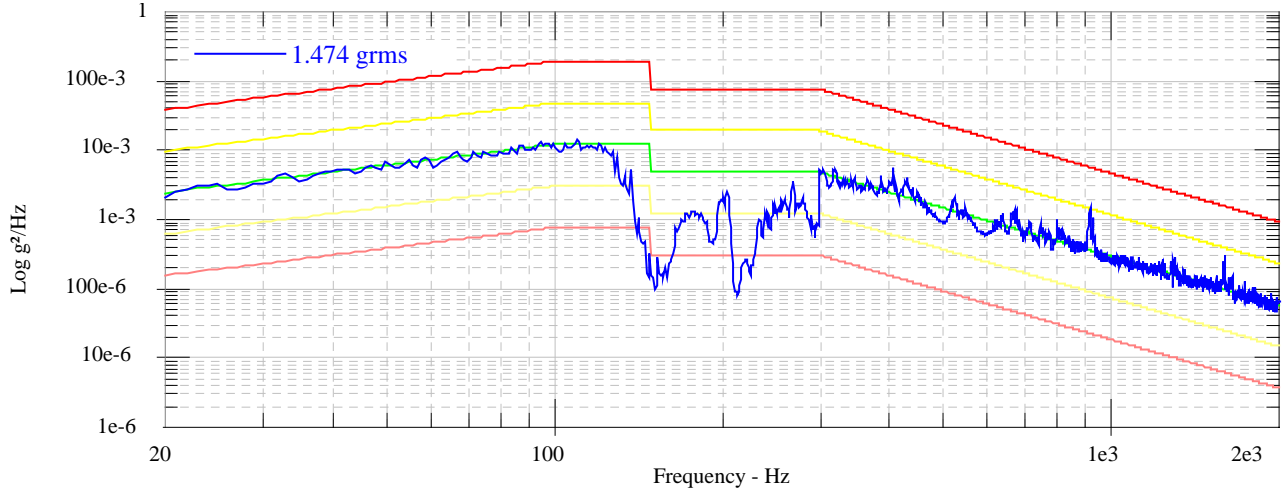
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Error Channel n° -1



Control Channel n° 0

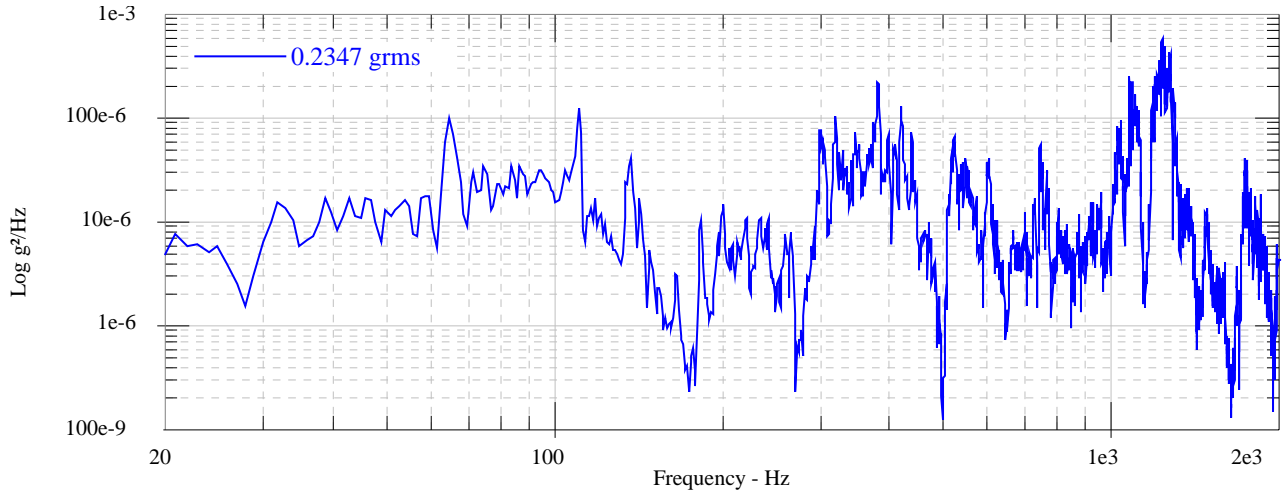


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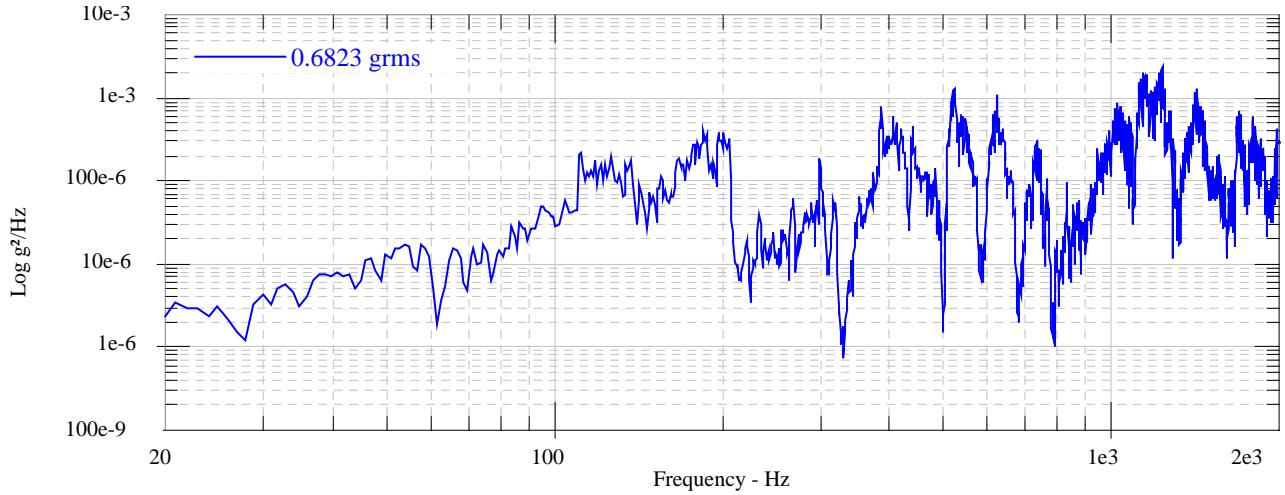
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Date : 1-May-04
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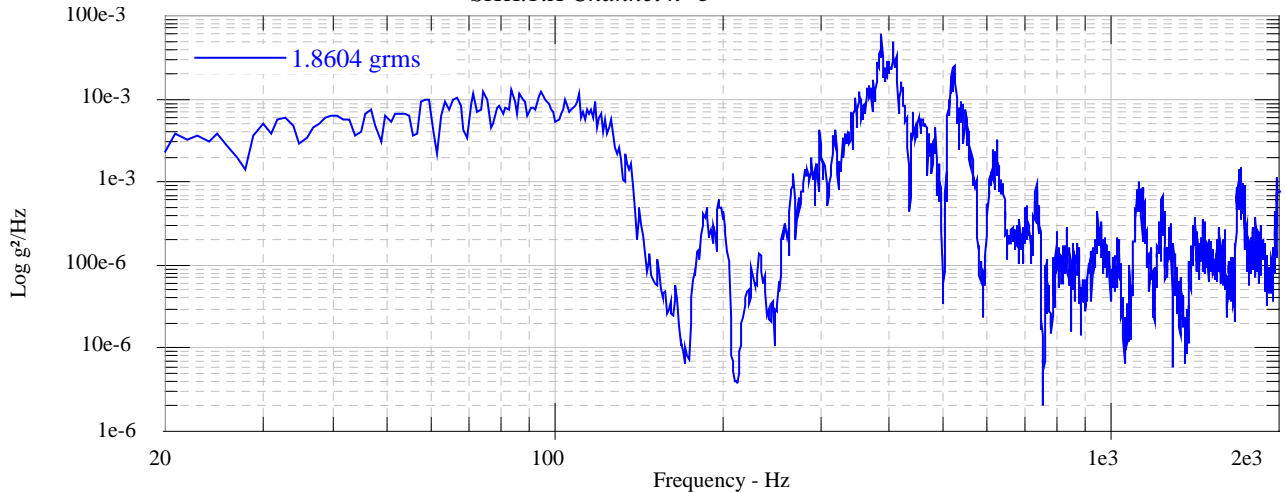
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

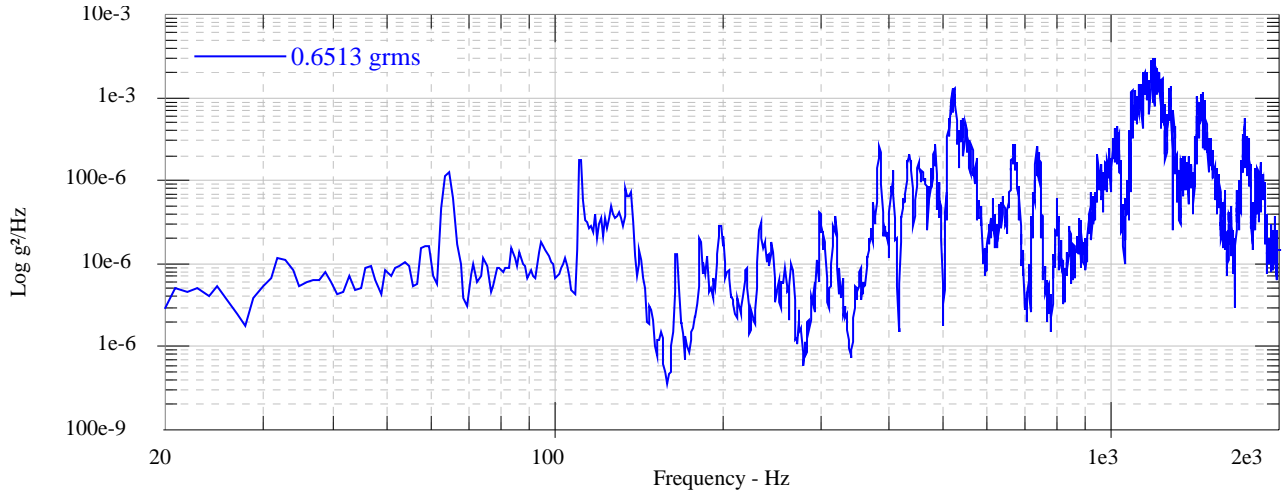


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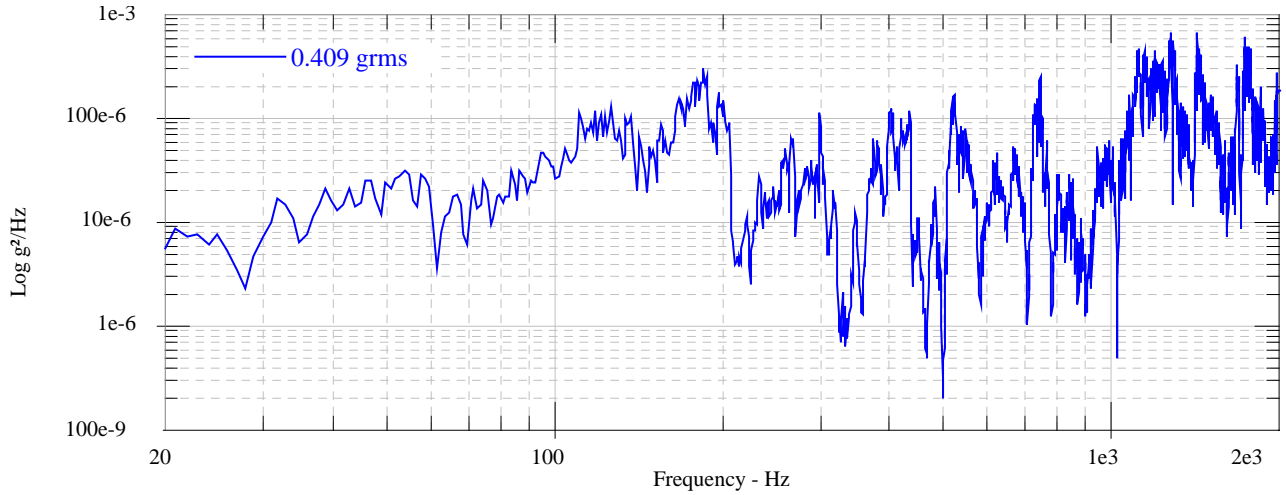
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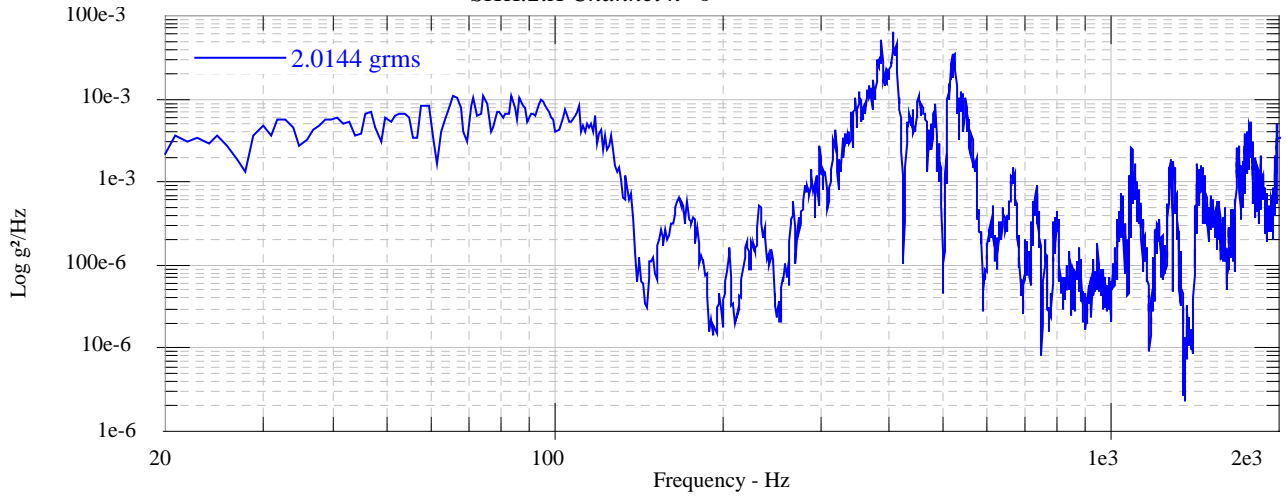
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

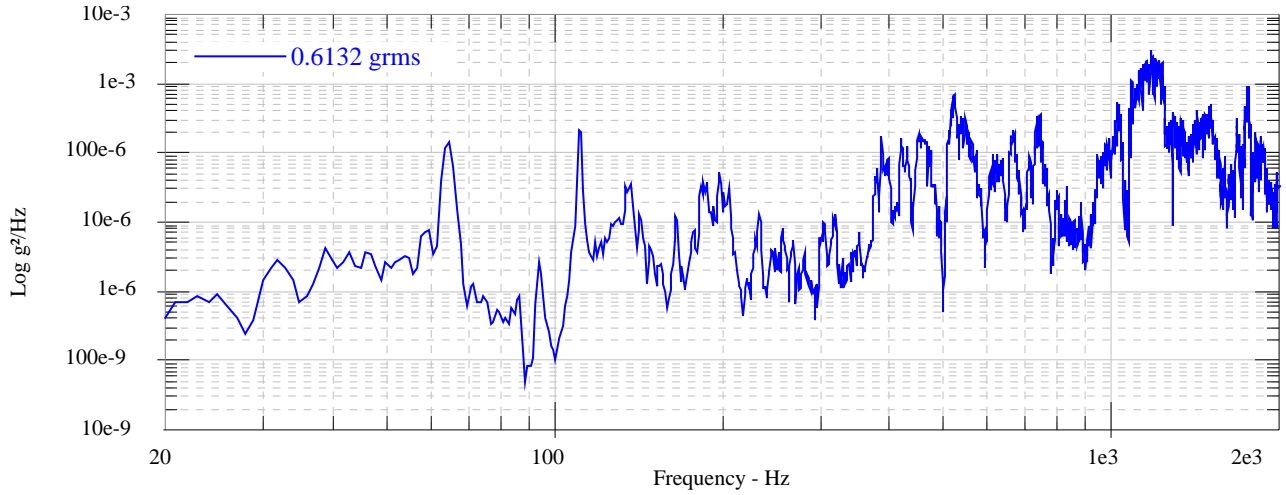


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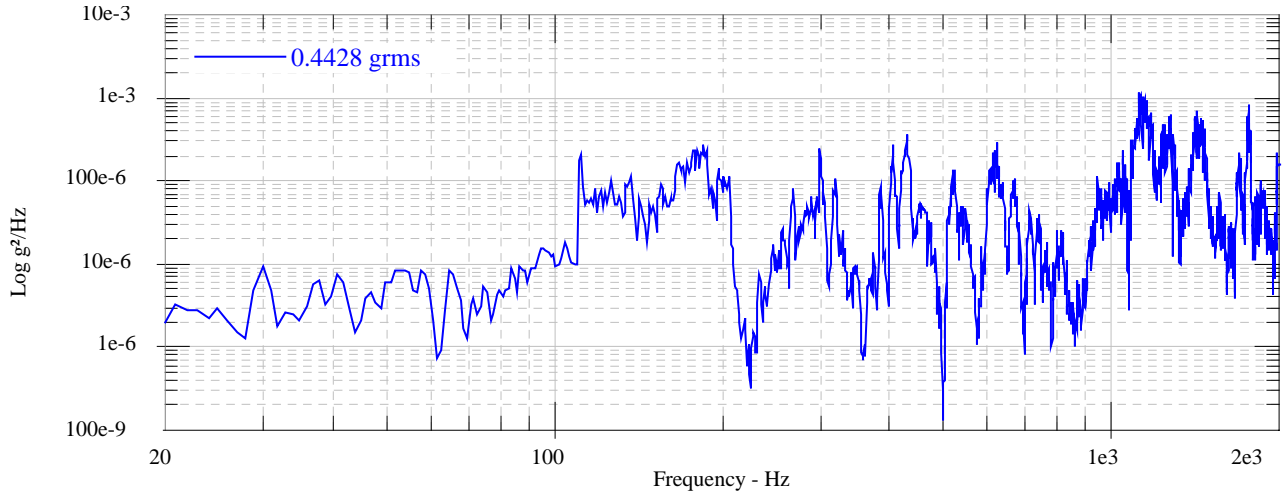
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Date : 1-May-04
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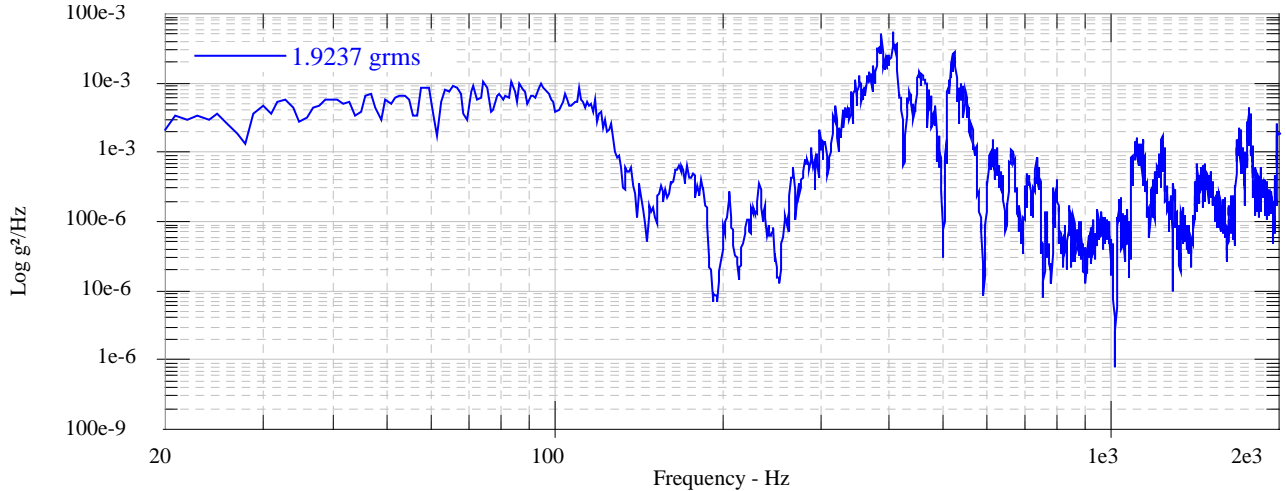
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

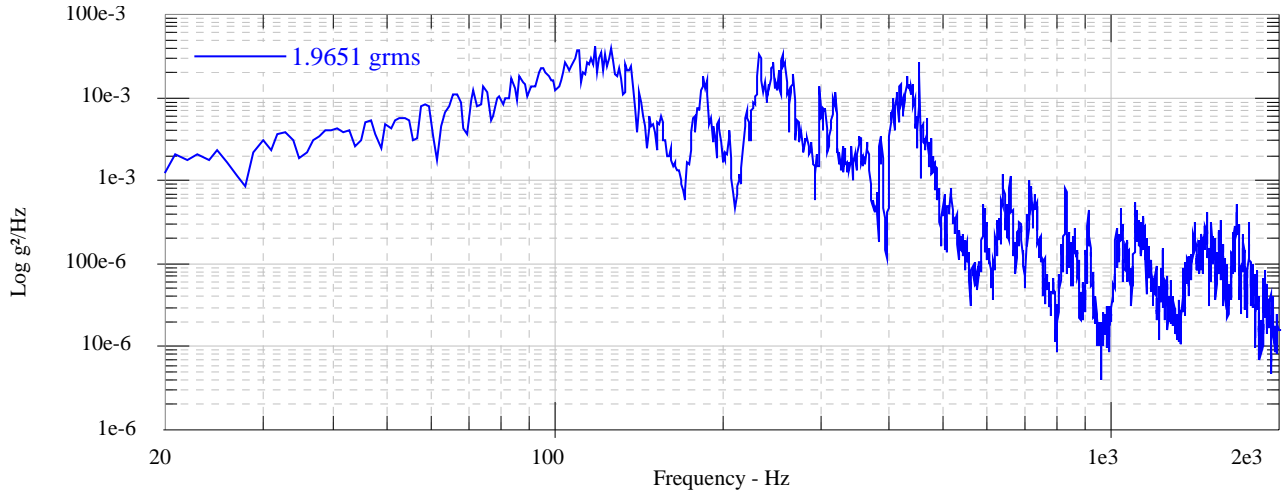


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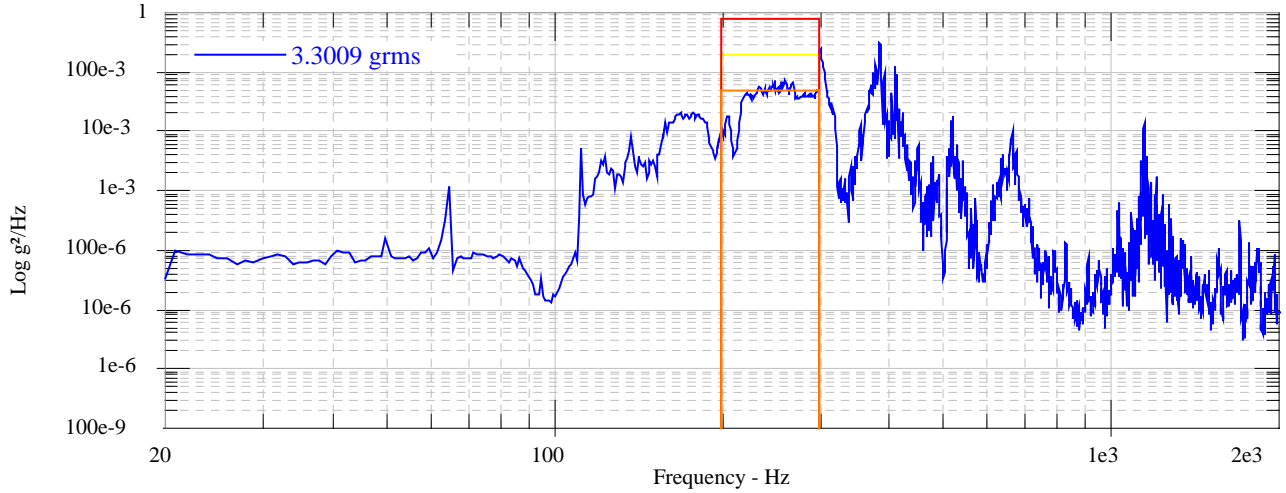
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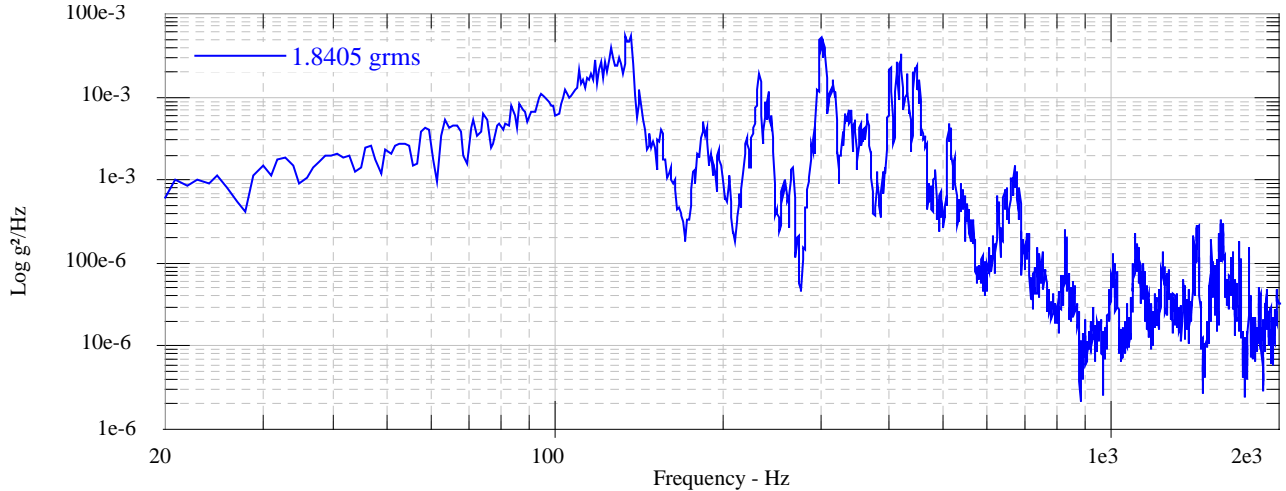
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

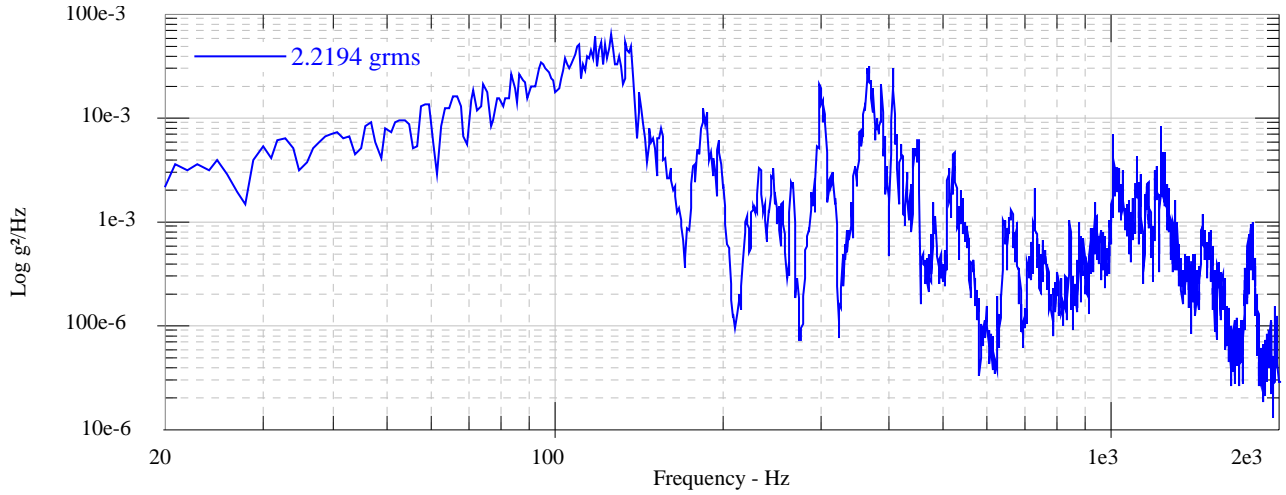


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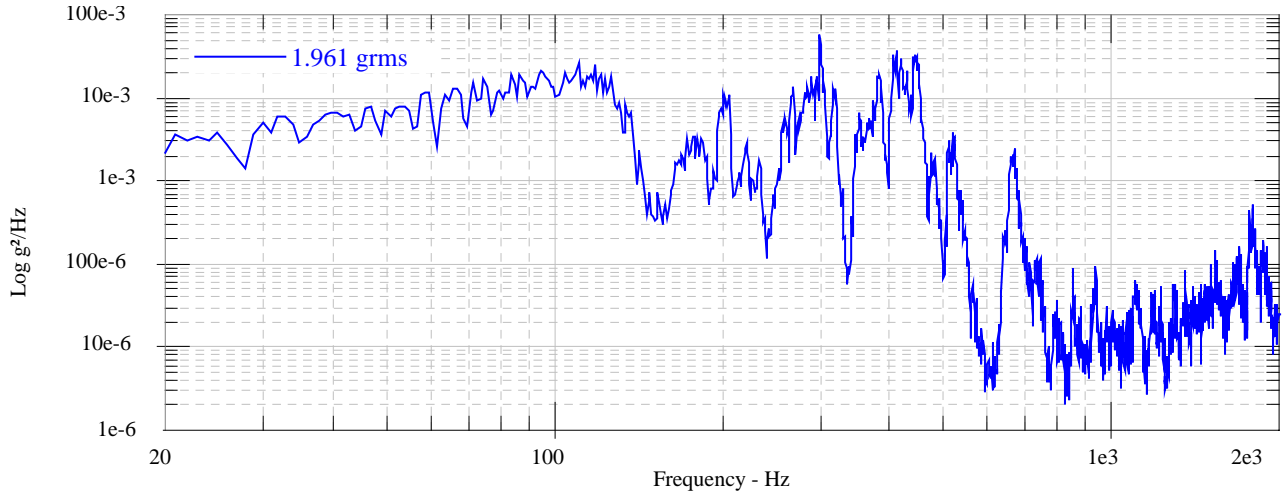
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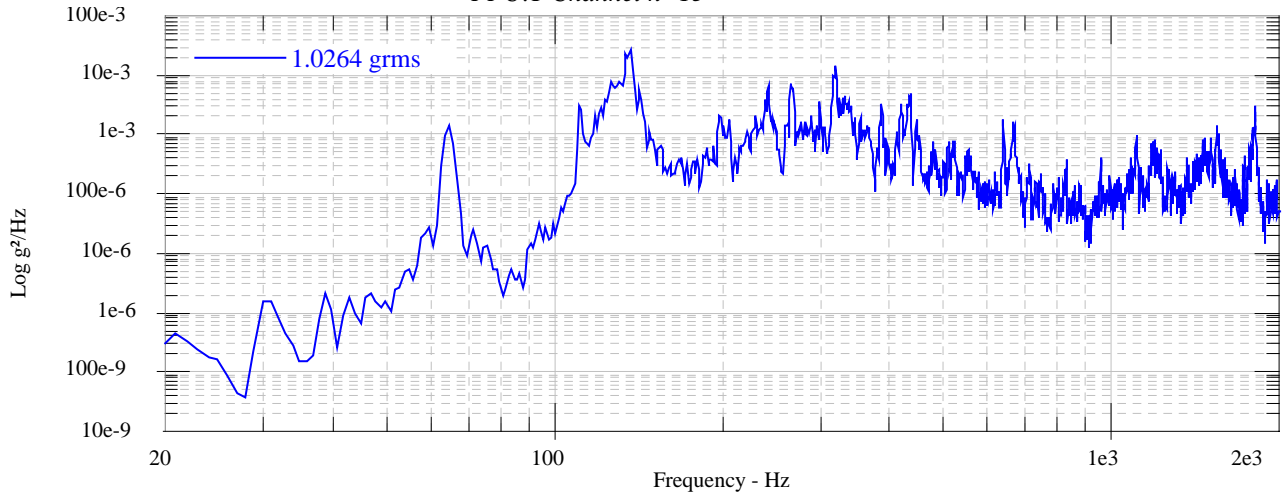
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FPU.X Channel n° 14



FPU.Y Channel n° 15

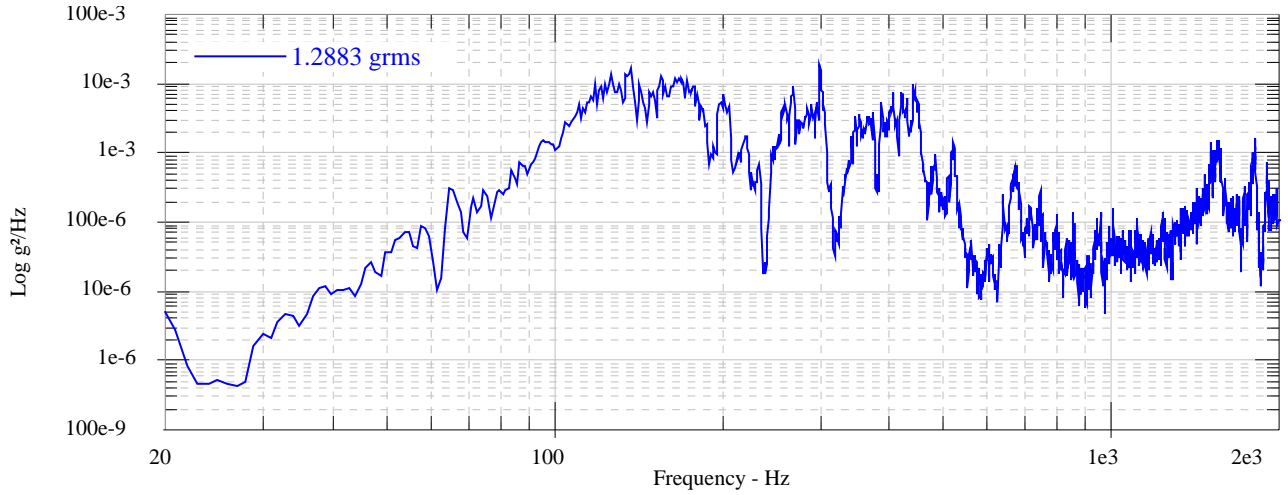


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SPIRE QM

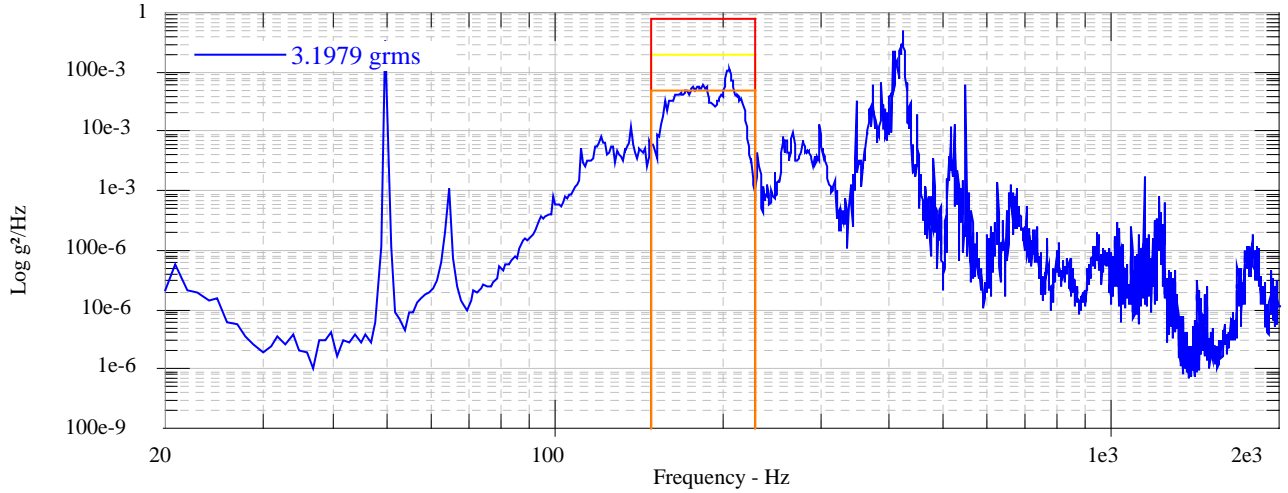
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Version : 01
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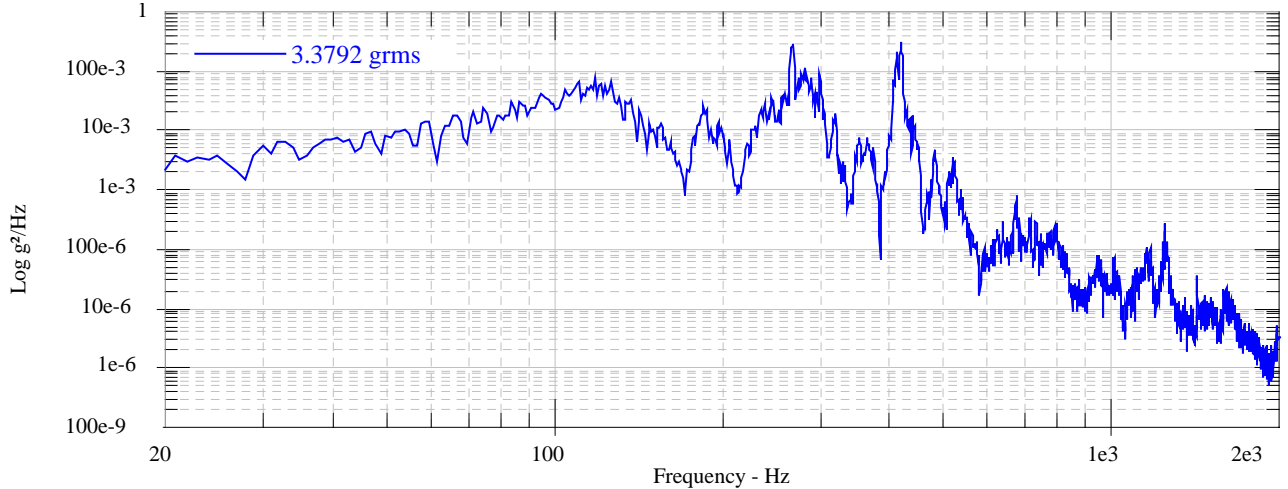
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

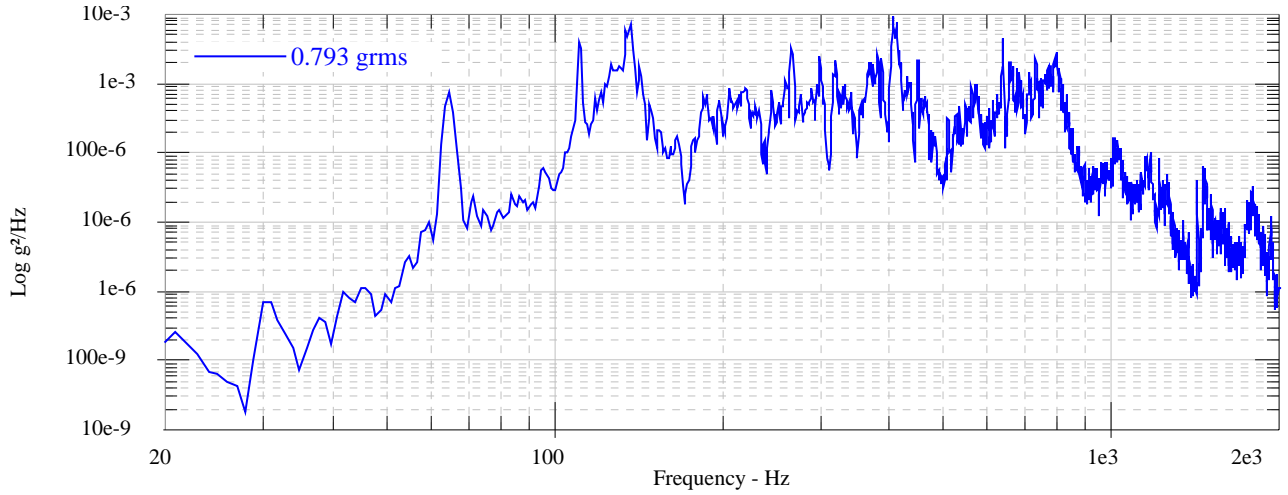


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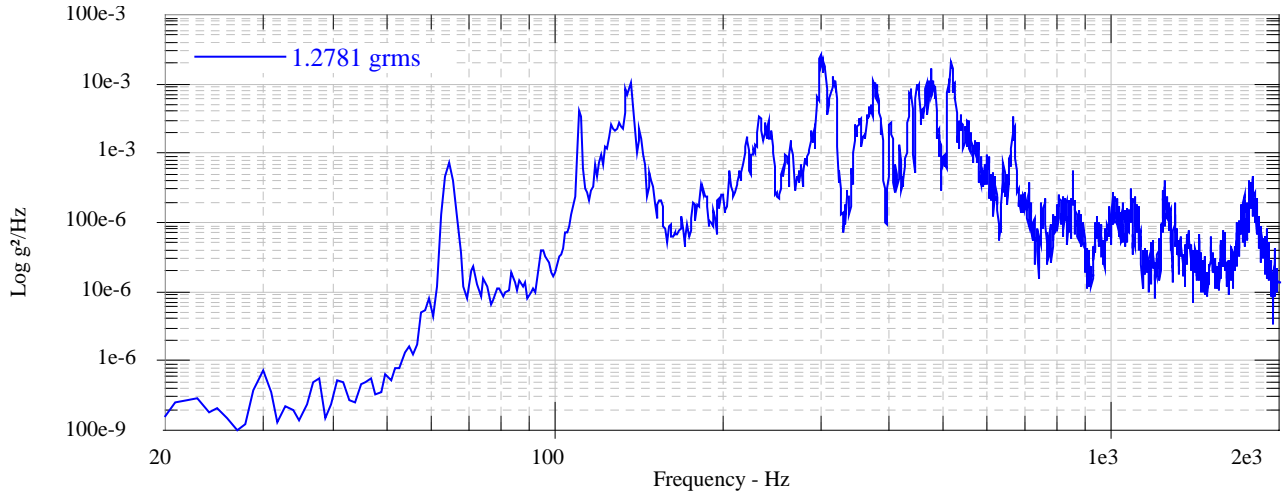
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Date : 1-May-04
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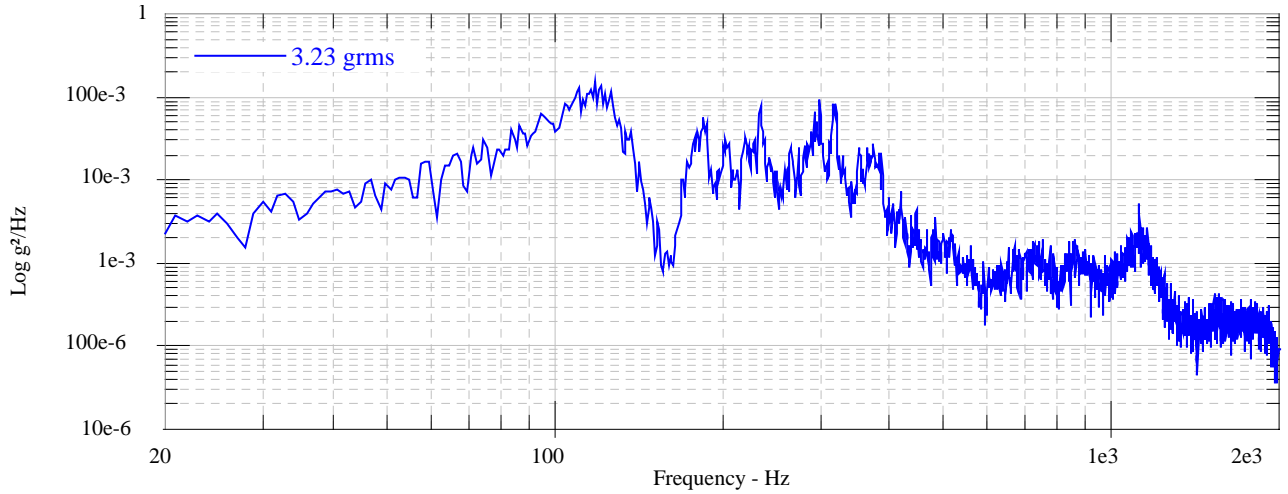
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

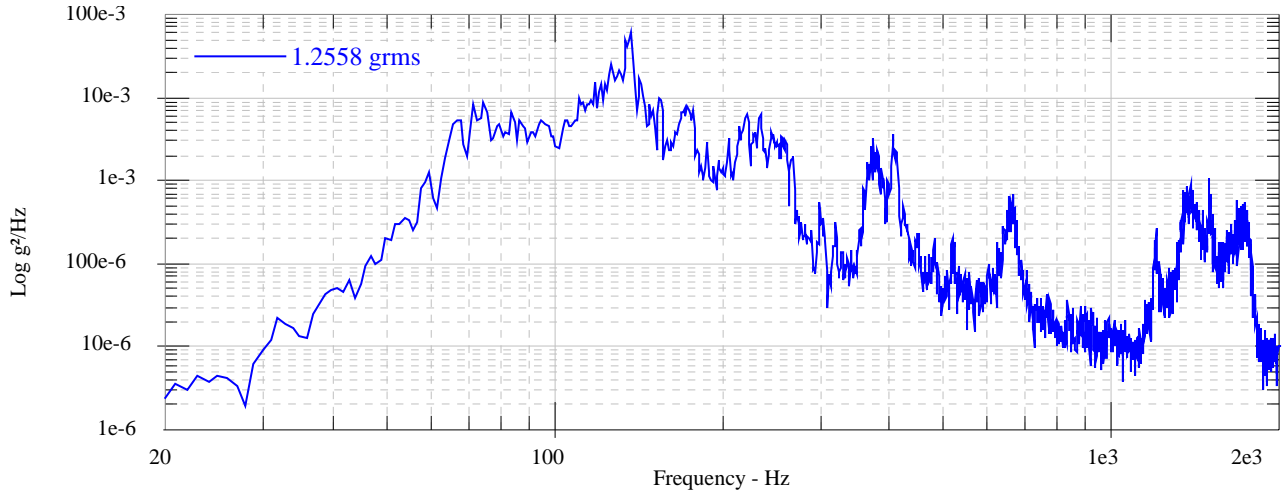


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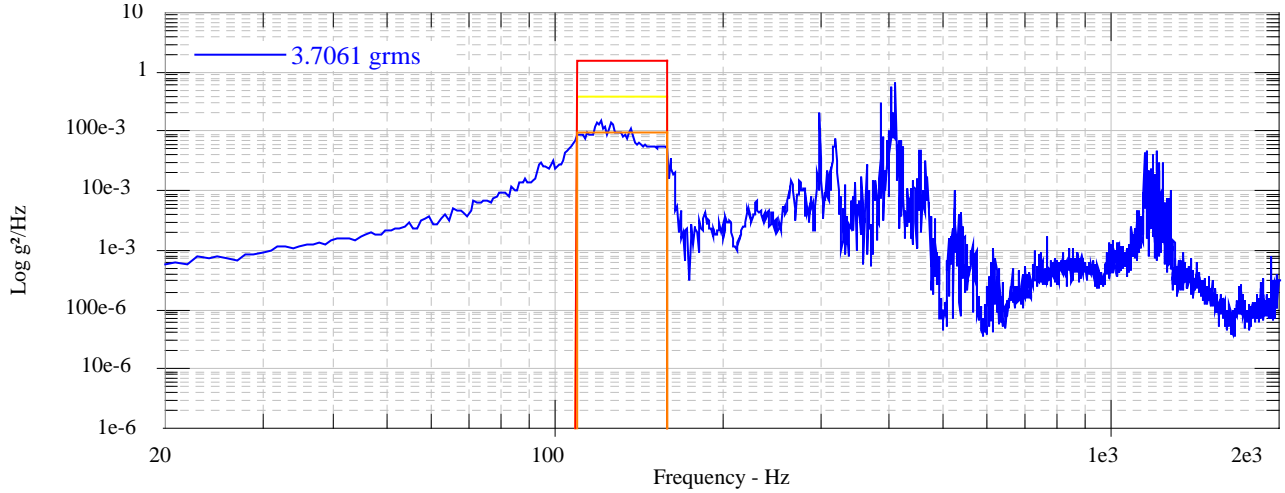
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Révision : 00
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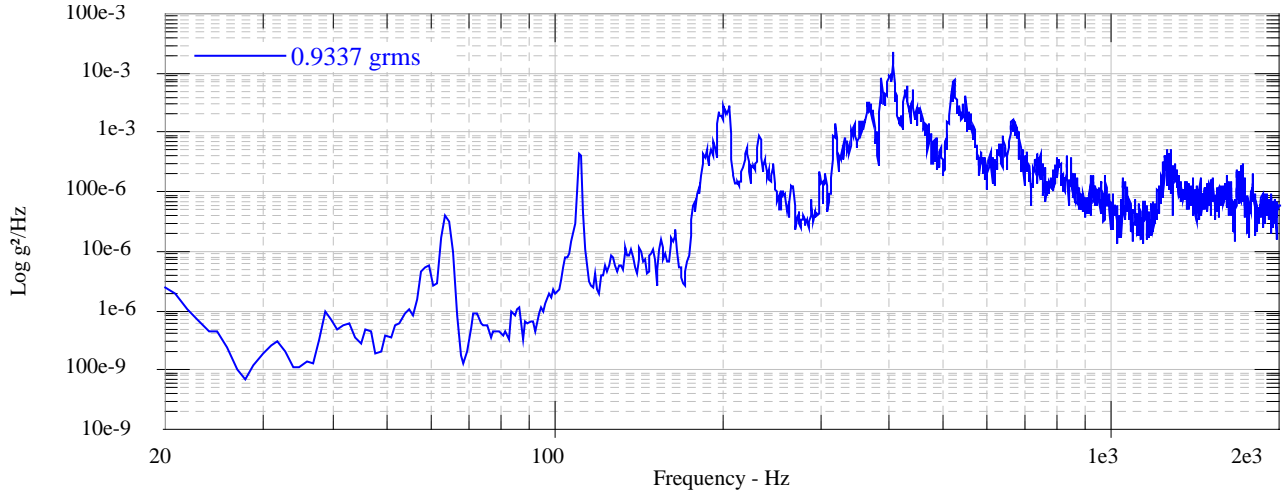
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

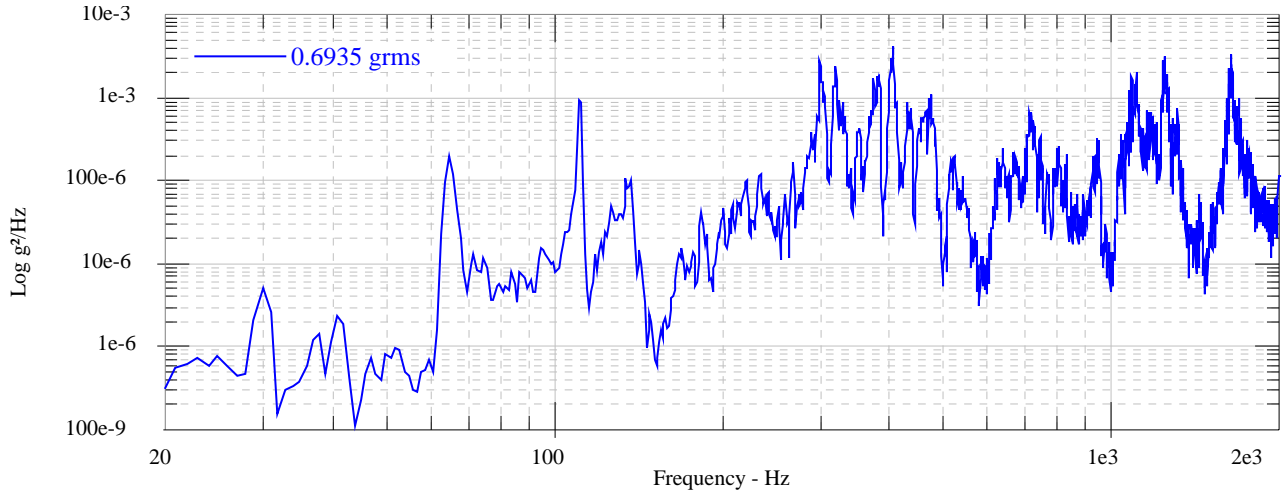


VIBRATION TEST REPORT
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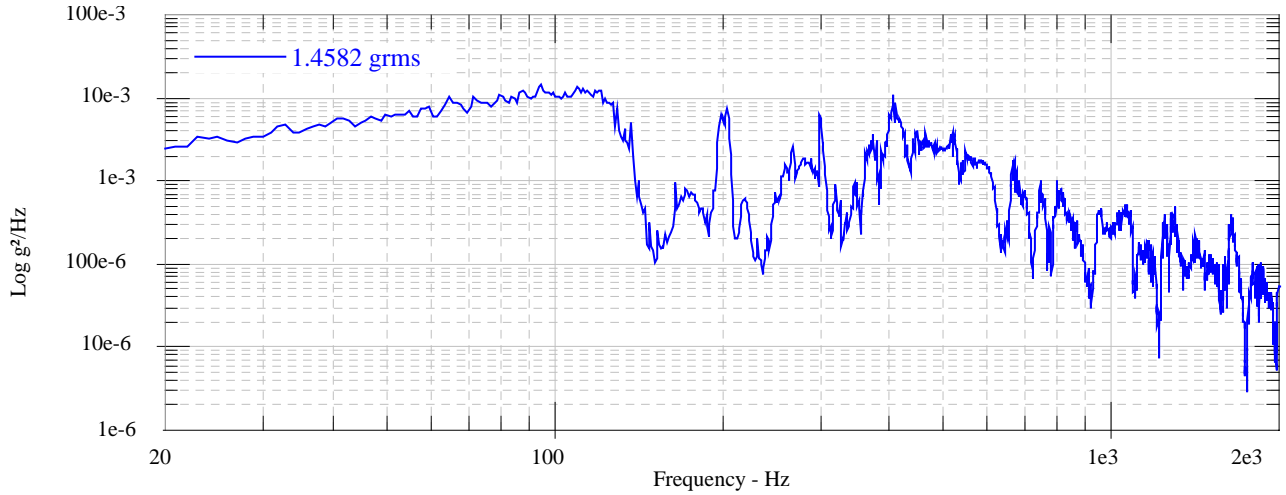
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Version : 01
Révision : 00
Date : 1-May-04
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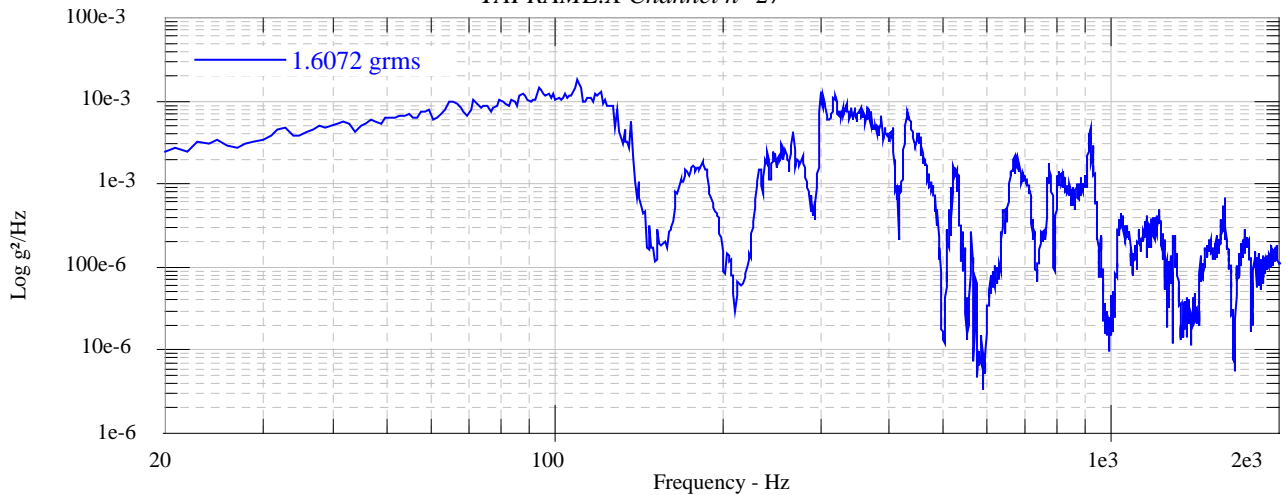
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

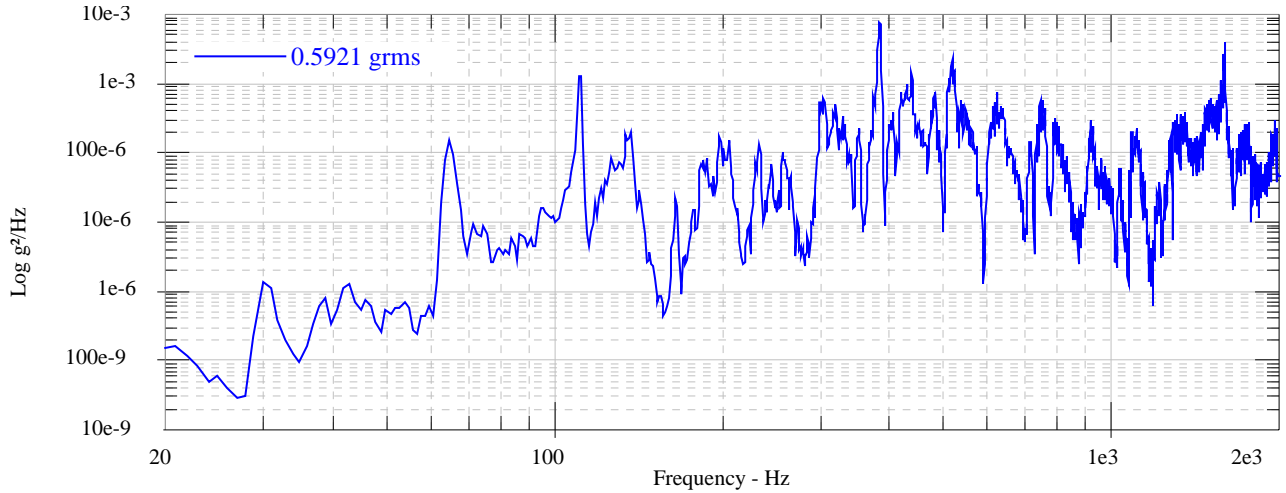


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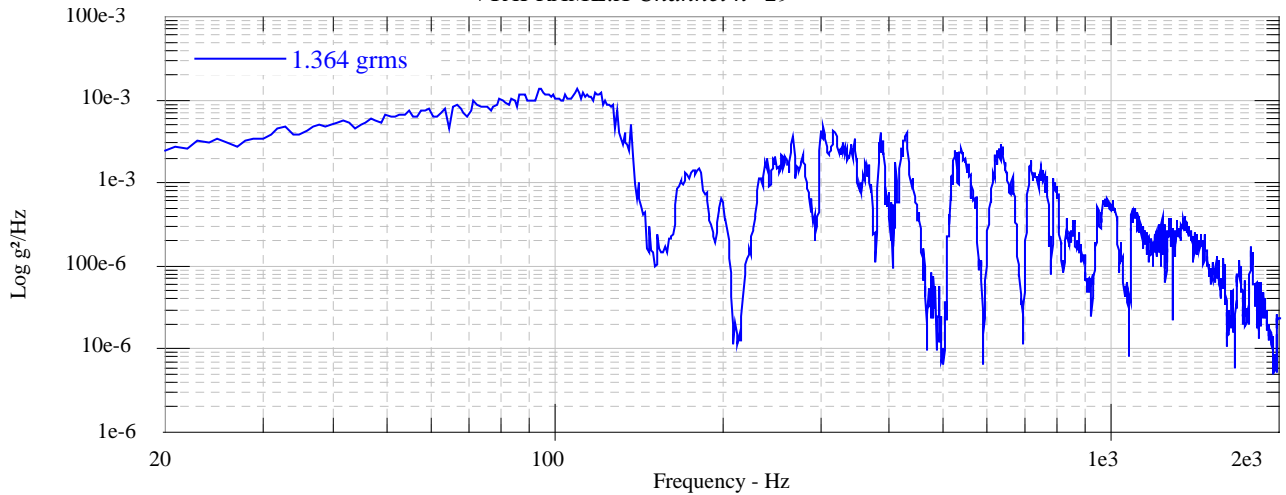
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Date : 1-May-04
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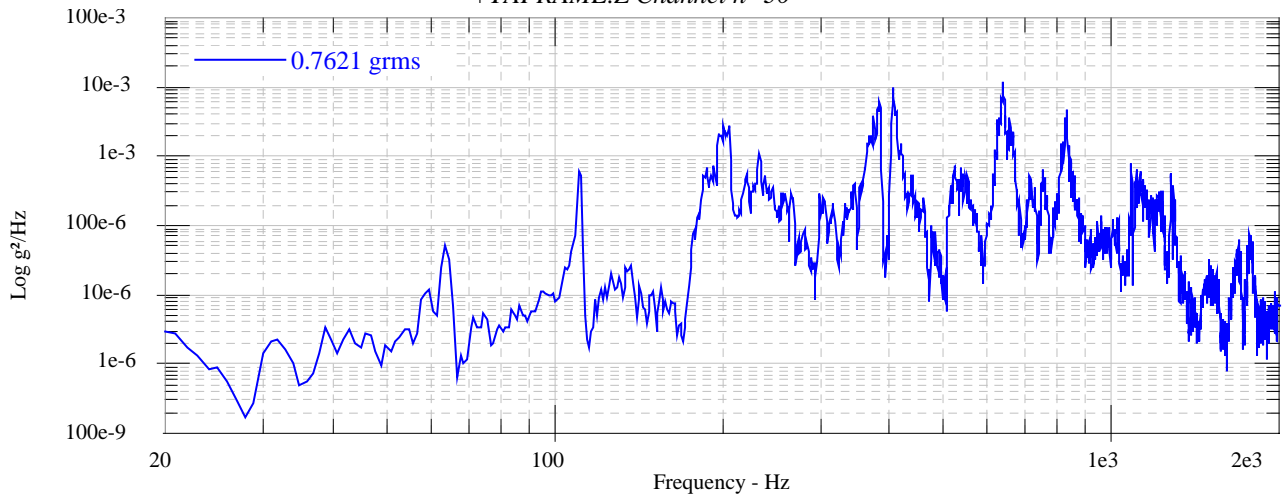
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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12.37 HNA12X.

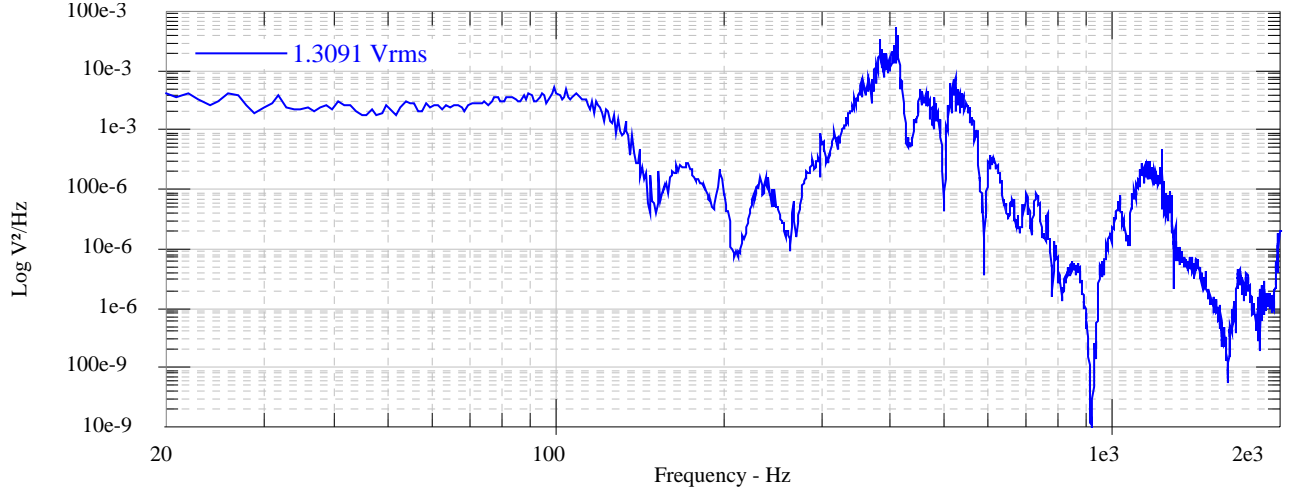
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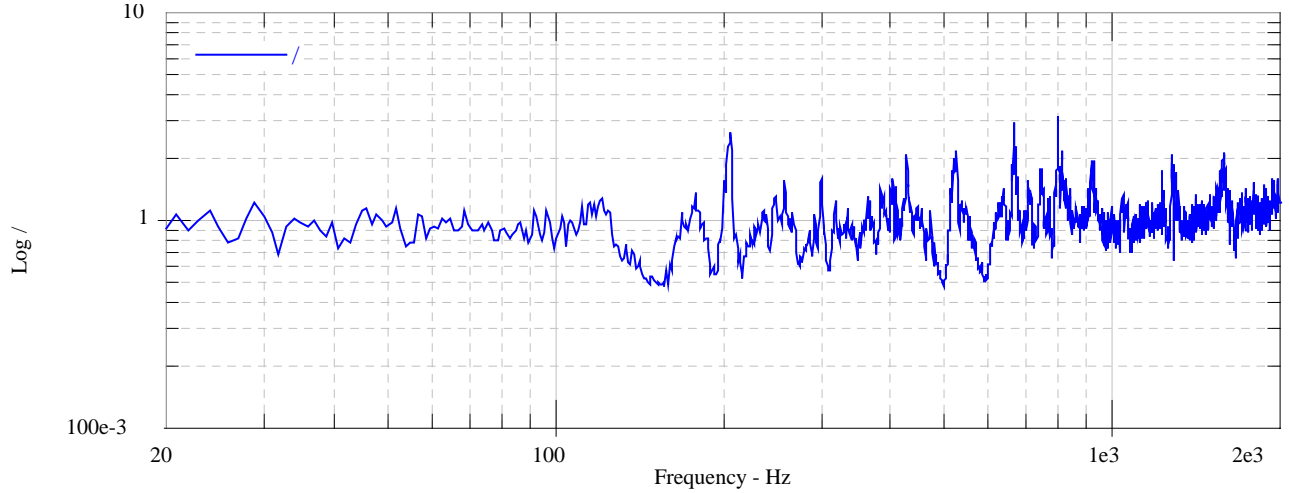
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Date : 1-May-04
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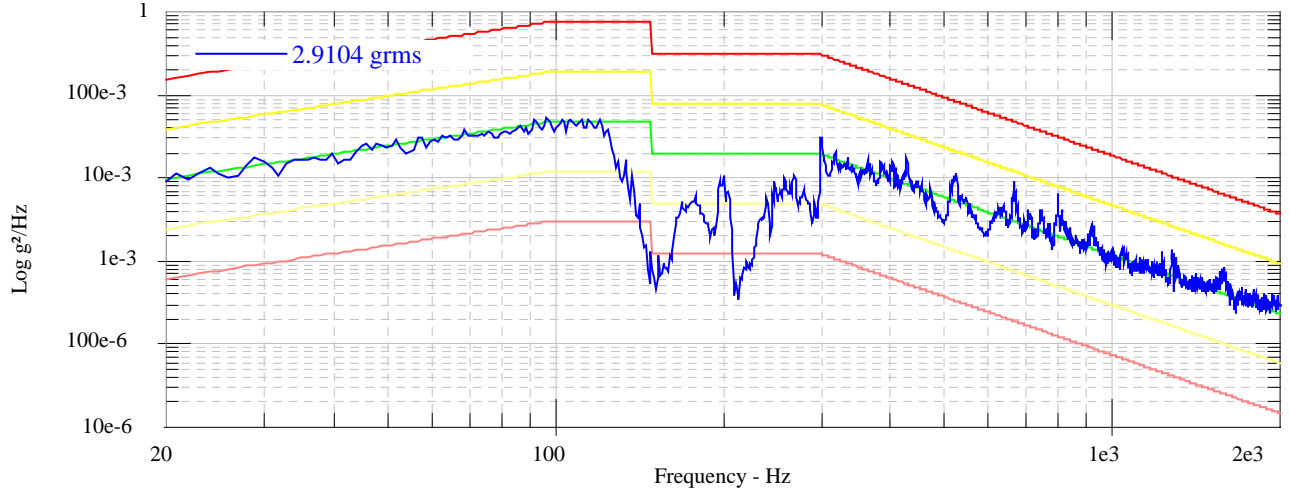
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

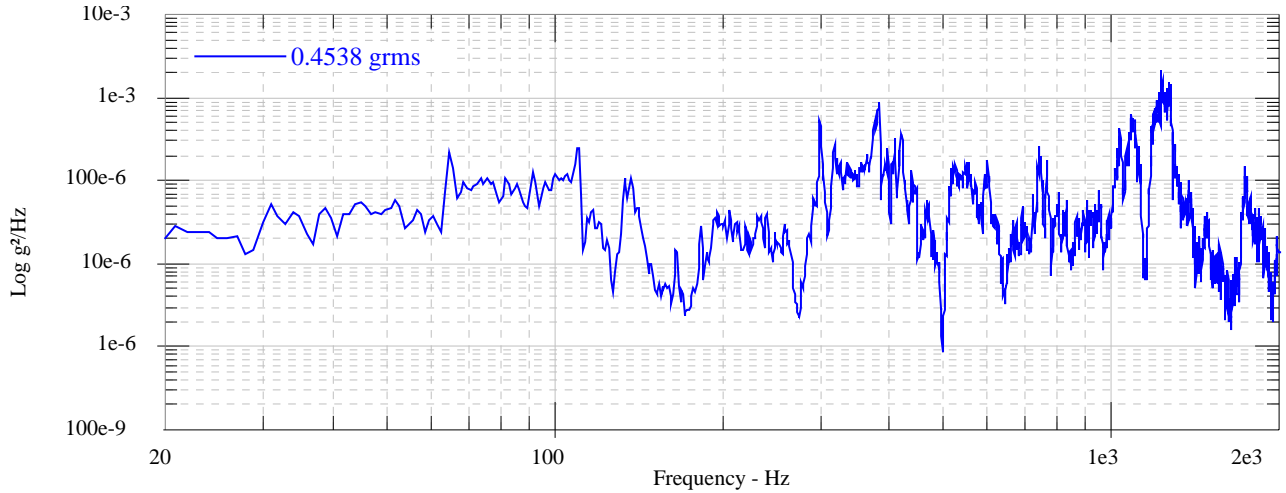


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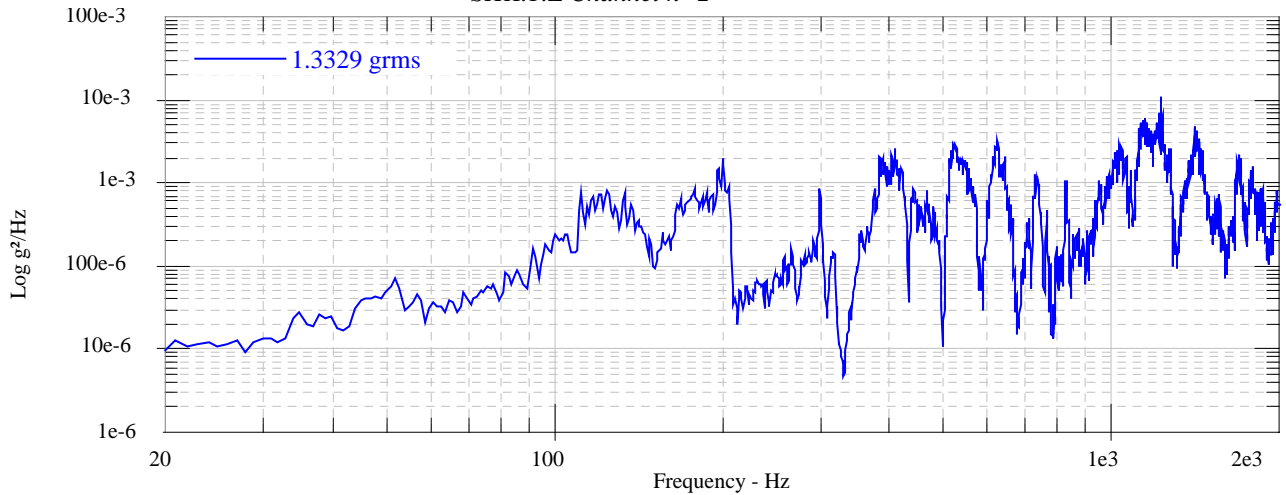
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Révision : 00
Date : 1-May-04
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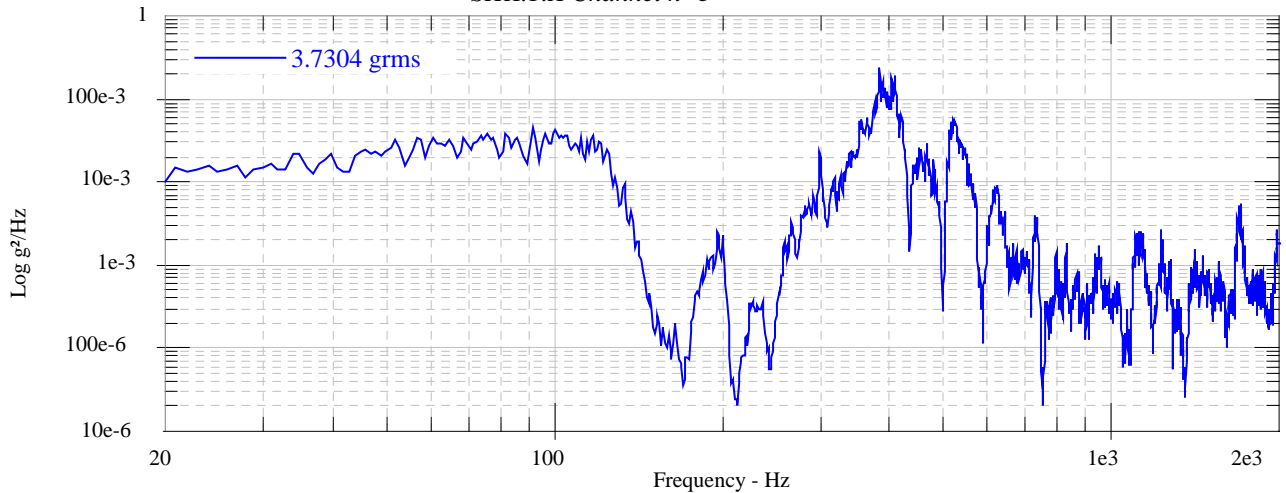
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SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

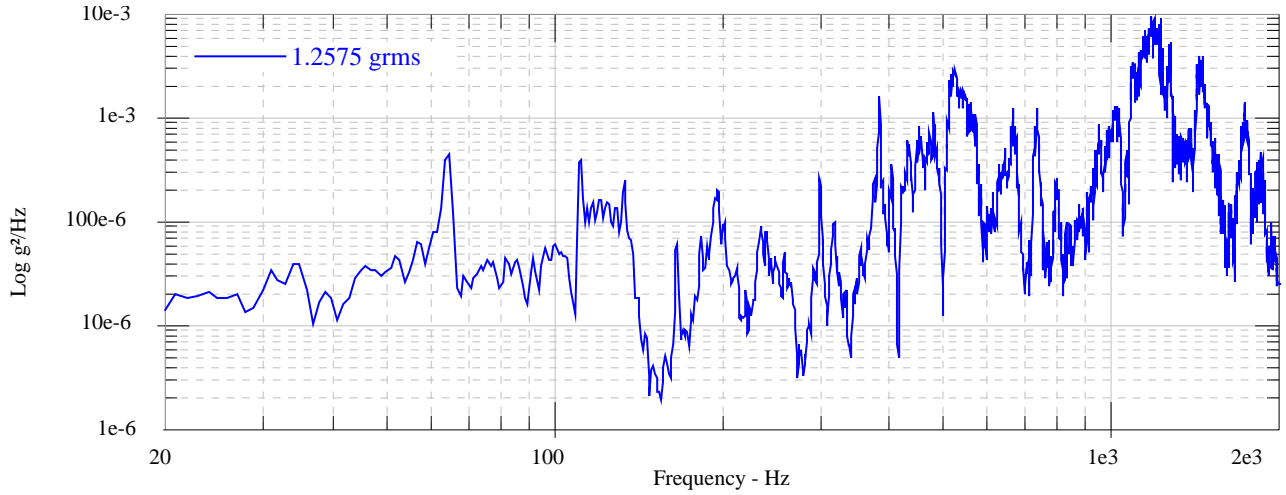


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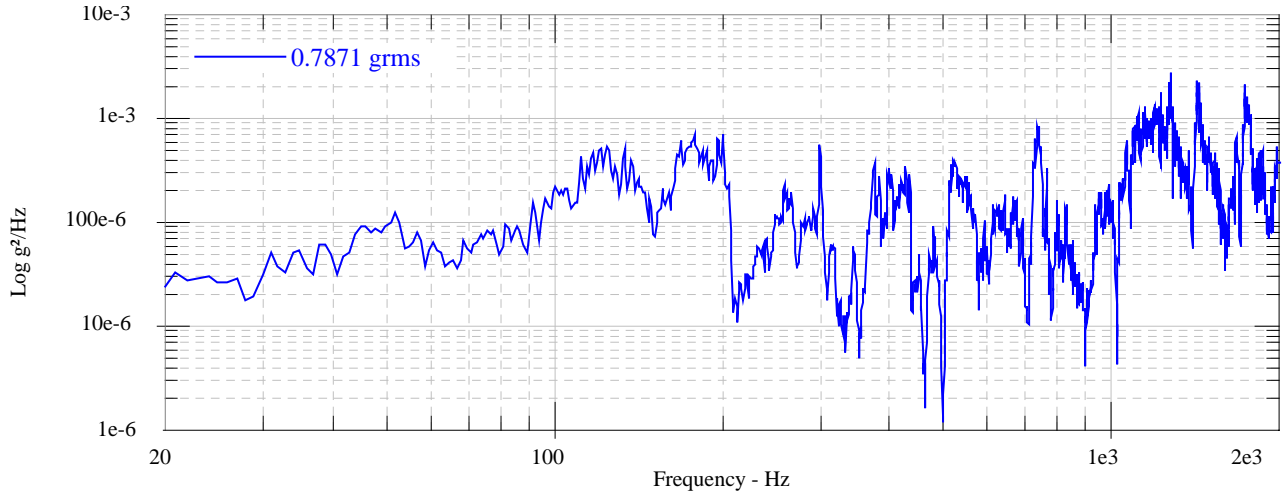
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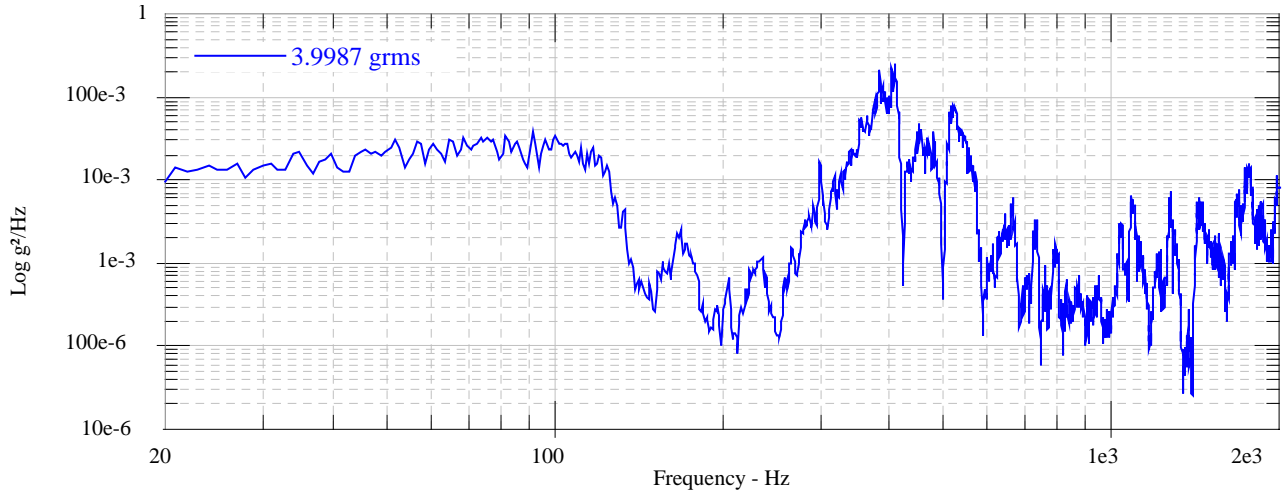
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SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

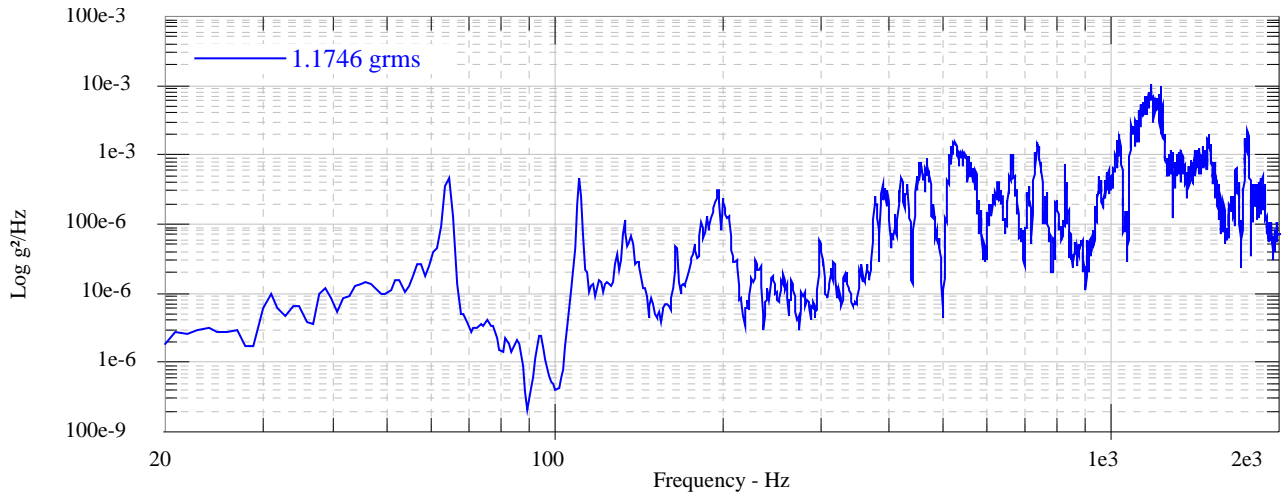


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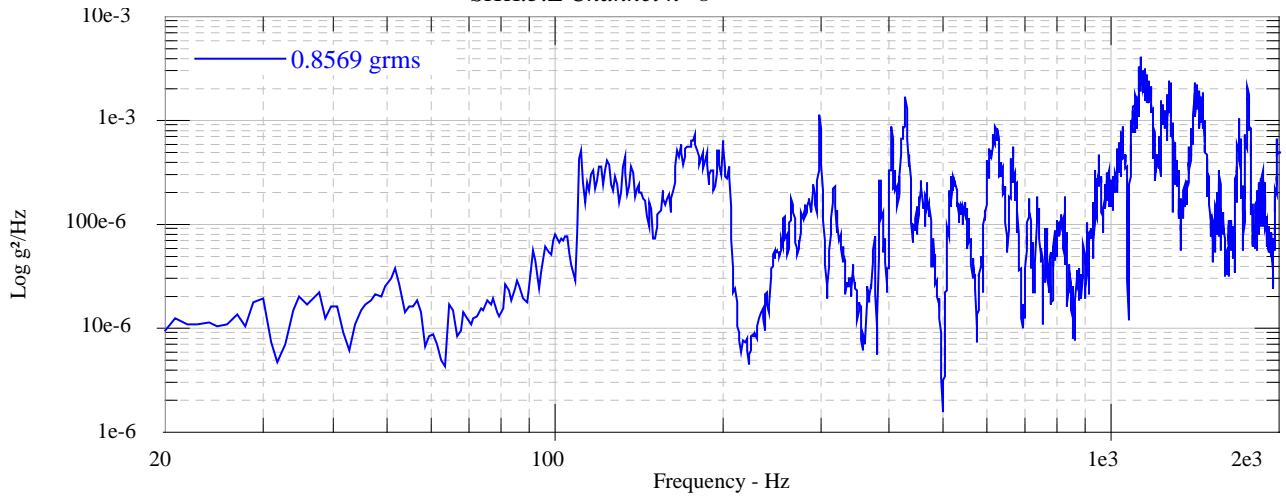
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Révision : 00
Date : 1-May-04
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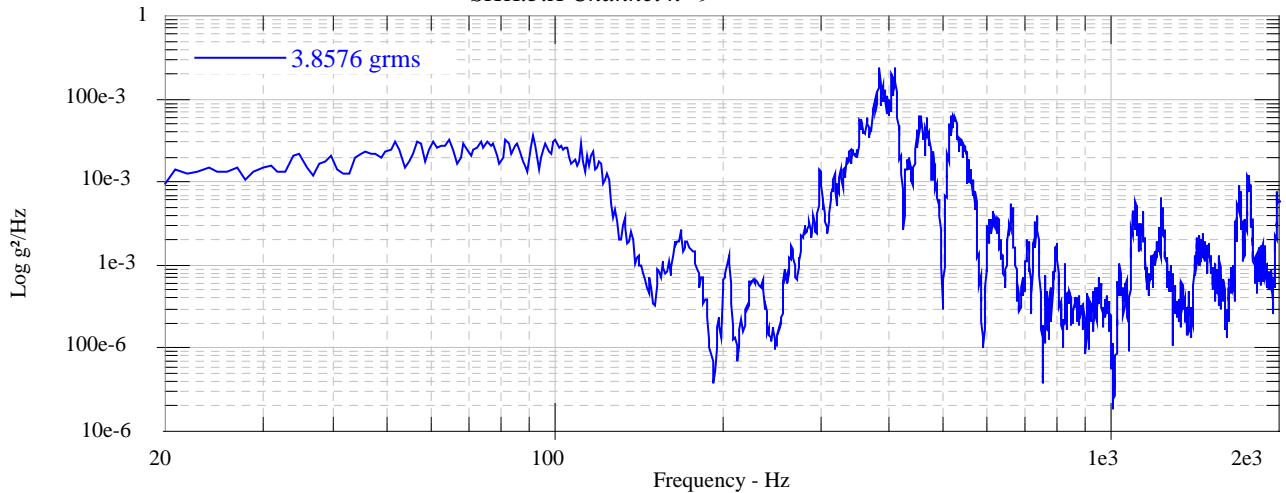
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SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

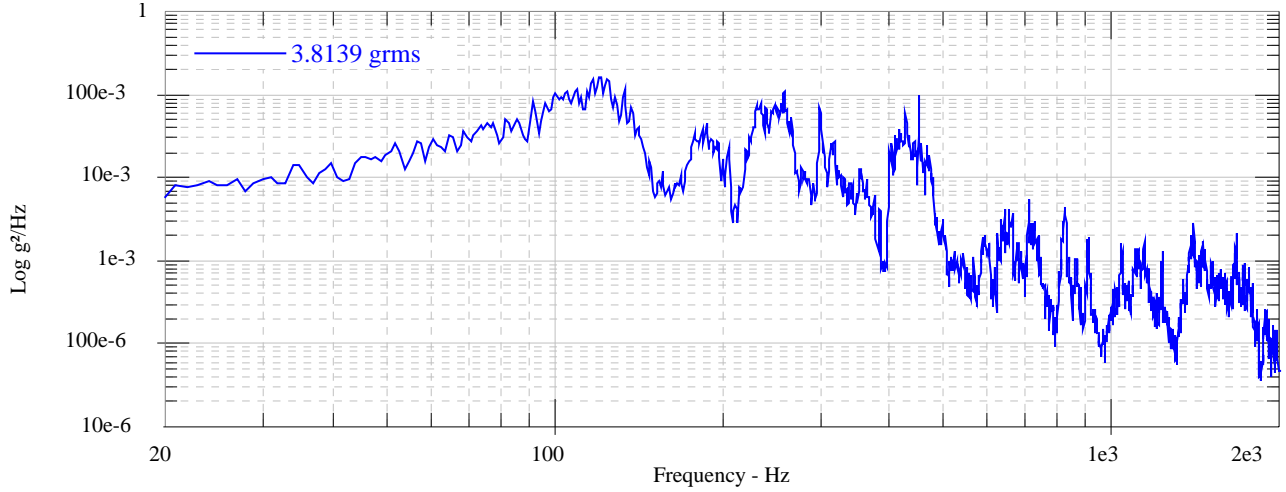


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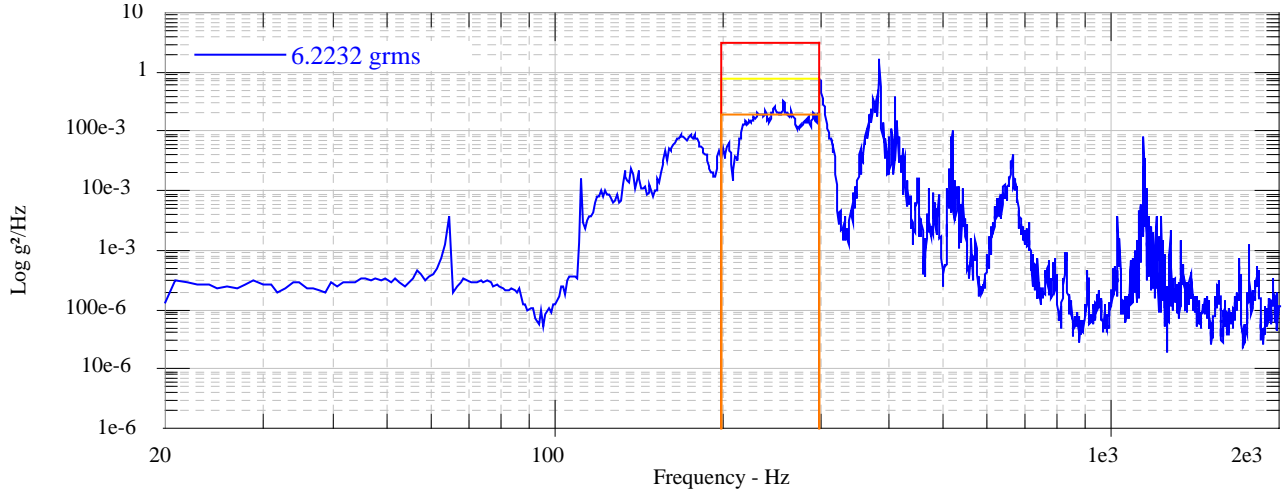
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Date : 1-May-04
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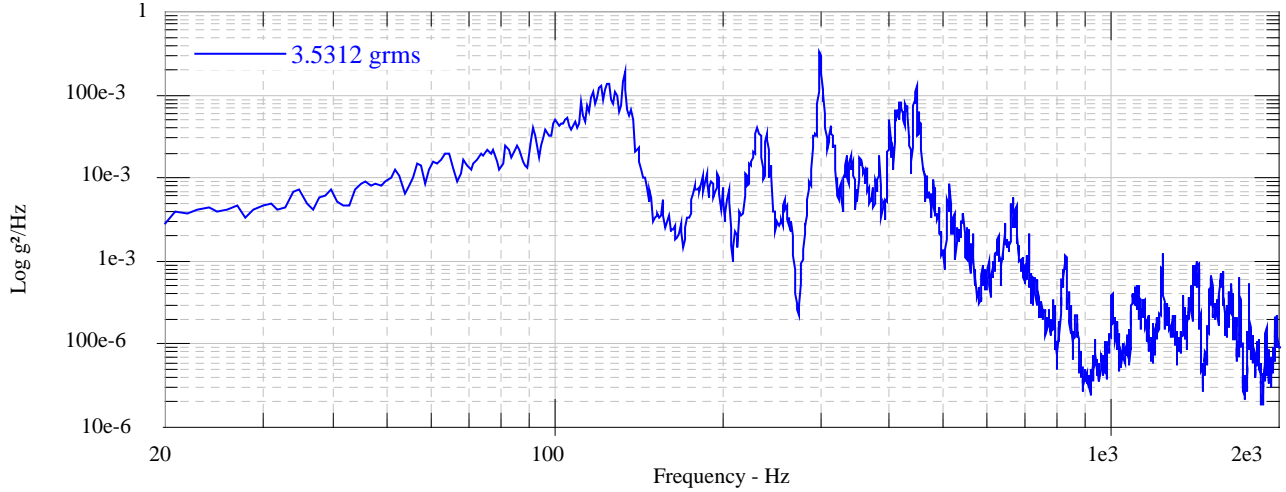
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

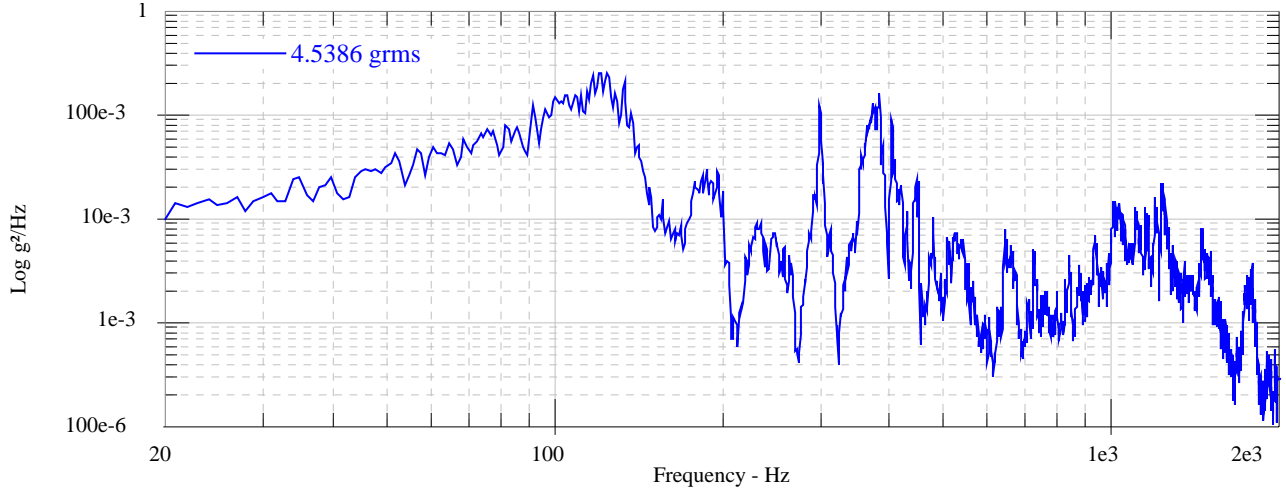


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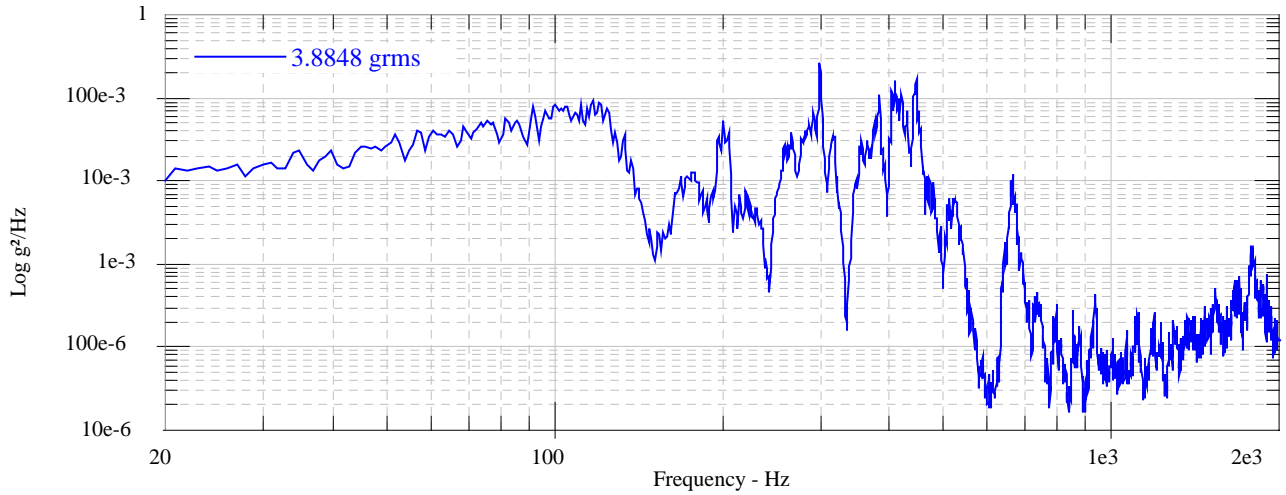
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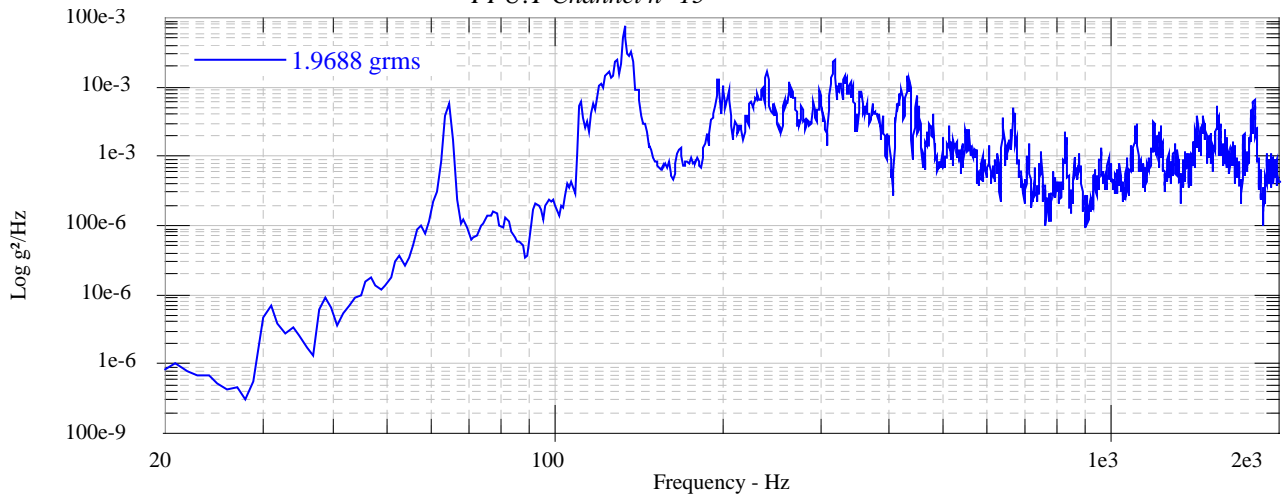
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

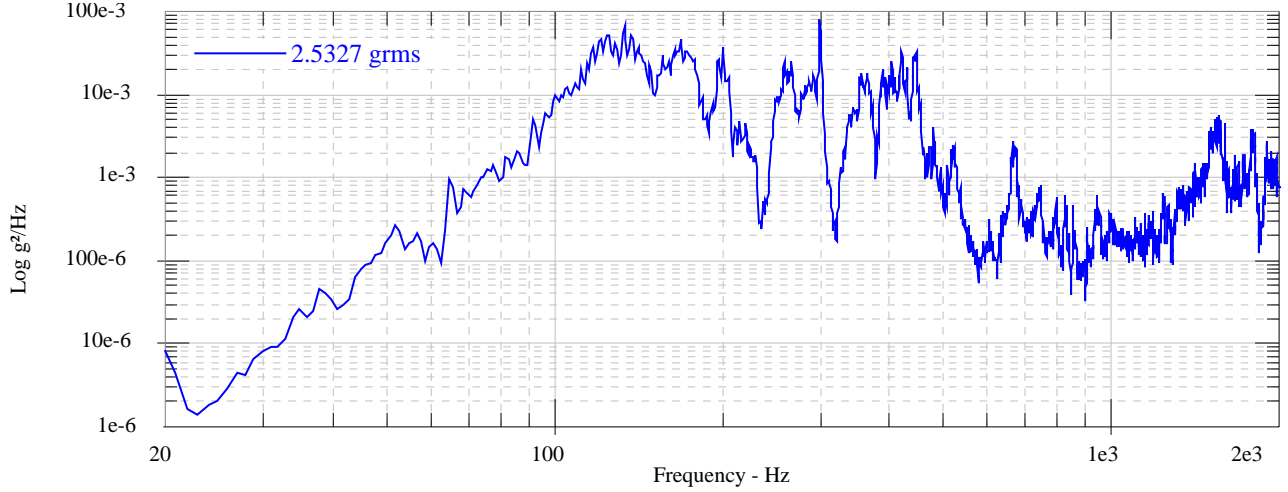


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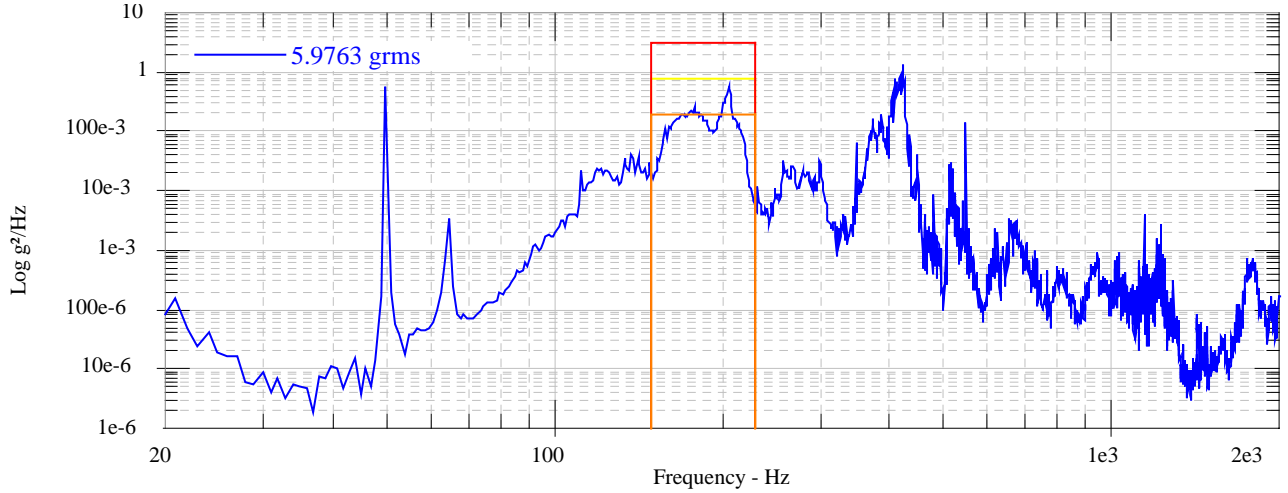
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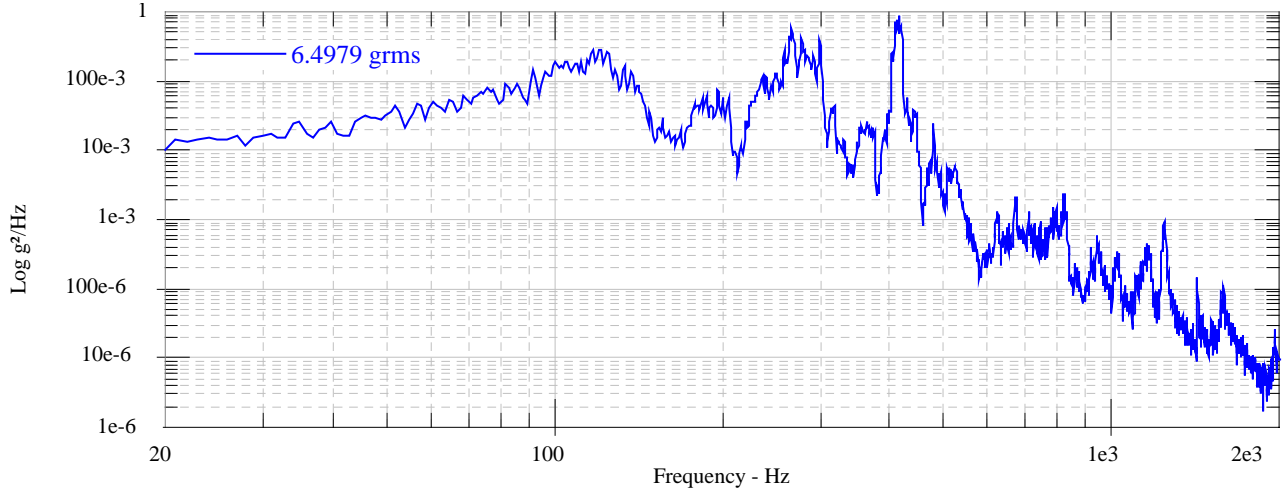
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SPEC.X Channel n° 17



SPEC.Z Channel n° 18

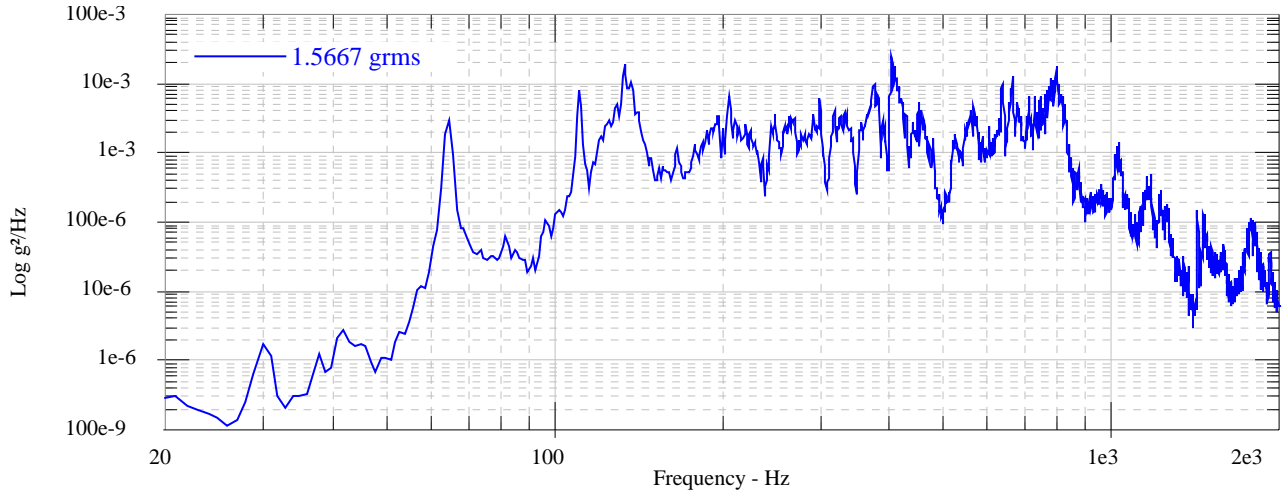


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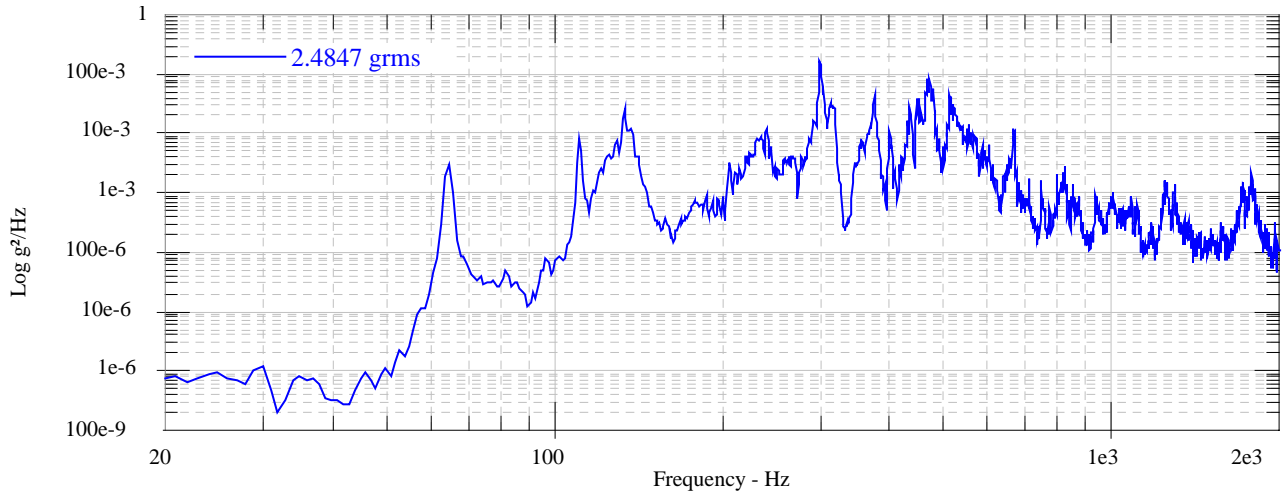
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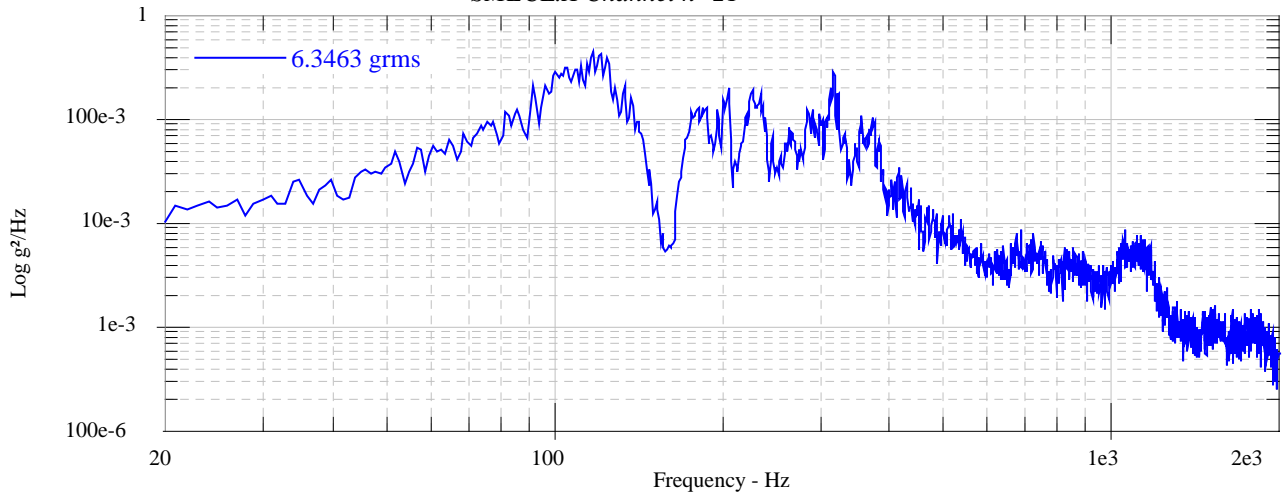
SPEC.Y Channel n° 19



OB.Y Channel n° 20



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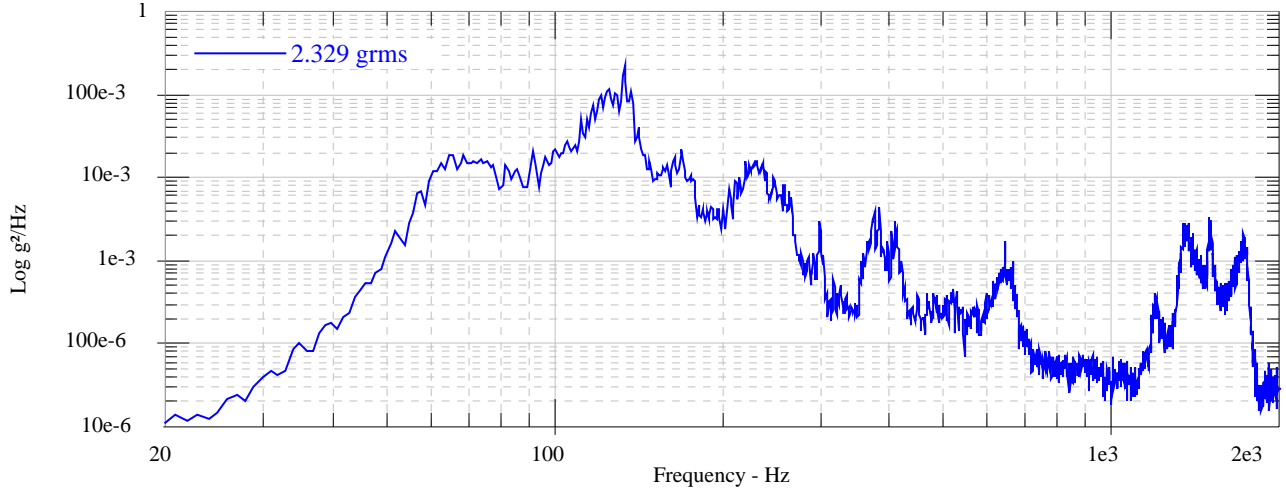


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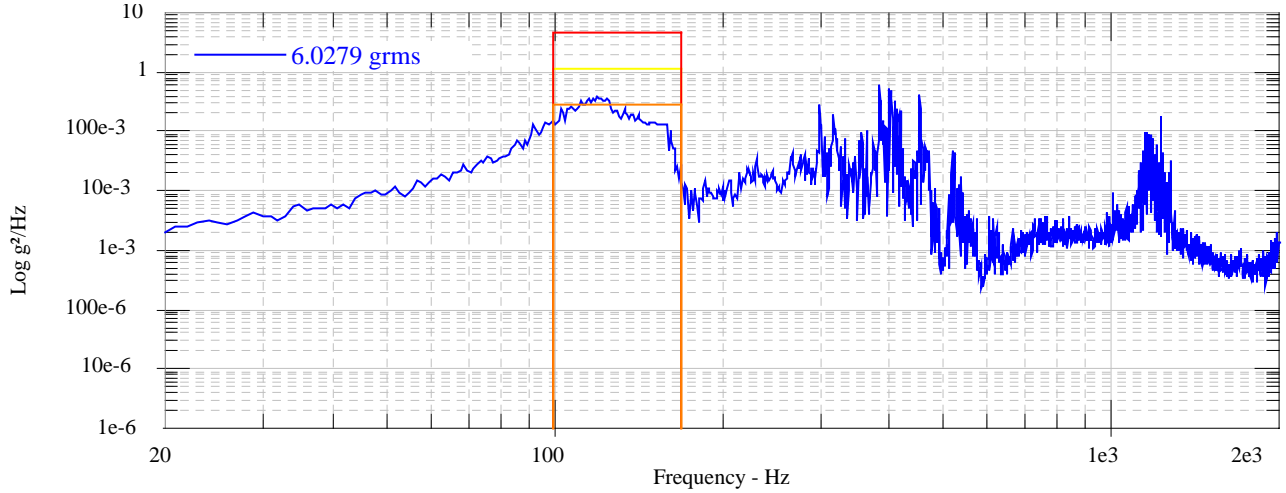
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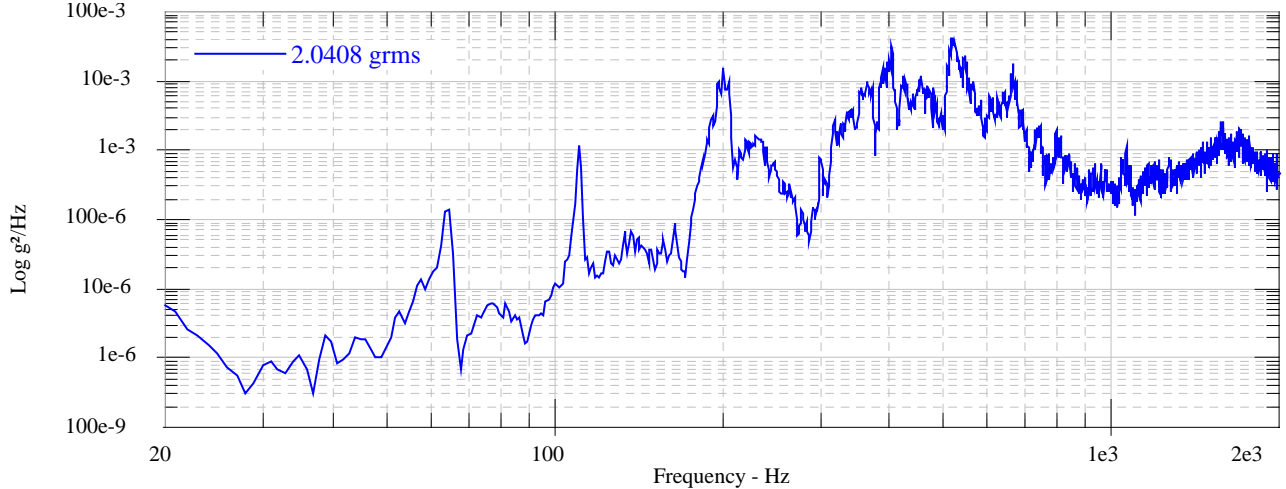
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SMECU.X Channel n° 23



CONE.Z Channel n° 24

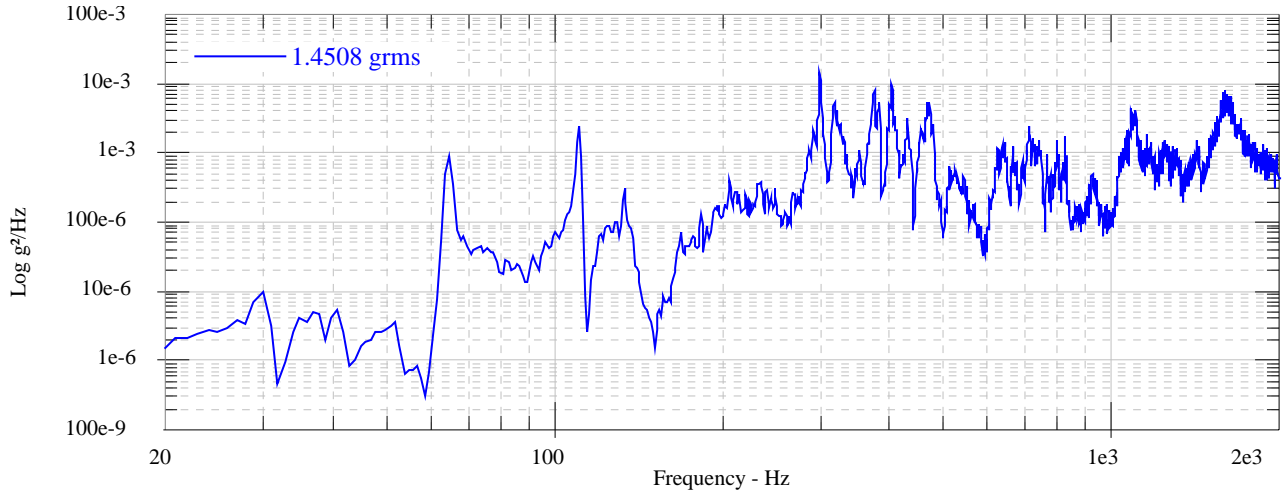


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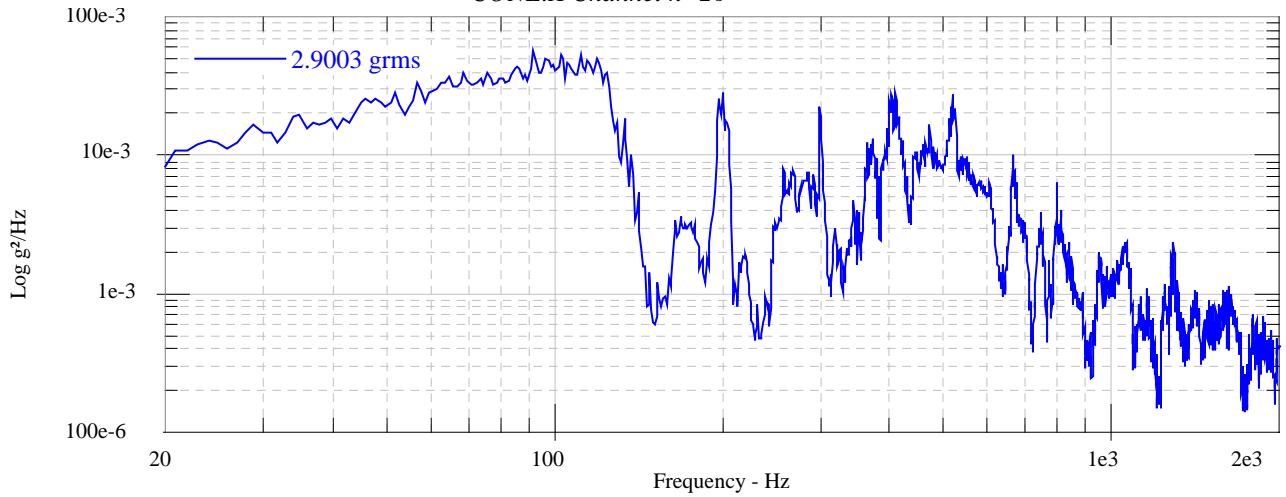
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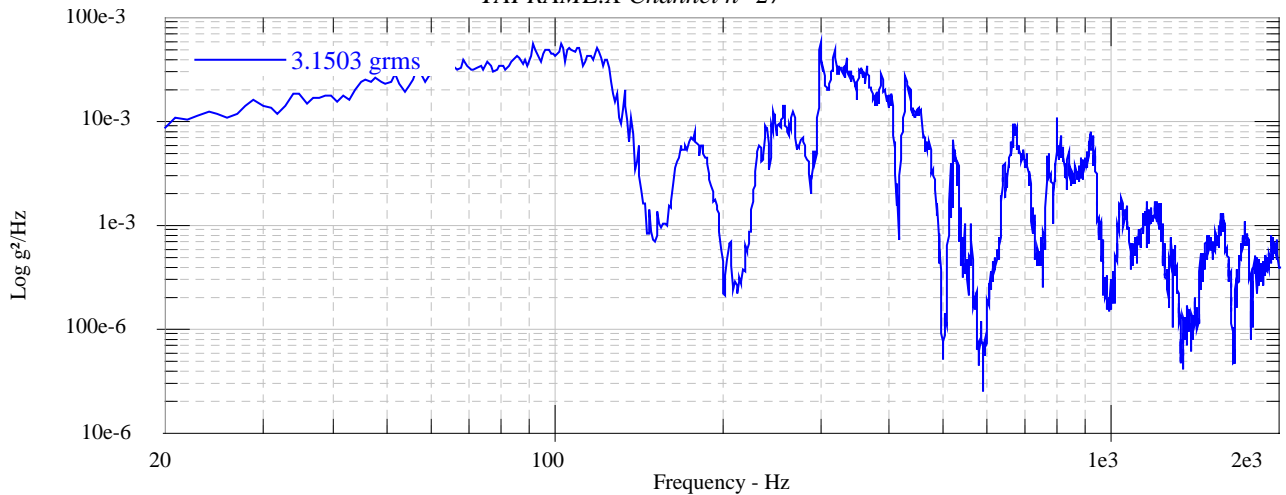
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

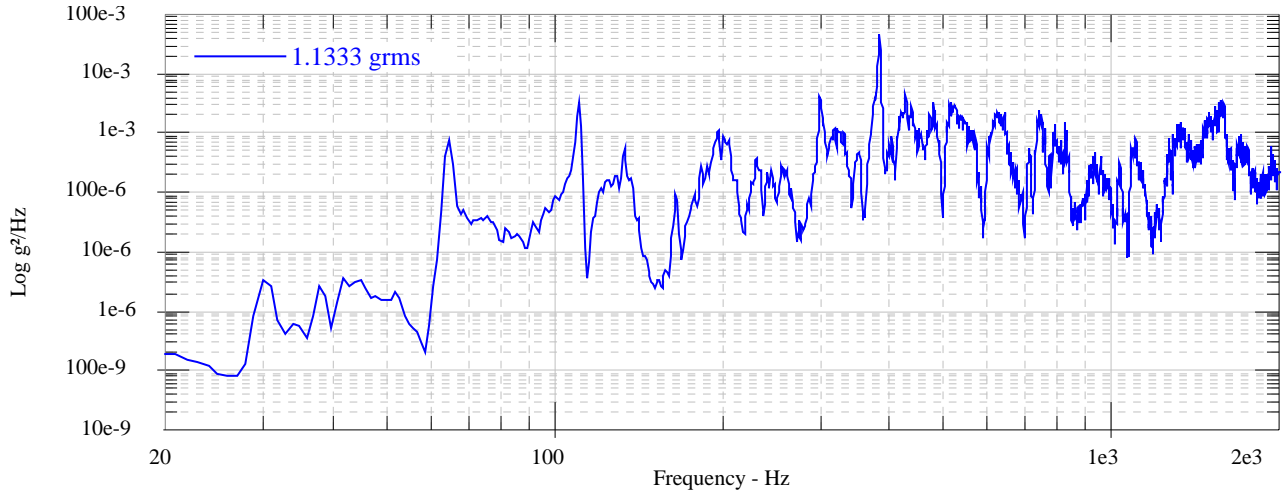


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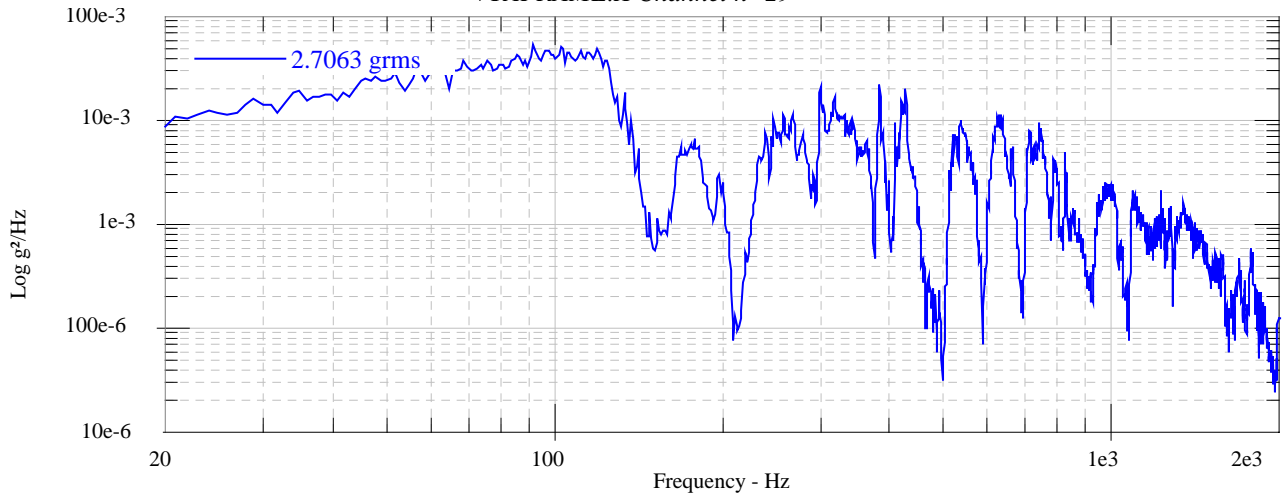
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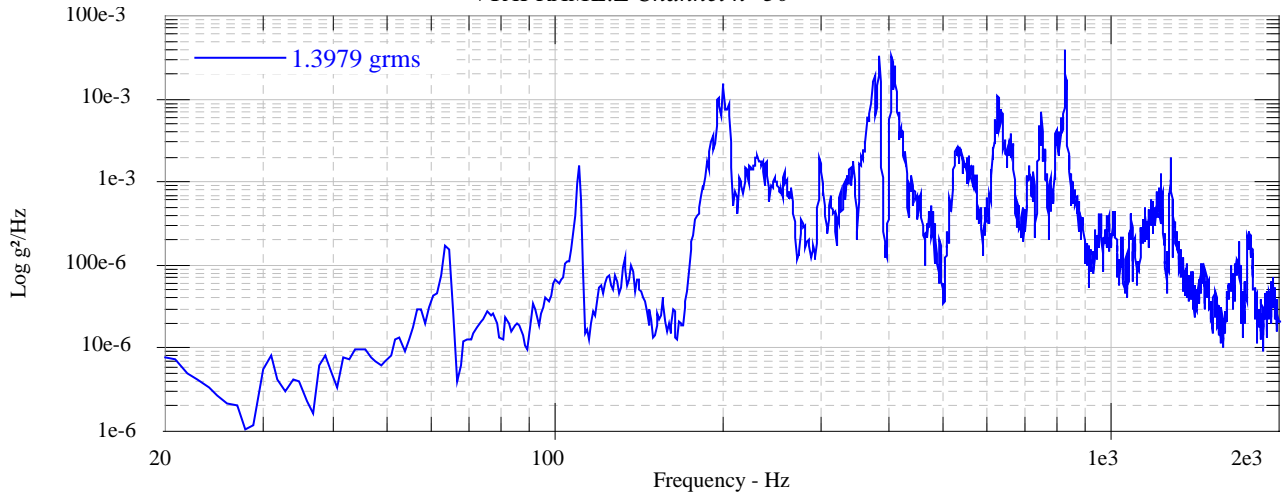
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



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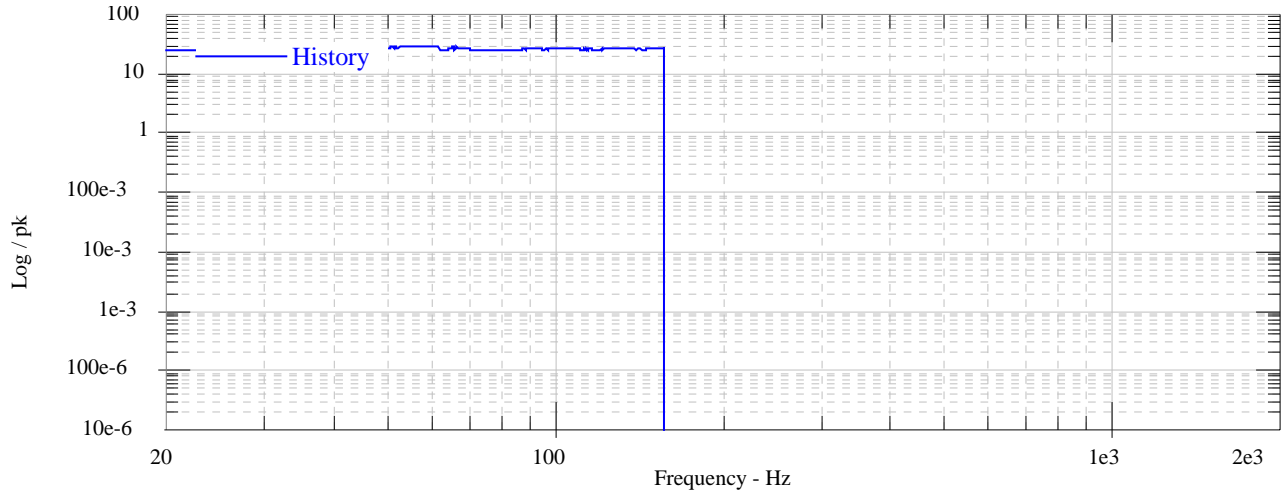
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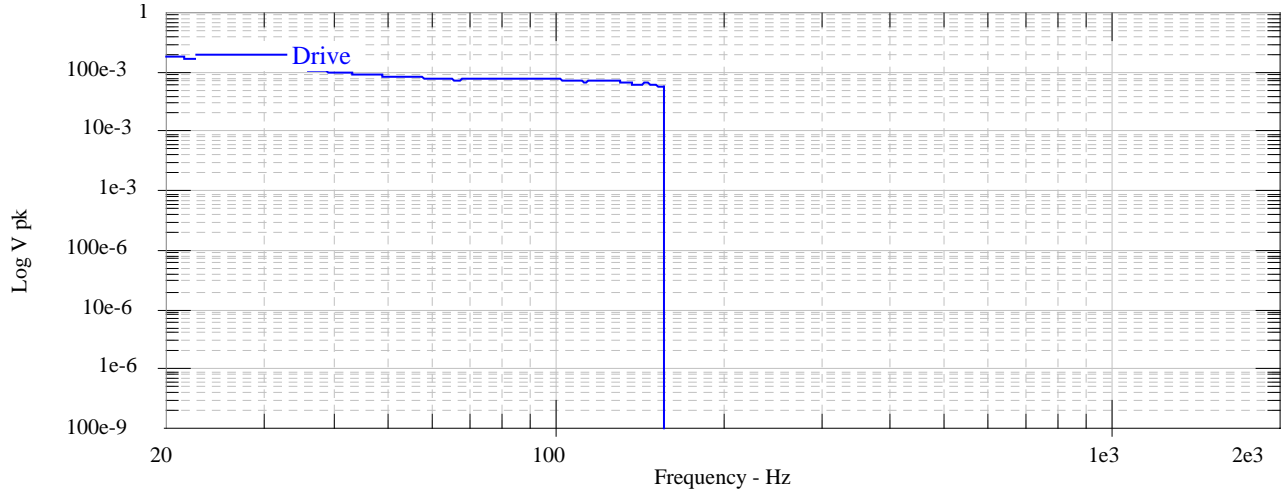
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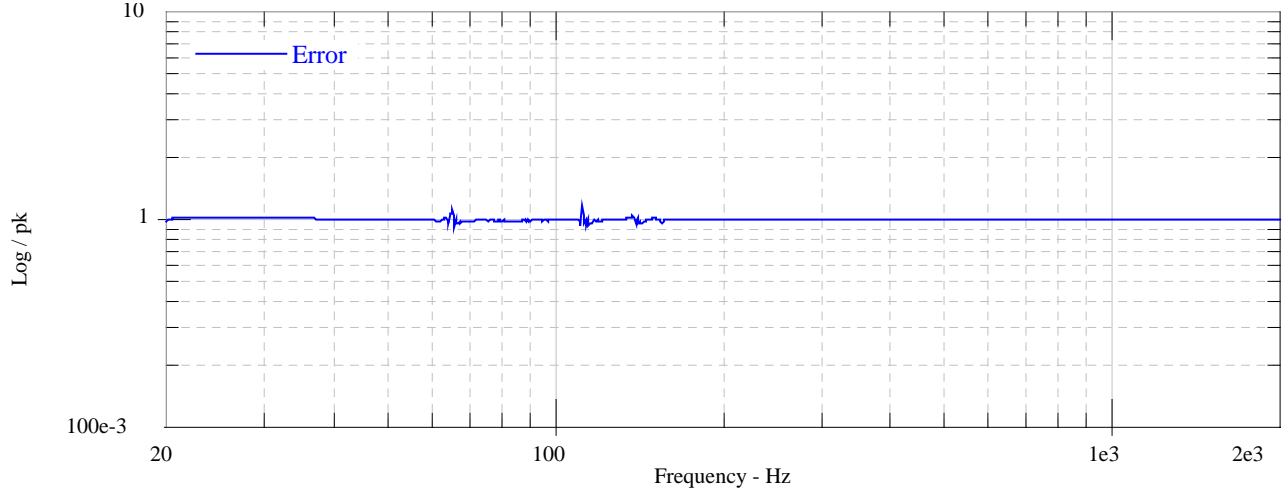
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Drive Channel n° -2



Error Channel n° -1

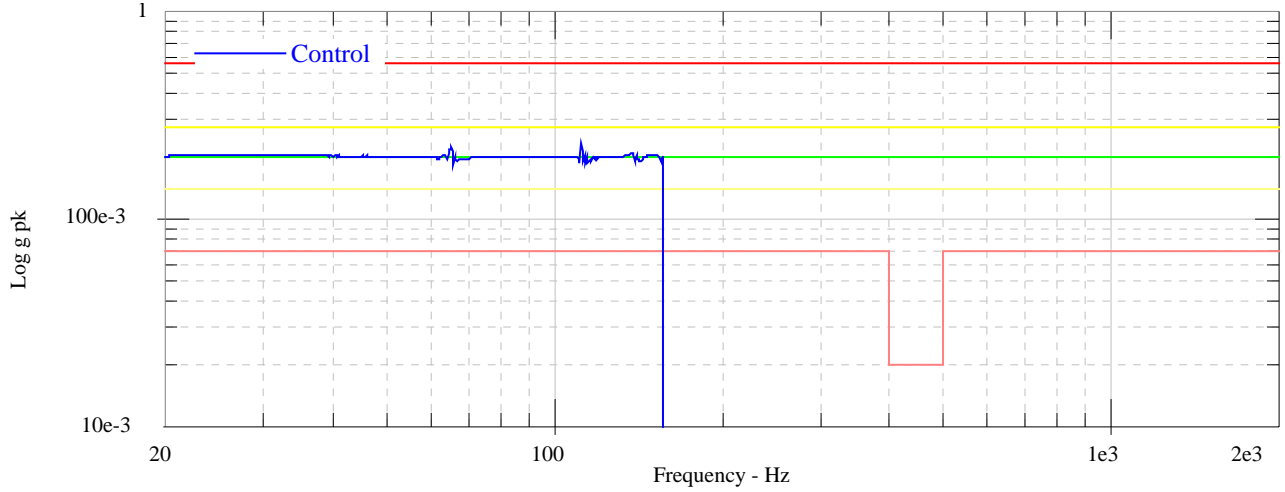


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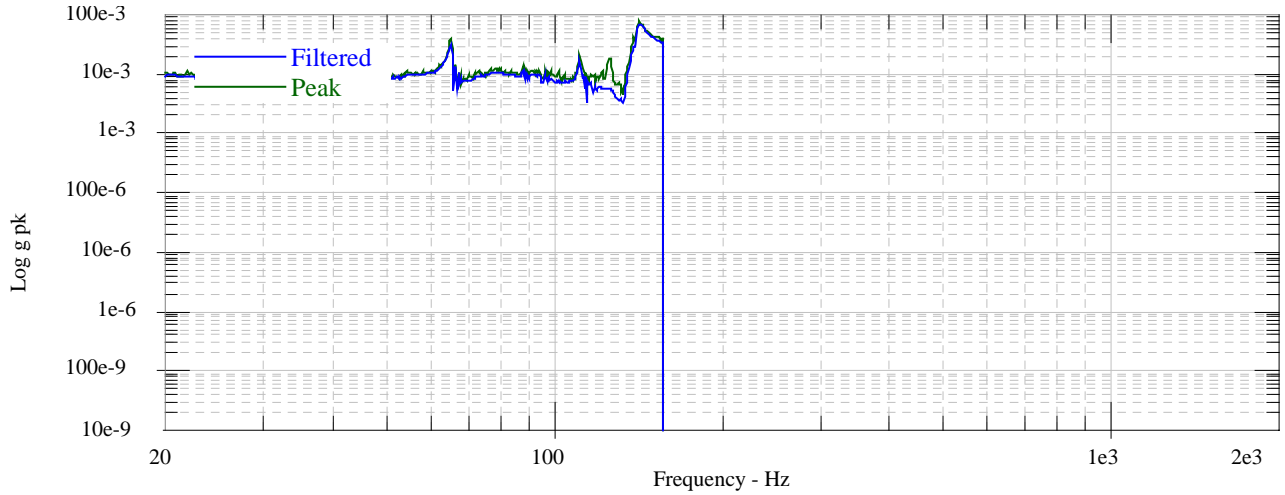
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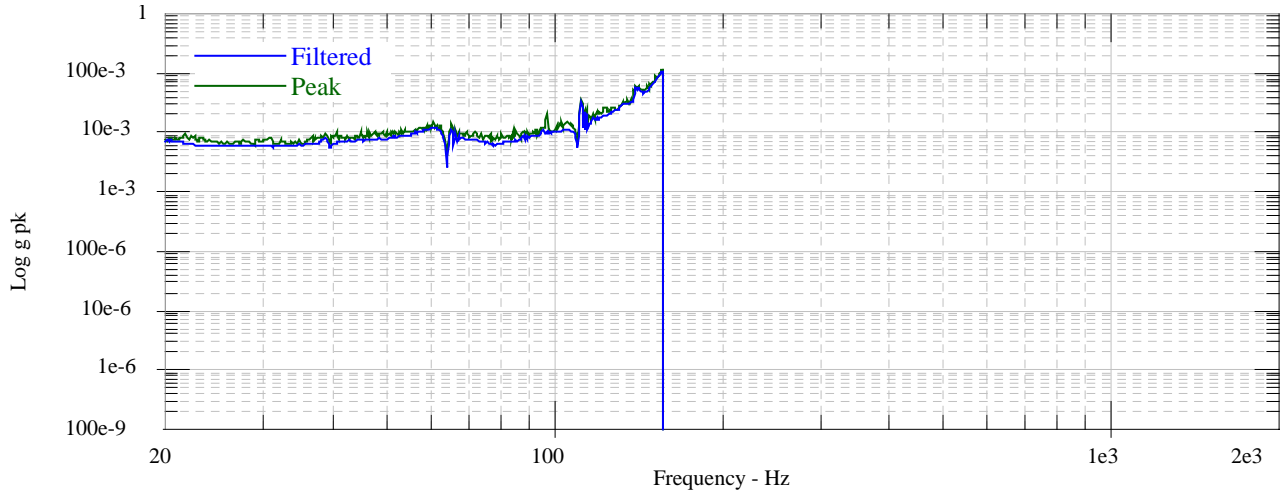
Control Channel n° 0



SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2

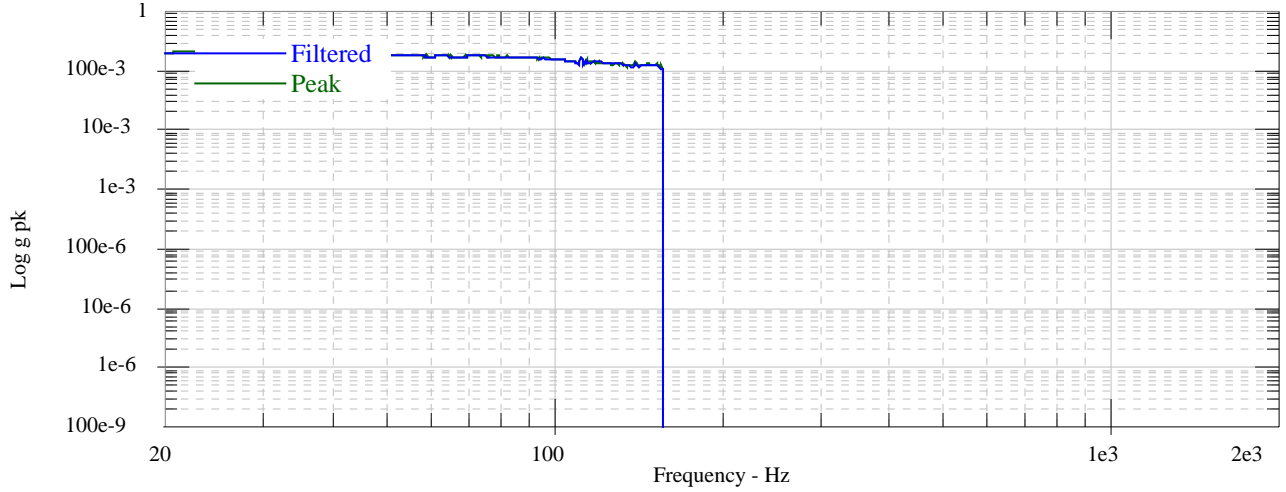


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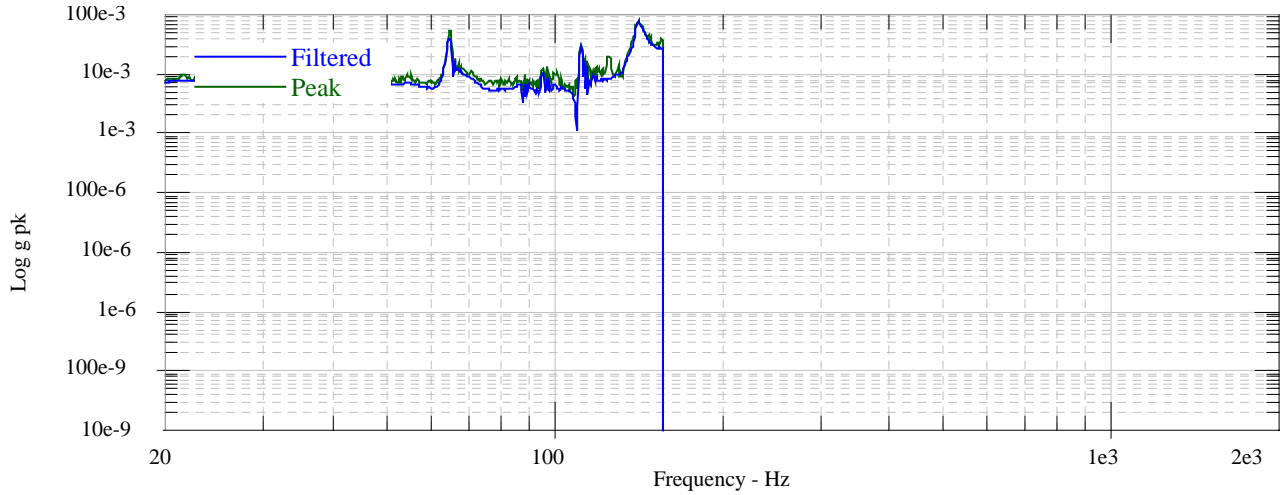
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Date : 1-May-04
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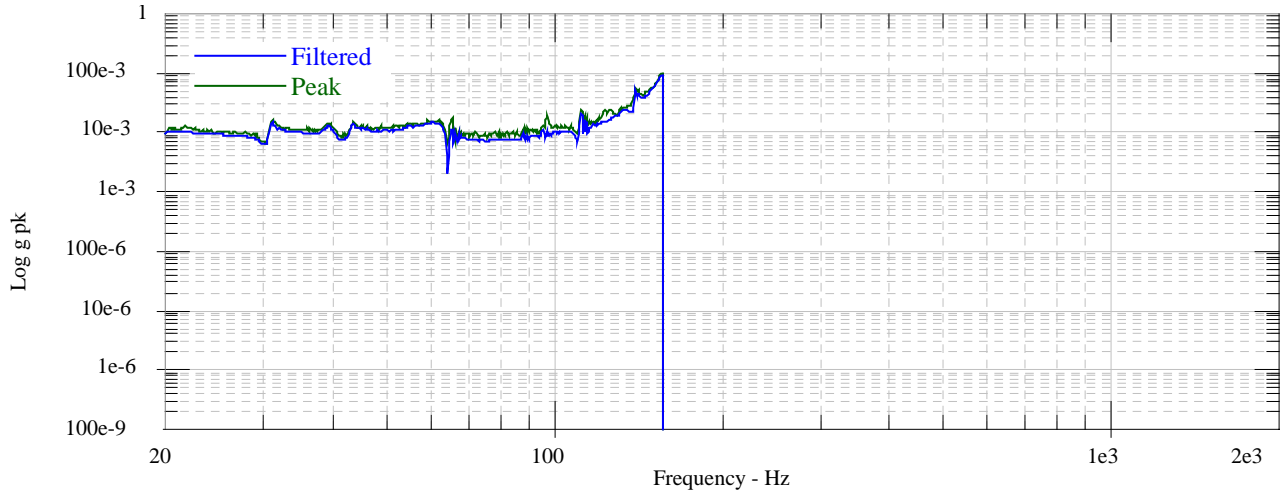
SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



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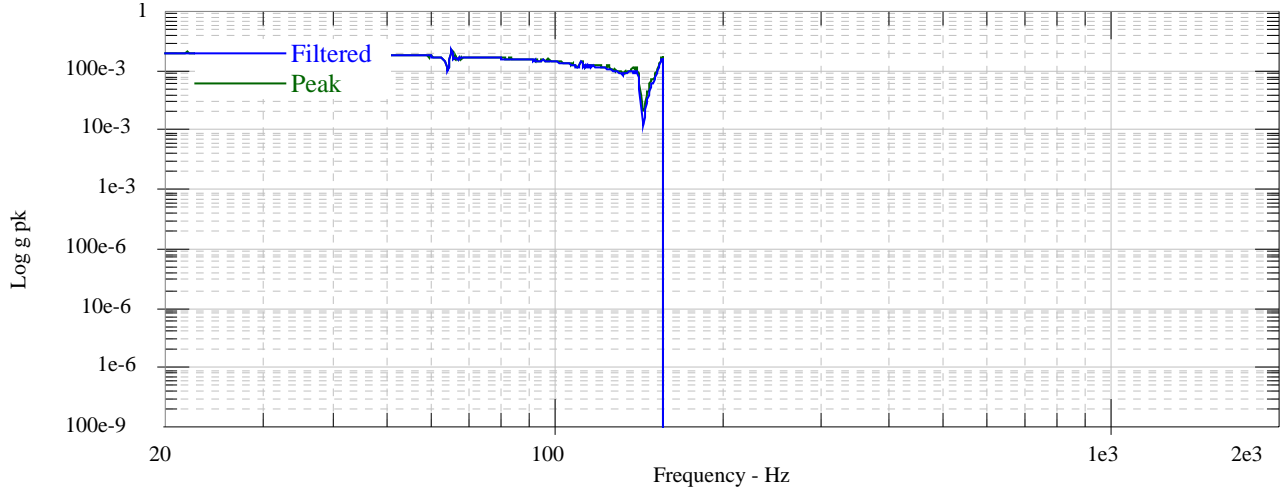


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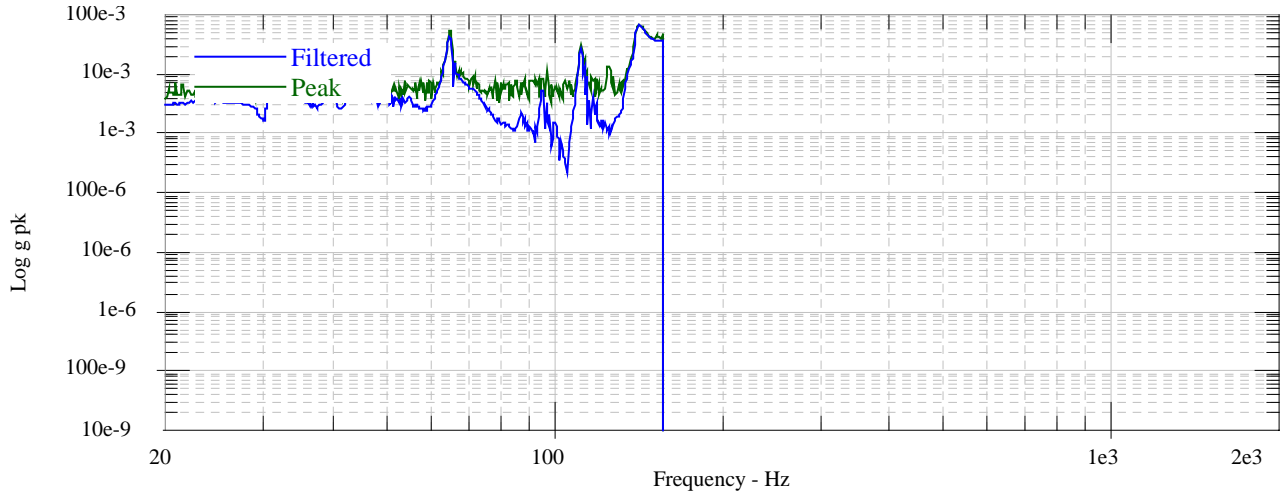
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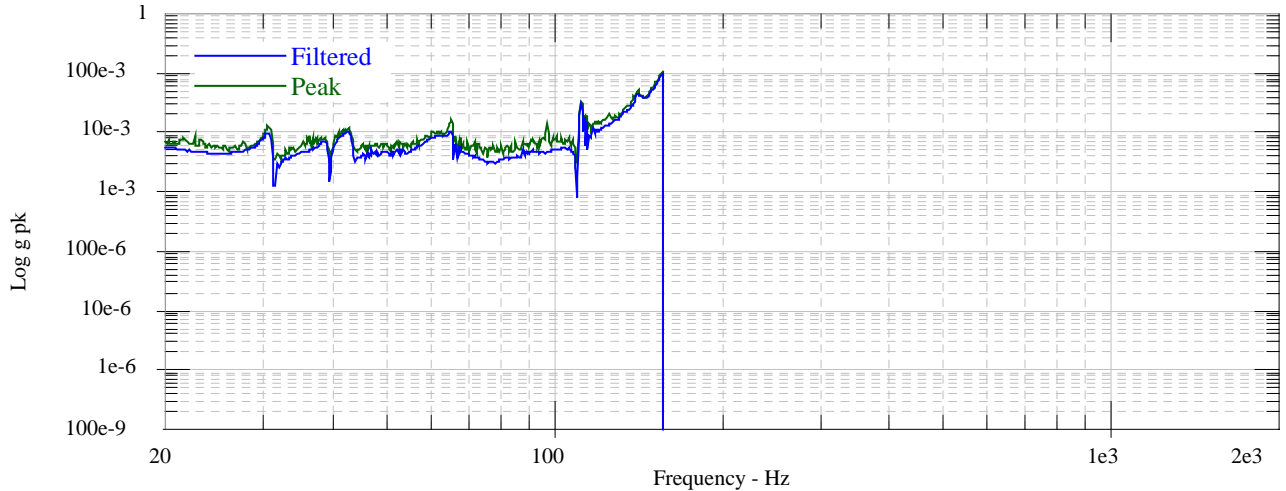
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SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8

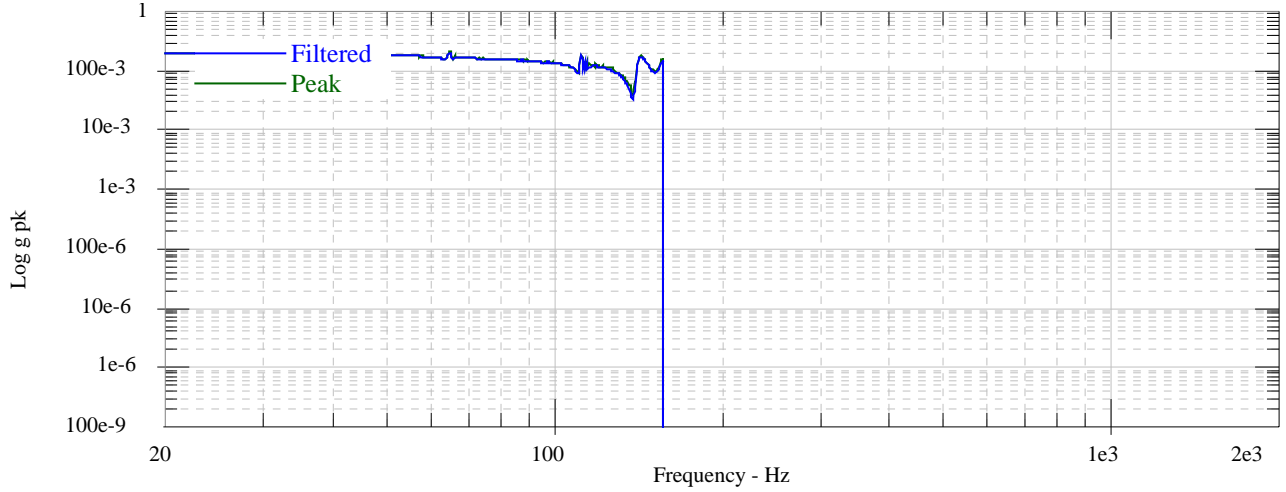


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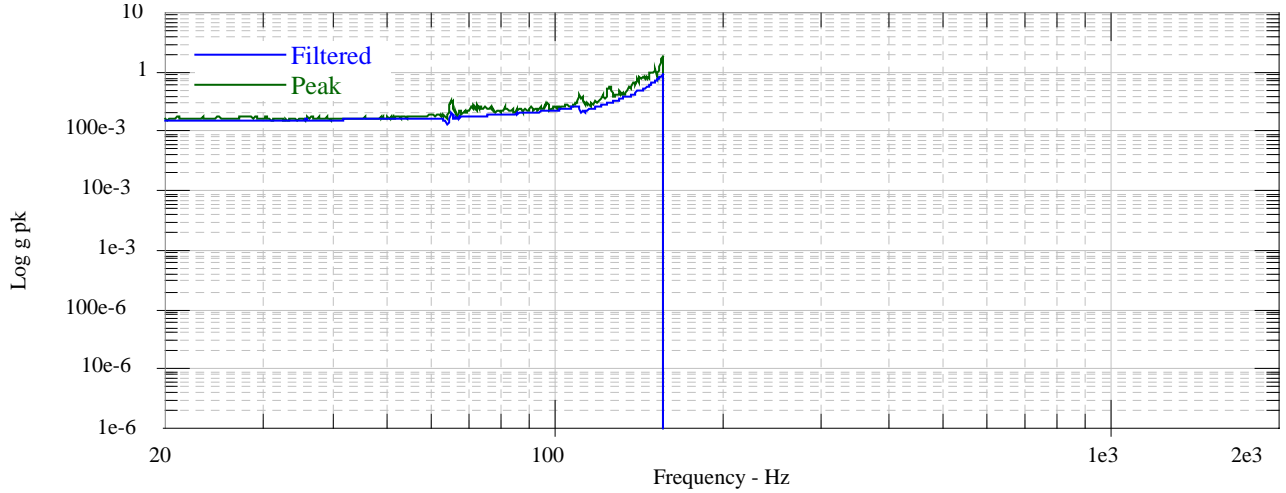
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Date : 1-May-04
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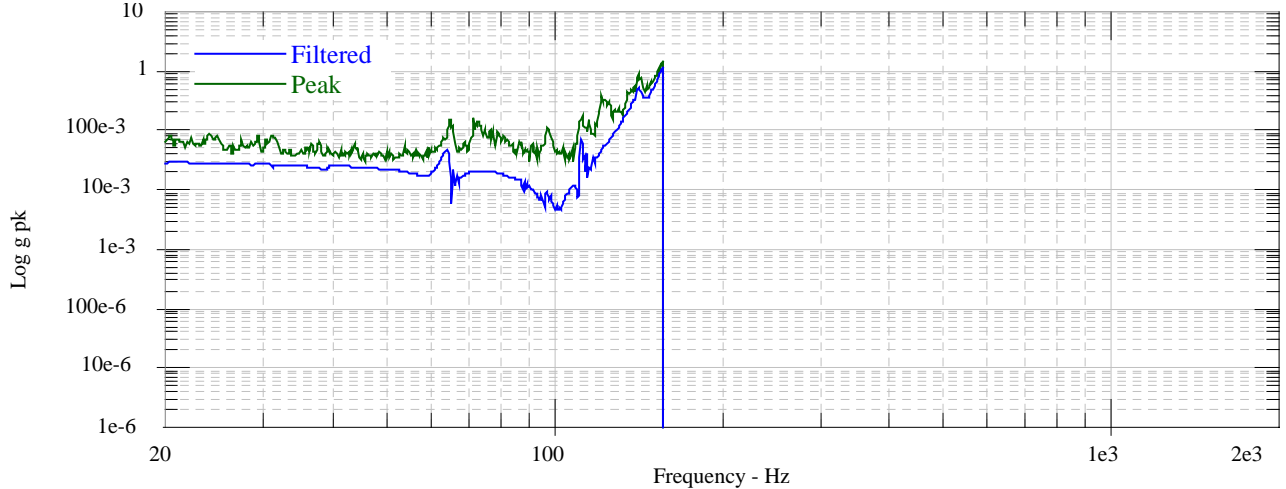
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PHS.XY Channel n° 10



PHS.Z Channel n° 11

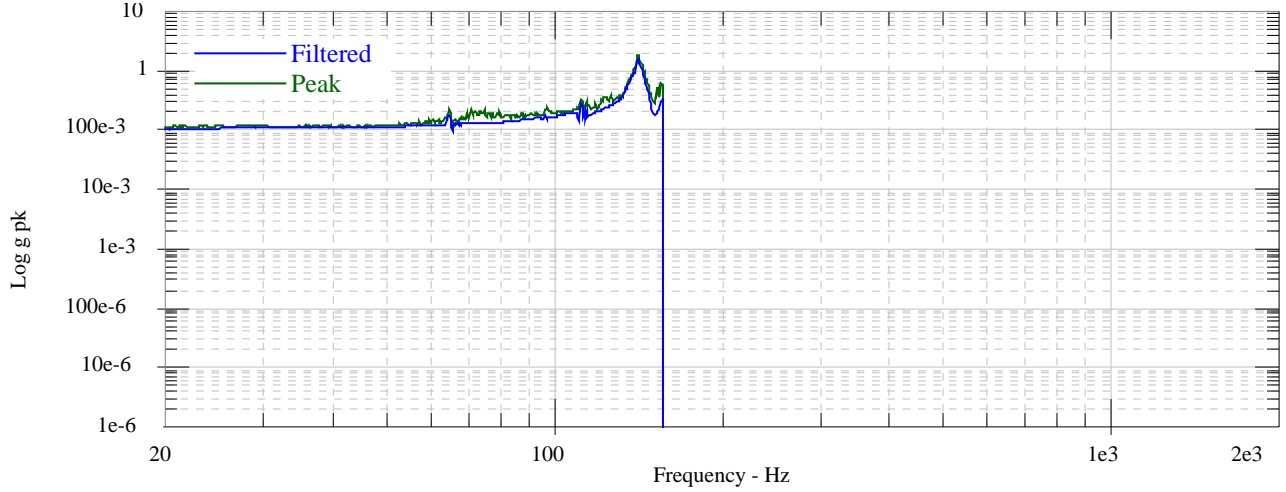


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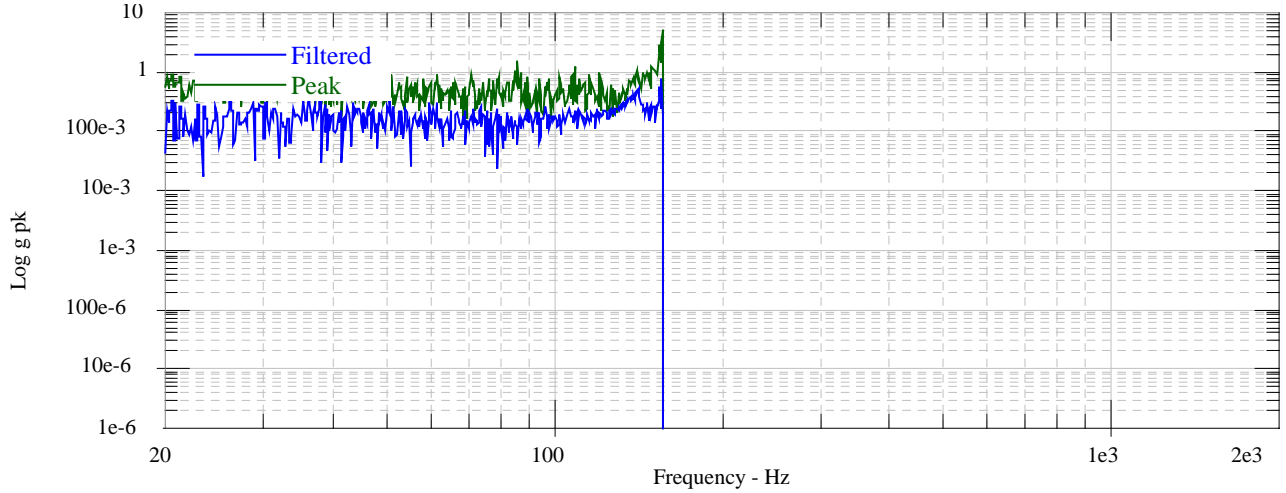
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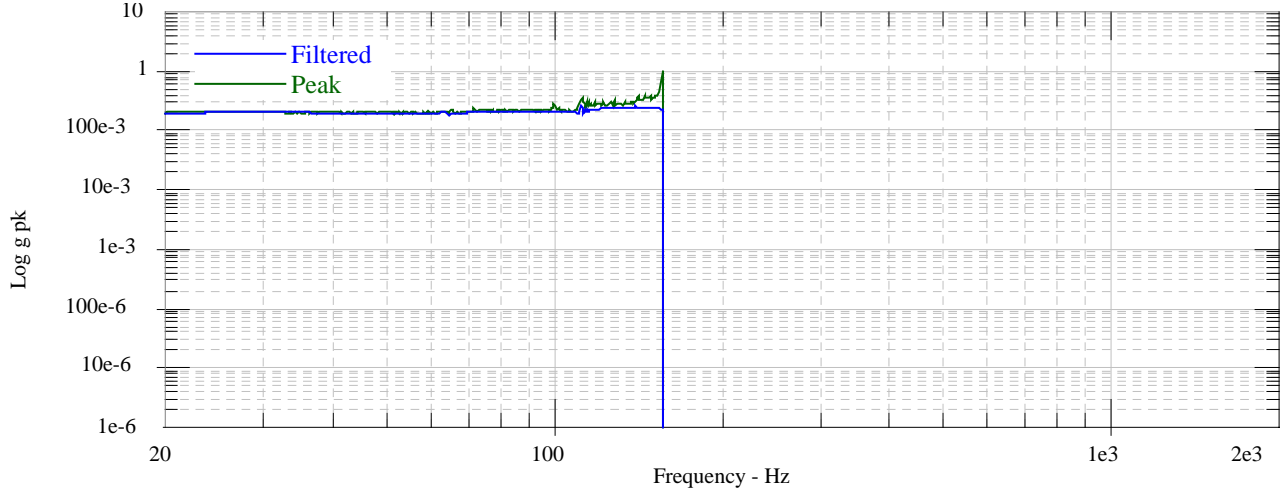
PHE.XY Channel n° 12



COOL.X Channel n° 13



FPU.X Channel n° 14

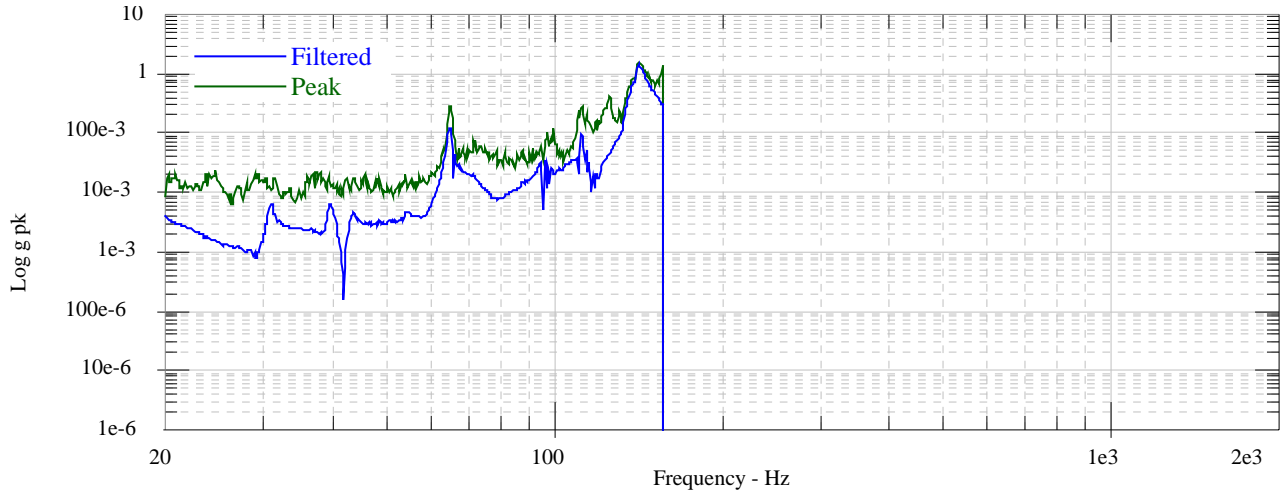


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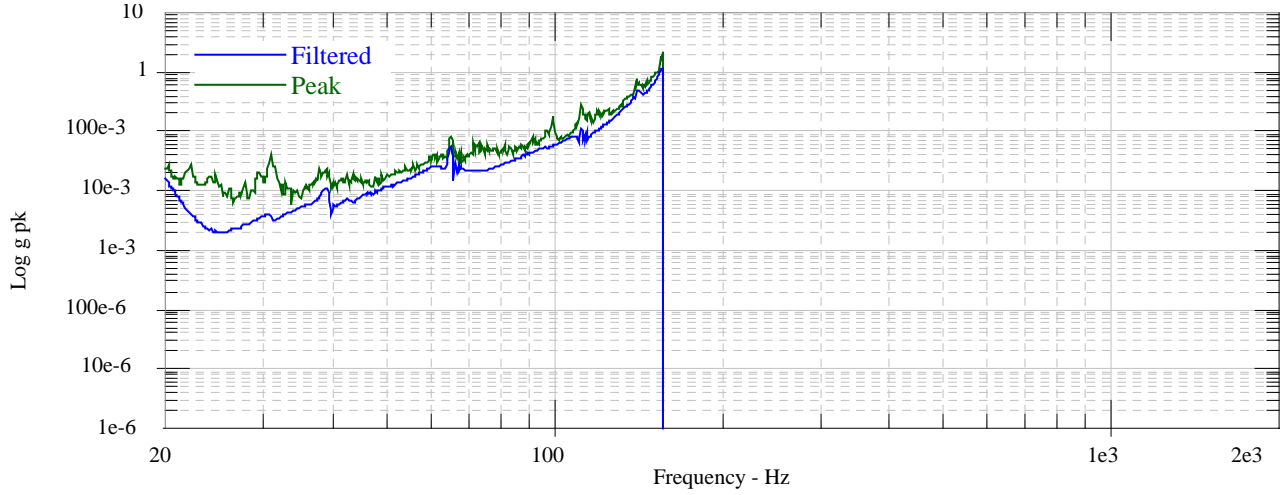
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FPU.Y Channel n° 15



FPU.Z Channel n° 16



SPEC.X Channel n° 17

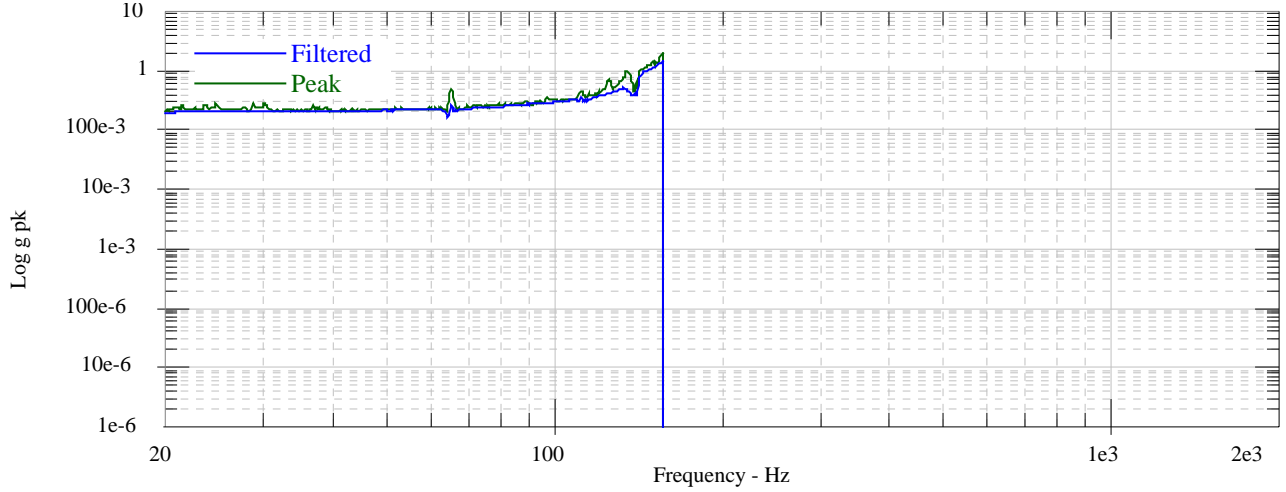


VIBRATION TEST REPORT
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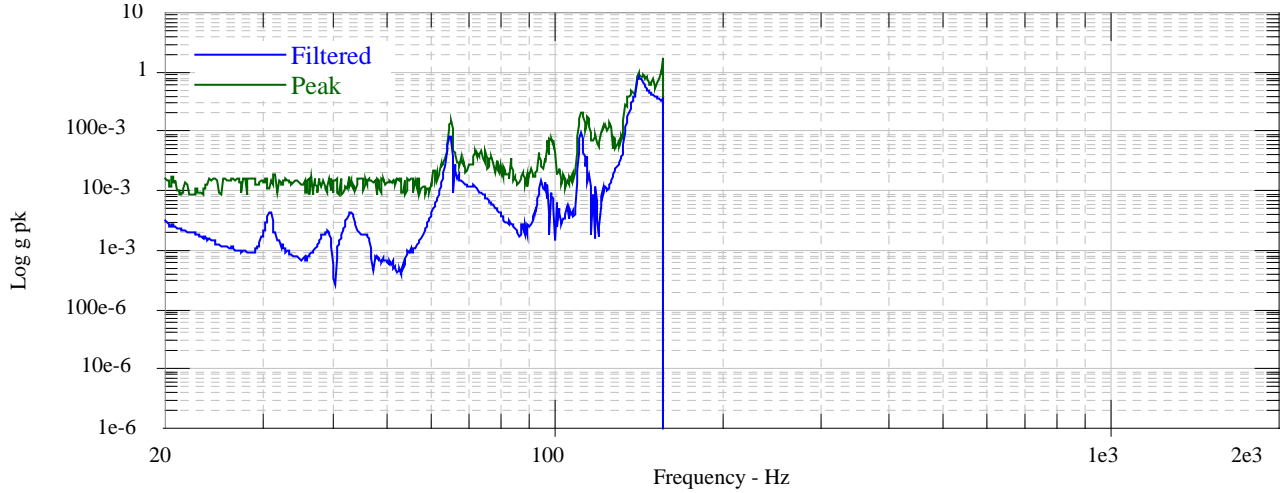
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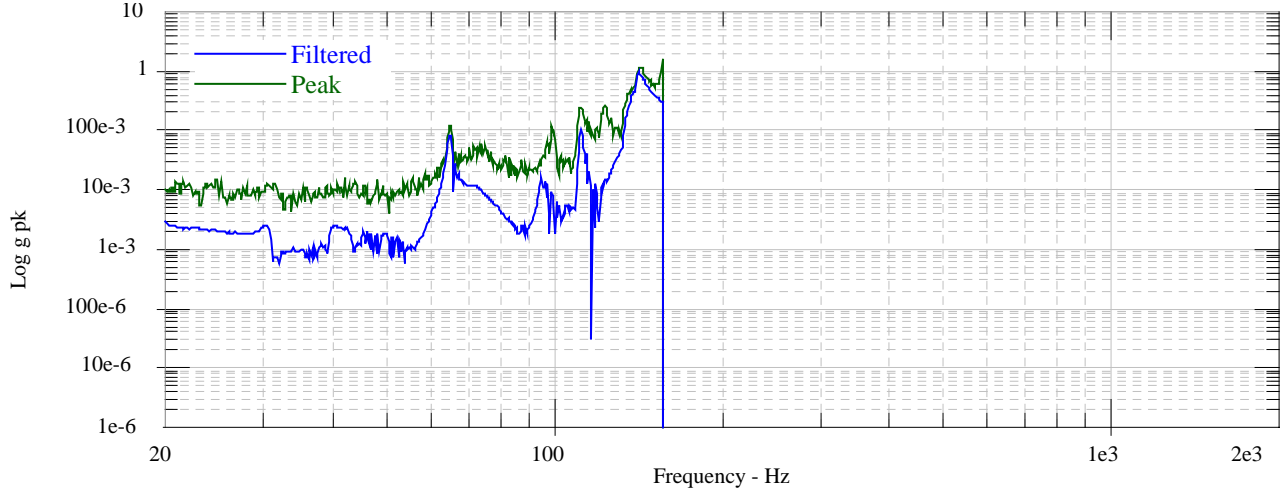
SPEC.Z Channel n° 18



SPEC.Y Channel n° 19



OB.Y Channel n° 20

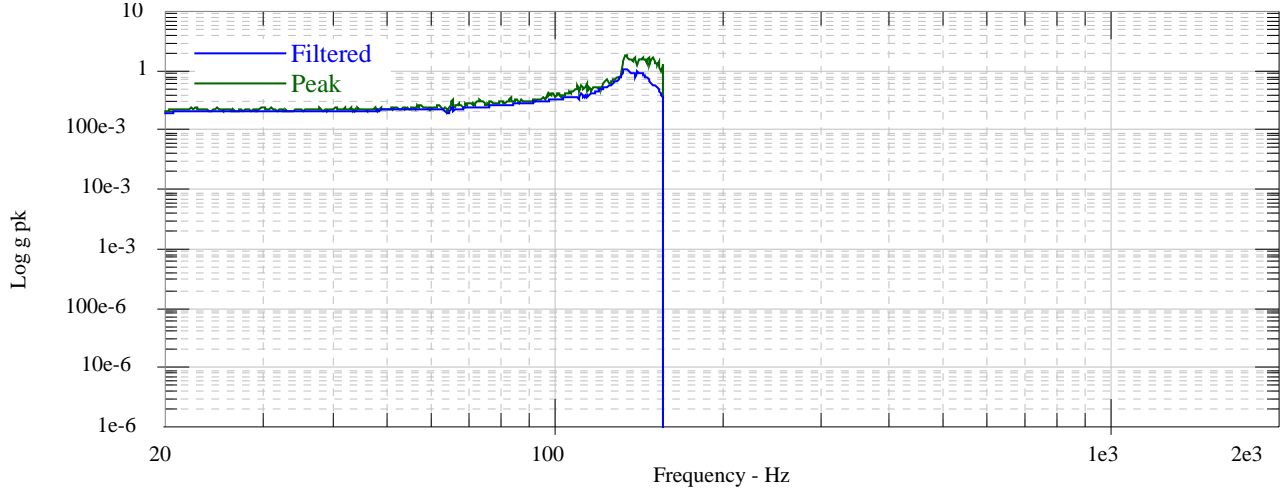


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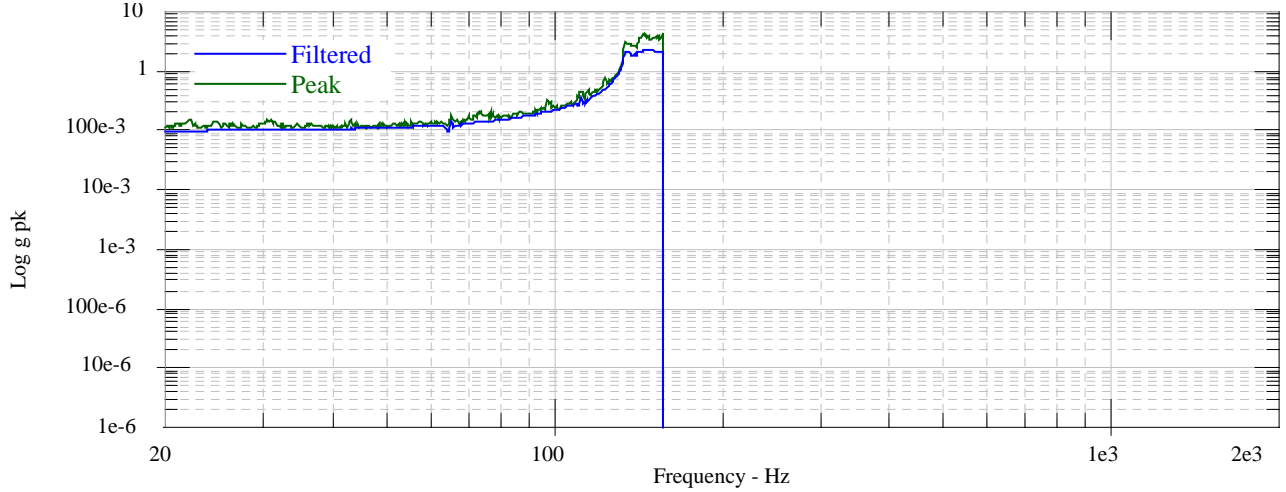
SMECL.X Channel n° 21



CTIP.Y Channel n° 22



SMECU.X Channel n° 23

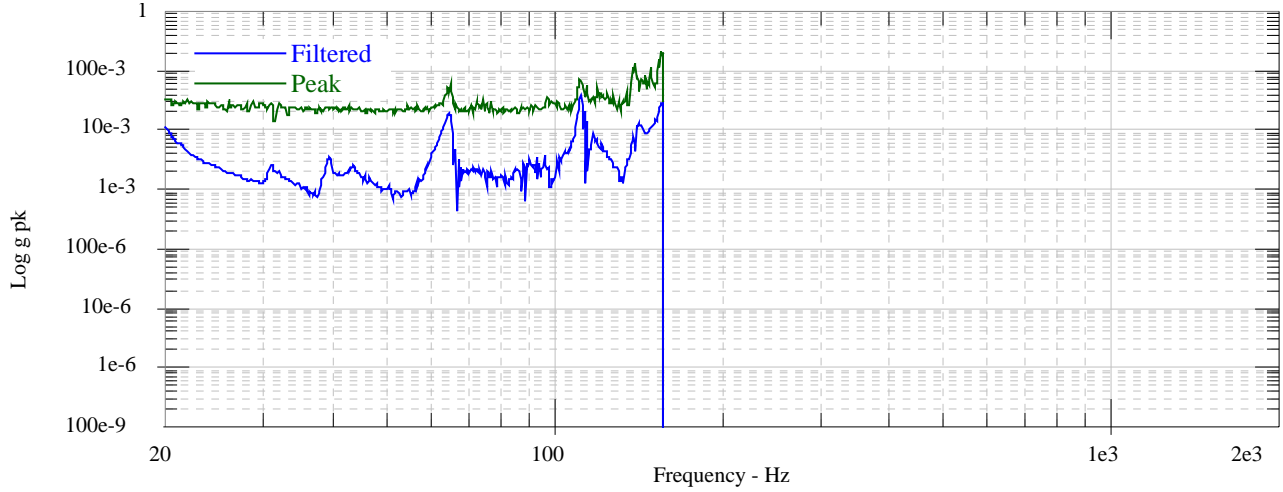


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SPIRE QM

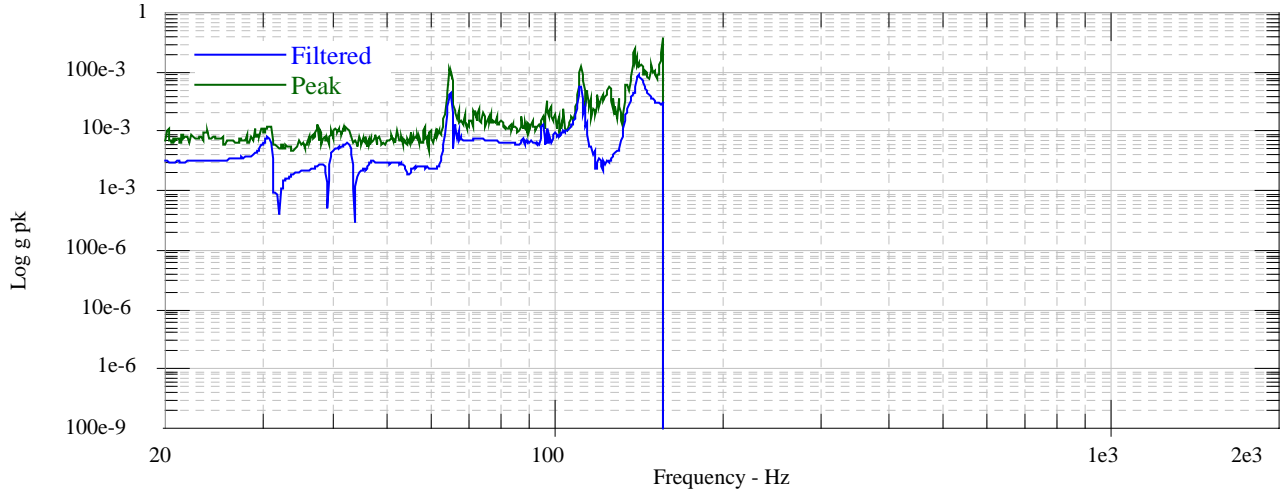
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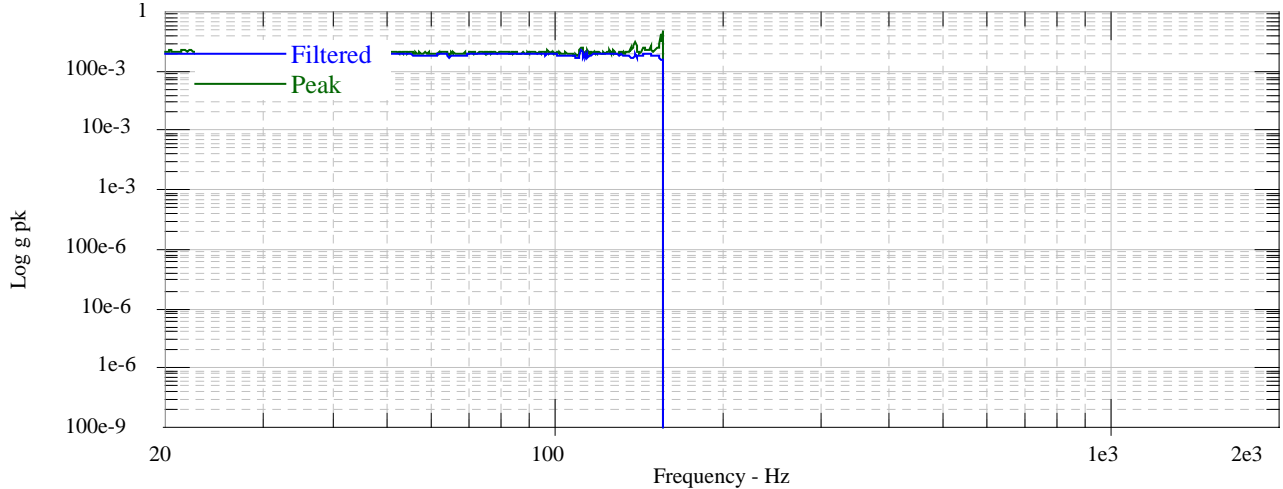
CONE.Z Channel n° 24



CONE.Y Channel n° 25



CONE.X Channel n° 26

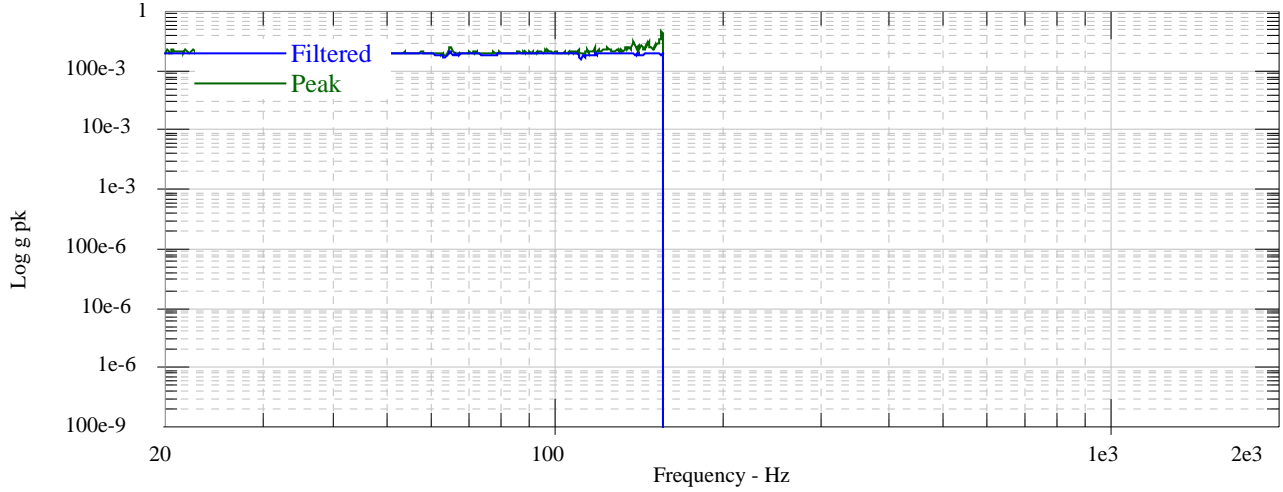


VIBRATION TEST REPORT
SPIRE QM

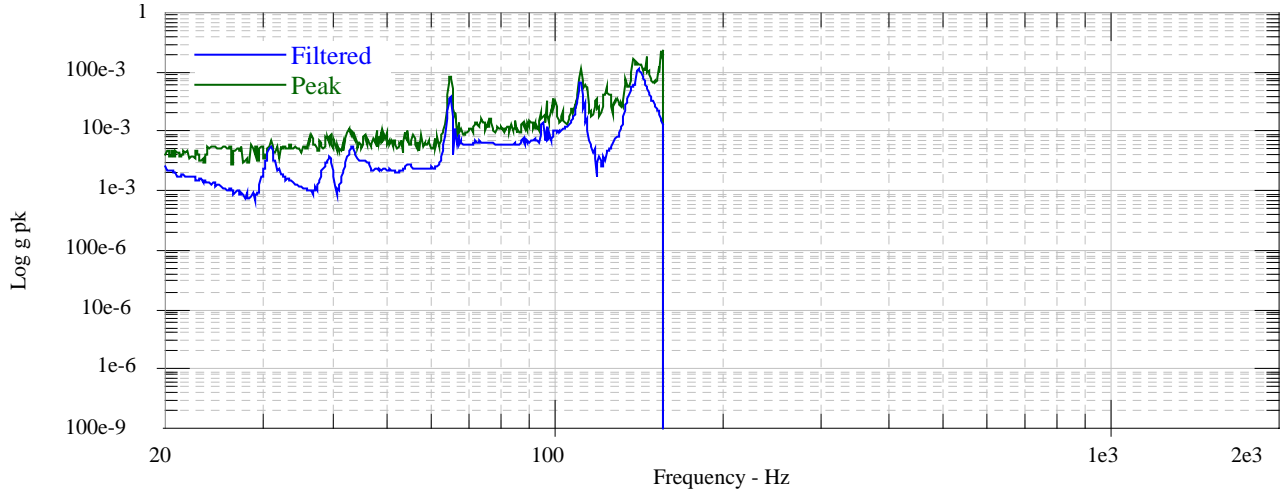
RP-CSL-CRYOV-04001
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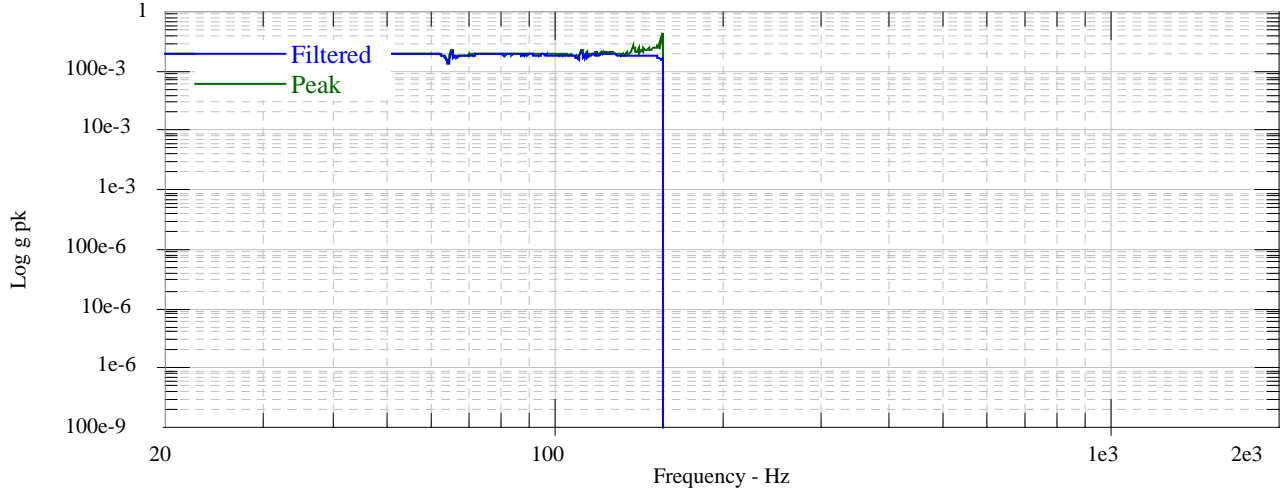
-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29

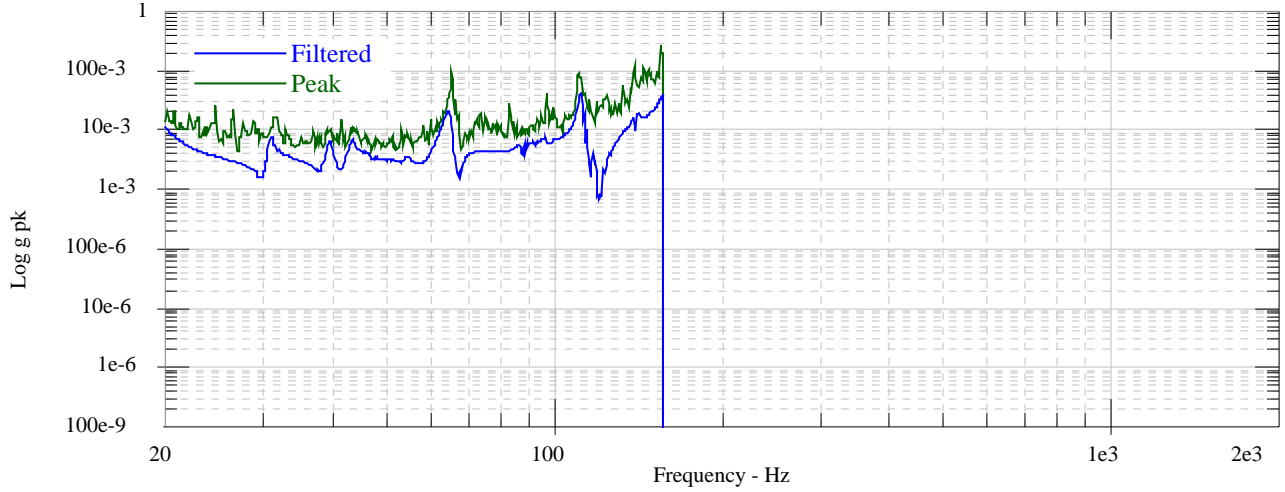


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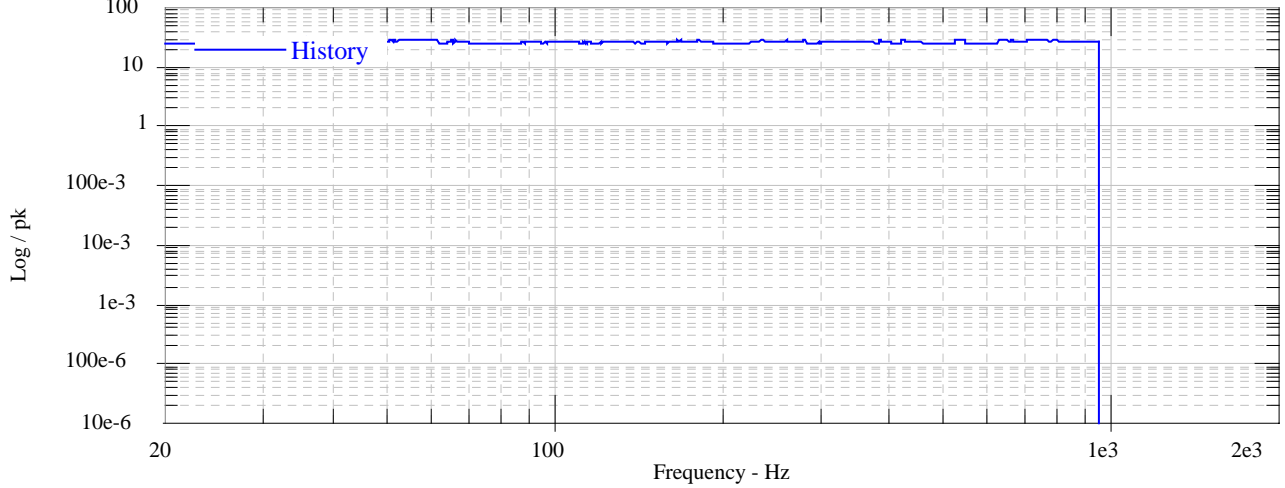
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+YAFRAME.Z Channel n° 30

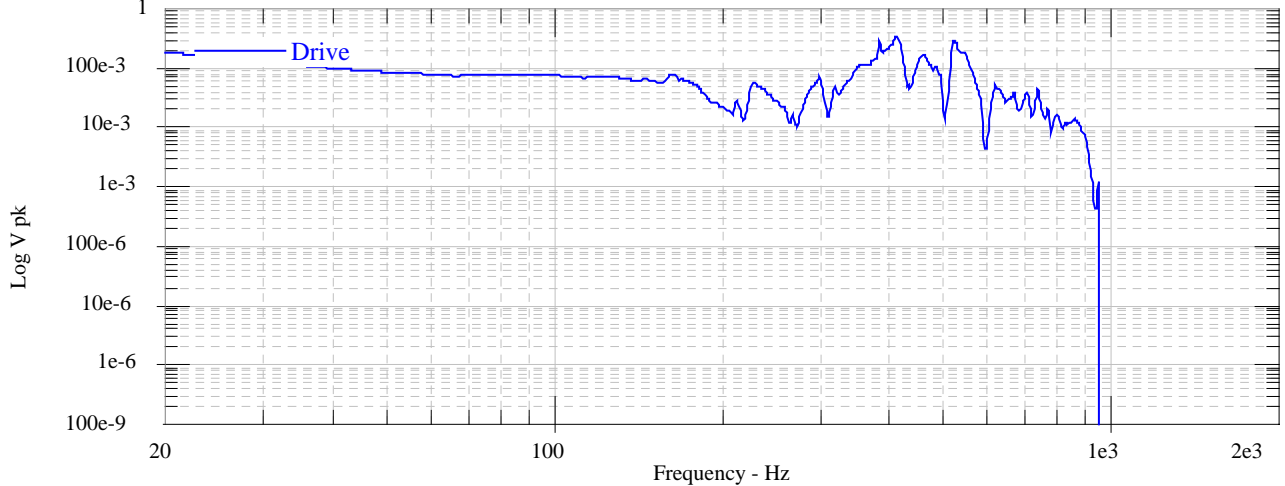


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History Channel n° -3



Drive Channel n° -2

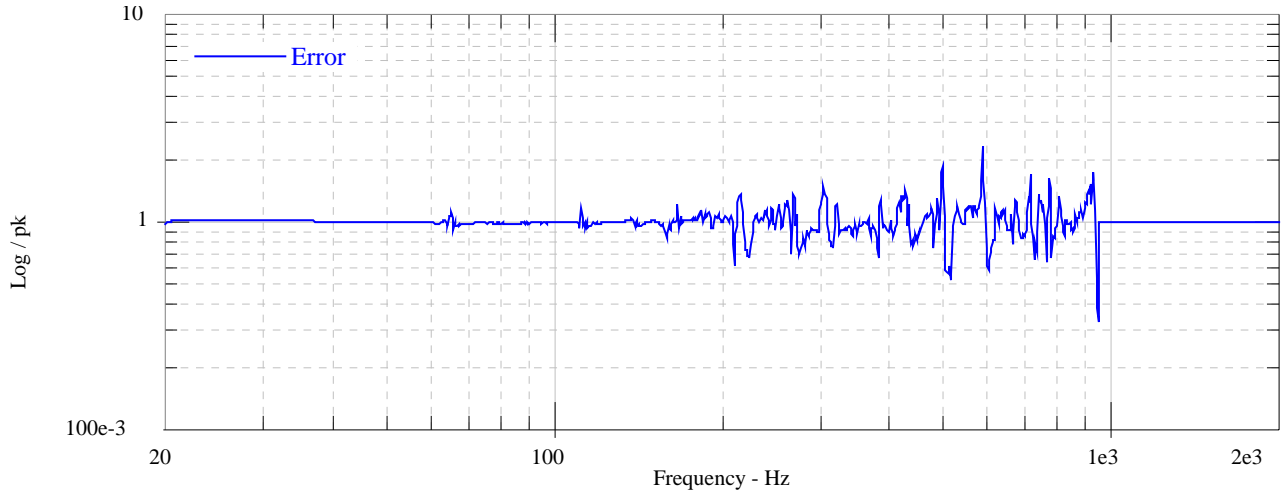


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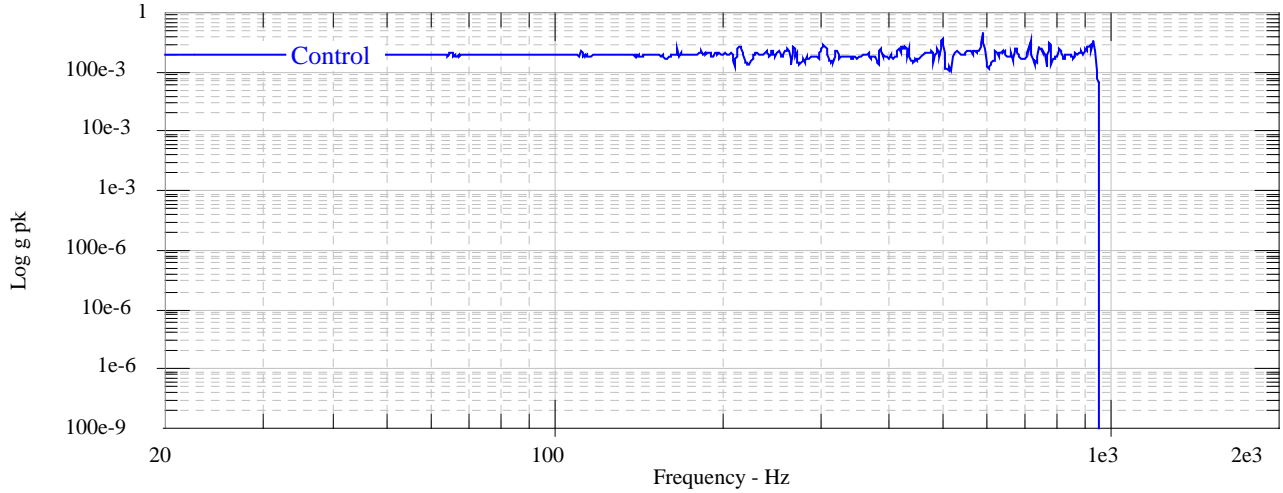
RP-CSL-CRYOV-04001
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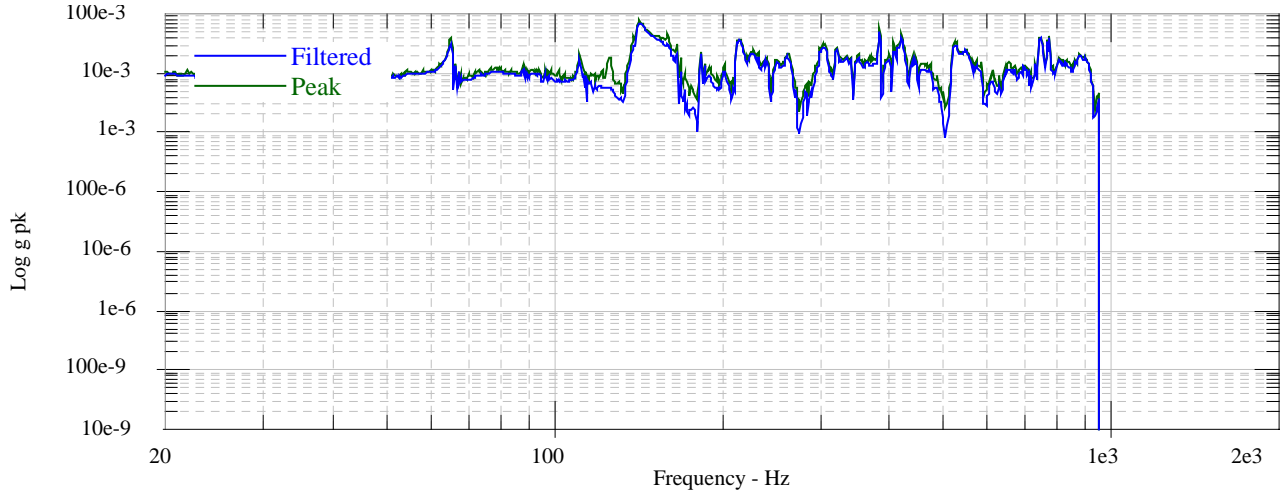
Error Channel n° -1



Control Channel n° 0



SHK.1.Y Channel n° 1

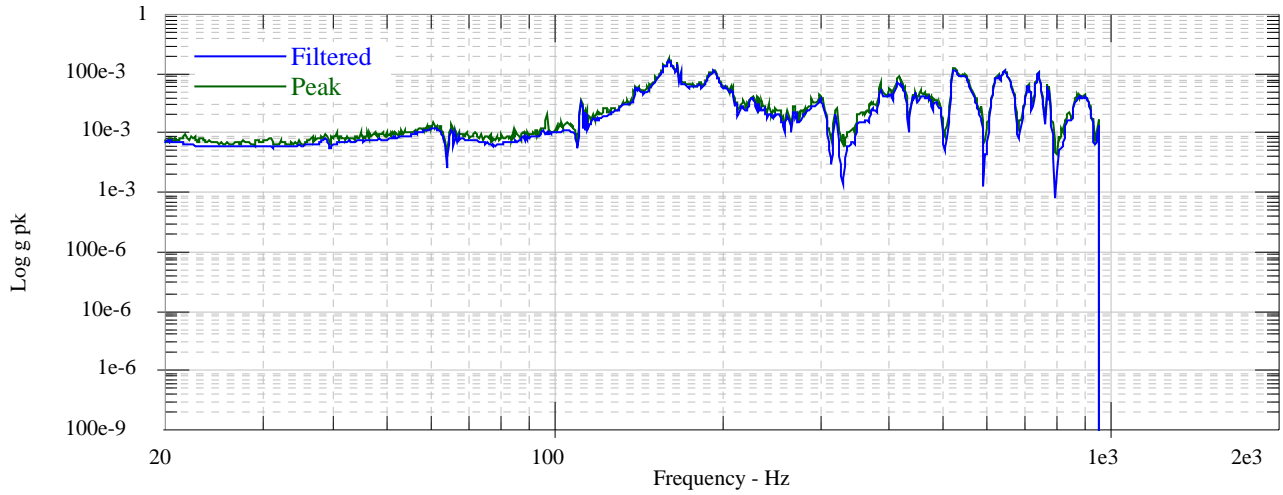


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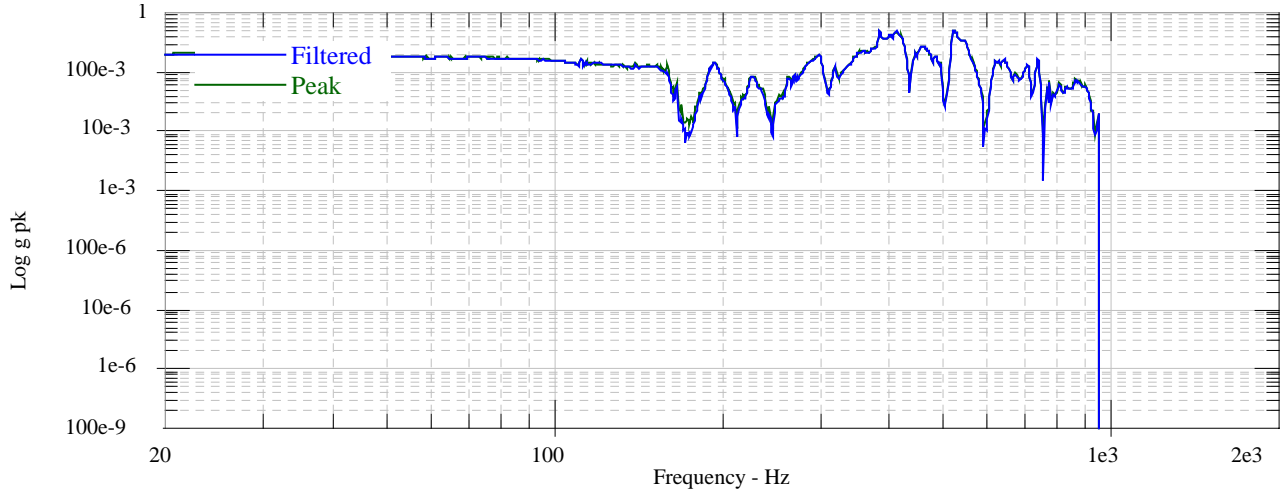
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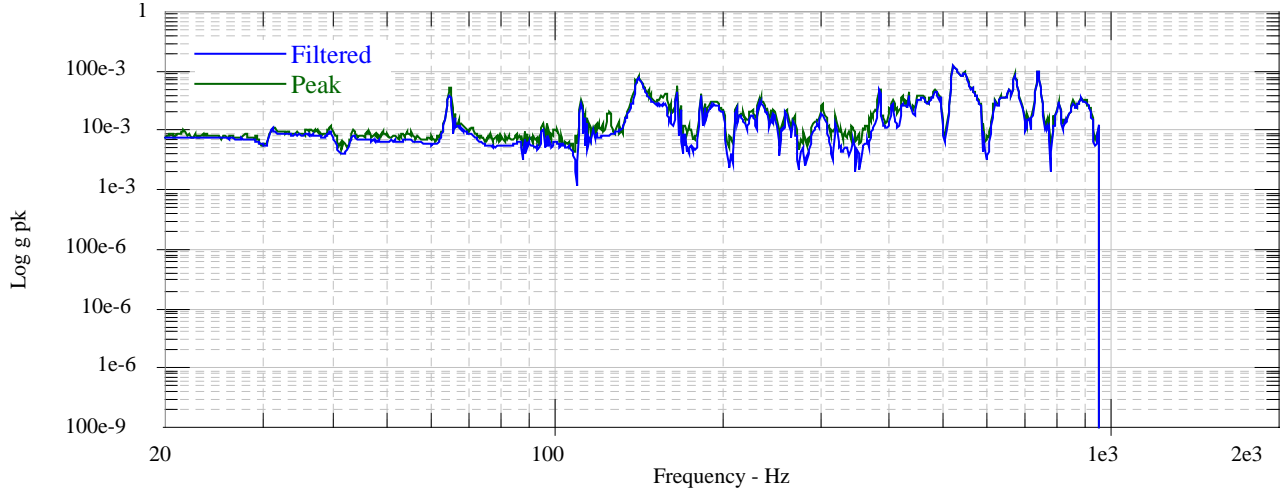
SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3



SHK.2.Y Channel n° 4



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SPIRE QM

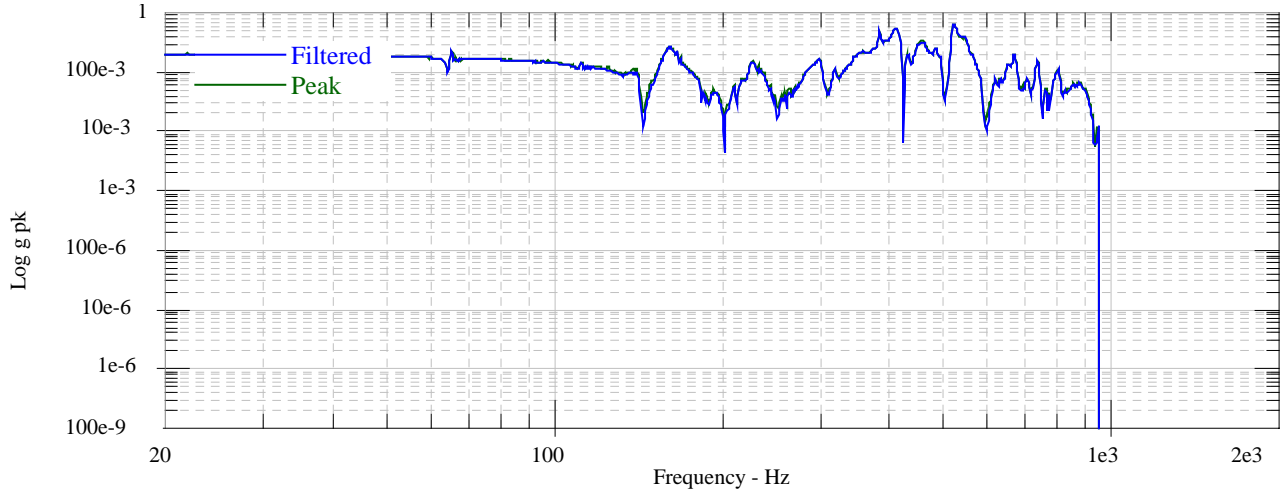
RP-CSL-CRYOV-04001
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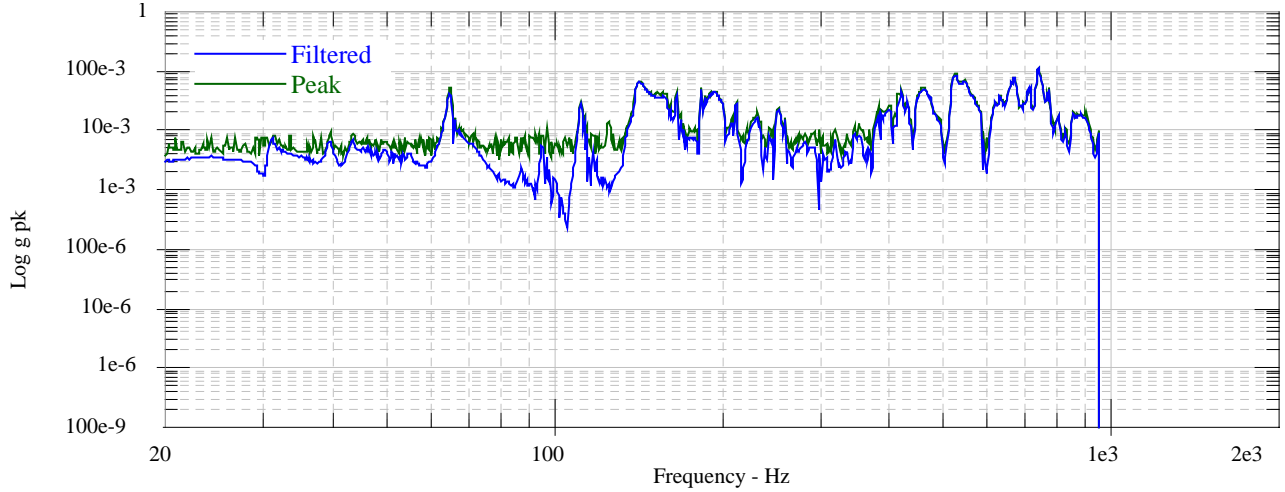
SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6



SHK.3.Y Channel n° 7

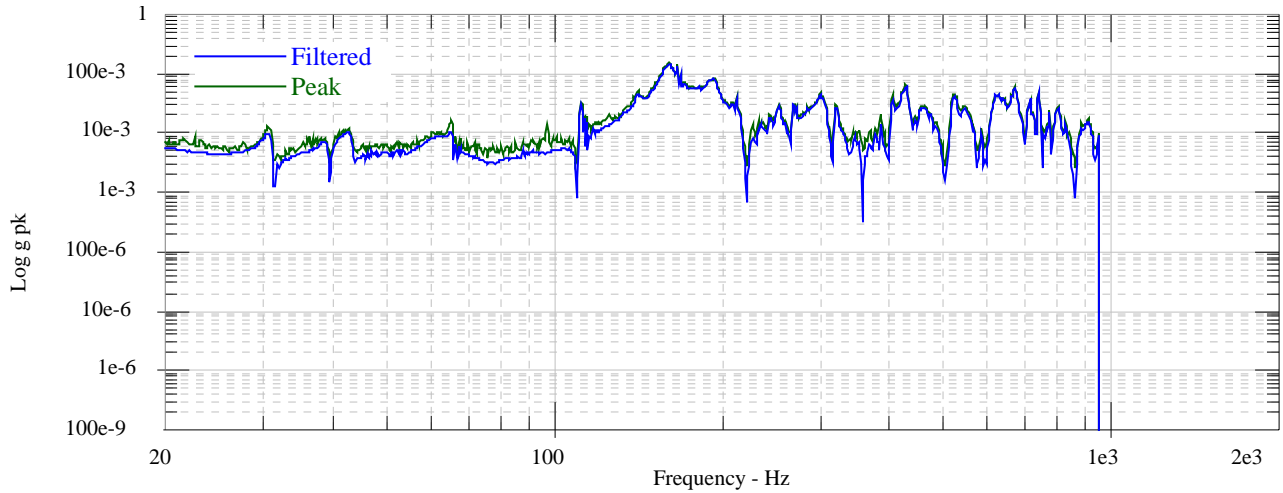


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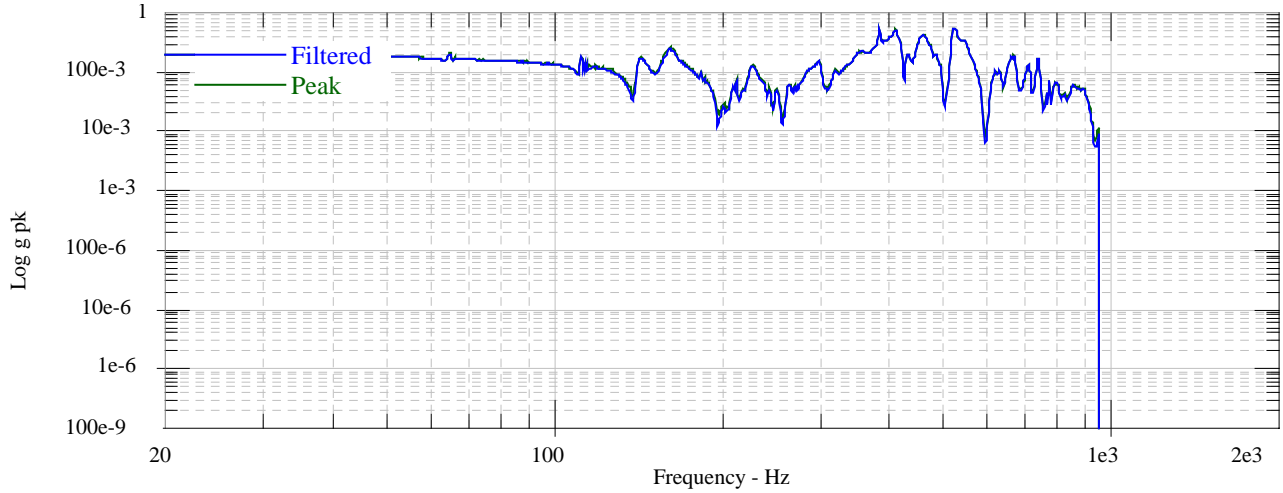
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Version : 01
Révision : 00
Date : 1-May-04
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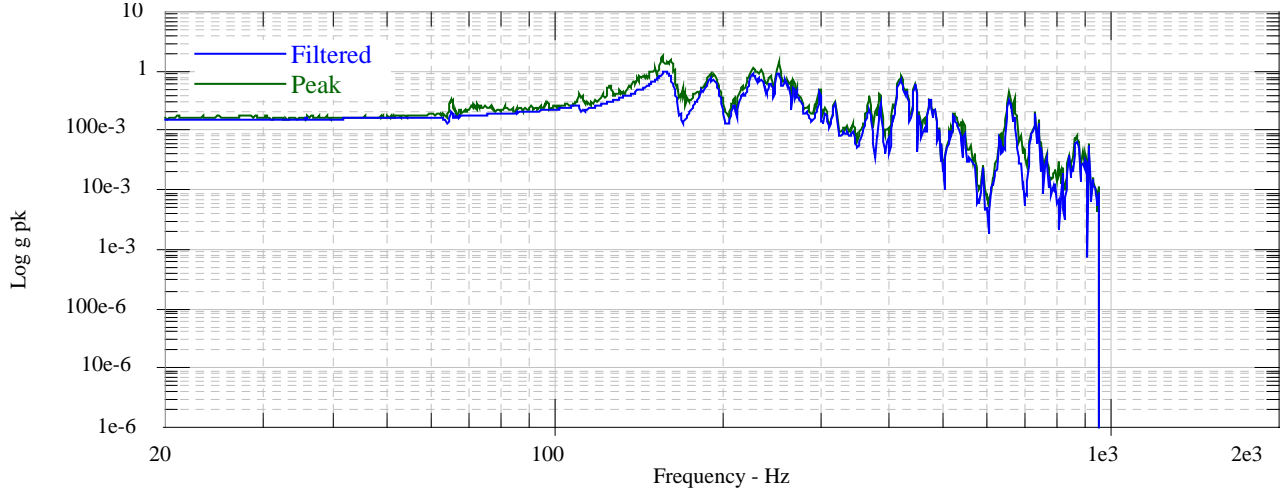
SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9



PHS.XY Channel n° 10

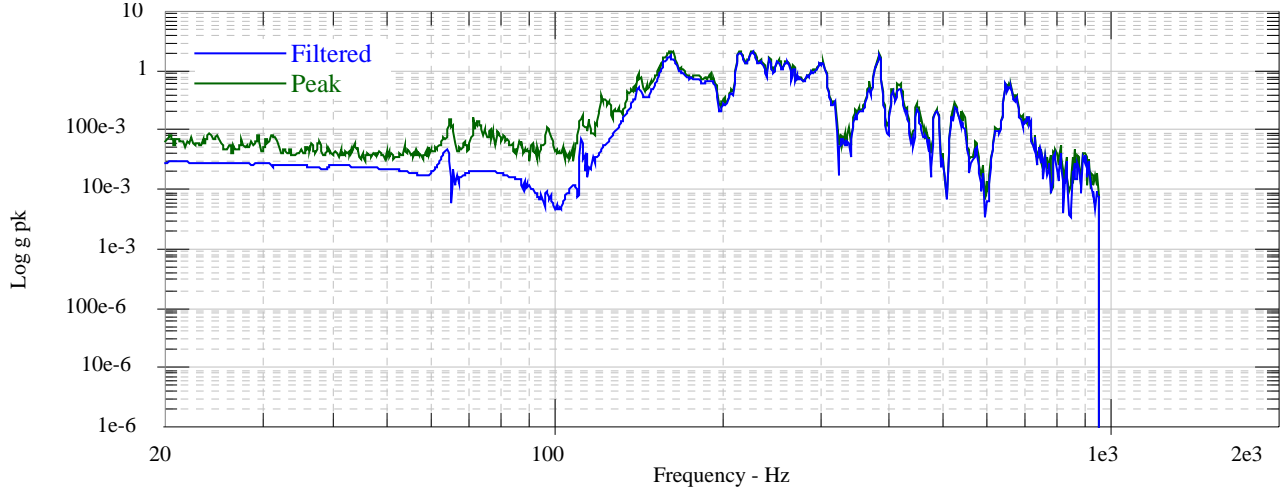


VIBRATION TEST REPORT
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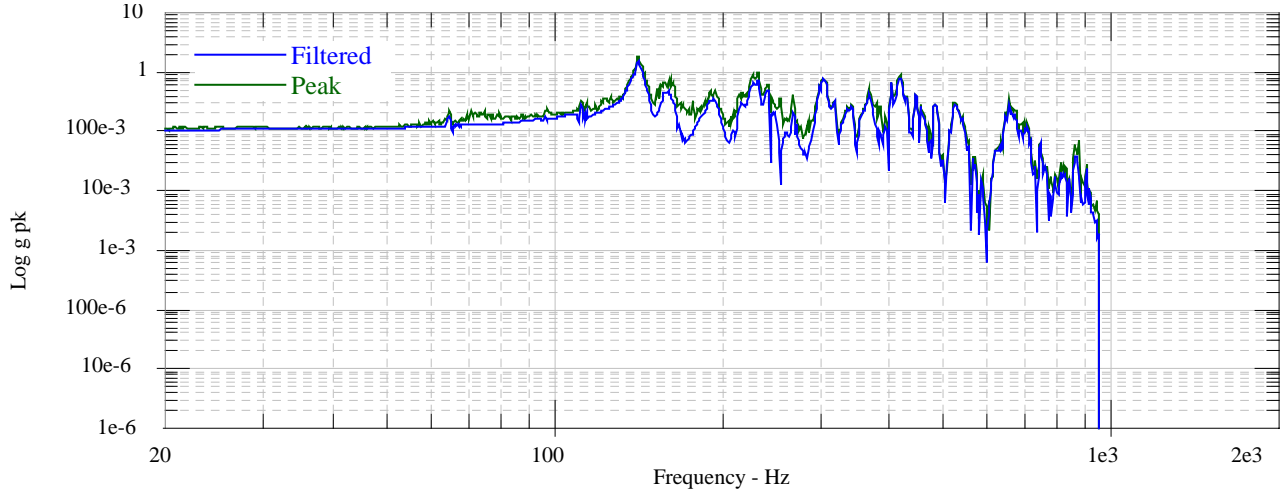
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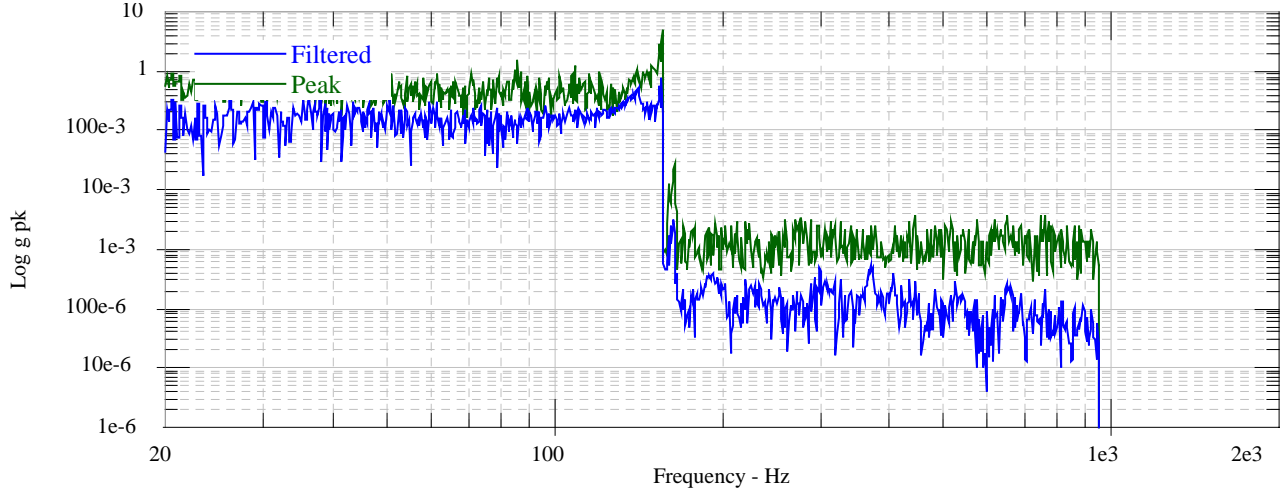
PHS.Z Channel n° 11



PHE.XY Channel n° 12



COOLX Channel n° 13

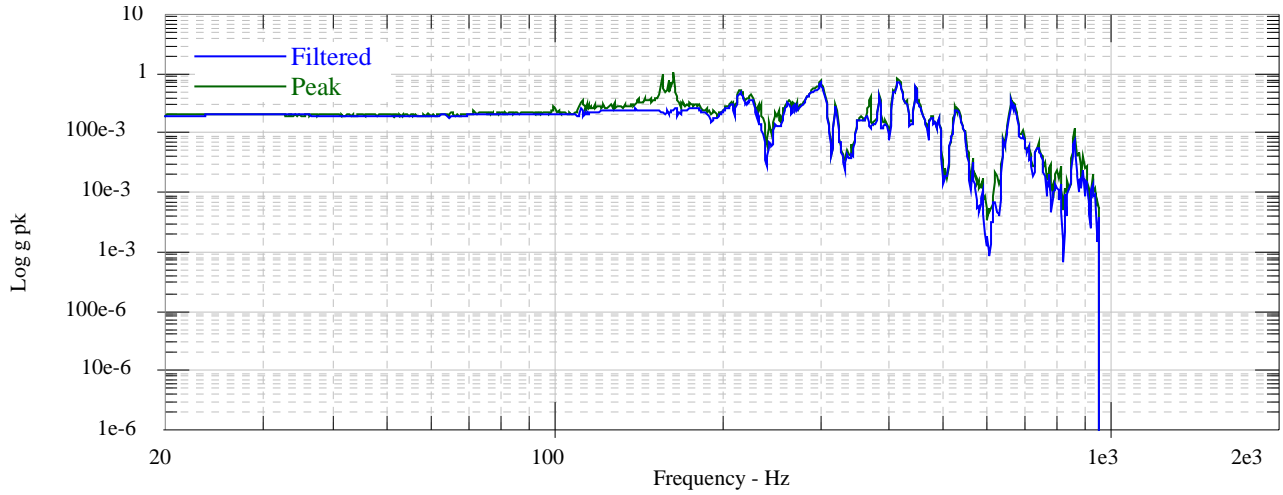


VIBRATION TEST REPORT
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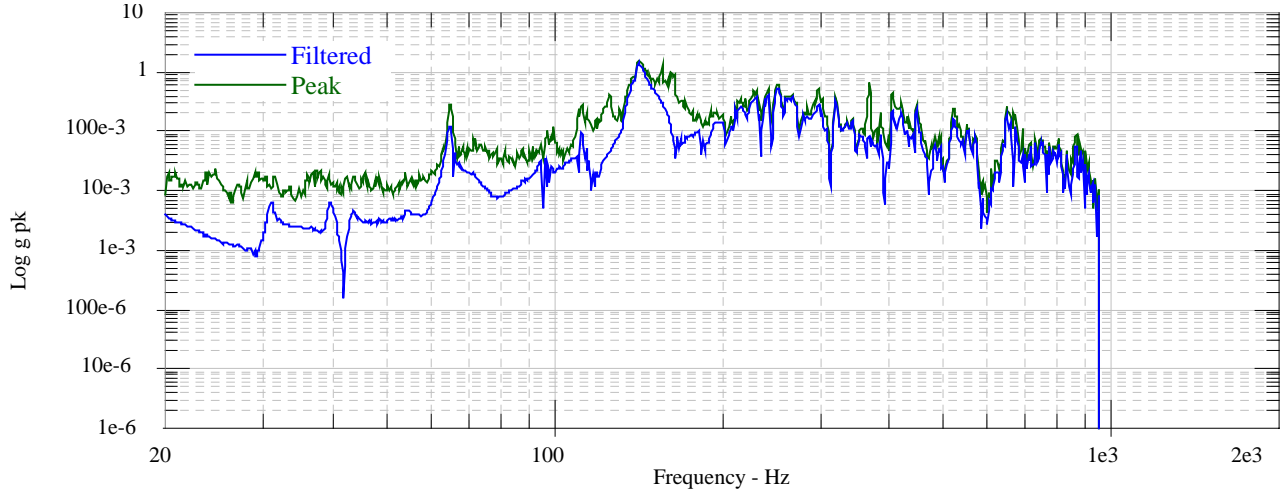
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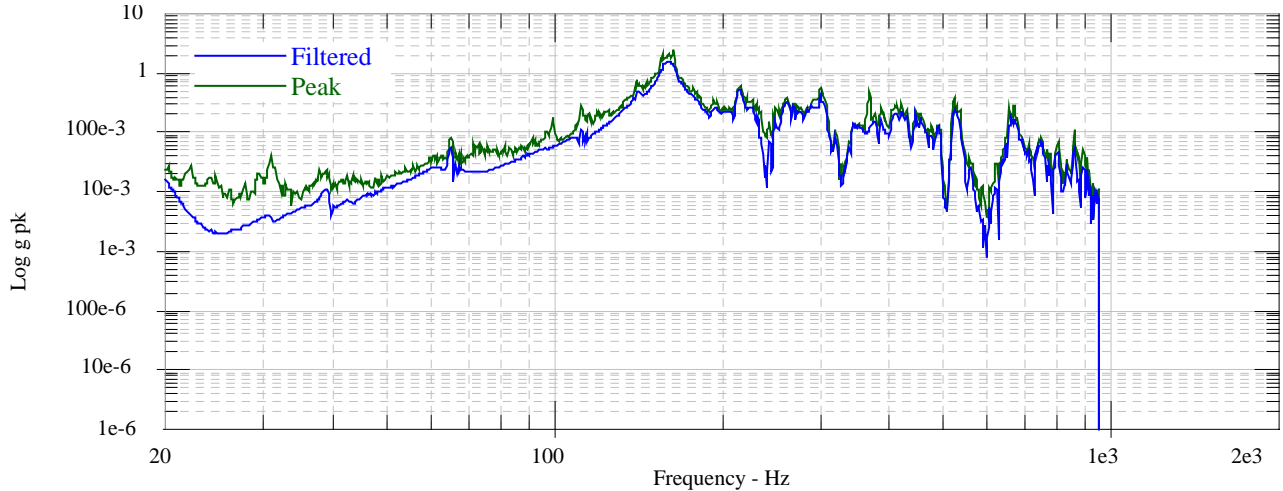
FPU.X Channel n° 14



FPU.Y Channel n° 15



FPU.Z Channel n° 16

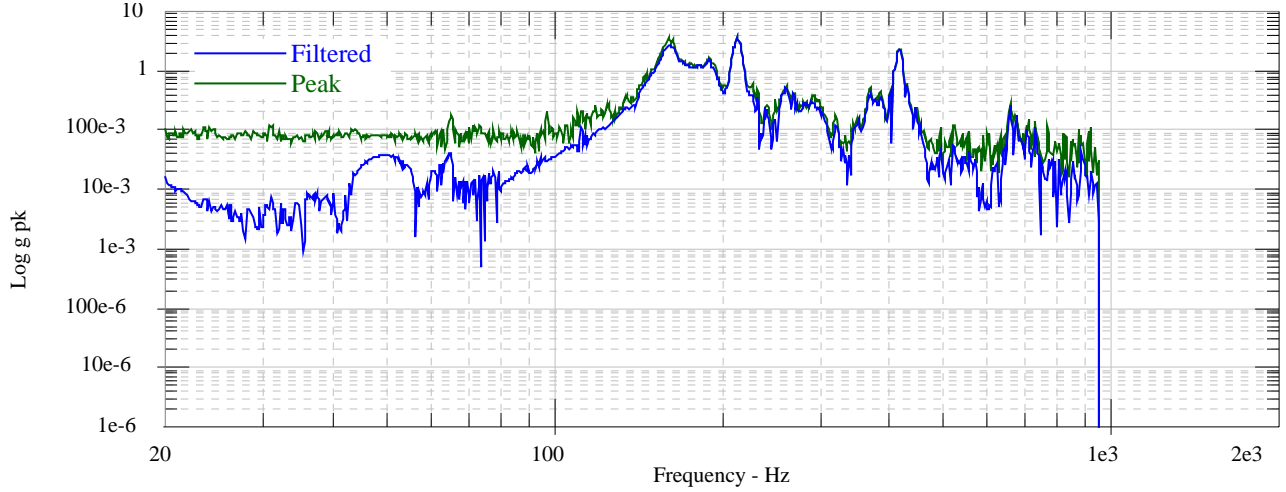


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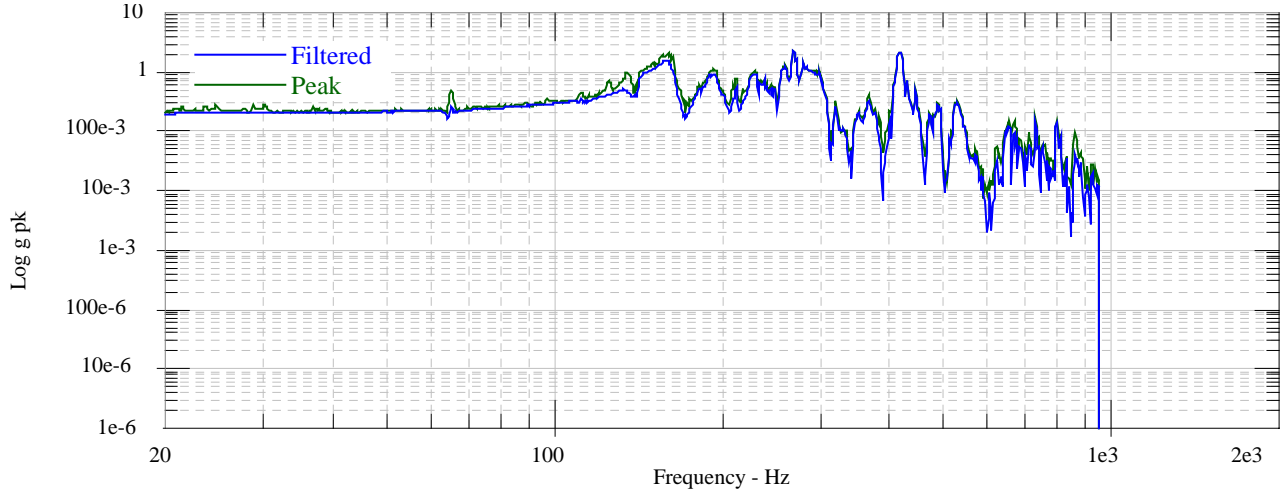
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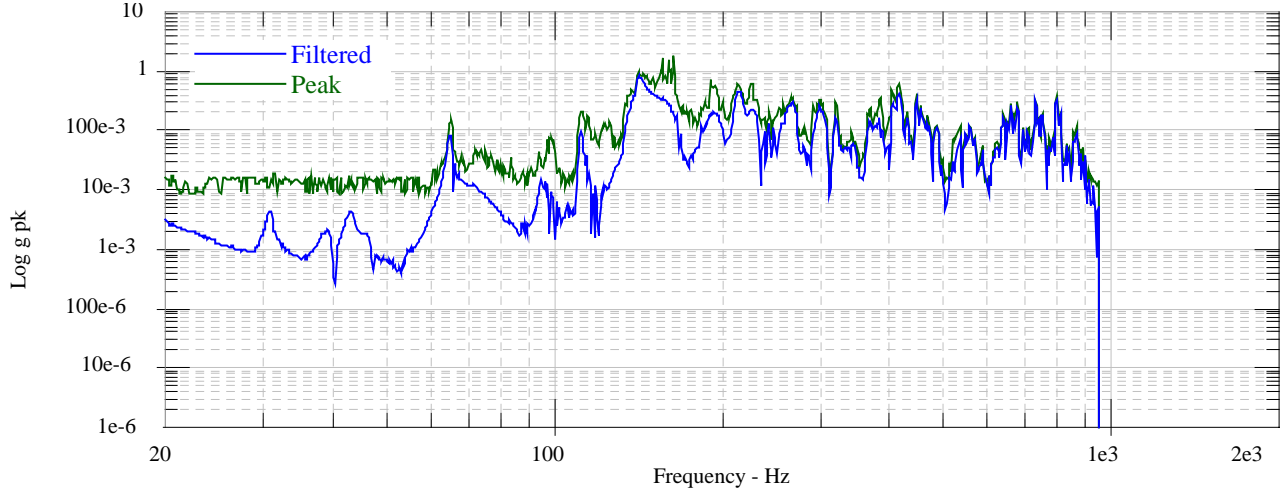
SPEC.X Channel n° 17



SPEC.Z Channel n° 18



SPEC.Y Channel n° 19

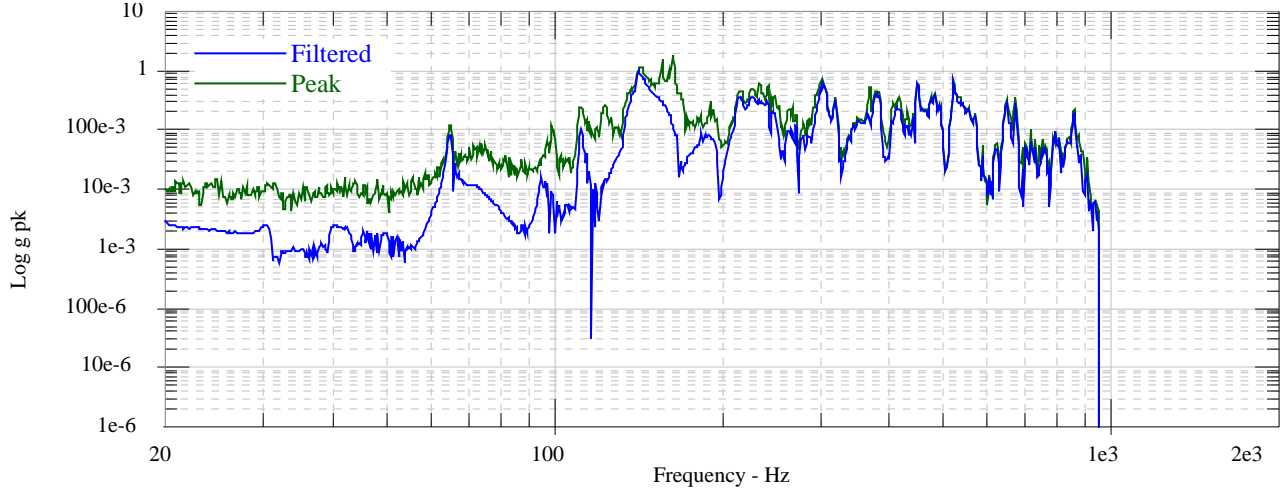


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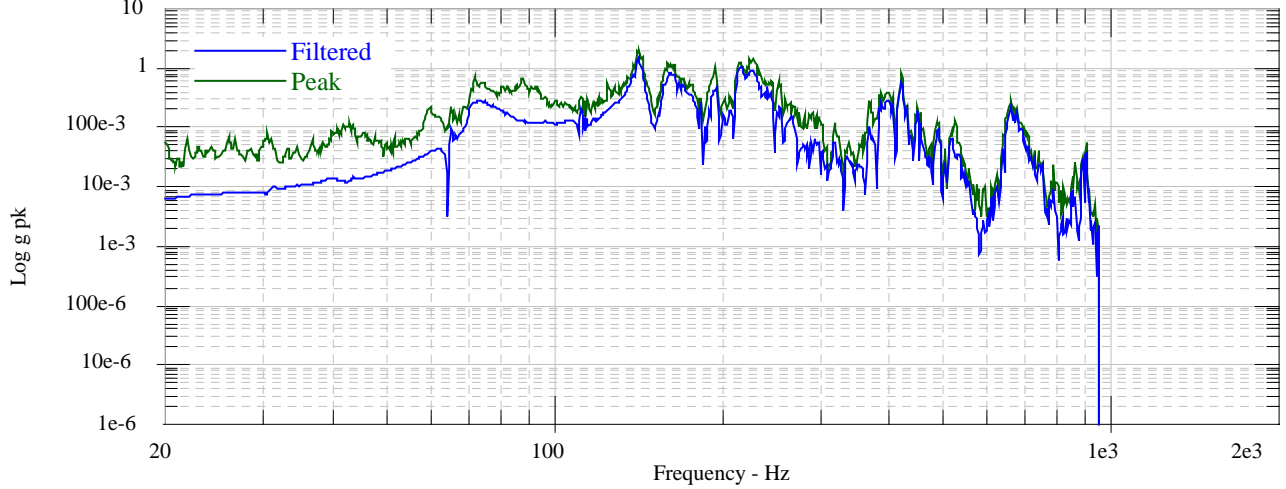
OB.Y Channel n° 20



SMECL.X Channel n° 21



CTIP.Y Channel n° 22

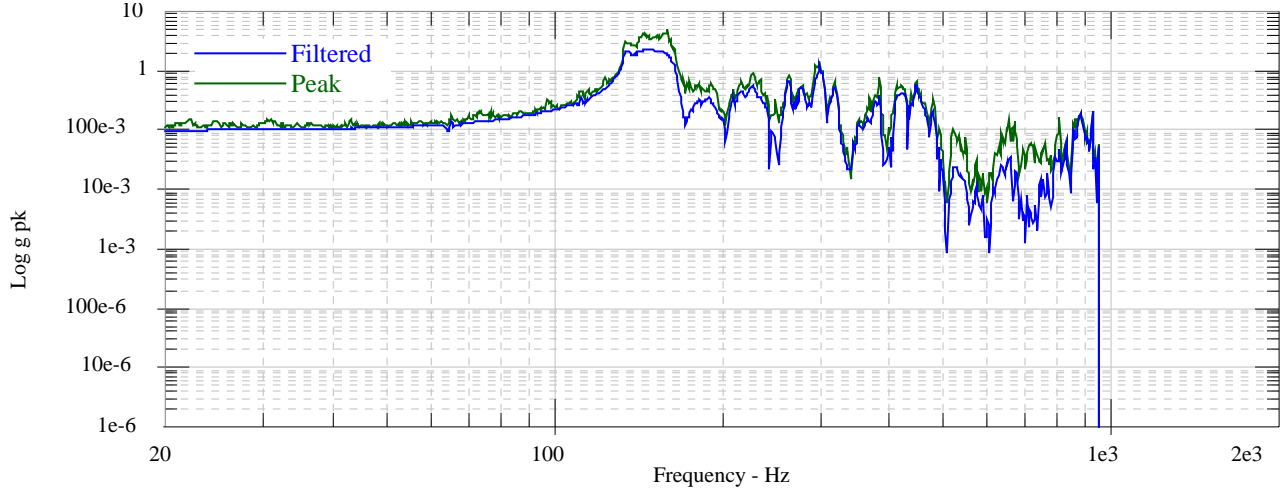


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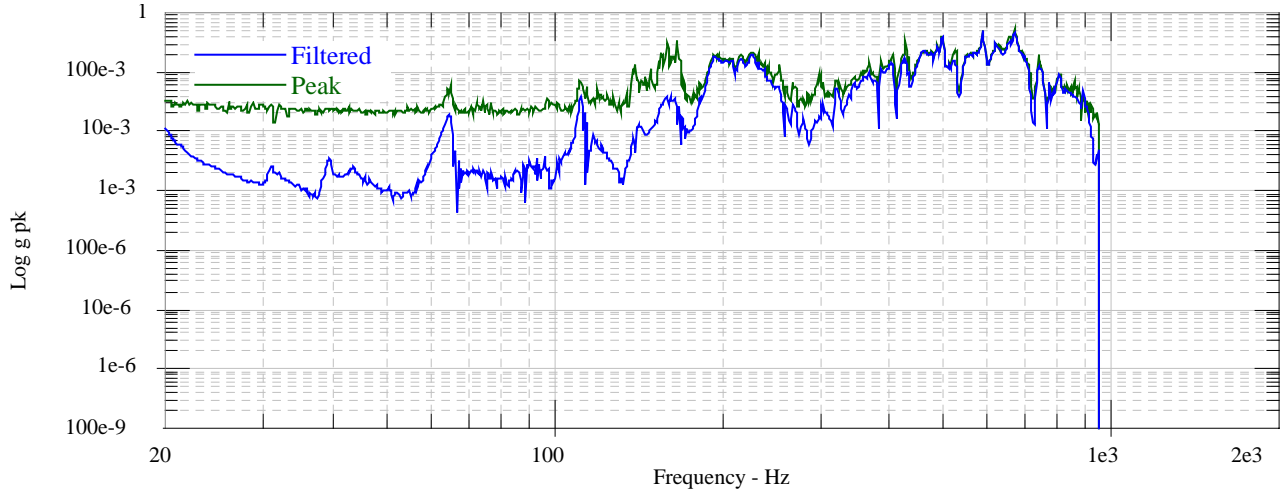
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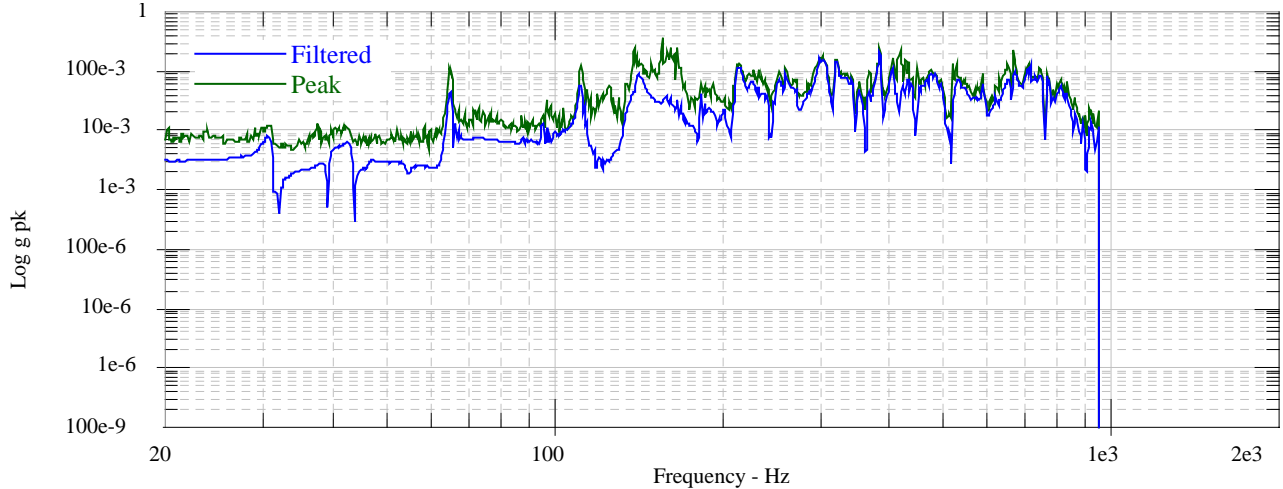
SMECU.X Channel n° 23



CONE.Z Channel n° 24



CONE.Y Channel n° 25

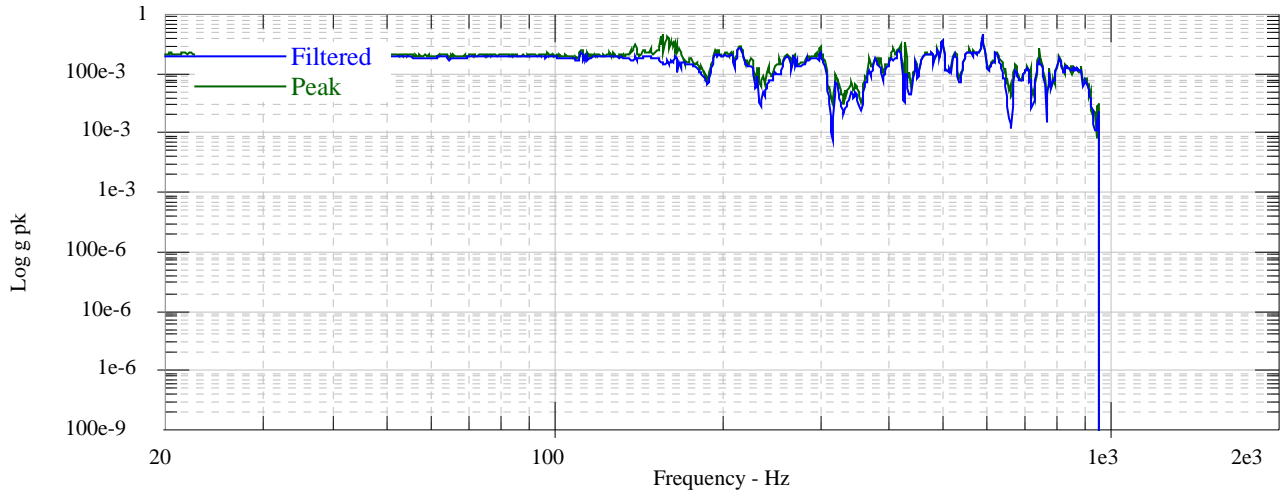


VIBRATION TEST REPORT
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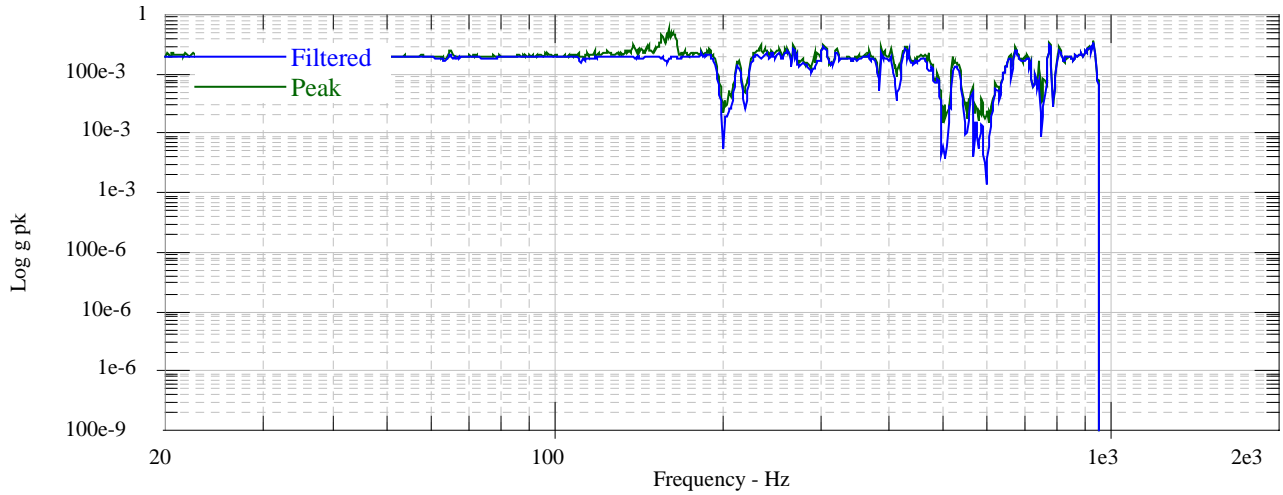
RP-CSL-CRYOV-04001
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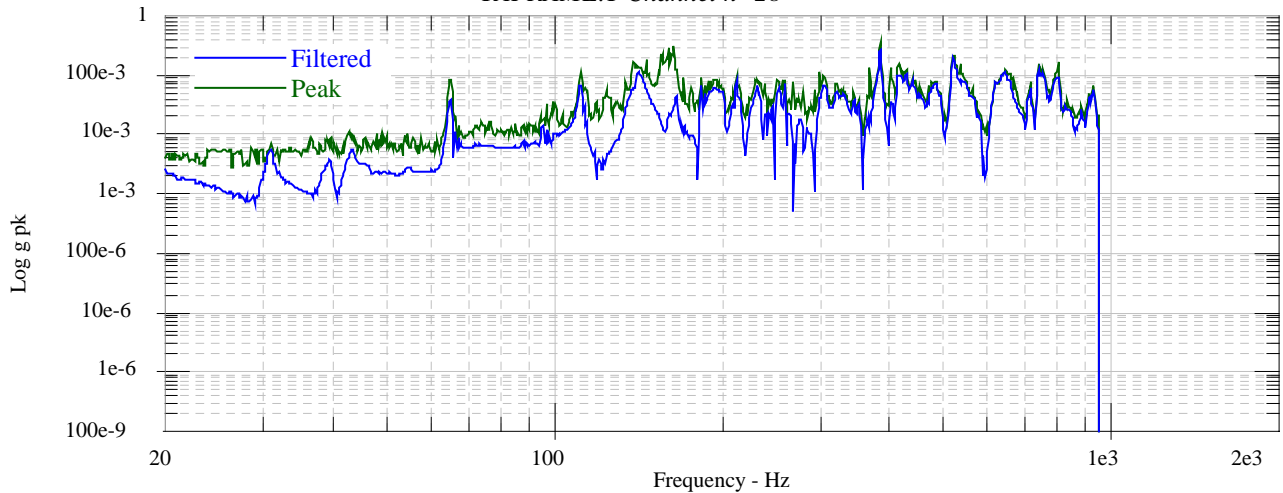
CONE.X Channel n° 26



-YAFRAME.X Channel n° 27



-YAFRAME.Y Channel n° 28

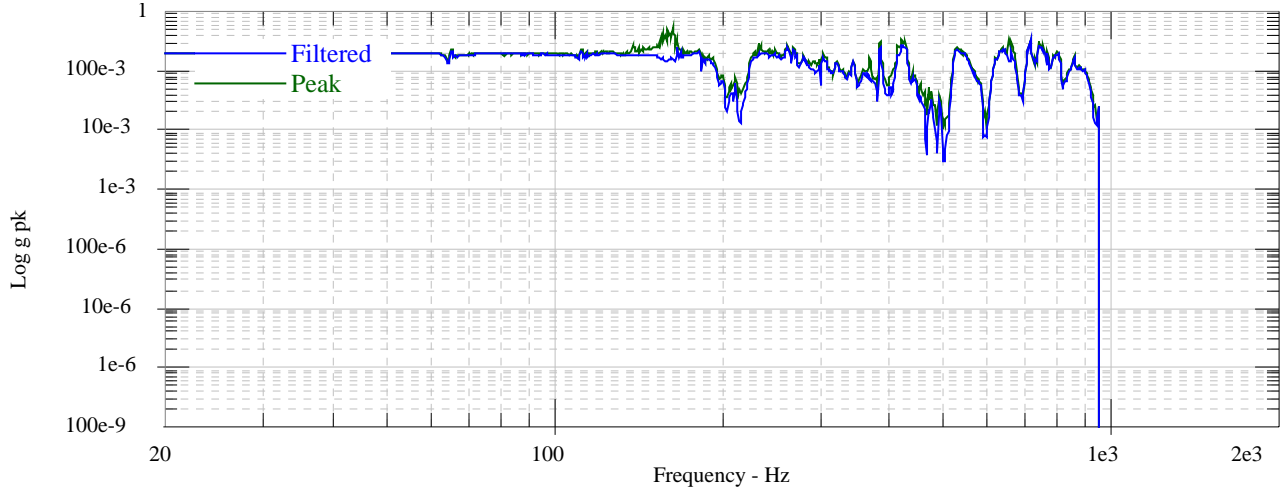


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+YAFRAME.X Channel n° 29

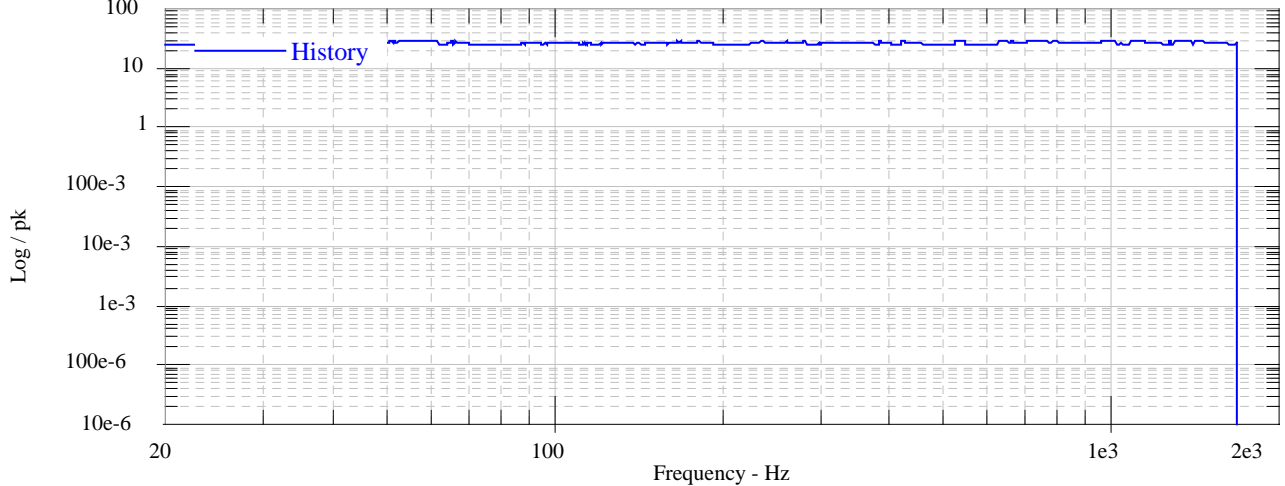


+YAFRAME.Z Channel n° 30



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History Channel n° -3

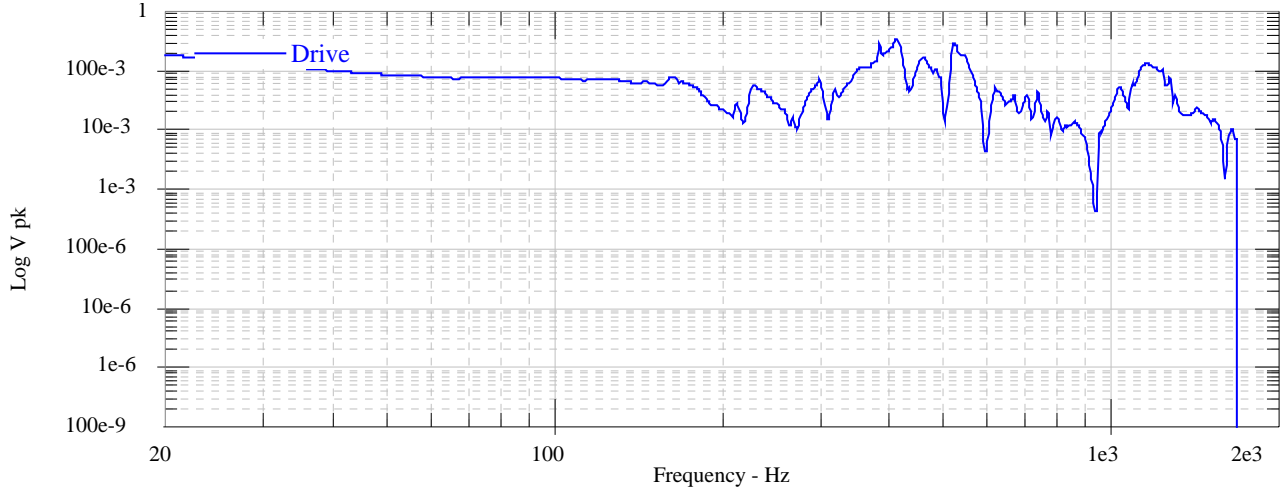


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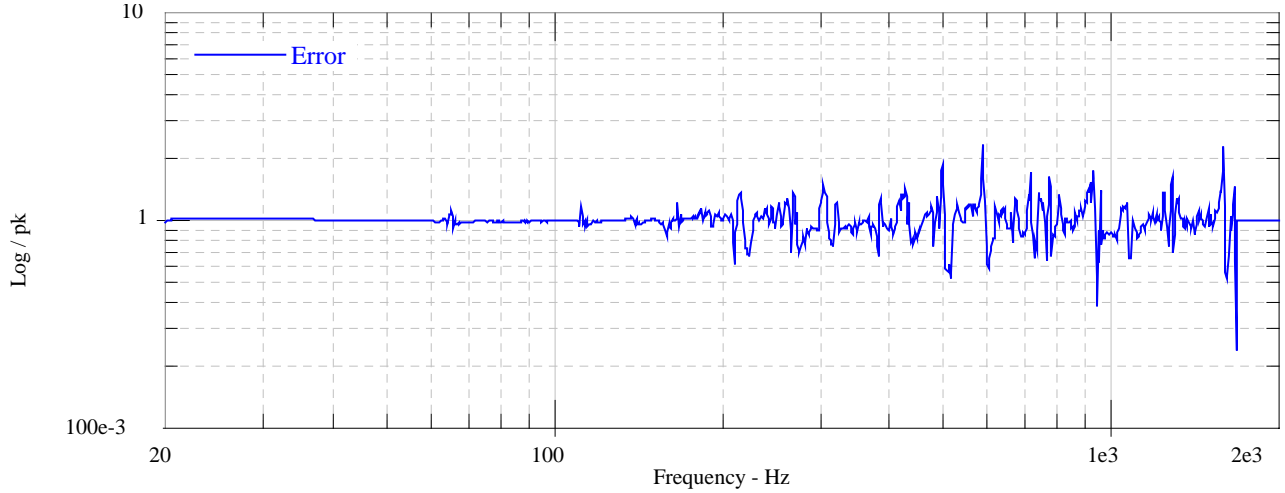
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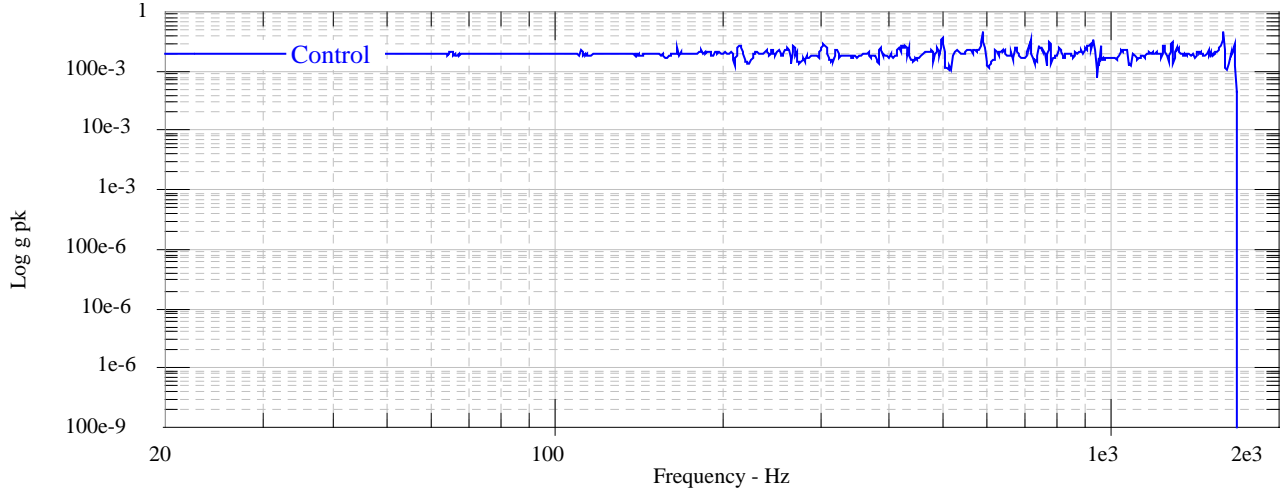
Drive Channel n° -2



Error Channel n° -1



Control Channel n° 0

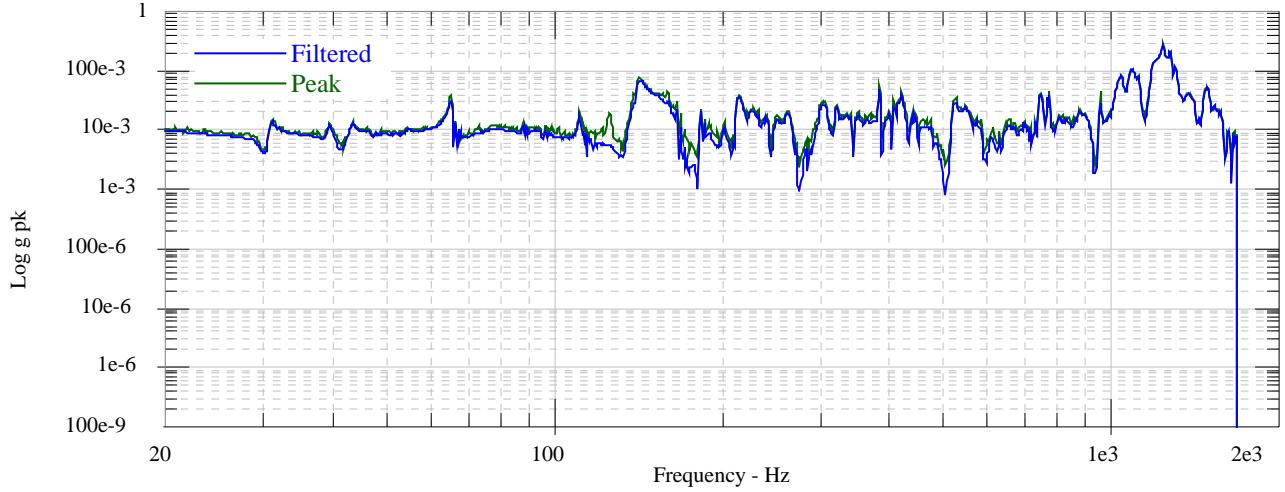


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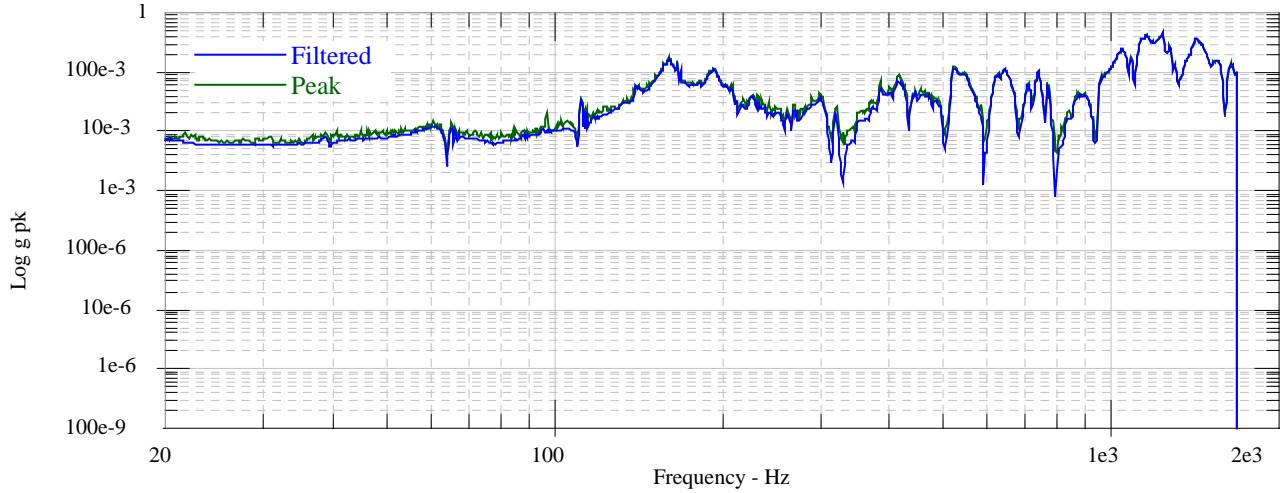
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Version : 01
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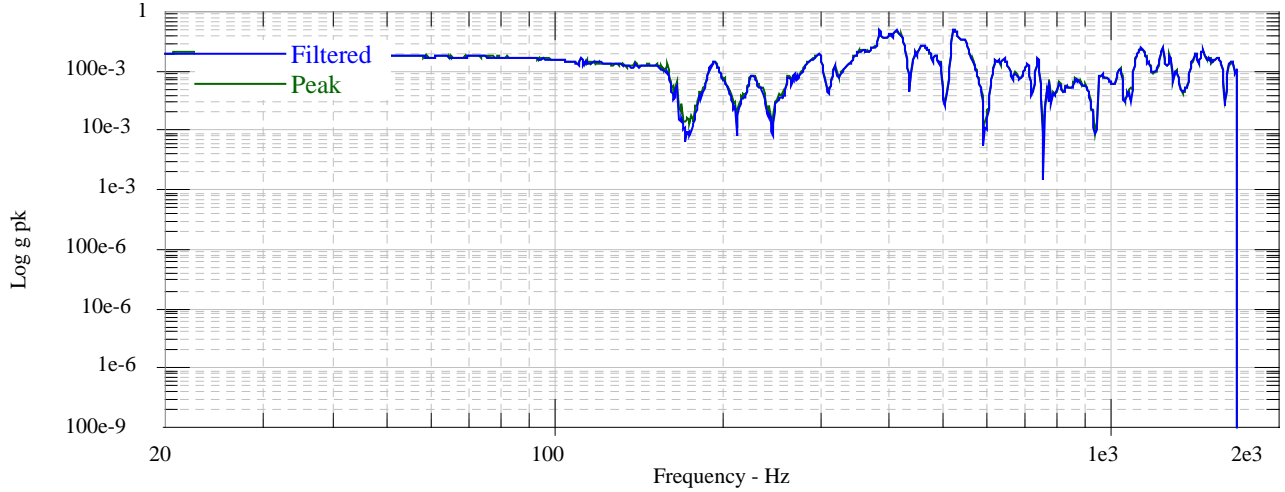
SHK.1.Y Channel n° 1



SHK.1.Z Channel n° 2



SHK.1.X Channel n° 3

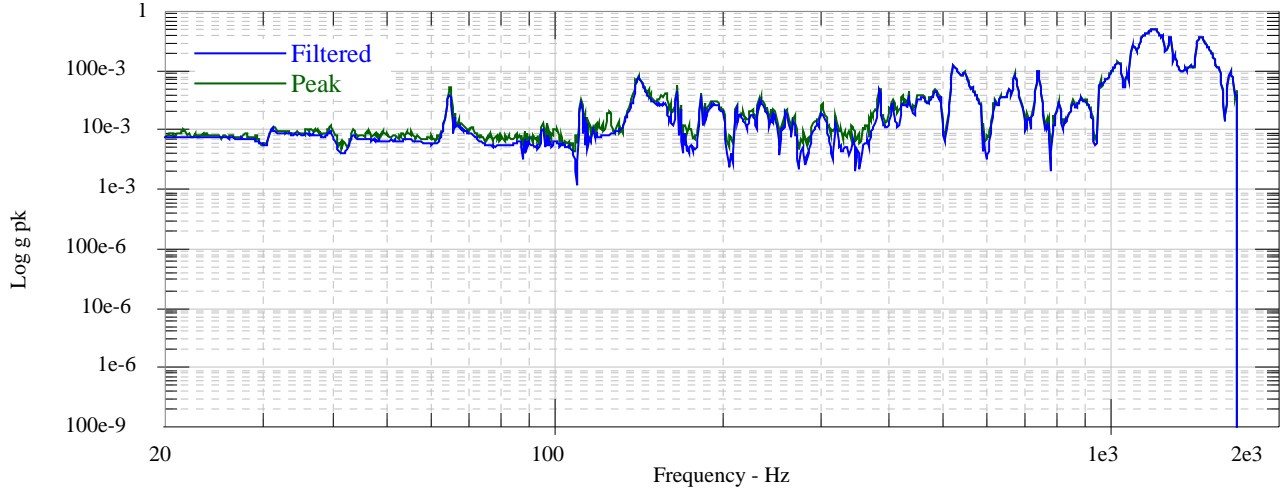


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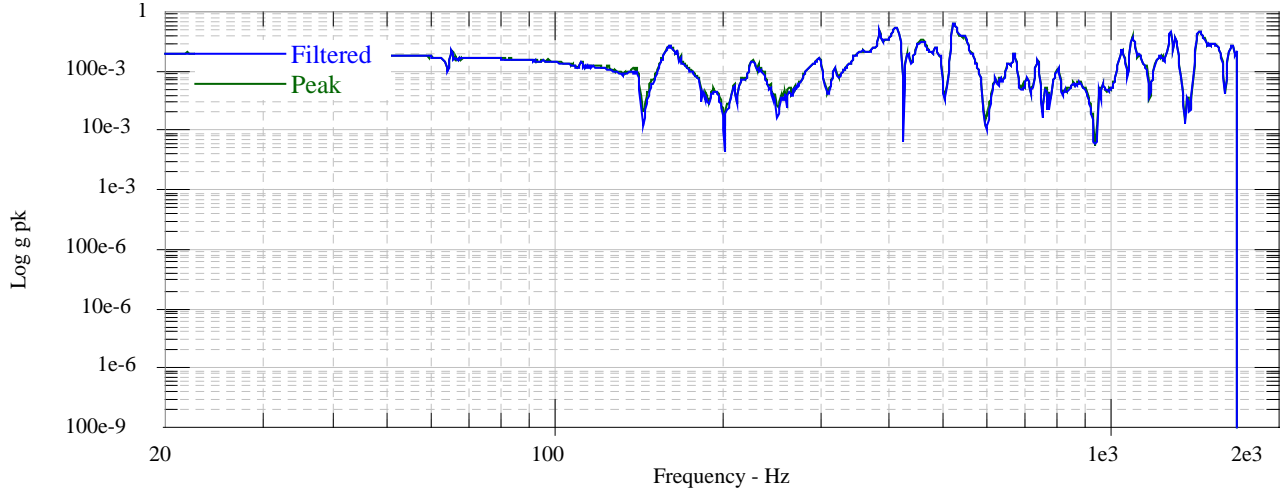
SHK.2.Y Channel n° 4



SHK.2.Z Channel n° 5



SHK.2.X Channel n° 6

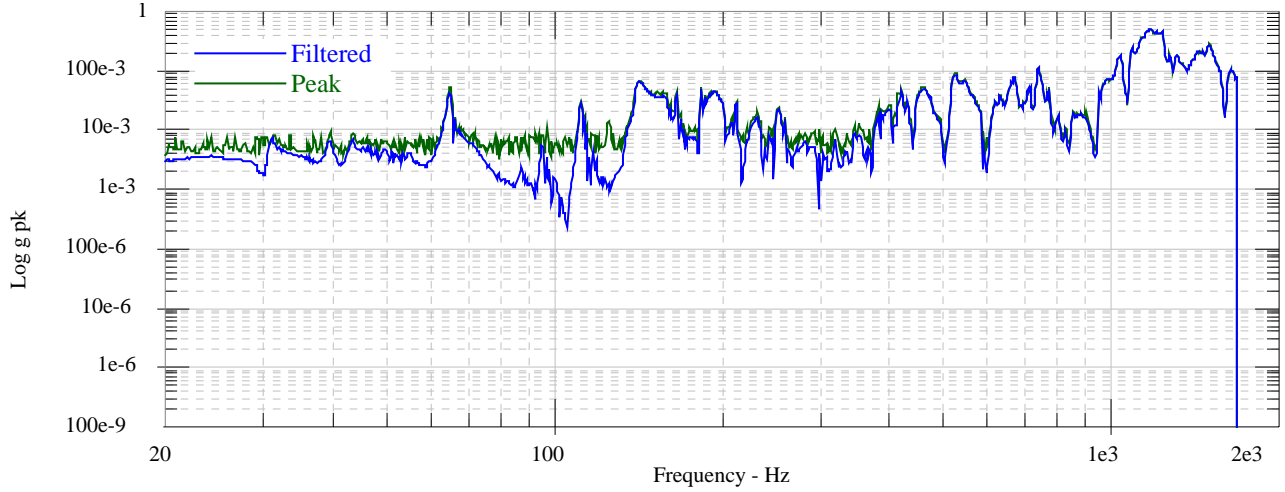


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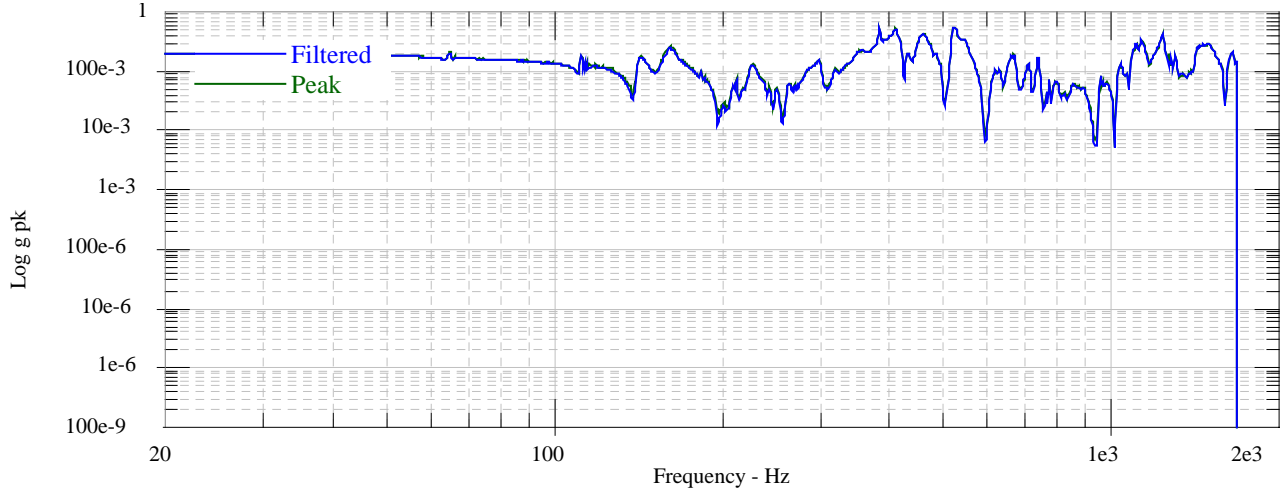
SHK.3.Y Channel n° 7



SHK.3.Z Channel n° 8



SHK.3.X Channel n° 9

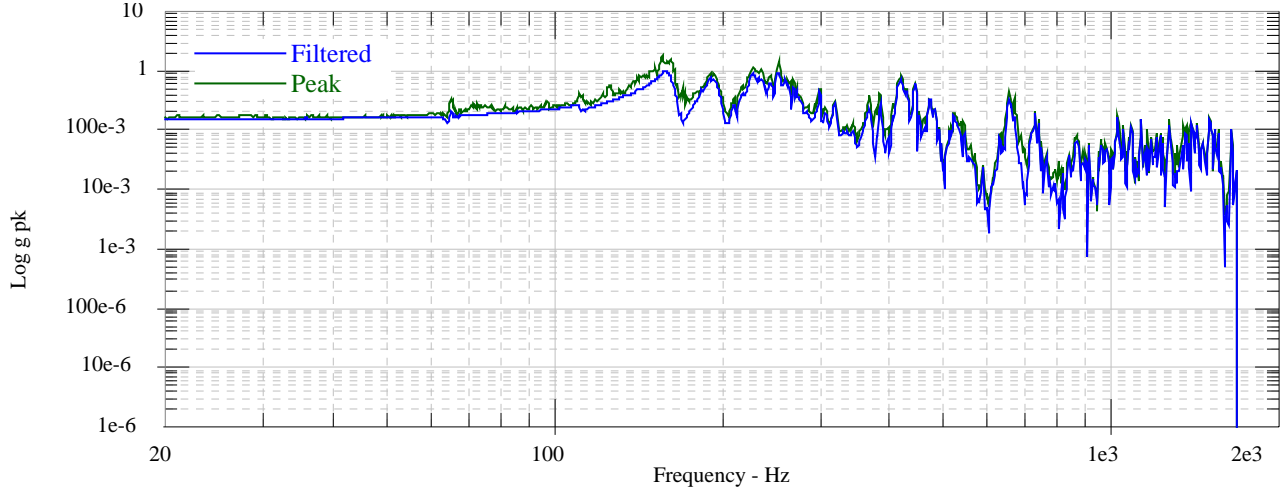


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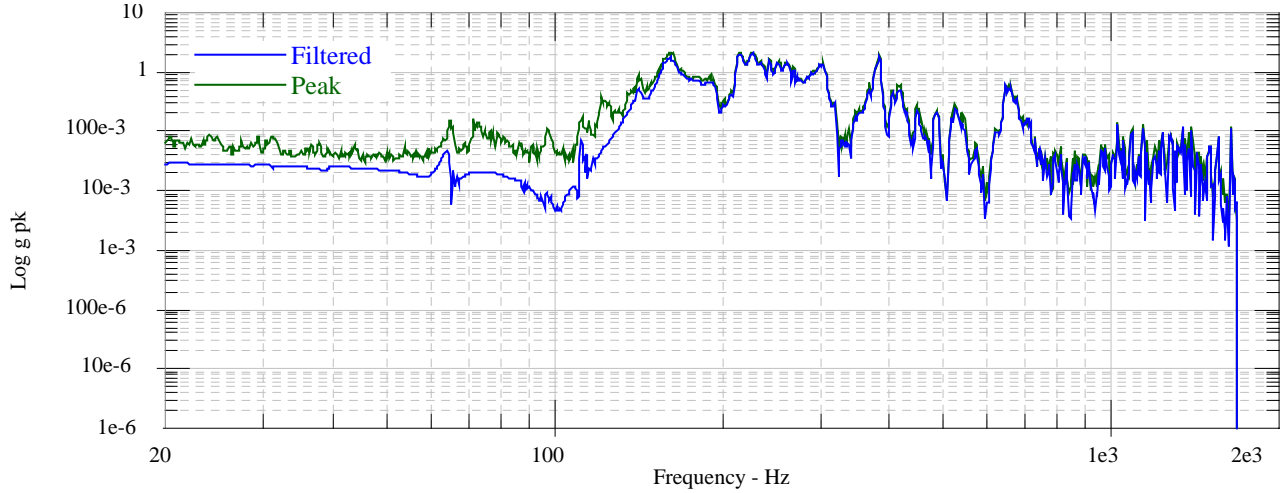
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Version : 01
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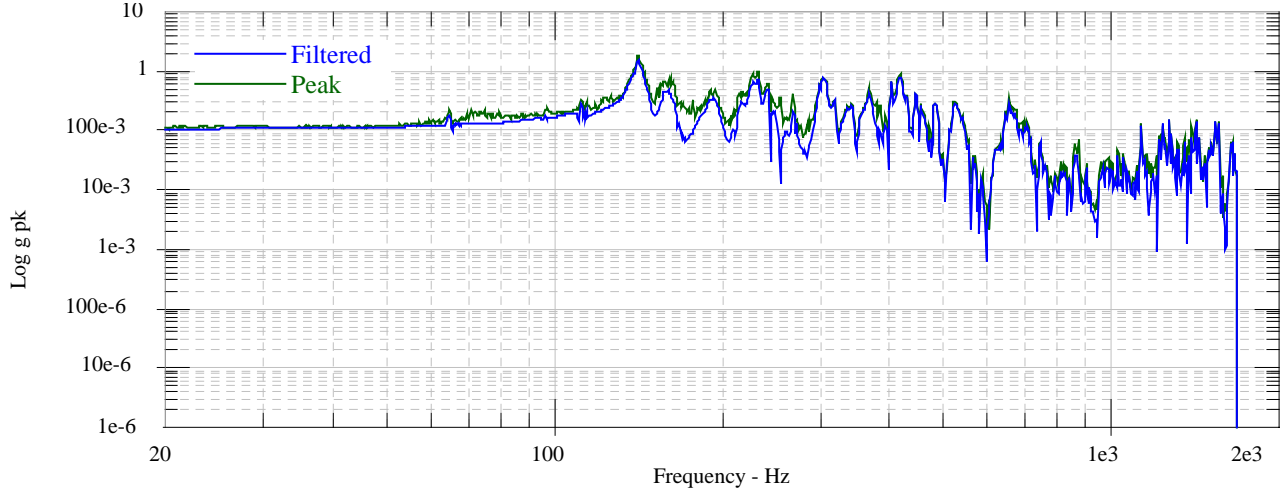
PHS.XY Channel n° 10



PHS.Z Channel n° 11



PHE.XY Channel n° 12

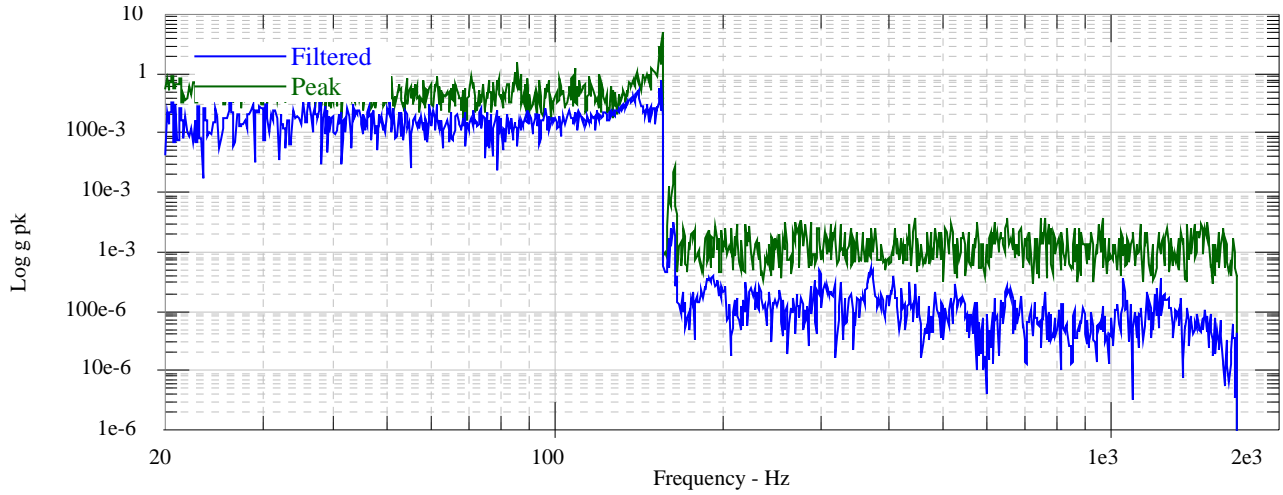


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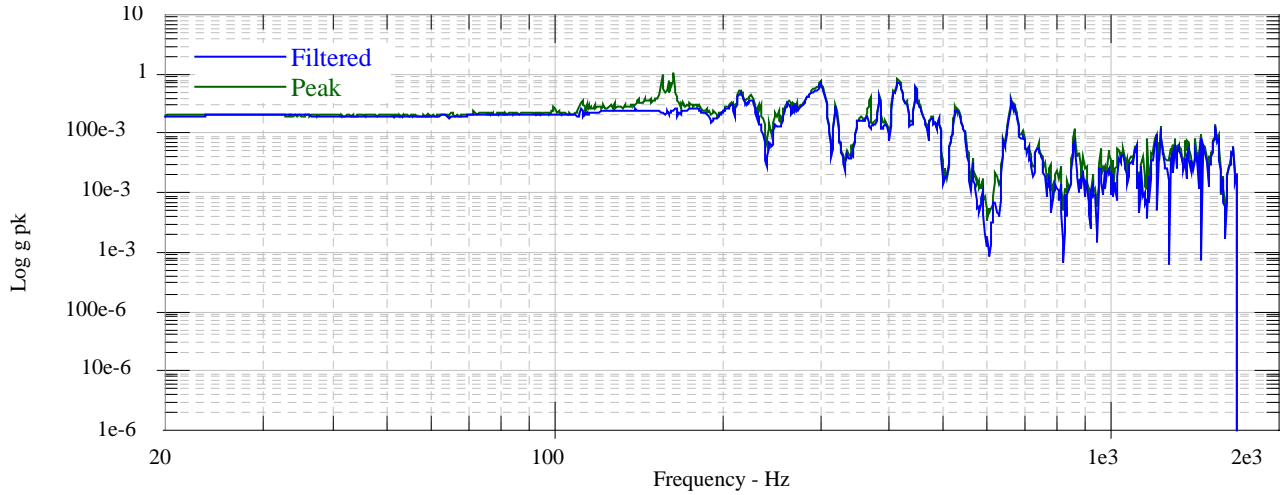
RP-CSL-CRYOV-04001
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Révision : 00
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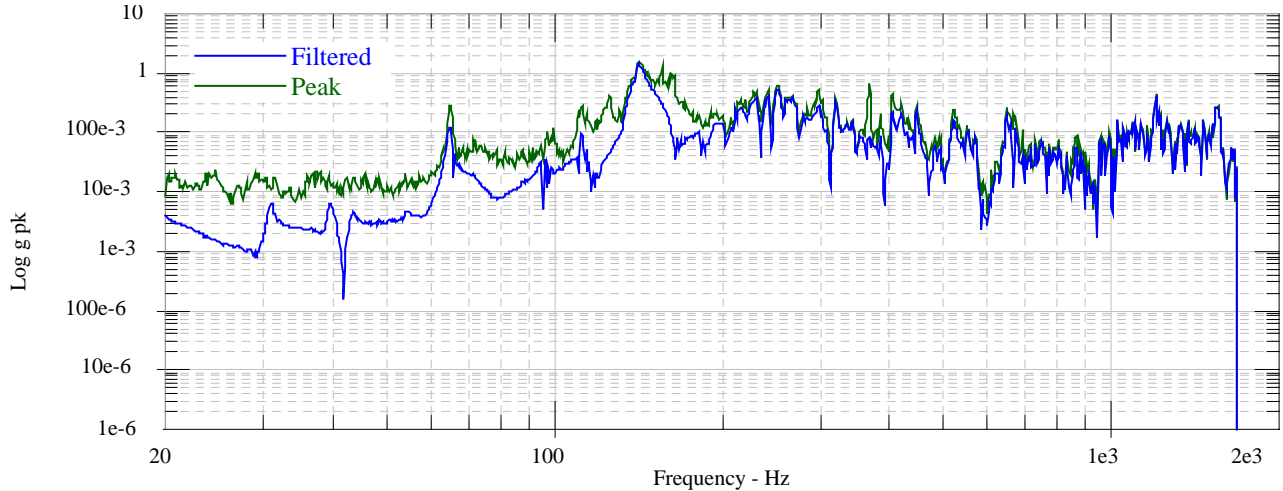
COOL.X Channel n° 13



FPU.X Channel n° 14



FPU.Y Channel n° 15

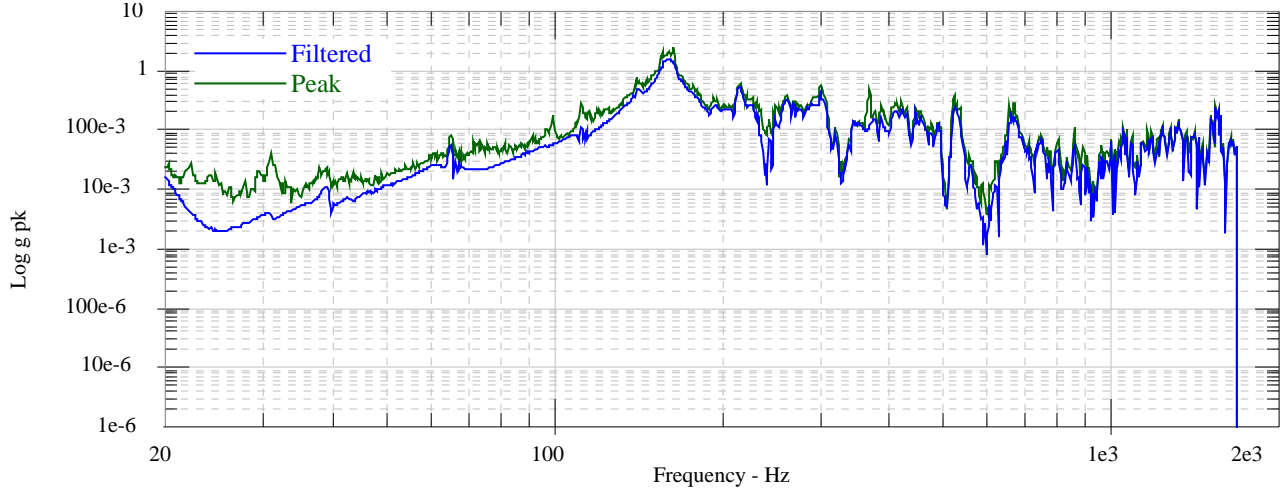


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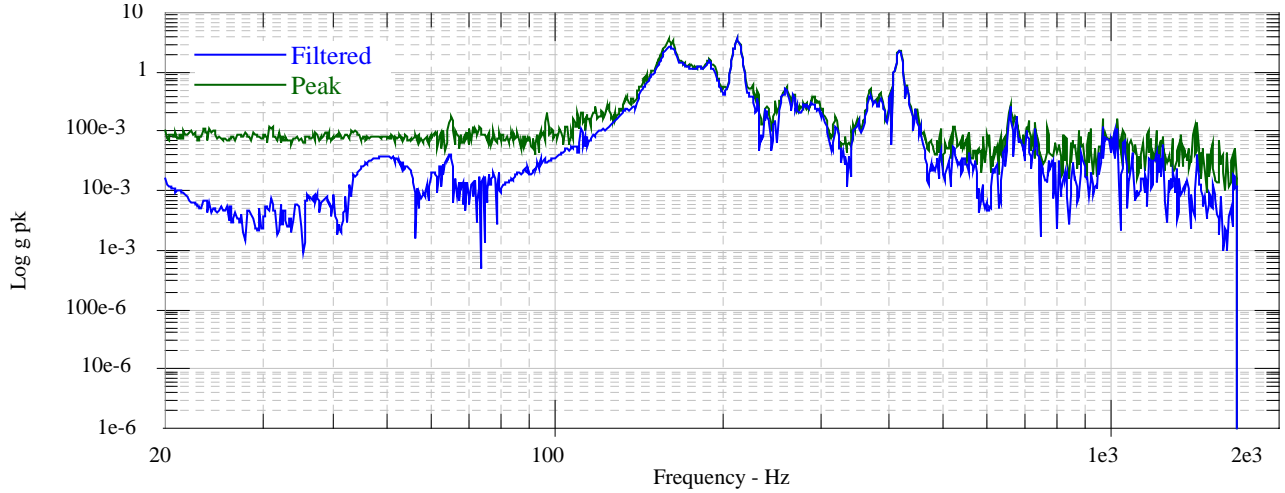
RP-CSL-CRYOV-04001
Version : 01
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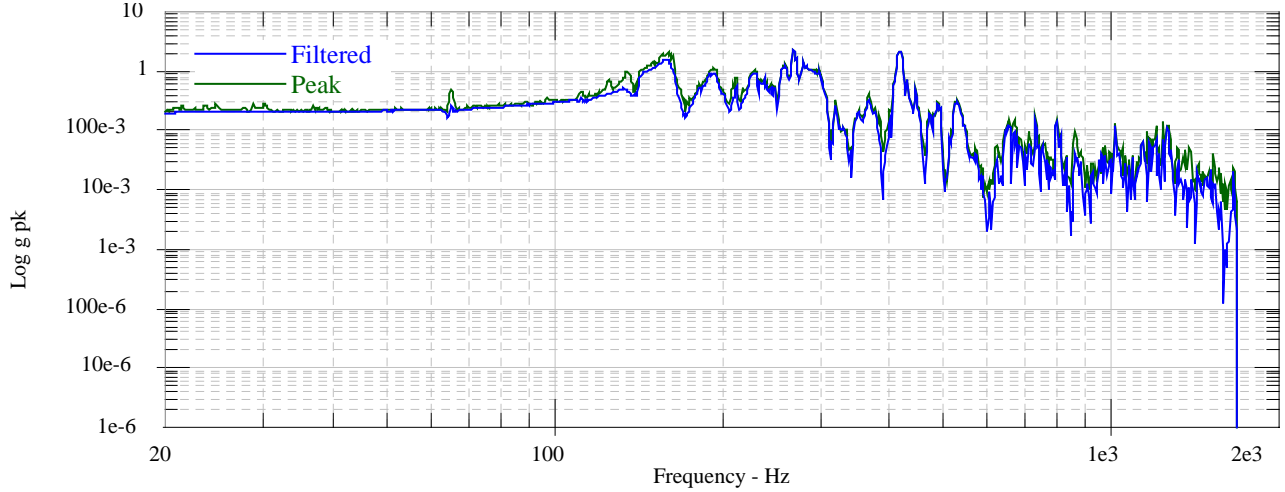
FPU.Z Channel n° 16



SPEC.X Channel n° 17



SPEC.Z Channel n° 18

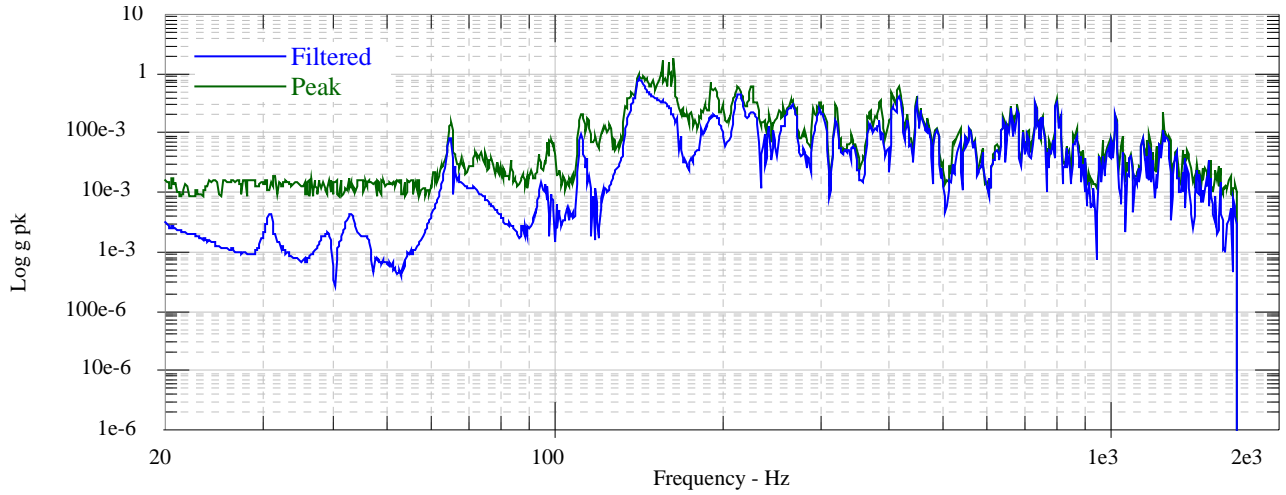


VIBRATION TEST REPORT
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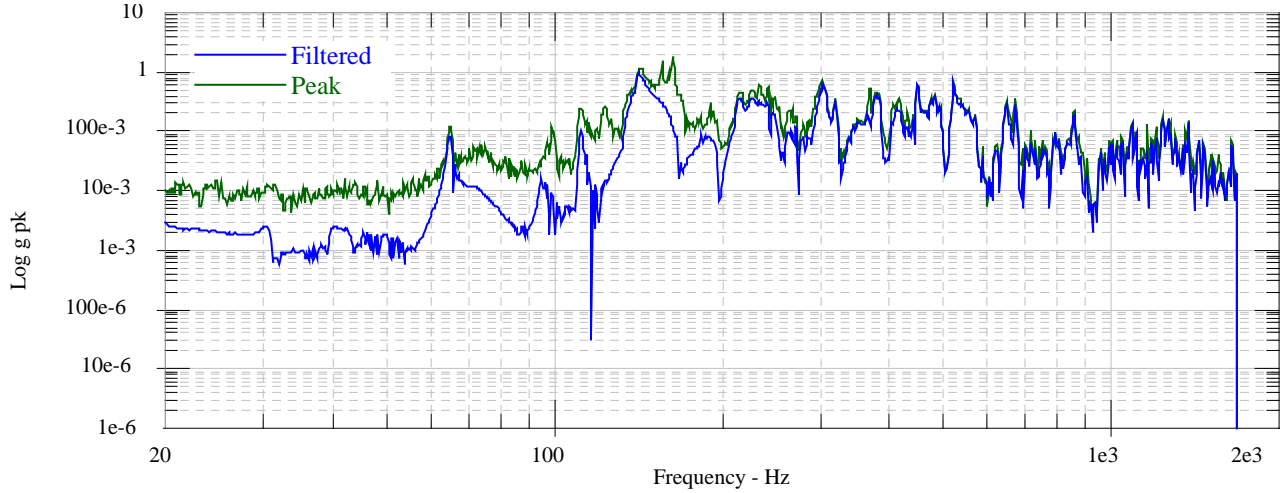
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 1-May-04
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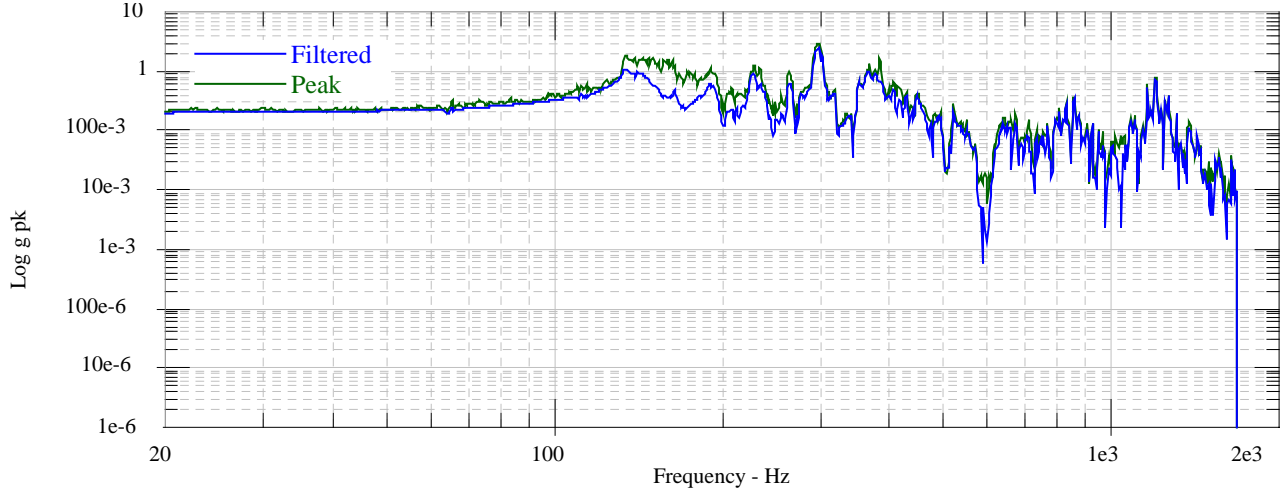
SPEC.Y Channel n° 19



OB.Y Channel n° 20



SMECL.X Channel n° 21

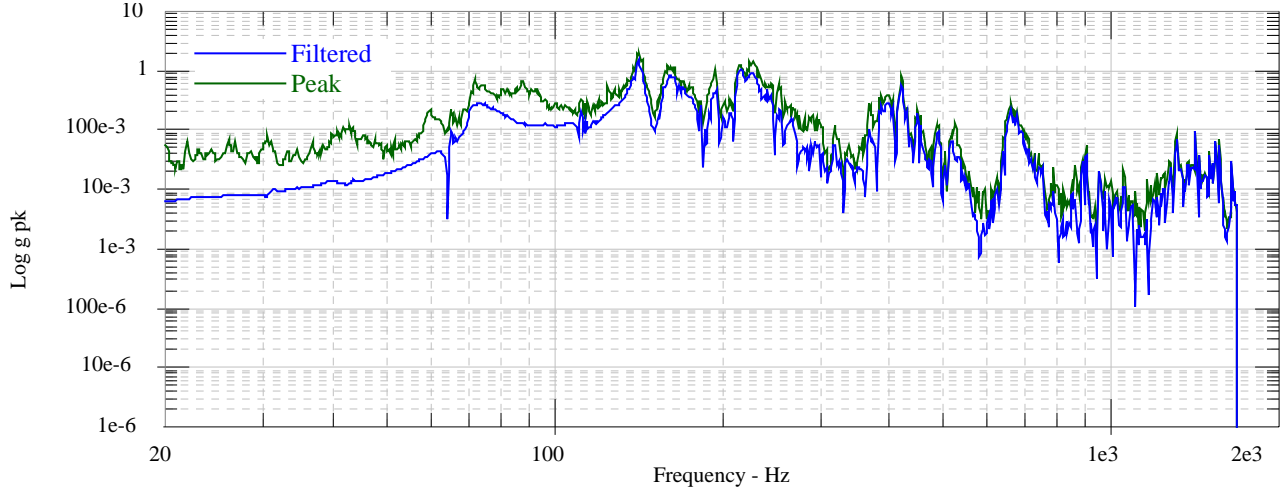


VIBRATION TEST REPORT
SPIRE QM

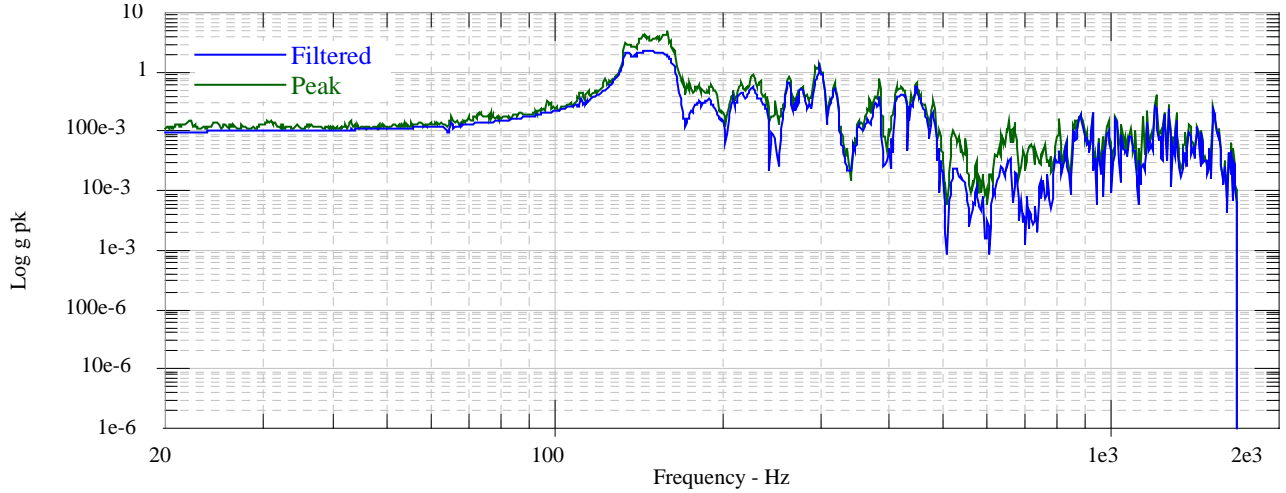
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 1-May-04
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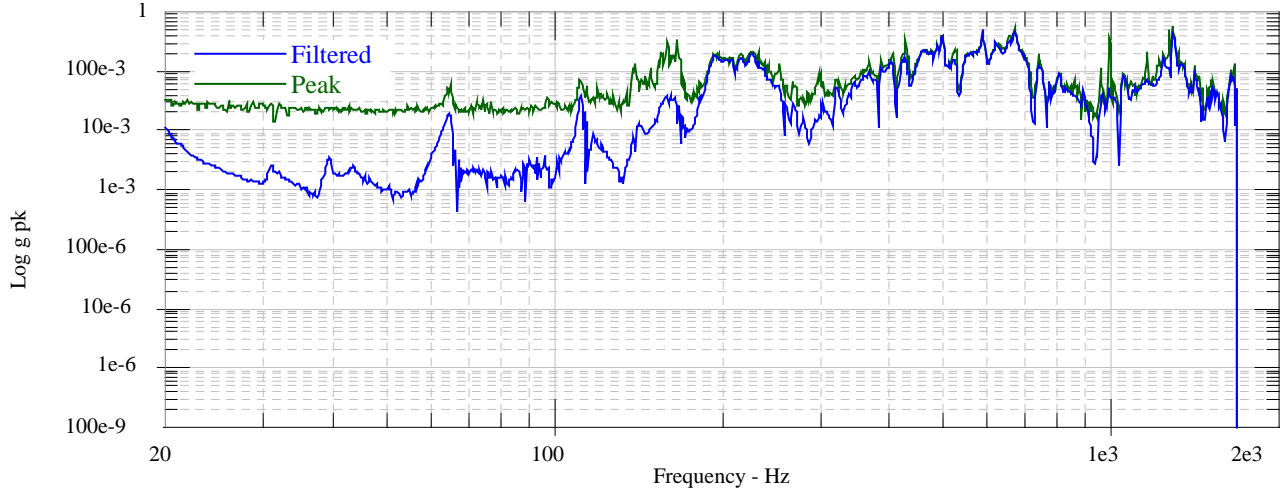
CTIP.Y Channel n° 22



SMECU.X Channel n° 23



CONE.Z Channel n° 24

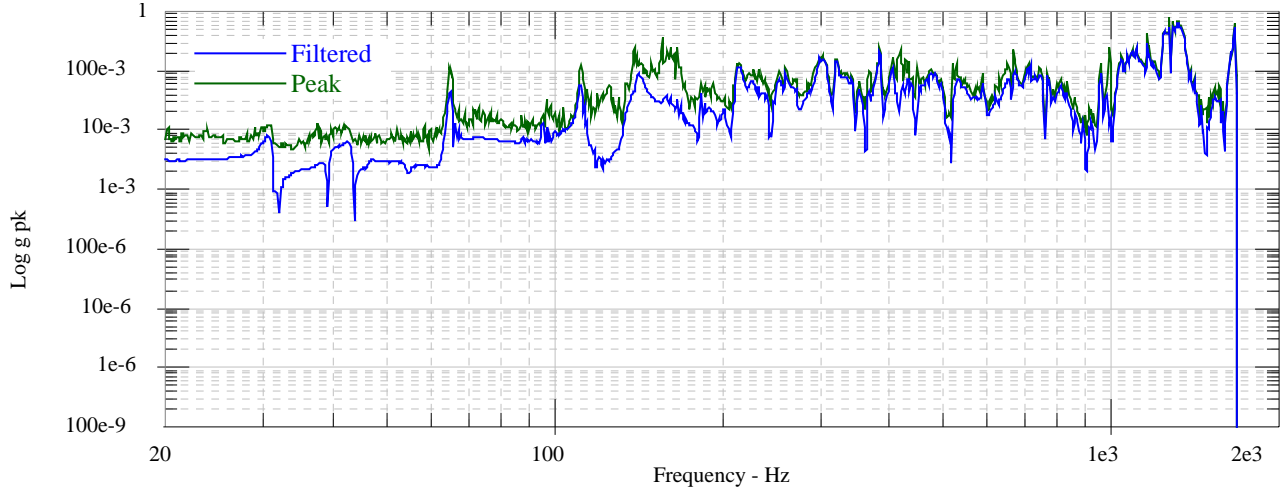


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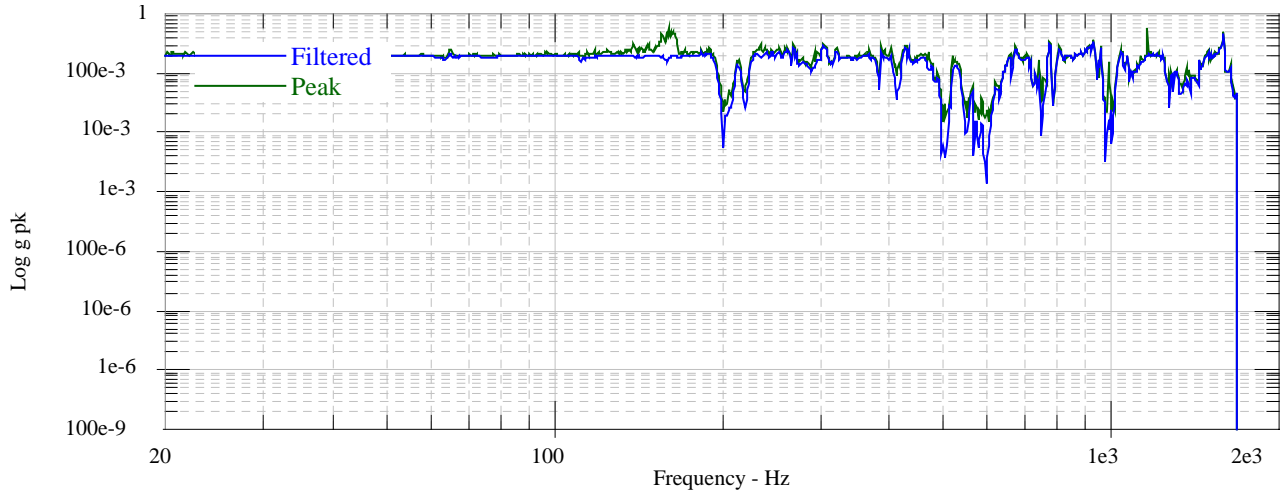
CONE.Y Channel n° 25



CONE.X Channel n° 26



-YAFRAME.X Channel n° 27

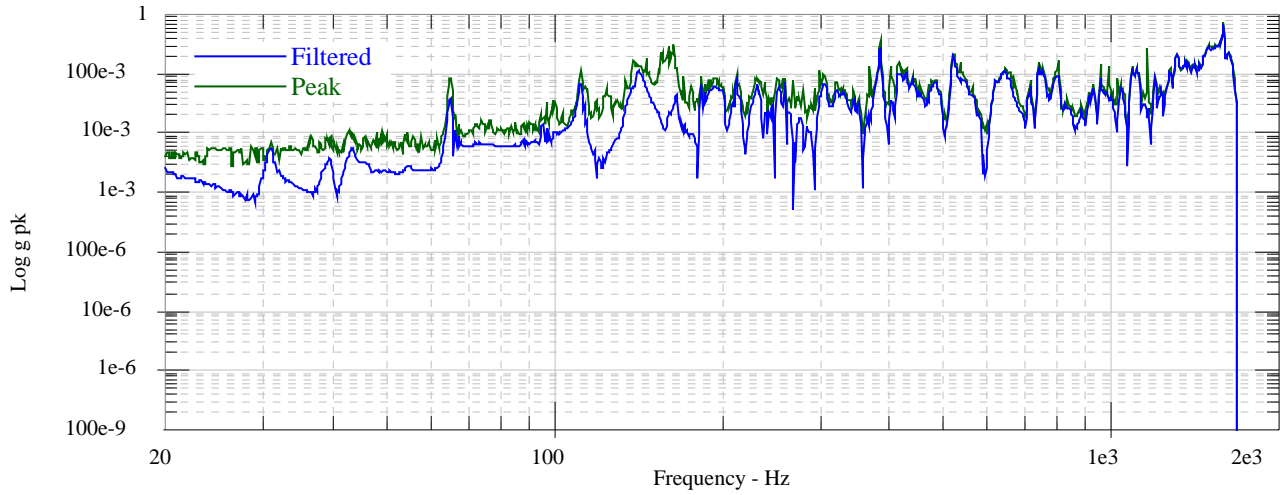


VIBRATION TEST REPORT
SPIRE QM

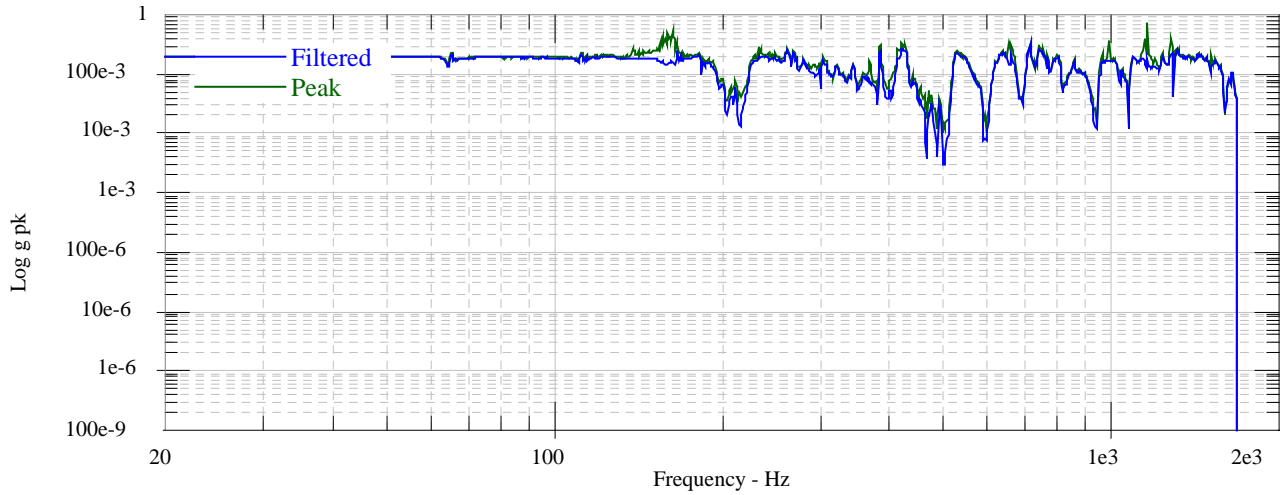
RP-CSL-CRYOV-04001
Version : 01
Révision : 00
Date : 1-May-04
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01/05/04 16:03:43

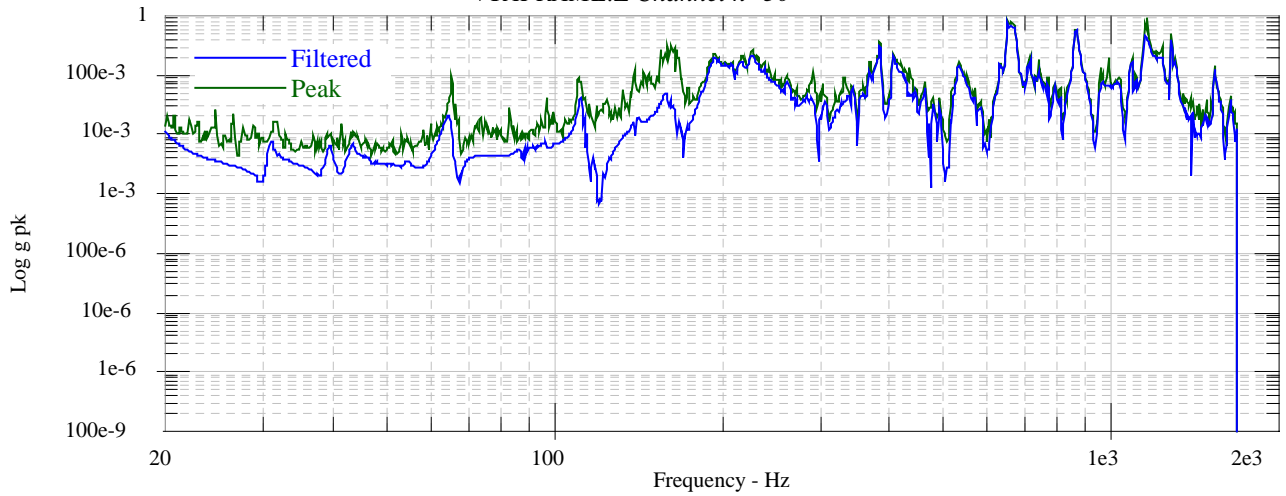
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+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



VIBRATION TEST REPORT
SPIRE QM

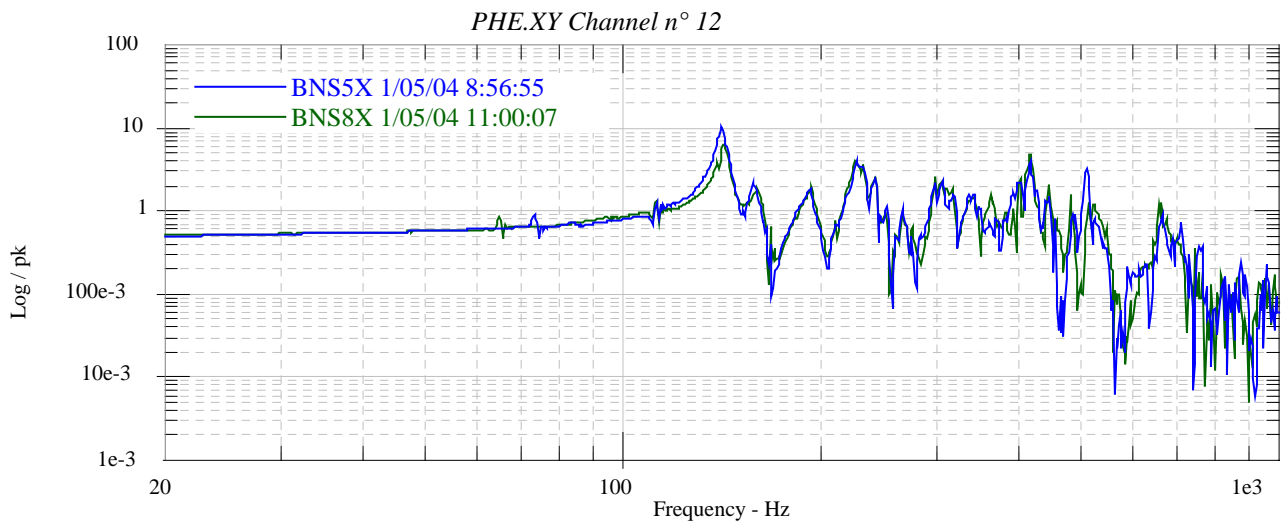
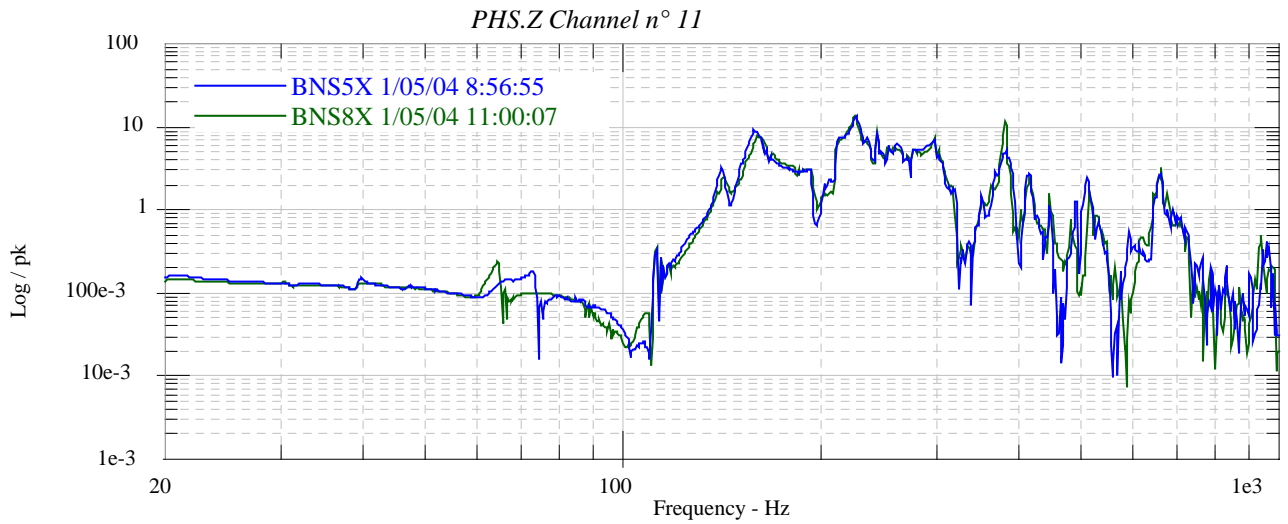
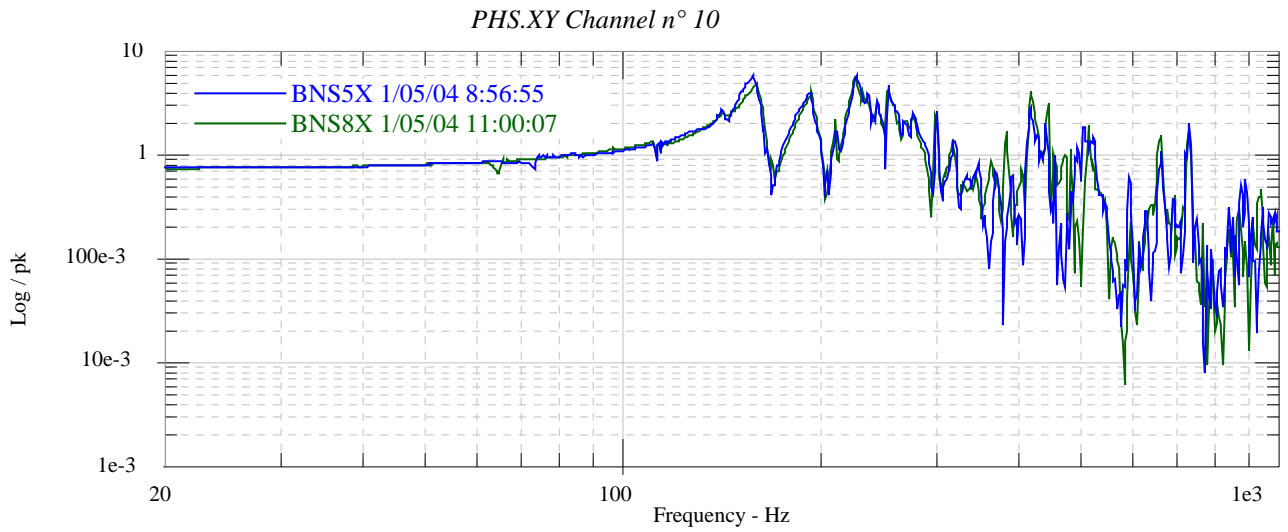
RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
Date : 7 May, 2004
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12.39 Comparison BNS_X transfer functions pre and post high level sine.

H:\Users\J-S.Servaye\Cryovibrations\Rapports\SPIRE_QM\FT_BNS_X_1.doc

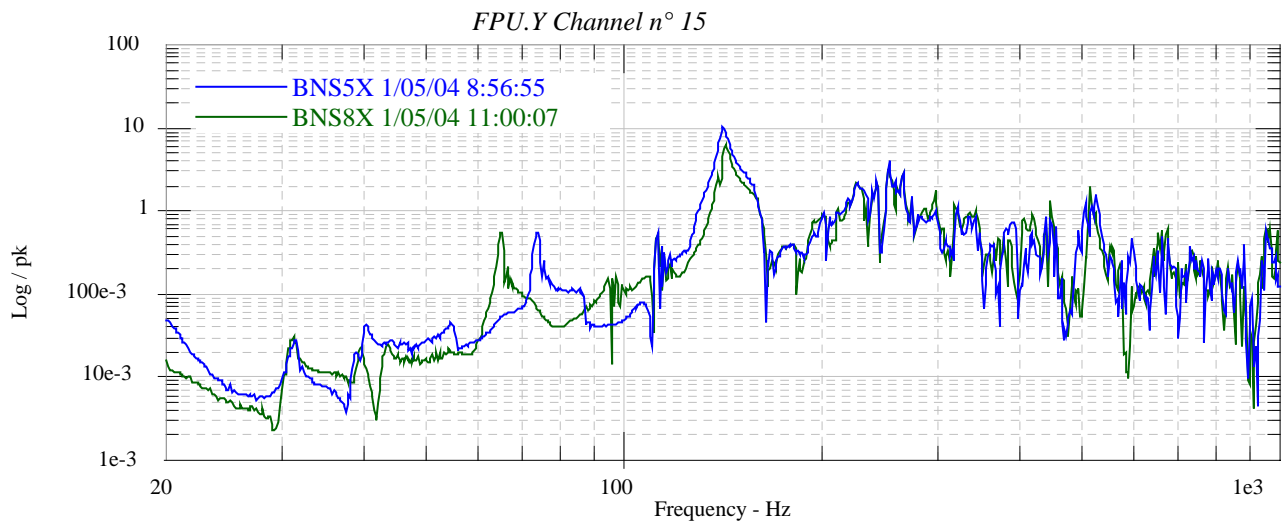
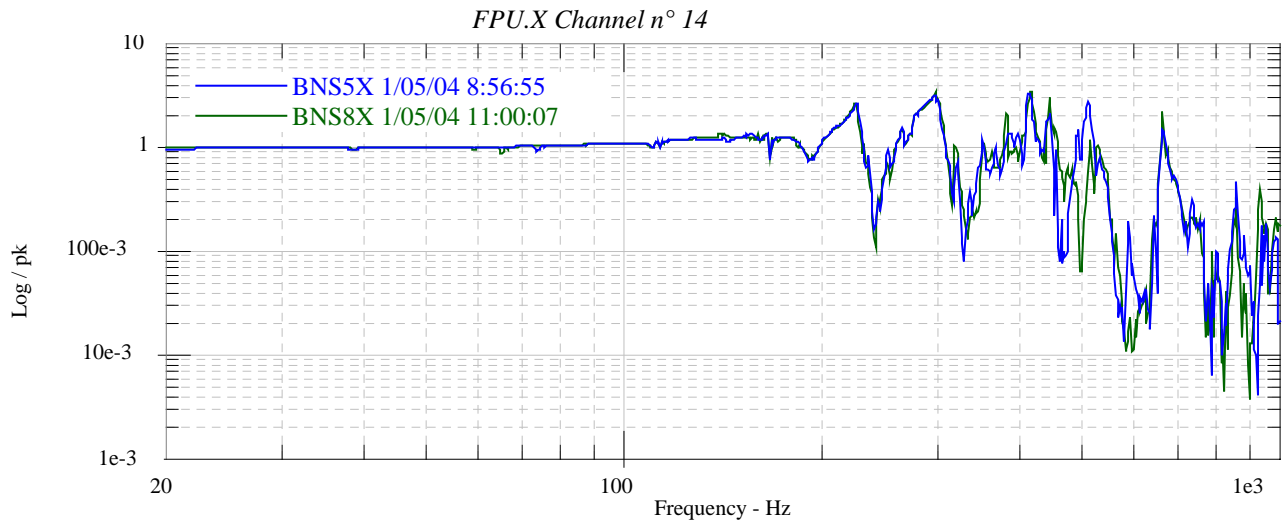
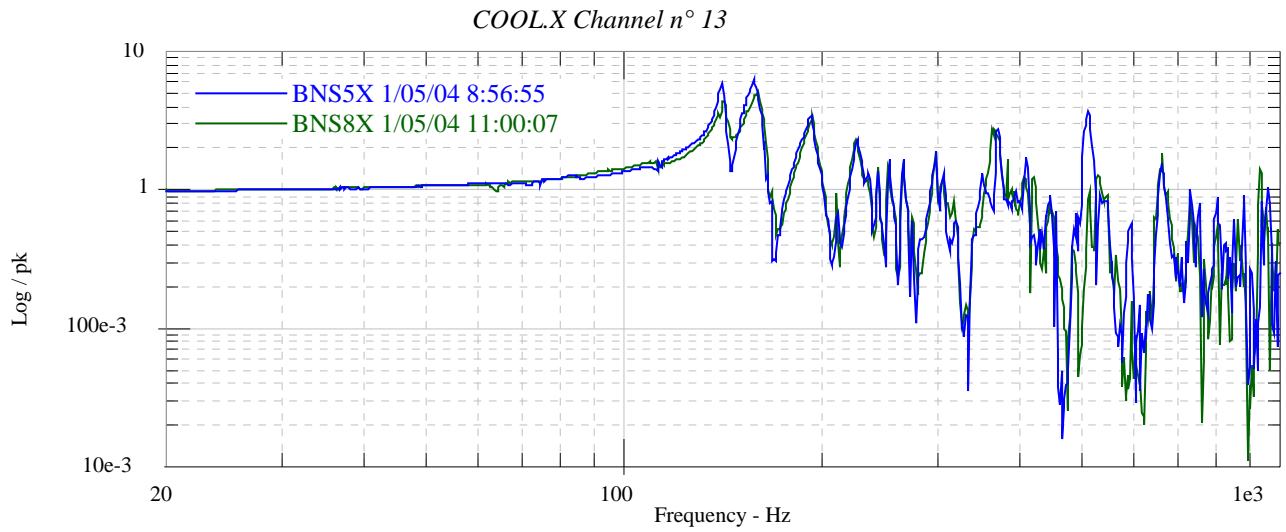
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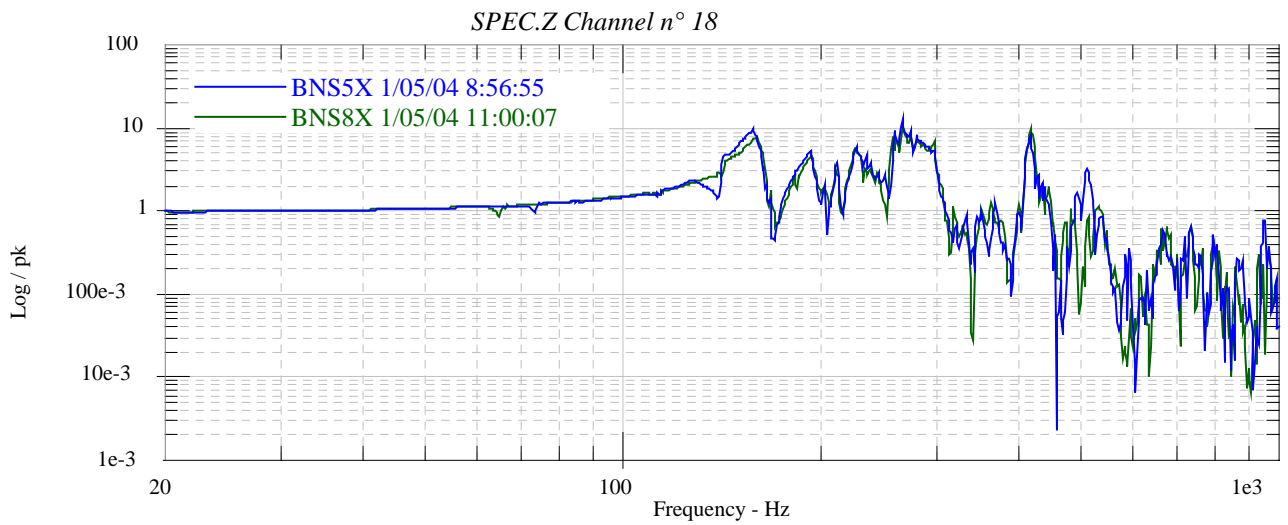
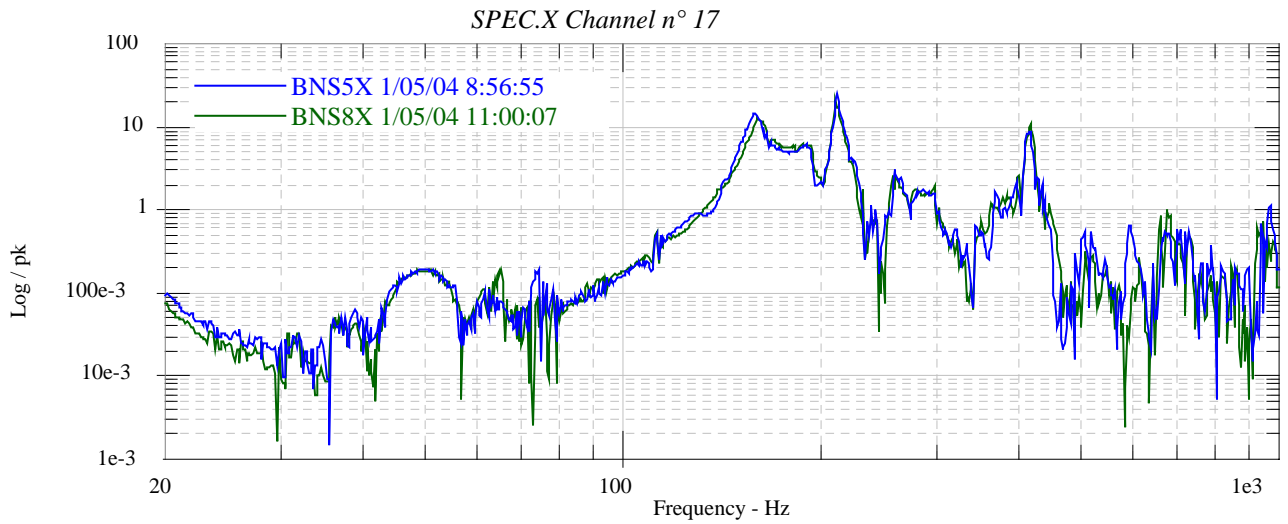
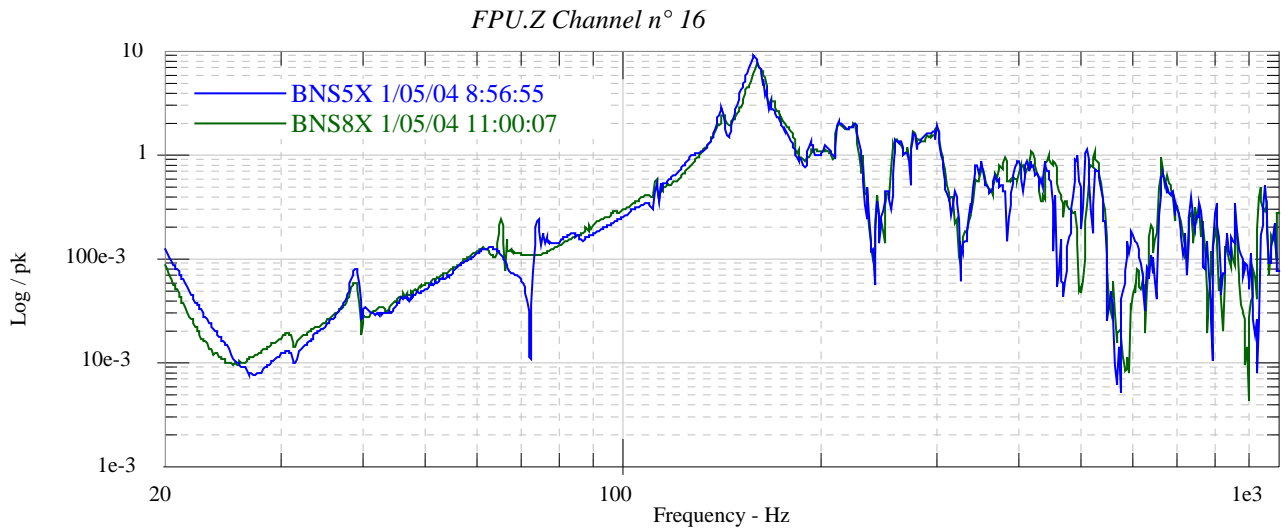
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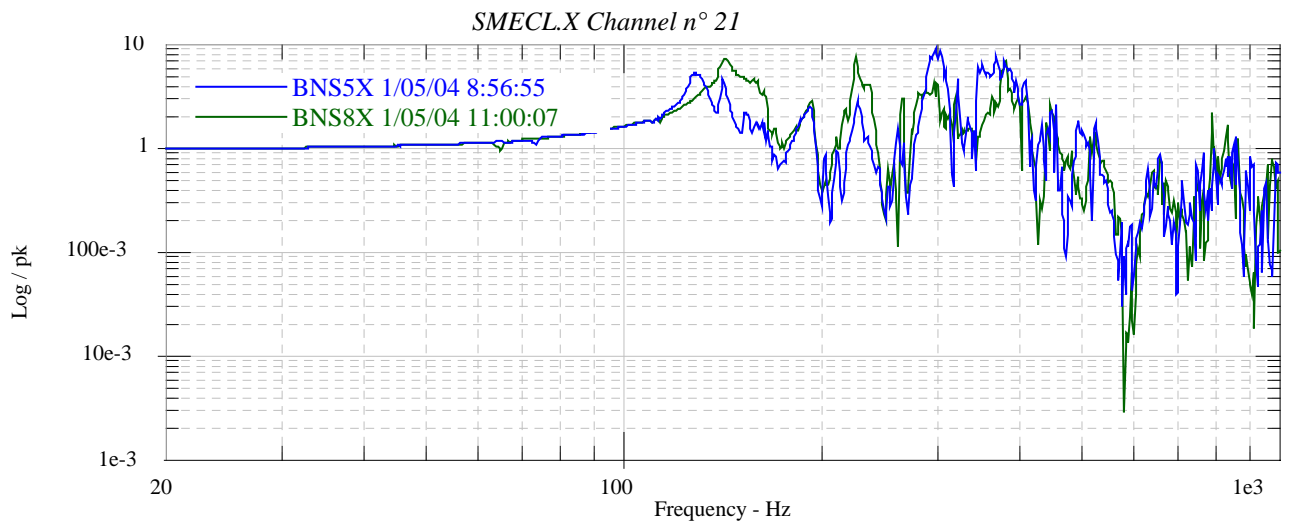
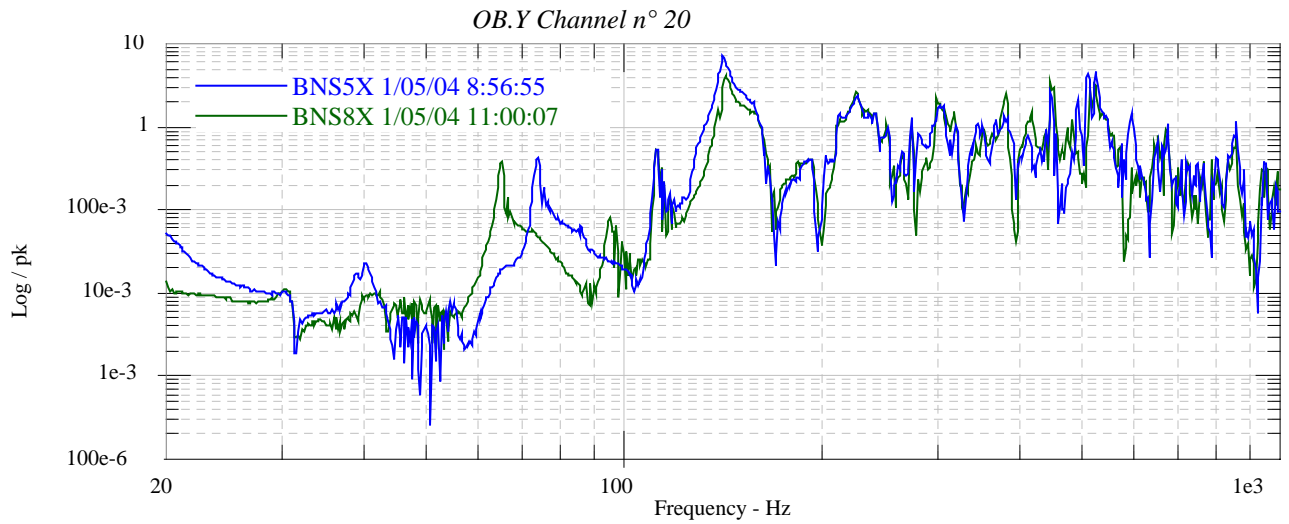
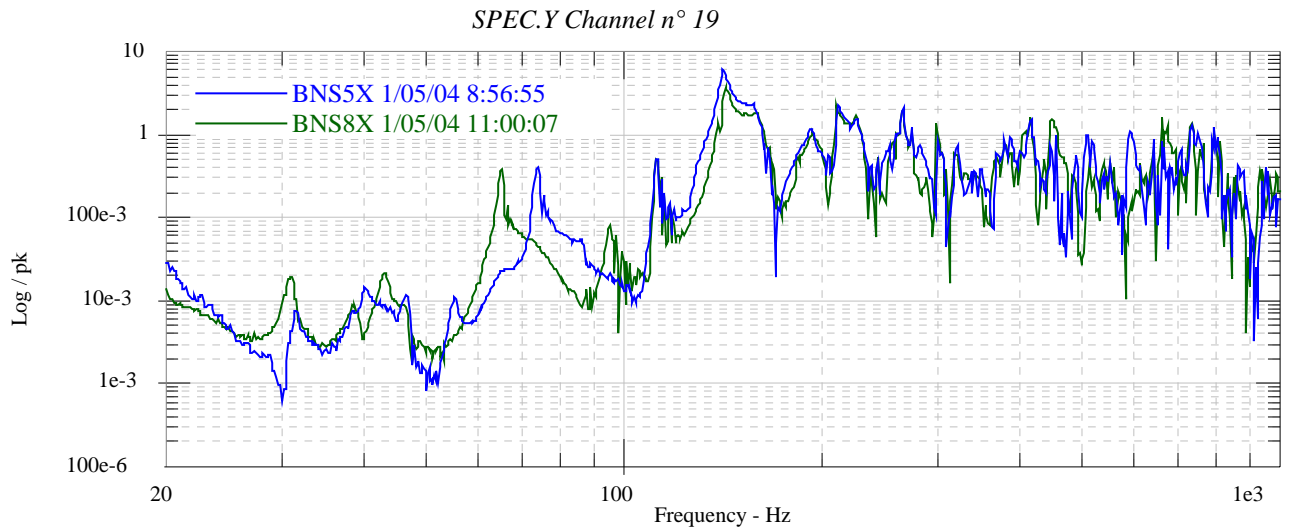
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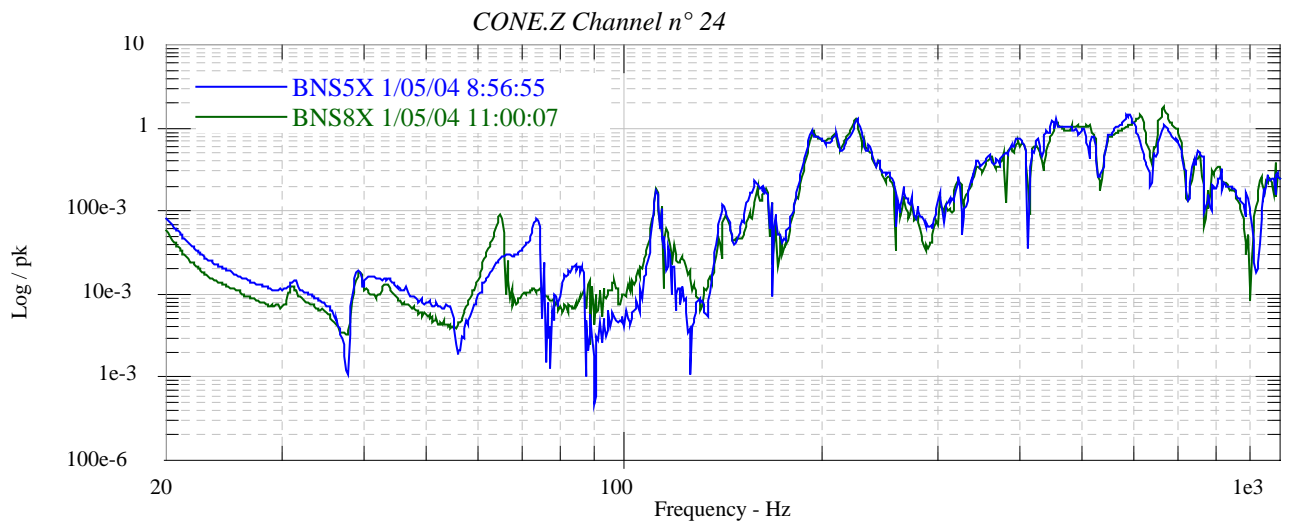
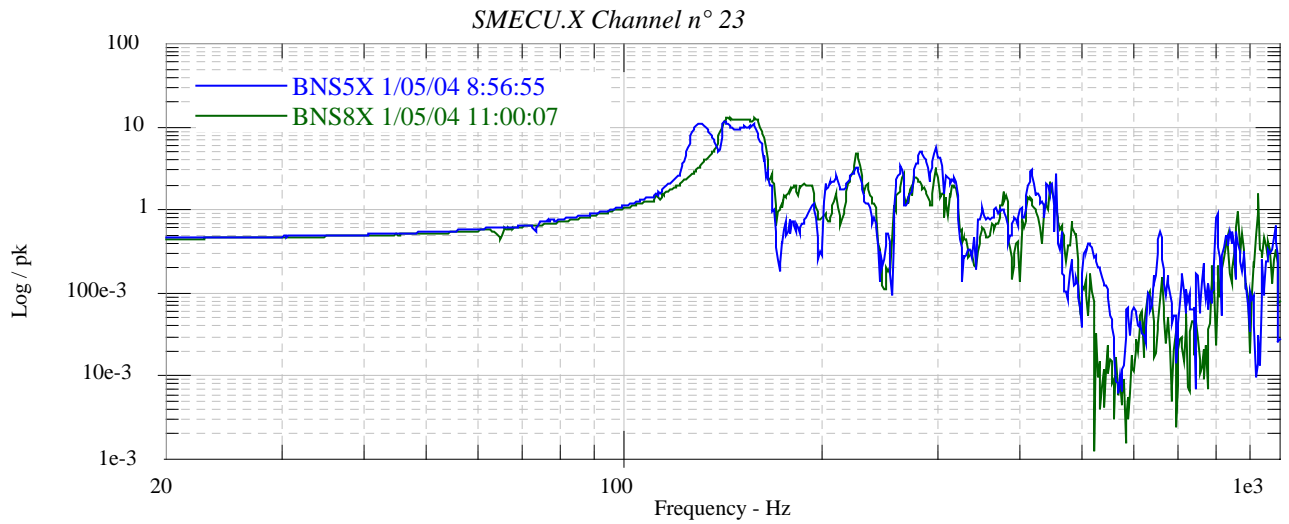
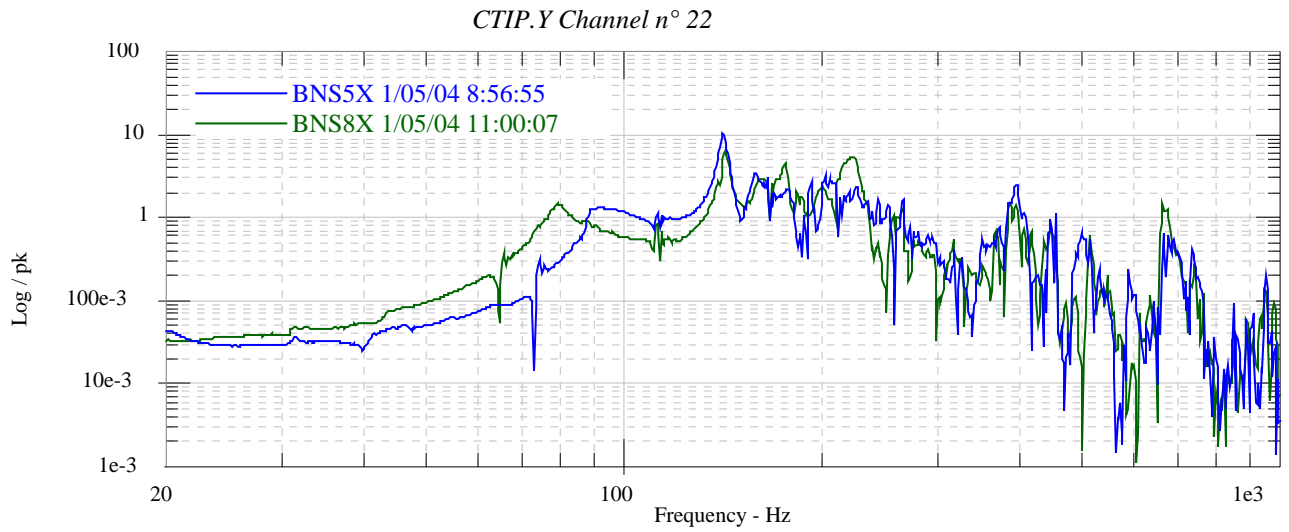
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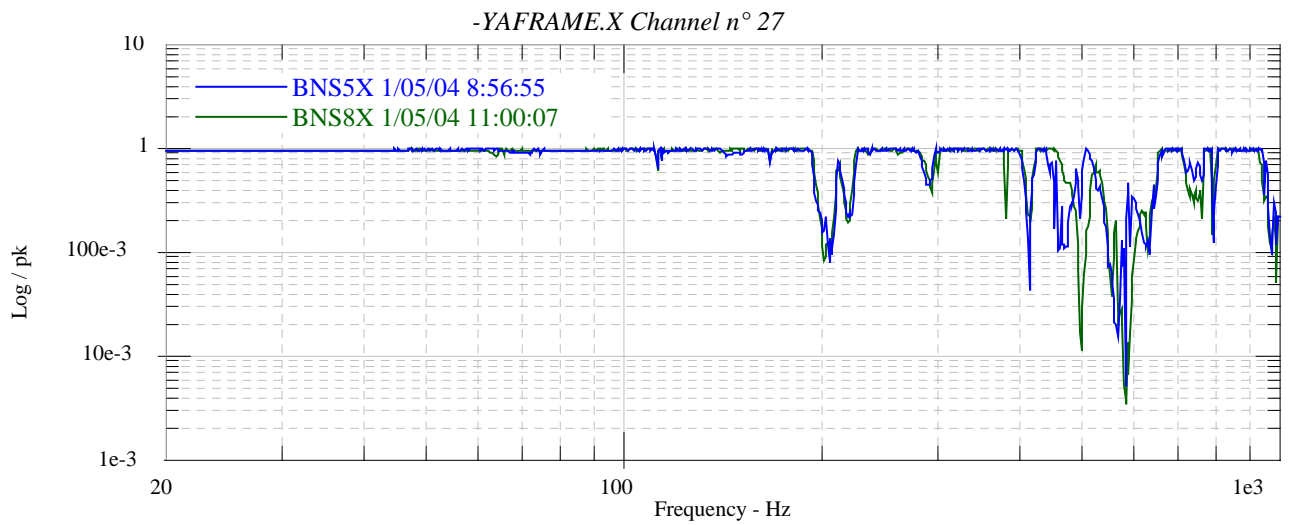
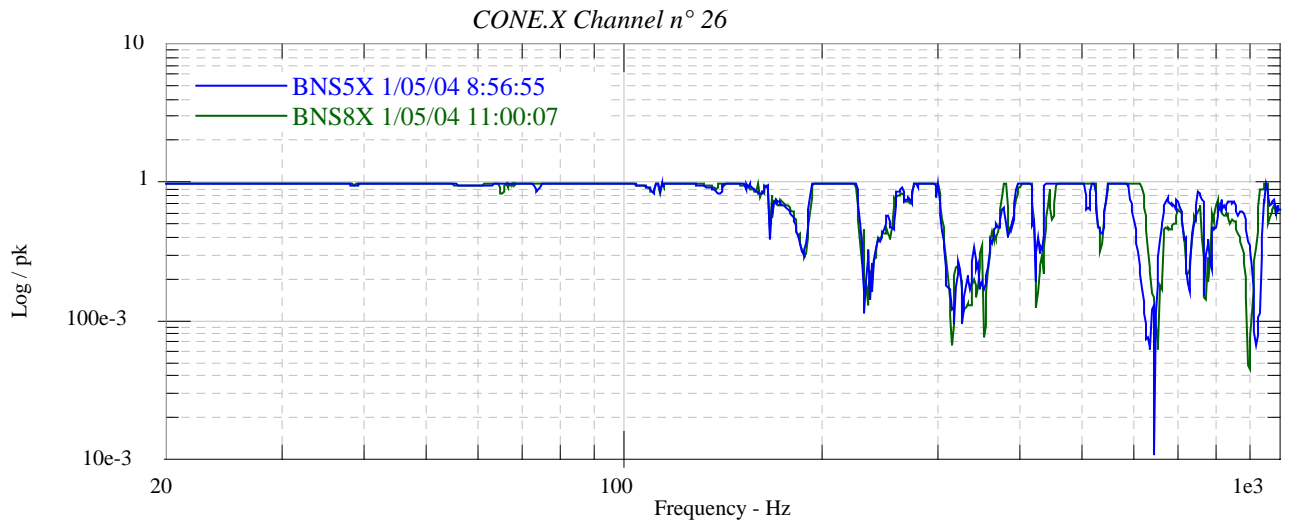
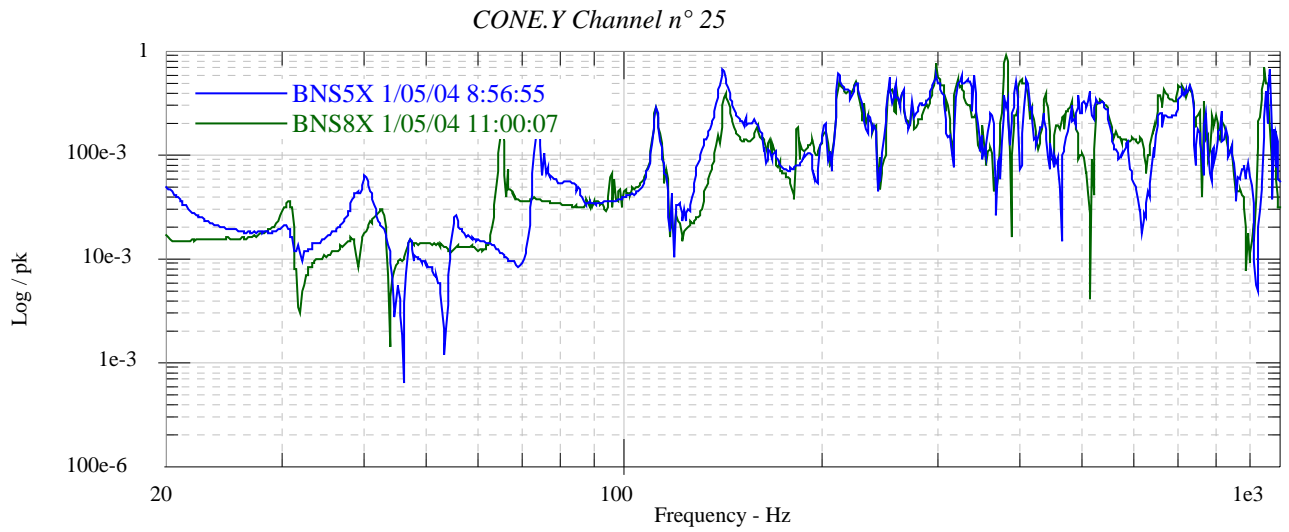
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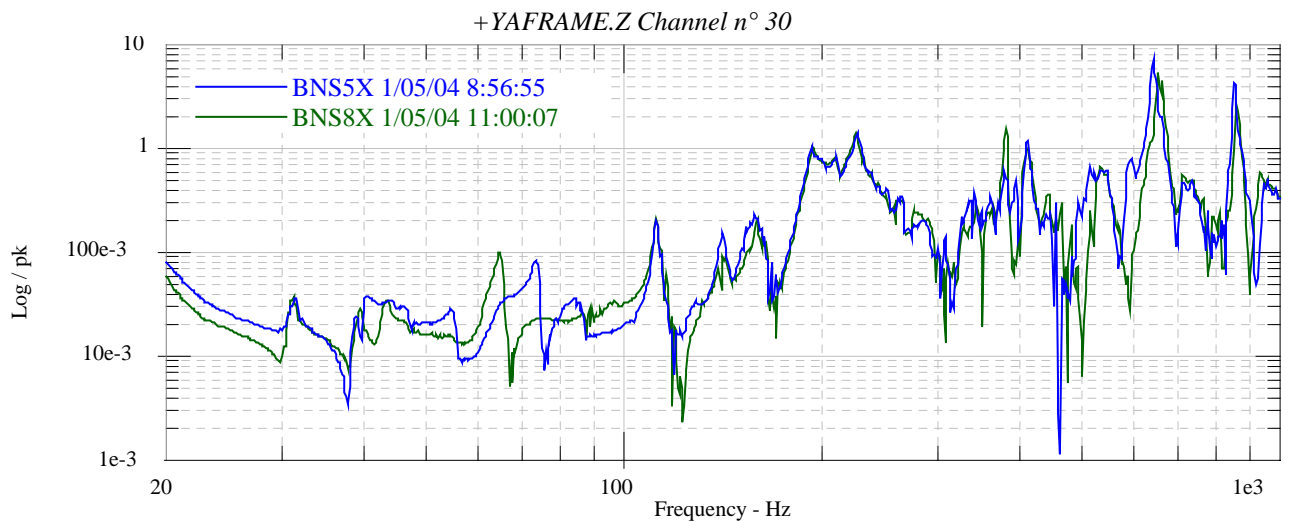
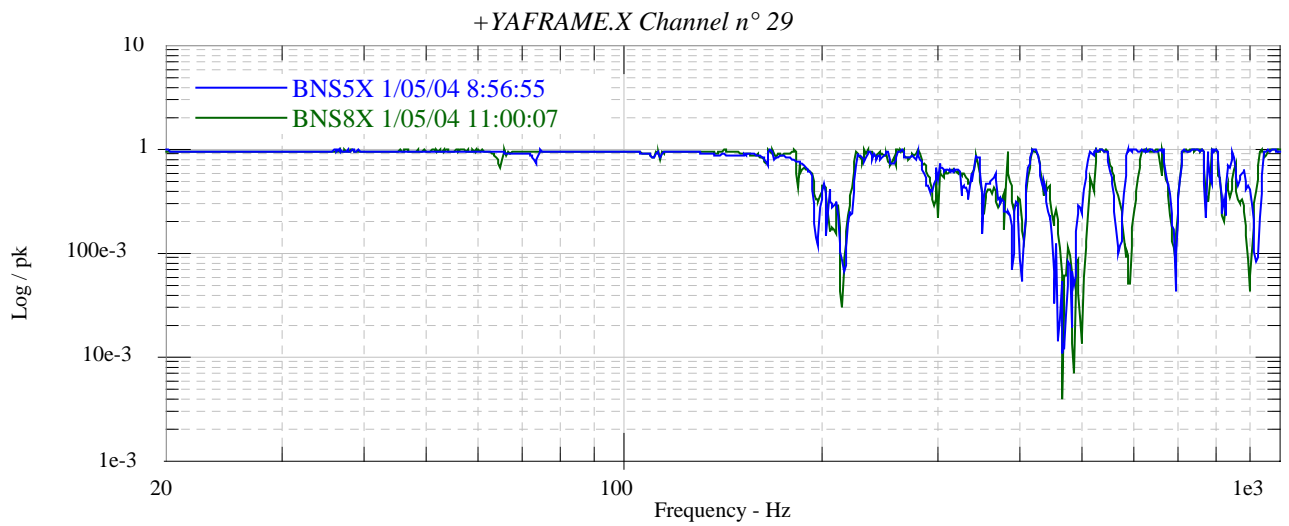
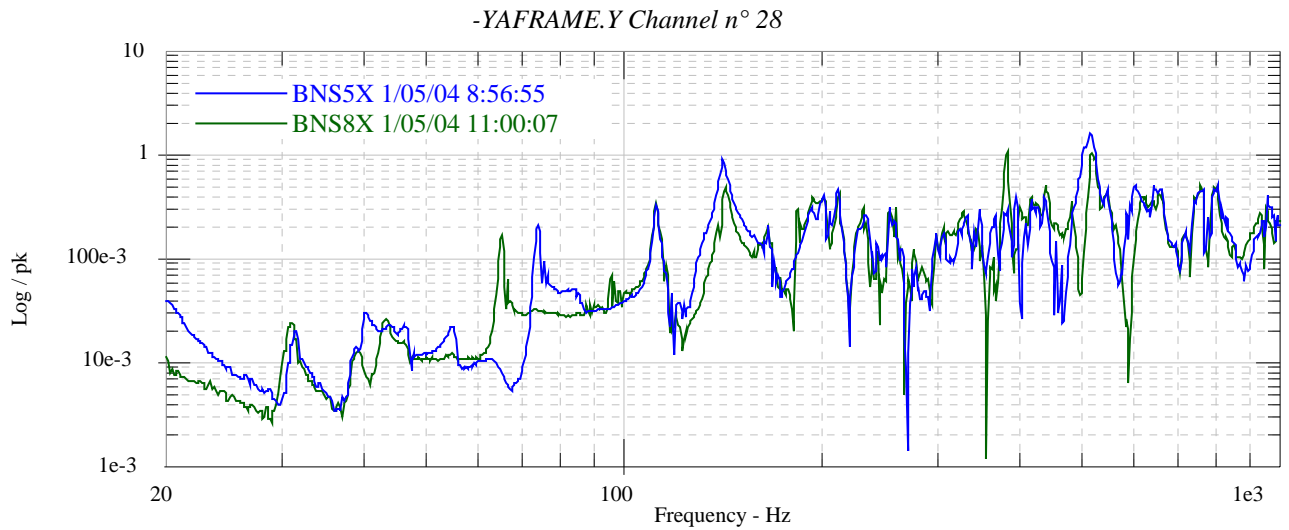
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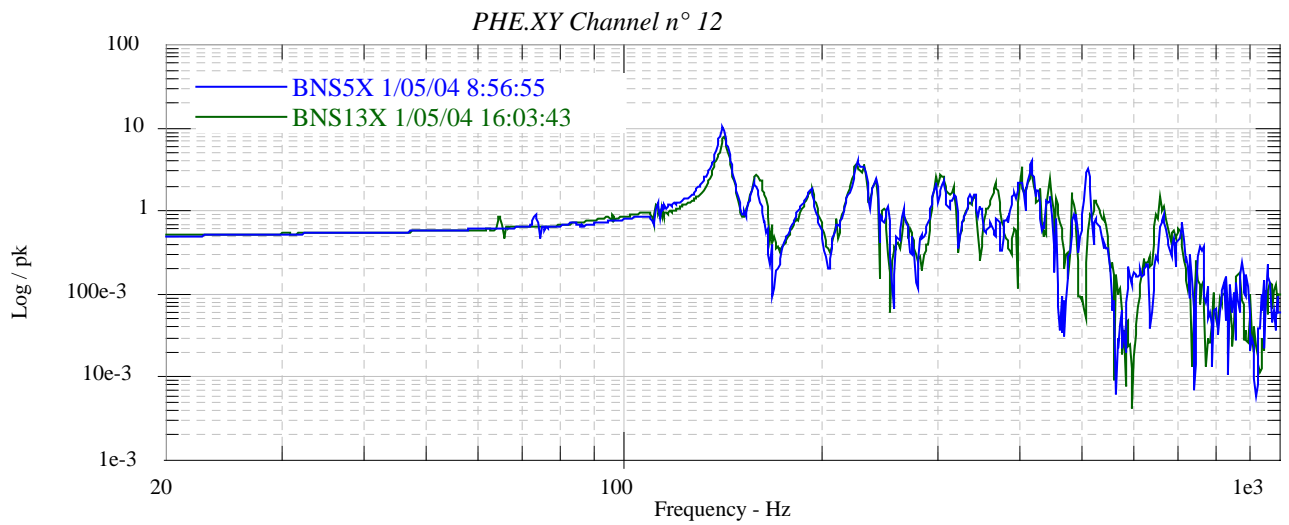
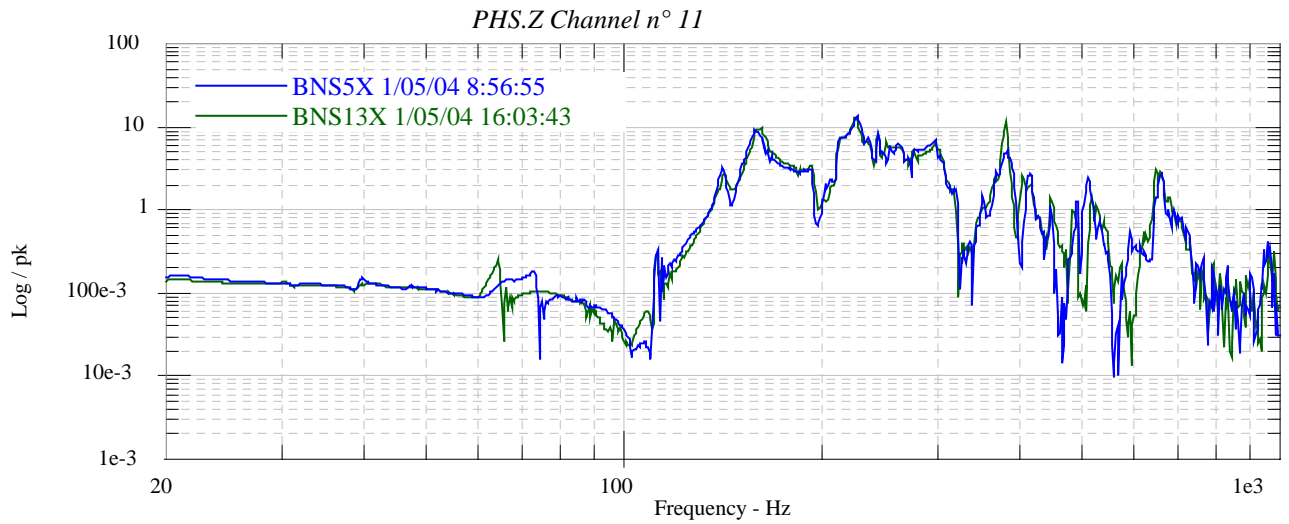
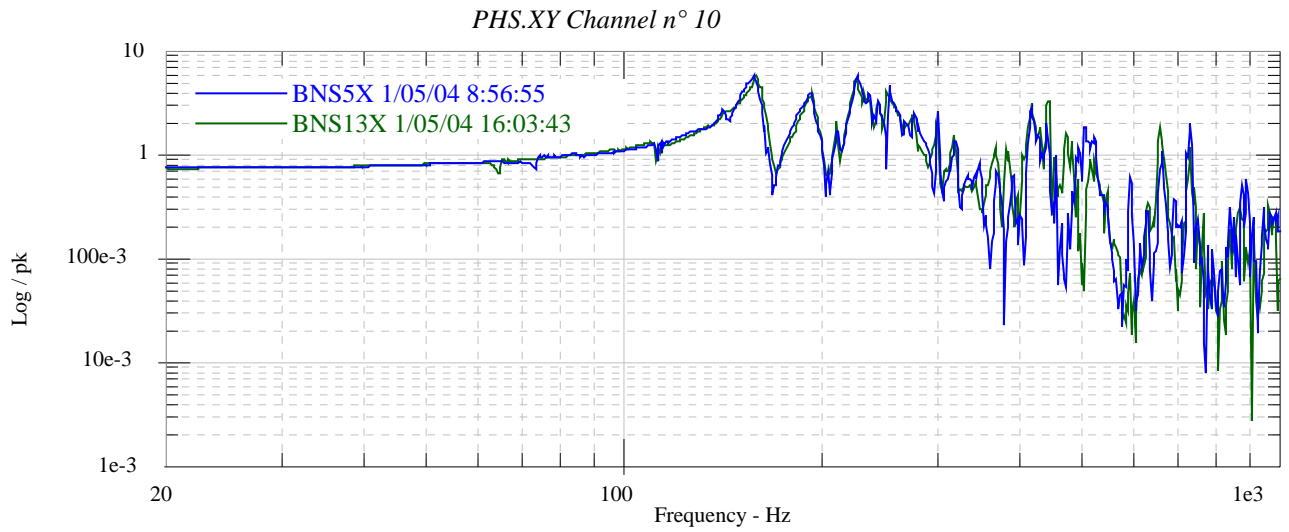
RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
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12.40 Comparison BNS_X transfer functions pre high level sine and post high level random.

H:\Users\J-S.Servaye\Cryovibrations\Rapports\SPIRE_QM\FT_BNS_X_2.doc

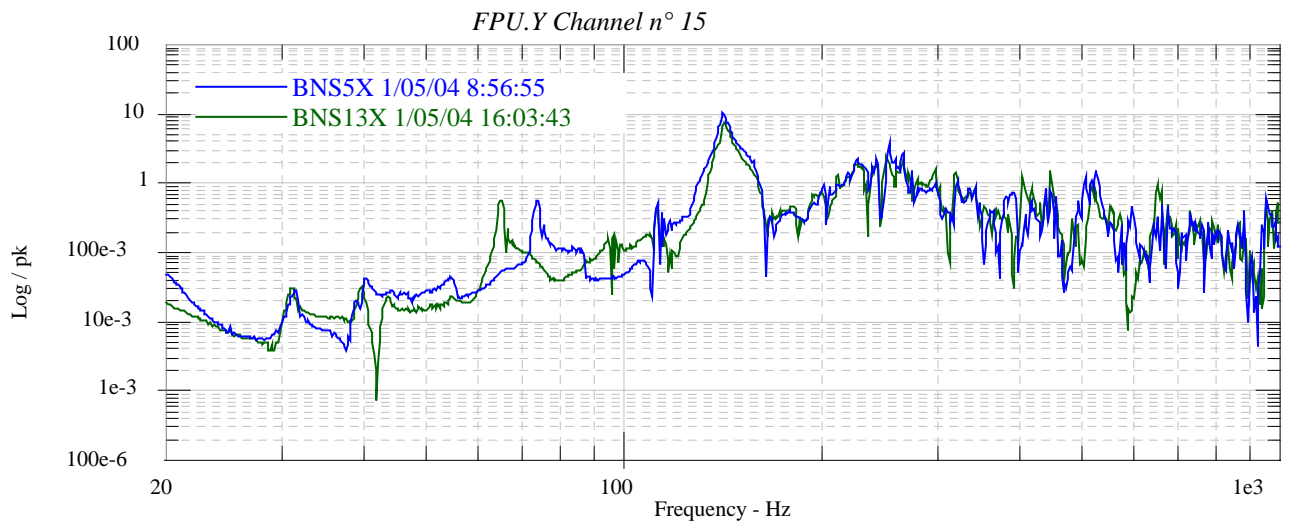
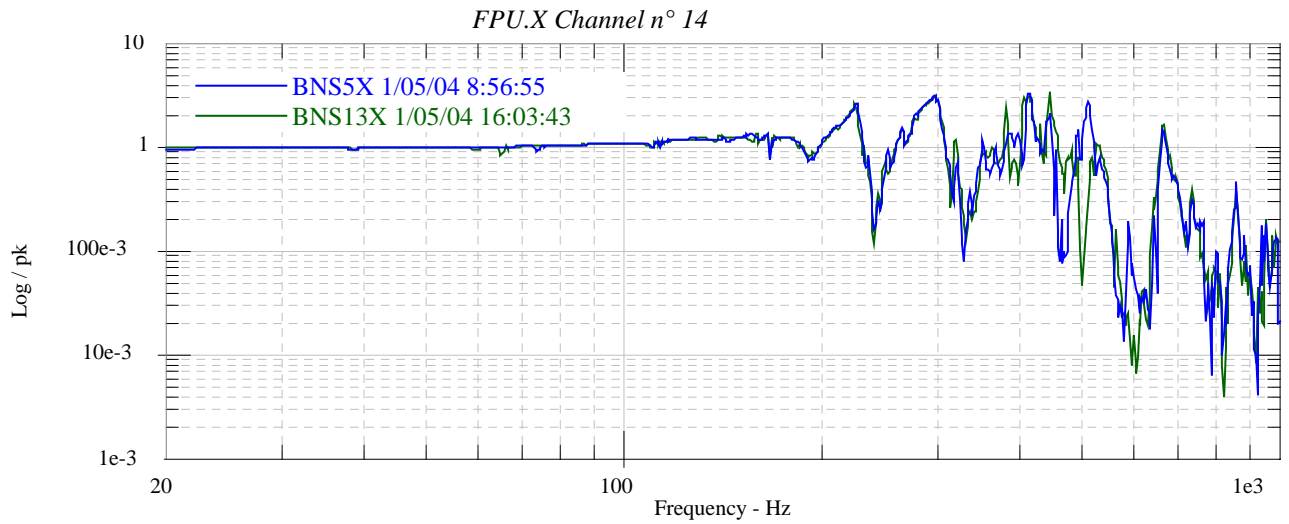
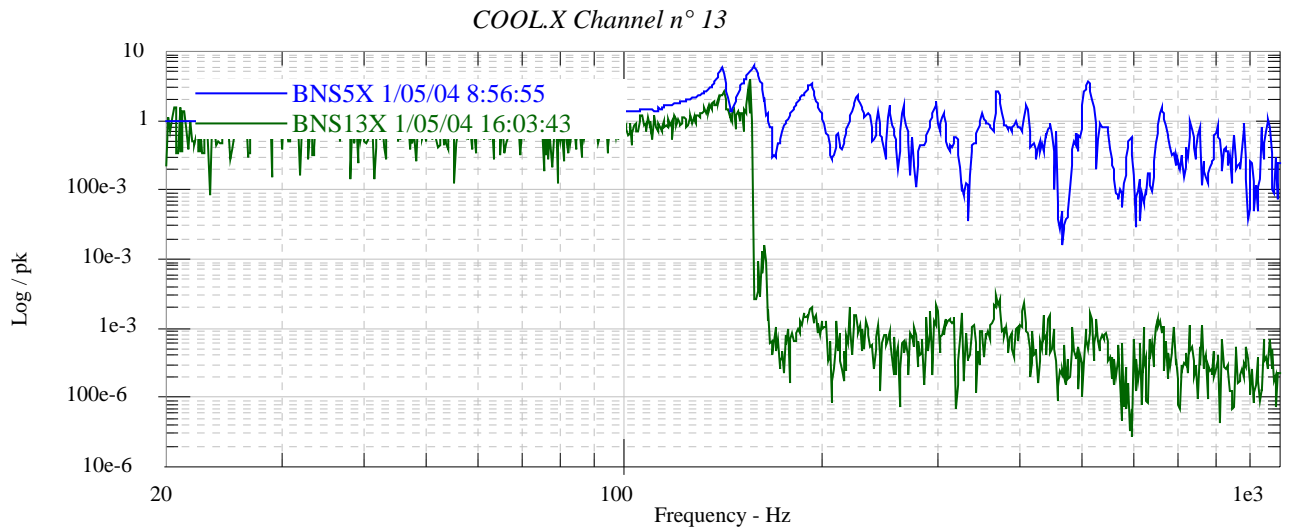
VIBRATION TEST REPORT
SPIRE QM

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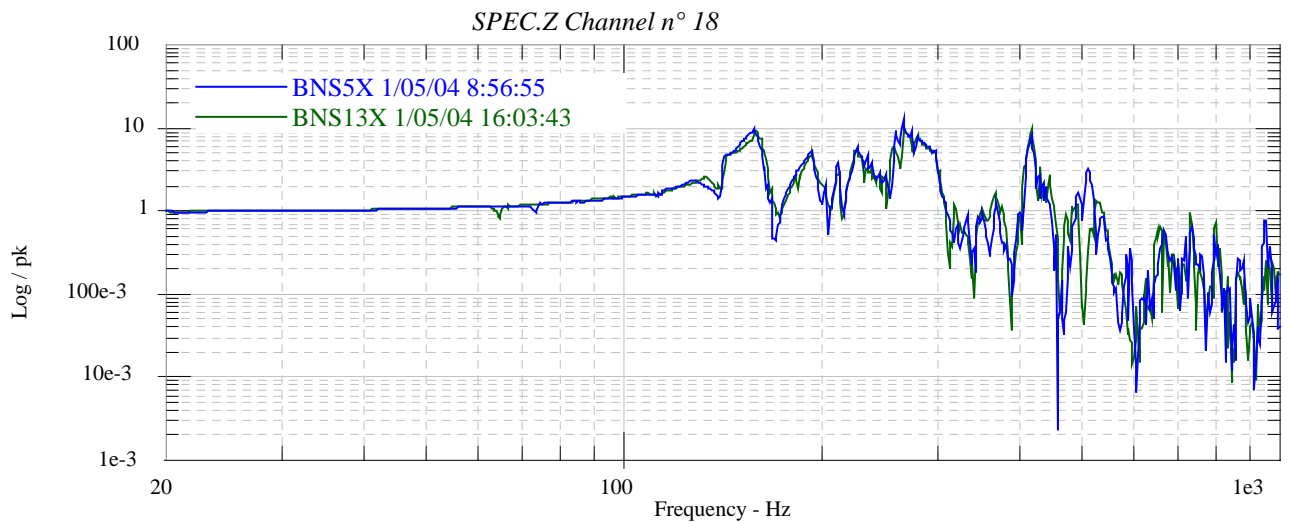
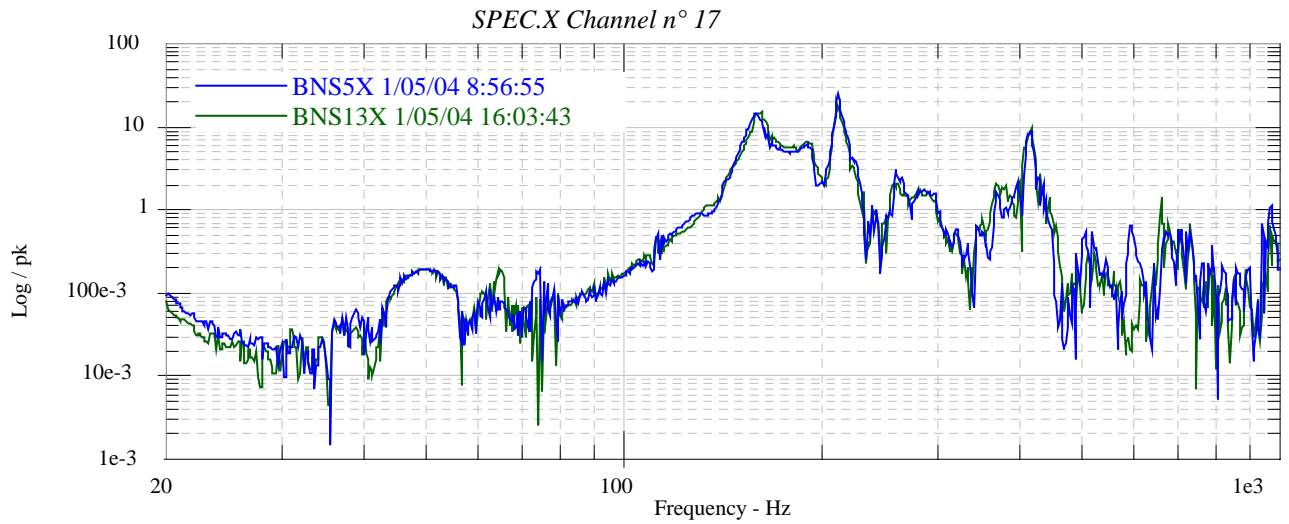
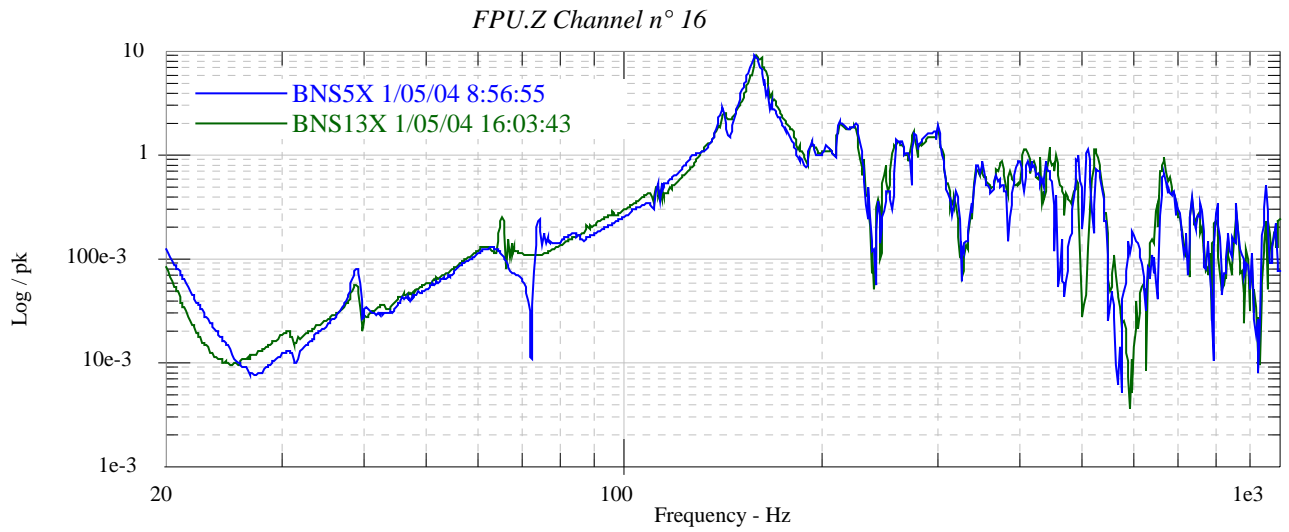
VIBRATION TEST REPORT
SPIRE QM

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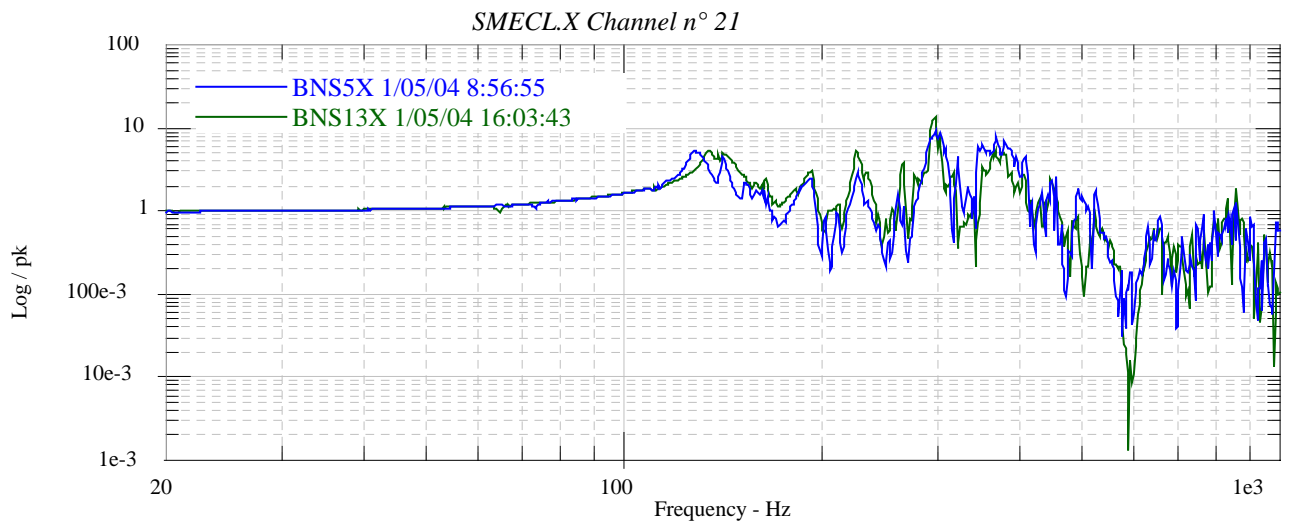
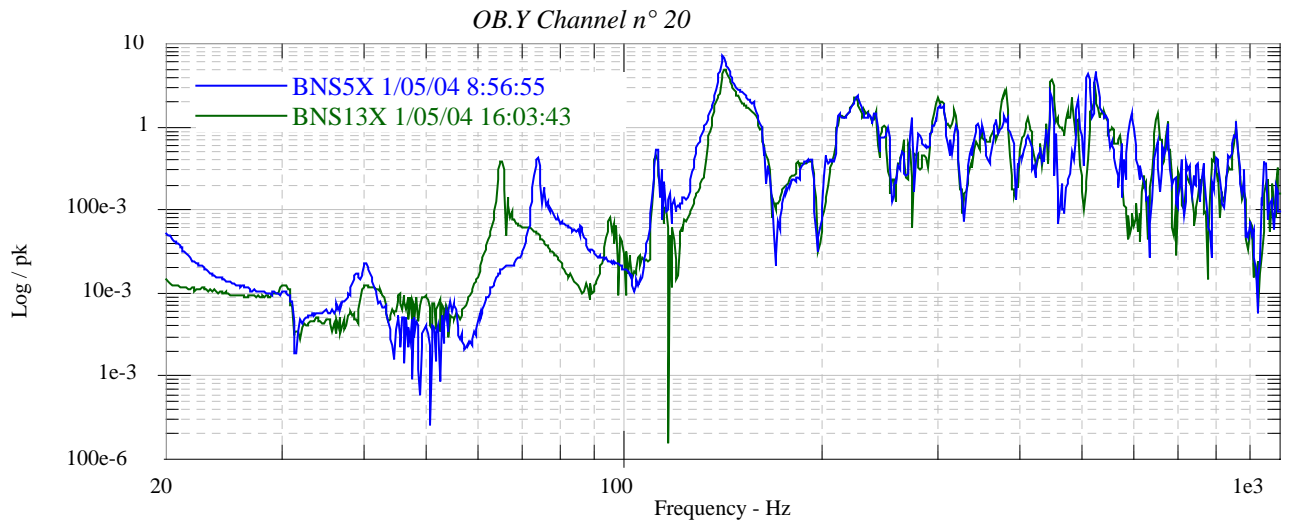
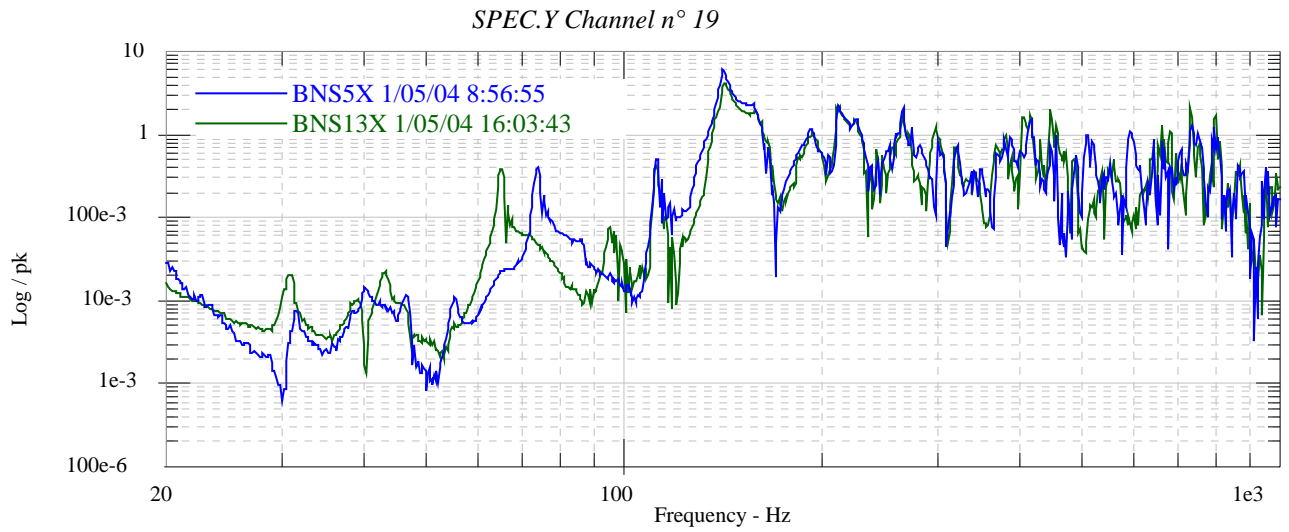
VIBRATION TEST REPORT
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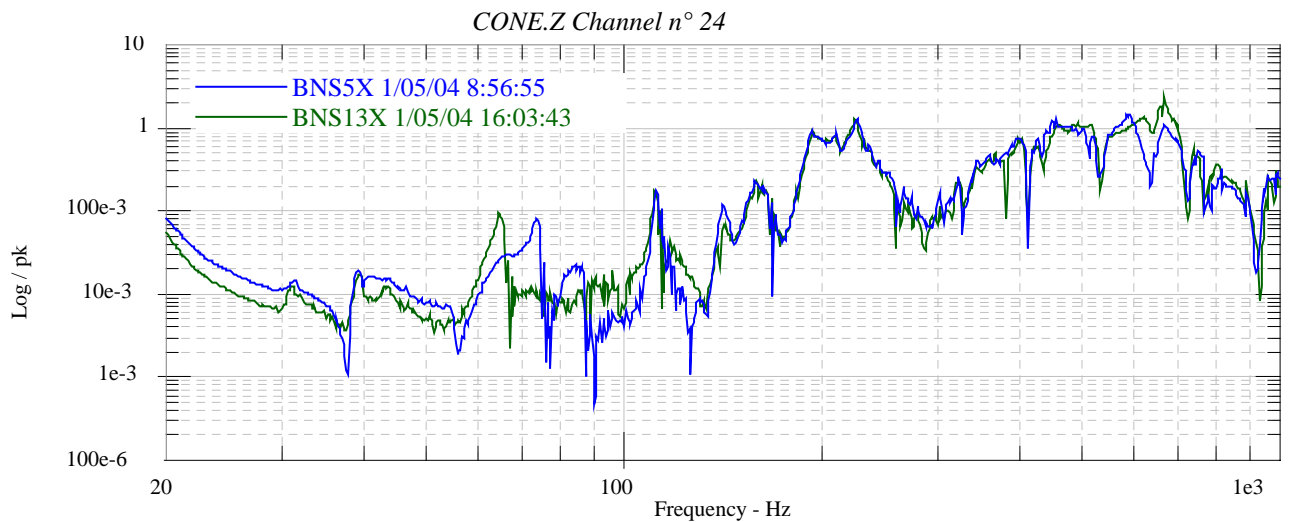
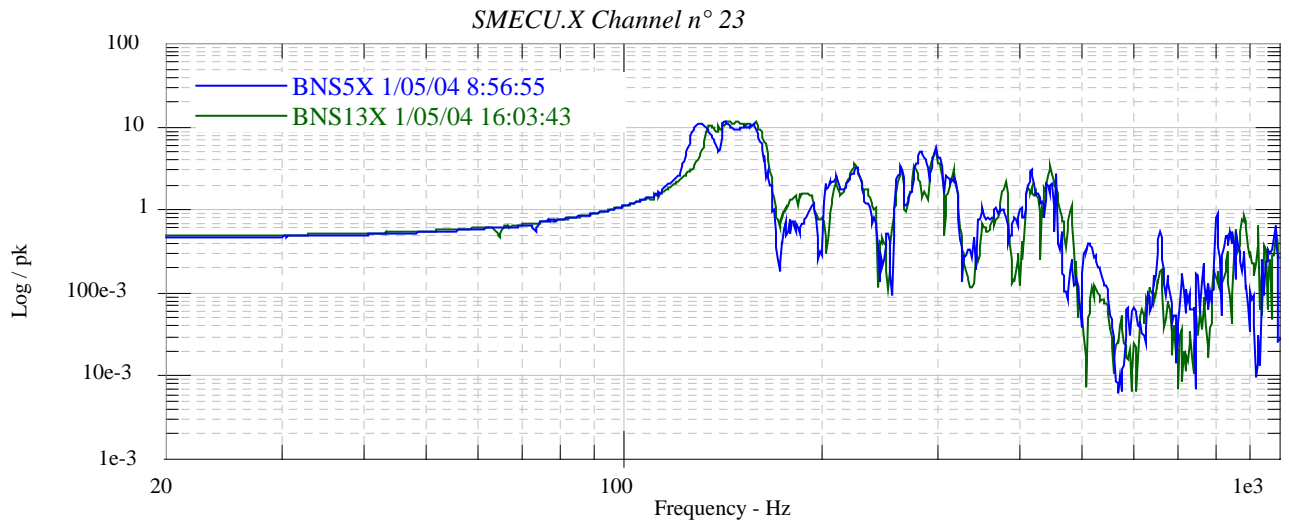
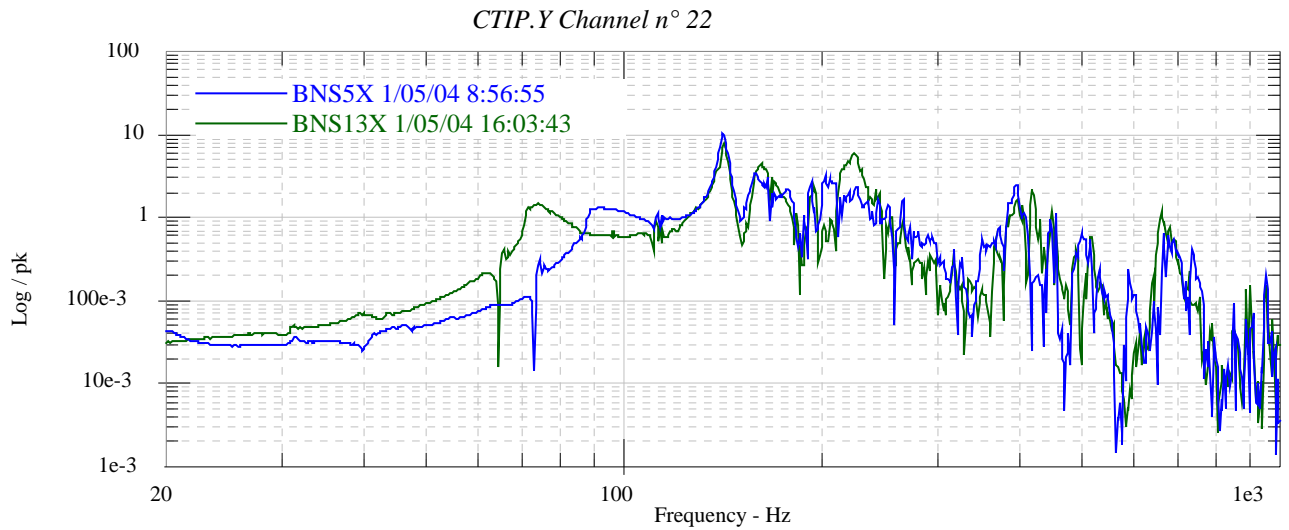
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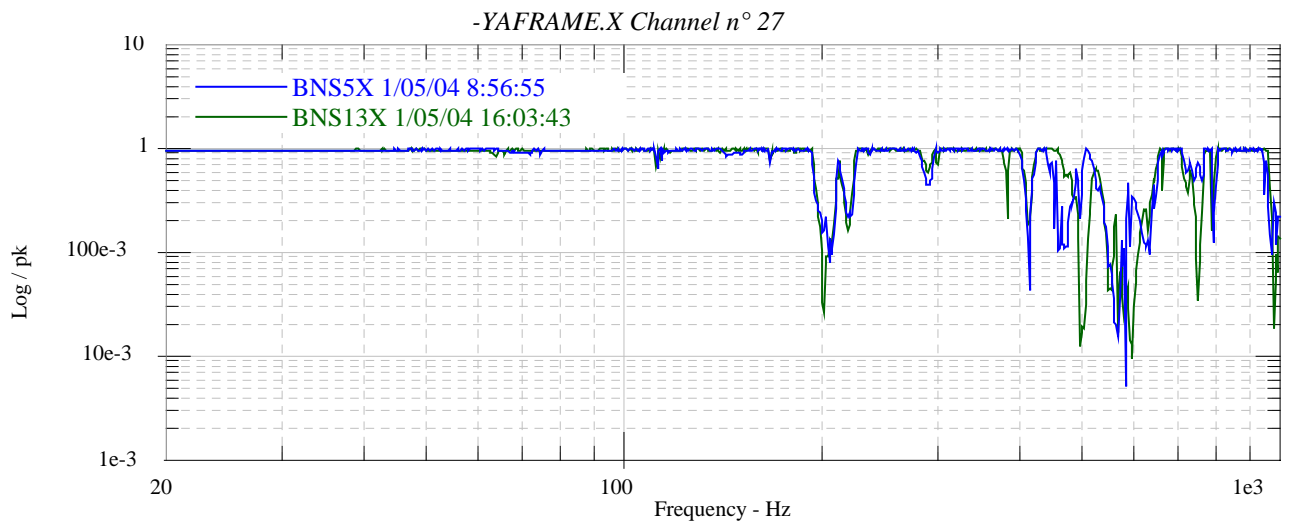
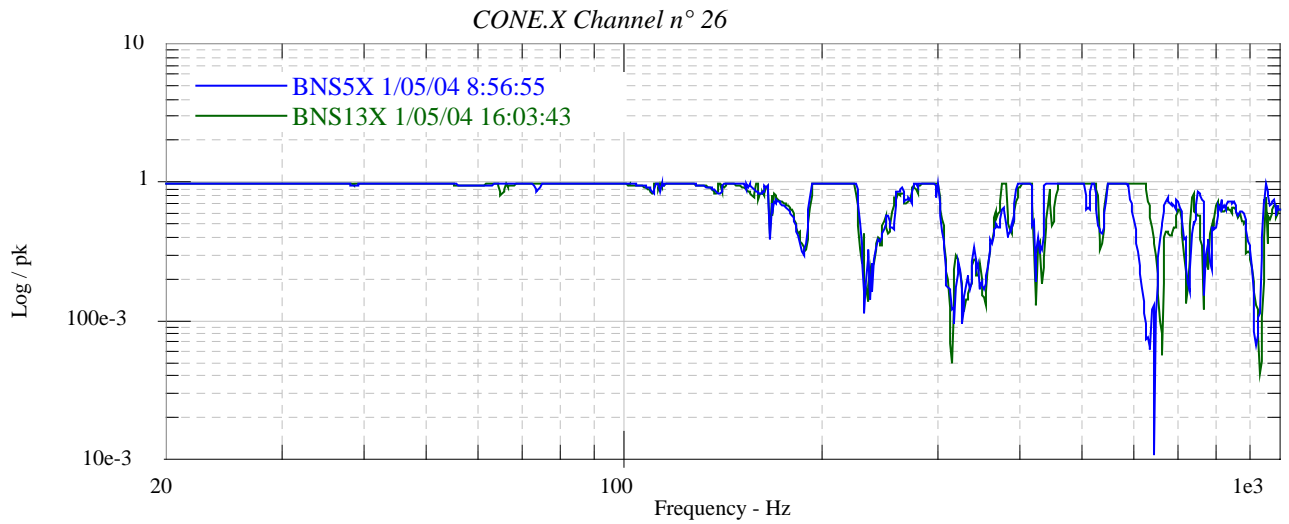
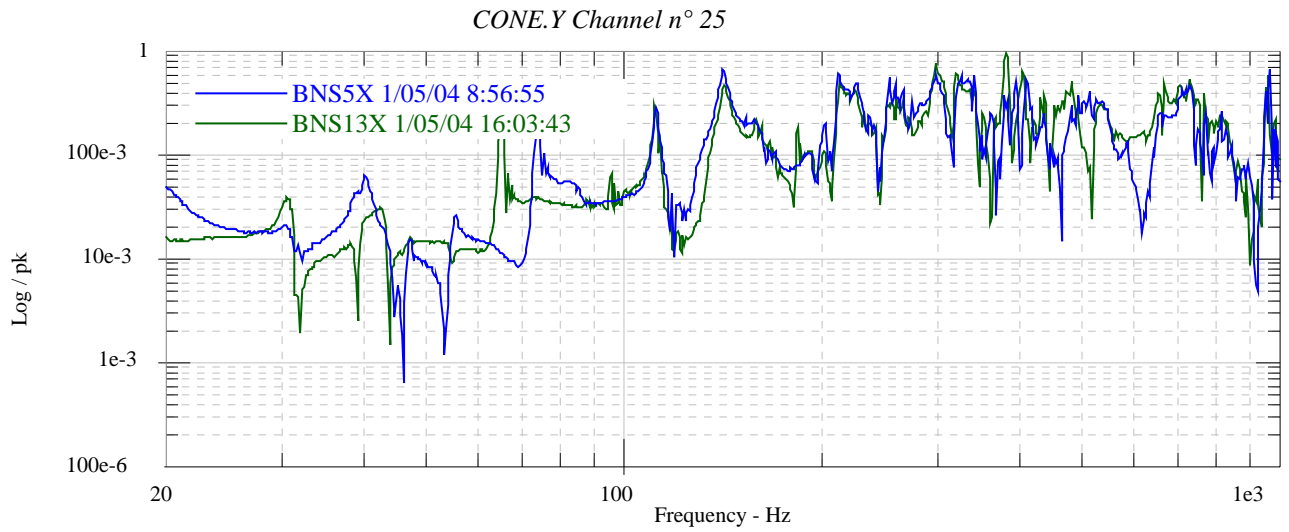
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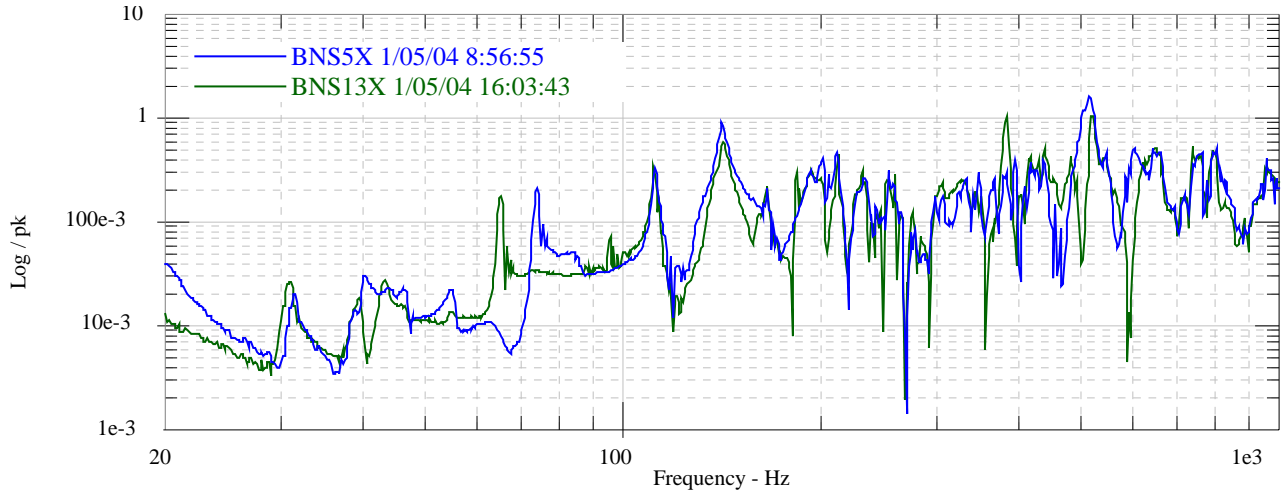
RP-CSL-CRYOV-04001
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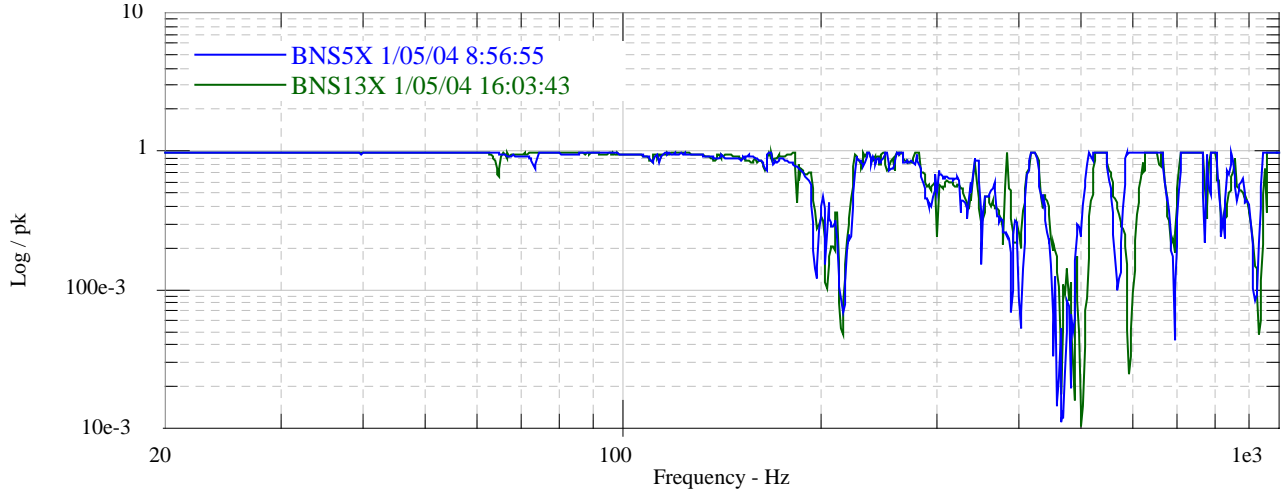
VIBRATION TEST REPORT
SPIRE QM

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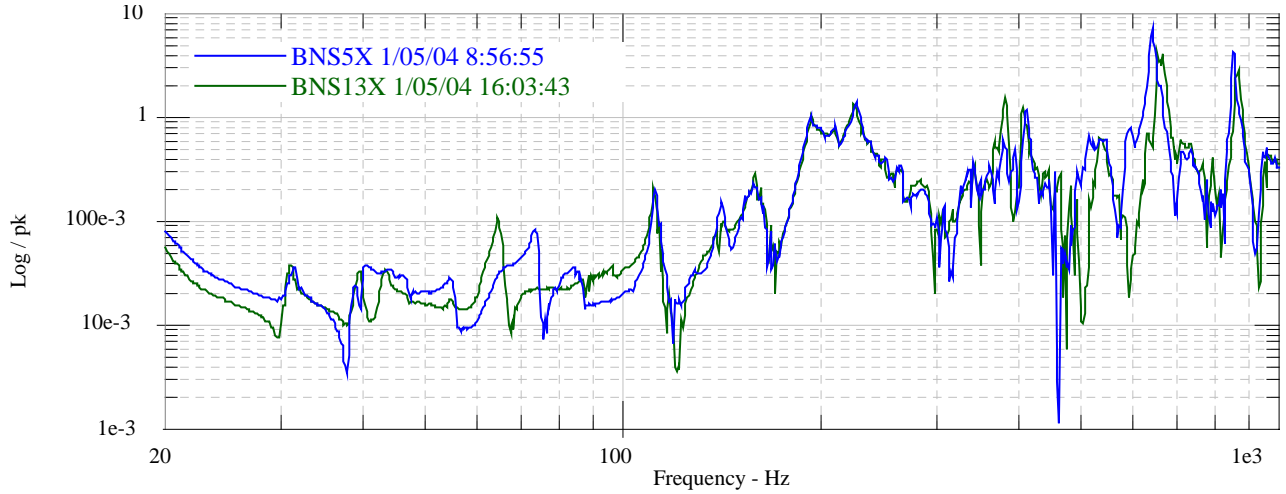
-YAFRAME.Y Channel n° 28



+YAFRAME.X Channel n° 29



+YAFRAME.Z Channel n° 30



VIBRATION TEST REPORT
SPIRE QM

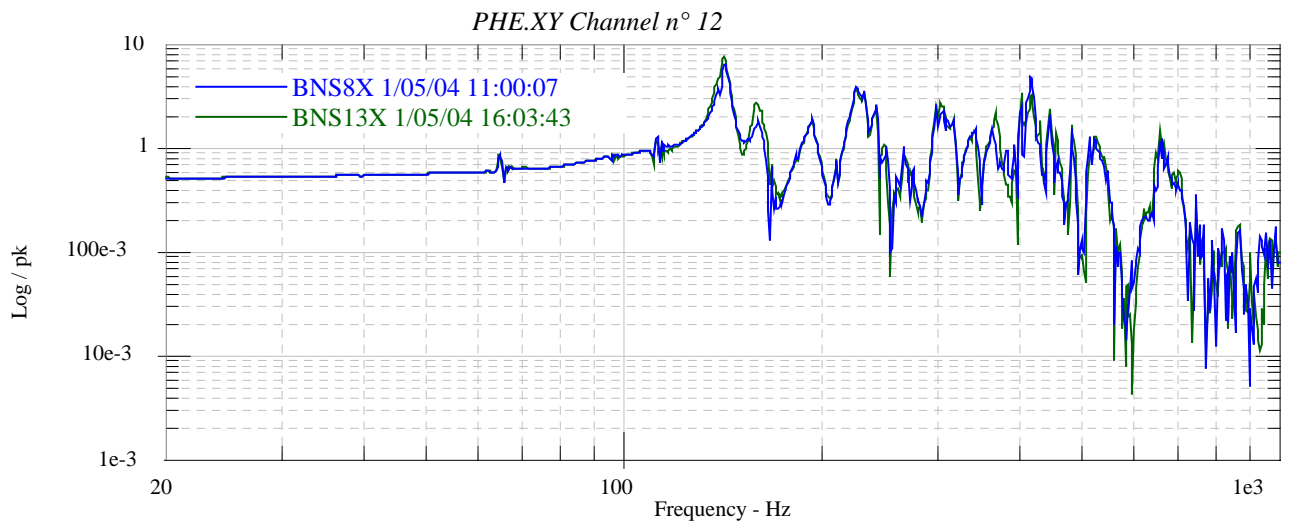
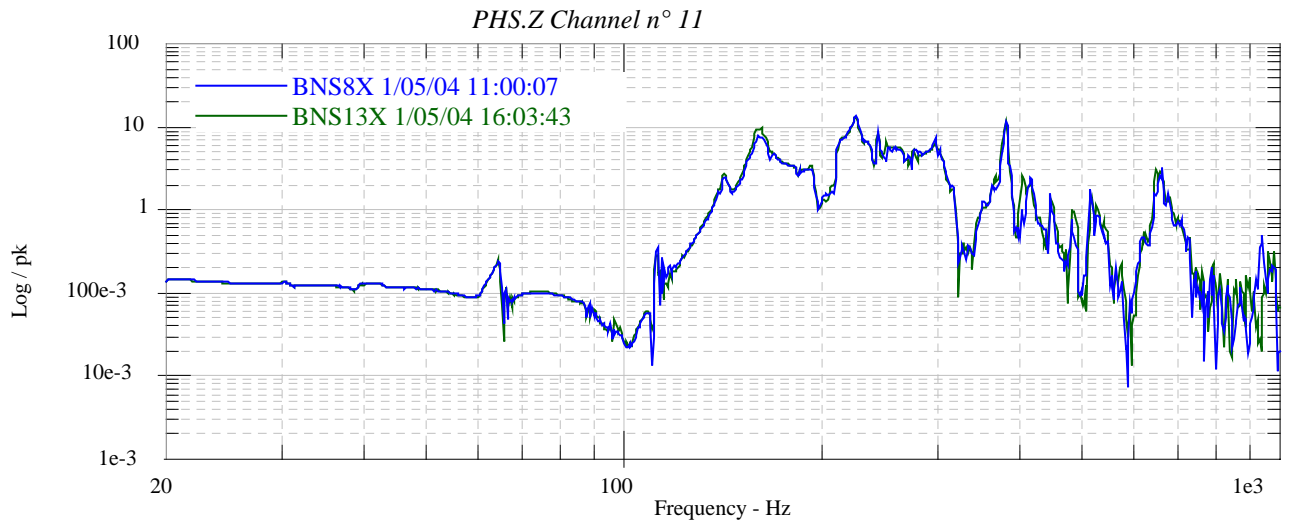
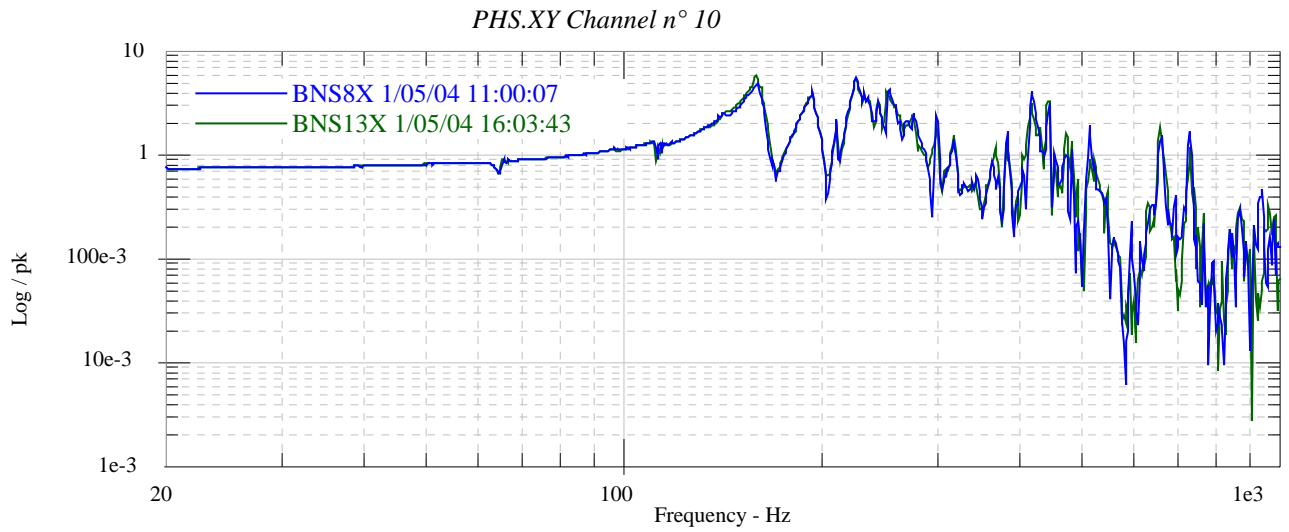
RP-CSL-CRYOV-04001
Version : **01**
Révision : **00**
Date : 7 May, 2004
Page : Annexe XLI

12.41 Comparison BNS_X transfer functions pre and post high level random.

H:\Users\J-S.Servaye\Cryovibrations\Rapports\SPIRE_QM\FT_BNS_X_3.doc

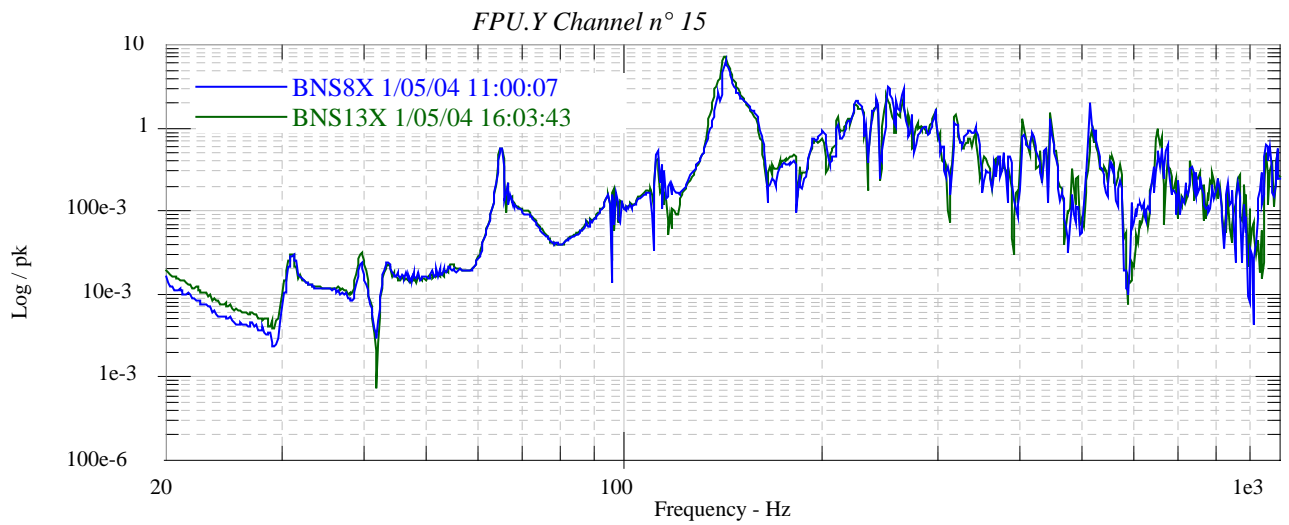
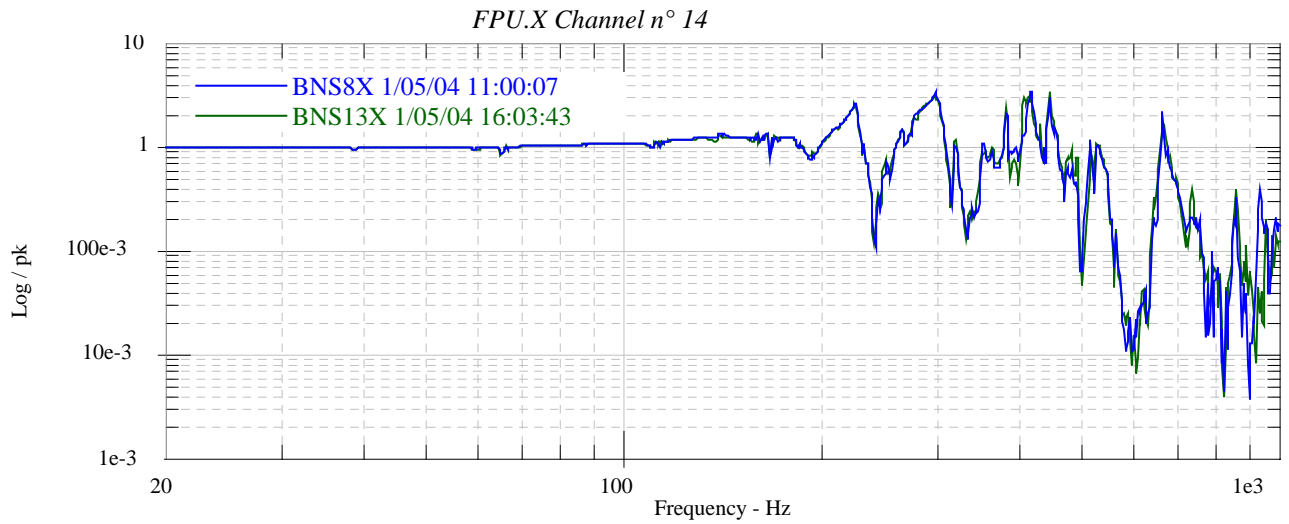
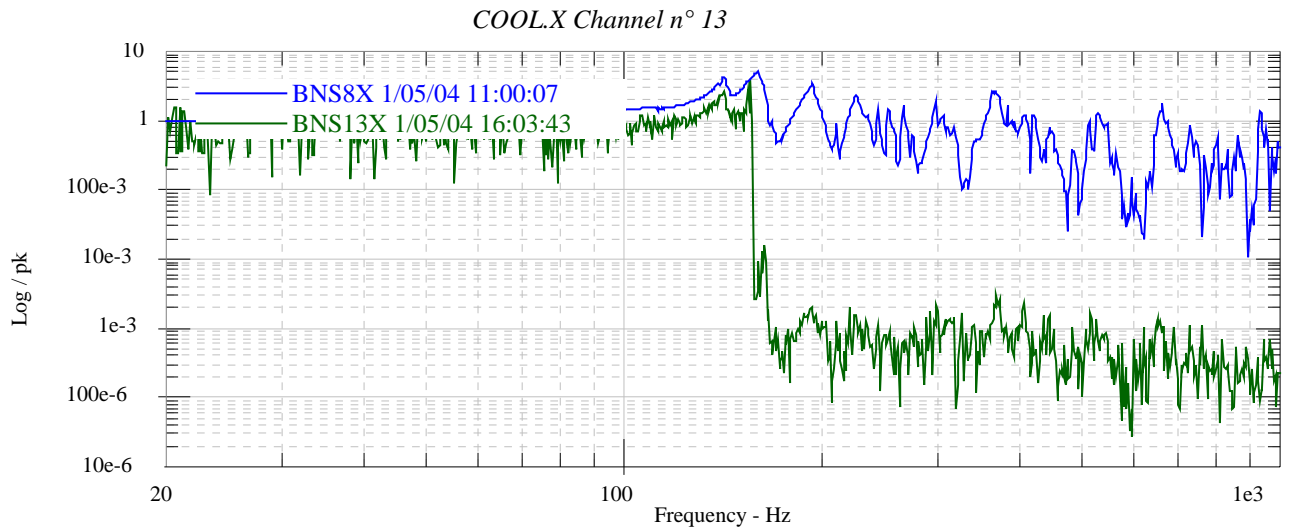
VIBRATION TEST REPORT
SPIRE QM

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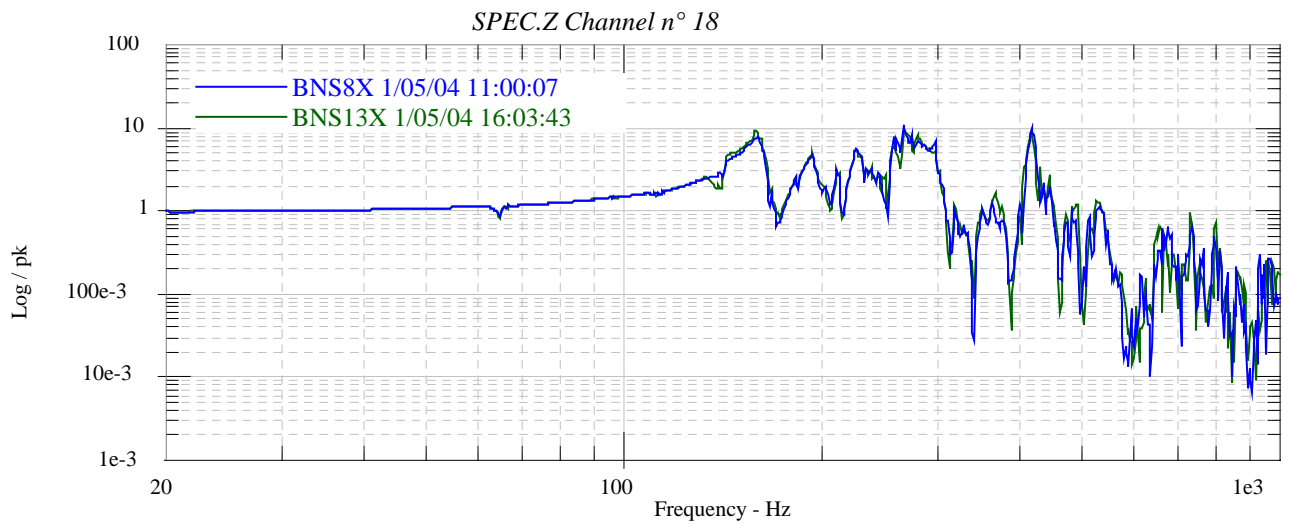
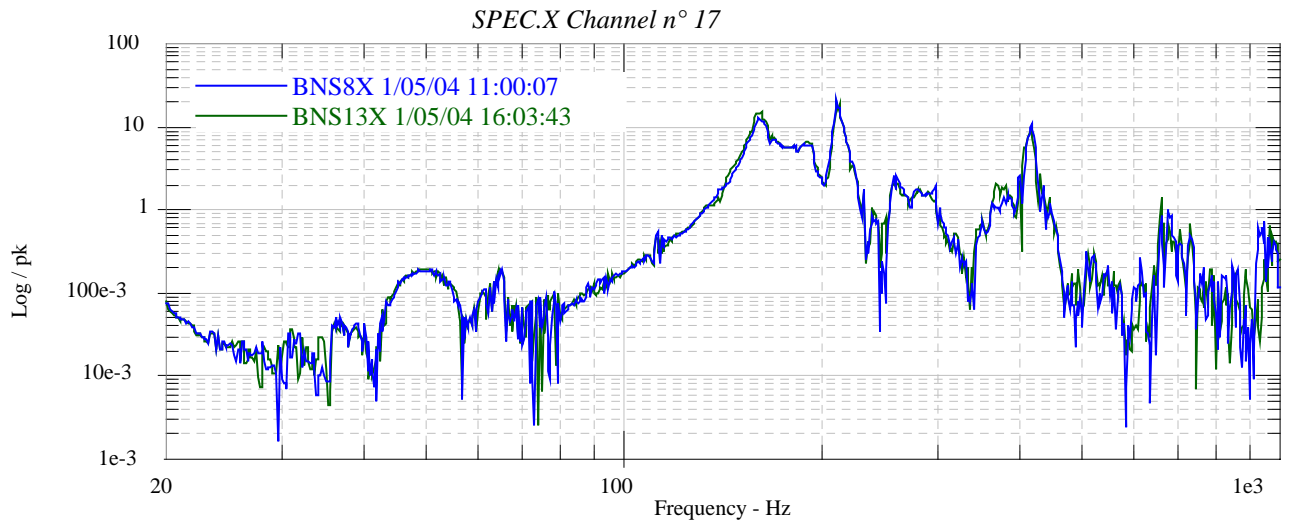
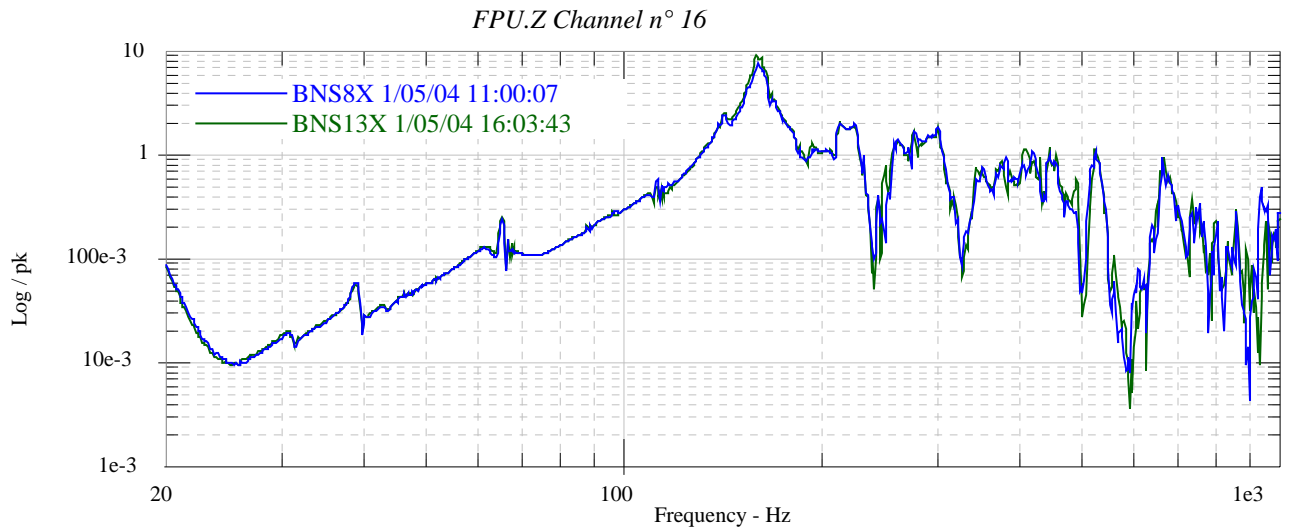
VIBRATION TEST REPORT
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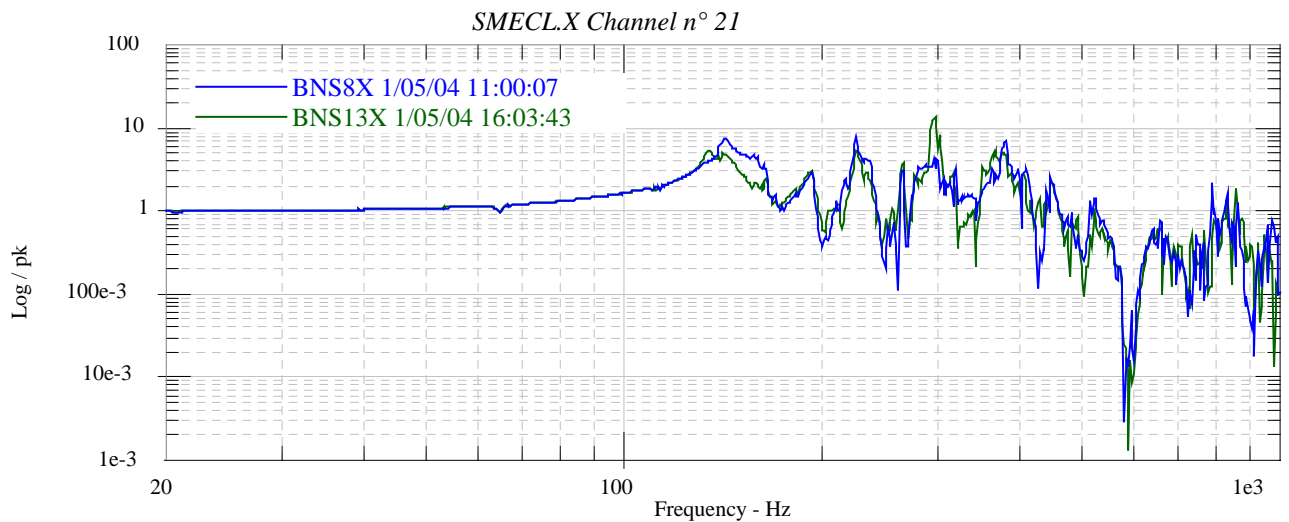
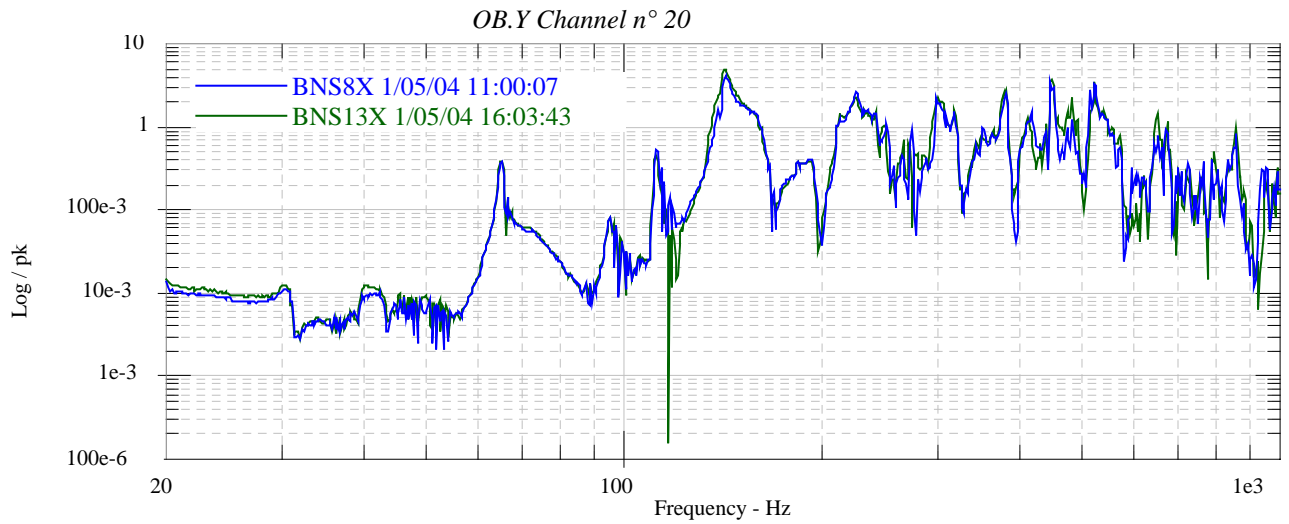
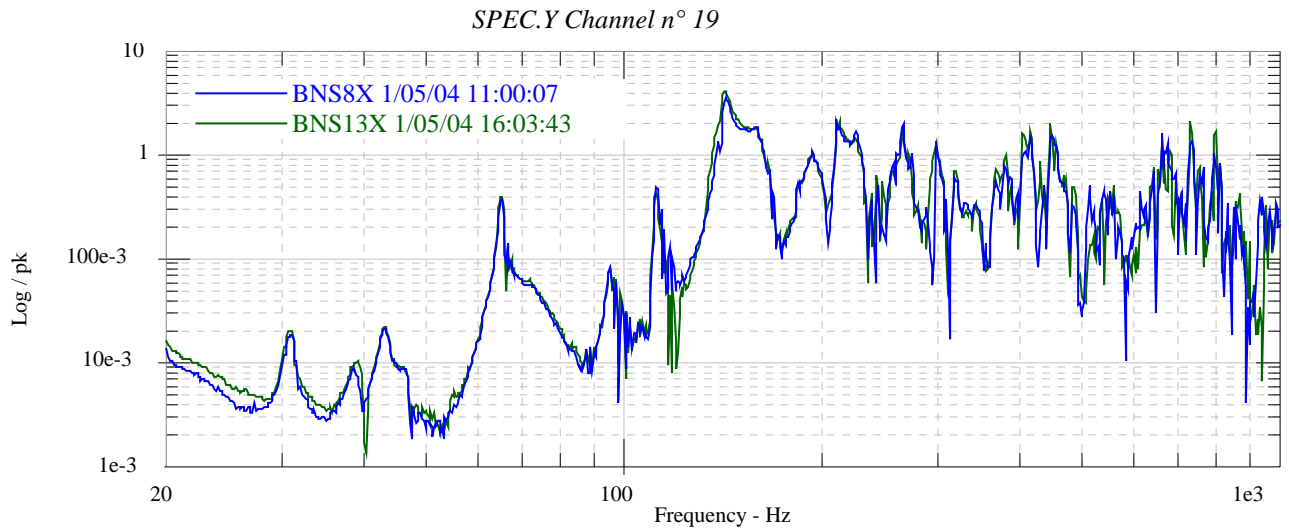
VIBRATION TEST REPORT
SPIRE QM

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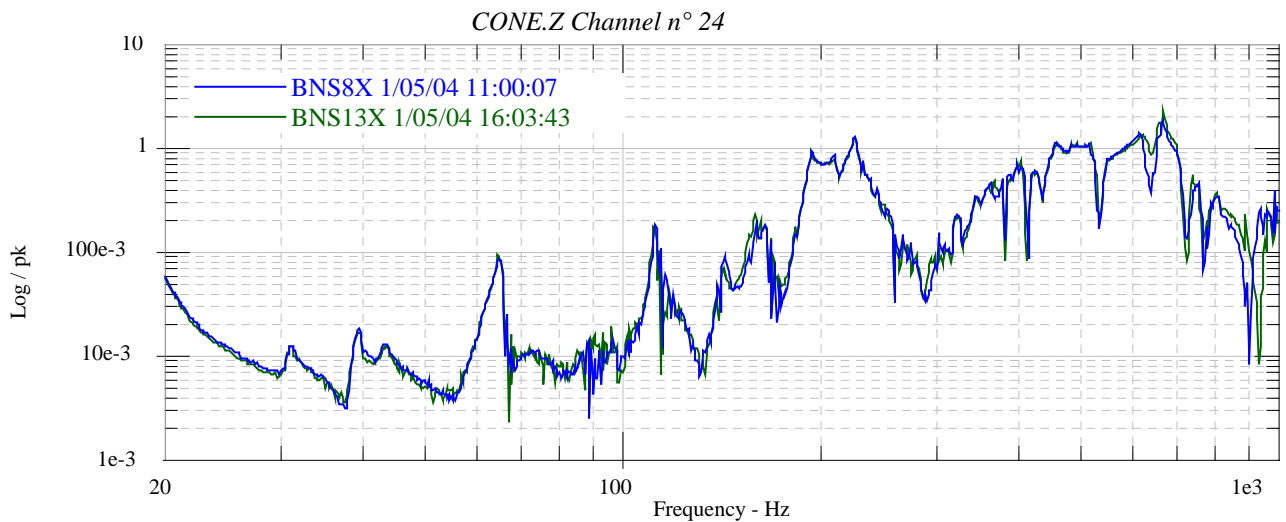
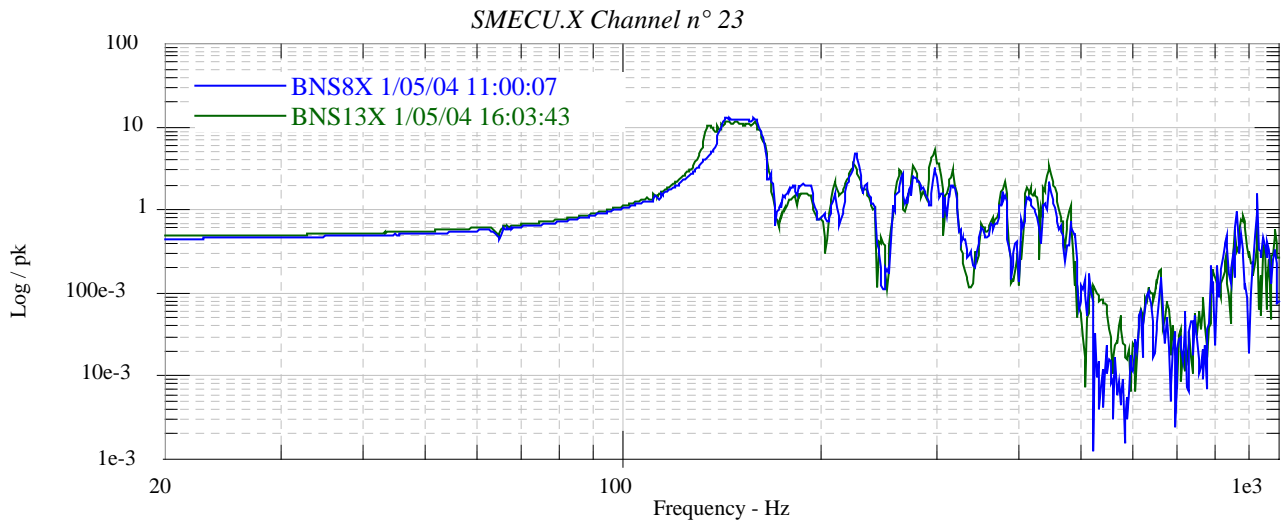
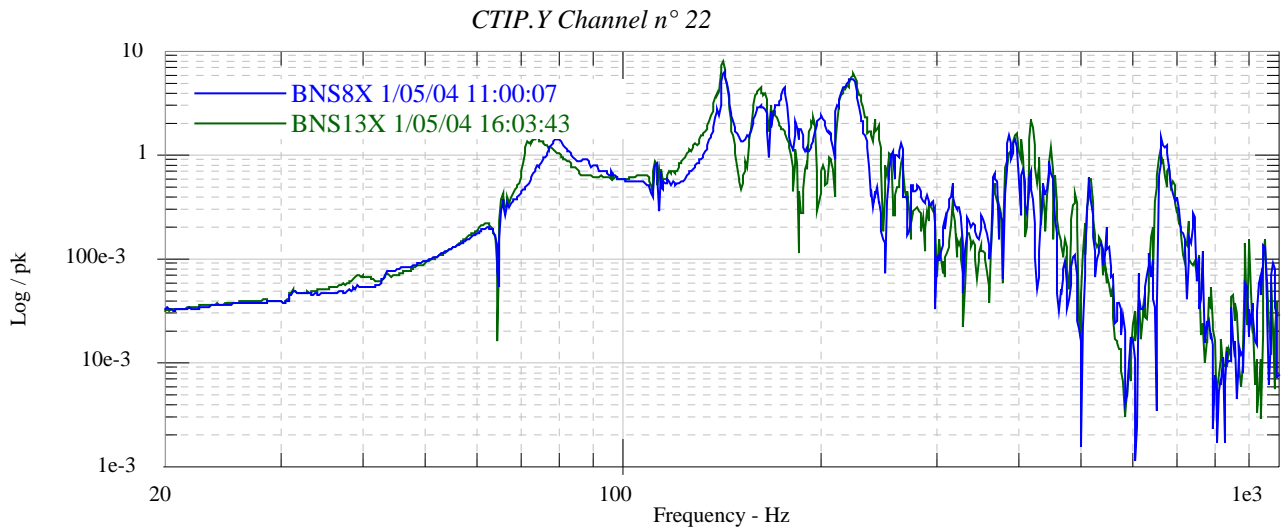
VIBRATION TEST REPORT
SPIRE QM

RP-CSL-CRYOV-04001
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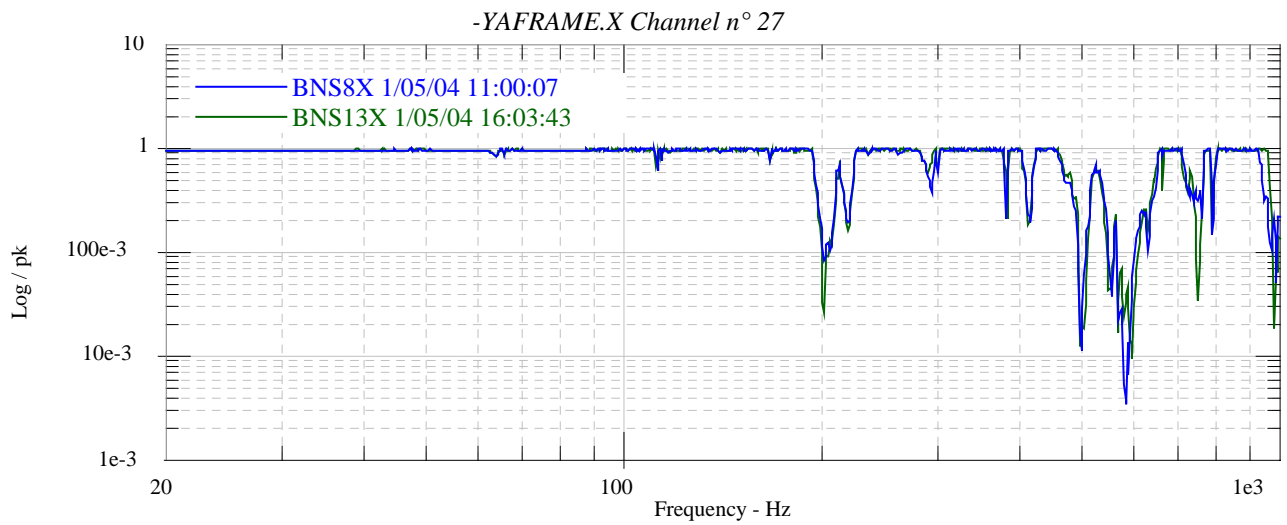
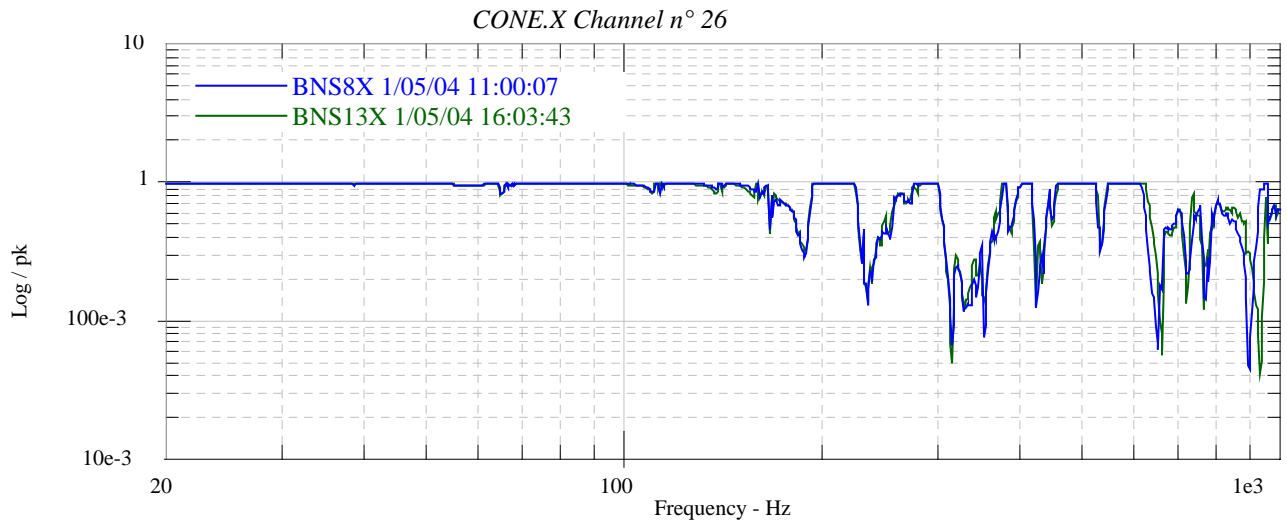
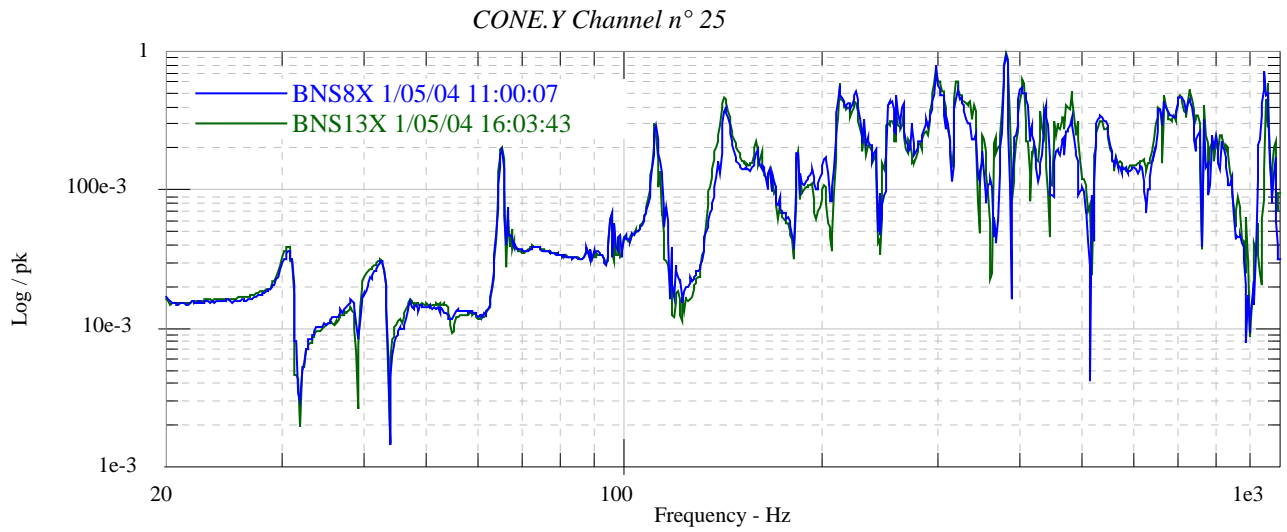
VIBRATION TEST REPORT
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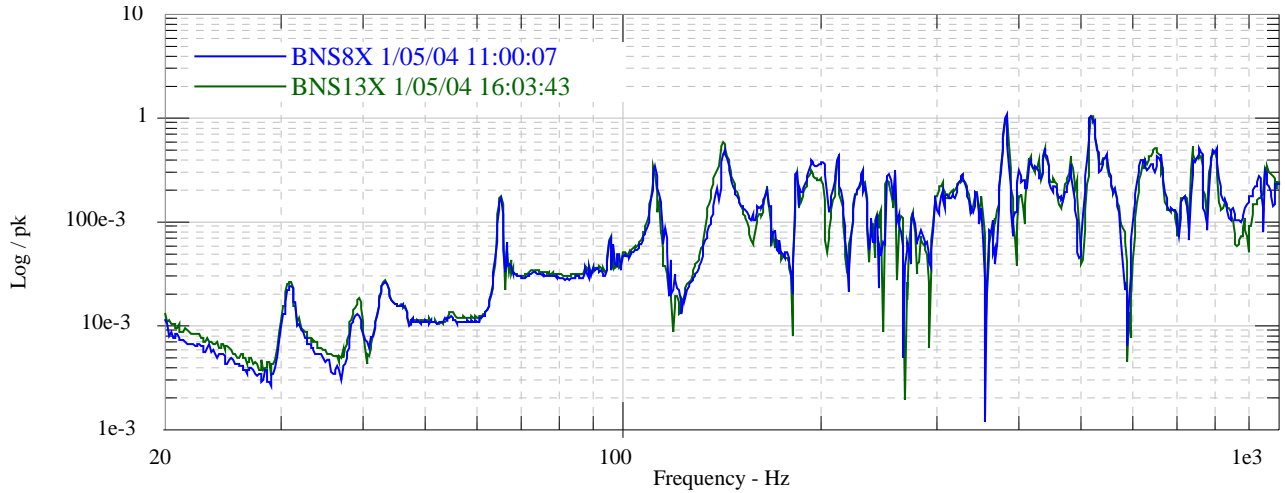
RP-CSL-CRYOV-04001
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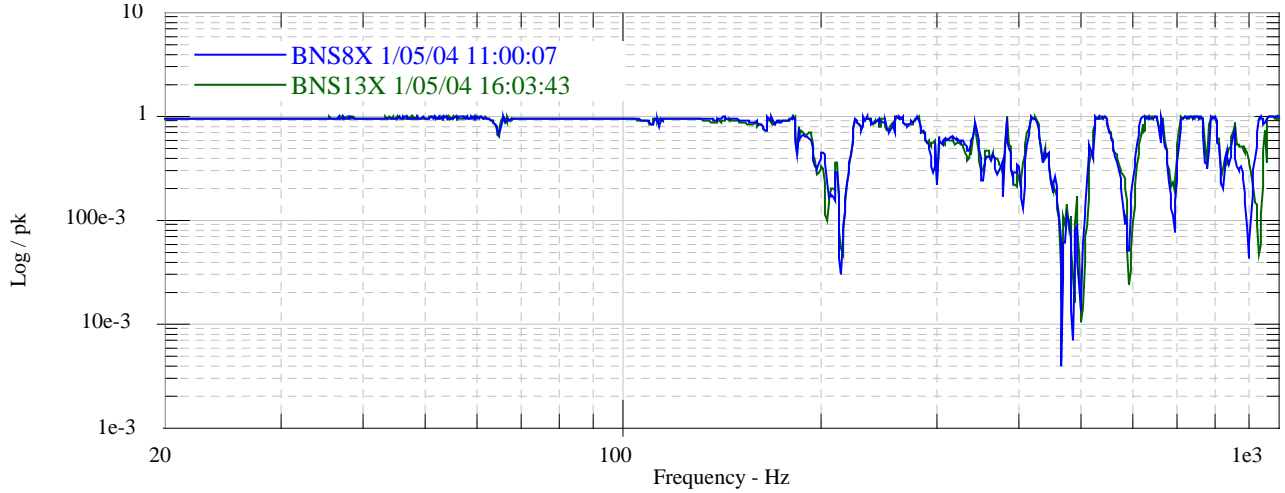
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