TECHNICAL NOTE

TITLE: SVM THERMAL ANALYSIS REPORT

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SIGNATURE AND APPROVALS ON ORIGINAL

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1. INTRODUCTION

The purpose of this document is the description of the geometric and thermal mathematical model built for HERSCHEL and PLANCK Service Modules as well as the presentation of the temperature results derived from the thermal analysis performed for both satellites.
In the present document each satellite has been described in a dedicate chapter, so that all aspects concerning HERSCHEL are presented and discuss in chapter 3, while the description and analysis of PLANCK is presented and discuss in chapter 4.

2. APPLICABLE AND REFERENCE DOCUMENT

2.1 APPLICABLE DOCUMENT

The Applicable Documents here reported are applicable in their last issue and are part of this Specification.
The rules and requirements that they contain shall be applied for the SVM thermal control development, design, testing and delivery.

In the event of conflict between the requirements and/or conditions of these documents/specifications and the present one, the document having the higher level in the above list has precedence.

In the event of conflict between equal level documents, such conflict shall be referred to and solved by ALENIA in conjunction with ALCATEL and ESA.

In the event of conflict between this document and other than those cited above, the detailed content of this document has precedence.

System Support Documents

AD-2.1	Herschel/Planck Environment and Tests Requirements	H-P-1-ASPI-SP-0030
AD-2.2	General Design & Interface Requirements	H-P-1-ASPI-SP-0027
AD-2.3	SVM Mechanical Interface control document	H-P-IC-AI-0001
AD-2.4	General Requirements for the Thermal and Geometrical Math. Models	(to be issued)
AD-2.5	SVM Requirement Specification	H-P-4-ASPI-SP-0019
AD-2.6	SVM Interface Specification	H-P-4-ASPI-IS-0042
AD-2.7	SVM Design Report	H-P-RP-AI-0005
AD-2.8	PLANCK HEAT-PIPES Network Definition and Interfaces	H-P-TN-AI-0020
AD-2.9	Not used	
AD-2.10	Thermal Interface control document	H-P-IC-AI-0002
AD-2.11	Instrument Interface Document, Part B (IID-B): High Frequency Instrument	SCI-PT-IIDB/HFI-04141
AD-2.12	Instrument Interface Document, Part B (IID-B): Low Frequency Instrument	SCI-PT-IIDB/LFI-04142
AD-2.13	Instrument Interface Document, Part B (IID-B): Photo-conductor Instrument	SCI-PT-IIDB/PACS-2126
AD-2.14	Instrument Interface Document, Part B (IID-B): Instrument ”HIFI”	SCI-PT-IIDB/HIFI-2125

2.2 REFERENCE DOCUMENT

2.3 LIST OF ACRONYMS

AAD	: Attitude Anomaly Detector
AIT	: Assembly Integration and Testing
HPLM	: Payload Module
CoG	: Centre of Gravity
CSS	: Coarse Sun sensor
GYR	: Gyroscope
H/W	: Hardware
L/GA	: Low Gain antenna
M/GA	: Medium Gain antenna
MGSE	: Mechanical Ground Support Equipment
PPLM	: Planck Payload Module
P/ST	: Primary Structure (occasionally used)
P.Tanks	: Propellant Tanks
PTSS	: Propellant Tank Support Structure
rpm	: revolution per minute
S/C	: Spacecraft or Satellite
SAS	: Sun Acquisition sensor
SCC	: Sorption Cooler Compressors
STM	: Star Mapper
STR	: Star Trackers
TBC	: To Be Confirmed
TBD	: To Be Defined

3. HERSCHEL – MODEL DESCRIPTION AND THERMAL ANALYSIS

3.1 HERSCHEL - PRESENTATION OF THE MODEL

Herschel and Planck are two satellites dedicated to the observation of the universe.

- Herschel key science targets are focused on the formation of stars and galaxies. It will complement the successful progress of ISO ('95-'98) and SIRTF (to be launched this year).

The spacecraft is planned to operate from Lissajous orbits around the Langragian point L2 of the Sun / Earth system. This point is aligned with the Earth and the Sun and located at 1.5 10^6 Km from the Earth.

Both satellites are planned to be launched by ARIANE 5 dual launch.

The main modules are:

- The Service Module (SVM)
- The Payload Module (PLM), carrying the scientific instruments and telescopes and relevant electronic units
- The Sunshields, protecting the Payload or the S/C and used also as Solar Arrays.

3.1.1 Geometric Mathematical Model (GMM)

The Geometric models detail all the satellite surfaces and their thermo-optical properties, in order to evaluate the radiative exchange factors among nodes and, only for the external nodes, the fluxes (solar, albedo and Earth shine) on spacecraft surfaces during the orbit. Due to the huge distance of the HERSCHEL orbit from the Earth, only solar fluxes have been considerate in the thermal analysis.

The Geometric Mathematical Model (GMM) of HERSCHEL satellite has been built using Esarad (ver. 4.3) software and it is composed by a single model, which describe both the external environment and the internal enclosures of the spacecraft. Some components of the Payload Module have been also considered in order to evaluate the radiative impact on the HERSCHEL Service Module.

The termo-optical properties of the material used in theGMM/TMM are listed in Table 3.1.1.
The geometrical nodes of HERSCHEL Service Module are shown on Table 3.1.1-1 and the HERSCHEL Payload Module nodes are listed in Table 3.1.1-2, with the area and thermal properties of each node. The only thermal propertie that change during the satellite life is the alpha value and only for the OSR and for the MLI closure between the SVM and PLM.
In addition to the previous list the nodal breakdown of the Geometric Model, both internal and external nodes, is shown on Fig 3.1.1-1 to Fig. 3.1.1-10

SURFACES	MATERIALS	Alpha BOL	Alpha EOL	Epsilon
Internal surfaces (black paint, carbon fibre & Units)	Black Paint	0.9	0.9	0.9
Radiators	OSR	0.1	0.18	0.78
Internal MLI and Top MLI	Kapton Aluminized	0.15	0.15	0.05
External MLI	Carbon Filled	0.92	0.92	0.86
Launcher Adaptor Ring	Alumnium	0.15	0.15	0.05

Table 3.1.1 HERSCHEL – Service Module Thermal Properties Materials

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
43	STRMY CONE	0.32818	0.9	=	0.9
44	STRMZPY CONE	0.32818	0.9	=	0.9
101	RFDN	0.96421	0.9	=	0.9
102	EPC1	0.11285	0.9	=	0.9
103	EPC2	0.11285	0.9	=	0.9
104	TRANSX1	0.24000	0.9	=	0.9
105	TRANSX2	0.24000	0.9	=	0.9
106	TWTA1	0.11603	0.9	=	0.9
107	TWTA2	0.11603	0.9	=	0.9
201	PCDU	0.68539	0.9	=	0.9
202	CMDU	0.63672	0.9	=	0.9
203	ACC	0.53471	0.9	=	0.9
204	BATT	0.26920	0.9	=	0.9
301	FPSPU1_2	0.28930	0.9	=	0.9
303	FPDPU	0.34780	0.9	=	0.9
304	FPBOLC	0.72539	0.9	=	0.9
305	FPMECDEC	0.88640	0.9	=	0.9
401	CRYOE	0.49500	0.9	=	0.9
404	HSDCU	0.73967	0.9	=	0.9
405	HSDPU	0.34780	0.9	=	0.9
406	HSFCU	0.69461	0.9	=	0.9
701	RWL1_C	0.32437	0.9	=	0.9
702	RWL2_C	0.32437	0.9	=	0.9
703	RWL3_C	0.32437	0.9	=	0.9
704	RWL4_C	0.32437	0.9	=	0.9
705	RWDE	0.29955	0.9	=	0.9
706	QRS1	0.20140	0.9	=	0.9
707	QRS2	0.20140	0.9	=	0.9
801	GYRO	0.24740	0.9	=	0.9
802	PDU	0.13500	0.9	=	0.9
900	TANK1_LOWER MLI	1.60504	0.15	=	0.05
910	TANK2_LOWER MLI	1.60504	0.15	=	0.05
1000	SVM Bot +Z MLI	0.55924	0.92	=	0.86
1001	SVM Bot +Y+Z MLI	0.67106	0.92	=	0.86
1002	SVM Bot +Y MLI	0.55924	0.92	=	0.86
1003	SVM Bot +Y-Z MLI	0.85843	0.92	=	0.86
1004	SVM Bot -Z MLI	0.18450	0.92	=	0.86
1005	SVM Bot -Z-Y MLI	0.85843	0.92	=	0.86
1006	SVM Bot -Y MLI	0.55924	0.92	=	0.86
1007	SVM Bot -Y+Z MLI	0.67106	0.92	=	0.86
1600	SVM Bot +Z	0.55924	0.9	=	0.9
1601	SVM Bot +Y+Z	0.67106	0.9	=	0.9
1602	SVM Bot +Y	0.55924	0.9	=	0.9
1603	SVM Bot +Y-Z	0.85843	0.9	=	0.9
1604	SVM Bot -Z	0.18450	0.9	=	0.9
1605	SVM Bot -Z-Y	0.85843	0.9	=	0.9
1606	SVM Bot -Y	0.55924	0.9	=	0.9
1607	SVM Bot -Y+Z	0.67106	0.9	=	0.9
2000	Launch Adapter Cone Ext	0.08010	0.15	=	0.05
2001	Launch Adapter Cone Ext	0.04766	0.15	=	0.05
2002	Launch Adapter Cone Ext	0.08010	0.15	=	0.05
2003	Launch Adapter Cone Ext	0.07348	0.15	=	0.05
2004	Launch Adapter Cone Ext	0.02844	0.15	=	0.05
2005	Launch Adapter Cone Ext	0.07343	0.15	=	0.05

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
2006	Launch Adapter Cone Ext	0.08010	0.15	=	0.05
2007	Launch Adapter Cone Ext	0.04766	0.15	=	0.05
2010	Launch Adapter Edge Ext	0.10841	0.15	=	0.05
2011	Launch Adapter Edge Ext	0.06450	0.15	=	0.05
2012	Launch Adapter Edge Ext	0.10841	0.15	=	0.05
2013	Launch Adapter Edge Ext	0.09945	0.15	=	0.05
2014	Launch Adapter Edge Ext	0.03811	0.15	=	0.05
2015	Launch Adapter Edge Ext	0.09838	0.15	=	0.05
2016	Launch Adapter Edge Ext	0.10841	0.15	=	0.05
2017	Launch Adapter Edge Ext	0.06450	0.15	=	0.05
2050	Adapter Cone Covered Ext	0.08707	0.15	=	0.05
2051	Adapter Cone Covered Ext	0.05181	0.15	=	0.05
2052	Adapter Cone Covered Ext	0.08707	0.15	=	0.05
2053	Adapter Cone Covered Ext	0.07985	0.15	=	0.05
2054	Adapter Cone Covered Ext	0.03100	0.15	=	0.05
2055	Adapter Cone Covered Ext	0.07983	0.15	=	0.05
2056	Adapter Cone Covered Ext	0.08707	0.15	=	0.05
2057	Adapter Cone Covered Ext	0.05181	0.15	=	0.05
2100	Launch Adapter Cone Int	0.08010	0.15	=	0.05
2101	Launch Adapter Cone Int	0.04766	0.15	=	0.05
2102	Launch Adapter Cone Int	0.08010	0.15	=	0.05
2103	Launch Adapter Cone Int	0.07348	0.15	=	0.05
2104	Launch Adapter Cone Int	0.02844	0.15	=	0.05
2105	Launch Adapter Cone Int	0.07343	0.15	=	0.05
2106	Launch Adapter Cone Int	0.08010	0.15	=	0.05
2107	Launch Adapter Cone Int	0.04766	0.15	=	0.05
2110	Launch Adapter Edge Int	0.10841	0.15	=	0.05
2111	Launch Adapter Edge Int	0.06450	0.15	=	0.05
2112	Launch Adapter Edge Int	0.10841	0.15	=	0.05
2113	Launch Adapter Edge Int	0.09945	0.15	=	0.05
2114	Launch Adapter Edge Int	0.03811	0.15	=	0.05
2115	Launch Adapter Edge Int	0.09838	0.15	=	0.05
2116	Launch Adapter Edge Int	0.10841	0.15	=	0.05
2117	Launch Adapter Edge Int	0.06450	0.15	=	0.05
2150	Adapter Cone Covered Int	0.08707	0.15	=	0.05
2151	Adapter Cone Covered Int	0.05181	0.15	=	0.05
2152	Adapter Cone Covered Int	0.08707	0.15	=	0.05
2153	Adapter Cone Covered Int	0.07985	0.15	=	0.05
2154	Adapter Cone Covered Int	0.03100	0.15	=	0.05
2155	Adapter Cone Covered Int	0.07983	0.15	=	0.05
2156	Adapter Cone Covered Int	0.08707	0.15	=	0.05
2157	Adapter Cone Covered Int	0.05181	0.15	=	0.05
2200	RCS Panel MLI	0.47526	0.92	=	0.86
2201	RCS Panel MLI	0.28260	0.92	=	0.86
2202	RCS Panel MLI	0.47526	0.92	=	0.86
2203	RCS Panel MLI	0.43587	0.92	=	0.86
2204	RCS Panel MLI	0.16871	0.92	=	0.86
2205	RCS Panel MLI	0.43581	0.92	=	0.86
2206	RCS Panel MLI	0.47526	0.92	=	0.86
2207	RCS Panel MLI	0.28260	0.92	=	0.86
2210	Bottom Disc MLI	0.27675	0.92	=	0.86
2211	Bottom Disc MLI	0.16412	0.92	=	0.86
2212	Bottom Disc MLI	0.27675	0.92	=	0.86
2213	Bottom Disc MLI	0.25327	0.92	=	0.86
2214	Bottom Disc MLI	0.09854	0.92	=	0.86

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
2215	Bottom Disc MLI	0.25345	0.92	=	0.86
2216	Bottom Disc MLI	0.27675	0.92	=	0.86
2217	Bottom Disc MLI	0.16412	0.92	=	0.86
2250	Adapter Cone MLI	0.08722	0.92	=	0.86
2251	Adapter Cone MLI	0.05182	0.92	=	0.86
2252	Adapter Cone MLI	0.08722	0.92	=	0.86
2253	Adapter Cone MLI	0.07985	0.92	=	0.86
2254	Adapter Cone MLI	0.03114	0.92	=	0.86
2255	Adapter Cone MLI	0.07982	0.92	=	0.86
2256	Adapter Cone MLI	0.08722	0.92	=	0.86
2257	Adapter Cone MLI	0.05182	0.92	=	0.86
2400	RCS Panel	0.47526	0.9	=	0.9
2401	RCS Panel	0.28260	0.9	=	0.9
2402	RCS Panel	0.47526	0.9	=	0.9
2403	RCS Panel	0.43587	0.9	=	0.9
2404	RCS Panel	0.16871	0.9	=	0.9
2405	RCS Panel	0.43581	0.9	=	0.9
2406	RCS Panel	0.47526	0.9	=	0.9
2407	RCS Panel	0.28260	0.9	=	0.9
2410	Bottom Disc	0.27675	0.9	=	0.9
2411	Bottom Disc	0.16412	0.9	=	0.9
2412	Bottom Disc	0.27675	0.9	=	0.9
2413	Bottom Disc	0.25327	0.9	=	0.9
2414	Bottom Disc	0.09854	0.9	=	0.9
2415	Bottom Disc	0.25345	0.9	=	0.9
2416	Bottom Disc	0.27675	0.9	=	0.9
2417	Bottom Disc	0.16412	0.9	=	0.9
2500	SVM Cone +Z Ext	0.18765	0.9	=	0.9
2501	SVM Cone +Z+Y Ext	0.11157	0.9	=	0.9
2502	SVM Cone +Y Ext	0.18765	0.9	=	0.9
2503	SVM Cone +Y-Z Ext	0.17200	0.9	=	0.9
2504	SVM Cone -Z Ext	0.06679	0.9	=	0.9
2505	SVM Cone -Z-Y Ext	0.17197	0.9	=	0.9
2506	SVM Cone -Y Ext	0.18765	0.9	=	0.9
2507	SVM Cone -Z+Y Ext	0.11157	0.9	=	0.9
2510	SVM Cone +Z Ext	0.19488	0.9	=	0.9
2511	SVM Cone +Z+Y Ext	0.11587	0.9	=	0.9
2512	SVM Cone +Y Ext	0.19488	0.9	=	0.9
2513	SVM Cone +Y-Z Ext	0.17862	0.9	=	0.9
2514	SVM Cone -Z Ext	0.06936	0.9	=	0.9
2515	SVM Cone -Z-Y Ext	0.17859	0.9	=	0.9
2516	SVM Cone -Y Ext	0.19488	0.9	=	0.9
2517	SVM Cone -Z+Y Ext	0.11587	0.9	=	0.9
2520	SVM Cone +Z Ext	0.20210	0.9	=	0.9
2521	SVM Cone +Z+Y Ext	0.12016	0.9	=	0.9
2522	SVM Cone +Y Ext	0.20210	0.9	=	0.9
2523	SVM Cone +Y-Z Ext	0.18524	0.9	=	0.9
2524	SVM Cone -Z Ext	0.07194	0.9	=	0.9
2525	SVM Cone -Z-Y Ext	0.18521	0.9	=	0.9
2526	SVM Cone -Y Ext	0.20210	0.9	=	0.9
2527	SVM Cone -Z+Y Ext	0.12016	0.9	=	0.9
2530	SVM Cone +Z Ext	0.20932	0.9	=	0.9
2531	SVM Cone +Z+Y Ext	0.12446	0.9	=	0.9
2532	SVM Cone +Y Ext	0.20932	0.9	=	0.9
2533	SVM Cone +Y-Z Ext	0.19186	0.9	=	0.9

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
2534	SVM Cone -Z Ext	0.07451	0.9	=	0.9
2535	SVM Cone -Z-Y Ext	0.19183	0.9	=	0.9
2536	SVM Cone -Y Ext	0.20932	0.9	=	0.9
2537	SVM Cone -Z+Y Ext	0.12446	0.9	=	0.9
2540	SVM Cone +Z Ext	0.21655	0.9	=	0.9
2541	SVM Cone +Z+Y Ext	0.12875	0.9	=	0.9
2542	SVM Cone +Y Ext	0.21655	0.9	=	0.9
2543	SVM Cone +Y-Z Ext	0.19848	0.9	=	0.9
2544	SVM Cone -Z Ext	0.07708	0.9	=	0.9
2545	SVM Cone -Z-Y Ext	0.19845	0.9	=	0.9
2546	SVM Cone -Y Ext	0.21655	0.9	=	0.9
2547	SVM Cone -Z+Y Ext	0.12875	0.9	=	0.9
2600	SVM Cone +Z Int	0.18765	0.9	=	0.9
2601	SVM Cone +Z+Y Int	0.11157	0.9	=	0.9
2602	SVM Cone +Y Int	0.18765	0.9	=	0.9
2603	SVM Cone +Y-Z Int	0.17200	0.9	=	0.9
2604	SVM Cone -Z Int	0.06679	0.9	=	0.9
2605	SVM Cone -Z-Y Int	0.17197	0.9	=	0.9
2606	SVM Cone -Y Int	0.18765	0.9	=	0.9
2607	SVM Cone -Z+Y Int	0.11157	0.9	=	0.9
2610	SVM Cone +Z Int	0.19488	0.9	=	0.9
2611	SVM Cone +Z+Y Int	0.11587	0.9	=	0.9
2612	SVM Cone +Y Int	0.19488	0.9	=	0.9
2613	SVM Cone +Y-Z Int	0.17862	0.9	=	0.9
2614	SVM Cone -Z Int	0.06936	0.9	=	0.9
2615	SVM Cone -Z-Y Int	0.17859	0.9	=	0.9
2616	SVM Cone -Y Int	0.19488	0.9	=	0.9
2617	SVM Cone -Z+Y Int	0.11587	0.9	=	0.9
2620	SVM Cone +Z Int	0.20210	0.9	=	0.9
2621	SVM Cone +Z+Y Int	0.12016	0.9	=	0.9
2622	SVM Cone +Y Int	0.20210	0.9	=	0.9
2623	SVM Cone +Y-Z Int	0.18524	0.9	=	0.9
2624	SVM Cone -Z Int	0.07194	0.9	=	0.9
2625	SVM Cone -Z-Y Int	0.18521	0.9	=	0.9
2626	SVM Cone -Y Int	0.20210	0.9	=	0.9
2627	SVM Cone -Z+Y Int	0.12016	0.9	=	0.9
2630	SVM Cone +Z Int	0.20932	0.9	=	0.9
2631	SVM Cone +Z+Y Int	0.12446	0.9	=	0.9
2632	SVM Cone +Y Int	0.20932	0.9	=	0.9
2633	SVM Cone +Y-Z Int	0.19186	0.9	=	0.9
2634	SVM Cone -Z Int	0.07451	0.9	=	0.9
2635	SVM Cone -Z-Y Int	0.19183	0.9	=	0.9
2636	SVM Cone -Y Int	0.20932	0.9	=	0.9
2637	SVM Cone -Z+Y Int	0.12446	0.9	=	0.9
2640	SVM Cone +Z Int	0.21655	0.9	=	0.9
2641	SVM Cone +Z+Y Int	0.12875	0.9	=	0.9
2642	SVM Cone +Y Int	0.21655	0.9	=	0.9
2643	SVM Cone +Y-Z Int	0.19848	0.9	=	0.9
2644	SVM Cone -Z Int	0.07708	0.9	=	0.9
2645	SVM Cone -Z-Y Int	0.19845	0.9	=	0.9
2646	SVM Cone -Y Int	0.21655	0.9	=	0.9
2647	SVM Cone -Z+Y Int	0.12875	0.9	=	0.9
3001	MLI Rad +Z	0.06090	0.92	=	0.86
3002	MLI Rad +Z	0.06090	0.92	=	0.86
3003	MLI Rad +Z	0.06090	0.92	=	0.86

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
3004	MLI Rad +Z	0.06090	0.92	=	0.86
3005	MLI Rad +Z	0.06090	0.92	=	0.86
3006	MLI Rad +Z	0.06090	0.92	=	0.86
3007	MLI Rad +Z	0.06090	0.92	=	0.86
3008	MLI Rad +Z	0.06090	0.92	=	0.86
3009	MLI Rad +Z	0.06090	0.92	=	0.86
3010	MLI Rad +Z	0.06090	0.92	=	0.86
3011	MLI Rad +Z	0.06090	0.92	=	0.86
3012	MLI Rad +Z	0.06090	0.92	=	0.86
3013	MLI Rad +Z	0.06090	0.92	=	0.86
3014	MLI Rad +Z	0.06090	0.92	=	0.86
3015	MLI Rad +Z	0.06090	0.92	=	0.86
3016	MLI Rad +Z	0.06090	0.92	=	0.86
3017	MLI Rad +Z	0.06090	0.92	=	0.86
3018	MLI Rad +Z	0.06090	0.92	=	0.86
3019	MLI Rad +Z	0.06090	0.92	=	0.86
3020	MLI Rad +Z	0.06090	0.92	=	0.86
3021	MLI Rad +Z	0.06090	0.92	=	0.86
3022	MLI Rad +Z	0.06090	0.92	=	0.86
3023	MLI Rad +Z	0.06090	0.92	=	0.86
3024	MLI Rad +Z	0.06090	0.92	=	0.86
3101	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3102	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3103	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3104	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3105	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3106	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3107	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3108	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3109	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3110	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3111	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3112	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3113	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3114	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3115	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3116	MLI Rad +Y+Z	0.06088	0.92	=	0.86
3201	MLI Rad +Y	0.06090	0.92	=	0.86
3202	MLI Rad +Y	0.06090	0.92	=	0.86
3203	MLI Rad +Y	0.06090	0.92	=	0.86
3204	MLI Rad +Y	0.06090	0.92	=	0.86
3205	MLI Rad +Y	0.06090	0.92	=	0.86
3206	MLI Rad +Y	0.06090	0.92	=	0.86
3207	MLI Rad +Y	0.06090	0.92	=	0.86
3208	MLI Rad +Y	0.06090	0.92	=	0.86
3209	MLI Rad +Y	0.06090	0.92	=	0.86
3210	MLI Rad +Y	0.06090	0.92	=	0.86
3211	MLI Rad +Y	0.06090	0.92	=	0.86
3212	MLI Rad +Y	0.06090	0.92	=	0.86
3213	MLI Rad +Y	0.06090	0.92	=	0.86
3214	MLI Rad +Y	0.06090	0.92	=	0.86
3215	MLI Rad +Y	0.06090	0.92	=	0.86
3216	MLI Rad +Y	0.06090	0.92	=	0.86
3217	MLI Rad +Y	0.06090	0.92	=	0.86
3218	MLI Rad +Y	0.06090	0.92	=	0.86

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
3219	MLI Rad +Y	0.06090	0.92	=	0.86
3220	MLI Rad +Y	0.06090	0.92	=	0.86
3221	MLI Rad +Y	0.06090	0.92	=	0.86
3222	MLI Rad +Y	0.06090	0.92	=	0.86
3223	MLI Rad +Y	0.06090	0.92	=	0.86
3224	MLI Rad +Y	0.06090	0.92	=	0.86
3301	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3302	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3303	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3304	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3305	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3306	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3307	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3308	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3309	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3310	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3311	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3312	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3313	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3314	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3315	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3316	MLI Rad +Y-Z	0.06088	0.92	=	0.86
3401	MLI Rad -Z	0.06090	0.92	=	0.86
3402	MLI Rad -Z	0.06090	0.92	=	0.86
3403	MLI Rad -Z	0.06090	0.92	=	0.86
3404	MLI Rad -Z	0.06090	0.92	=	0.86
3405	MLI Rad -Z	0.06090	0.92	=	0.86
3406	MLI Rad -Z	0.06090	0.92	=	0.86
3407	MLI Rad -Z	0.06090	0.92	=	0.86
3408	MLI Rad -Z	0.06090	0.92	=	0.86
3409	MLI Rad -Z	0.06090	0.92	=	0.86
3410	MLI Rad -Z	0.06090	0.92	=	0.86
3411	MLI Rad -Z	0.06090	0.92	=	0.86
3412	MLI Rad -Z	0.06090	0.92	=	0.86
3413	MLI Rad -Z	0.06090	0.92	=	0.86
3414	MLI Rad -Z	0.06090	0.92	=	0.86
3415	MLI Rad -Z	0.06090	0.92	=	0.86
3416	MLI Rad -Z	0.06090	0.92	=	0.86
3417	MLI Rad -Z	0.06090	0.92	=	0.86
3418	MLI Rad -Z	0.06090	0.92	=	0.86
3419	MLI Rad -Z	0.06090	0.92	=	0.86
3420	MLI Rad -Z	0.06090	0.92	=	0.86
3421	MLI Rad -Z	0.06090	0.92	=	0.86
3422	MLI Rad -Z	0.06090	0.92	=	0.86
3423	MLI Rad -Z	0.06090	0.92	=	0.86
3424	MLI Rad -Z	0.06090	0.92	=	0.86
3501	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3502	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3503	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3504	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3505	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3506	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3507	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3508	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3509	MLI Rad -Y-Z	0.06088	0.92	=	0.86

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
3510	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3511	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3512	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3513	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3514	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3515	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3516	MLI Rad -Y-Z	0.06088	0.92	=	0.86
3551	MLI FHWOV	0.28420	0.15	=	0.05
3552	MLI FHHRV	0.42888	0.15	=	0.05
3553	MLI FHICU	0.34780	0.15	=	0.05
3554	MLI FHFCU	0.38664	0.15	=	0.05
3556	MLI FHWEV	0.31940	0.15	=	0.05
3561	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3562	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3563	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3564	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3565	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3566	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3567	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3568	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3569	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3570	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3571	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3572	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3573	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3574	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3575	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3576	MLI Internal Rad -Y-Z	0.06088	0.15	=	0.05
3601	MLI Rad -Y	0.06090	0.92	=	0.86
3602	MLI Rad -Y	0.06090	0.92	=	0.86
3603	MLI Rad -Y	0.06090	0.92	=	0.86
3604	MLI Rad -Y	0.06090	0.92	=	0.86
3605	MLI Rad -Y	0.06090	0.92	=	0.86
3606	MLI Rad -Y	0.06090	0.92	=	0.86
3607	MLI Rad -Y	0.06090	0.92	=	0.86
3608	MLI Rad -Y	0.06090	0.92	=	0.86
3609	MLI Rad -Y	0.06090	0.92	=	0.86
3610	MLI Rad -Y	0.06090	0.92	=	0.86
3611	MLI Rad -Y	0.06090	0.92	=	0.86
3612	MLI Rad -Y	0.06090	0.92	=	0.86
3613	MLI Rad -Y	0.06090	0.92	=	0.86
3614	MLI Rad -Y	0.06090	0.92	=	0.86
3615	MLI Rad -Y	0.06090	0.92	=	0.86
3616	MLI Rad -Y	0.06090	0.92	=	0.86
3617	MLI Rad -Y	0.06090	0.92	=	0.86
3618	MLI Rad -Y	0.06090	0.92	=	0.86
3619	MLI Rad -Y	0.06090	0.92	=	0.86
3620	MLI Rad -Y	0.06090	0.92	=	0.86
3621	MLI Rad -Y	0.06090	0.92	=	0.86
3622	MLI Rad -Y	0.06090	0.92	=	0.86
3623	MLI Rad -Y	0.06090	0.92	=	0.86
3624	MLI Rad -Y	0.06090	0.92	=	0.86
3651	MLI FHWOH	0.28420	0.15	=	0.05
3652	MLI FHWEH	0.31940	0.15	=	0.05
3653	MLI FHHRH	0.42888	0.15	=	0.05

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
3654	MLI FHLCU	0.47200	0.15	=	0.05
3655	MLI FHLSU	0.56416	0.15	=	0.05
3701	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3702	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3703	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3704	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3705	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3706	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3707	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3708	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3709	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3710	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3711	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3712	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3713	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3714	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3715	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3716	MLI Rad -Y+Z	0.06088	0.92	=	0.86
3901	MLI THRPZ	0.13158	0.92	=	0.86
3902	MLI AAD	0.03652	0.92	=	0.86
3904	MLI VMC	0.02980	0.92	=	0.86
3905	MLI SASZ_BRK	0.09548	0.92	=	0.86
3906	MLI SASZ	0.03696	0.92	=	0.86
3921	MLI THRPY	0.09843	0.92	=	0.86
3941	MLI THRMZ	0.13158	0.92	=	0.86
3942	MLI STRMZMY	0.13888	0.92	=	0.86
3943	STRMY CONE	0.32818	0.92	=	0.86
3944	STRMZPY CONE	0.32818	0.92	=	0.86
3945	MLI STRMZPY	0.14464	0.92	=	0.86
3946	MLI SAS	0.03696	0.92	=	0.86
3947	MLI SAS_BRK	0.09548	0.92	=	0.86
3948	MLI SREM	0.09700	0.92	=	0.86
3961	MLI THRMY	0.09907	0.92	=	0.86
4001	OSR Rad +Z	0.06090	0.10	0.18	0.78
4002	OSR Rad +Z	0.06090	0.10	0.18	0.78
4003	OSR Rad +Z	0.06090	0.10	0.18	0.78
4004	OSR Rad +Z	0.06090	0.10	0.18	0.78
4005	OSR Rad +Z	0.06090	0.10	0.18	0.78
4006	OSR Rad +Z	0.06090	0.10	0.18	0.78
4007	OSR Rad +Z	0.06090	0.10	0.18	0.78
4008	OSR Rad +Z	0.06090	0.10	0.18	0.78
4009	OSR Rad +Z	0.06090	0.10	0.18	0.78
4010	OSR Rad +Z	0.06090	0.10	0.18	0.78
4011	OSR Rad +Z	0.06090	0.10	0.18	0.78
4012	OSR Rad +Z	0.06090	0.10	0.18	0.78
4013	OSR Rad +Z	0.06090	0.10	0.18	0.78
4014	OSR Rad +Z	0.06090	0.10	0.18	0.78
4015	OSR Rad +Z	0.06090	0.10	0.18	0.78
4016	OSR Rad +Z	0.06090	0.10	0.18	0.78
4017	OSR Rad +Z	0.06090	0.10	0.18	0.78
4018	OSR Rad +Z	0.06090	0.10	0.18	0.78
4019	OSR Rad +Z	0.06090	0.10	0.18	0.78
4020	OSR Rad +Z	0.06090	0.10	0.18	0.78
4021	OSR Rad +Z	0.06090	0.10	0.18	0.78
4022	OSR Rad +Z	0.06090	0.10	0.18	0.78

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
4023	OSR Rad +Z	0.06090	0.10	0.18	0.78
4024	OSR Rad +Z	0.06090	0.10	0.18	0.78
4101	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4102	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4103	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4104	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4105	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4106	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4107	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4108	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4109	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4110	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4111	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4112	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4113	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4114	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4115	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4116	OSR Rad +Y+Z	0.06088	0.10	0.18	0.78
4201	OSR Rad +Y	0.06090	0.10	0.18	0.78
4202	OSR Rad +Y	0.06090	0.10	0.18	0.78
4203	OSR Rad +Y	0.06090	0.10	0.18	0.78
4204	OSR Rad +Y	0.06090	0.10	0.18	0.78
4205	OSR Rad +Y	0.06090	0.10	0.18	0.78
4206	OSR Rad +Y	0.06090	0.10	0.18	0.78
4207	OSR Rad +Y	0.06090	0.10	0.18	0.78
4208	OSR Rad +Y	0.06090	0.10	0.18	0.78
4209	OSR Rad +Y	0.06090	0.10	0.18	0.78
4210	OSR Rad +Y	0.06090	0.10	0.18	0.78
4211	OSR Rad +Y	0.06090	0.10	0.18	0.78
4212	OSR Rad +Y	0.06090	0.10	0.18	0.78
4213	OSR Rad +Y	0.06090	0.10	0.18	0.78
4214	OSR Rad +Y	0.06090	0.10	0.18	0.78
4215	OSR Rad +Y	0.06090	0.10	0.18	0.78
4216	OSR Rad +Y	0.06090	0.10	0.18	0.78
4217	OSR Rad +Y	0.06090	0.10	0.18	0.78
4218	OSR Rad +Y	0.06090	0.10	0.18	0.78
4219	OSR Rad +Y	0.06090	0.10	0.18	0.78
4220	OSR Rad +Y	0.06090	0.10	0.18	0.78
4221	OSR Rad +Y	0.06090	0.10	0.18	0.78
4222	OSR Rad +Y	0.06090	0.10	0.18	0.78
4223	OSR Rad +Y	0.06090	0.10	0.18	0.78
4224	OSR Rad +Y	0.06090	0.10	0.18	0.78
4301	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4302	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4303	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4304	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4305	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4306	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4307	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4308	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4309	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4310	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4311	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4312	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4313	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
4314	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4315	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4316	OSR Rad +Y-Z	0.06088	0.10	0.18	0.78
4401	OSR Rad -Z	0.06090	0.10	0.18	0.78
4402	OSR Rad -Z	0.06090	0.10	0.18	0.78
4403	OSR Rad -Z	0.06090	0.10	0.18	0.78
4404	OSR Rad -Z	0.06090	0.10	0.18	0.78
4405	OSR Rad -Z	0.06090	0.10	0.18	0.78
4406	OSR Rad -Z	0.06090	0.10	0.18	0.78
4407	OSR Rad -Z	0.06090	0.10	0.18	0.78
4408	OSR Rad -Z	0.06090	0.10	0.18	0.78
4409	OSR Rad -Z	0.06090	0.10	0.18	0.78
4410	OSR Rad -Z	0.06090	0.10	0.18	0.78
4411	OSR Rad -Z	0.06090	0.10	0.18	0.78
4412	OSR Rad -Z	0.06090	0.10	0.18	0.78
4413	OSR Rad -Z	0.06090	0.10	0.18	0.78
4414	OSR Rad -Z	0.06090	0.10	0.18	0.78
4415	OSR Rad -Z	0.06090	0.10	0.18	0.78
4416	OSR Rad -Z	0.06090	0.10	0.18	0.78
4417	OSR Rad -Z	0.06090	0.10	0.18	0.78
4418	OSR Rad -Z	0.06090	0.10	0.18	0.78
4419	OSR Rad -Z	0.06090	0.10	0.18	0.78
4420	OSR Rad -Z	0.06090	0.10	0.18	0.78
4421	OSR Rad -Z	0.06090	0.10	0.18	0.78
4422	OSR Rad -Z	0.06090	0.10	0.18	0.78
4423	OSR Rad -Z	0.06090	0.10	0.18	0.78
4424	OSR Rad -Z	0.06090	0.10	0.18	0.78
4501	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4502	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4503	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4504	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4505	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4506	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4507	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4508	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4509	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4510	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4511	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4512	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4513	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4514	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4515	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4516	OSR Rad -Y-Z	0.06088	0.10	0.18	0.78
4601	OSR Rad -Y	0.06090	0.10	0.18	0.78
4602	OSR Rad -Y	0.06090	0.10	0.18	0.78
4603	OSR Rad -Y	0.06090	0.10	0.18	0.78
4604	OSR Rad -Y	0.06090	0.10	0.18	0.78
4605	OSR Rad -Y	0.06090	0.10	0.18	0.78
4606	OSR Rad -Y	0.06090	0.10	0.18	0.78
4607	OSR Rad -Y	0.06090	0.10	0.18	0.78
4608	OSR Rad -Y	0.06090	0.10	0.18	0.78
4609	OSR Rad -Y	0.06090	0.10	0.18	0.78
4610	OSR Rad -Y	0.06090	0.10	0.18	0.78
4611	OSR Rad -Y	0.06090	0.10	0.18	0.78
4612	OSR Rad -Y	0.06090	0.10	0.18	0.78

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
4613	OSR Rad -Y	0.06090	0.10	0.18	0.78
4614	OSR Rad -Y	0.06090	0.10	0.18	0.78
4615	OSR Rad -Y	0.06090	0.10	0.18	0.78
4616	OSR Rad -Y	0.06090	0.10	0.18	0.78
4617	OSR Rad -Y	0.06090	0.10	0.18	0.78
4618	OSR Rad -Y	0.06090	0.10	0.18	0.78
4619	OSR Rad -Y	0.06090	0.10	0.18	0.78
4620	OSR Rad -Y	0.06090	0.10	0.18	0.78
4621	OSR Rad -Y	0.06090	0.10	0.18	0.78
4622	OSR Rad -Y	0.06090	0.10	0.18	0.78
4623	OSR Rad -Y	0.06090	0.10	0.18	0.78
4624	OSR Rad -Y	0.06090	0.10	0.18	0.78
4701	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4702	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4703	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4704	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4705	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4706	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4707	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4708	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4709	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4710	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4711	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4712	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4713	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4714	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4715	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
4716	OSR Rad -Y+Z	0.06088	0.10	0.18	0.78
6001	Rad +Z	0.06090	0.9	=	0.9
6002	Rad +Z	0.06090	0.9	=	0.9
6003	Rad +Z	0.06090	0.9	=	0.9
6004	Rad +Z	0.06090	0.9	=	0.9
6005	Rad +Z	0.06090	0.9	=	0.9
6006	Rad +Z	0.06090	0.9	=	0.9
6007	Rad +Z	0.06090	0.9	=	0.9
6008	Rad +Z	0.06090	0.9	=	0.9
6009	Rad +Z	0.06090	0.9	=	0.9
6010	Rad +Z	0.06090	0.9	=	0.9
6011	Rad +Z	0.06090	0.9	=	0.9
6012	Rad +Z	0.06090	0.9	=	0.9
6013	Rad +Z	0.06090	0.9	=	0.9
6014	Rad +Z	0.06090	0.9	=	0.9
6015	Rad +Z	0.06090	0.9	=	0.9
6016	Rad +Z	0.06090	0.9	=	0.9
6017	Rad +Z	0.06090	0.9	=	0.9
6018	Rad +Z	0.06090	0.9	=	0.9
6019	Rad +Z	0.06090	0.9	=	0.9
6020	Rad +Z	0.06090	0.9	=	0.9
6021	Rad +Z	0.06090	0.9	=	0.9
6022	Rad +Z	0.06090	0.9	=	0.9
6023	Rad +Z	0.06090	0.9	=	0.9
6024	Rad +Z	0.06090	0.9	=	0.9
6051	Shear Web1 +Z	0.09711	0.9	=	0.9
6052	Shear Web1 +Z	0.10539	0.9	=	0.9
6053	Shear Web1 +Z	0.11368	0.9	=	0.9

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
6054	Shear Web1 +Z	0.12197	0.9	=	0.9
6055	Shear Web1 +Z	0.13026	0.9	=	0.9
6061	Shear Web1 +Z	0.09711	0.9	=	0.9
6062	Shear Web1 +Z	0.10539	0.9	=	0.9
6063	Shear Web1 +Z	0.11368	0.9	=	0.9
6064	Shear Web1 +Z	0.12197	0.9	=	0.9
6065	Shear Web1 +Z	0.13026	0.9	=	0.9
6071	Shear Web2 +Z	0.09711	0.9	=	0.9
6072	Shear Web2 +Z	0.10539	0.9	=	0.9
6073	Shear Web2 +Z	0.11368	0.9	=	0.9
6074	Shear Web2 +Z	0.12197	0.9	=	0.9
6075	Shear Web2 +Z	0.13026	0.9	=	0.9
6081	Shear Web2 +Z	0.09711	0.9	=	0.9
6082	Shear Web2 +Z	0.10539	0.9	=	0.9
6083	Shear Web2 +Z	0.11368	0.9	=	0.9
6084	Shear Web2 +Z	0.12197	0.9	=	0.9
6085	Shear Web2 +Z	0.13026	0.9	=	0.9
6101	Rad +Y+Z	0.06088	0.9	=	0.9
6102	Rad +Y+Z	0.06088	0.9	=	0.9
6103	Rad +Y+Z	0.06088	0.9	=	0.9
6104	Rad +Y+Z	0.06088	0.9	=	0.9
6105	Rad +Y+Z	0.06088	0.9	=	0.9
6106	Rad +Y+Z	0.06088	0.9	=	0.9
6107	Rad +Y+Z	0.06088	0.9	=	0.9
6108	Rad +Y+Z	0.06088	0.9	=	0.9
6109	Rad +Y+Z	0.06088	0.9	=	0.9
6110	Rad +Y+Z	0.06088	0.9	=	0.9
6111	Rad +Y+Z	0.06088	0.9	=	0.9
6112	Rad +Y+Z	0.06088	0.9	=	0.9
6113	Rad +Y+Z	0.06088	0.9	=	0.9
6114	Rad +Y+Z	0.06088	0.9	=	0.9
6115	Rad +Y+Z	0.06088	0.9	=	0.9
6116	Rad +Y+Z	0.06088	0.9	=	0.9
6201	Rad +Y	0.06090	0.9	=	0.9
6202	Rad +Y	0.06090	0.9	=	0.9
6203	Rad +Y	0.06090	0.9	=	0.9
6204	Rad +Y	0.06090	0.9	=	0.9
6205	Rad +Y	0.06090	0.9	=	0.9
6206	Rad +Y	0.06090	0.9	=	0.9
6207	Rad +Y	0.06090	0.9	=	0.9
6208	Rad +Y	0.06090	0.9	=	0.9
6209	Rad +Y	0.06090	0.9	=	0.9
6210	Rad +Y	0.06090	0.9	=	0.9
6211	Rad +Y	0.06090	0.9	=	0.9
6212	Rad +Y	0.06090	0.9	=	0.9
6213	Rad +Y	0.06090	0.9	=	0.9
6214	Rad +Y	0.06090	0.9	=	0.9
6215	Rad +Y	0.06090	0.9	=	0.9
6216	Rad +Y	0.06090	0.9	=	0.9
6217	Rad +Y	0.06090	0.9	=	0.9
6218	Rad +Y	0.06090	0.9	=	0.9
6219	Rad +Y	0.06090	0.9	=	0.9
6220	Rad +Y	0.06090	0.9	=	0.9
6221	Rad +Y	0.06090	0.9	=	0.9
6222	Rad +Y	0.06090	0.9	=	0.9

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
6223	Rad +Y	0.06090	0.9	=	0.9
6224	Rad +Y	0.06090	0.9	=	0.9
6251	Shear Web3 +Y	0.09711	0.9	=	0.9
6252	Shear Web3 +Y	0.10539	0.9	=	0.9
6253	Shear Web3 +Y	0.11368	0.9	=	0.9
6254	Shear Web3 +Y	0.12197	0.9	=	0.9
6255	Shear Web3 +Y	0.13026	0.9	=	0.9
6261	Shear Web3 +Y	0.09711	0.9	=	0.9
6262	Shear Web3 +Y	0.10539	0.9	=	0.9
6263	Shear Web3 +Y	0.11368	0.9	=	0.9
6264	Shear Web3 +Y	0.12197	0.9	=	0.9
6265	Shear Web3 +Y	0.13026	0.9	=	0.9
6271	Shear Web4 +Y	0.09711	0.9	=	0.9
6272	Shear Web4 +Y	0.10539	0.9	=	0.9
6273	Shear Web4 +Y	0.11368	0.9	=	0.9
6274	Shear Web4 +Y	0.12197	0.9	=	0.9
6275	Shear Web4 +Y	0.13026	0.9	=	0.9
6281	Shear Web4 +Y	0.09711	0.9	=	0.9
6282	Shear Web4 +Y	0.10539	0.9	=	0.9
6283	Shear Web4 +Y	0.11368	0.9	=	0.9
6284	Shear Web4 +Y	0.12197	0.9	=	0.9
6285	Shear Web4 +Y	0.13026	0.9	=	0.9
6301	Rad +Y-Z	0.06088	0.9	=	0.9
6302	Rad +Y-Z	0.06088	0.9	=	0.9
6303	Rad +Y-Z	0.06088	0.9	=	0.9
6304	Rad +Y-Z	0.06088	0.9	=	0.9
6305	Rad +Y-Z	0.06088	0.9	=	0.9
6306	Rad +Y-Z	0.06088	0.9	=	0.9
6307	Rad +Y-Z	0.06088	0.9	=	0.9
6308	Rad +Y-Z	0.06088	0.9	=	0.9
6309	Rad +Y-Z	0.06088	0.9	=	0.9
6310	Rad +Y-Z	0.06088	0.9	=	0.9
6311	Rad +Y-Z	0.06088	0.9	=	0.9
6312	Rad +Y-Z	0.06088	0.9	=	0.9
6313	Rad +Y-Z	0.06088	0.9	=	0.9
6314	Rad +Y-Z	0.06088	0.9	=	0.9
6315	Rad +Y-Z	0.06088	0.9	=	0.9
6316	Rad +Y-Z	0.06088	0.9	=	0.9
6401	Rad -Z	0.06090	0.9	=	0.9
6402	Rad -Z	0.06090	0.9	=	0.9
6403	Rad -Z	0.06090	0.9	=	0.9
6404	Rad -Z	0.06090	0.9	=	0.9
6405	Rad -Z	0.06090	0.9	=	0.9
6406	Rad -Z	0.06090	0.9	=	0.9
6407	Rad -Z	0.06090	0.9	=	0.9
6408	Rad -Z	0.06090	0.9	=	0.9
6409	Rad -Z	0.06090	0.9	=	0.9
6410	Rad -Z	0.06090	0.9	=	0.9
6411	Rad -Z	0.06090	0.9	=	0.9
6412	Rad -Z	0.06090	0.9	=	0.9
6413	Rad -Z	0.06090	0.9	=	0.9
6414	Rad -Z	0.06090	0.9	=	0.9
6415	Rad -Z	0.06090	0.9	=	0.9
6416	Rad -Z	0.06090	0.9	=	0.9
6417	Rad -Z	0.06090	0.9	=	0.9

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
6418	Rad -Z	0.06090	0.9	=	0.9
6419	Rad -Z	0.06090	0.9	=	0.9
6420	Rad -Z	0.06090	0.9	=	0.9
6421	Rad -Z	0.06090	0.9	=	0.9
6422	Rad -Z	0.06090	0.9	=	0.9
6423	Rad -Z	0.06090	0.9	=	0.9
6424	Rad -Z	0.06090	0.9	=	0.9
6451	Shear Web5 -Z	0.07424	0.9	=	0.9
6452	Shear Web5 -Z	0.08159	0.9	=	0.9
6453	Shear Web5 -Z	0.08895	0.9	=	0.9
6454	Shear Web5 -Z	0.09630	0.9	=	0.9
6455	Shear Web5 -Z	0.10366	0.9	=	0.9
6461	Shear Web5 -Z	0.07424	0.9	=	0.9
6462	Shear Web5 -Z	0.08159	0.9	=	0.9
6463	Shear Web5 -Z	0.08895	0.9	=	0.9
6464	Shear Web5 -Z	0.09630	0.9	=	0.9
6465	Shear Web5 -Z	0.10366	0.9	=	0.9
6471	Shear Web6 -Z	0.07424	0.9	=	0.9
6472	Shear Web6 -Z	0.08159	0.9	=	0.9
6473	Shear Web6 -Z	0.08895	0.9	=	0.9
6474	Shear Web6 -Z	0.09630	0.9	=	0.9
6475	Shear Web6 -Z	0.10366	0.9	=	0.9
6481	Shear Web6 -Z	0.07424	0.9	=	0.9
6482	Shear Web6 -Z	0.08159	0.9	=	0.9
6483	Shear Web6 -Z	0.08895	0.9	=	0.9
6484	Shear Web6 -Z	0.09630	0.9	=	0.9
6485	Shear Web6 -Z	0.10366	0.9	=	0.9
6501	Rad -Y-Z	0.06088	0.9	=	0.9
6502	Rad -Y-Z	0.06088	0.9	=	0.9
6503	Rad -Y-Z	0.06088	0.9	=	0.9
6504	Rad -Y-Z	0.06088	0.9	=	0.9
6505	Rad -Y-Z	0.06088	0.9	=	0.9
6506	Rad -Y-Z	0.06088	0.9	=	0.9
6507	Rad -Y-Z	0.06088	0.9	=	0.9
6508	Rad -Y-Z	0.06088	0.9	=	0.9
6509	Rad -Y-Z	0.06088	0.9	=	0.9
6510	Rad -Y-Z	0.06088	0.9	=	0.9
6511	Rad -Y-Z	0.06088	0.9	=	0.9
6512	Rad -Y-Z	0.06088	0.9	=	0.9
6513	Rad -Y-Z	0.06088	0.9	=	0.9
6514	Rad -Y-Z	0.06088	0.9	=	0.9
6515	Rad -Y-Z	0.06088	0.9	=	0.9
6516	Rad -Y-Z	0.06088	0.9	=	0.9
6601	Rad -Y	0.06090	0.9	=	0.9
6602	Rad -Y	0.06090	0.9	=	0.9
6603	Rad -Y	0.06090	0.9	=	0.9
6604	Rad -Y	0.06090	0.9	=	0.9
6605	Rad -Y	0.06090	0.9	=	0.9
6606	Rad -Y	0.06090	0.9	=	0.9
6607	Rad -Y	0.06090	0.9	=	0.9
6608	Rad -Y	0.06090	0.9	=	0.9
6609	Rad -Y	0.06090	0.9	=	0.9
6610	Rad -Y	0.06090	0.9	=	0.9
6611	Rad -Y	0.06090	0.9	=	0.9
6612	Rad -Y	0.06090	0.9	=	0.9

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
6613	Rad -Y	0.06090	0.9	=	0.9
6614	Rad -Y	0.06090	0.9	=	0.9
6615	Rad -Y	0.06090	0.9	=	0.9
6616	Rad -Y	0.06090	0.9	=	0.9
6617	Rad -Y	0.06090	0.9	=	0.9
6618	Rad -Y	0.06090	0.9	=	0.9
6619	Rad -Y	0.06090	0.9	=	0.9
6620	Rad -Y	0.06090	0.9	=	0.9
6621	Rad -Y	0.06090	0.9	=	0.9
6622	Rad -Y	0.06090	0.9	=	0.9
6623	Rad -Y	0.06090	0.9	=	0.9
6624	Rad -Y	0.06090	0.9	=	0.9
6651	Shear Web7 -Y	0.09711	0.9	=	0.9
6652	Shear Web7 -Y	0.10539	0.9	=	0.9
6653	Shear Web7 -Y	0.11368	0.9	=	0.9
6654	Shear Web7 -Y	0.12197	0.9	=	0.9
6655	Shear Web7 -Y	0.13026	0.9	=	0.9
6661	Shear Web7 -Y	0.09880	0.9	=	0.9
6662	Shear Web7 -Y	0.10709	0.9	=	0.9
6663	Shear Web7 -Y	0.11538	0.9	=	0.9
6664	Shear Web7 -Y	0.12366	0.9	=	0.9
6665	Shear Web7 -Y	0.13195	0.9	=	0.9
6671	Shear Web8 -Y	0.09711	0.9	=	0.9
6672	Shear Web8 -Y	0.10539	0.9	=	0.9
6673	Shear Web8 -Y	0.11368	0.9	=	0.9
6674	Shear Web8 -Y	0.12197	0.9	=	0.9
6675	Shear Web8 -Y	0.13026	0.9	=	0.9
6681	Shear Web8 -Y	0.09711	0.9	=	0.9
6682	Shear Web8 -Y	0.10539	0.9	=	0.9
6683	Shear Web8 -Y	0.11368	0.9	=	0.9
6684	Shear Web8 -Y	0.12197	0.9	=	0.9
6685	Shear Web8 -Y	0.13026	0.9	=	0.9
6701	Rad -Y+Z	0.06088	0.9	=	0.9
6702	Rad -Y+Z	0.06088	0.9	=	0.9
6703	Rad -Y+Z	0.06088	0.9	=	0.9
6704	Rad -Y+Z	0.06088	0.9	=	0.9
6705	Rad -Y+Z	0.06088	0.9	=	0.9
6706	Rad -Y+Z	0.06088	0.9	=	0.9
6707	Rad -Y+Z	0.06088	0.9	=	0.9
6708	Rad -Y+Z	0.06088	0.9	=	0.9
6709	Rad -Y+Z	0.06088	0.9	=	0.9
6710	Rad -Y+Z	0.06088	0.9	=	0.9
6711	Rad -Y+Z	0.06088	0.9	=	0.9
6712	Rad -Y+Z	0.06088	0.9	=	0.9
6713	Rad -Y+Z	0.06088	0.9	=	0.9
6714	Rad -Y+Z	0.06088	0.9	=	0.9
6715	Rad -Y+Z	0.06088	0.9	=	0.9
6716	Rad -Y+Z	0.06088	0.9	=	0.9
7000	SVM Top +Z MLI	0.83532	0.15	=	0.05
7001	SVM Top +Y+Z MLI	0.78747	0.15	=	0.05
7002	SVM Top +Y MLI	0.83532	0.15	=	0.05
7003	SVM Top +Y-Z MLI	1.06446	0.15	=	0.05
7004	SVM Top -Z MLI	0.28134	0.15	=	0.05
7005	SVM Top -Z-Y MLI	1.06446	0.15	=	0.05
7006	SVM Top -Y MLI	0.83532	0.15	=	0.05

NODE	LABEL	Area	Alpha		Epsilon
		[m²]	BOL	EOL	
7007	SVM Top -Y+Z MLI	0.78747	0.15	=	0.05
7200	SVM Top Disc +Z MLI	0.69952	0.15	=	0.05
7201	SVM Top Disc +Z+Y MLI	0.21485	0.15	=	0.05
7202	SVM Top Disc +Y MLI	0.69952	0.15	=	0.05
7203	SVM Top Disc +Y-Z MLI	0.44185	0.15	=	0.05
7204	SVM Top Disc -Z MLI	0.24366	0.15	=	0.05
7205	SVM Top Disc -Z-Y MLI	0.43852	0.15	=	0.05
7206	SVM Top Disc -Y MLI	0.69952	0.15	=	0.05
7207	SVM Top Disc -Y+Z MLI	0.21485	0.15	=	0.05
7400	SVM Top Disc +Z	0.69952	0.9	=	0.9
7401	SVM Top Disc +Z+Y	0.21485	0.9	=	0.9
7402	SVM Top Disc +Y	0.69952	0.9	=	0.9
7403	SVM Top Disc +Y-Z	0.44185	0.9	=	0.9
7404	SVM Top Disc -Z	0.24366	0.9	=	0.9
7405	SVM Top Disc -Z-Y	0.43852	0.9	=	0.9
7406	SVM Top Disc -Y	0.69952	0.9	=	0.9
7407	SVM Top Disc -Y+Z	0.21485	0.9	=	0.9
7600	SVM Top +Z	0.83532	0.9	=	0.9
7601	SVM Top +Y+Z	0.78747	0.9	=	0.9
7602	SVM Top +Y	0.83532	0.9	=	0.9
7603	SVM Top +Y-Z	1.06446	0.9	=	0.9
7604	SVM Top -Z	0.28134	0.9	=	0.9
7605	SVM Top -Z-Y	1.06446	0.9	=	0.9
7606	SVM Top -Y	0.83532	0.9	=	0.9
7607	SVM Top -Y+Z	0.78747	0.9	=	0.9

Table 3.1.1-1 HERSCHEL – Service Module Geometrical Nodes List

NODE	LABEL	Area [m²]	Alpha BOL	Alpha EOL	Epsilon
10000	Cryocooler middle	14.62206	0.15	=	0.05
10010	Cryocooler lower	0.88505	0.15	=	0.05
10011	Cryocooler lower	0.88505	0.15	=	0.05
10012	Cryocooler lower	0.88505	0.15	=	0.05
10013	Cryocooler lower	0.88505	0.15	=	0.05
18001	Top Shield +Z	1.791135	0.15	=	0.05
18002	Top Shield +Y	1.791135	0.15	=	0.05
18003	Top Shield -Z	1.791135	0.15	=	0.05
18004	Top Shield -Y	1.791135	0.15	=	0.05
18101	Top Shield +Z	1.791135	0.15	=	0.05
18102	Top Shield +Y	1.791135	0.15	=	0.05
18103	Top Shield -Z	1.791135	0.15	=	0.05
18104	Top Shield -Y	1.791135	0.15	=	0.05
18501	Frontal Shield -Y+Z	1.95000	0.72	=	0.82
18502	Frontal Shield -Y+Z	1.95000	0.72	=	0.82
18503	Frontal Shield +Z	1.95000	0.72	=	0.82
18504	Frontal Shield +Z	1.95000	0.72	=	0.82
18505	Frontal Shield +Y+Z	1.95000	0.72	=	0.82
18506	Frontal Shield +Y+Z	1.95000	0.72	=	0.82
18510	MLI Closure SVM -Y	0.25357	0.17	0.55	0.87
18512	MLI Closure SVM -Y+Z	0.24806	0.17	0.55	0.87
18514	MLI Closure SVM +Z	0.30663	0.17	0.55	0.87
18516	MLI Closure SVM +Y+Z	0.24806	0.17	0.55	0.87
18518	MLI Closure SVM +Y	0.25357	0.17	0.55	0.87
18601	Frontal Shield -Y+Z	1.95000	0.9	=	0.9
18602	Frontal Shield -Y+Z	1.95000	0.9	=	0.9
18603	Frontal Shield +Z	1.95000	0.9	=	0.9
18604	Frontal Shield +Z	1.95000	0.9	=	0.9
18605	Frontal Shield +Y+Z	1.95000	0.9	=	0.9
18606	Frontal Shield +Y+Z	1.95000	0.9	=	0.9
18610	MLI Closure SVM -Y	0.25357	0.17	0.55	0.87
18612	MLI Closure SVM -Y+Z	0.24806	0.17	0.55	0.87
18614	MLI Closure SVM +Z	0.30663	0.17	0.55	0.87
18616	MLI Closure SVM +Y+Z	0.24806	0.17	0.55	0.87
18618	MLI Closure SVM +Y	0.25357	0.17	0.55	0.87
19000	MLI Struct Braces	0.06865	0.15	=	0.05
19005	MLI Struct Braces	0.06845	0.15	=	0.05
19010	MLI Struct Braces	0.08116	0.15	=	0.05
19015	MLI Struct Braces	0.06865	0.15	=	0.05
19020	MLI Struct Braces	0.06865	0.15	=	0.05
19025	MLI Struct Braces	0.06845	0.15	=	0.05
19030	MLI Struct Braces	0.08116	0.15	=	0.05
19035	MLI Struct Braces	0.06865	0.15	=	0.05
19040	MLI Struct Braces	0.06865	0.15	=	0.05
19045	MLI Struct Braces	0.08116	0.15	=	0.05

NODE	LABEL	Area [m²]	Alpha BOL		Epsilon
19050	MLI Struct Braces	0.06845	0.15	=	0.05
19055	MLI Struct Braces	0.06865	0.15	=	0.05
19060	MLI Struct Braces	0.06865	0.15	=	0.05
19065	MLI Struct Braces	0.08116	0.15	=	0.05
19070	MLI Struct Braces	0.06845	0.15	=	0.05
19075	MLI Struct Braces	0.06865	0.15	=	0.05
19080	MLI Struct Braces Front	0.23255	0.15	=	0.05
19081	MLI Struct Braces Front	0.28112	0.15	=	0.05
19082	MLI Struct Braces Front	0.21709	0.15	=	0.05
19083	MLI Struct Braces Front	0.21709	0.15	=	0.05
19084	MLI Struct Braces Front	0.28112	0.15	=	0.05
19085	MLI Struct Braces Front	0.23255	0.15	=	0.05
19086	MLI Struct Braces Front	0.15503	0.15	=	0.05
19087	MLI Struct Braces Front	0.18742	0.15	=	0.05
19088	MLI Struct Braces Front	0.14472	0.15	=	0.05
19089	MLI Struct Braces Front	0.14472	0.15	=	0.05
19090	MLI Struct Braces Front	0.18742	0.15	=	0.05
19091	MLI Struct Braces Front	0.15503	0.15	=	0.05
19092	MLI Struct Braces Front	0.28209	0.15	=	0.05
19093	MLI Struct Braces Front	0.34718	0.15	=	0.05
19094	MLI Struct Braces Front	0.34718	0.15	=	0.05
19095	MLI Struct Braces Front	0.28209	0.15	=	0.05

Table 3.1.1-2 HERSCHEL – Payload Module Geometrical Nodes List

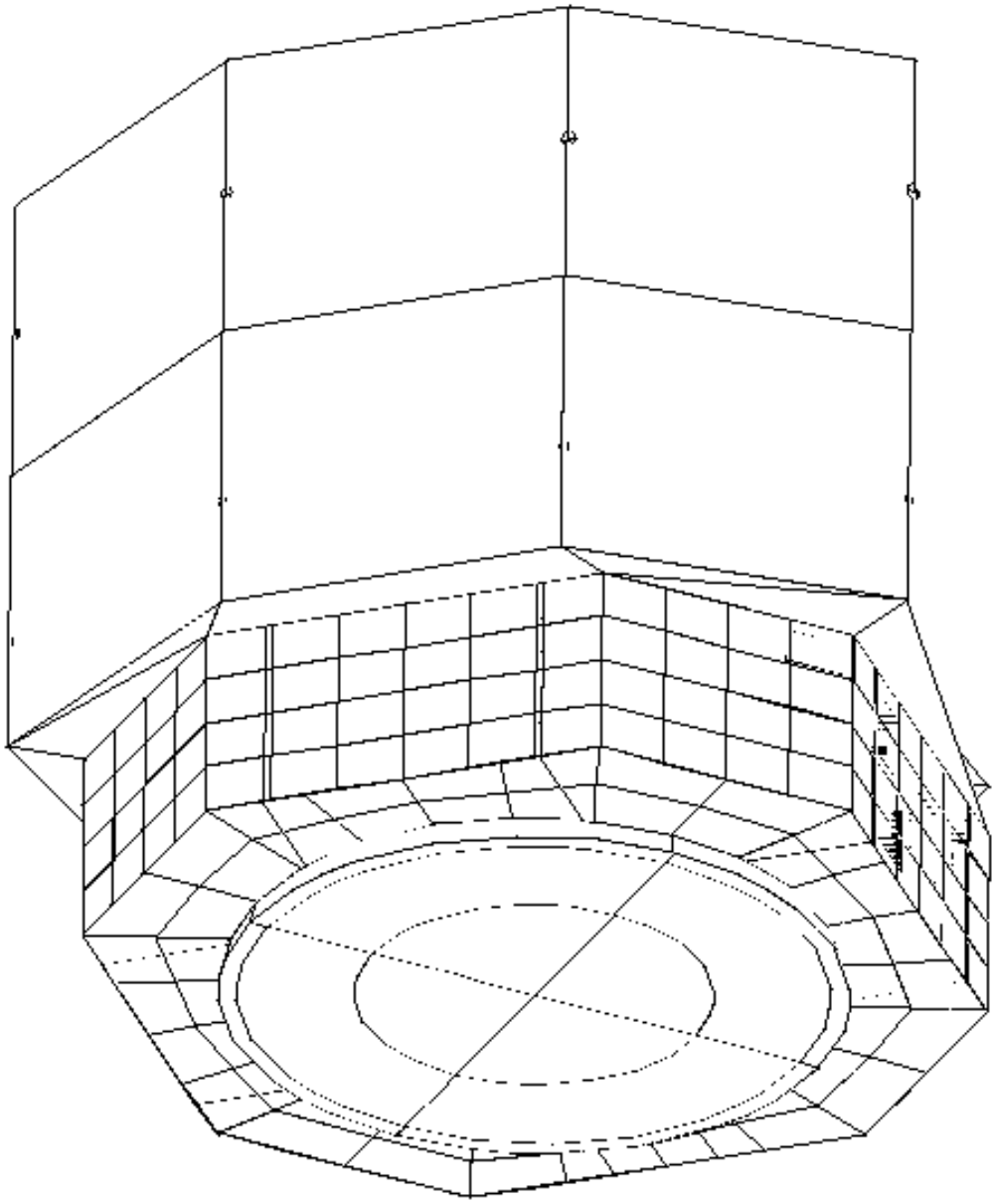


Figure 3.1.1-1 HERSCHEL – Overall view

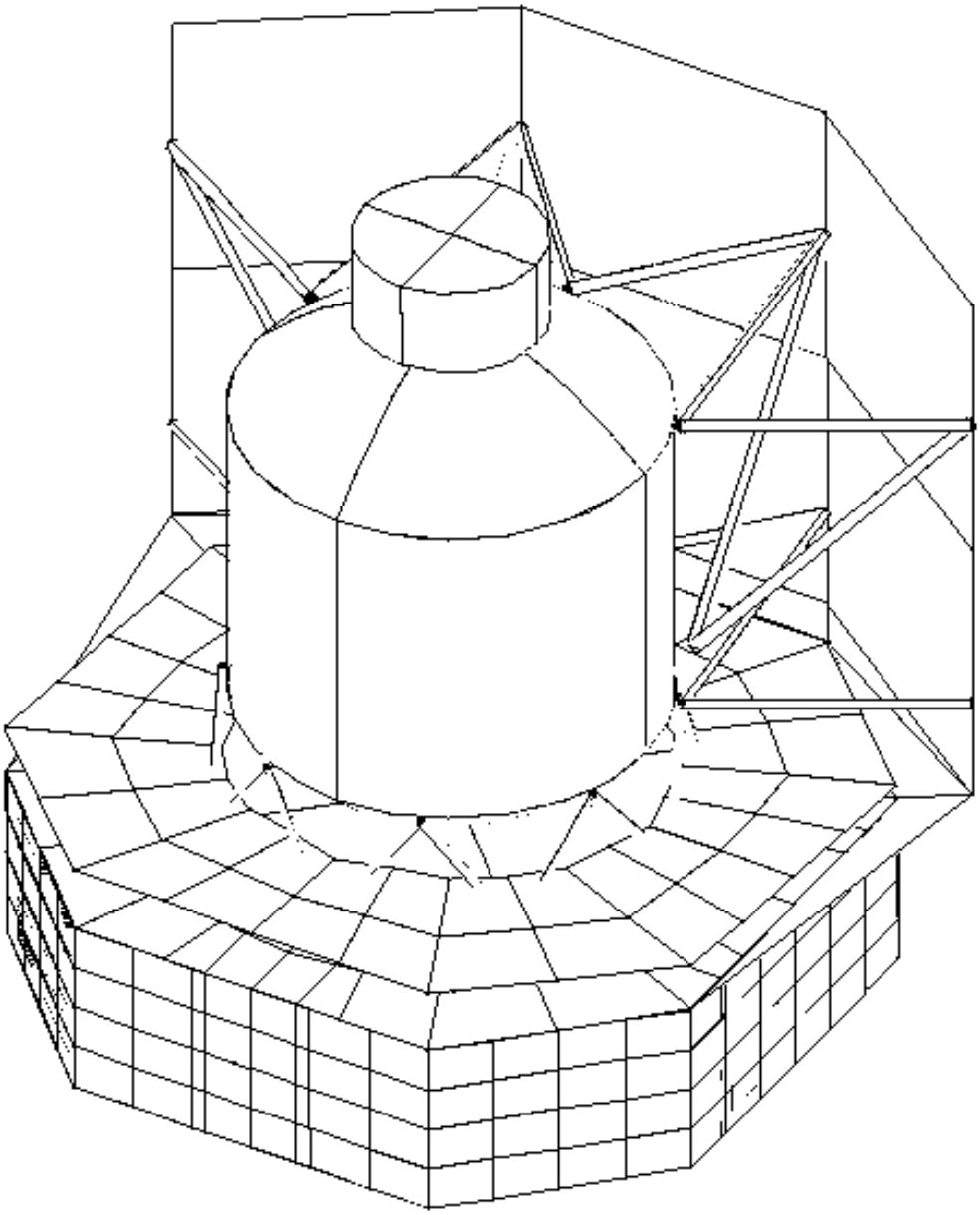


Figure 3.1.1-2 HERSCHEL – Overall View

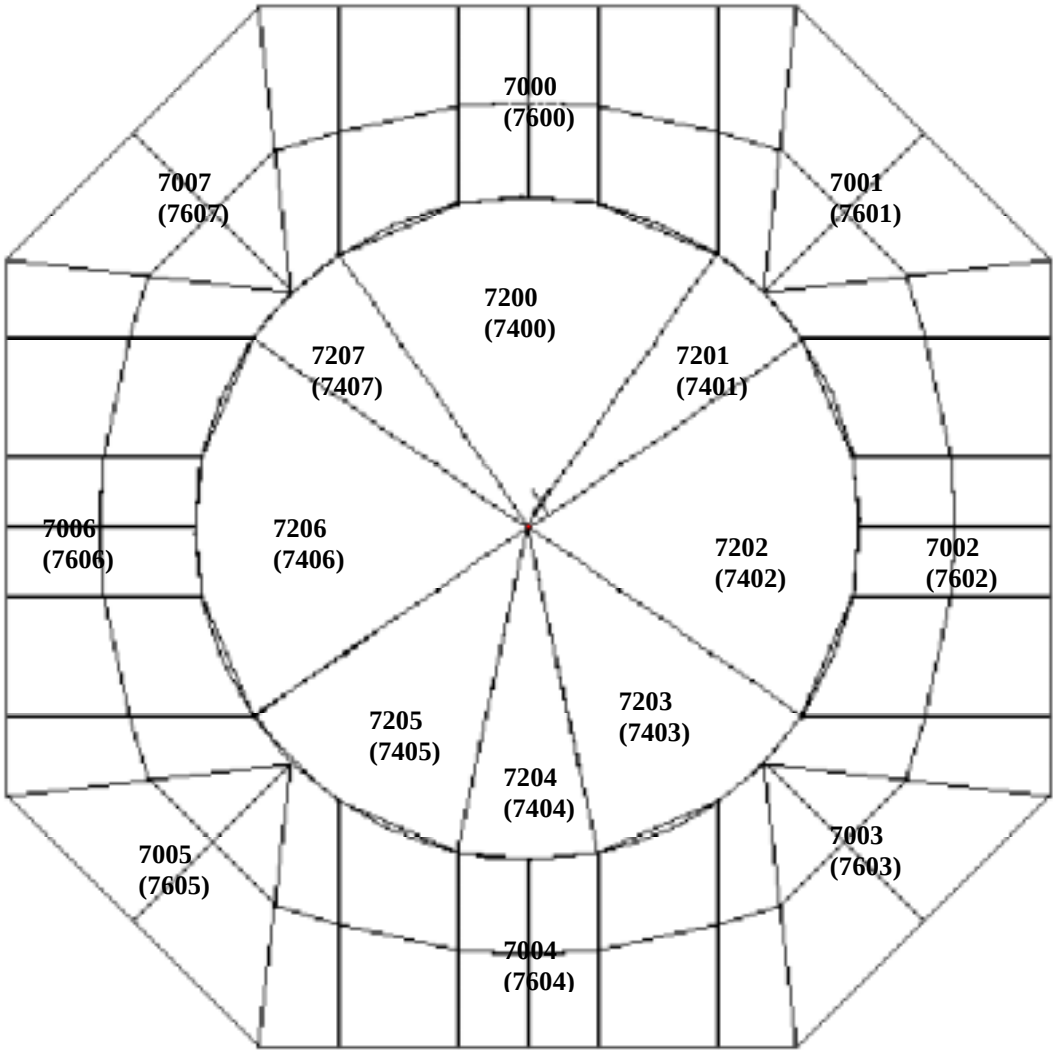


Figure 3.1.1-3 HERSCHEL – Upper Closure and Payload Subplatform +X View
7000÷7: Upper Closure MLI nodes
7600÷7: Upper Closure Structural nodes
7200÷7: Payload Subplatform MLI nodes
7400÷7: Payload Subplatform Structural nodes

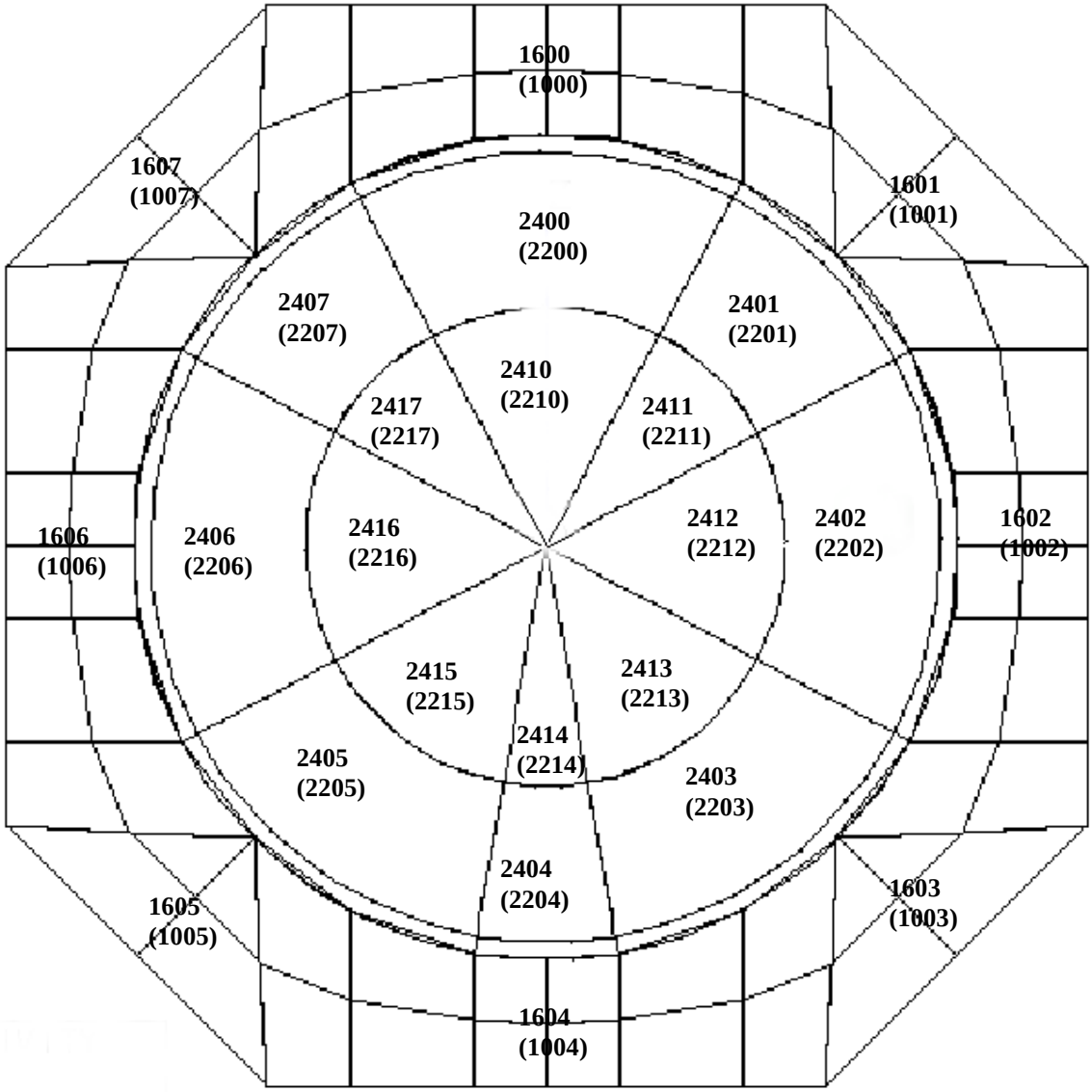


Figure 3.1.1-4 HERSCHEL – Bottom Closure, RCS Panel and Payload Subplatform +X View
1000÷7: Bottom Closure MLI nodes
1600÷7: Bottom Closure Structural nodes
2200÷7: RCS Panel MLI nodes
2400÷7: RCS Panel Structural nodes
2210÷7: Payload Subplatform MLI nodes
2410÷7: Payload Subplatform Structural nodes

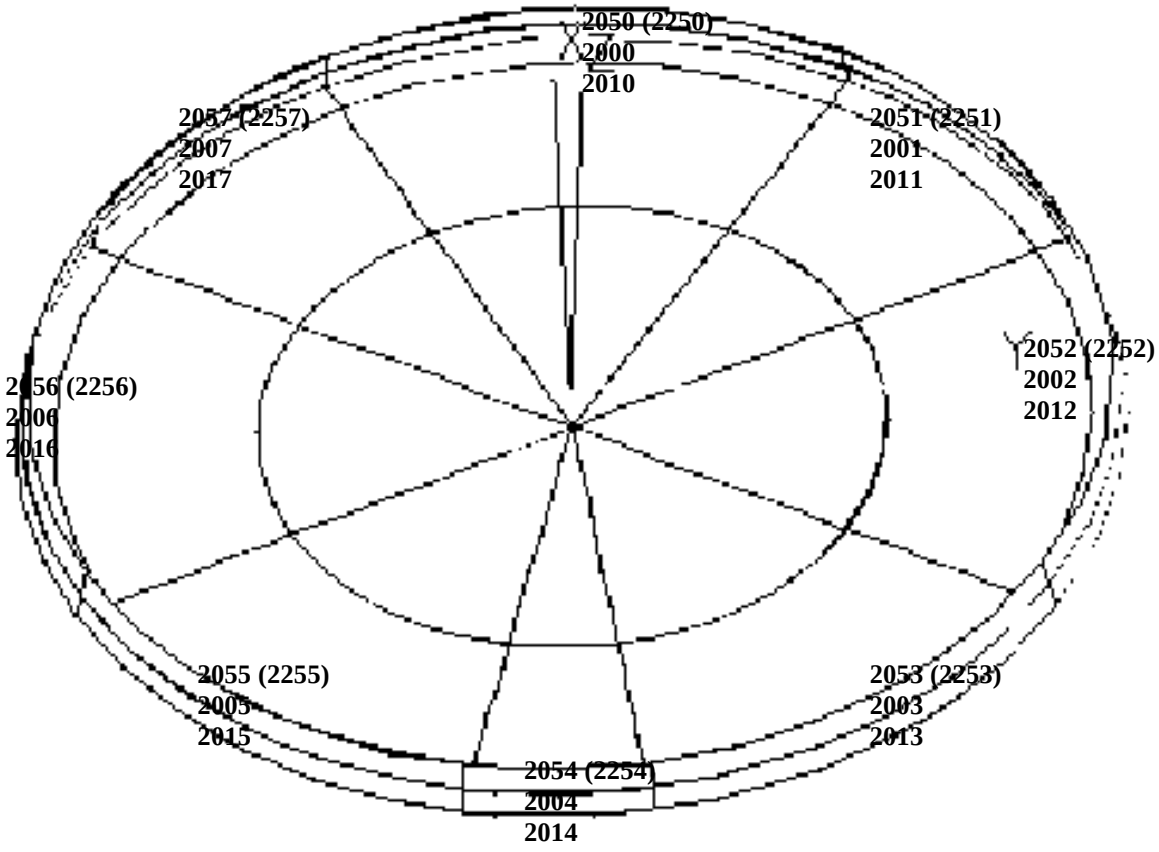


Figure 3.1.1-5 HERSCHEL – Adapter Ring External view
2050÷7: Adapter Cone Structural External nodes under MLI nodes
2250÷7: Adapter Cone MLI nodes
2000÷7: Adapter Cone Structural External nodes
2010÷7: Adapter Edge Structural External nodes
The Internal Structural nodes are the same but they start with 21XX.

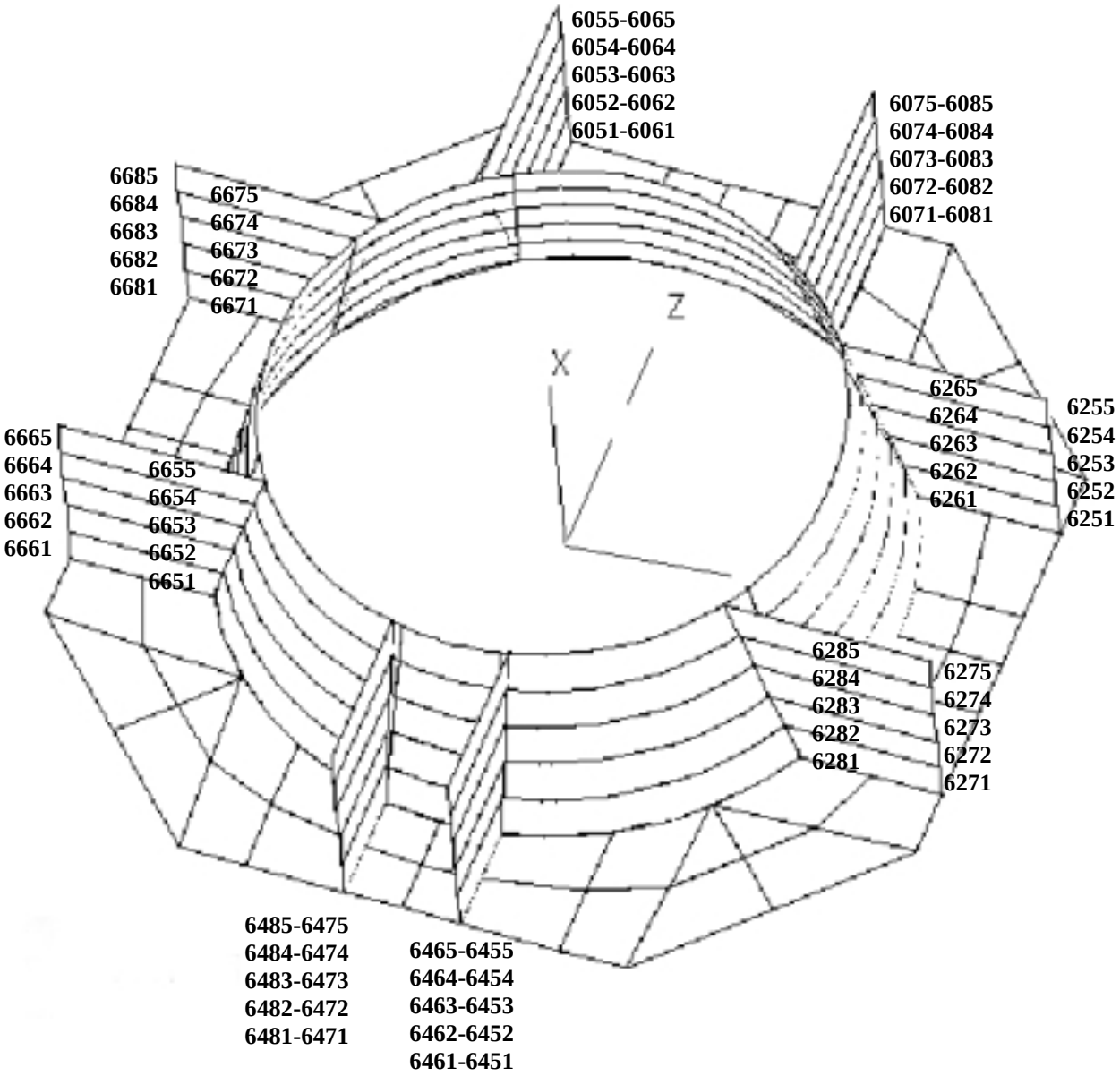


Figure 3.1.1-6 HERSCHEL – Shear Panels

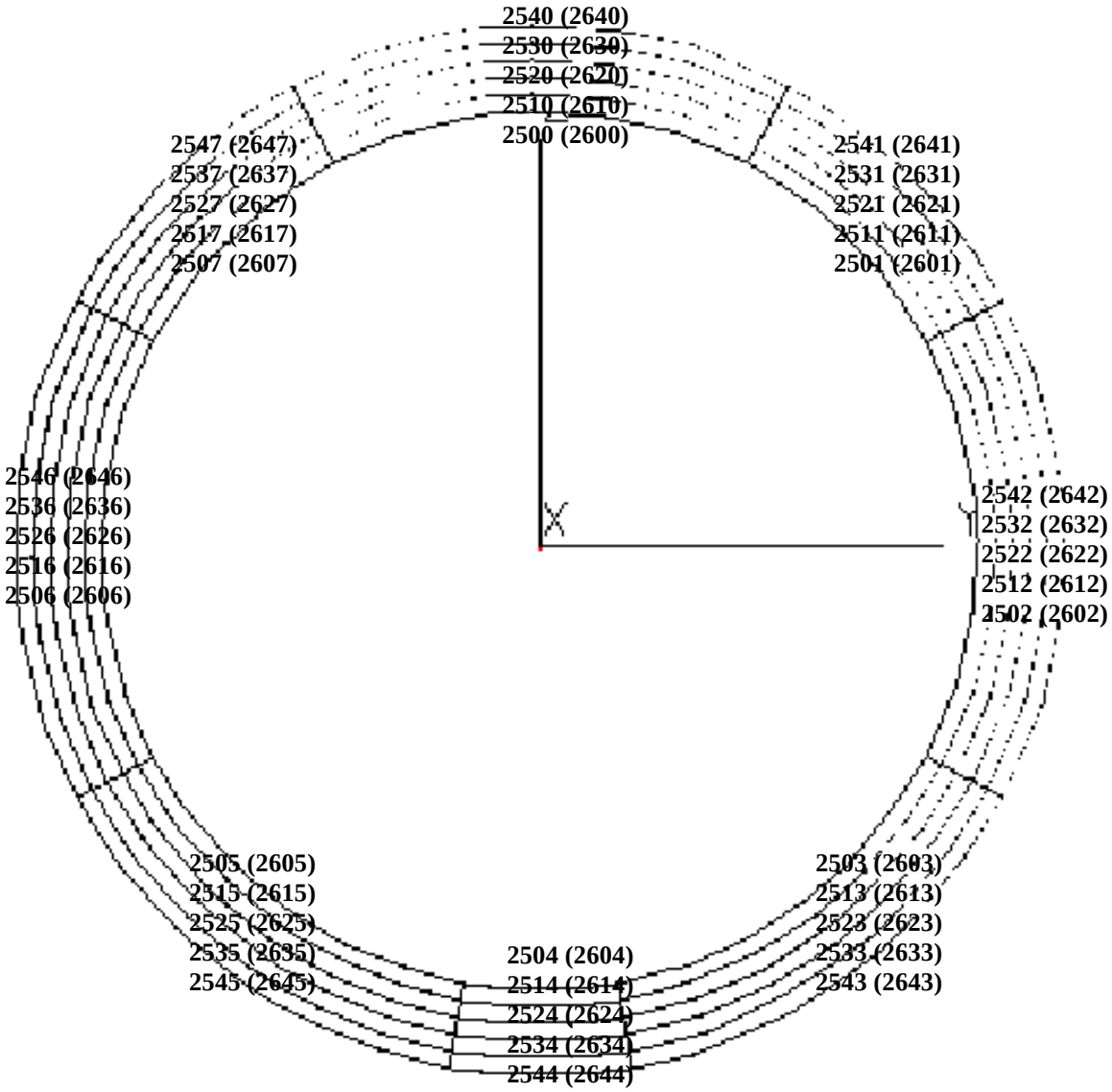


Figure 3.1.1-7 HERSCHEL – Cone: Internal (External) 25XX (26XX) nodes.

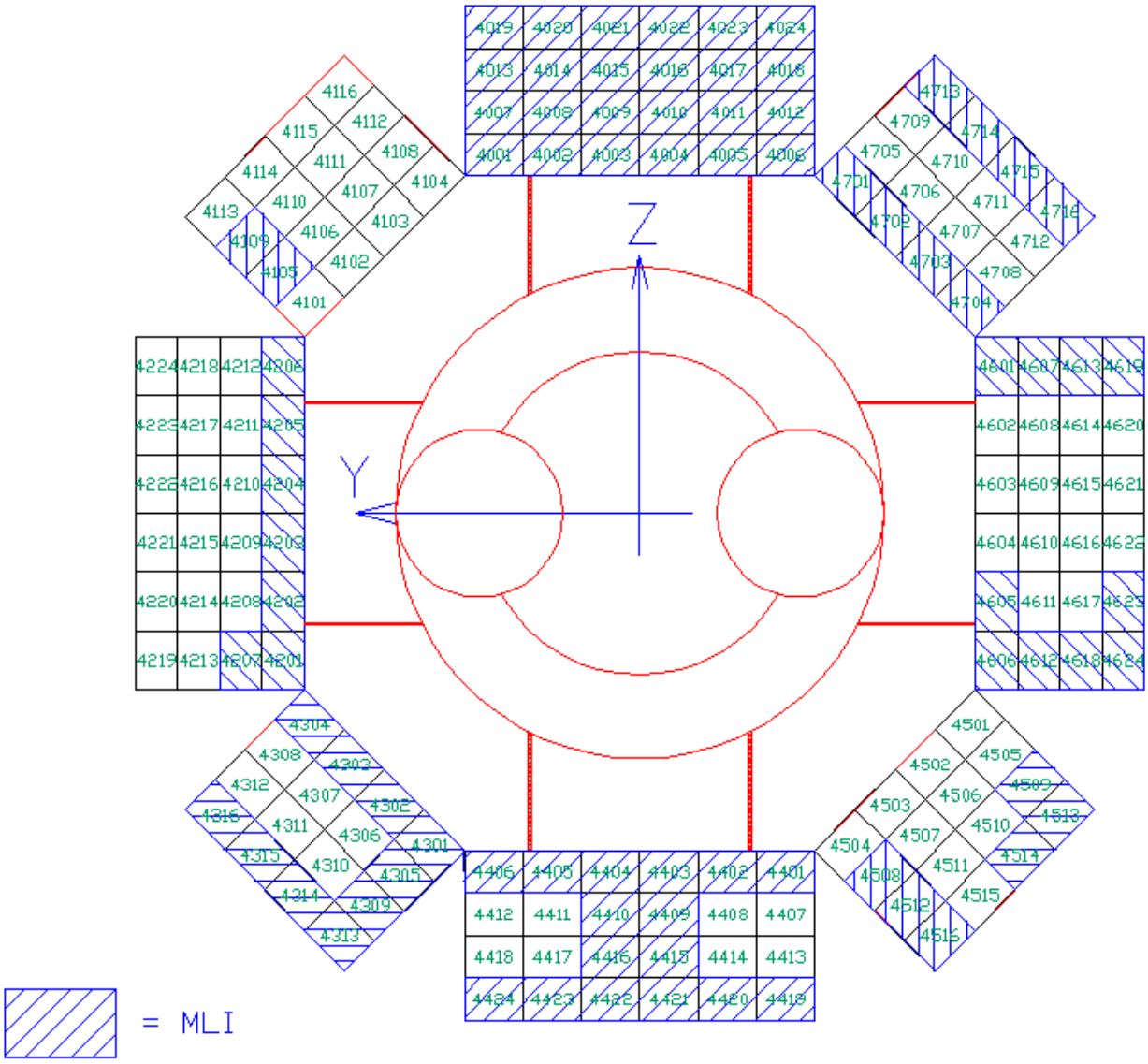


Figure 3.1.1-8 HERSCHEL – Lateral Panel External View
4X01÷24: External Lateral Panels OSR nodes
The MLI nodes are the same: 3XXX.

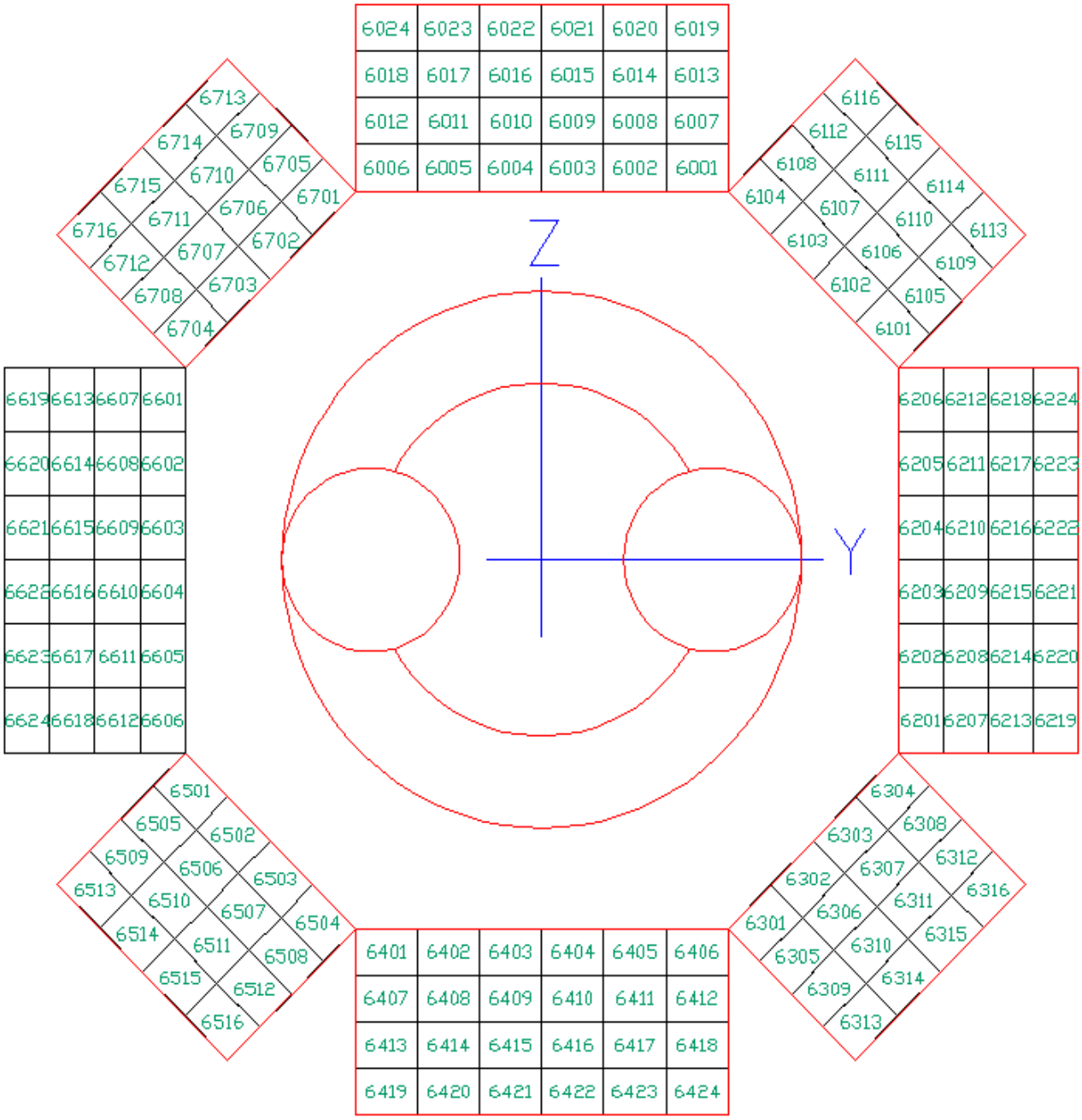


Figure 3.1.1-9 HERSCHEL – Lateral Panel Internal View
6X01÷24: Internal Lateral Panels nodes

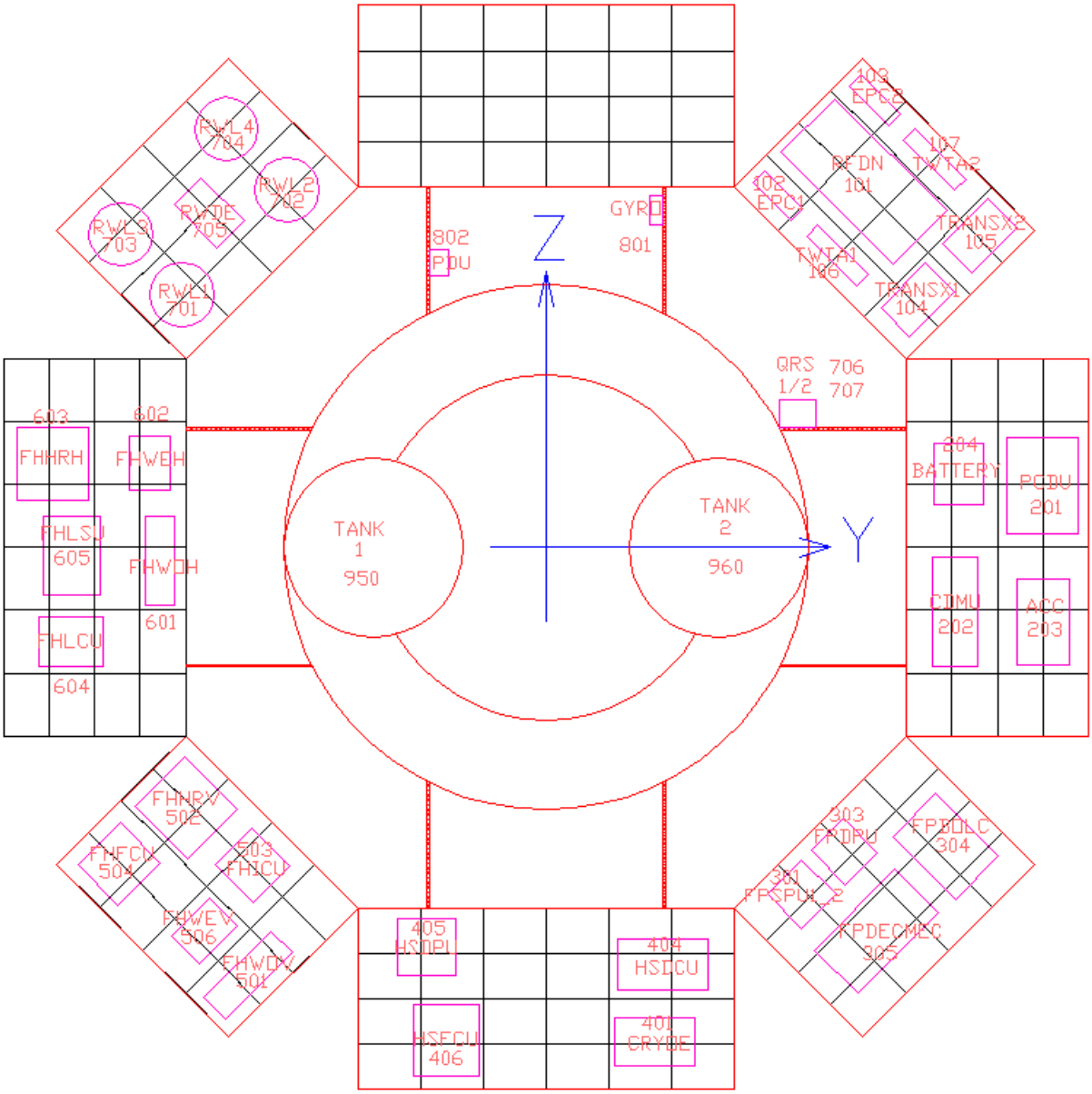


Figure 3.1.1-10 HERSCHEL – Lateral Panel & Units Internal View

3.1.2 Thermal Mathematical Model (TMM)

The Thermal Mathematical Model (TMM) has been prepared with Esatan software and contains the thermal node description, the thermal conductivity network and the unit and heater dissipation. It is composed by 886 nodes describing the Service Module and 113 nodes for the Payload Module, for a total of 999 nodes.

The external units, the Tanks and the HIFI units are covered by MLI. In the GMM we have a MLI node for each unit, while in the TMM we have the boxe nodes connected to the respective MLI node and to the skin.
These thermal nodes are listed below.

GEOMETRICAL MLI NODE	THERMAL NODE	LABEL
3901	1	THRPZ
3902	2	AAD
3904	4	VMC
3905	5	SASZ_BRK
3906	6	SASZ
3921	21	THRPY
3941	41	THRMZ
3942	42	STRMZMY
3945	45	STRMZPY
3946	46	SAS
3947	47	SAS_BRK
3948	48	SREM
3961	61	THRMY
900	950	TANK1
910	960	TANK2
3501	501	FHWOV
3502	502	FHHRV
3503	503	FHICU
3504	504	FHFCU
3506	506	FHWEV
3601	601	FHWOH
3602	602	FHWEH
3603	603	FHHRH
3604	604	FHLCU
3605	605	FHLSU

Table 3.1.2-1 HERSCHEL – Units Thermal Nodes List

There are also the 12 nodes that represent the I/F PLM points. They are connected to the Upper Payload Subplatform, to the Upper Closure Panel and to the Upper Cone (Internal and External) with a linear conductor. The 12 nodes are listed hereafter:

NODE	LABEL
2701	I/F Cone - Top Floor
2702	I/F Cone - Top Floor
2703	I/F Cone - Top Floor
2704	I/F Cone - Top Floor
2705	I/F Cone - Top Floor
2706	I/F Cone - Top Floor
2707	I/F Cone - Top Floor
2708	I/F Cone - Top Floor
2709	I/F Cone - Top Floor
2710	I/F Cone - Top Floor
2711	I/F Cone - Top Floor
2712	I/F Cone - Top Floor

Table 3.1.2-2 HERSCHEL – I/F Thermal Nodes List

Node 99999 defines the space with a temperature of –269 °C and node 99998 is an inactive node derived from the calculation of the radiative conductors.

The radiative areas obtained from the thermal analysis are shown in Fig. 3.1.2-1 and the amounts of MLI and OSR areas are reported in the Table 3.1.2-1.

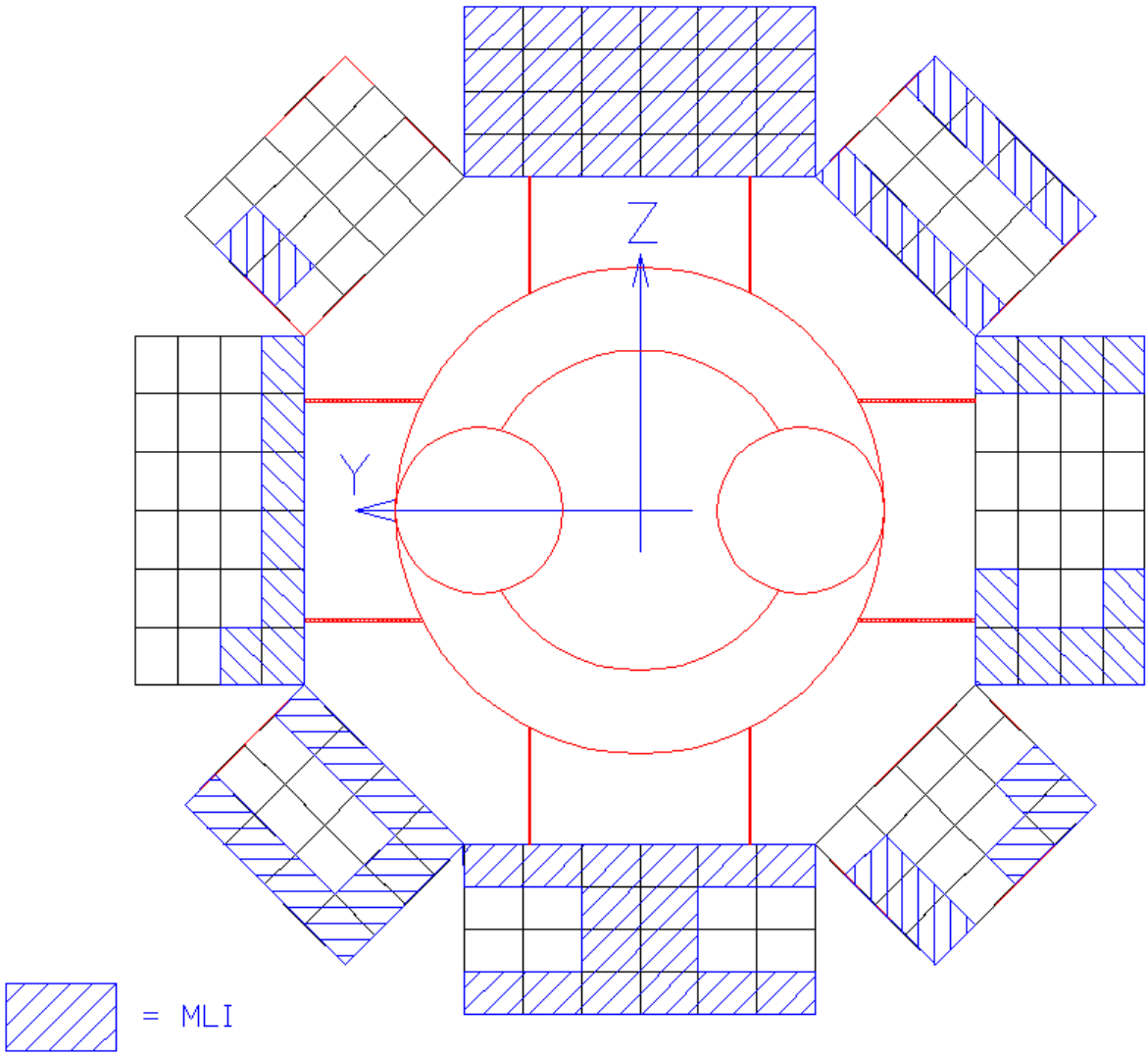


Figure 3.1.2-1 HERSCHEL – Radiative Areas External View

Panel	MLI Area [m²]	OSR Area [m²]
+Z	1.462	0.0
+Y +Z	0.122	0.852
+Y	0.426	1.035
+Y -Z	0.609	0.365
-Z	0.974	0.487
-Y –Z	0.365	0.609
-Y	0.609	0.853
-Y +Z	0.487	0.487
Total	5.054	4.688

Table 3.1.2-3 HERSCHEL – Radiative and MLI Areas

A temperature variable linear conductor along the thickness represents the MLI blanket behaviour. The different MLI used in the TMM are the following:

MLI 20 layers on the Top of the Satellite (nodes 72XX and 70XX) facing to PLM:

Temperature [°C]	Conductivity [W/m² °C]
-100	0.0175
-90	0.0212
-80	0.0251
-70	0.0292
-60	0.0334
-50	0.0378
-40	0.0424
-30	0.0473
-20	0.0523
-10	0.0577
0	0.0633
10	0.0692
25	0.0786
30	0.0819
40	0.0888
50	0.0960
60	0.1036
70	0.1116
80	0.1200
90	0.1288
100	0.1381

Table 3.1.2-4 HERSCHEL – MLI 20 layers conductivity

MLI 5 layers on the HIFI units, on the internal –Y –Z Panel and on the Tanks:

Temperature [°C]	Conductivity [W/m² °C]
-100	0.0314
-90	0.0362
-80	0.0413
-70	0.0468
-60	0.0527
-50	0.0590
-40	0.0659
-30	0.0733
-20	0.0812
-10	0.0898
0	0.0990
10	0.1088
25	0.1250
30	0.1308
40	0.1430
50	0.1560
60	0.1699
70	0.1848
80	0.2006
90	0.2174
100	0.2352

Table 3.1.2-5 HERSCHEL – MLI 5 layers conductivity

MLI 10 layers on all the other external surfaces:

Temperature [°C]	Conductivity [W/m² °C]
-100	0.0233
-90	0.0275
-80	0.0320
-70	0.0366
-60	0.0416
-50	0.0469
-40	0.0524
-30	0.0584
-20	0.0647
-10	0.0714
0	0.0785
10	0.0861
25	0.0984
30	0.1027
40	0.1118
50	0.1214
60	0.1317
70	0.1425
80	0.1540
90	0.1661
100	0.1789

Table 3.1.2-6 HERSCHEL – MLI 10 layers conductivity

The structural characteristcs and the evaluated conductivity of the various sandwich panels are hereafter reported:

Location	H/C Type	Skin Type	Thickness Skin [mm]	Thickness Core [mm]	KXY plane [W/m2K]	KZ axis [W/m2K]
Upper/Lower Closure Panel	3/16-5056-.0007	M18/G801	0.4	20	1.21	1.19
Lateral Panel	3/16-5056-.0007	AA7075T6	0.3	35	2.64	1.17
Equipment Platform/RCS panel	3/16-5056-.0007	M18/G801	0.3	20	1.03	1.18
Shear Web	3/16-5056-.001	M18/G969	0.76	15	2.43	1.78
Cone	3/16-5056-.001	M40/914	0.54	15	1.95	1.74
Reinforced Cone	1/8-5056-.002	M40/914	1.08	13.92	4.39	5.32

Table 3.1.2-7 HERSCHEL – SVM Sandwich thermal properties

In the thermal analysis performed the following part of the satellite have been set to a boundary temperature (see AD-2.6):

- PLM Tilted Shield: BOL case -173.15 °C
  EOL case -123.15 °C
- MLI between Sunshield and SVM (PLM side): BOL/EOL case -23.15 °C
- CVV (Cryocooler) : BOL/EOL case -133.15 °C
- Space node : -269 °C

In the thermal analysis we have take in account also the I/F Fluxes:

- Positive conductive loads from Sunshield uniformly distributed on each attachment point: 15 W
- Negative conductive loads from SVM uniformly distributed on each attachment point: 1 W
- Negative conductive loads from Cryostat Vacuum Vessel uniformly distributed on each attachment point: 1 W
- Negative conductive loads from Wave-guides/cryo-harness on FHLSU: 1 W

3.2 HERSCHEL - THERMAL ANALYSIS

3.2.1 Thermal Analysis Cases

3.2.1.1 Steady State

In according to AD-2.10, the following sizing cases are been performed:
Case 1) = Nominal Case (Hot and Cold)
Case 2) = Cold Case with worst Attitude, low power dissipation during various Operative Modes

- Mode 1 is sizing for HIFI
- Mode 3 is the lowest power dissipation mode (sizing for SPIRE)
- Survival = all the warm units are OFF

Case 7) = Hot Case in worst Attitude during various operative Modes

- Mode 2 is sizing for PACS

CASE	α Degradation	Sun on Panel	Solar Aspect Angle	Attitude	Solar Constant [W/m²]	Dissipation Mode
1	BOL	+Z	0	Rot X = 0 Rot Y = 0	1285	Scientific / MODE3
2A	BOL	+X+Y	30	Rot X = +1 Rot Y = +30	1285	Scientific / MODE3
2A	BOL	+X+Y	30	Rot X = +1 Rot Y = +30	1285	SURVIVAL
2B	BOL	+X-Y	30	Rot X = -1 Rot Y = +30	1285	Scientific / MODE3
2B	BOL	+X-Y	30	Rot X = -1 Rot Y = +30	1285	Scientific / MODE1
1	EOL	+Z	0	Rot X = 0 Rot Y = 0	1405	Telecom / MODE2 Photometry
7A	EOL	+X+Y	30	Rot X = +1 Rot Y = -30	1405	Telecom / MODE1
7A	EOL	+X+Y	30	Rot X = +1 Rot Y = -30	1405	Telecom / MODE2 Photometry
7A	EOL	+X+Y	30	Rot X = +1 Rot Y = -30	1405	Telecom / MODE2 Spectroscopy
7B	EOL	+X-Y	30	Rot X = -1 Rot Y = -30	1405	Telecom / MODE1
7B	EOL	+X-Y	30	Rot X = -1 Rot Y = -30	1405	Telecom / MODE2 Photometry
7B	EOL	+X-Y	30	Rot X = -1 Rot Y = -30	1405	Telecom / MODE2 Spectroscopy

Table 3.2.1.1-1 HERSCHEL – Steady State Orbit Cases description

The Solar Constants used, in according to AD-2.10, are the following:
Cold Cases (BOL1, BOL2A, BOL2B, Survival) 1285 W/m², temperature of the Sun of 5772 K
Hot Cases (EOL1, 7A, 7B) 1405 W/m², temperature of the Sun of 5792 K

3.2.2 Power Dissipation

The following table summarises the Herschel Payload Operative Modes (see AD-2.10):

MODE	HIFI	PACS	SPIRE	COMMENTS
1	Prime	Standby	Standby	
2	Standby	Prime	Standby	Photometry / Spectrometry in PACS Prime
3	Standby	Standby	Prime	

Table 3.2.2-1 Herschel Payload Operative Mode

The power dissipations used in the analysis cases are shown in Table 3.2.2-2.
In the cold cases (BOL1, BOL2) analyses, the Equipment units power dissipation has been considered as Scientific Observations mode and the Warm units in MODE3.
Instead, the hot cases (EOL1, EOL7A, EOL7B) has been performed with the Equipment units in Telecom phase. Within the Telecom Phase, the analysis have been performed taking into account that, the warm units have two different dissipation values: MODE1 or MODE2 and within the MODE2, Photometry and Spectroscopy.
The PCDU unit has a higher dissipation in the BOL (153W) case then in the EOL (127W).

		Scientific Observation	Scientific Observation	Telecom Phase	Telecom Phase	Telecom Phase	Survival
		MODE3	MODE1	MODE1	MODE2 / Photometry	MODE2 / Spectroscopy	
NODE	LABEL	BOL Case	BOL Case	EOL Case	EOL Case	EOL Case	
		[W]	[W]	[W]	[W]	[W]	[W]
101	RFDN	0	0	8	8	8	8
102	EPC1	9	9	9	9	9	9
103	EPC2	0	0	0	0	0	0
104	TRANSX1	7	7	13	13	13	13
105	TRANSX2	7	7	7	7	7	7
106	TWTA1	0	0	38	38	38	38
107	TWTA2	0	0	0	0	0	0
201	PCDU	153	153	127	127	127	97
202	CMDU	36	36	36	36	36	360
203	ACC	24	24	24	24	24	24
204	BATT	0	0	0	0	0	0
301	FPSPU1_2	30.3	30.3	30.3	30.3	30.3	0
303	FPDPU	24	24	24	24	24	0
304	FPBOLC	6.6	6.6	6.6	*48.6*	*6.6*	0
305	FPMECDEC	20.9	20.9	20.9	*21.6*	*65*	0
401	CRYOE	15	15	15	15	15	0
404	HSDCU	37	37	37	37	37	0
405	HSDPU	15.3	15.3	15.3	15.3	15.3	0
406	HSFCU	42.9	42.9	42.9	42.9	42.9	0
501	FHWOV	2.2	2.2	2.2	2.2	2.2	0
502	FHHRV	63.3	63.3	63.3	63.3	63.3	0
503	FHICU	29.6	29.6	29.6	29.6	29.6	0
504	FHFCU	13	13	13	13	13	0
506	FHWEV	26.9	26.9	26.9	26.9	26.9	0
601	FHWOH	2.2	2.2	2.2	2.2	2.2	0

602	FHWEH	26.9	26.9	26.9	26.9	26.9	0
603	FHHRH	63.3	63.3	63.3	63.3	63.3	0
604	FHLCU	26	35.4	35.4	*26*	*26*	0
605	FHLSU	5	45.8	45.8	*5*	*5*	0
701	RWL1_C	7.3	7.3	7.3	7.3	7.3	0
702	RWL2_C	7.3	7.3	7.3	7.3	7.3	0
703	RWL3_C	7.3	7.3	7.3	7.3	7.3	0
704	RWL4_C	0	0	0	0	0	0
705	RWDE	23.1	23.1	23.1	23.1	23.1	0
706	QRS1	8	8	8	8	8	0
707	QRS2	8	8	8	8	8	0
801	GYRO	21	21	21	21	21	0
802	PDU	10	10	10	10	10	0
42	STREMY	13	13	13	13	13	0

Table 3.2.2-2 HERSCHEL - Units Power Dissipations

3.2.3 Transient Cases

In order to verify the thermal stability requirement for the PLM Warm units mounted on the Service Module –Y and –Y-Z panels three transient analyses have been performed.

The analysed cases are hereafter described:

- Cold Transient (Case 1A):
  Starting from S/S case BOL2B: Sun on +X -Y axis, SAA=+30°/-1°
  Ending to case S/S case BOL7A: Sun on -X +Y axis, SAA=-30°/+1°
  Power units dissipation: constant (see value corresponding to BOL Cases in Table 3.2.2-2, Scientific Observation and Warm Units in MODE3)
  Heater dissipation: constant (the values are derived from the steady state analysis and reported in Table 3.3.3-1)
  Duration of change of attitude: 1200s (20 min)
  Overall duration of transient case: 108000s (30 hours)

- Cold Transient (Case 1B):
  Starting from S/S case BOL2B: Sun on +X -Y axis, SAA=+30°/-1°
  Ending to case S/S case BOL7A: Sun on -X +Y axis, SAA=-30°/+1°
  Power units dissipation: constant (see value corresponding to BOL Cases in Table 3.2.2-2, Scientific Observation and Warm Units in MODE1)
  Heater dissipation: constant (the values are derived from the steady state analysis and reported in Table 3.3.3-1)
  Duration of change of attitude: 1200s (20 min)
  Overall duration of transient case: 108000s (30 hours)

- Cold Transient (Case 2):
  Starting from S/S case BOL2B: Sun on +X -Y axis, SAA=+30°/-1°
  Power units dissipation: Constant (see value corresponding to BOL Cases in Table 3.2.2-2, Scientific Observation and Warm Units in MODE3)
  Heater dissipation: Constant for the HIFI heater lines and variable for the others
  Overall duration of transient case: 108000s (30 hours)

- Hot Transient (Case 3A):
  Starting from S/S case EOL7A: Sun on -X +Y axis, SAA=-30°/+1°
  Ending to S/S case EOL2B: Sun on +X -Y axis, SAA=+30°/-1°
  Power units dissipation: constant (see value corresponding to EOL Cases in Table 3.2.2-2, Telecom Phase and Warm Units in MODE2 Photometry)
  Duration of change of attitude: 1200s (20 min)
  Overall duration of transient case: 108000s (30 hours)

- Hot Transient (Case 3B):
  Starting from S/S case EOL7A: Sun on -X +Y axis, SAA=-30°/+1°
  Ending to S/S case EOL2B: Sun on +X -Y axis, SAA=+30°/-1°
  Power units dissipation: constant (see value corresponding to EOL Cases in Table 3.2.2-2, Telecom Phase and Warm Units in MODE1)
  Duration of change of attitude: 1200s (20 min)
  Overall duration of transient case: 108000s (30 hours)

3.2.3.1 Emergency Mode Cases

Due to an emergency situation of the satellite, with the units in the power dissipation mode hereafter described, a supplementary case should be study.
This analyses will perform order to evaluate, after how many times, the units will go out of their requirement temperature range (operative for the units switch-on and not operative for the units switch-off):

All the units are OFF except the following items with reduced power dissipation:

CDMU	20 W
ACC	10 W
2 Transponder	7x2 W

Degradation α = BOL;
Rot. Around X axis = 0, Rot. Around Y axis = 0;
Solar Constant = 1285[W/m^2]

In this situation only two heaters power line of 30 W (total 60W) are available.

A particular attention should be dedicated to the item necessary to the satellite to continue his mission (Battery, Thruster and ACMS units).

3.2.3.1.1 Emergency mode analysis results

TBW

3.3 HERSCHEL - ANALYSIS RESULTS

3.3.1 Results of Steady State Cases

The temperature results hereafter presented refer to the Steady State analysed cases reported in paragraph 3.2.1.1. The values are inclusive of 7°C of uncertainty. The Tables 3.3.1-1,2,3,4 present the unit results with the Temperature Limits (Operative and Not Operative), the Tables 3.3.1-5,6 present the temperature results for all the nodes.

Steady State Case BOL:

BOL		Operative Temperatures Limits		Not Operative Temperatures Limits		BOL1 Scientific MODE3	BOL2A Scientific MODE3	BOL2B Scientific MODE3	BOL2B Scientific MODE1	BOL2A Scientific Survival
		MIN	MAX	MIN	MAX	T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
101	RFDN	-40	70	-50	80	-16.24	-18.90	-19.17	-19.03	-18.10
102	EPC1	-15	45	-25	55	-7.88	-9.30	-9.43	-9.35	-0.53
103	EPC2	-15	45	-25	55	-12.05	-12.09	-12.09	-12.09	-12.10
104	TRANSX1	-10	50	-20	60	-7.03	-7.05	-7.06	-7.06	-7.01
105	TRANSX2	-10	50	-20	60	-7.01	-7.07	-7.08	-7.07	-7.12
106	TWTA1	-15	50	-25	60	-12.05	-12.09	-12.09	-12.09	6.48
107	TWTA2	-15	50	-25	60	-12.08	-12.15	-12.16	-12.16	-12.17
201	PCDU	-10	45	-20	55	23.19	22.42	22.33	22.46	3.74
202	CMDU	-10	45	-20	55	-0.12	-0.98	-1.18	-1.01	-6.93
203	ACC	-20	55	-30	65	-7.31	-8.27	-8.38	-8.20	-16.01
204	BATT	0	35	--	--	2.73	2.71	2.71	2.71	2.54
301	FPSPU1_2	-15	45	-30	60	6.22	5.35	5.32	5.53	-12.06
303	FPDPU	-15	45	-30	60	1.38	0.58	0.55	0.74	-12.15
304	FPBOLC	-15	45	-30	60	-12.08	-12.12	-12.12	-12.11	-12.45
305	FPMECDEC	-15	45	-30	60	-5.32	-6.13	-6.15	-5.96	-12.25
401	CRYOE	-15	45	-25	55	-10.77	-12.01	-12.01	-11.49	-12.28
404	HSDCU	-15	45	-35	80	-3.17	-4.56	-4.55	-3.80	-12.27
405	HSDPU	-15	45	-35	80	-9.67	-10.69	-10.72	-10.46	-12.27
406	HSFCU	-15	45	-35	80	3.38	2.31	2.28	2.56	-12.21
501	FHWOV	0	15	-25	55	2.93	2.93	2.93	2.93	2.89
502	FHHRV	-10	40	-25	55	8.23	7.86	7.86	8.17	-7.57
503	FHICU	-25	45	-30	60	-1.34	-1.66	-1.66	-1.41	-22.09
504	FHFCU	-10	40	-25	55	-1.74	-2.32	-2.32	-1.72	-7.14
506	FHWEV	0	25	-25	55	2.97	2.97	2.97	2.97	2.67
601	FHWOH	0	15	-25	55	2.77	2.77	2.78	2.79	2.74
602	FHWEH	0	25	-25	55	2.83	2.82	2.83	2.87	2.53
603	FHHRH	-10	40	-25	55	7.78	7.41	7.43	13.32	-7.35
604	FHLCU	-10	40	-25	55	-3.65	-4.78	-4.77	6.39	-7.26
605	FHLSU	-10	40	-25	55	-7.20	-7.21	-7.21	3.79	-7.43
701	RWL1_C	0	50	-10	60	2.93	2.90	2.90	2.91	2.79
702	RWL2_C	0	50	-10	60	2.94	2.90	2.90	2.90	2.76
703	RWL3_C	0	50	-10	60	2.94	2.90	2.90	2.91	2.78
704	RWL4_C	0	70	-10	60	2.93	2.89	2.89	2.90	2.83
705	RWDE	-10	50	-20	60	-0.99	-3.11	-2.91	-2.71	-7.15
706	QRS1	-15	45	-35	65	1.12	-0.33	-0.44	-0.27	-10.77
707	QRS2	-15	45	-35	65	1.24	-0.22	-0.33	-0.15	-10.92
801	GYRO	-15	45	-25	55	5.18	1.68	1.61	1.92	-10.61
802	PDU	-15	45	-25	55	5.87	2.84	2.86	3.24	-7.19
950	TANK1	10	40	10	40	12.98	12.97	12.97	12.98	12.97

BOL		Operative Temperatures Limits		Not Operative Temperatures Limits		BOL1 Scientific MODE3	BOL2A Scientific MODE3	BOL2B Scientific MODE3	BOL2B Scientific MODE1	BOL2A Scientific Survival
		MIN	MAX	MIN	MAX	T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
960	TANK2	10	40	10	40	12.98	12.98	12.98	12.98	12.97
42	STRMZMY	-20	40	-30	50	27.50	26.30	26.29	26.77	-17.03
45	STRMZPY	-20	40	-30	50	-17.00	-17.01	-17.01	-17.00	-17.03
6	SASZ	-70	80	-70	80	14.00	11.21	11.18	11.49	7.02
46	SAS-Z	-70	80	-70	80	-22.07	-23.13	-23.14	-22.67	-23.71

Table 3.3.1-1 HERSCHEL - Units Temperature results: Case BOL.

Steady State Case EOL1:

EOL1		Operative Temperatures Limits		Not Operative Temperatures Limits		EOL1 Telecom MODE2 Photometry
		MIN	MAX	MIN	MAX	T+UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]
101	RFDN	-40	70	-50	80	18.53
102	EPC1	-15	45	-25	55	33.84
103	EPC2	-15	45	-25	55	15.36
104	TRANSX1	-10	50	-20	60	25.47
105	TRANSX2	-10	50	-20	60	21.81
106	TWTA1	-15	50	-25	60	40.55
107	TWTA2	-15	50	-25	60	15.64
201	PCDU	-10	45	-20	55	34.22
202	CMDU	-10	45	-20	55	17.63
203	ACC	-20	55	-30	65	9.86
204	BATT	0	35			9.80
301	FPSPU1_2	-15	45	-30	60	27.69
303	FPDPU	-15	45	-30	60	23.32
304	FPBOLC	-15	45	-30	60	16.31
305	FPMECDEC	-15	45	-30	60	17.28
401	CRYOE	-15	45	-25	55	7.06
404	HSDCU	-15	45	-35	80	14.54
405	HSDPU	-15	45	-35	80	10.90
406	HSFCU	-15	45	-35	80	23.55
501	FHWOV	0	15	-25	55	9.94
502	FHHRV	-10	40	-25	55	23.09
503	FHICU	-25	45	-30	60	13.44
504	FHFCU	-10	40	-25	55	13.66
506	FHWEV	0	25	-25	55	9.97
601	FHWOH	0	15	-25	55	9.79
602	FHWEH	0	25	-25	55	9.86
603	FHHRH	-10	40	-25	55	22.71
604	FHLCU	-10	40	-25	55	12.77
605	FHLSU	-10	40	-25	55	-0.17
701	RWL1_C	0	50	-10	60	20.87
702	RWL2_C	0	50	-10	60	22.78
703	RWL3_C	0	50	-10	60	21.06
704	RWL4_C	0	70	-10	60	20.41
705	RWDE	-10	50	-20	60	22.64

EOL1		Operative Temperatures Limits		Not Operative Temperatures Limits		EOL1 Telecom MODE2 Photometry
		MIN	MAX	MIN	MAX	T+UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]
706	QRS1	-15	45	-35	65	24.42
707	QRS2	-15	45	-35	65	23.50
801	GYRO	-15	45	-25	55	30.76
802	PDU	-15	45	-25	55	27.15
950	TANK1	10	40	10	40	19.98
960	TANK2	10	40	10	40	19.99
42	STRMZMY	-20	40	-30	50	45.54
45	STRMZPY	-20	40	-30	50	1.37
6	SASZ	-70	80	-70	80	36.59
46	SAS-Z	-70	80	-70	80	-4.82

Table 3.3.1-2 HERSCHEL - Units Temperature results: Case EOL1.

Steady State Case EOL7A

EOL7A		Operative Temperatures Limits		Not Operative Temperatures Limits		EOL7A Telecom MODE1	EOL7A Telecom MODE2 Photometry	EOL7A Telecom MODE2 Spectrometry
		MIN	MAX	MIN	MAX	T+UFP	T+UFP	T+UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
101	RFDN	-40	70	-50	80	27.82	28.19	28.26
102	EPC1	-15	45	-25	55	41.81	42.13	42.19
103	EPC2	-15	45	-25	55	26.03	26.36	26.42
104	TRANSX1	-10	50	-20	60	34.59	35.09	35.13
105	TRANSX2	-10	50	-20	60	33.55	34.04	34.08
106	TWTA1	-15	50	-25	60	47.90	48.22	48.28
107	TWTA2	-15	50	-25	60	27.04	27.37	27.43
201	PCDU	-10	45	-20	55	44.73	**45.86**	**45.81**
202	CMDU	-10	45	-20	55	28.15	30.22	30.03
203	ACC	-20	55	-30	65	21.24	23.34	23.11
204	BATT	0	35			19.67	20.99	20.94
301	FPSPU1_2	-15	45	-30	60	34.87	40.14	42.39
303	FPDPU	-15	45	-30	60	29.87	35.69	37.16
304	FPBOLC	-15	45	-30	60	14.93	28.26	21.90
305	FPMECDEC	-15	45	-30	60	23.42	29.81	36.59
401	CRYOE	-15	45	-25	55	21.39	21.39	21.72
404	HSDCU	-15	45	-35	80	27.41	27.39	27.71
405	HSDPU	-15	45	-35	80	19.32	23.49	25.25
406	HSFCU	-15	45	-35	80	32.67	36.41	37.53
501	FHWOV	0	15	-25	55	9.68	9.54	9.71
502	FHHRV	-10	40	-25	55	26.29	26.07	26.15
503	FHICU	-25	45	-30	60	16.08	15.91	15.99
504	FHFCU	-10	40	-25	55	18.67	18.21	18.34
506	FHWEV	0	25	-25	55	14.72	14.57	14.66
601	FHWOH	0	15	-25	55	9.25	4.25	4.38
602	FHWEH	0	25	-25	55	15.62	10.10	10.23
603	FHHRH	-10	40	-25	55	39.81	28.27	28.38
604	FHLCU	-10	40	-25	55	33.36	21.51	21.68
605	FHLSU	-10	40	-25	55	28.57	6.41	6.52

EOL7A		Operative Temperatures Limits		Not Operative Temperatures Limits		EOL7A Telecom MODE1	EOL7A Telecom MODE2 Photometry	EOL7A Telecom MODE2 Spectrometry
		MIN	MAX	MIN	MAX	T+UFP	T+UFP	T+UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
701	RWL1_C	0	50	-10	60	32.38	31.37	31.53
702	RWL2_C	0	50	-10	60	34.04	33.42	33.56
703	RWL3_C	0	50	-10	60	32.94	31.84	31.99
704	RWL4_C	0	70	-10	60	32.72	32.06	32.22
705	RWDE	-10	50	-20	60	31.93	31.31	31.43
706	QRS1	-15	45	-35	65	35.70	36.56	36.57
707	QRS2	-15	45	-35	65	35.25	36.14	36.15
801	GYRO	-15	45	-25	55	43.80	44.05	44.18
802	PDU	-15	45	-25	55	40.87	40.62	40.79
950	TANK1	10	40	10	40	33.32	33.07	33.35
960	TANK2	10	40	10	40	33.58	34.58	34.82
42	STRMZMY	-20	40	-30	50	58.77	59.77	60.25
45	STRMZPY	-20	40	-30	50	14.78	16.92	17.72
6	SASZ	-70	80	-70	80	50.10	50.06	50.18
46	SAS-Z	-70	80	-70	80	7.79	7.82	8.10

Table 3.3.1-3 HERSCHEL - Units Temperature results: Case EOL7A.

Steady State Case EOL7B

EOL7B		Operative Temperatures Limits		Not Operative Temperatures Limits		EOL7B Telecom MODE1	EOL7B Telecom MODE2 Photometry	EOL7B Telecom MODE2 Spectrometry
		MIN	MAX	MIN	MAX	T+UFP	T+UFP	T+UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
101	RFDN	-40	70	-50	80	26.93	27.30	27.37
102	EPC1	-15	45	-25	55	41.04	41.37	41.43
103	EPC2	-15	45	-25	55	25.04	25.38	25.44
104	TRANSX1	-10	50	-20	60	33.71	34.22	34.26
105	TRANSX2	-10	50	-20	60	32.54	33.03	33.07
106	TWTA1	-15	50	-25	60	47.11	47.44	47.49
107	TWTA2	-15	50	-25	60	25.96	26.31	26.36
201	PCDU	-10	45	-20	55	43.70	44.84	44.79
202	CMDU	-10	45	-20	55	27.35	29.44	29.24
203	ACC	-20	55	-30	65	20.15	22.28	22.04
204	BATT	0	35			18.66	20.01	19.95
301	FPSPU1_2	-15	45	-30	60	34.61	39.89	42.15
303	FPDPU	-15	45	-30	60	29.60	35.43	36.91
304	FPBOLC	-15	45	-30	60	14.58	27.94	21.57
305	FPMECDEC	-15	45	-30	60	23.15	29.56	36.34
401	CRYOE	-15	45	-25	55	21.39	21.39	21.72
404	HSDCU	-15	45	-35	80	27.40	27.38	27.70
405	HSDPU	-15	45	-35	80	19.08	23.27	25.03
406	HSFCU	-15	45	-35	80	32.44	36.20	37.31
501	FHWOV	0	15	-25	55	9.69	9.55	9.72
502	FHHRV	-10	40	-25	55	26.31	26.10	26.18
503	FHICU	-25	45	-30	60	16.10	15.93	16.01
504	FHFCU	-10	40	-25	55	18.71	18.25	18.38
506	FHWEV	0	25	-25	55	14.73	14.58	14.67

EOL7B		Operative Temperatures Limits		Not Operative Temperatures Limits		EOL7B Telecom MODE1	EOL7B Telecom MODE2 Photometry	EOL7B Telecom MODE2 Spectrometry
		MIN	MAX	MIN	MAX	T+UFP	T+UFP	T+UFP
NODE	LABEL	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
601	FHWOH	0	15	-25	55	10.13	5.20	5.33
602	FHWEH	0	25	-25	55	16.52	11.07	11.19
603	FHHRH	-10	40	-25	55	**41.06**	29.65	29.76
604	FHLCU	-10	40	-25	55	33.91	22.13	22.29
605	FHLSU	-10	40	-25	55	29.69	7.66	7.78
701	RWL1_C	0	50	-10	60	32.92	31.92	32.07
702	RWL2_C	0	50	-10	60	34.49	33.88	34.02
703	RWL3_C	0	50	-10	60	33.44	32.35	32.50
704	RWL4_C	0	70	-10	60	33.09	32.44	32.60
705	RWDE	-10	50	-20	60	32.54	31.92	32.05
706	QRS1	-15	45	-35	65	34.91	35.78	35.80
707	QRS2	-15	45	-35	65	34.43	35.33	35.35
801	GYRO	-15	45	-25	55	43.41	43.66	43.79
802	PDU	-15	45	-25	55	40.93	40.68	40.85
950	TANK1	10	40	10	40	33.25	33.00	33.29
960	TANK2	10	40	10	40	33.24	34.24	34.49
42	STRMZMY	-20	40	-30	50	58.64	59.64	60.12
45	STRMZPY	-20	40	-30	50	14.48	16.63	17.43
6	SASZ	-70	80	-70	80	50.01	50.00	50.11
46	SAS-Z	-70	80	-70	80	7.78	7.81	8.09

Table 3.3.1-4 HERSCHEL - Units Temperature results: Case EOL7B.

Hereafter there are all the Temperature results for all the BOL Steady State Cases:

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
1	THRPZ	1.52	-1.95	-2.04	-1.82	-4.92
2	AAD	6.30	1.59	1.60	1.98	-3.60
4	VMC	5.36	0.82	0.82	1.20	-4.37
5	SASZ_BRK	13.55	10.77	10.75	11.05	6.55
6	SASZ	14.00	11.21	11.18	11.49	7.02
21	THRPY	-0.82	-0.97	-1.34	-1.23	-4.67
41	THRMZ	-13.89	-15.12	-15.12	-14.58	-16.00
42	STRMZMY	27.50	26.30	26.29	26.77	-17.03
43	STRMY CONE	-40.77	-41.34	-41.35	-41.12	-62.94
44	STRMZPY CONE	-62.87	-62.89	-62.89	-62.89	-63.04
45	STRMZPY	-17.00	-17.01	-17.01	-17.00	-17.03
46	SAS	-22.07	-23.13	-23.14	-22.67	-23.71
47	SAS_BRK	-21.78	-22.85	-22.85	-22.39	-23.44
48	SREM	-12.81	-14.05	-14.05	-13.53	-14.70
61	THRMY	-6.43	-5.92	-5.45	-5.15	-6.15
101	RFDN	-16.24	-18.90	-19.17	-19.03	-18.10
102	EPC1	-7.88	-9.30	-9.43	-9.35	-0.53
103	EPC2	-12.05	-12.09	-12.09	-12.09	-12.10
104	TRANSX1	-7.03	-7.05	-7.06	-7.06	-7.01
105	TRANSX2	-7.01	-7.07	-7.08	-7.07	-7.12
106	TWTA1	-12.05	-12.09	-12.09	-12.09	6.48

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
107	TWTA2	-12.08	-12.15	-12.16	-12.16	-12.17
201	PCDU	23.19	22.42	22.33	22.46	3.74
202	CMDU	-0.12	-0.98	-1.18	-1.01	-6.93
203	ACC	-7.31	-8.27	-8.38	-8.20	-16.01
204	BATT	2.73	2.71	2.71	2.71	2.54
301	FPSPU1_2	6.22	5.35	5.32	5.53	-12.06
303	FPDPU	1.38	0.58	0.55	0.74	-12.15
304	FPBOLC	-12.08	-12.12	-12.12	-12.11	-12.45
305	FPMECDEC	-5.32	-6.13	-6.15	-5.96	-12.25
401	CRYOE	-10.77	-12.01	-12.01	-11.49	-12.28
404	HSDCU	-3.17	-4.56	-4.55	-3.80	-12.27
405	HSDPU	-9.67	-10.69	-10.72	-10.46	-12.27
406	HSFCU	3.38	2.31	2.28	2.56	-12.21
501	FHWOV	2.93	2.93	2.93	2.93	2.89
502	FHHRV	8.23	7.86	7.86	8.17	-7.57
503	FHICU	-1.34	-1.66	-1.66	-1.41	-22.09
504	FHFCU	-1.74	-2.32	-2.32	-1.72	-7.14
506	FHWEV	2.97	2.97	2.97	2.97	2.67
601	FHWOH	2.77	2.77	2.78	2.79	2.74
602	FHWEH	2.83	2.82	2.83	2.87	2.53
603	FHHRH	7.78	7.41	7.43	13.32	-7.35
604	FHLCU	-3.65	-4.78	-4.77	6.39	-7.26
605	FHLSU	-7.20	-7.21	-7.21	3.79	-7.43
701	RWL1_C	2.93	2.90	2.90	2.91	2.79
702	RWL2_C	2.94	2.90	2.90	2.90	2.76
703	RWL3_C	2.94	2.90	2.90	2.91	2.78
704	RWL4_C	2.93	2.89	2.89	2.90	2.83
705	RWDE	-0.99	-3.11	-2.91	-2.71	-7.15
706	QRS1	1.12	-0.33	-0.44	-0.27	-10.77
707	QRS2	1.24	-0.22	-0.33	-0.15	-10.92
801	GYRO	5.18	1.68	1.61	1.92	-10.61
802	PDU	5.87	2.84	2.86	3.24	-7.19
900	TANK1_LOWER MLI	0.44	-1.55	-1.56	-0.90	-4.83
910	TANK2_LOWER MLI	1.23	-0.63	-0.67	-0.32	-4.61
950	TANK1	12.98	12.97	12.97	12.98	12.97
960	TANK2	12.98	12.98	12.98	12.98	12.97
1000	SVM Bot +Z MLI	-38.08	-152.43	-152.44	-152.26	-154.62
1001	SVM Bot +Y+Z MLI	-87.23	-152.33	-152.35	-152.28	-152.87
1002	SVM Bot +Y MLI	-122.03	-159.04	-159.12	-158.99	-161.54
1003	SVM Bot +Y-Z MLI	-162.51	-164.32	-164.34	-164.19	-167.67
1004	SVM Bot -Z MLI	-168.24	-169.18	-169.19	-168.96	-171.93
1005	SVM Bot -Z-Y MLI	-162.65	-164.61	-164.62	-164.23	-166.72
1006	SVM Bot -Y MLI	-123.44	-160.63	-160.63	-159.97	-162.25
1007	SVM Bot -Y+Z MLI	-82.77	-162.79	-162.77	-162.60	-163.88
1600	SVM Bot +Z	1.36	-3.66	-3.70	-3.29	-10.12
1601	SVM Bot +Y+Z	-7.72	-10.04	-10.16	-9.98	-10.92
1602	SVM Bot +Y	-1.48	-2.48	-2.74	-2.56	-8.47
1603	SVM Bot +Y-Z	-4.21	-5.26	-5.30	-5.06	-14.77
1604	SVM Bot -Z	-7.14	-8.80	-8.82	-8.26	-16.26
1605	SVM Bot -Z-Y	-9.02	-10.68	-10.69	-9.68	-15.72
1606	SVM Bot -Y	-6.34	-8.15	-8.13	-6.28	-11.32
1607	SVM Bot -Y+Z	-1.09	-3.31	-3.25	-2.85	-5.83
2000	Launch Adapter Cone Ext	18.10	-15.66	-15.70	-15.16	-20.45

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
2001	Launch Adapter Cone Ext	7.68	-16.33	-16.40	-15.96	-20.80
2002	Launch Adapter Cone Ext	-3.93	-15.44	-15.55	-15.13	-20.74
2003	Launch Adapter Cone Ext	-11.39	-16.52	-16.57	-16.08	-22.38
2004	Launch Adapter Cone Ext	-12.55	-17.28	-17.32	-16.68	-22.73
2005	Launch Adapter Cone Ext	-12.32	-17.75	-17.77	-16.98	-22.62
2006	Launch Adapter Cone Ext	-4.97	-17.14	-17.16	-16.14	-21.39
2007	Launch Adapter Cone Ext	9.44	-16.02	-16.03	-15.33	-20.26
2010	Launch Adapter Edge Ex	17.62	-15.73	-15.77	-15.24	-20.51
2011	Launch Adapter Edge Ex	7.52	-16.36	-16.43	-15.99	-20.84
2012	Launch Adapter Edge Ex	-4.02	-15.52	-15.62	-15.21	-20.81
2013	Launch Adapter Edge Ex	-11.43	-16.58	-16.63	-16.14	-22.43
2014	Launch Adapter Edge Ex	-12.56	-17.30	-17.34	-16.71	-22.75
2015	Launch Adapter Edge Ex	-12.36	-17.80	-17.82	-17.03	-22.67
2016	Launch Adapter Edge Ex	-5.04	-17.20	-17.22	-16.21	-21.45
2017	Launch Adapter Edge Ex	9.24	-16.06	-16.08	-15.38	-20.31
2050	Adapter Cone Covered Ext	16.27	-14.74	-14.78	-14.25	-19.66
2051	Adapter Cone Covered Ext	6.27	-15.77	-15.84	-15.40	-20.11
2052	Adapter Cone Covered Ext	-3.89	-14.46	-14.57	-14.16	-19.84
2053	Adapter Cone Covered Ext	-10.86	-15.66	-15.71	-15.22	-21.69
2054	Adapter Cone Covered Ext	-12.04	-16.52	-16.56	-15.93	-22.09
2055	Adapter Cone Covered Ext	-11.94	-17.04	-17.07	-16.26	-21.95
2056	Adapter Cone Covered Ext	-5.18	-16.40	-16.41	-15.34	-20.64
2057	Adapter Cone Covered Ext	8.32	-15.08	-15.09	-14.41	-19.28
2100	Launch Adapter Cone Int	17.62	-15.60	-15.64	-15.10	-20.39
2101	Launch Adapter Cone Int	7.52	-16.29	-16.37	-15.92	-20.77
2102	Launch Adapter Cone Int	-3.93	-15.38	-15.48	-15.07	-20.68
2103	Launch Adapter Cone Int	-11.33	-16.46	-16.51	-16.02	-22.32
2104	Launch Adapter Cone Int	-12.52	-17.26	-17.29	-16.66	-22.71
2105	Launch Adapter Cone Int	-12.26	-17.69	-17.71	-16.92	-22.57
2106	Launch Adapter Cone Int	-4.97	-17.08	-17.09	-16.08	-21.33
2107	Launch Adapter Cone Int	9.26	-15.98	-15.99	-15.30	-20.22
2110	Launch Adapter Edge Ext	17.49	-15.65	-15.69	-15.15	-20.44
2111	Launch Adapter Edge Ext	7.49	-16.31	-16.38	-15.94	-20.79
2112	Launch Adapter Edge Ext	-3.97	-15.44	-15.54	-15.12	-20.73
2113	Launch Adapter Edge Ext	-11.36	-16.50	-16.56	-16.06	-22.36
2114	Launch Adapter Edge Ext	-12.54	-17.28	-17.31	-16.68	-22.72
2115	Launch Adapter Edge Ext	-12.28	-17.72	-17.75	-16.95	-22.60
2116	Launch Adapter Edge Ext	-4.99	-17.12	-17.13	-16.12	-21.37
2117	Launch Adapter Edge Ext	9.20	-16.01	-16.03	-15.33	-20.26
2150	Adapter Cone Covered Int	16.24	-14.73	-14.77	-14.24	-19.65
2151	Adapter Cone Covered Int	6.25	-15.76	-15.84	-15.40	-20.10
2152	Adapter Cone Covered Int	-3.88	-14.45	-14.56	-14.15	-19.83
2153	Adapter Cone Covered Int	-10.86	-15.65	-15.70	-15.21	-21.68
2154	Adapter Cone Covered Int	-12.04	-16.51	-16.55	-15.92	-22.09
2155	Adapter Cone Covered Int	-11.93	-17.03	-17.06	-16.25	-21.94
2156	Adapter Cone Covered Int	-5.17	-16.39	-16.41	-15.33	-20.63
2157	Adapter Cone Covered Int	8.30	-15.07	-15.09	-14.40	-19.27
2200	RCS Panel MLI	-178.32	-180.09	-180.11	-179.89	-182.06
2201	RCS Panel MLI	-178.77	-180.24	-180.27	-180.07	-182.15
2202	RCS Panel MLI	-178.85	-179.95	-179.98	-179.80	-182.10
2203	RCS Panel MLI	-179.39	-180.33	-180.34	-180.13	-182.56
2204	RCS Panel MLI	-179.51	-180.46	-180.47	-180.22	-182.59
2205	RCS Panel MLI	-179.71	-180.72	-180.73	-180.42	-182.67

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
2206	RCS Panel MLI	-179.33	-180.54	-180.55	-180.16	-182.29
2207	RCS Panel MLI	-178.64	-180.15	-180.16	-179.89	-181.94
2210	Bottom Disc MLI	-178.76	-179.97	-179.98	-179.75	-181.94
2211	Bottom Disc MLI	-178.86	-180.02	-180.03	-179.81	-182.01
2212	Bottom Disc MLI	-179.00	-180.07	-180.09	-179.87	-182.11
2213	Bottom Disc MLI	-179.17	-180.15	-180.16	-179.93	-182.25
2214	Bottom Disc MLI	-179.25	-180.24	-180.25	-180.00	-182.30
2215	Bottom Disc MLI	-179.28	-180.29	-180.30	-180.02	-182.29
2216	Bottom Disc MLI	-179.11	-180.21	-180.22	-179.94	-182.13
2217	Bottom Disc MLI	-178.85	-180.03	-180.04	-179.78	-181.93
2250	Adapter Cone MLI	116.01	-148.20	-148.21	-148.05	-149.90
2251	Adapter Cone MLI	53.79	-150.18	-150.20	-150.09	-151.14
2252	Adapter Cone MLI	-40.22	-159.70	-159.76	-159.62	-162.07
2253	Adapter Cone MLI	-160.49	-162.62	-162.64	-162.46	-165.58
2254	Adapter Cone MLI	-163.55	-165.06	-165.07	-164.82	-167.62
2255	Adapter Cone MLI	-160.61	-162.83	-162.84	-162.48	-164.94
2256	Adapter Cone MLI	-41.47	-161.12	-161.13	-160.59	-162.83
2257	Adapter Cone MLI	78.35	-160.43	-160.43	-160.21	-161.83
2400	RCS Panel	-4.14	-9.10	-9.14	-8.52	-14.56
2401	RCS Panel	-5.41	-9.52	-9.58	-9.04	-14.80
2402	RCS Panel	-5.63	-8.70	-8.79	-8.29	-14.67
2403	RCS Panel	-7.15	-9.74	-9.79	-9.21	-15.97
2404	RCS Panel	-7.48	-10.11	-10.14	-9.45	-16.06
2405	RCS Panel	-8.05	-10.82	-10.85	-9.99	-16.28
2406	RCS Panel	-6.98	-10.33	-10.35	-9.29	-15.20
2407	RCS Panel	-5.03	-9.26	-9.28	-8.53	-14.21
2410	Bottom Disc	-5.36	-8.76	-8.80	-8.15	-14.21
2411	Bottom Disc	-5.65	-8.88	-8.93	-8.33	-14.41
2412	Bottom Disc	-6.06	-9.04	-9.09	-8.48	-14.71
2413	Bottom Disc	-6.52	-9.25	-9.29	-8.65	-15.10
2414	Bottom Disc	-6.76	-9.49	-9.53	-8.83	-15.25
2415	Bottom Disc	-6.84	-9.64	-9.67	-8.90	-15.20
2416	Bottom Disc	-6.36	-9.43	-9.46	-8.69	-14.77
2417	Bottom Disc	-5.63	-8.91	-8.95	-8.23	-14.20
2500	SVM Cone +Z Int	-0.76	-4.47	-4.51	-3.99	-10.37
2501	SVM Cone +Z+Y Int	-4.20	-6.88	-6.95	-6.54	-12.01
2502	SVM Cone +Y Int	0.05	-1.76	-1.85	-1.51	-9.98
2503	SVM Cone +Y-Z Int	-5.31	-7.16	-7.20	-6.76	-13.08
2504	SVM Cone -Z Int	-5.66	-7.88	-7.90	-7.27	-14.76
2505	SVM Cone -Z-Y Int	-5.10	-7.34	-7.36	-6.37	-12.99
2506	SVM Cone -Y Int	-4.70	-6.97	-6.97	-5.05	-11.49
2507	SVM Cone -Z+Y Int	-1.62	-4.24	-4.24	-3.57	-8.59
2510	SVM Cone +Z Int	-1.43	-5.17	-5.21	-4.68	-11.17
2511	SVM Cone +Z+Y Int	-5.02	-7.75	-7.83	-7.41	-12.72
2512	SVM Cone +Y Int	-0.70	-2.51	-2.61	-2.27	-10.54
2513	SVM Cone +Y-Z Int	-5.85	-7.76	-7.80	-7.35	-13.89
2514	SVM Cone -Z Int	-5.67	-7.89	-7.92	-7.29	-14.76
2515	SVM Cone -Z-Y Int	-6.00	-8.31	-8.32	-7.36	-13.93
2516	SVM Cone -Y Int	-5.43	-7.74	-7.74	-5.94	-12.16
2517	SVM Cone -Z+Y Int	-2.26	-4.81	-4.86	-4.22	-9.14
2520	SVM Cone +Z Int	-1.31	-5.17	-5.21	-4.68	-11.25
2521	SVM Cone +Z+Y Int	-5.31	-8.10	-8.19	-7.78	-12.70
2522	SVM Cone +Y Int	-1.24	-3.06	-3.17	-2.84	-10.59

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
2523	SVM Cone +Y-Z Int	-5.57	-7.47	-7.51	-7.06	-14.02
2524	SVM Cone -Z Int	-5.81	-8.04	-8.07	-7.44	-14.85
2525	SVM Cone -Z-Y Int	-6.38	-8.69	-8.71	-7.77	-14.17
2526	SVM Cone -Y Int	-5.70	-8.06	-8.06	-6.30	-12.36
2527	SVM Cone -Z+Y Int	-2.48	-5.16	-5.15	-4.55	-9.22
2530	SVM Cone +Z Int	-0.96	-5.29	-5.33	-4.80	-11.39
2531	SVM Cone +Z+Y Int	-5.81	-8.89	-8.98	-8.58	-12.74
2532	SVM Cone +Y Int	-1.94	-3.92	-4.06	-3.72	-10.73
2533	SVM Cone +Y-Z Int	-5.11	-7.04	-7.08	-6.64	-14.22
2534	SVM Cone -Z Int	-6.03	-8.30	-8.33	-7.70	-15.07
2535	SVM Cone -Z-Y Int	-6.84	-9.19	-9.21	-8.28	-14.50
2536	SVM Cone -Y Int	-6.01	-8.56	-8.56	-6.82	-12.77
2537	SVM Cone -Z+Y Int	-2.42	-5.40	-5.38	-4.81	-9.28
2540	SVM Cone +Z Int	1.22	-6.48	-6.51	-5.99	-12.44
2541	SVM Cone +Z+Y Int	-4.91	-10.35	-10.44	-10.05	-13.57
2542	SVM Cone +Y Int	-2.63	-5.61	-5.79	-5.44	-11.75
2543	SVM Cone +Y-Z Int	-5.56	-7.81	-7.85	-7.42	-15.37
2544	SVM Cone -Z Int	-7.01	-9.58	-9.61	-8.98	-16.20
2545	SVM Cone -Z-Y Int	-7.85	-10.53	-10.55	-9.63	-15.70
2546	SVM Cone -Y Int	-5.98	-9.64	-9.64	-8.07	-13.80
2547	SVM Cone -Z+Y Int	-1.10	-6.57	-6.56	-5.99	-10.38
2600	SVM Cone +Z Ext	-0.74	-4.46	-4.49	-3.97	-10.36
2601	SVM Cone +Z+Y Ext	-4.21	-6.88	-6.95	-6.54	-12.00
2602	SVM Cone +Y Ext	0.07	-1.73	-1.83	-1.48	-9.97
2603	SVM Cone +Y-Z Ext	-5.31	-7.16	-7.20	-6.76	-13.08
2604	SVM Cone -Z Ext	-5.66	-7.87	-7.90	-7.27	-14.76
2605	SVM Cone -Z-Y Ext	-5.10	-7.34	-7.36	-6.37	-12.99
2606	SVM Cone -Y Ext	-4.70	-6.97	-6.97	-5.04	-11.49
2607	SVM Cone -Z+Y Ext	-1.60	-4.22	-4.22	-3.55	-8.56
2610	SVM Cone +Z Ext	-1.36	-5.11	-5.15	-4.62	-11.12
2611	SVM Cone +Z+Y Ext	-5.04	-7.75	-7.83	-7.42	-12.70
2612	SVM Cone +Y Ext	-0.64	-2.43	-2.53	-2.20	-10.51
2613	SVM Cone +Y-Z Ext	-5.86	-7.75	-7.79	-7.34	-13.89
2614	SVM Cone -Z Ext	-5.66	-7.88	-7.91	-7.28	-14.77
2615	SVM Cone -Z-Y Ext	-6.01	-8.30	-8.32	-7.35	-13.92
2616	SVM Cone -Y Ext	-5.43	-7.73	-7.73	-5.92	-12.15
2617	SVM Cone -Z+Y Ext	-2.21	-4.74	-4.79	-4.16	-9.06
2620	SVM Cone +Z Ext	-1.24	-5.11	-5.15	-4.62	-11.20
2621	SVM Cone +Z+Y Ext	-5.33	-8.10	-8.19	-7.78	-12.68
2622	SVM Cone +Y Ext	-1.18	-2.99	-3.10	-2.77	-10.55
2623	SVM Cone +Y-Z Ext	-5.57	-7.45	-7.49	-7.05	-14.01
2624	SVM Cone -Z Ext	-5.81	-8.03	-8.06	-7.43	-14.86
2625	SVM Cone -Z-Y Ext	-6.39	-8.68	-8.70	-7.76	-14.17
2626	SVM Cone -Y Ext	-5.70	-8.05	-8.05	-6.28	-12.34
2627	SVM Cone -Z+Y Ext	-2.43	-5.09	-5.09	-4.49	-9.14
2630	SVM Cone +Z Ext	-0.89	-5.23	-5.26	-4.74	-11.34
2631	SVM Cone +Z+Y Ext	-5.83	-8.90	-8.99	-8.59	-12.72
2632	SVM Cone +Y Ext	-1.89	-3.84	-3.98	-3.65	-10.68
2633	SVM Cone +Y-Z Ext	-5.09	-7.01	-7.05	-6.61	-14.21
2634	SVM Cone -Z Ext	-6.03	-8.28	-8.31	-7.68	-15.07
2635	SVM Cone -Z-Y Ext	-6.85	-9.18	-9.20	-8.27	-14.50
2636	SVM Cone -Y Ext	-6.02	-8.55	-8.55	-6.80	-12.75
2637	SVM Cone -Z+Y Ext	-2.37	-5.33	-5.32	-4.74	-9.19

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
2640	SVM Cone +Z Ext	1.28	-6.41	-6.44	-5.92	-12.39
2641	SVM Cone +Z+Y Ext	-4.95	-10.36	-10.45	-10.07	-13.53
2642	SVM Cone +Y Ext	-2.58	-5.52	-5.71	-5.36	-11.68
2643	SVM Cone +Y-Z Ext	-5.53	-7.76	-7.80	-7.37	-15.35
2644	SVM Cone -Z Ext	-7.01	-9.56	-9.59	-8.96	-16.19
2645	SVM Cone -Z-Y Ext	-7.86	-10.52	-10.54	-9.63	-15.69
2646	SVM Cone -Y Ext	-5.98	-9.62	-9.62	-8.03	-13.76
2647	SVM Cone -Z+Y Ext	-1.06	-6.50	-6.48	-5.92	-10.28
2701	I/F Cone - Top Floor	1.35	-2.39	-2.43	-1.91	-8.31
2702	I/F Cone - Top Floor	-2.67	-5.33	-5.40	-5.00	-10.36
2703	I/F Cone - Top Floor	2.14	0.33	0.24	0.59	-7.93
2704	I/F Cone - Top Floor	2.14	0.33	0.24	0.59	-7.93
2705	I/F Cone - Top Floor	-3.09	-4.91	-4.95	-4.52	-10.80
2706	I/F Cone - Top Floor	-3.09	-4.91	-4.95	-4.52	-10.80
2707	I/F Cone - Top Floor	-2.80	-5.03	-5.05	-4.06	-10.68
2708	I/F Cone - Top Floor	-2.80	-5.03	-5.05	-4.06	-10.68
2709	I/F Cone - Top Floor	-2.67	-4.93	-4.94	-2.99	-9.46
2710	I/F Cone - Top Floor	-2.67	-4.93	-4.94	-2.99	-9.46
2711	I/F Cone - Top Floor	0.17	-2.43	-2.43	-1.77	-6.70
2712	I/F Cone - Top Floor	1.35	-2.39	-2.43	-1.91	-8.31
3001	MLI Rad +Z	103.89	92.84	93.00	93.01	92.81
3002	MLI Rad +Z	114.14	100.01	100.01	100.01	99.96
3003	MLI Rad +Z	113.95	99.78	99.78	99.78	99.74
3004	MLI Rad +Z	114.86	100.76	100.76	100.76	100.72
3005	MLI Rad +Z	108.00	85.55	85.36	85.37	85.48
3006	MLI Rad +Z	117.29	101.92	102.02	102.02	101.89
3007	MLI Rad +Z	115.04	100.85	100.85	100.85	100.83
3008	MLI Rad +Z	114.73	100.26	100.25	100.26	100.21
3009	MLI Rad +Z	114.53	99.97	99.97	99.98	99.93
3010	MLI Rad +Z	114.96	100.53	100.53	100.53	100.49
3011	MLI Rad +Z	117.66	103.86	103.87	103.87	103.82
3012	MLI Rad +Z	115.66	101.68	101.68	101.69	101.65
3013	MLI Rad +Z	115.24	100.27	100.27	100.27	100.24
3014	MLI Rad +Z	116.30	100.85	100.85	100.85	100.81
3015	MLI Rad +Z	116.20	100.71	100.71	100.71	100.67
3016	MLI Rad +Z	116.42	100.98	100.97	100.98	100.94
3017	MLI Rad +Z	116.30	101.09	101.09	101.09	101.05
3018	MLI Rad +Z	115.69	100.77	100.77	100.77	100.74
3019	MLI Rad +Z	122.11	76.47	76.18	76.18	76.44
3020	MLI Rad +Z	123.75	71.64	71.62	71.62	71.59
3021	MLI Rad +Z	124.22	70.92	70.89	70.89	70.86
3022	MLI Rad +Z	123.82	72.38	72.35	72.35	72.32
3023	MLI Rad +Z	123.96	71.69	71.68	71.68	71.63
3024	MLI Rad +Z	122.29	75.03	75.66	75.67	74.99
3105	MLI Rad +Y+Z	81.64	69.90	66.86	66.86	69.90
3109	MLI Rad +Y+Z	83.76	70.91	67.88	67.89	70.90
3201	MLI Rad +Y	-178.60	-178.64	-178.69	-178.62	-181.07
3202	MLI Rad +Y	-173.07	-171.53	-172.71	-172.66	-173.50
3203	MLI Rad +Y	-125.93	-112.44	-119.83	-119.78	-113.77
3204	MLI Rad +Y	-117.97	-92.98	-114.88	-114.85	-93.70
3205	MLI Rad +Y	-168.26	-128.80	-168.52	-168.50	-129.04
3206	MLI Rad +Y	-173.41	-131.58	-175.24	-175.20	-132.03
3207	MLI Rad +Y	-180.92	-181.19	-181.20	-181.14	-183.14

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
3301	MLI Rad +Y-Z	-174.99	-175.29	-175.30	-175.23	-181.28
3302	MLI Rad +Y-Z	-176.25	-176.53	-176.54	-176.47	-181.34
3303	MLI Rad +Y-Z	-177.32	-177.60	-177.61	-177.54	-181.67
3304	MLI Rad +Y-Z	-180.13	-180.41	-180.42	-180.36	-182.71
3305	MLI Rad +Y-Z	-175.88	-176.18	-176.19	-176.12	-181.43
3309	MLI Rad +Y-Z	-178.78	-179.07	-179.08	-179.01	-181.41
3313	MLI Rad +Y-Z	-179.05	-179.35	-179.36	-179.29	-181.50
3314	MLI Rad +Y-Z	-179.24	-179.53	-179.54	-179.47	-181.64
3315	MLI Rad +Y-Z	-180.69	-180.84	-180.85	-180.81	-181.85
3316	MLI Rad +Y-Z	-181.45	-181.51	-181.51	-181.50	-181.84
3401	MLI Rad -Z	-134.55	-135.20	-135.20	-134.92	-135.93
3402	MLI Rad -Z	-140.74	-141.33	-141.33	-141.08	-142.41
3403	MLI Rad -Z	-144.91	-145.43	-145.43	-145.23	-150.72
3404	MLI Rad -Z	-148.90	-149.33	-149.33	-149.19	-152.49
3405	MLI Rad -Z	-171.00	-171.37	-171.38	-171.28	-176.07
3406	MLI Rad -Z	-178.09	-178.46	-178.47	-178.38	-182.64
3409	MLI Rad -Z	-140.31	-140.89	-140.90	-140.67	-144.66
3410	MLI Rad -Z	-142.31	-142.83	-142.84	-142.66	-146.66
3415	MLI Rad -Z	-144.02	-144.58	-144.58	-144.35	-148.94
3416	MLI Rad -Z	-146.95	-147.43	-147.43	-147.27	-150.87
3419	MLI Rad -Z	-175.78	-176.26	-176.26	-176.00	-179.04
3420	MLI Rad -Z	-169.99	-170.47	-170.46	-170.21	-174.01
3421	MLI Rad -Z	-146.25	-146.71	-146.71	-146.51	-155.06
3422	MLI Rad -Z	-152.24	-152.52	-152.53	-152.42	-155.37
3423	MLI Rad -Z	-173.82	-174.17	-174.18	-174.08	-175.27
3424	MLI Rad -Z	-178.90	-179.26	-179.27	-179.18	-180.05
3508	MLI Rad -Y-Z	-177.76	-177.80	-177.80	-177.78	-178.32
3509	MLI Rad -Y-Z	-177.66	-177.86	-177.87	-177.65	-179.69
3512	MLI Rad -Y-Z	-176.09	-176.10	-176.10	-176.09	-176.15
3513	MLI Rad -Y-Z	-177.61	-177.82	-177.82	-177.60	-179.52
3514	MLI Rad -Y-Z	-178.22	-178.42	-178.42	-178.22	-180.05
3516	MLI Rad -Y-Z	-176.09	-176.10	-176.10	-176.09	-176.16
3551	MLI FHWOV	-3.01	-4.05	-4.05	-3.46	-7.78
3552	MLI FHHRV	-1.82	-3.03	-3.03	-2.10	-12.10
3553	MLI FHICU	-5.62	-6.88	-6.88	-6.11	-17.02
3554	MLI FHFCU	-5.08	-6.44	-6.44	-5.27	-11.56
3556	MLI FHWEV	-3.52	-4.68	-4.68	-3.97	-8.30
3561	MLI Internal Rad -Y-Z	-3.00	-4.12	-4.12	-3.23	-13.31
3562	MLI Internal Rad -Y-Z	-5.63	-6.83	-6.84	-6.03	-16.33
3563	MLI Internal Rad -Y-Z	-6.97	-8.19	-8.19	-7.50	-18.37
3564	MLI Internal Rad -Y-Z	-16.11	-17.54	-17.54	-16.81	-22.01
3565	MLI Internal Rad -Y-Z	-1.71	-2.78	-2.78	-1.81	-12.37
3566	MLI Internal Rad -Y-Z	-3.92	-5.11	-5.11	-4.30	-14.74
3567	MLI Internal Rad -Y-Z	-6.24	-7.48	-7.48	-6.77	-17.58
3568	MLI Internal Rad -Y-Z	-6.19	-7.39	-7.40	-6.80	-10.91
3569	MLI Internal Rad -Y-Z	-4.84	-6.12	-6.12	-4.90	-11.28
3570	MLI Internal Rad -Y-Z	-7.78	-9.21	-9.22	-8.24	-14.47
3571	MLI Internal Rad -Y-Z	-3.83	-4.91	-4.91	-4.26	-8.35
3572	MLI Internal Rad -Y-Z	-2.62	-3.56	-3.56	-3.05	-7.06
3573	MLI Internal Rad -Y-Z	-4.86	-6.15	-6.15	-4.99	-11.26
3574	MLI Internal Rad -Y-Z	-5.59	-7.03	-7.03	-6.06	-12.21
3575	MLI Internal Rad -Y-Z	-4.79	-5.96	-5.97	-5.24	-9.71
3576	MLI Internal Rad -Y-Z	-2.53	-3.54	-3.54	-2.96	-7.26

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
3601	MLI Rad -Y	-168.72	-171.34	-130.11	-129.99	-172.13
3605	MLI Rad -Y	-178.68	-179.71	-179.03	-177.96	-180.91
3606	MLI Rad -Y	-179.02	-179.94	-179.93	-179.27	-181.84
3607	MLI Rad -Y	-164.46	-168.00	-129.39	-129.18	-169.00
3612	MLI Rad -Y	-179.00	-179.58	-179.57	-178.63	-181.46
3613	MLI Rad -Y	-154.92	-160.08	-130.28	-129.81	-161.65
3618	MLI Rad -Y	-178.78	-179.35	-179.34	-178.22	-181.05
3619	MLI Rad -Y	-133.64	-140.19	-138.05	-136.44	-142.60
3623	MLI Rad -Y	-158.41	-159.42	-159.18	-156.05	-161.26
3624	MLI Rad -Y	-170.27	-171.09	-170.97	-169.60	-173.04
3651	MLI FHWOH	-2.57	-3.46	-3.44	-2.25	-5.07
3652	MLI FHWEH	-1.94	-2.84	-2.82	-1.87	-4.67
3653	MLI FHHRH	0.61	-0.37	-0.35	3.95	-9.51
3654	MLI FHLCU	-5.83	-7.34	-7.34	-0.84	-10.64
3655	MLI FHLSU	-7.15	-8.11	-8.10	-1.63	-10.55
3701	MLI Rad -Y+Z	80.91	66.49	69.49	69.50	66.47
3702	MLI Rad -Y+Z	81.22	66.68	69.69	69.69	66.66
3703	MLI Rad -Y+Z	81.22	66.62	69.64	69.65	66.60
3704	MLI Rad -Y+Z	81.24	66.63	69.66	69.67	66.62
3713	MLI Rad -Y+Z	87.08	52.69	57.07	57.08	52.67
3714	MLI Rad -Y+Z	88.66	36.55	40.33	40.33	36.50
3715	MLI Rad -Y+Z	90.36	17.87	21.13	21.14	17.81
3716	MLI Rad -Y+Z	90.35	-11.00	-3.85	-3.82	-11.09
3901	MLI THRPZ	49.61	45.07	45.09	45.09	45.03
3902	MLI AAD	99.14	90.17	91.03	91.03	90.10
3904	MLI VMC	-3.40	6.76	6.79	6.80	6.64
3905	MLI SASZ_BRK	32.59	39.12	38.99	39.00	39.02
3906	MLI SASZ	66.55	63.92	63.93	63.94	63.85
3921	MLI THRPY	-25.75	-4.41	-15.82	-15.75	-6.06
3941	MLI THRMZ	-149.83	-150.45	-150.45	-150.20	-151.24
3942	MLI STRMZMY	-140.51	-140.89	-140.90	-140.70	-151.30
3943	STRMY CONE	-138.89	-139.42	-139.42	-139.19	-143.93
3944	STRMZPY CONE	-141.64	-142.06	-142.07	-141.93	-145.57
3945	MLI STRMZPY	-149.44	-149.54	-149.57	-149.48	-151.56
3946	MLI SAS	-143.94	-144.50	-144.50	-144.25	-145.73
3947	MLI SAS_BRK	-105.67	-106.41	-106.41	-106.08	-107.56
3948	MLI SREM	-122.12	-122.79	-122.79	-122.50	-123.64
3961	MLI THRMY	-20.86	-6.96	1.70	1.85	-7.11
4001	OSR Rad +Z	0.19	-3.20	-3.30	-3.07	-6.24
4002	OSR Rad +Z	4.11	-0.56	-0.61	-0.25	-7.29
4003	OSR Rad +Z	4.17	-0.87	-0.91	-0.51	-7.22
4004	OSR Rad +Z	4.26	-0.76	-0.79	-0.38	-6.74
4005	OSR Rad +Z	5.41	0.79	0.79	1.17	-4.43
4006	OSR Rad +Z	2.98	-0.29	-0.25	0.09	-3.62
4007	OSR Rad +Z	-1.29	-4.87	-4.99	-4.75	-8.90
4008	OSR Rad +Z	4.16	-0.36	-0.42	-0.07	-7.36
4009	OSR Rad +Z	4.26	-0.63	-0.67	-0.26	-6.96
4010	OSR Rad +Z	4.35	-0.52	-0.54	-0.12	-6.48
4011	OSR Rad +Z	4.52	0.06	0.06	0.45	-5.35
4012	OSR Rad +Z	2.66	-0.57	-0.52	-0.20	-4.09
4013	OSR Rad +Z	-2.39	-6.07	-6.19	-5.94	-9.97
4014	OSR Rad +Z	3.15	-1.44	-1.49	-1.13	-7.68
4015	OSR Rad +Z	4.02	-0.88	-0.92	-0.51	-7.06

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
4016	OSR Rad +Z	4.31	-0.56	-0.59	-0.17	-6.58
4017	OSR Rad +Z	4.56	0.07	0.06	0.46	-5.68
4018	OSR Rad +Z	3.18	-0.11	-0.06	0.26	-4.00
4019	OSR Rad +Z	-2.43	-6.51	-6.61	-6.38	-10.32
4020	OSR Rad +Z	2.69	-2.64	-2.69	-2.32	-8.43
4021	OSR Rad +Z	3.88	-1.76	-1.79	-1.38	-7.85
4022	OSR Rad +Z	4.25	-1.32	-1.34	-0.92	-7.40
4023	OSR Rad +Z	4.63	-0.58	-0.59	-0.19	-6.50
4024	OSR Rad +Z	4.17	0.37	0.41	0.75	-3.58
4101	OSR Rad +Y+Z	-12.99	-13.57	-13.69	-13.68	-13.21
4102	OSR Rad +Y+Z	-17.28	-18.00	-18.13	-18.12	-4.08
4103	OSR Rad +Y+Z	-13.31	-14.50	-14.65	-14.60	-3.63
4104	OSR Rad +Y+Z	-43.72	-47.67	-48.52	-48.48	-45.83
4105	OSR Rad +Y+Z	-7.40	-7.63	-7.66	-7.66	-7.61
4106	OSR Rad +Y+Z	-21.15	-23.79	-24.13	-24.02	-22.22
4107	OSR Rad +Y+Z	-21.66	-24.43	-24.78	-24.66	-22.94
4108	OSR Rad +Y+Z	-22.62	-25.52	-25.91	-25.78	-24.72
4109	OSR Rad +Y+Z	-7.32	-7.71	-7.75	-7.74	-7.89
4110	OSR Rad +Y+Z	-20.90	-23.78	-24.12	-24.01	-23.19
4111	OSR Rad +Y+Z	-21.72	-24.64	-24.99	-24.87	-23.97
4112	OSR Rad +Y+Z	-21.61	-24.45	-24.81	-24.69	-23.94
4113	OSR Rad +Y+Z	-11.35	-14.40	-14.51	-14.50	-14.57
4114	OSR Rad +Y+Z	-16.04	-18.97	-19.11	-19.10	-19.07
4115	OSR Rad +Y+Z	-16.59	-18.95	-19.09	-19.07	-19.03
4116	OSR Rad +Y+Z	-16.67	-18.28	-18.42	-18.40	-18.39
4201	OSR Rad +Y	-7.81	-8.72	-8.81	-8.62	-15.33
4202	OSR Rad +Y	-1.81	-2.68	-2.88	-2.71	-8.59
4203	OSR Rad +Y	-1.24	-1.94	-2.19	-2.03	-7.30
4204	OSR Rad +Y	0.32	0.12	-0.05	0.01	-2.00
4205	OSR Rad +Y	1.08	0.95	0.90	0.92	0.22
4206	OSR Rad +Y	-11.65	-12.82	-13.04	-12.92	-15.40
4207	OSR Rad +Y	-14.18	-14.94	-15.02	-14.86	-20.22
4208	OSR Rad +Y	-11.40	-12.15	-12.32	-12.17	-17.51
4209	OSR Rad +Y	-10.82	-11.52	-11.71	-11.57	-16.88
4210	OSR Rad +Y	-7.38	-7.50	-7.58	-7.54	-9.96
4211	OSR Rad +Y	-7.30	-7.37	-7.46	-7.43	-9.29
4212	OSR Rad +Y	-30.85	-31.60	-31.86	-31.76	-34.91
4213	OSR Rad +Y	-34.31	-34.88	-34.94	-34.82	-38.85
4214	OSR Rad +Y	-17.76	-18.58	-18.68	-18.53	-25.03
4215	OSR Rad +Y	-15.79	-16.59	-16.70	-16.55	-23.70
4216	OSR Rad +Y	4.49	3.90	3.82	3.92	-9.70
4217	OSR Rad +Y	3.67	3.08	2.99	3.08	-10.37
4218	OSR Rad +Y	-29.00	-29.80	-30.01	-29.91	-35.81
4219	OSR Rad +Y	-35.78	-36.41	-36.46	-36.32	-40.52
4220	OSR Rad +Y	-18.17	-19.00	-19.09	-18.94	-25.69
4221	OSR Rad +Y	-15.85	-16.68	-16.77	-16.62	-24.19
4222	OSR Rad +Y	6.12	5.46	5.38	5.49	-9.46
4223	OSR Rad +Y	5.32	4.65	4.56	4.67	-10.17
4224	OSR Rad +Y	-27.03	-28.06	-28.17	-28.06	-34.63
4301	OSR Rad +Y-Z	5.27	4.41	4.38	4.58	-12.47
4302	OSR Rad +Y-Z	1.51	0.70	0.67	0.86	-12.79
4303	OSR Rad +Y-Z	-1.75	-2.53	-2.56	-2.38	-13.75
4304	OSR Rad +Y-Z	-9.47	-10.24	-10.28	-10.11	-16.61

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
4305	OSR Rad +Y-Z	2.56	1.70	1.68	1.88	-12.93
4306	OSR Rad +Y-Z	-10.00	-10.70	-10.72	-10.56	-21.10
4307	OSR Rad +Y-Z	-18.80	-19.16	-19.17	-19.09	-23.67
4308	OSR Rad +Y-Z	-21.98	-22.12	-22.13	-22.10	-23.26
4309	OSR Rad +Y-Z	-5.50	-6.32	-6.34	-6.14	-12.91
4310	OSR Rad +Y-Z	-14.74	-15.44	-15.46	-15.29	-20.99
4311	OSR Rad +Y-Z	-20.07	-20.36	-20.37	-20.30	-22.65
4312	OSR Rad +Y-Z	-21.21	-21.27	-21.28	-21.26	-21.77
4313	OSR Rad +Y-Z	-6.29	-7.15	-7.17	-6.97	-13.06
4314	OSR Rad +Y-Z	-7.02	-7.82	-7.85	-7.66	-13.62
4315	OSR Rad +Y-Z	-11.01	-11.43	-11.44	-11.34	-14.23
4316	OSR Rad +Y-Z	-13.08	-13.24	-13.24	-13.21	-14.21
4401	OSR Rad -Z	-12.66	-13.91	-13.91	-13.36	-14.80
4402	OSR Rad -Z	-11.94	-13.18	-13.18	-12.66	-13.84
4403	OSR Rad -Z	-8.38	-9.98	-9.99	-9.42	-16.04
4404	OSR Rad -Z	-5.61	-7.12	-7.14	-6.67	-15.89
4405	OSR Rad -Z	1.98	0.90	0.88	1.15	-13.14
4406	OSR Rad -Z	-7.08	-8.12	-8.15	-7.90	-19.76
4407	OSR Rad -Z	-21.20	-22.29	-22.29	-21.81	-23.40
4408	OSR Rad -Z	-18.73	-19.85	-19.85	-19.37	-20.76
4409	OSR Rad -Z	-8.08	-9.65	-9.66	-9.09	-16.46
4410	OSR Rad -Z	-6.56	-8.03	-8.05	-7.59	-16.44
4411	OSR Rad -Z	-7.53	-8.48	-8.50	-8.26	-20.61
4412	OSR Rad -Z	-27.08	-27.91	-27.93	-27.73	-35.82
4413	OSR Rad -Z	-15.04	-16.22	-16.21	-15.59	-22.38
4414	OSR Rad -Z	-13.44	-14.66	-14.65	-14.01	-21.18
4415	OSR Rad -Z	-4.55	-6.04	-6.05	-5.47	-16.58
4416	OSR Rad -Z	-8.59	-9.92	-9.94	-9.52	-16.77
4417	OSR Rad -Z	-18.90	-19.81	-19.83	-19.60	-22.51
4418	OSR Rad -Z	-19.42	-20.31	-20.33	-20.11	-22.44
4419	OSR Rad -Z	-4.41	-5.78	-5.77	-5.02	-13.17
4420	OSR Rad -Z	-3.72	-5.11	-5.09	-4.35	-13.21
4421	OSR Rad -Z	10.52	9.24	9.23	9.75	-16.47
4422	OSR Rad -Z	-11.61	-12.30	-12.31	-12.09	-16.54
4423	OSR Rad -Z	-10.48	-11.49	-11.51	-11.25	-13.54
4424	OSR Rad -Z	-10.32	-11.33	-11.36	-11.10	-13.23
4501	OSR Rad -Y-Z	-5.16	-5.50	-5.50	-5.22	-18.47
4502	OSR Rad -Y-Z	-10.57	-10.89	-10.89	-10.64	-25.52
4503	OSR Rad -Y-Z	-12.89	-13.19	-13.19	-12.96	-30.31
4504	OSR Rad -Y-Z	-39.85	-40.23	-40.23	-40.01	-44.32
4505	OSR Rad -Y-Z	-3.96	-4.29	-4.29	-4.00	-17.14
4506	OSR Rad -Y-Z	-8.13	-8.44	-8.44	-8.18	-22.46
4507	OSR Rad -Y-Z	-11.58	-11.84	-11.84	-11.64	-28.20
4508	OSR Rad -Y-Z	-3.69	-3.79	-3.79	-3.74	-5.46
4509	OSR Rad -Y-Z	-2.54	-3.12	-3.12	-2.52	-8.38
4510	OSR Rad -Y-Z	-16.45	-16.88	-16.88	-16.44	-21.57
4511	OSR Rad -Y-Z	-7.28	-7.31	-7.31	-7.29	-8.33
4512	OSR Rad -Y-Z	1.97	1.95	1.95	1.96	1.75
4513	OSR Rad -Y-Z	-2.24	-2.84	-2.84	-2.22	-7.66
4514	OSR Rad -Y-Z	-4.22	-4.80	-4.80	-4.23	-9.32
4515	OSR Rad -Y-Z	-8.95	-8.99	-8.99	-8.96	-9.48
4516	OSR Rad -Y-Z	2.06	2.02	2.02	2.04	1.84
4601	OSR Rad -Y	-2.93	-4.39	-4.30	-3.77	-6.46

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
4602	OSR Rad -Y	-7.39	-7.40	-7.27	-7.15	-7.82
4603	OSR Rad -Y	-4.93	-4.30	-3.74	-3.50	-4.57
4604	OSR Rad -Y	-7.52	-7.50	-7.40	-7.04	-7.70
4605	OSR Rad -Y	-9.42	-10.94	-10.92	-7.95	-14.08
4606	OSR Rad -Y	-8.36	-9.96	-9.96	-8.16	-15.20
4607	OSR Rad -Y	-3.17	-4.48	-4.35	-3.63	-6.88
4608	OSR Rad -Y	-10.45	-10.63	-10.54	-9.97	-11.92
4609	OSR Rad -Y	-14.57	-14.72	-14.62	-11.79	-15.57
4610	OSR Rad -Y	-21.84	-22.24	-22.22	-16.22	-23.11
4611	OSR Rad -Y	-18.67	-19.75	-19.74	-12.65	-22.08
4612	OSR Rad -Y	-8.71	-10.26	-10.26	-7.68	-15.35
4613	OSR Rad -Y	-2.25	-3.55	-3.44	-2.12	-7.48
4614	OSR Rad -Y	-4.38	-4.74	-4.71	0.03	-16.32
4615	OSR Rad -Y	-13.28	-13.40	-13.38	-5.47	-16.90
4616	OSR Rad -Y	-16.68	-16.77	-16.77	-7.55	-17.22
4617	OSR Rad -Y	-12.79	-13.79	-13.78	-4.36	-16.03
4618	OSR Rad -Y	-8.03	-9.56	-9.56	-6.47	-14.15
4619	OSR Rad -Y	-1.75	-3.19	-3.13	-1.69	-7.55
4620	OSR Rad -Y	-3.85	-4.24	-4.22	0.68	-16.43
4621	OSR Rad -Y	-12.37	-12.74	-12.71	-6.92	-20.44
4622	OSR Rad -Y	-22.31	-22.74	-22.73	-15.53	-24.23
4623	OSR Rad -Y	-5.29	-6.44	-6.43	3.60	-9.05
4624	OSR Rad -Y	-7.17	-8.72	-8.71	-5.64	-13.33
4701	OSR Rad -Y+Z	-2.68	-5.32	-5.13	-4.86	-7.70
4702	OSR Rad -Y+Z	-0.70	-2.90	-2.74	-2.47	-5.17
4703	OSR Rad -Y+Z	-0.79	-2.95	-2.76	-2.50	-5.25
4704	OSR Rad -Y+Z	-0.39	-1.92	-1.78	-1.52	-3.31
4705	OSR Rad -Y+Z	-17.45	-20.47	-20.11	-19.95	-22.26
4706	OSR Rad -Y+Z	-7.17	-9.04	-8.81	-8.69	-11.09
4707	OSR Rad -Y+Z	-9.12	-11.58	-11.29	-11.12	-14.52
4708	OSR Rad -Y+Z	-7.19	-8.40	-8.23	-8.14	-8.91
4709	OSR Rad -Y+Z	-16.58	-19.59	-19.22	-19.07	-21.33
4710	OSR Rad -Y+Z	-7.57	-10.16	-9.88	-9.71	-13.40
4711	OSR Rad -Y+Z	-7.31	-9.98	-9.71	-9.53	-13.25
4712	OSR Rad -Y+Z	-6.75	-8.33	-8.15	-8.03	-8.98
4713	OSR Rad -Y+Z	1.32	0.17	0.25	0.34	-0.78
4714	OSR Rad -Y+Z	0.27	-2.60	-2.43	-2.16	-5.20
4715	OSR Rad -Y+Z	0.12	-3.27	-3.11	-2.79	-6.02
4716	OSR Rad -Y+Z	0.15	-3.10	-2.95	-2.55	-5.09
6001	Rad +Z	-0.56	-3.86	-3.96	-3.73	-6.82
6002	Rad +Z	3.73	-0.89	-0.94	-0.58	-7.70
6003	Rad +Z	3.72	-1.26	-1.30	-0.89	-7.63
6004	Rad +Z	3.79	-1.17	-1.20	-0.79	-7.17
6005	Rad +Z	4.68	0.11	0.10	0.49	-5.18
6006	Rad +Z	2.50	-0.67	-0.63	-0.29	-3.97
6007	Rad +Z	-1.86	-5.36	-5.48	-5.24	-9.38
6008	Rad +Z	3.82	-0.63	-0.69	-0.33	-7.75
6009	Rad +Z	3.81	-1.01	-1.05	-0.64	-7.36
6010	Rad +Z	3.89	-0.91	-0.93	-0.52	-6.89
6011	Rad +Z	4.04	-0.35	-0.36	0.04	-5.80
6012	Rad +Z	2.15	-0.99	-0.94	-0.62	-4.48
6013	Rad +Z	-2.99	-6.56	-6.69	-6.44	-10.43
6014	Rad +Z	2.73	-1.76	-1.82	-1.45	-8.05

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
6015	Rad +Z	3.56	-1.25	-1.29	-0.88	-7.45
6016	Rad +Z	3.83	-0.95	-0.97	-0.55	-6.98
6017	Rad +Z	4.11	-0.29	-0.30	0.10	-6.09
6018	Rad +Z	2.68	-0.50	-0.45	-0.13	-4.38
6019	Rad +Z	-3.05	-6.87	-6.97	-6.74	-10.65
6020	Rad +Z	2.21	-2.88	-2.93	-2.56	-8.70
6021	Rad +Z	3.36	-2.03	-2.06	-1.65	-8.13
6022	Rad +Z	3.72	-1.60	-1.63	-1.21	-7.70
6023	Rad +Z	4.12	-0.85	-0.86	-0.46	-6.83
6024	Rad +Z	3.69	0.15	0.19	0.53	-3.78
6051	Shear Web1 +Z	0.57	-2.94	-2.92	-2.54	-7.16
6052	Shear Web1 +Z	0.46	-2.76	-2.74	-2.36	-6.99
6053	Shear Web1 +Z	0.87	-2.13	-2.11	-1.74	-6.94
6054	Shear Web1 +Z	4.35	1.44	1.47	1.84	-6.94
6055	Shear Web1 +Z	2.83	-0.05	-0.02	0.37	-6.89
6061	Shear Web1 +Z	0.62	-2.96	-2.94	-2.56	-7.26
6062	Shear Web1 +Z	0.50	-2.77	-2.75	-2.37	-7.07
6063	Shear Web1 +Z	0.91	-2.14	-2.12	-1.74	-7.02
6064	Shear Web1 +Z	4.57	1.62	1.64	2.02	-7.04
6065	Shear Web1 +Z	2.94	0.01	0.04	0.43	-7.00
6071	Shear Web2 +Z	1.42	-2.12	-2.20	-1.90	-10.49
6072	Shear Web2 +Z	3.95	0.51	0.43	0.73	-10.65
6073	Shear Web2 +Z	2.68	-0.70	-0.78	-0.48	-10.84
6074	Shear Web2 +Z	-3.05	-6.29	-6.37	-6.06	-11.46
6075	Shear Web2 +Z	-3.61	-6.78	-6.86	-6.55	-11.53
6081	Shear Web2 +Z	1.04	-2.44	-2.52	-2.23	-10.49
6082	Shear Web2 +Z	3.44	0.05	-0.03	0.27	-10.68
6083	Shear Web2 +Z	2.20	-1.13	-1.21	-0.92	-10.92
6084	Shear Web2 +Z	-3.24	-6.43	-6.51	-6.21	-11.53
6085	Shear Web2 +Z	-3.80	-6.92	-7.00	-6.69	-11.60
6101	Rad +Y+Z	-8.96	-9.23	-9.28	-9.27	-9.07
6102	Rad +Y+Z	-13.59	-13.95	-14.00	-13.99	2.18
6103	Rad +Y+Z	-12.04	-12.69	-12.76	-12.73	1.67
6104	Rad +Y+Z	-9.55	-10.96	-11.10	-11.02	-1.97
6105	Rad +Y+Z	-7.26	-7.36	-7.38	-7.37	-7.38
6106	Rad +Y+Z	-18.28	-20.86	-21.16	-21.03	-19.48
6107	Rad +Y+Z	-18.68	-21.37	-21.67	-21.54	-20.01
6108	Rad +Y+Z	-18.83	-21.60	-21.92	-21.78	-20.76
6109	Rad +Y+Z	-7.25	-7.45	-7.47	-7.46	-7.65
6110	Rad +Y+Z	-18.21	-20.91	-21.21	-21.08	-20.27
6111	Rad +Y+Z	-18.81	-21.57	-21.87	-21.74	-20.84
6112	Rad +Y+Z	-18.53	-21.27	-21.57	-21.44	-20.70
6113	Rad +Y+Z	-8.22	-9.09	-9.12	-9.12	-9.28
6114	Rad +Y+Z	-13.26	-14.33	-14.39	-14.38	-14.46
6115	Rad +Y+Z	-13.56	-14.48	-14.54	-14.52	-14.60
6116	Rad +Y+Z	-13.37	-13.99	-14.04	-14.02	-14.13
6201	Rad +Y	-7.53	-8.45	-8.54	-8.34	-15.13
6202	Rad +Y	-1.20	-2.08	-2.28	-2.11	-8.02
6203	Rad +Y	-0.80	-1.59	-1.82	-1.65	-7.21
6204	Rad +Y	0.92	0.69	0.57	0.62	-1.20
6205	Rad +Y	1.78	1.66	1.63	1.65	1.03
6206	Rad +Y	-11.06	-12.28	-12.49	-12.36	-14.87
6207	Rad +Y	-13.61	-14.38	-14.45	-14.29	-19.67

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
6208	Rad +Y	-4.17	-4.99	-5.18	-5.02	-10.78
6209	Rad +Y	-3.82	-4.63	-4.82	-4.66	-10.42
6210	Rad +Y	-1.29	-1.42	-1.46	-1.44	-3.16
6211	Rad +Y	-0.73	-0.80	-0.84	-0.83	-1.96
6212	Rad +Y	-26.82	-27.66	-27.90	-27.80	-31.20
6213	Rad +Y	-30.75	-31.36	-31.41	-31.29	-35.47
6214	Rad +Y	-11.25	-12.15	-12.26	-12.09	-19.38
6215	Rad +Y	-10.02	-10.91	-11.02	-10.86	-18.72
6216	Rad +Y	14.52	13.82	13.74	13.85	-2.34
6217	Rad +Y	14.57	13.87	13.78	13.90	-2.36
6218	Rad +Y	-25.29	-26.17	-26.37	-26.26	-32.39
6219	Rad +Y	-31.91	-32.58	-32.63	-32.48	-36.88
6220	Rad +Y	-11.34	-12.26	-12.36	-12.19	-19.65
6221	Rad +Y	-9.98	-10.89	-10.99	-10.83	-18.96
6222	Rad +Y	15.15	14.41	14.32	14.45	-2.34
6223	Rad +Y	15.22	14.47	14.38	14.50	-2.38
6224	Rad +Y	-23.41	-24.51	-24.62	-24.51	-31.23
6251	Shear Web3 +Y	-4.13	-5.64	-5.80	-5.63	-9.35
6252	Shear Web3 +Y	-3.22	-4.63	-4.76	-4.59	-9.68
6253	Shear Web3 +Y	0.67	-0.76	-0.87	-0.70	-10.68
6254	Shear Web3 +Y	0.92	-0.53	-0.63	-0.45	-10.74
6255	Shear Web3 +Y	0.42	-1.04	-1.15	-0.96	-10.82
6261	Shear Web3 +Y	-3.96	-5.46	-5.62	-5.45	-9.26
6262	Shear Web3 +Y	-3.05	-4.44	-4.58	-4.41	-9.58
6263	Shear Web3 +Y	0.75	-0.67	-0.79	-0.62	-10.55
6264	Shear Web3 +Y	1.12	-0.32	-0.42	-0.24	-10.59
6265	Shear Web3 +Y	0.63	-0.83	-0.93	-0.75	-10.68
6271	Shear Web4 +Y	-3.84	-4.92	-5.05	-4.84	-11.79
6272	Shear Web4 +Y	-4.72	-5.76	-5.86	-5.66	-12.26
6273	Shear Web4 +Y	-6.20	-7.18	-7.26	-7.07	-13.24
6274	Shear Web4 +Y	-7.00	-7.99	-8.06	-7.86	-14.04
6275	Shear Web4 +Y	-6.10	-7.15	-7.22	-7.01	-13.77
6281	Shear Web4 +Y	-3.94	-5.01	-5.15	-4.94	-11.91
6282	Shear Web4 +Y	-4.84	-5.87	-5.97	-5.77	-12.36
6283	Shear Web4 +Y	-6.35	-7.32	-7.40	-7.21	-13.32
6284	Shear Web4 +Y	-7.15	-8.12	-8.20	-8.00	-14.09
6285	Shear Web4 +Y	-6.28	-7.32	-7.39	-7.17	-13.84
6301	Rad +Y-Z	5.67	4.81	4.78	4.98	-12.25
6302	Rad +Y-Z	2.10	1.28	1.26	1.45	-12.33
6303	Rad +Y-Z	-0.90	-1.69	-1.72	-1.54	-13.21
6304	Rad +Y-Z	-8.99	-9.77	-9.81	-9.64	-16.25
6305	Rad +Y-Z	3.18	2.32	2.29	2.50	-12.62
6306	Rad +Y-Z	-2.92	-3.70	-3.73	-3.54	-15.25
6307	Rad +Y-Z	-12.96	-13.33	-13.34	-13.26	-18.08
6308	Rad +Y-Z	-16.32	-16.46	-16.46	-16.43	-17.50
6309	Rad +Y-Z	-5.36	-6.18	-6.21	-6.01	-12.57
6310	Rad +Y-Z	-8.36	-9.14	-9.16	-8.98	-15.12
6311	Rad +Y-Z	-14.15	-14.46	-14.47	-14.40	-16.86
6312	Rad +Y-Z	-15.25	-15.31	-15.31	-15.30	-15.79
6313	Rad +Y-Z	-6.10	-6.96	-6.98	-6.78	-12.87
6314	Rad +Y-Z	-6.51	-7.32	-7.34	-7.15	-13.19
6315	Rad +Y-Z	-10.55	-10.97	-10.99	-10.89	-13.78
6316	Rad +Y-Z	-12.64	-12.79	-12.80	-12.76	-13.74

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
6401	Rad -Z	-11.90	-13.18	-13.18	-12.61	-14.07
6402	Rad -Z	-11.13	-12.39	-12.39	-11.86	-12.95
6403	Rad -Z	-8.21	-9.81	-9.83	-9.25	-15.91
6404	Rad -Z	-5.49	-7.01	-7.03	-6.56	-15.76
6405	Rad -Z	2.79	1.71	1.69	1.96	-12.56
6406	Rad -Z	-6.40	-7.44	-7.47	-7.22	-19.19
6407	Rad -Z	-15.87	-17.05	-17.05	-16.53	-18.10
6408	Rad -Z	-13.37	-14.58	-14.58	-14.07	-15.28
6409	Rad -Z	-7.87	-9.45	-9.46	-8.89	-16.26
6410	Rad -Z	-6.31	-7.79	-7.81	-7.35	-16.23
6411	Rad -Z	0.15	-0.89	-0.92	-0.65	-14.60
6412	Rad -Z	-22.82	-23.71	-23.74	-23.52	-32.26
6413	Rad -Z	-8.66	-9.94	-9.94	-9.25	-16.80
6414	Rad -Z	-7.06	-8.40	-8.38	-7.68	-15.60
6415	Rad -Z	-4.52	-6.03	-6.04	-5.46	-16.36
6416	Rad -Z	-8.28	-9.64	-9.66	-9.22	-16.54
6417	Rad -Z	-13.54	-14.53	-14.55	-14.30	-17.12
6418	Rad -Z	-13.30	-14.27	-14.29	-14.05	-16.41
6419	Rad -Z	-3.87	-5.25	-5.24	-4.49	-12.69
6420	Rad -Z	-3.44	-4.84	-4.83	-4.07	-12.73
6421	Rad -Z	7.60	6.28	6.28	6.80	-16.23
6422	Rad -Z	-10.58	-11.42	-11.43	-11.16	-16.31
6423	Rad -Z	-10.01	-11.03	-11.06	-10.79	-13.03
6424	Rad -Z	-9.84	-10.85	-10.88	-10.62	-12.75
6451	Shear Web5 -Z	-3.78	-5.24	-5.27	-4.84	-14.64
6452	Shear Web5 -Z	-3.57	-5.03	-5.06	-4.62	-14.37
6453	Shear Web5 -Z	-4.85	-6.30	-6.32	-5.88	-14.43
6454	Shear Web5 -Z	-5.99	-7.40	-7.42	-6.99	-14.51
6455	Shear Web5 -Z	-6.48	-7.85	-7.88	-7.46	-14.57
6461	Shear Web5 -Z	-3.90	-5.37	-5.39	-4.96	-14.67
6462	Shear Web5 -Z	-3.68	-5.15	-5.18	-4.73	-14.41
6463	Shear Web5 -Z	-4.90	-6.35	-6.38	-5.93	-14.46
6464	Shear Web5 -Z	-5.98	-7.41	-7.43	-6.99	-14.53
6465	Shear Web5 -Z	-6.45	-7.84	-7.87	-7.44	-14.59
6471	Shear Web6 -Z	-7.68	-9.37	-9.38	-8.68	-14.99
6472	Shear Web6 -Z	-7.19	-8.84	-8.85	-8.19	-14.58
6473	Shear Web6 -Z	-6.24	-7.89	-7.90	-7.21	-14.48
6474	Shear Web6 -Z	-5.24	-6.88	-6.89	-6.18	-14.40
6475	Shear Web6 -Z	-5.00	-6.65	-6.66	-5.90	-14.45
6481	Shear Web6 -Z	-7.73	-9.41	-9.43	-8.73	-14.97
6482	Shear Web6 -Z	-7.23	-8.88	-8.89	-8.22	-14.55
6483	Shear Web6 -Z	-6.26	-7.91	-7.92	-7.22	-14.45
6484	Shear Web6 -Z	-5.24	-6.88	-6.89	-6.17	-14.37
6485	Shear Web6 -Z	-5.01	-6.66	-6.67	-5.90	-14.41
6501	Rad -Y-Z	2.83	2.46	2.46	2.77	-11.87
6502	Rad -Y-Z	-3.38	-3.73	-3.73	-3.45	-19.83
6503	Rad -Y-Z	-5.41	-5.74	-5.74	-5.49	-24.81
6504	Rad -Y-Z	-36.90	-37.32	-37.32	-37.08	-41.56
6505	Rad -Y-Z	4.15	3.79	3.79	4.11	-10.67
6506	Rad -Y-Z	-0.20	-0.54	-0.54	-0.26	-16.26
6507	Rad -Y-Z	-4.67	-4.98	-4.98	-4.75	-23.72
6508	Rad -Y-Z	-2.33	-2.42	-2.42	-2.37	-3.80
6509	Rad -Y-Z	-2.02	-2.61	-2.61	-1.99	-7.67

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
6510	Rad -Y-Z	-10.85	-11.34	-11.34	-10.85	-16.25
6511	Rad -Y-Z	0.58	0.57	0.57	0.58	-0.04
6512	Rad -Y-Z	2.54	2.53	2.53	2.54	2.39
6513	Rad -Y-Z	-1.98	-2.58	-2.58	-1.96	-7.41
6514	Rad -Y-Z	-3.55	-4.14	-4.14	-3.56	-8.74
6515	Rad -Y-Z	-1.82	-1.86	-1.86	-1.83	-2.31
6516	Rad -Y-Z	2.50	2.47	2.47	2.49	2.29
6601	Rad -Y	-2.63	-4.12	-4.04	-3.50	-6.22
6602	Rad -Y	-0.34	-0.40	-0.35	-0.25	-0.81
6603	Rad -Y	0.24	0.36	0.52	0.68	0.08
6604	Rad -Y	0.14	0.11	0.13	0.32	-0.03
6605	Rad -Y	-8.99	-10.54	-10.53	-7.62	-13.74
6606	Rad -Y	-8.15	-9.76	-9.76	-8.00	-15.05
6607	Rad -Y	-2.90	-4.22	-4.11	-3.39	-6.61
6608	Rad -Y	-3.81	-3.99	-3.94	-3.48	-5.10
6609	Rad -Y	-8.35	-8.57	-8.51	-5.49	-9.43
6610	Rad -Y	-16.70	-17.16	-17.14	-10.45	-18.12
6611	Rad -Y	-13.03	-14.19	-14.19	-6.25	-16.70
6612	Rad -Y	-8.40	-9.96	-9.96	-7.45	-15.13
6613	Rad -Y	-2.01	-3.33	-3.23	-1.94	-7.17
6614	Rad -Y	3.55	3.16	3.19	8.60	-10.21
6615	Rad -Y	-6.63	-6.75	-6.75	2.28	-10.47
6616	Rad -Y	-10.03	-10.09	-10.09	0.27	-10.45
6617	Rad -Y	-6.04	-7.14	-7.13	3.47	-9.58
6618	Rad -Y	-7.79	-9.33	-9.33	-6.33	-13.96
6619	Rad -Y	-1.51	-2.97	-2.91	-1.52	-7.22
6620	Rad -Y	3.74	3.33	3.35	8.84	-10.34
6621	Rad -Y	-5.75	-6.14	-6.12	0.18	-14.74
6622	Rad -Y	-17.30	-17.75	-17.74	-9.97	-19.26
6623	Rad -Y	-4.51	-5.68	-5.67	4.57	-8.30
6624	Rad -Y	-7.01	-8.56	-8.56	-5.60	-13.22
6651	Shear Web7 -Y	-7.29	-9.17	-9.16	-7.46	-13.50
6652	Shear Web7 -Y	-7.17	-9.03	-9.03	-7.15	-13.48
6653	Shear Web7 -Y	-6.81	-8.66	-8.66	-6.81	-13.34
6654	Shear Web7 -Y	-6.49	-8.33	-8.33	-6.43	-13.11
6655	Shear Web7 -Y	-6.30	-8.10	-8.10	-6.00	-12.90
6661	Shear Web7 -Y	-7.26	-9.14	-9.14	-7.41	-13.44
6662	Shear Web7 -Y	-7.16	-9.02	-9.02	-7.12	-13.44
6663	Shear Web7 -Y	-6.79	-8.65	-8.65	-6.77	-13.30
6664	Shear Web7 -Y	-6.47	-8.32	-8.32	-6.40	-13.08
6665	Shear Web7 -Y	-6.28	-8.08	-8.08	-5.94	-12.86
6671	Shear Web8 -Y	-2.84	-4.73	-4.69	-3.67	-7.44
6672	Shear Web8 -Y	-2.68	-4.41	-4.37	-3.30	-7.21
6673	Shear Web8 -Y	-2.61	-4.26	-4.22	-3.02	-7.30
6674	Shear Web8 -Y	-2.35	-4.00	-3.97	-2.73	-7.20
6675	Shear Web8 -Y	-2.40	-4.12	-4.09	-2.75	-7.51
6681	Shear Web8 -Y	-2.74	-4.61	-4.58	-3.58	-7.31
6682	Shear Web8 -Y	-2.58	-4.31	-4.27	-3.23	-7.09
6683	Shear Web8 -Y	-2.52	-4.16	-4.12	-2.95	-7.17
6684	Shear Web8 -Y	-2.25	-3.89	-3.86	-2.66	-7.06
6685	Shear Web8 -Y	-2.29	-4.00	-3.97	-2.67	-7.36
6701	Rad -Y+Z	-2.50	-5.09	-4.92	-4.64	-7.50
6702	Rad -Y+Z	-0.70	-2.86	-2.71	-2.43	-5.14

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
6703	Rad -Y+Z	-0.79	-2.90	-2.73	-2.46	-5.21
6704	Rad -Y+Z	-0.39	-1.87	-1.74	-1.47	-3.28
6705	Rad -Y+Z	-14.49	-17.37	-17.06	-16.88	-19.31
6706	Rad -Y+Z	-2.47	-3.98	-3.82	-3.70	-6.20
6707	Rad -Y+Z	-5.08	-7.32	-7.08	-6.89	-10.63
6708	Rad -Y+Z	-2.74	-3.52	-3.42	-3.34	-4.01
6709	Rad -Y+Z	-13.65	-16.48	-16.16	-16.00	-18.40
6710	Rad -Y+Z	-3.23	-5.49	-5.27	-5.08	-9.16
6711	Rad -Y+Z	-3.13	-5.42	-5.20	-5.01	-9.12
6712	Rad -Y+Z	-2.53	-3.55	-3.45	-3.32	-4.18
6713	Rad -Y+Z	1.62	0.72	0.77	0.86	-0.17
6714	Rad -Y+Z	0.21	-2.46	-2.31	-2.03	-5.08
6715	Rad -Y+Z	0.04	-3.09	-2.95	-2.62	-5.85
6716	Rad -Y+Z	0.08	-2.85	-2.71	-2.30	-4.87
7000	SVM Top +Z MLI	-69.52	-70.14	-69.96	-69.71	-73.77
7001	SVM Top +Y+Z MLI	-71.33	-71.30	-71.34	-71.23	-73.41
7002	SVM Top +Y MLI	-71.66	-71.66	-71.82	-71.70	-76.95
7003	SVM Top +Y-Z MLI	-87.21	-87.19	-87.25	-87.09	-90.60
7004	SVM Top -Z MLI	-87.56	-88.47	-88.50	-88.15	-93.57
7005	SVM Top -Z-Y MLI	-86.36	-86.91	-86.87	-86.20	-90.40
7006	SVM Top -Y MLI	-75.64	-75.85	-75.43	-73.98	-78.18
7007	SVM Top -Y+Z MLI	-67.35	-67.34	-67.36	-67.10	-69.00
7200	SVM Top Disc +Z MLI	-76.13	-74.23	-74.21	-73.88	-77.10
7201	SVM Top Disc +Z+Y MLI	-77.81	-76.46	-76.40	-76.10	-79.40
7202	SVM Top Disc +Y MLI	-80.68	-80.48	-80.39	-80.08	-83.96
7203	SVM Top Disc +Y-Z MLI	-86.97	-88.16	-88.23	-87.86	-91.77
7204	SVM Top Disc -Z MLI	-88.62	-90.14	-90.16	-89.73	-93.80
7205	SVM Top Disc -Z-Y MLI	-87.48	-88.82	-88.82	-88.32	-92.25
7206	SVM Top Disc -Y MLI	-81.48	-81.46	-81.39	-80.83	-84.35
7207	SVM Top Disc -Y+Z MLI	-77.47	-76.16	-75.99	-75.59	-78.88
7400	SVM Top Disc +Z	-4.83	-8.55	-8.59	-7.96	-13.98
7401	SVM Top Disc +Z+Y	-5.25	-8.67	-8.73	-8.16	-14.15
7402	SVM Top Disc +Y	-4.89	-7.68	-7.74	-7.19	-13.81
7403	SVM Top Disc +Y-Z	-6.51	-9.18	-9.22	-8.61	-15.08
7404	SVM Top Disc -Z	-7.02	-9.79	-9.82	-9.13	-15.60
7405	SVM Top Disc -Z-Y	-6.87	-9.66	-9.70	-8.89	-15.23
7406	SVM Top Disc -Y	-5.86	-8.81	-8.84	-7.86	-13.96
7407	SVM Top Disc -Y+Z	-4.99	-8.45	-8.48	-7.75	-13.56
7600	SVM Top +Z	0.44	-3.63	-3.66	-3.24	-9.95
7601	SVM Top +Y+Z	-7.72	-9.71	-9.81	-9.62	-13.46
7602	SVM Top +Y	1.50	0.27	0.16	0.37	-9.65
7603	SVM Top +Y-Z	-8.08	-9.13	-9.16	-8.90	-14.62
7604	SVM Top -Z	-6.05	-7.67	-7.69	-7.13	-15.79
7605	SVM Top -Z-Y	-6.56	-8.28	-8.28	-7.19	-13.97
7606	SVM Top -Y	-6.10	-7.91	-7.90	-5.12	-12.17
7607	SVM Top -Y+Z	-0.39	-2.29	-2.24	-1.80	-5.24
10000	Cryocooler middle	-133.15	-133.15	-133.15	-133.15	-133.15
10010	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15
10011	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15
10012	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15
10013	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15
18001	Top Shield +Z	-173.15	-173.15	-173.15	-173.15	-173.15
18002	Top Shield +Y	-173.15	-173.15	-173.15	-173.15	-173.15

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
18003	Top Shield -Z	-173.15	-173.15	-173.15	-173.15	-173.15
18004	Top Shield -Y	-173.15	-173.15	-173.15	-173.15	-173.15
18101	Top Shield +Z	-173.15	-173.15	-173.15	-173.15	-173.15
18102	Top Shield +Y	-173.15	-173.15	-173.15	-173.15	-173.15
18103	Top Shield -Z	-173.15	-173.15	-173.15	-173.15	-173.15
18104	Top Shield -Y	-173.15	-173.15	-173.15	-173.15	-173.15
18501	Frontal Shield -Y+Z	77.11	63.42	65.53	65.53	63.42
18502	Frontal Shield -Y+Z	77.11	63.40	65.53	65.53	63.40
18503	Frontal Shield +Z	95.38	82.11	82.11	82.11	82.11
18504	Frontal Shield +Z	95.39	82.11	82.11	82.11	82.11
18505	Frontal Shield +Y+Z	77.11	65.53	63.42	63.42	65.53
18506	Frontal Shield +Y+Z	77.08	65.55	63.44	63.44	65.55
18510	MLI Closure SVM -Y	-98.33	-100.87	-100.16	-96.93	-104.80
18512	MLI Closure SVM -Y+Z	-17.92	-65.31	-62.89	-62.87	-65.59
18514	MLI Closure SVM +Z	23.31	-14.18	-14.16	-14.16	-14.22
18516	MLI Closure SVM +Y+Z	-46.05	-76.55	-77.52	-77.50	-76.47
18518	MLI Closure SVM +Y	-83.56	-84.13	-84.60	-84.52	-90.76
18601	Frontal Shield -Y+Z	-134.25	-120.82	-120.38	-120.37	-120.90
18602	Frontal Shield -Y+Z	-145.03	-93.22	-91.71	-91.71	-93.23
18603	Frontal Shield +Z	-133.17	-117.71	-117.98	-117.97	-117.79
18604	Frontal Shield +Z	-135.60	-82.52	-84.56	-84.56	-82.53
18605	Frontal Shield +Y+Z	-134.72	-120.73	-120.60	-120.59	-120.81
18606	Frontal Shield +Y+Z	-144.40	-92.66	-92.78	-92.78	-92.68
18610	MLI Closure SVM -Y	-23.15	-23.15	-23.15	-23.15	-23.15
18612	MLI Closure SVM -Y+Z	-23.15	-23.15	-23.15	-23.15	-23.15
18614	MLI Closure SVM +Z	-23.15	-23.15	-23.15	-23.15	-23.15
18616	MLI Closure SVM +Y+Z	-23.15	-23.15	-23.15	-23.15	-23.15
18618	MLI Closure SVM +Y	-23.15	-23.15	-23.15	-23.15	-23.15
19000	MLI Struct Braces	-130.87	-115.80	-116.97	-116.95	-116.07
19005	MLI Struct Braces	-132.20	-120.68	-118.32	-118.30	-120.99
19010	MLI Struct Braces	-137.98	-126.13	-124.63	-124.60	-126.47
19015	MLI Struct Braces	-143.43	-136.75	-136.72	-136.69	-137.28
19020	MLI Struct Braces	-152.21	-146.10	-141.02	-140.99	-146.72
19025	MLI Struct Braces	-163.20	-155.82	-152.88	-152.84	-156.49
19030	MLI Struct Braces	-169.59	-167.32	-167.34	-167.27	-168.18
19035	MLI Struct Braces	-174.11	-172.34	-172.72	-172.63	-173.31
19040	MLI Struct Braces	-171.73	-170.29	-170.54	-170.42	-171.18
19045	MLI Struct Braces	-169.26	-166.70	-167.27	-167.13	-167.47
19050	MLI Struct Braces	-161.41	-157.71	-157.43	-157.30	-158.28
19055	MLI Struct Braces	-153.63	-145.74	-146.87	-146.75	-146.17
19060	MLI Struct Braces	-144.60	-136.90	-136.74	-136.64	-137.27
19065	MLI Struct Braces	-137.25	-125.90	-121.90	-121.85	-126.19
19070	MLI Struct Braces	-130.67	-118.60	-119.38	-119.34	-118.87
19075	MLI Struct Braces	-130.22	-116.78	-114.08	-114.05	-117.05
19080	MLI Struct Braces Front	-145.54	-7.15	-14.74	-14.74	-7.15
19081	MLI Struct Braces Front	-125.78	5.92	6.23	6.23	5.92
19082	MLI Struct Braces Front	-123.08	-69.55	-71.17	-71.17	-69.56
19083	MLI Struct Braces Front	-117.63	-62.37	-60.40	-60.40	-62.38
19084	MLI Struct Braces Front	-125.57	4.12	5.29	5.29	4.11
19085	MLI Struct Braces Front	-142.06	-12.73	-9.04	-9.04	-12.73
19086	MLI Struct Braces Front	-141.18	-123.69	-126.94	-126.94	-123.73
19087	MLI Struct Braces Front	-136.48	-121.27	-118.86	-118.85	-121.33
19088	MLI Struct Braces Front	-131.91	-114.32	-115.60	-115.60	-114.37

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A
NODE	LABEL	MODE3	MODE3	MODE3	MODE1	SURVIVAL
		T-UFP	T-UFP	T-UFP	T-UFP	T-UFP
		[°C]	[°C]	[°C]	[°C]	[°C]
19089	MLI Struct Braces Front	-129.93	-115.35	-113.58	-113.57	-115.41
19090	MLI Struct Braces Front	-136.77	-119.80	-119.95	-119.94	-119.87
19091	MLI Struct Braces Front	-143.27	-127.18	-128.57	-128.56	-127.22
19092	MLI Struct Braces Front	-132.42	-110.64	-103.23	-103.23	-110.66
19093	MLI Struct Braces Front	-122.69	-96.33	-92.75	-92.75	-96.35
19094	MLI Struct Braces Front	-121.74	-96.60	-95.31	-95.30	-96.62
19095	MLI Struct Braces Front	-132.89	-112.25	-109.11	-109.11	-112.26
99998	INACTIVE_NODE	0	0	0	0	0
99999	space node	-269	-269	-269	-269	-269

Table 3.3.1-5 HERSCHEL – BOL Steady State Analysis Results

Hereafter there are all the Temperature results for all the EOL Steady State Cases:

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
1	THRPZ	30.48	41.26	41.59	41.68	40.76	41.09	41.18
2	AAD	28.70	42.76	42.72	42.88	42.71	42.67	42.83
4	VMC	27.69	42.05	42.01	42.18	41.98	41.95	42.11
5	SASZ_BRK	36.13	49.74	49.70	49.83	49.65	49.64	49.75
6	SASZ	36.59	50.10	50.06	50.18	50.01	50.00	50.11
21	THRPY	15.54	23.88	25.56	25.44	22.92	24.62	24.5
41	THRMZ	3.80	19.72	19.67	19.98	19.72	19.68	19.99
42	STRMZMY	45.54	58.77	59.77	60.25	58.64	59.64	60.12
43	STRMY CONE	-24.64	-5.48	-5.06	-4.86	-5.80	-5.38	-5.18
44	STRMZPY CONE	-46.50	-26.43	-25.40	-25.01	-27.41	-26.37	-25.99
45	STRMZPY	1.37	14.78	16.92	17.72	14.48	16.63	17.43
46	SAS	-4.82	7.79	7.82	8.10	7.78	7.81	8.09
47	SAS_BRK	-4.51	8.17	8.20	8.48	8.16	8.19	8.48
48	SREM	4.94	19.37	19.41	19.73	19.36	19.40	19.73
61	THRMY	7.87	5.20	0.51	0.63	6.17	1.54	1.66
101	RFDN	18.53	27.82	28.19	28.26	26.93	27.30	27.37
102	EPC1	33.84	41.81	42.13	42.19	41.04	41.37	41.43
103	EPC2	15.36	26.03	26.36	26.42	25.04	25.38	25.44
104	TRANSX1	25.47	34.59	35.09	35.13	33.71	34.22	34.26
105	TRANSX2	21.81	33.55	34.04	34.08	32.54	33.03	33.07
106	TWTA1	40.55	47.90	48.22	48.28	47.11	47.44	47.49
107	TWTA2	15.64	27.04	27.37	27.43	25.96	26.31	26.36
201	PCDU	34.22	44.73	45.86	45.81	43.70	44.84	44.79
202	CMDU	17.63	28.15	30.22	30.03	27.35	29.44	29.24
203	ACC	9.86	21.24	23.34	23.11	20.15	22.28	22.04
204	BATT	9.80	19.67	20.99	20.94	18.66	20.01	19.95
301	FPSPU1_2	27.69	34.87	40.14	42.39	34.61	39.89	42.15
303	FPDPU	23.32	29.87	35.69	37.16	29.60	35.43	36.91
304	FPBOLC	16.31	14.93	28.26	21.90	14.58	27.94	21.57
305	FPMECDEC	17.28	23.42	29.81	36.59	23.15	29.56	36.34
401	CRYOE	7.06	21.39	21.39	21.72	21.39	21.39	21.72
404	HSDCU	14.54	27.41	27.39	27.71	27.40	27.38	27.7
405	HSDPU	10.90	19.32	23.49	25.25	19.08	23.27	25.03
406	HSFCU	23.55	32.67	36.41	37.53	32.44	36.20	37.31
501	FHWOV	9.94	9.68	9.54	9.71	9.69	9.55	9.72
502	FHHRV	23.09	26.29	26.07	26.15	26.31	26.10	26.18
503	FHICU	13.44	16.08	15.91	15.99	16.10	15.93	16.01
504	FHFCU	13.66	18.67	18.21	18.34	18.71	18.25	18.38
506	FHWEV	9.97	14.72	14.57	14.66	14.73	14.58	14.67
601	FHWOH	9.79	9.25	4.25	4.38	10.13	5.20	5.33
602	FHWEH	9.86	15.62	10.10	10.23	16.52	11.07	11.19
603	FHHRH	22.71	39.81	28.27	28.38	41.06	29.65	29.76
604	FHLCU	12.77	33.36	21.51	21.68	33.91	22.13	22.29
605	FHLSU	-0.17	28.57	6.41	6.52	29.69	7.66	7.78
701	RWL1_C	20.87	32.38	31.37	31.53	32.92	31.92	32.07
702	RWL2_C	22.78	34.04	33.42	33.56	34.49	33.88	34.02
703	RWL3_C	21.06	32.94	31.84	31.99	33.44	32.35	32.5
704	RWL4_C	20.41	32.72	32.06	32.22	33.09	32.44	32.6
705	RWDE	22.64	31.93	31.31	31.43	32.54	31.92	32.05

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
706	QRS1	24.42	35.70	36.56	36.57	34.91	35.78	35.8
707	QRS2	23.50	35.25	36.14	36.15	34.43	35.33	35.35
801	GYRO	30.76	43.80	44.05	44.18	43.41	43.66	43.79
802	PDU	27.15	40.87	40.62	40.79	40.93	40.68	40.85
900	TANK1_LOWER MLI	18.44	33.32	33.07	33.35	33.25	33.00	33.29
910	TANK2_LOWER MLI	19.49	33.58	34.58	34.82	33.24	34.24	34.49
950	TANK1	19.98	33.32	33.07	33.35	33.25	33.00	33.29
960	TANK2	19.99	33.58	34.58	34.82	33.24	34.24	34.49
1000	SVM Bot +Z MLI	-18.98	92.27	92.28	92.28	92.09	92.09	92.09
1001	SVM Bot +Y+Z MLI	-68.61	79.59	79.60	79.60	79.31	79.32	79.32
1002	SVM Bot +Y MLI	-104.84	72.21	72.25	72.25	71.12	71.16	71.16
1003	SVM Bot +Y-Z MLI	-145.27	47.29	47.40	47.41	46.36	46.46	46.48
1004	SVM Bot -Z MLI	-151.56	6.92	6.98	7.00	7.02	7.08	7.1
1005	SVM Bot -Z-Y MLI	-147.12	47.17	47.17	47.18	47.96	47.96	47.97
1006	SVM Bot -Y MLI	-106.02	71.28	71.23	71.23	72.28	72.23	72.24
1007	SVM Bot -Y+Z MLI	-63.65	80.94	80.93	80.93	81.26	81.25	81.26
1600	SVM Bot +Z	24.37	40.87	40.96	41.12	40.71	40.80	40.96
1601	SVM Bot +Y+Z	23.09	36.03	36.51	36.58	35.32	35.80	35.87
1602	SVM Bot +Y	16.73	29.62	31.42	31.32	28.82	30.63	30.53
1603	SVM Bot +Y-Z	17.48	27.53	32.64	33.30	27.21	32.34	33
1604	SVM Bot -Z	12.43	27.57	29.31	29.95	27.44	29.19	29.83
1605	SVM Bot -Z-Y	9.03	25.62	25.22	25.52	25.67	25.27	25.58
1606	SVM Bot -Y	11.22	27.01	23.88	24.09	27.45	24.34	24.54
1607	SVM Bot -Y+Z	19.19	34.13	33.28	33.45	34.50	33.67	33.83
2000	Launch Adapter Cone Ext	41.03	76.57	76.74	76.90	76.42	76.59	76.75
2001	Launch Adapter Cone Ext	30.58	69.53	70.02	70.16	68.86	69.35	69.49
2002	Launch Adapter Cone Ext	16.54	57.70	58.65	58.80	57.01	57.96	58.12
2003	Launch Adapter Cone Ext	8.62	51.83	53.23	53.58	51.58	52.98	53.33
2004	Launch Adapter Cone Ext	7.02	51.26	52.08	52.39	51.16	51.98	52.3
2005	Launch Adapter Cone Ext	6.94	51.48	51.68	51.94	51.53	51.73	52
2006	Launch Adapter Cone Ext	14.76	56.73	56.18	56.39	57.14	56.60	56.8
2007	Launch Adapter Cone Ext	30.91	68.80	68.62	68.79	69.22	69.05	69.22
2010	Launch Adapter Edge Ex	40.50	76.68	76.85	77.00	76.53	76.71	76.86
2011	Launch Adapter Edge Ex	30.39	69.67	70.16	70.30	69.00	69.49	69.64
2012	Launch Adapter Edge Ex	16.44	58.17	59.11	59.27	57.49	58.44	58.6
2013	Launch Adapter Edge Ex	8.56	52.29	53.68	54.03	52.04	53.43	53.78
2014	Launch Adapter Edge Ex	7.00	51.45	52.26	52.58	51.35	52.16	52.48
2015	Launch Adapter Edge Ex	6.91	51.94	52.14	52.40	51.99	52.19	52.45
2016	Launch Adapter Edge Ex	14.69	57.21	56.67	56.88	57.62	57.08	57.29
2017	Launch Adapter Edge Ex	30.69	68.94	68.76	68.94	69.36	69.18	69.36
2050	Adapter Cone Covered Ext	39.08	72.52	72.69	72.85	72.36	72.54	72.7
2051	Adapter Cone Covered Ext	29.47	65.94	66.42	66.57	65.28	65.76	65.91
2052	Adapter Cone Covered Ext	16.45	54.82	55.81	55.96	54.14	55.13	55.28
2053	Adapter Cone Covered Ext	9.25	49.30	50.86	51.24	49.05	50.62	51
2054	Adapter Cone Covered Ext	7.55	48.83	49.68	50.02	48.73	49.58	49.92
2055	Adapter Cone Covered Ext	7.31	48.96	49.14	49.41	49.00	49.18	49.45
2056	Adapter Cone Covered Ext	14.46	53.82	53.15	53.36	54.22	53.55	53.76
2057	Adapter Cone Covered Ext	29.67	65.22	65.03	65.21	65.62	65.43	65.61
2100	Launch Adapter Cone Int	40.51	76.03	76.20	76.36	75.89	76.06	76.22
2101	Launch Adapter Cone Int	30.41	69.29	69.77	69.92	68.62	69.11	69.26
2102	Launch Adapter Cone Int	16.53	57.56	58.51	58.67	56.88	57.83	57.99
2103	Launch Adapter Cone Int	8.68	51.75	53.15	53.50	51.50	52.90	53.25

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
2104	Launch Adapter Cone Int	7.05	51.24	52.05	52.37	51.14	51.95	52.27
2105	Launch Adapter Cone Int	7.01	51.41	51.60	51.87	51.45	51.65	51.92
2106	Launch Adapter Cone Int	14.76	56.60	56.05	56.26	57.01	56.46	56.67
2107	Launch Adapter Cone Int	30.71	68.56	68.38	68.56	68.98	68.80	68.98
2110	Launch Adapter Edge Ext	40.36	76.16	76.33	76.49	76.01	76.19	76.35
2111	Launch Adapter Edge Ext	30.36	69.39	69.88	70.02	68.72	69.21	69.36
2112	Launch Adapter Edge Ext	16.50	57.80	58.75	58.90	57.12	58.07	58.23
2113	Launch Adapter Edge Ext	8.65	51.97	53.36	53.71	51.72	53.11	53.46
2114	Launch Adapter Edge Ext	7.03	51.34	52.15	52.47	51.23	52.05	52.37
2115	Launch Adapter Edge Ext	6.99	51.62	51.82	52.08	51.67	51.87	52.14
2116	Launch Adapter Edge Ext	14.74	56.85	56.30	56.51	57.25	56.71	56.92
2117	Launch Adapter Edge Ext	30.65	68.66	68.48	68.66	69.08	68.90	69.08
2150	Adapter Cone Covered Int	39.05	72.48	72.65	72.81	72.32	72.50	72.66
2151	Adapter Cone Covered Int	29.46	65.91	66.39	66.53	65.25	65.73	65.88
2152	Adapter Cone Covered Int	16.45	54.80	55.79	55.94	54.12	55.12	55.27
2153	Adapter Cone Covered Int	9.26	49.29	50.85	51.23	49.04	50.61	50.99
2154	Adapter Cone Covered Int	7.56	48.82	49.68	50.01	48.72	49.58	49.91
2155	Adapter Cone Covered Int	7.31	48.95	49.13	49.40	48.99	49.17	49.44
2156	Adapter Cone Covered Int	14.46	53.80	53.13	53.34	54.20	53.54	53.74
2157	Adapter Cone Covered Int	29.66	65.19	65.00	65.17	65.59	65.40	65.58
2200	RCS Panel MLI	-161.78	72.56	72.56	72.56	72.56	72.56	72.56
2201	RCS Panel MLI	-162.08	72.54	72.55	72.55	72.54	72.55	72.55
2202	RCS Panel MLI	-162.65	72.52	72.54	72.54	72.52	72.53	72.53
2203	RCS Panel MLI	-163.16	72.50	72.52	72.52	72.50	72.51	72.52
2204	RCS Panel MLI	-163.33	72.49	72.51	72.51	72.49	72.50	72.51
2205	RCS Panel MLI	-163.64	72.50	72.50	72.51	72.50	72.50	72.51
2206	RCS Panel MLI	-163.30	72.52	72.51	72.51	72.52	72.51	72.51
2207	RCS Panel MLI	-162.36	72.54	72.54	72.54	72.54	72.54	72.54
2210	Bottom Disc MLI	-162.33	72.52	72.53	72.53	72.52	72.53	72.53
2211	Bottom Disc MLI	-162.39	72.52	72.53	72.53	72.52	72.52	72.53
2212	Bottom Disc MLI	-162.66	72.51	72.52	72.53	72.51	72.52	72.52
2213	Bottom Disc MLI	-162.93	72.50	72.51	72.52	72.50	72.51	72.51
2214	Bottom Disc MLI	-163.04	72.50	72.51	72.51	72.49	72.50	72.51
2215	Bottom Disc MLI	-163.10	72.50	72.50	72.51	72.50	72.50	72.51
2216	Bottom Disc MLI	-162.87	72.51	72.52	72.52	72.51	72.51	72.52
2217	Bottom Disc MLI	-162.53	72.52	72.52	72.52	72.52	72.52	72.52
2250	Adapter Cone MLI	138.19	140.27	140.27	140.28	140.16	140.17	140.17
2251	Adapter Cone MLI	75.17	113.37	113.38	113.38	110.71	110.72	110.72
2252	Adapter Cone MLI	-20.87	38.74	38.79	38.80	35.31	35.36	35.37
2253	Adapter Cone MLI	-143.89	0.90	1.03	1.06	0.07	0.20	0.22
2254	Adapter Cone MLI	-147.02	-26.77	-26.69	-26.67	-26.75	-26.67	-26.64
2255	Adapter Cone MLI	-144.83	1.81	1.81	1.83	2.50	2.50	2.52
2256	Adapter Cone MLI	-22.08	36.15	36.10	36.11	39.28	39.23	39.24
2257	Adapter Cone MLI	100.24	112.04	112.03	112.04	114.69	114.69	114.69
2400	RCS Panel	17.19	37.86	38.15	38.38	37.70	37.99	38.22
2401	RCS Panel	16.32	36.80	37.33	37.53	36.49	37.02	37.22
2402	RCS Panel	14.68	35.18	36.22	36.44	34.82	35.87	36.09
2403	RCS Panel	13.19	33.34	34.77	35.19	33.13	34.57	34.99
2404	RCS Panel	12.69	32.92	33.86	34.26	32.77	33.72	34.12
2405	RCS Panel	11.80	33.37	33.67	33.99	33.29	33.59	33.92
2406	RCS Panel	12.80	34.72	34.28	34.54	34.71	34.28	34.54
2407	RCS Panel	15.52	36.55	36.50	36.74	36.53	36.49	36.73

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
2410	Bottom Disc	15.62	35.23	35.61	35.87	35.07	35.46	35.72
2411	Bottom Disc	15.44	34.95	35.50	35.75	34.74	35.30	35.55
2412	Bottom Disc	14.64	34.37	35.17	35.47	34.13	34.94	35.24
2413	Bottom Disc	13.87	33.24	34.23	34.60	33.06	34.06	34.43
2414	Bottom Disc	13.53	33.08	33.88	34.24	32.93	33.74	34.1
2415	Bottom Disc	13.36	33.26	33.77	34.10	33.12	33.64	33.97
2416	Bottom Disc	14.02	34.31	34.60	34.89	34.19	34.48	34.77
2417	Bottom Disc	15.02	34.84	35.08	35.35	34.76	35.00	35.27
2500	SVM Cone +Z Int	21.13	37.39	37.63	37.85	37.22	37.47	37.68
2501	SVM Cone +Z+Y Int	19.20	34.18	34.69	34.85	33.70	34.22	34.38
2502	SVM Cone +Y Int	18.66	32.43	33.86	33.91	31.84	33.28	33.33
2503	SVM Cone +Y-Z Int	15.75	28.71	31.85	32.67	28.47	31.62	32.44
2504	SVM Cone -Z Int	14.33	30.25	31.53	32.06	30.11	31.39	31.92
2505	SVM Cone -Z-Y Int	14.03	30.67	30.64	30.97	30.63	30.61	30.94
2506	SVM Cone -Y Int	14.19	31.14	29.08	29.33	31.32	29.28	29.53
2507	SVM Cone -Z+Y Int	18.73	34.42	34.03	34.25	34.51	34.12	34.34
2510	SVM Cone +Z Int	20.46	36.85	37.09	37.31	36.67	36.92	37.14
2511	SVM Cone +Z+Y Int	18.79	33.84	34.34	34.49	33.37	33.88	34.04
2512	SVM Cone +Y Int	18.04	31.87	33.35	33.38	31.26	32.75	32.78
2513	SVM Cone +Y-Z Int	15.19	28.48	31.53	32.36	28.23	31.30	32.13
2514	SVM Cone -Z Int	14.29	30.31	31.57	32.10	30.15	31.41	31.95
2515	SVM Cone -Z-Y Int	13.25	30.13	30.16	30.49	30.09	30.12	30.45
2516	SVM Cone -Y Int	13.53	30.54	28.62	28.87	30.73	28.81	29.06
2517	SVM Cone -Z+Y Int	18.15	33.93	33.58	33.80	34.02	33.68	33.9
2520	SVM Cone +Z Int	20.66	37.13	37.36	37.58	36.96	37.21	37.42
2521	SVM Cone +Z+Y Int	19.26	34.24	34.73	34.88	33.76	34.26	34.41
2522	SVM Cone +Y Int	17.63	31.66	33.16	33.18	31.06	32.58	32.59
2523	SVM Cone +Y-Z Int	15.55	28.95	32.04	32.85	28.73	31.84	32.65
2524	SVM Cone -Z Int	14.16	30.36	31.61	32.13	30.22	31.47	31.99
2525	SVM Cone -Z-Y Int	12.84	30.03	30.09	30.42	29.97	30.03	30.36
2526	SVM Cone -Y Int	13.10	30.38	28.43	28.68	30.57	28.63	28.88
2527	SVM Cone -Z+Y Int	18.04	33.81	33.46	33.68	33.93	33.59	33.81
2530	SVM Cone +Z Int	21.08	37.84	38.07	38.28	37.68	37.91	38.12
2531	SVM Cone +Z+Y Int	19.56	34.80	35.29	35.44	34.31	34.80	34.95
2532	SVM Cone +Y Int	17.07	31.84	33.30	33.33	31.26	32.73	32.77
2533	SVM Cone +Y-Z Int	15.92	29.81	32.91	33.65	29.59	32.70	33.44
2534	SVM Cone -Z Int	13.91	30.64	31.88	32.39	30.47	31.72	32.23
2535	SVM Cone -Z-Y Int	12.38	30.12	30.17	30.49	30.04	30.09	30.41
2536	SVM Cone -Y Int	12.82	30.47	28.53	28.77	30.67	28.74	28.98
2537	SVM Cone -Z+Y Int	18.06	34.21	33.86	34.08	34.37	34.03	34.24
2540	SVM Cone +Z Int	23.30	41.69	41.89	42.09	41.53	41.74	41.93
2541	SVM Cone +Z+Y Int	21.02	38.21	38.69	38.83	37.70	38.18	38.32
2542	SVM Cone +Y Int	16.69	34.15	35.51	35.57	33.58	34.95	35.01
2543	SVM Cone +Y-Z Int	15.47	31.97	34.98	35.63	31.73	34.75	35.4
2544	SVM Cone -Z Int	12.87	32.62	33.82	34.29	32.50	33.70	34.18
2545	SVM Cone -Z-Y Int	11.32	31.66	31.70	32.01	31.63	31.67	31.98
2546	SVM Cone -Y Int	12.95	32.87	31.18	31.42	33.09	31.41	31.65
2547	SVM Cone -Z+Y Int	19.37	37.54	37.21	37.41	37.74	37.40	37.61
2600	SVM Cone +Z Ext	21.16	37.41	37.65	37.86	37.24	37.49	37.7
2601	SVM Cone +Z+Y Ext	19.22	34.17	34.69	34.84	33.69	34.21	34.37
2602	SVM Cone +Y Ext	18.67	32.42	33.86	33.90	31.82	33.27	33.32
2603	SVM Cone +Y-Z Ext	15.75	28.66	31.83	32.65	28.42	31.59	32.42

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
2604	SVM Cone -Z Ext	14.33	30.23	31.51	32.04	30.08	31.37	31.9
2605	SVM Cone -Z-Y Ext	14.02	30.65	30.61	30.94	30.61	30.58	30.9
2606	SVM Cone -Y Ext	14.18	31.12	29.05	29.30	31.31	29.24	29.49
2607	SVM Cone -Z+Y Ext	18.74	34.41	34.02	34.24	34.50	34.11	34.34
2610	SVM Cone +Z Ext	20.56	36.91	37.15	37.36	36.73	36.98	37.19
2611	SVM Cone +Z+Y Ext	18.84	33.82	34.32	34.47	33.35	33.85	34.01
2612	SVM Cone +Y Ext	18.07	31.84	33.33	33.35	31.22	32.72	32.74
2613	SVM Cone +Y-Z Ext	15.20	28.35	31.47	32.31	28.11	31.23	32.08
2614	SVM Cone -Z Ext	14.29	30.23	31.50	32.04	30.08	31.35	31.89
2615	SVM Cone -Z-Y Ext	13.22	30.06	30.07	30.40	30.01	30.03	30.36
2616	SVM Cone -Y Ext	13.50	30.49	28.53	28.78	30.68	28.72	28.97
2617	SVM Cone -Z+Y Ext	18.20	33.92	33.55	33.77	34.02	33.66	33.88
2620	SVM Cone +Z Ext	20.76	37.19	37.42	37.64	37.03	37.27	37.48
2621	SVM Cone +Z+Y Ext	19.33	34.22	34.71	34.87	33.74	34.24	34.39
2622	SVM Cone +Y Ext	17.66	31.61	33.12	33.13	31.01	32.53	32.54
2623	SVM Cone +Y-Z Ext	15.57	28.83	31.98	32.80	28.61	31.78	32.6
2624	SVM Cone -Z Ext	14.15	30.28	31.54	32.07	30.14	31.41	31.94
2625	SVM Cone -Z-Y Ext	12.81	29.94	29.99	30.32	29.88	29.93	30.26
2626	SVM Cone -Y Ext	13.08	30.31	28.32	28.56	30.50	28.52	28.77
2627	SVM Cone -Z+Y Ext	18.09	33.78	33.42	33.64	33.91	33.56	33.77
2630	SVM Cone +Z Ext	21.18	37.91	38.13	38.34	37.74	37.97	38.18
2631	SVM Cone +Z+Y Ext	19.64	34.78	35.27	35.42	34.28	34.78	34.93
2632	SVM Cone +Y Ext	17.10	31.77	33.24	33.27	31.19	32.67	32.7
2633	SVM Cone +Y-Z Ext	15.96	29.70	32.87	33.62	29.48	32.65	33.41
2634	SVM Cone -Z Ext	13.90	30.56	31.82	32.33	30.40	31.66	32.17
2635	SVM Cone -Z-Y Ext	12.35	30.03	30.06	30.39	29.95	29.98	30.31
2636	SVM Cone -Y Ext	12.79	30.38	28.40	28.64	30.59	28.61	28.85
2637	SVM Cone -Z+Y Ext	18.11	34.18	33.82	34.03	34.35	33.99	34.2
2640	SVM Cone +Z Ext	23.39	41.72	41.92	42.12	41.57	41.77	41.96
2641	SVM Cone +Z+Y Ext	21.09	38.17	38.65	38.79	37.66	38.14	38.28
2642	SVM Cone +Y Ext	16.72	34.05	35.43	35.48	33.48	34.86	34.92
2643	SVM Cone +Y-Z Ext	15.52	31.87	34.94	35.60	31.63	34.71	35.36
2644	SVM Cone -Z Ext	12.86	32.53	33.74	34.22	32.41	33.63	34.11
2645	SVM Cone -Z-Y Ext	11.29	31.55	31.58	31.89	31.52	31.55	31.86
2646	SVM Cone -Y Ext	12.92	32.76	31.02	31.26	32.98	31.26	31.49
2647	SVM Cone -Z+Y Ext	19.41	37.49	37.14	37.34	37.69	37.34	37.54
2701	I/F Cone - Top Floor	23.27	39.53	39.76	39.98	39.36	39.60	39.82
2702	I/F Cone - Top Floor	20.92	35.82	36.33	36.48	35.33	35.85	36
2703	I/F Cone - Top Floor	20.72	34.48	35.92	35.96	33.88	35.33	35.37
2704	I/F Cone - Top Floor	20.72	34.48	35.92	35.96	33.88	35.33	35.37
2705	I/F Cone - Top Floor	18.03	30.83	34.08	34.92	30.58	33.85	34.68
2706	I/F Cone - Top Floor	18.03	30.83	34.08	34.92	30.58	33.85	34.68
2707	I/F Cone - Top Floor	16.29	32.89	32.85	33.18	32.85	32.81	33.14
2708	I/F Cone - Top Floor	16.29	32.89	32.85	33.18	32.85	32.81	33.14
2709	I/F Cone - Top Floor	16.20	33.17	31.06	31.31	33.36	31.26	31.51
2710	I/F Cone - Top Floor	16.20	33.17	31.06	31.31	33.36	31.26	31.51
2711	I/F Cone - Top Floor	20.50	36.12	35.72	35.94	36.23	35.82	36.04
2712	I/F Cone - Top Floor	23.27	39.53	39.76	39.98	39.36	39.60	39.82
3001	MLI Rad +Z	126.22	102.48	102.48	102.48	102.90	102.90	102.9
3002	MLI Rad +Z	137.23	123.91	123.91	123.91	123.86	123.86	123.86
3003	MLI Rad +Z	136.97	123.53	123.53	123.53	123.42	123.42	123.42
3004	MLI Rad +Z	137.42	124.20	124.20	124.21	124.13	124.13	124.13

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
3005	MLI Rad +Z	130.34	115.16	115.16	115.16	114.64	114.64	114.64
3006	MLI Rad +Z	139.66	122.94	122.93	122.94	123.34	123.34	123.34
3007	MLI Rad +Z	137.86	124.59	124.59	124.59	124.69	124.70	124.7
3008	MLI Rad +Z	137.44	124.38	124.38	124.38	124.43	124.44	124.44
3009	MLI Rad +Z	137.61	124.78	124.78	124.78	124.85	124.85	124.85
3010	MLI Rad +Z	137.73	125.01	125.01	125.01	125.29	125.29	125.29
3011	MLI Rad +Z	140.70	115.12	115.12	115.12	115.05	115.05	115.05
3012	MLI Rad +Z	138.46	125.57	125.57	125.57	125.50	125.50	125.5
3013	MLI Rad +Z	138.25	126.22	126.22	126.22	126.31	126.31	126.31
3014	MLI Rad +Z	138.92	127.53	127.53	127.53	127.48	127.49	127.49
3015	MLI Rad +Z	139.32	128.09	128.09	128.09	128.35	128.35	128.35
3016	MLI Rad +Z	139.28	128.23	128.23	128.23	128.14	128.14	128.14
3017	MLI Rad +Z	139.61	128.45	128.45	128.45	128.16	128.16	128.16
3018	MLI Rad +Z	138.85	126.87	126.87	126.87	127.14	127.14	127.14
3019	MLI Rad +Z	145.31	139.19	139.20	139.20	139.43	139.43	139.43
3020	MLI Rad +Z	146.62	142.31	142.31	142.31	142.92	142.92	142.92
3021	MLI Rad +Z	147.37	143.03	143.03	143.03	143.22	143.23	143.23
3022	MLI Rad +Z	147.01	142.66	142.66	142.67	142.88	142.88	142.88
3023	MLI Rad +Z	146.74	142.10	142.10	142.10	142.68	142.68	142.68
3024	MLI Rad +Z	145.23	140.06	140.05	140.05	139.43	139.43	139.43
3105	MLI Rad +Y+Z	103.95	94.89	94.90	94.90	91.65	91.65	91.65
3109	MLI Rad +Y+Z	106.14	100.46	100.47	100.47	97.03	97.04	97.04
3201	MLI Rad +Y	-162.03	-111.79	-111.17	-111.25	-153.39	-151.88	-152.07
3202	MLI Rad +Y	-158.05	-113.31	-113.02	-113.05	-146.01	-145.44	-145.5
3203	MLI Rad +Y	-109.91	-87.51	-87.11	-87.14	-92.59	-92.16	-92.18
3204	MLI Rad +Y	-101.16	-69.82	-69.55	-69.57	-85.77	-85.43	-85.44
3205	MLI Rad +Y	-152.22	-99.42	-99.27	-99.28	-127.89	-127.65	-127.66
3206	MLI Rad +Y	-155.88	-100.57	-100.48	-100.48	-130.15	-129.99	-129.98
3207	MLI Rad +Y	-163.84	-121.72	-120.89	-121.10	-155.73	-153.98	-154.42
3301	MLI Rad +Y-Z	-158.49	-156.07	-154.31	-153.58	-156.16	-154.40	-153.66
3302	MLI Rad +Y-Z	-159.60	-157.39	-155.47	-154.92	-157.48	-155.55	-155
3303	MLI Rad +Y-Z	-160.54	-158.37	-156.36	-156.04	-158.46	-156.46	-156.13
3304	MLI Rad +Y-Z	-162.91	-160.64	-158.34	-158.73	-160.77	-158.45	-158.84
3305	MLI Rad +Y-Z	-159.31	-157.00	-155.17	-154.17	-157.09	-155.25	-154.25
3309	MLI Rad +Y-Z	-161.84	-159.71	-157.65	-155.52	-159.80	-157.73	-155.6
3313	MLI Rad +Y-Z	-162.13	-159.90	-157.88	-155.97	-159.99	-157.96	-156.05
3314	MLI Rad +Y-Z	-162.24	-160.16	-158.04	-156.12	-160.25	-158.12	-156.21
3315	MLI Rad +Y-Z	-162.61	-161.79	-158.48	-158.85	-161.91	-158.57	-158.95
3316	MLI Rad +Y-Z	-162.68	-162.72	-158.61	-160.37	-162.85	-158.72	-160.49
3401	MLI Rad -Z	-118.56	-29.05	-29.05	-29.01	-29.05	-29.05	-29
3402	MLI Rad -Z	-124.38	-105.53	-105.50	-105.37	-104.91	-104.87	-104.75
3403	MLI Rad -Z	-129.05	-104.15	-103.85	-103.70	-108.34	-108.01	-107.85
3404	MLI Rad -Z	-132.36	-105.36	-104.77	-104.55	-110.01	-109.36	-109.13
3405	MLI Rad -Z	-154.52	-147.26	-146.14	-145.80	-147.38	-146.26	-145.92
3406	MLI Rad -Z	-161.55	-158.35	-156.89	-156.43	-158.45	-156.99	-156.52
3409	MLI Rad -Z	-123.50	-114.92	-114.44	-114.20	-115.25	-114.78	-114.53
3410	MLI Rad -Z	-125.27	-117.83	-116.83	-116.46	-118.24	-117.23	-116.85
3415	MLI Rad -Z	-127.77	-120.02	-119.54	-119.30	-120.29	-119.81	-119.57
3416	MLI Rad -Z	-130.21	-123.26	-122.30	-121.92	-123.60	-122.63	-122.25
3419	MLI Rad -Z	-160.31	-155.27	-155.27	-155.16	-155.29	-155.29	-155.18
3420	MLI Rad -Z	-154.89	-149.72	-149.65	-149.52	-149.80	-149.73	-149.6
3421	MLI Rad -Z	-129.69	-123.06	-122.61	-122.39	-123.31	-122.85	-122.63

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
3422	MLI Rad -Z	-135.45	-129.09	-128.21	-127.86	-129.31	-128.43	-128.08
3423	MLI Rad -Z	-157.56	-153.88	-152.58	-152.06	-154.00	-152.70	-152.18
3424	MLI Rad -Z	-162.36	-159.27	-157.86	-157.26	-159.37	-157.95	-157.35
3508	MLI Rad -Y-Z	-163.72	-163.69	-163.74	-163.69	-163.68	-163.73	-163.67
3509	MLI Rad -Y-Z	-163.18	-161.46	-161.62	-161.58	-161.45	-161.61	-161.57
3512	MLI Rad -Y-Z	-162.08	-164.47	-164.52	-164.46	-164.47	-164.52	-164.46
3513	MLI Rad -Y-Z	-163.10	-161.32	-161.48	-161.44	-161.31	-161.47	-161.42
3514	MLI Rad -Y-Z	-163.74	-162.07	-162.21	-162.17	-162.05	-162.20	-162.16
3516	MLI Rad -Y-Z	-162.05	-164.37	-164.42	-164.36	-164.37	-164.42	-164.36
3551	MLI FHWOV	13.63	21.15	20.95	21.23	21.16	20.96	21.24
3552	MLI FHHRV	15.02	26.27	25.61	25.82	26.33	25.68	25.9
3553	MLI FHICU	11.41	23.09	22.75	22.99	23.12	22.78	23.03
3554	MLI FHFCU	12.13	24.24	23.43	23.68	24.31	23.50	23.75
3556	MLI FHWEV	13.30	23.14	22.81	23.06	23.16	22.83	23.08
3561	MLI Internal Rad -Y-Z	13.62	24.32	23.65	23.85	24.39	23.73	23.94
3562	MLI Internal Rad -Y-Z	11.20	22.58	22.11	22.34	22.62	22.16	22.39
3563	MLI Internal Rad -Y-Z	9.97	21.51	21.26	21.50	21.53	21.29	21.53
3564	MLI Internal Rad -Y-Z	1.44	14.64	14.47	14.75	14.65	14.48	14.77
3565	MLI Internal Rad -Y-Z	14.78	24.75	23.94	24.13	24.83	24.03	24.22
3566	MLI Internal Rad -Y-Z	12.89	23.65	23.19	23.40	23.69	23.23	23.45
3567	MLI Internal Rad -Y-Z	10.76	21.95	21.71	21.95	21.97	21.72	21.97
3568	MLI Internal Rad -Y-Z	10.82	20.56	20.41	20.69	20.56	20.42	20.7
3569	MLI Internal Rad -Y-Z	12.15	23.65	22.68	22.91	23.73	22.78	23
3570	MLI Internal Rad -Y-Z	9.61	21.96	21.44	21.69	22.00	21.48	21.73
3571	MLI Internal Rad -Y-Z	12.79	21.90	21.58	21.82	21.92	21.60	21.85
3572	MLI Internal Rad -Y-Z	13.81	20.17	20.02	20.29	20.18	20.03	20.3
3573	MLI Internal Rad -Y-Z	12.22	23.79	22.95	23.19	23.86	23.03	23.27
3574	MLI Internal Rad -Y-Z	11.83	24.21	23.72	23.99	24.24	23.76	24.02
3575	MLI Internal Rad -Y-Z	12.09	21.94	21.61	21.87	21.95	21.63	21.89
3576	MLI Internal Rad -Y-Z	14.00	20.81	20.61	20.89	20.82	20.63	20.9
3601	MLI Rad -Y	-153.18	-125.88	-126.33	-126.31	-98.78	-99.05	-99.03
3605	MLI Rad -Y	-163.71	-149.76	-150.84	-150.79	-110.73	-111.19	-111.17
3606	MLI Rad -Y	-163.80	-153.74	-154.25	-154.18	-112.17	-112.37	-112.34
3607	MLI Rad -Y	-148.41	-113.55	-114.03	-114.00	-89.98	-90.30	-90.28
3612	MLI Rad -Y	-163.89	-152.12	-152.82	-152.76	-111.62	-111.90	-111.88
3613	MLI Rad -Y	-136.27	-75.79	-76.33	-76.32	-60.64	-61.07	-61.06
3618	MLI Rad -Y	-163.39	-148.19	-148.99	-148.93	-133.61	-134.16	-134.11
3619	MLI Rad -Y	-116.99	-20.68	-21.35	-21.34	-9.35	-9.94	-9.93
3623	MLI Rad -Y	-144.26	-72.98	-74.20	-74.18	-50.74	-51.62	-51.61
3624	MLI Rad -Y	-154.98	-115.77	-116.56	-116.53	-88.27	-88.75	-88.73
3651	MLI FHWOH	13.23	18.43	14.12	14.29	19.05	14.78	14.96
3652	MLI FHWEH	14.10	21.61	17.47	17.64	22.24	18.15	18.32
3653	MLI FHHRH	16.99	33.37	25.53	25.68	34.24	26.47	26.62
3654	MLI FHLCU	11.40	29.55	22.47	22.68	29.98	22.93	23.14
3655	MLI FHLSU	8.92	27.33	15.69	15.86	28.09	16.51	16.68
3701	MLI Rad -Y+Z	103.06	89.14	89.14	89.14	92.27	92.26	92.26
3702	MLI Rad -Y+Z	103.35	89.61	89.60	89.60	92.84	92.83	92.83
3703	MLI Rad -Y+Z	103.36	89.90	89.89	89.89	92.95	92.94	92.95
3704	MLI Rad -Y+Z	103.37	89.96	89.94	89.95	93.01	93.00	93
3713	MLI Rad -Y+Z	109.42	103.18	103.18	103.18	106.24	106.23	106.23
3714	MLI Rad -Y+Z	111.13	108.71	108.70	108.70	111.21	111.20	111.21
3715	MLI Rad -Y+Z	112.90	112.72	112.70	112.71	115.75	115.74	115.75

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
3716	MLI Rad -Y+Z	113.01	113.61	113.58	113.58	116.60	116.57	116.57
3901	MLI THRPZ	71.58	72.87	72.87	72.88	73.12	73.13	73.13
3902	MLI AAD	121.48	114.64	114.64	114.64	115.37	115.37	115.37
3904	MLI VMC	16.93	49.42	49.42	49.42	49.00	49.00	49.01
3905	MLI SASZ_BRK	54.00	67.49	67.49	67.49	67.22	67.22	67.22
3906	MLI SASZ	88.00	88.02	88.02	88.02	88.29	88.29	88.29
3921	MLI THRPY	-6.83	21.97	22.46	22.44	19.36	19.87	19.84
3941	MLI THRMZ	-133.79	8.59	8.59	8.61	8.78	8.78	8.8
3942	MLI STRMZMY	-124.01	-116.97	-116.59	-116.39	-117.39	-117.00	-116.81
3943	STRMY CONE	-122.76	-113.35	-113.02	-112.81	-113.77	-113.43	-113.23
3944	STRMZPY CONE	-124.57	-116.70	-115.57	-115.14	-117.25	-116.11	-115.67
3945	MLI STRMZPY	-132.21	-125.91	-124.98	-124.62	-126.04	-125.11	-124.75
3946	MLI SAS	-128.27	-116.92	-116.90	-116.76	-117.16	-117.12	-116.99
3947	MLI SAS_BRK	-89.05	-73.25	-73.22	-73.05	-73.28	-73.24	-73.07
3948	MLI SREM	-105.95	-43.24	-43.23	-43.16	-43.57	-43.57	-43.49
3961	MLI THRMY	-3.39	20.36	18.86	18.90	22.72	21.26	21.3
4001	OSR Rad +Z	29.23	40.25	40.58	40.68	39.73	40.07	40.16
4002	OSR Rad +Z	28.60	42.49	42.66	42.81	42.21	42.40	42.54
4003	OSR Rad +Z	27.24	42.00	42.12	42.29	41.81	41.94	42.11
4004	OSR Rad +Z	26.98	41.83	41.91	42.08	41.69	41.78	41.94
4005	OSR Rad +Z	27.75	42.00	41.97	42.13	41.94	41.91	42.07
4006	OSR Rad +Z	24.36	37.33	36.88	37.04	37.56	37.11	37.27
4007	OSR Rad +Z	27.20	38.27	38.60	38.70	37.72	38.04	38.14
4008	OSR Rad +Z	28.71	42.11	42.30	42.45	41.81	42.02	42.16
4009	OSR Rad +Z	27.31	41.66	41.80	41.97	41.48	41.62	41.79
4010	OSR Rad +Z	26.93	41.39	41.47	41.64	41.26	41.35	41.52
4011	OSR Rad +Z	26.72	40.49	40.44	40.61	40.45	40.40	40.57
4012	OSR Rad +Z	24.24	36.60	36.18	36.34	36.83	36.42	36.58
4013	OSR Rad +Z	25.33	36.57	36.89	36.99	35.99	36.32	36.42
4014	OSR Rad +Z	27.34	40.79	40.99	41.14	40.50	40.71	40.86
4015	OSR Rad +Z	27.02	41.21	41.35	41.52	41.03	41.17	41.34
4016	OSR Rad +Z	26.84	41.13	41.21	41.38	41.00	41.08	41.26
4017	OSR Rad +Z	26.70	40.53	40.48	40.65	40.48	40.44	40.61
4018	OSR Rad +Z	24.50	36.78	36.35	36.51	37.00	36.58	36.74
4019	OSR Rad +Z	24.24	36.03	36.38	36.48	35.42	35.77	35.88
4020	OSR Rad +Z	26.55	40.35	40.54	40.69	40.07	40.27	40.42
4021	OSR Rad +Z	26.84	41.16	41.30	41.47	40.99	41.13	41.3
4022	OSR Rad +Z	26.84	41.26	41.34	41.52	41.13	41.22	41.39
4023	OSR Rad +Z	26.78	40.83	40.79	40.97	40.78	40.75	40.92
4024	OSR Rad +Z	24.95	37.67	37.20	37.37	37.87	37.40	37.56
4101	OSR Rad +Y+Z	20.52	27.68	28.10	28.13	26.75	27.18	27.21
4102	OSR Rad +Y+Z	30.72	36.47	36.75	36.80	35.62	35.91	35.95
4103	OSR Rad +Y+Z	31.14	37.83	38.12	38.18	37.02	37.32	37.37
4104	OSR Rad +Y+Z	-0.34	-2.03	-1.94	-1.92	-3.45	-3.35	-3.33
4105	OSR Rad +Y+Z	24.93	33.99	34.48	34.52	33.09	33.58	33.63
4106	OSR Rad +Y+Z	15.30	22.31	22.62	22.67	21.36	21.67	21.72
4107	OSR Rad +Y+Z	14.79	21.66	21.95	22.01	20.68	20.98	21.04
4108	OSR Rad +Y+Z	13.47	19.92	20.21	20.26	18.93	19.22	19.28
4109	OSR Rad +Y+Z	21.88	33.31	33.79	33.84	32.29	32.78	32.82
4110	OSR Rad +Y+Z	14.49	22.45	22.76	22.82	21.41	21.72	21.78
4111	OSR Rad +Y+Z	13.89	21.36	21.66	21.71	20.37	20.67	20.72
4112	OSR Rad +Y+Z	13.66	20.82	21.12	21.17	19.83	20.13	20.19

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
4113	OSR Rad +Y+Z	19.81	32.01	32.43	32.46	30.88	31.30	31.33
4114	OSR Rad +Y+Z	14.96	26.65	26.94	26.99	25.47	25.77	25.82
4115	OSR Rad +Y+Z	14.21	25.20	25.49	25.54	24.08	24.37	24.42
4116	OSR Rad +Y+Z	13.46	23.31	23.59	23.65	22.26	22.55	22.61
4201	OSR Rad +Y	13.65	22.37	27.69	27.03	21.80	27.15	26.49
4202	OSR Rad +Y	16.17	26.69	28.90	28.69	25.87	28.10	27.89
4203	OSR Rad +Y	16.15	26.24	28.18	28.01	25.39	27.34	27.17
4204	OSR Rad +Y	15.61	21.58	23.05	22.98	20.58	22.07	22
4205	OSR Rad +Y	15.88	19.86	21.18	21.13	18.83	20.16	20.11
4206	OSR Rad +Y	13.43	24.34	25.11	25.14	23.27	24.05	24.07
4207	OSR Rad +Y	7.67	14.78	20.87	19.33	14.20	20.32	18.78
4208	OSR Rad +Y	5.98	15.19	17.10	16.89	14.44	16.37	16.16
4209	OSR Rad +Y	6.27	15.62	17.36	17.20	14.78	16.53	16.37
4210	OSR Rad +Y	6.74	11.31	12.47	12.42	10.28	11.46	11.4
4211	OSR Rad +Y	6.92	11.08	12.18	12.14	10.03	11.15	11.11
4212	OSR Rad +Y	-8.73	1.26	1.87	1.89	0.17	0.79	0.81
4213	OSR Rad +Y	-13.93	-8.20	-3.10	-4.62	-8.87	-3.73	-5.26
4214	OSR Rad +Y	-0.70	9.17	11.18	10.90	8.10	10.14	9.86
4215	OSR Rad +Y	0.64	10.94	12.63	12.46	9.82	11.54	11.36
4216	OSR Rad +Y	16.69	26.01	27.01	26.96	24.91	25.92	25.87
4217	OSR Rad +Y	16.18	25.84	26.77	26.73	24.71	25.65	25.61
4218	OSR Rad +Y	-8.71	3.99	4.58	4.60	2.66	3.26	3.27
4219	OSR Rad +Y	-15.75	-8.01	-3.37	-4.33	-9.24	-4.55	-5.52
4220	OSR Rad +Y	-1.15	10.33	12.31	12.06	8.99	10.99	10.75
4221	OSR Rad +Y	0.51	13.15	14.83	14.65	11.68	13.38	13.2
4222	OSR Rad +Y	18.16	30.23	31.22	31.17	28.85	29.85	29.8
4223	OSR Rad +Y	17.66	30.43	31.35	31.31	28.99	29.93	29.89
4224	OSR Rad +Y	-6.85	11.44	12.01	12.02	9.52	10.10	10.11
4301	OSR Rad +Y-Z	26.74	33.94	39.17	41.38	33.67	38.92	41.14
4302	OSR Rad +Y-Z	23.25	29.92	35.55	37.19	29.65	35.30	36.94
4303	OSR Rad +Y-Z	20.38	26.79	32.82	33.70	26.51	32.55	33.44
4304	OSR Rad +Y-Z	13.67	20.14	27.08	25.86	19.78	26.74	25.52
4305	OSR Rad +Y-Z	24.13	31.10	36.48	39.49	30.84	36.23	39.25
4306	OSR Rad +Y-Z	11.01	16.57	21.61	23.72	16.34	21.40	23.51
4307	OSR Rad +Y-Z	4.83	6.95	15.06	13.23	6.68	14.82	12.99
4308	OSR Rad +Y-Z	3.58	3.59	13.88	9.32	3.28	13.61	9.03
4309	OSR Rad +Y-Z	16.92	23.18	29.37	35.60	22.91	29.11	35.35
4310	OSR Rad +Y-Z	6.82	12.03	17.58	22.92	11.79	17.36	22.71
4311	OSR Rad +Y-Z	4.36	5.69	14.66	13.33	5.41	14.41	13.08
4312	OSR Rad +Y-Z	5.07	4.22	15.35	10.21	3.91	15.08	9.93
4313	OSR Rad +Y-Z	16.08	22.60	28.68	34.35	22.33	28.42	34.11
4314	OSR Rad +Y-Z	15.56	21.61	27.99	33.61	21.33	27.73	33.36
4315	OSR Rad +Y-Z	14.48	16.85	26.64	25.52	16.53	26.35	25.22
4316	OSR Rad +Y-Z	14.27	14.18	26.23	21.02	13.82	25.90	20.68
4401	OSR Rad -Z	5.09	19.96	19.91	20.23	19.96	19.92	20.24
4402	OSR Rad -Z	5.87	20.17	20.20	20.53	20.16	20.20	20.53
4403	OSR Rad -Z	10.70	25.32	26.57	27.14	25.21	26.47	27.04
4404	OSR Rad -Z	14.09	27.26	29.55	30.30	27.09	29.39	30.14
4405	OSR Rad -Z	22.12	31.28	34.99	36.08	31.05	34.77	35.87
4406	OSR Rad -Z	13.71	22.57	27.00	28.41	22.32	26.75	28.17
4407	OSR Rad -Z	-3.99	8.38	8.36	8.63	8.38	8.36	8.63
4408	OSR Rad -Z	-1.35	11.24	11.28	11.57	11.23	11.27	11.56

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
4409	OSR Rad -Z	10.91	25.04	26.28	26.85	24.94	26.18	26.75
4410	OSR Rad -Z	13.13	25.97	28.25	29.04	25.80	28.09	28.88
4411	OSR Rad -Z	11.87	19.85	23.06	24.04	19.65	22.87	23.86
4412	OSR Rad -Z	-7.70	-0.86	2.62	4.04	-1.06	2.43	3.86
4413	OSR Rad -Z	2.05	12.89	12.87	13.14	12.89	12.87	13.13
4414	OSR Rad -Z	3.81	15.05	15.07	15.36	15.04	15.06	15.35
4415	OSR Rad -Z	14.31	27.78	28.99	29.55	27.67	28.88	29.45
4416	OSR Rad -Z	11.10	23.74	26.08	26.95	23.56	25.90	26.78
4417	OSR Rad -Z	0.74	8.27	11.71	13.11	8.07	11.52	12.92
4418	OSR Rad -Z	0.37	7.64	11.29	12.91	7.43	11.09	12.72
4419	OSR Rad -Z	13.25	25.81	25.76	26.08	25.80	25.76	26.08
4420	OSR Rad -Z	14.00	26.81	26.82	27.15	26.80	26.81	27.14
4421	OSR Rad -Z	28.86	41.87	42.95	43.48	41.75	42.84	43.36
4422	OSR Rad -Z	7.53	20.54	22.84	23.69	20.30	22.61	23.47
4423	OSR Rad -Z	10.02	18.63	22.70	24.36	18.39	22.48	24.14
4424	OSR Rad -Z	10.30	18.61	22.85	24.69	18.37	22.62	24.47
4501	OSR Rad -Y-Z	9.64	12.62	12.42	12.49	12.64	12.45	12.52
4502	OSR Rad -Y-Z	4.18	6.90	6.74	6.80	6.92	6.76	6.82
4503	OSR Rad -Y-Z	1.82	4.27	4.12	4.19	4.28	4.14	4.21
4504	OSR Rad -Y-Z	-24.91	-22.31	-22.43	-22.31	-22.30	-22.42	-22.3
4505	OSR Rad -Y-Z	10.83	13.74	13.53	13.60	13.77	13.56	13.63
4506	OSR Rad -Y-Z	6.59	9.21	9.03	9.10	9.23	9.05	9.12
4507	OSR Rad -Y-Z	3.05	4.95	4.81	4.88	4.97	4.82	4.89
4508	OSR Rad -Y-Z	10.55	5.67	5.53	5.69	5.68	5.54	5.7
4509	OSR Rad -Y-Z	12.83	17.76	17.30	17.42	17.79	17.34	17.46
4510	OSR Rad -Y-Z	-1.41	2.16	1.83	1.92	2.19	1.86	1.95
4511	OSR Rad -Y-Z	6.77	5.00	4.86	4.94	5.01	4.88	4.96
4512	OSR Rad -Y-Z	16.02	9.21	9.07	9.24	9.22	9.08	9.25
4513	OSR Rad -Y-Z	13.20	18.36	17.89	18.02	18.40	17.93	18.06
4514	OSR Rad -Y-Z	11.12	15.87	15.45	15.57	15.90	15.48	15.61
4515	OSR Rad -Y-Z	5.14	3.52	3.38	3.46	3.53	3.39	3.47
4516	OSR Rad -Y-Z	16.15	9.52	9.38	9.55	9.53	9.39	9.56
4601	OSR Rad -Y	15.75	27.52	25.65	25.82	28.16	26.31	26.48
4602	OSR Rad -Y	6.94	7.08	2.40	2.52	8.00	3.39	3.51
4603	OSR Rad -Y	9.40	7.71	2.95	3.07	8.71	4.02	4.14
4604	OSR Rad -Y	6.67	2.20	-2.52	-2.40	3.07	-1.57	-1.46
4605	OSR Rad -Y	7.64	21.46	17.47	17.68	22.04	18.09	18.3
4606	OSR Rad -Y	9.21	24.12	22.46	22.73	24.40	22.76	23.02
4607	OSR Rad -Y	15.40	27.23	25.14	25.30	27.92	25.87	26.03
4608	OSR Rad -Y	4.07	6.32	1.51	1.62	7.23	2.49	2.6
4609	OSR Rad -Y	-0.05	6.82	-1.31	-1.19	7.77	-0.26	-0.14
4610	OSR Rad -Y	-6.98	6.75	-5.13	-5.00	7.55	-4.21	-4.08
4611	OSR Rad -Y	-2.44	13.22	5.56	5.72	13.71	6.11	6.26
4612	OSR Rad -Y	8.79	23.86	21.50	21.75	24.14	21.80	22.05
4613	OSR Rad -Y	16.35	29.77	27.06	27.22	30.51	27.85	28
4614	OSR Rad -Y	10.55	25.35	16.00	16.10	26.56	17.34	17.44
4615	OSR Rad -Y	1.03	18.72	2.88	2.98	19.90	4.22	4.32
4616	OSR Rad -Y	-2.48	16.43	-1.72	-1.62	17.54	-0.46	-0.35
4617	OSR Rad -Y	3.36	21.26	11.20	11.35	21.81	11.82	11.96
4618	OSR Rad -Y	9.49	24.88	22.06	22.32	25.10	22.30	22.56
4619	OSR Rad -Y	16.88	31.10	28.37	28.53	31.82	29.12	29.28
4620	OSR Rad -Y	11.14	28.44	19.02	19.12	29.88	20.59	20.68

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
4621	OSR Rad -Y	2.44	20.84	9.78	9.88	22.37	11.46	11.56
4622	OSR Rad -Y	-7.46	12.19	-0.97	-0.85	13.66	0.67	0.79
4623	OSR Rad -Y	11.21	31.12	20.31	20.48	31.76	21.02	21.19
4624	OSR Rad -Y	10.36	25.89	23.11	23.37	26.16	23.40	23.66
4701	OSR Rad -Y+Z	19.92	31.64	31.06	31.21	32.10	31.52	31.67
4702	OSR Rad -Y+Z	20.95	32.84	32.16	32.32	33.37	32.70	32.85
4703	OSR Rad -Y+Z	20.64	32.31	31.55	31.69	32.86	32.10	32.25
4704	OSR Rad -Y+Z	19.79	31.46	30.43	30.58	32.02	31.00	31.15
4705	OSR Rad -Y+Z	10.46	16.56	16.17	16.27	17.34	16.96	17.06
4706	OSR Rad -Y+Z	17.34	25.11	24.59	24.70	25.77	25.26	25.38
4707	OSR Rad -Y+Z	16.58	23.72	23.17	23.28	24.45	23.91	24.02
4708	OSR Rad -Y+Z	15.12	23.62	22.78	22.90	24.36	23.52	23.64
4709	OSR Rad -Y+Z	10.74	17.18	16.78	16.89	17.94	17.55	17.65
4710	OSR Rad -Y+Z	17.95	25.58	25.05	25.16	26.27	25.75	25.87
4711	OSR Rad -Y+Z	18.19	26.06	25.50	25.61	26.80	26.25	26.36
4712	OSR Rad -Y+Z	15.87	25.40	24.49	24.61	26.09	25.20	25.32
4713	OSR Rad -Y+Z	20.47	32.35	31.72	31.88	32.76	32.13	32.29
4714	OSR Rad -Y+Z	21.42	33.10	32.38	32.54	33.60	32.89	33.04
4715	OSR Rad -Y+Z	21.44	33.21	32.40	32.55	33.73	32.94	33.09
4716	OSR Rad -Y+Z	20.49	32.75	31.62	31.78	33.30	32.19	32.35
6001	Rad +Z	28.57	39.77	40.11	40.20	39.24	39.58	39.67
6002	Rad +Z	28.14	42.18	42.36	42.51	41.91	42.09	42.24
6003	Rad +Z	26.75	41.65	41.78	41.95	41.47	41.60	41.77
6004	Rad +Z	26.49	41.47	41.55	41.72	41.33	41.41	41.58
6005	Rad +Z	26.99	41.43	41.40	41.56	41.36	41.34	41.5
6006	Rad +Z	23.81	36.92	36.45	36.61	37.15	36.69	36.85
6007	Rad +Z	26.69	37.84	38.16	38.26	37.27	37.60	37.7
6008	Rad +Z	28.31	41.84	42.03	42.18	41.54	41.74	41.89
6009	Rad +Z	26.81	41.28	41.42	41.59	41.10	41.24	41.41
6010	Rad +Z	26.43	41.02	41.10	41.27	40.89	40.97	41.15
6011	Rad +Z	26.21	40.17	40.12	40.29	40.12	40.08	40.25
6012	Rad +Z	23.70	36.14	35.71	35.87	36.37	35.95	36.11
6013	Rad +Z	24.79	36.08	36.41	36.51	35.50	35.83	35.93
6014	Rad +Z	26.85	40.43	40.63	40.78	40.15	40.35	40.5
6015	Rad +Z	26.50	40.80	40.95	41.12	40.62	40.77	40.94
6016	Rad +Z	26.33	40.73	40.81	40.98	40.59	40.68	40.85
6017	Rad +Z	26.22	40.17	40.13	40.30	40.12	40.08	40.25
6018	Rad +Z	23.96	36.31	35.88	36.04	36.53	36.11	36.27
6019	Rad +Z	23.61	35.45	35.80	35.90	34.83	35.19	35.29
6020	Rad +Z	25.98	39.87	40.06	40.22	39.60	39.79	39.95
6021	Rad +Z	26.26	40.65	40.79	40.96	40.48	40.62	40.79
6022	Rad +Z	26.26	40.74	40.83	41.00	40.61	40.70	40.87
6023	Rad +Z	26.23	40.37	40.33	40.50	40.31	40.28	40.45
6024	Rad +Z	24.37	37.15	36.67	36.83	37.35	36.87	37.04
6051	Shear Web1 +Z	22.27	36.91	36.59	36.76	37.02	36.71	36.87
6052	Shear Web1 +Z	22.13	36.24	35.92	36.09	36.36	36.05	36.22
6053	Shear Web1 +Z	22.38	36.15	35.83	36.00	36.27	35.96	36.13
6054	Shear Web1 +Z	25.51	39.05	38.75	38.92	39.15	38.85	39.01
6055	Shear Web1 +Z	23.96	37.59	37.26	37.43	37.69	37.36	37.53
6061	Shear Web1 +Z	22.37	37.10	36.80	36.97	37.20	36.90	37.07
6062	Shear Web1 +Z	22.21	36.40	36.11	36.28	36.51	36.22	36.39
6063	Shear Web1 +Z	22.47	36.31	36.01	36.18	36.42	36.13	36.3

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
6064	Shear Web1 +Z	25.79	39.41	39.13	39.30	39.49	39.22	39.38
6065	Shear Web1 +Z	24.13	37.84	37.53	37.70	37.92	37.62	37.79
6071	Shear Web2 +Z	27.67	40.84	41.11	41.23	40.42	40.69	40.81
6072	Shear Web2 +Z	29.72	42.65	42.90	43.03	42.24	42.50	42.63
6073	Shear Web2 +Z	28.39	41.26	41.52	41.64	40.84	41.11	41.23
6074	Shear Web2 +Z	22.58	35.80	36.09	36.22	35.33	35.63	35.76
6075	Shear Web2 +Z	21.64	35.07	35.37	35.50	34.61	34.91	35.04
6081	Shear Web2 +Z	27.50	40.55	40.83	40.95	40.12	40.40	40.52
6082	Shear Web2 +Z	29.40	42.20	42.46	42.58	41.78	42.04	42.17
6083	Shear Web2 +Z	28.05	40.80	41.07	41.19	40.37	40.65	40.77
6084	Shear Web2 +Z	22.51	35.62	35.92	36.05	35.15	35.45	35.58
6085	Shear Web2 +Z	21.56	34.89	35.20	35.32	34.41	34.72	34.84
6101	Rad +Y+Z	23.81	32.43	32.90	32.95	31.54	32.02	32.06
6102	Rad +Y+Z	36.42	43.47	43.79	43.84	42.67	42.99	43.04
6103	Rad +Y+Z	35.97	43.35	43.67	43.73	42.56	42.89	42.94
6104	Rad +Y+Z	32.54	40.28	40.60	40.66	39.51	39.83	39.89
6105	Rad +Y+Z	25.08	34.22	34.72	34.76	33.34	33.84	33.88
6106	Rad +Y+Z	17.49	25.76	26.11	26.17	24.84	25.19	25.25
6107	Rad +Y+Z	17.13	25.31	25.65	25.71	24.38	24.72	24.78
6108	Rad +Y+Z	16.62	24.67	25.01	25.07	23.74	24.08	24.14
6109	Rad +Y+Z	21.67	33.27	33.76	33.80	32.26	32.76	32.8
6110	Rad +Y+Z	16.67	25.44	25.79	25.85	24.47	24.82	24.88
6111	Rad +Y+Z	16.30	24.77	25.11	25.17	23.83	24.17	24.23
6112	Rad +Y+Z	16.30	24.68	25.01	25.08	23.74	24.08	24.14
6113	Rad +Y+Z	21.11	33.00	33.47	33.51	31.96	32.43	32.47
6114	Rad +Y+Z	15.61	27.11	27.44	27.49	26.01	26.35	26.4
6115	Rad +Y+Z	15.27	26.47	26.80	26.85	25.40	25.73	25.79
6116	Rad +Y+Z	14.97	25.44	25.76	25.82	24.44	24.77	24.83
6201	Rad +Y	14.00	22.74	28.11	27.46	22.20	27.59	26.94
6202	Rad +Y	16.75	27.36	29.54	29.33	26.56	28.75	28.55
6203	Rad +Y	16.78	27.18	29.16	28.99	26.35	28.35	28.17
6204	Rad +Y	16.08	21.75	23.21	23.14	20.77	22.24	22.17
6205	Rad +Y	16.44	20.24	21.57	21.52	19.23	20.58	20.53
6206	Rad +Y	14.32	25.37	26.14	26.17	24.34	25.12	25.15
6207	Rad +Y	8.41	15.49	21.72	20.12	14.92	21.18	19.58
6208	Rad +Y	13.51	23.59	25.66	25.44	22.81	24.89	24.68
6209	Rad +Y	13.68	23.83	25.77	25.59	23.00	24.97	24.79
6210	Rad +Y	12.91	17.09	18.38	18.32	16.08	17.38	17.33
6211	Rad +Y	13.51	17.14	18.39	18.34	16.12	17.38	17.33
6212	Rad +Y	-3.92	6.58	7.25	7.27	5.50	6.17	6.19
6213	Rad +Y	-9.74	-3.86	1.84	0.10	-4.54	1.21	-0.54
6214	Rad +Y	5.95	16.77	18.88	18.62	15.69	17.83	17.57
6215	Rad +Y	6.66	17.64	19.54	19.34	16.54	18.46	18.26
6216	Rad +Y	26.25	36.34	37.45	37.39	35.27	36.39	36.34
6217	Rad +Y	26.40	36.60	37.65	37.61	35.52	36.58	36.54
6218	Rad +Y	-4.21	8.78	9.41	9.43	7.48	8.12	8.14
6219	Rad +Y	-11.27	-3.57	1.62	0.55	-4.69	0.54	-0.53
6220	Rad +Y	5.83	17.24	19.33	19.09	16.06	18.18	17.93
6221	Rad +Y	6.66	18.62	20.50	20.30	17.37	19.27	19.08
6222	Rad +Y	26.85	38.01	39.12	39.07	36.84	37.97	37.91
6223	Rad +Y	27.00	38.44	39.50	39.45	37.25	38.32	38.27
6224	Rad +Y	-2.43	15.09	15.70	15.71	13.33	13.95	13.96

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
6251	Shear Web3 +Y	19.80	31.47	32.51	32.51	30.68	31.73	31.74
6252	Shear Web3 +Y	20.07	31.26	32.26	32.27	30.47	31.48	31.49
6253	Shear Web3 +Y	23.75	34.99	35.87	35.89	34.21	35.10	35.11
6254	Shear Web3 +Y	22.96	34.68	35.59	35.60	33.86	34.78	34.79
6255	Shear Web3 +Y	22.36	34.19	35.12	35.13	33.37	34.31	34.32
6261	Shear Web3 +Y	19.69	31.34	32.42	32.41	30.55	31.64	31.64
6262	Shear Web3 +Y	20.01	31.19	32.21	32.21	30.39	31.43	31.43
6263	Shear Web3 +Y	23.62	34.85	35.75	35.76	34.06	34.97	34.98
6264	Shear Web3 +Y	22.96	34.69	35.61	35.63	33.87	34.80	34.81
6265	Shear Web3 +Y	22.33	34.17	35.13	35.14	33.35	34.32	34.33
6271	Shear Web4 +Y	16.64	26.95	31.00	30.75	26.39	30.46	30.21
6272	Shear Web4 +Y	16.13	25.46	30.00	29.35	24.90	29.46	28.81
6273	Shear Web4 +Y	14.96	23.52	28.53	27.46	22.94	27.98	26.91
6274	Shear Web4 +Y	13.99	22.50	27.51	26.57	21.90	26.93	25.99
6275	Shear Web4 +Y	14.47	23.58	28.09	27.74	22.98	27.51	27.16
6281	Shear Web4 +Y	16.62	26.81	30.97	30.72	26.26	30.44	30.19
6282	Shear Web4 +Y	16.10	25.29	29.95	29.27	24.75	29.43	28.75
6283	Shear Web4 +Y	14.92	23.32	28.47	27.35	22.75	27.92	26.8
6284	Shear Web4 +Y	13.96	22.31	27.45	26.47	21.71	26.88	25.9
6285	Shear Web4 +Y	14.41	23.37	28.00	27.64	22.78	27.43	27.08
6301	Rad +Y-Z	27.14	34.38	39.62	41.83	34.11	39.37	41.58
6302	Rad +Y-Z	23.91	30.64	36.31	37.95	30.37	36.06	37.7
6303	Rad +Y-Z	21.20	27.77	33.74	34.74	27.48	33.47	34.47
6304	Rad +Y-Z	14.12	20.82	27.69	26.54	20.46	27.35	26.2
6305	Rad +Y-Z	24.77	31.80	37.18	40.15	31.54	36.93	39.9
6306	Rad +Y-Z	18.76	25.01	30.60	32.95	24.75	30.36	32.71
6307	Rad +Y-Z	11.71	13.92	23.04	20.87	13.63	22.78	20.6
6308	Rad +Y-Z	10.50	10.29	21.88	16.64	9.95	21.58	16.32
6309	Rad +Y-Z	17.11	23.38	29.62	36.01	23.10	29.37	35.77
6310	Rad +Y-Z	13.92	19.75	25.90	32.12	19.48	25.65	31.89
6311	Rad +Y-Z	11.37	12.75	22.79	21.27	12.44	22.52	20.99
6312	Rad +Y-Z	12.32	11.29	23.75	17.91	10.95	23.44	17.59
6313	Rad +Y-Z	16.28	22.84	28.93	34.60	22.57	28.67	34.36
6314	Rad +Y-Z	16.09	22.24	28.61	34.38	21.96	28.35	34.13
6315	Rad +Y-Z	15.02	17.41	27.28	26.12	17.09	26.99	25.82
6316	Rad +Y-Z	14.82	14.70	26.86	21.56	14.33	26.53	21.22
6401	Rad -Z	5.88	20.53	20.48	20.81	20.54	20.49	20.81
6402	Rad -Z	6.70	21.09	21.10	21.43	21.08	21.10	21.43
6403	Rad -Z	10.90	25.60	26.87	27.43	25.50	26.77	27.33
6404	Rad -Z	14.24	27.49	29.79	30.53	27.32	29.63	30.37
6405	Rad -Z	22.97	32.13	35.88	36.98	31.90	35.66	36.76
6406	Rad -Z	14.47	23.42	27.91	29.33	23.16	27.66	29.08
6407	Rad -Z	1.64	14.90	14.88	15.18	14.90	14.88	15.18
6408	Rad -Z	4.33	18.07	18.09	18.41	18.06	18.09	18.41
6409	Rad -Z	11.16	25.38	26.63	27.20	25.27	26.53	27.1
6410	Rad -Z	13.42	26.34	28.63	29.42	26.18	28.47	29.26
6411	Rad -Z	20.12	28.95	32.56	33.65	28.74	32.35	33.44
6412	Rad -Z	-3.02	4.38	8.18	9.76	4.17	7.98	9.56
6413	Rad -Z	8.75	20.64	20.61	20.91	20.63	20.61	20.91
6414	Rad -Z	10.50	22.83	22.83	23.15	22.82	22.83	23.14
6415	Rad -Z	14.36	27.91	29.13	29.70	27.81	29.02	29.6
6416	Rad -Z	11.44	24.18	26.52	27.39	24.00	26.35	27.22

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
6417	Rad -Z	6.63	14.81	18.63	20.20	14.59	18.42	19.99
6418	Rad -Z	7.05	15.06	19.11	20.92	14.83	18.89	20.7
6419	Rad -Z	13.80	26.45	26.40	26.72	26.44	26.40	26.72
6420	Rad -Z	14.29	27.20	27.19	27.51	27.19	27.18	27.51
6421	Rad -Z	26.01	38.99	40.09	40.62	38.87	39.98	40.51
6422	Rad -Z	8.72	21.75	24.08	24.95	21.52	23.86	24.73
6423	Rad -Z	10.55	19.15	23.28	24.96	18.91	23.06	24.74
6424	Rad -Z	10.83	19.19	23.47	25.33	18.95	23.24	25.1
6451	Shear Web5 -Z	16.48	29.02	31.96	32.75	28.83	31.78	32.57
6452	Shear Web5 -Z	16.59	28.90	31.68	32.54	28.71	31.50	32.36
6453	Shear Web5 -Z	15.39	27.33	30.22	31.22	27.14	30.04	31.04
6454	Shear Web5 -Z	14.41	26.10	29.15	30.22	25.90	28.96	30.03
6455	Shear Web5 -Z	14.07	25.50	28.78	29.86	25.29	28.58	29.66
6461	Shear Web5 -Z	16.33	28.98	31.85	32.63	28.79	31.67	32.45
6462	Shear Web5 -Z	16.45	28.85	31.57	32.42	28.67	31.40	32.24
6463	Shear Web5 -Z	15.31	27.35	30.19	31.16	27.16	30.01	30.99
6464	Shear Web5 -Z	14.38	26.17	29.16	30.21	25.98	28.97	30.02
6465	Shear Web5 -Z	14.05	25.60	28.80	29.86	25.40	28.61	29.67
6471	Shear Web6 -Z	11.26	26.61	27.47	27.98	26.54	27.41	27.91
6472	Shear Web6 -Z	11.80	26.57	27.52	28.04	26.49	27.44	27.96
6473	Shear Web6 -Z	12.75	27.08	28.03	28.57	27.00	27.96	28.49
6474	Shear Web6 -Z	13.71	27.78	28.71	29.25	27.70	28.64	29.18
6475	Shear Web6 -Z	13.92	28.06	28.90	29.43	27.99	28.83	29.36
6481	Shear Web6 -Z	11.18	26.53	27.35	27.84	26.47	27.29	27.78
6482	Shear Web6 -Z	11.73	26.50	27.40	27.92	26.42	27.33	27.84
6483	Shear Web6 -Z	12.70	27.04	27.95	28.47	26.96	27.87	28.4
6484	Shear Web6 -Z	13.68	27.76	28.65	29.18	27.68	28.57	29.1
6485	Shear Web6 -Z	13.88	28.04	28.82	29.34	27.97	28.76	29.28
6501	Rad -Y-Z	17.73	21.07	20.85	20.92	21.09	20.87	20.95
6502	Rad -Y-Z	11.46	14.49	14.30	14.38	14.51	14.32	14.4
6503	Rad -Y-Z	9.38	12.10	11.93	12.01	12.11	11.95	12.03
6504	Rad -Y-Z	-21.86	-18.91	-19.03	-18.90	-18.89	-19.02	-18.89
6505	Rad -Y-Z	19.02	22.21	21.98	22.06	22.24	22.01	22.09
6506	Rad -Y-Z	14.60	17.49	17.29	17.36	17.51	17.31	17.39
6507	Rad -Y-Z	10.05	12.36	12.20	12.28	12.38	12.22	12.3
6508	Rad -Y-Z	11.90	6.69	6.55	6.72	6.70	6.57	6.73
6509	Rad -Y-Z	13.37	18.40	17.93	18.05	18.44	17.97	18.09
6510	Rad -Y-Z	4.29	8.31	7.93	8.04	8.34	7.97	8.07
6511	Rad -Y-Z	14.61	12.51	12.36	12.45	12.52	12.37	12.46
6512	Rad -Y-Z	16.58	9.60	9.46	9.63	9.61	9.47	9.64
6513	Rad -Y-Z	13.47	18.66	18.19	18.31	18.70	18.23	18.36
6514	Rad -Y-Z	11.83	16.75	16.32	16.44	16.78	16.36	16.48
6515	Rad -Y-Z	12.27	10.45	10.30	10.39	10.46	10.31	10.4
6516	Rad -Y-Z	16.59	9.86	9.72	9.89	9.87	9.73	9.9
6601	Rad -Y	16.13	28.13	26.31	26.48	28.74	26.94	27.11
6602	Rad -Y	13.89	13.54	8.33	8.46	14.43	9.29	9.42
6603	Rad -Y	14.47	11.17	6.11	6.24	12.07	7.08	7.21
6604	Rad -Y	14.27	8.06	3.08	3.21	8.93	4.03	4.16
6605	Rad -Y	8.16	22.25	18.34	18.55	22.79	18.92	19.13
6606	Rad -Y	9.45	24.41	22.81	23.07	24.66	23.08	23.35
6607	Rad -Y	15.75	27.72	25.69	25.85	28.38	26.38	26.54
6608	Rad -Y	10.70	12.30	7.14	7.27	13.19	8.10	8.22

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
6609	Rad -Y	6.23	13.44	4.63	4.76	14.36	5.64	5.77
6610	Rad -Y	-1.74	13.73	0.47	0.61	14.56	1.43	1.56
6611	Rad -Y	3.41	20.70	12.13	12.29	21.20	12.68	12.85
6612	Rad -Y	9.12	24.22	21.93	22.19	24.47	22.21	22.46
6613	Rad -Y	16.67	30.10	27.48	27.64	30.81	28.23	28.39
6614	Rad -Y	18.53	34.72	24.06	24.16	35.94	25.41	25.51
6615	Rad -Y	7.67	27.19	9.08	9.19	28.34	10.37	10.49
6616	Rad -Y	4.11	24.93	4.24	4.36	26.03	5.49	5.61
6617	Rad -Y	10.32	30.17	18.86	19.03	30.72	19.48	19.64
6618	Rad -Y	9.76	25.16	22.44	22.69	25.37	22.67	22.93
6619	Rad -Y	17.21	31.34	28.71	28.87	32.01	29.42	29.58
6620	Rad -Y	18.76	35.87	25.19	25.30	37.16	26.62	26.72
6621	Rad -Y	9.17	27.52	15.34	15.46	28.85	16.82	16.93
6622	Rad -Y	-2.34	17.67	3.22	3.35	18.96	4.67	4.8
6623	Rad -Y	12.01	32.08	21.11	21.29	32.66	21.75	21.92
6624	Rad -Y	10.56	26.03	23.38	23.65	26.28	23.65	23.92
6651	Shear Web7 -Y	10.66	26.72	24.86	25.12	26.95	25.09	25.35
6652	Shear Web7 -Y	10.86	26.85	24.89	25.16	27.06	25.11	25.37
6653	Shear Web7 -Y	11.34	27.32	25.58	25.85	27.49	25.76	26.03
6654	Shear Web7 -Y	11.72	27.67	25.93	26.21	27.83	26.10	26.38
6655	Shear Web7 -Y	11.85	27.82	25.74	26.01	28.01	25.94	26.21
6661	Shear Web7 -Y	10.68	26.75	24.82	25.08	26.98	25.06	25.32
6662	Shear Web7 -Y	10.87	26.87	24.85	25.11	27.09	25.08	25.34
6663	Shear Web7 -Y	11.36	27.36	25.57	25.85	27.54	25.76	26.03
6664	Shear Web7 -Y	11.74	27.72	25.93	26.21	27.88	26.11	26.39
6665	Shear Web7 -Y	11.86	27.88	25.72	25.99	28.08	25.93	26.2
6671	Shear Web8 -Y	15.99	30.32	28.40	28.59	30.73	28.83	29.02
6672	Shear Web8 -Y	16.19	30.13	28.14	28.33	30.55	28.58	28.77
6673	Shear Web8 -Y	16.28	30.20	28.09	28.27	30.63	28.53	28.71
6674	Shear Web8 -Y	16.63	30.92	28.90	29.08	31.32	29.31	29.5
6675	Shear Web8 -Y	16.59	31.15	29.08	29.27	31.53	29.47	29.67
6681	Shear Web8 -Y	16.15	30.45	28.58	28.77	30.87	29.02	29.2
6682	Shear Web8 -Y	16.33	30.23	28.29	28.48	30.66	28.74	28.92
6683	Shear Web8 -Y	16.42	30.30	28.24	28.42	30.73	28.68	28.86
6684	Shear Web8 -Y	16.76	30.99	29.01	29.20	31.40	29.43	29.62
6685	Shear Web8 -Y	16.74	31.24	29.21	29.40	31.62	29.61	29.8
6701	Rad -Y+Z	19.93	31.91	31.32	31.47	32.35	31.76	31.91
6702	Rad -Y+Z	20.81	32.93	32.25	32.40	33.44	32.76	32.91
6703	Rad -Y+Z	20.50	32.40	31.63	31.78	32.93	32.16	32.31
6704	Rad -Y+Z	19.65	31.50	30.46	30.61	32.05	31.02	31.17
6705	Rad -Y+Z	12.39	19.77	19.34	19.46	20.49	20.06	20.18
6706	Rad -Y+Z	20.47	29.82	29.24	29.37	30.41	29.83	29.96
6707	Rad -Y+Z	19.37	27.81	27.20	27.32	28.47	27.87	27.99
6708	Rad -Y+Z	17.68	27.71	26.75	26.89	28.34	27.40	27.54
6709	Rad -Y+Z	12.58	20.23	19.79	19.91	20.92	20.49	20.61
6710	Rad -Y+Z	20.90	29.78	29.19	29.32	30.41	29.83	29.95
6711	Rad -Y+Z	20.98	29.95	29.33	29.45	30.59	29.98	30.11
6712	Rad -Y+Z	18.13	28.88	27.85	27.99	29.49	28.47	28.61
6713	Rad -Y+Z	20.41	32.51	31.86	32.02	32.89	32.26	32.42
6714	Rad -Y+Z	21.21	33.01	32.29	32.44	33.49	32.78	32.93
6715	Rad -Y+Z	21.21	33.09	32.28	32.43	33.60	32.79	32.95
6716	Rad -Y+Z	20.28	32.62	31.48	31.63	33.15	32.03	32.18

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
7000	SVM Top +Z MLI	-47.89	-39.17	-39.12	-39.01	-39.37	-39.31	-39.21
7001	SVM Top +Y+Z MLI	-48.55	-42.06	-41.77	-41.73	-42.47	-42.19	-42.14
7002	SVM Top +Y MLI	-54.50	-48.13	-47.15	-47.19	-48.58	-47.59	-47.63
7003	SVM Top +Y-Z MLI	-67.31	-62.33	-59.00	-58.32	-62.51	-59.18	-58.49
7004	SVM Top -Z MLI	-69.06	-60.61	-59.52	-59.10	-60.71	-59.61	-59.19
7005	SVM Top -Z-Y MLI	-68.80	-59.84	-60.08	-59.89	-59.83	-60.07	-59.87
7006	SVM Top -Y MLI	-58.08	-49.26	-51.27	-51.15	-49.06	-51.06	-50.94
7007	SVM Top -Y+Z MLI	-48.06	-40.58	-41.06	-40.97	-40.62	-41.10	-41.01
7200	SVM Top Disc +Z MLI	-57.26	-48.06	-47.87	-47.73	-48.16	-47.96	-47.82
7201	SVM Top Disc +Z+Y MLI	-58.68	-49.61	-49.31	-49.18	-49.76	-49.45	-49.33
7202	SVM Top Disc +Y MLI	-62.55	-53.20	-52.64	-52.48	-53.38	-52.81	-52.66
7203	SVM Top Disc +Y-Z MLI	-68.59	-57.95	-57.16	-56.89	-58.09	-57.29	-57.03
7204	SVM Top Disc -Z MLI	-70.15	-58.78	-58.25	-58.01	-58.82	-58.29	-58.05
7205	SVM Top Disc -Z-Y MLI	-69.29	-58.01	-57.74	-57.54	-58.06	-57.79	-57.58
7206	SVM Top Disc -Y MLI	-63.32	-53.29	-53.39	-53.22	-53.32	-53.41	-53.24
7207	SVM Top Disc -Y+Z MLI	-59.15	-49.75	-49.70	-49.56	-49.78	-49.73	-49.58
7400	SVM Top Disc +Z	16.28	34.91	35.27	35.52	34.75	35.11	35.36
7401	SVM Top Disc +Z+Y	16.12	34.27	34.81	35.04	34.02	34.56	34.79
7402	SVM Top Disc +Y	15.43	32.56	33.50	33.76	32.27	33.21	33.48
7403	SVM Top Disc +Y-Z	13.92	31.89	33.15	33.57	31.66	32.92	33.35
7404	SVM Top Disc -Z	13.23	32.02	32.88	33.26	31.95	32.81	33.19
7405	SVM Top Disc -Z-Y	13.15	32.09	32.52	32.86	32.00	32.44	32.78
7406	SVM Top Disc -Y	14.15	32.45	32.32	32.61	32.40	32.28	32.57
7407	SVM Top Disc -Y+Z	15.59	34.22	34.33	34.59	34.14	34.26	34.52
7600	SVM Top +Z	23.19	38.12	38.22	38.40	37.95	38.06	38.23
7601	SVM Top +Y+Z	19.25	31.49	31.99	32.07	30.72	31.22	31.3
7602	SVM Top +Y	18.79	30.62	32.38	32.29	29.80	31.57	31.48
7603	SVM Top +Y-Z	14.16	22.25	27.90	29.07	21.95	27.62	28.79
7604	SVM Top -Z	13.56	27.33	29.12	29.82	27.19	28.98	29.68
7605	SVM Top -Z-Y	11.61	26.43	26.02	26.34	26.45	26.05	26.37
7606	SVM Top -Y	11.93	28.43	24.65	24.87	28.82	25.07	25.29
7607	SVM Top -Y+Z	19.60	32.78	31.91	32.08	33.13	32.27	32.44
10000	Cryocooler middle	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15
10010	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15
10011	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15
10012	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15
10013	Cryocooler lower	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15	-133.15
18001	Top Shield +Z	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18002	Top Shield +Y	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18003	Top Shield -Z	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18004	Top Shield -Y	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18101	Top Shield +Z	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18102	Top Shield +Y	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18103	Top Shield -Z	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18104	Top Shield -Y	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15	-123.15
18501	Frontal Shield -Y+Z	99.17	85.18	85.18	85.18	87.33	87.33	87.33
18502	Frontal Shield -Y+Z	99.18	85.13	85.13	85.13	87.35	87.35	87.35
18503	Frontal Shield +Z	117.86	104.28	104.28	104.28	104.28	104.28	104.28
18504	Frontal Shield +Z	117.88	104.28	104.28	104.28	104.30	104.30	104.3
18505	Frontal Shield +Y+Z	99.17	87.33	87.33	87.33	85.18	85.18	85.18
18506	Frontal Shield +Y+Z	99.15	87.36	87.36	87.36	85.20	85.20	85.2
18510	MLI Closure SVM -Y	-83.13	39.17	37.73	37.75	47.05	45.72	45.73

		EOL1	EOL7A	EOL7A	EOL7A	EOL7B	EOL7B	EOL7B
NODE	LABEL	MODE2	MODE1	MODE2	MODE2	MODE1	MODE2	MODE2
		Photo		Photo	Spectr		Photo	Spectr
		T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP	T+UFP
		[°C]	[°C]	[°C]	[°C]	[°C]	[°C]	[°C]
18512	MLI Closure SVM -Y+Z	28.60	81.70	81.67	81.67	82.94	82.91	82.92
18514	MLI Closure SVM +Z	64.00	103.04	103.04	103.04	103.08	103.08	103.08
18516	MLI Closure SVM +Y+Z	22.13	79.27	79.31	79.32	78.17	78.21	78.22
18518	MLI Closure SVM +Y	-65.94	50.52	50.74	50.73	42.30	42.54	42.53
18601	Frontal Shield -Y+Z	-118.58	-124.54	-124.55	-124.54	-124.53	-124.54	-124.53
18602	Frontal Shield -Y+Z	-128.17	-160.07	-160.07	-160.06	-160.04	-160.04	-160.03
18603	Frontal Shield +Z	-118.51	-125.51	-125.50	-125.49	-125.50	-125.50	-125.49
18604	Frontal Shield +Z	-118.96	-156.20	-156.20	-156.20	-156.20	-156.20	-156.19
18605	Frontal Shield +Y+Z	-119.15	-125.23	-125.21	-125.21	-125.23	-125.22	-125.21
18606	Frontal Shield +Y+Z	-128.15	-160.40	-160.39	-160.39	-160.40	-160.39	-160.39
18610	MLI Closure SVM -Y	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15
18612	MLI Closure SVM -Y+Z	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15
18614	MLI Closure SVM +Z	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15
18616	MLI Closure SVM +Y+Z	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15
18618	MLI Closure SVM +Y	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15	-23.15
19000	MLI Struct Braces	-114.12	-118.37	-118.35	-118.33	-118.39	-118.37	-118.35
19005	MLI Struct Braces	-115.24	-118.78	-118.74	-118.72	-118.81	-118.77	-118.75
19010	MLI Struct Braces	-121.98	-124.37	-124.31	-124.29	-124.41	-124.35	-124.33
19015	MLI Struct Braces	-127.19	-128.11	-127.99	-127.97	-128.16	-128.04	-128.02
19020	MLI Struct Braces	-136.54	-136.98	-136.81	-136.78	-137.04	-136.86	-136.84
19025	MLI Struct Braces	-144.57	-144.27	-143.97	-143.91	-144.33	-144.03	-143.97
19030	MLI Struct Braces	-151.03	-149.80	-149.43	-149.34	-149.85	-149.48	-149.39
19035	MLI Struct Braces	-154.61	-152.91	-152.63	-152.55	-152.95	-152.67	-152.58
19040	MLI Struct Braces	-154.07	-152.43	-152.28	-152.20	-152.44	-152.29	-152.22
19045	MLI Struct Braces	-151.04	-149.42	-149.42	-149.36	-149.43	-149.42	-149.37
19050	MLI Struct Braces	-144.49	-144.06	-144.15	-144.11	-144.06	-144.15	-144.11
19055	MLI Struct Braces	-136.94	-137.27	-137.41	-137.37	-137.26	-137.40	-137.37
19060	MLI Struct Braces	-127.59	-128.67	-128.78	-128.75	-128.67	-128.78	-128.75
19065	MLI Struct Braces	-120.95	-123.63	-123.69	-123.66	-123.63	-123.68	-123.66
19070	MLI Struct Braces	-114.06	-118.10	-118.13	-118.11	-118.11	-118.13	-118.11
19075	MLI Struct Braces	-114.09	-118.11	-118.10	-118.08	-118.12	-118.12	-118.1
19080	MLI Struct Braces Front	-129.18	-156.47	-156.47	-156.47	-159.66	-159.66	-159.66
19081	MLI Struct Braces Front	-108.84	-153.16	-153.15	-153.15	-152.76	-152.76	-152.76
19082	MLI Struct Braces Front	-105.99	-145.42	-145.42	-145.42	-146.46	-146.46	-146.45
19083	MLI Struct Braces Front	-101.11	-141.89	-141.89	-141.88	-146.66	-146.65	-146.65
19084	MLI Struct Braces Front	-107.98	-152.28	-152.28	-152.28	-152.75	-152.75	-152.74
19085	MLI Struct Braces Front	-126.40	-150.49	-150.49	-150.49	-157.86	-157.86	-157.85
19086	MLI Struct Braces Front	-126.57	-132.48	-132.48	-132.48	-132.48	-132.48	-132.48
19087	MLI Struct Braces Front	-120.87	-127.13	-127.13	-127.13	-127.12	-127.12	-127.11
19088	MLI Struct Braces Front	-115.80	-123.18	-123.17	-123.17	-123.18	-123.17	-123.17
19089	MLI Struct Braces Front	-115.25	-123.13	-123.12	-123.12	-123.13	-123.12	-123.12
19090	MLI Struct Braces Front	-121.17	-127.82	-127.81	-127.80	-127.82	-127.80	-127.8
19091	MLI Struct Braces Front	-127.12	-131.83	-131.82	-131.82	-131.83	-131.82	-131.82
19092	MLI Struct Braces Front	-116.42	-128.37	-128.37	-128.37	-124.23	-124.23	-124.22
19093	MLI Struct Braces Front	-105.77	-119.31	-119.31	-119.30	-114.10	-114.10	-114.1
19094	MLI Struct Braces Front	-106.30	-116.89	-116.89	-116.89	-117.84	-117.84	-117.84
19095	MLI Struct Braces Front	-115.88	-122.33	-122.33	-122.33	-118.69	-118.68	-118.68
99998	INACTIVE_NODE	0	0	0	0	0	0	0
99999	space node	-269	-269	-269	-269	-269	-269	-269

Table 3.3.1-6 HERSCHEL – EOL Steady State Analysis Results

3.3.2 Results of Transient Cases

The following Table 3.2.3-2 reports the list of PLM Warm Units with their thermal stability requirements, and the delta temperature every 100s evaluated from the transient analysis cases reported in paragraph 3.2.1.2
For the units mounted on –Y panel, which are out of the range required, it is also reported when, from the start of the transient case, each unit re-entry inside the thermal stability requirement.

Transient Case 1A:

NODE	UNIT	Stability Requirement Delta T	TRANSIENT 1A From BOL2B to BOL7A	
			Dtmax [°C]	Re-entry Time [s]
401	CRYOE	+/- 3K/hr	0.070	
404	HSDCU	+/- 3K/hr	0.059	
405	HSDPU	+/- 3K/hr	0.044	
406	HSFCU	+/- 3K/hr	0.045	
501	FHWOV	+/- 0.03/100s	0.019	
502	FHHRV	+/- 0.03/100s	0.011	
503	FHICU	+/-0.14/100s	0.010	
504	FHFCU	+/- 0.14/100s	0.016	
506	FHWEV	+/- 0.03/100s	0.010	
601	FHWOH	+/- 0.03/100s	**0.037**	19420 (~5.4 hours)
602	FHWEH	+/- 0.03/100s	**0.039**	19410 (~5.4 hours)
603	FHHRH	+/- 0.03/100s	**0.035**	17910 (~4.9 hours)
604	FHLCU	+/- 0.03/100s	**0.035**	24790 (~6.9 hours)
605	FHLSU	+/- 0.03/100s	**0.034**	18610 (~5.2 hours)

Note: Bold values are out of range.

Table 3.3.2-1 HERSCHEL – Warm units Transient Case 1A: analysis results

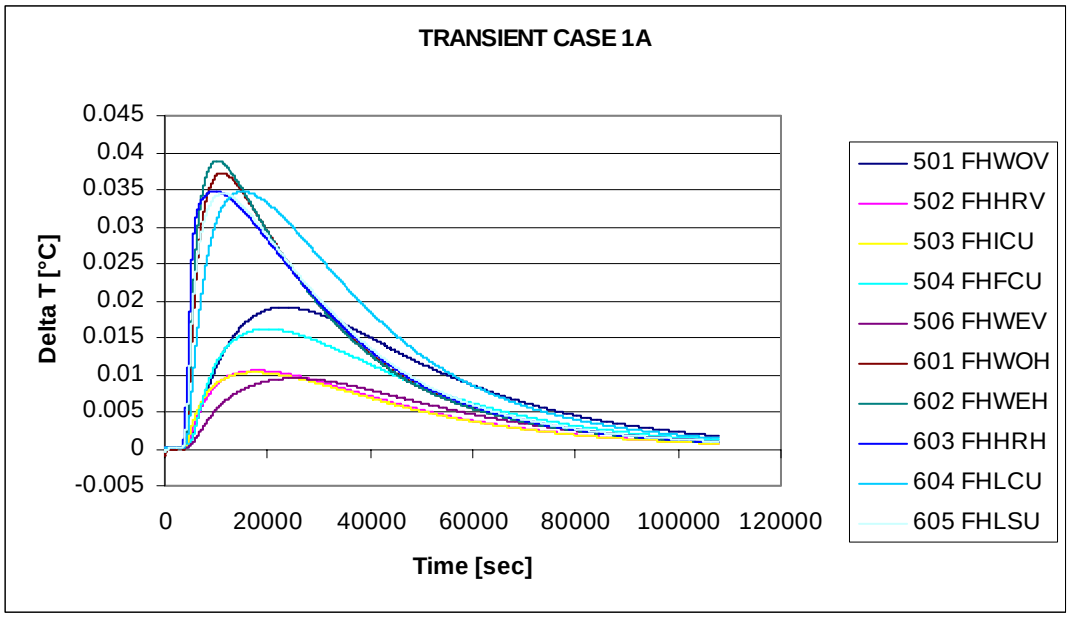


Figure 3.3.2-1 HERSCHEL – Warm units Transient Case 1A: Delta T

Transient Case 1B:

NODE	UNIT	Stability Requirement Delta T	TRANSIENT 1B From BOL2B to BOL7A	
			Dtmax [°C]	Re-entry Time [s]
401	CRYOE	+/- 3K/hr	0.070	
404	HSDCU	+/- 3K/hr	0.059	
405	HSDPU	+/- 3K/hr	0.044	
406	HSFCU	+/- 3K/hr	0.045	
501	FHWOV	+/- 0.03/100s	0.019	
502	FHHRV	+/- 0.03/100s	0.011	
503	FHICU	+/-0.14/100s	0.010	
504	FHFCU	+/- 0.14/100s	0.016	
506	FHWEV	+/- 0.03/100s	0.009	
601	FHWOH	+/- 0.03/100s	**0.037**	19100 (~5.3 hours)
602	FHWEH	+/- 0.03/100s	**0.039**	19060 (~5.3 hours)
603	FHHRH	+/- 0.03/100s	**0.034**	16580 (~4.6 hours)
604	FHLCU	+/- 0.03/100s	**0.033**	22300 (~6.2 hours)
605	FHLSU	+/- 0.03/100s	**0.033**	17040 (~4.7 hours)

Note: Bold values are out of range.

Table 3.3.2-1 HERSCHEL – Warm units Transient Case 1B: analysis results

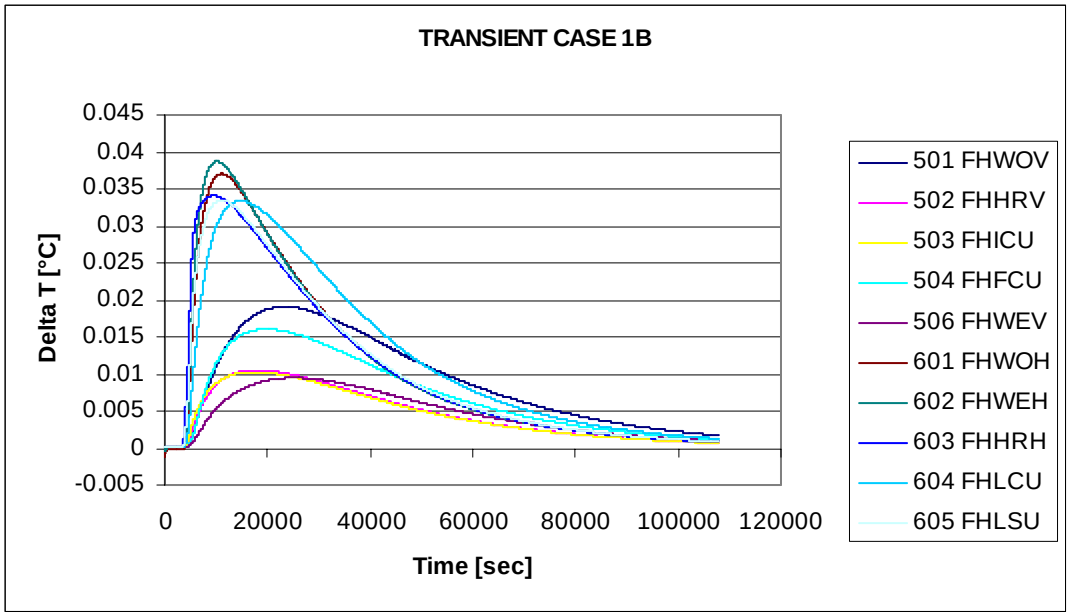


Figure 3.3.2-1 HERSCHEL – Warm units Transient Case 1B: Delta T

Transient Case 2:

NODE	UNIT	Stability Requirement Delta T	TRANSIENT 2 BOL2B HTR POWER VARIABLE Dtmax [°C]
401	CRYOE	+/- 3K/hr	-0.009
404	HSDCU	+/- 3K/hr	-0.005
405	HSDPU	+/- 3K/hr	-0.009
406	HSFCU	+/- 3K/hr	-0.008
501	FHWOV	+/- 0.03/100s	-0.0015
502	FHHRV	+/- 0.03/100s	-0.0008
503	FHICU	+/-0.14/100s	-0.0008
504	FHFCU	+/- 0.14/100s	-0.0013
506	FHWEV	+/- 0.03/100s	-0.0007
601	FHWOH	+/- 0.03/100s	-0.0057
602	FHWEH	+/- 0.03/100s	-0.0070
603	FHHRH	+/- 0.03/100s	-0.0050
604	FHLCU	+/- 0.03/100s	-0.0038
605	FHLSU	+/- 0.03/100s	-0.0042

Note: The values are all in range.

Table 3.3.2-2 HERSCHEL – Warm units Transient Case 2: analysis results

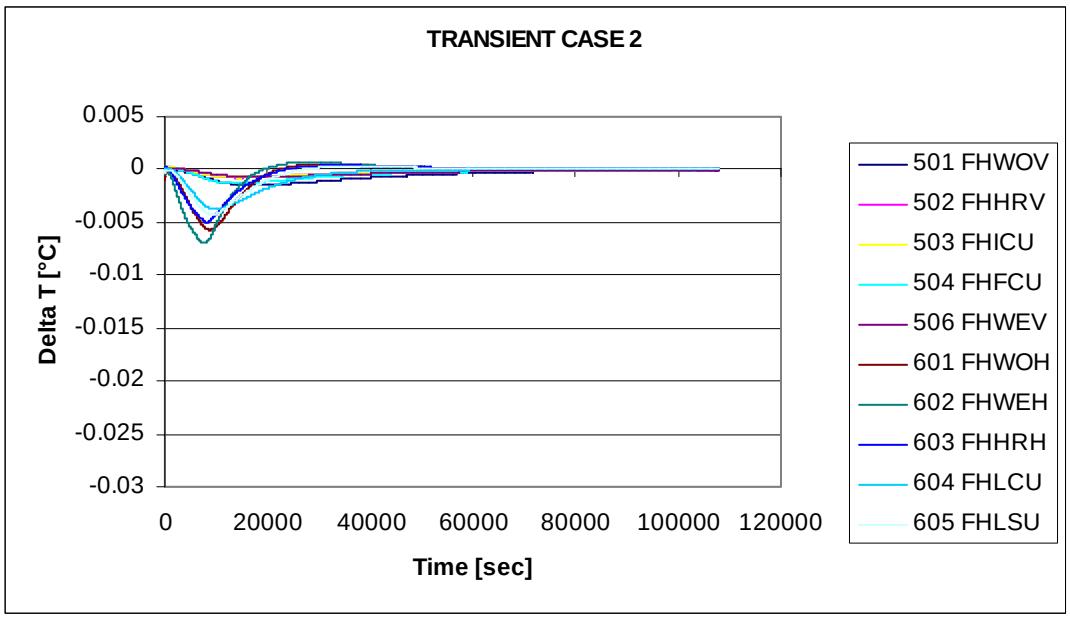


Figure 3.3.2-2 HERSCHEL – Warm units Transient Case 2: Delta T

Transient Case 3A:

NODE	UNIT	Stability Requirement Delta T	TRANSIENT 3A From EOL7A to EOL2B Dtmax [°C]	Re-entry Time [s]
401	CRYOE	+/- 3K/hr	-0.077	
404	HSDCU	+/- 3K/hr	-0.065	
405	HSDPU	+/- 3K/hr	-0.049	
406	HSFCU	+/- 3K/hr	-0.050	
501	FHWOV	+/- 0.03/100s	-0.021	
502	FHHRV	+/- 0.03/100s	-0.012	
503	FHICU	+/-0.14/100s	-0.011	
504	FHFCU	+/- 0.14/100s	-0.018	
506	FHWEV	+/- 0.03/100s	-0.011	
601	FHWOH	+/- 0.03/100s	**-0.048**	28300 (~7.9 hours)
602	FHWEH	+/- 0.03/100s	**-0.050**	27800 (~7.7 hours)
603	FHHRH	+/- 0.03/100s	**-0.064**	27640 (~7.7 hours)
604	FHLCU	+/- 0.03/100s	**-0.041**	31380 (~8.7 hours)
605	FHLSU	+/- 0.03/100s	**-0.054**	28330 (~7.9 hours)

Note: Bold values are out of range.

Table 3.3.2-3 HERSCHEL – Warm units Transient Case 3A analysis results

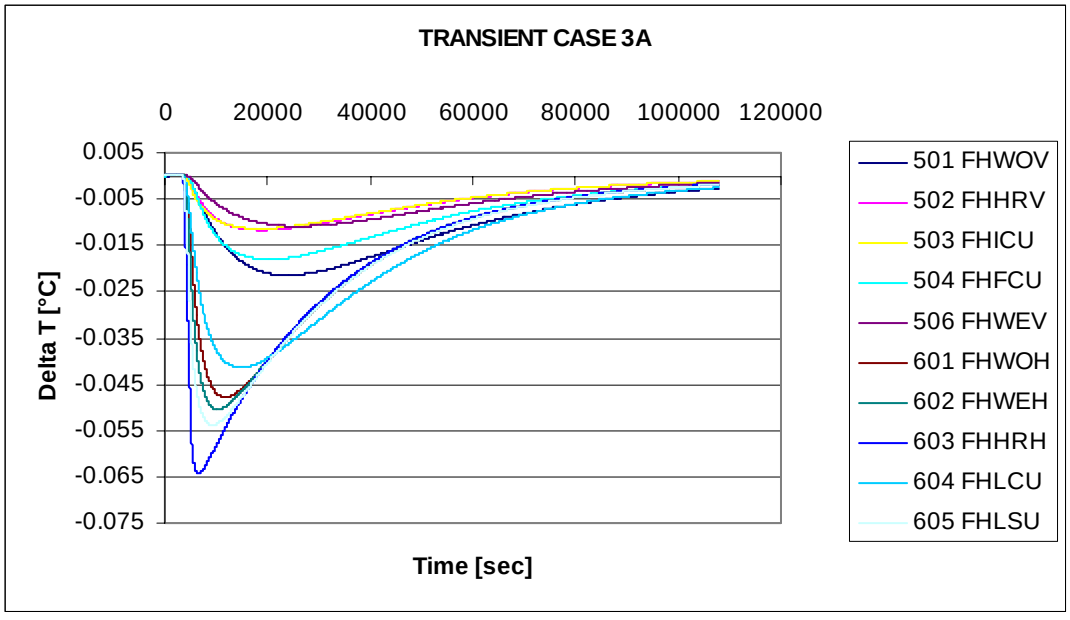


Figure 3.3.2-3 HERSCHEL – Warm units Transient Case 3A: Delta T

Transient Case 3B:

NODE	UNIT	Stability Requirement Delta T	TRANSIENT 3B From EOL7A to EOL2B Dtmax [°C]	Re-entry Time [s]
401	CRYOE	+/- 3K/hr	-0.073	
404	HSDCU	+/- 3K/hr	-0.062	
405	HSDPU	+/- 3K/hr	-0.032	
406	HSFCU	+/- 3K/hr	-0.033	
501	FHWOV	+/- 0.03/100s	-0.020	
502	FHHRV	+/- 0.03/100s	-0.011	
503	FHICU	+/-0.14/100s	-0.011	
504	FHFCU	+/- 0.14/100s	-0.017	
506	FHWEV	+/- 0.03/100s	-0.010	
601	FHWOH	+/- 0.03/100s	**-0.045**	24730 (~6.9 hours)
602	FHWEH	+/- 0.03/100s	**-0.048**	24320 (~6.8 hours)
603	FHHRH	+/- 0.03/100s	**-0.062**	23470 (~6.5 hours)
604	FHLCU	+/- 0.03/100s	**-0.038**	25860 (~7.2 hours)
605	FHLSU	+/- 0.03/100s	**-0.050**	23590 (~6.6 hours)

Note: Bold values are out of range.

Table 3.3.2-3 HERSCHEL – Warm units Transient Case 3B analysis results

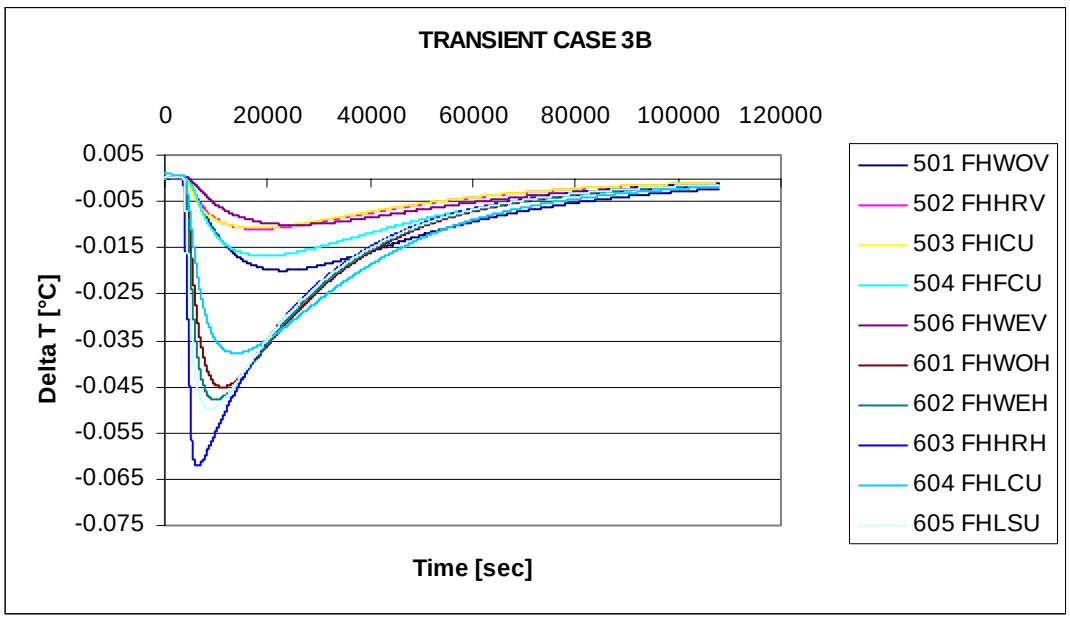


Figure 3.3.2-3 HERSCHEL – Warm units Transient Case 3B: Delta T

3.3.3 Heater Power Summary

The following table shows the Peak heater power need for the various BOL analysed cases and the EOL1 case.

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A	EOL1
		MODE3	MODE3	MODE3	MODE3	SURVIVAL	MODE2 Photometry
NODE	LABEL	Peak	Peak	Peak	Peak	Peak	Peak
		[W]	[W]	[W]	[W]	[W]	[W]
HTR101	RFDN	0	0	0	0	0	0
HTR102	EPC1	0	0	0	0	0	0
HTR103	EPC2	5.13	8.76	9.03	8,91	10.25	0
HTR104	TRANSX1	2.74	5.39	5.7	5,54	0.88	0
HTR105	TRANSX2	1.23	7.33	7.63	7,47	11.73	0
HTR106	TWTA1	5.1	8.98	9.42	9,22	0	0
HTR107	TWTA2	8.35	15.49	15.89	15,76	17.08	0
HTR201	PCDU	0	0	0	0	0	0
HTR202	CDMU	0	0	0	0	0	0
HTR203	ACC	0	0	0	0	0	0
HTR204	BATT	27	28.93	29.48	29,13	45.88	20.04
HTR301	FPSPU1_2	0	0	0	0	6.16	0
HTR303	FPDPU	0	0	0	0	14.99	0
HTR304	FPBOLC	8.26	12.03	12.19	11,34	44.87	0
HTR305	FPMECDEC	0	0	0	0	25.29	0
HTR401	CRYOE	0	0.68	0.68	0	28.2	0
HTR404	HSDCU	0	0	0	0	27.2	0
HTR405	HSDPU	0	0	0	0	26.68	0
HTR406	HSFCU	0	0	0	0	20.7	0
HTR501	FHWOV	6.57	6.87	6.87	6,7	11.43	5.82
HTR502	FHHRV	0	0	0	0	56.85	0
HTR503	FHICU	0	0	0	0	8.82	0
HTR504	FHFCU	0	0	0	0	13.87	0
HTR506	FHWEV	3.22	3.43	3.43	3,27	32.99	2.73
HTR601	FHWOH	22.93	22.86	22.26	20,66	26.48	21.49
HTR602	FHWEH	17.01	17.61	17	12,73	47.19	14.15
HTR603	FHHRH	0	0	0	0	35.04	0
HTR604	FHLCU	0	0	0	0	26.16	0
HTR605	FHLSU	19.86	21.28	21.2	0	43.38	16.64
HTR701	RWL1	6.58	10.11	9.87	9,15	21.04	0
HTR702	RWL2	5.52	10.49	10.19	9,57	24.12	0
HTR703	RWL3	5.97	9.84	9.62	8,66	21.51	0
HTR704	RWL4	6.94	11.04	10.87	10,28	16.54	0
HTR705	RWDE	0	0	0	0	15.17	0
HTR706	QRS1	0	0	0	0	0	0
HTR707	QRS2	0	0	0	0	0	0
HTR801	GYRO	0	0	0	0	0	0

		BOL1	BOL2A	BOL2B	BOL2B	BOL2A	EOL1
		MODE3	MODE3	MODE3	MODE3	SURVIVAL	MODE2 Photometry
NODE	LABEL	Peak	Peak	Peak	Peak	Peak	Peak
		[W]	[W]	[W]	[W]	[W]	[W]
HTR802	PDU	0	0	0	0	0	0
HTR950	TANK1	2.27	2.6	2.61	2,5	3.14	1.58
HTR960	TANK2	2.14	2.45	2.46	2,4	3.11	1.39
HTR042	STREMY	0	0	0	0	2.64	0
HTR045	STREPY	0.24	0.59	0.59	0,48	2.7	0
HTR006	SAS+Z	0	0	0	0	0	0
HTR046	SAS-Z	0	0	0	0	0	0
HTR	RCS	24	24	24	24	24	24
HTR	THRUSTERS	32	32	32	32	32	32
	Tot. Heater need:	213.1	262.8	263	229.8	748.1	139.8

The following table shows the Peak and the Average heater power need for the coldest case BOL2B and the SURVIVAL case.

		BOL2B		SURVIVAL	
NODE	LABEL	Peak	Average	Peak	Average
		[W]		[W]	
HTR101	RFDN	0	0	0	0
HTR102	EPC1	0	0	0	0
HTR103	EPC2	9.03	8.9	10.25	10.13
HTR104	TRANSX1	5.7	0	0.88	0
HTR105	TRANSX2	7.63	7.22	11.73	11.43
HTR106	TWTA1	9.42	9.2	0	0
HTR107	TWTA2	15.89	15.81	17.08	17
HTR201	PCDU	0	0	0	0
HTR202	CDMU	0	0	0	0
HTR203	ACC	0	0	0	0
HTR204	BATT	29.48	28.96	45.88	45.43
HTR301	FPSPU1_2	0	0	6.16	5.79
HTR303	FPDPU	0	0	14.99	14.44
HTR304	FPBOLC	12.19	0	44.87	43.85
HTR305	FPMECDEC	0	0	25.29	23.98
HTR401	CRYOE	0.68	0	28.2	27.55
HTR404	HSDCU	0	0	27.2	26.14
HTR405	HSDPU	0	0	26.68	26.21
HTR406	HSFCU	0	0	20.7	19.75
HTR501	FHWOV	6.87	6.87	11.43	11.43
HTR502	FHHRV	0	0	56.85	56.85

		BOL2B		SURVIVAL	
NODE	LABEL	Peak	Average	Peak	Average
		[W]		[W]	
HTR503	FHICU	0	0	8.82	8.82
HTR504	FHFCU	0	0	13.87	13.87
HTR506	FHWEV	3.43	3.43	32.99	32.99
HTR601	FHWOH	22.26	22.26	26.48	26.48
HTR602	FHWEH	17	17	47.19	47.19
HTR603	FHHRH	0	0	35.04	35.04
HTR604	FHLCU	0	0	26.16	26.16
HTR605	FHLSU	21.2	21.2	43.38	43.38
HTR701	RWL1	9.87	9.2	21.04	20.56
HTR702	RWL2	10.19	9.38	24.12	23.64
HTR703	RWL3	9.62	8.93	21.51	21.02
HTR704	RWL4	10.87	10.22	16.54	16.04
HTR705	RWDE	0	0	15.17	14.61
HTR706	QRS1	0	0	0	0
HTR707	QRS2	0	0	0	0
HTR801	GYRO	0	0	0	0
HTR802	PDU	0	0	0	0
HTR950	TANK1	2.61	1.64	3.14	2.27
HTR960	TANK2	2.46	1.55	3.11	2.24
HTR042	STREMY	0	0	2.64	0
HTR045	STREPY	0.59	0	2.7	0
HTR006	SAS+Z	0	0	0	0
HTR046	SAS-Z	0	0	0	0
HTR	RCS	24	12	24	12
HTR	THRUSTERS	32	16	32	16
	Tot. Heater need:	263	209.8	748.1	702.3

Table 3.3.3-1 HERSCHEL - Heater Power need

3.4 HERSCHEL - CONCLUSION

Steady State Analyses

All the units are maintained within their temperature limits with the exclusion of: the following minor out of specification:

- **PCDU:** case EOL7A 45.8°C vs 45.0°C
- **FHHRH:** case EOL7B 41.1°C vs 40.0°C

Transient Analyses

The temperature fluctuations on the HIFI units mounted on –Y panel are presenting some minor out of specification too.

In particular the stability goals (the requirements is +/-3K/hour) are not met during the attitude variation, but it is reached, for all units, after 6.9 hours in Transient Case 1,after 8.7 hours in Transient Case 2 and after 7.2 hours in Transient Case 3.

These out of spec during transient, relevant to thermal stability goal, have been pointed out in order to allow the assessment by all parts of the specific thermal stability behavior, and the possible relaxation of the requirement.

Is possible to recovery these out of spec on HI-FI units, maintain at their max temperature level by means of a similar heater control law, with an impact in terms of power budget of 80 watts (TBC)

Remarks:

- All transient cases presented have been performed based on "**constant power value of heater mounted on HIFI units".**
- The analysis of natural temperature response of HI-FI units to external disturbances (sun angle, heater operation) was evaluated to identify the major characteristics of the Heater Control Law: frequency of data monitoring, accuracy and sensitivity of thermistors, frequency of heater switching and heater power definition. According to the analysis, it seems viable to have a data monitoring frequency each 10 sec, a thermistor resolution of 0.01 °C and a fine heater command able to control temperatures within +/- 0.01°C in 10 seconds and consequently within +/- 0.03°C in 100 sec.
  According to above mentioned sensitivity figure, the induced unit temperature variation, can be compensate by means of heaters mounted on the units/panels having stringent stability requirement. The following approach will be implemented:

  - Temperature monitoring each 10 seconds with heater period command equal to 1 second
  - Temperature variation determination over in the last 10 seconds with a resolution of 0.01 °C
  - If this variation is higher than 0.01 °C over 10 seconds, the heater is operated according to the control laws to be defined by TCS supplier for the subsystem PDR

4. PLANCK – MODEL DESCRIPTION AND THERMAL ANALYSIS

4.1 PLANCK - PRESENTATION OF THE MODEL

Herschel and Planck are two satellites dedicated to the observation of the universe.

- Planck mission objective is to provide major source of information relevant to several cosmological and astrophysical issues such as the testing theories of the early universe and the origin of cosmic structure.

The spacecraft is planned to operate from Lissajous orbits around the Langragian point L2 of the Sun / Earth system. This point is aligned with the Earth and the Sun and located at 1.5 10^6 Km from the Earth.

Both satellites are planned to be launched by ARIANE 5 dual launch.

The main modules are:

- The Service Module (SVM)
- The Payload Module (PLM), carrying the scientific instruments and telescopes and relevant electronic units
- The Sunshields, protecting the Payload or the S/C and used also as Solar Arrays.

4.1.1 Geometric Mathematical Model (GMM)

The Geometric models detail all the satellite surfaces and their thermo-optical properties, in order to evaluate the radiative exchange factors among nodes and, only for the external nodes, the fluxes (solar, albedo and Earth shine) on spacecraft surfaces during the orbit. Due to the huge distance of the PLANCK orbit from the Earth, only solar fluxes have been considerate in the thermal analysis.

The Geometric Mathematical Model (GMM) of PLANCK satellite has been built using Esarad (ver. 4.3) software and it is composed by a single model, which describe both the external environment and the internal enclosures of the spacecraft. Some components of the Payload Module have been also considered in order to evaluate the radiative impact on the PLANCK Service Module.

The termo-optical properties of the material used in theGMM/TMM are listed in Table 4.1.1.
The geometrical nodes of PLANCK Service Module and Groove Shield are shown on Table 4.1.1-1 with the thermal properties of each node.
In addition to the previous list the nodal breakdown of the Geometric Model, both internal and external nodes, is shown on Fig 4.1.1-1 to Fig. 4.1.1-10

SURFACES	MATERIALS	Alpha BOL	Alpha EOL	Epsilon
Internal surfaces (black paint, carbon fibre & Units)	Black Paint (Aeroglaze)	0.9	0.9	0.9
Radiators	Black Paint (Electrodag)	0.80	0.80	0.80
Internal MLI and Top/Bottom MLI	Kapton Aluminized	0.15	0.15	0.05
External MLI	Carbon Filled	0.92	0.92	0.86
Launcher Adaptor Ring	Alumnium	0.15	0.15	0.05

Table 4.1.1 PLANCK – Service Module Thermal Properties Materials

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
11	STR1	0.295	0.90	-	0.90
12	STR2	0.295	0.90	-	0.90
13	DPU1	0.296	0.90	-	0.90
14	DPU2	0.296	0.90	-	0.90
15	REU	0.876	0.90	-	0.90
101	DCCU	1.815	0.90	-	0.90
102	REBA1	0.197	0.90	-	0.90
103	REBA2	0.197	0.90	-	0.90
201	4 CCU	0.417	0.90	-	0.90
202	4 CAU	0.423	0.90	-	0.90
203	4 PRE-REG	0.135	0.90	-	0.90
204	CEU	0.227	0.90	-	0.90
401	SCE1	0.258	0.90	-	0.90
402	SCE2	0.258	0.90	-	0.90
521	BEU	0.090	0.90	-	0.90
522	PAU	0.015	0.90	-	0.90
525	DAE Power Unit	0.550	0.90	-	0.90
551	QRS3	0.201	0.90	-	0.90
601	XPND_1	0.240	0.90	-	0.90
602	XPND_2	0.240	0.90	-	0.90
603	TWTA_1	0.116	0.90	-	0.90
604	TWTA_2	0.116	0.90	-	0.90
605	RFDN	0.635	0.90	-	0.90
606	EPC1	0.113	0.90	-	0.90
607	EPC2	0.113	0.90	-	0.90
701	CDMU	0.637	0.90	-	0.90
702	ACC	0.535	0.90	-	0.90
703	BATT	0.269	0.90	-	0.90
704	PCDU	0.685	0.90	-	0.90
705	QRS1	0.201	0.90	-	0.90
706	QRS2	0.201	0.90	-	0.90
707	PDU	0.135	0.90	-	0.90
900	Helium Tank +Z	0.636	0.15	-	0.05
905	Helium Tank +Y	0.636	0.15	-	0.05
910	Helium Tank -Z	0.636	0.15	-	0.05
915	Helium Tank -Y	0.636	0.15	-	0.05
920	Prop. Tank +Y+Z Lower	1.605	0.15	-	0.05
925	Prop. Tank -Z Lower	1.605	0.15	-	0.05
930	Prop. Tank -Y+Z Lower	1.605	0.15	-	0.05
1001	MLI SVM Bot +Z	0.663	0.15	-	0.05
1002	MLI SVM Bot +Z+Y	0.545	0.15	-	0.05
1003	MLI SVM Bot +Y	0.663	0.15	-	0.05
1004	MLI SVM Bot -Z-Y	0.545	0.15	-	0.05
1005	MLI SVM Bot -Z	0.663	0.15	-	0.05
1006	MLI SVM Bot -Z-Y	0.545	0.15	-	0.05
1007	MLI SVM Bot -Y	0.663	0.15	-	0.05
1008	MLI SVM Bot +Z-Y	0.545	0.15	-	0.05

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
1601	SVM Bot +Z	0.663	0.90	-	0.90
1602	SVM Bot +Z+Y	0.545	0.90	-	0.90
1603	SVM Bot +Y	0.663	0.90	-	0.90
1604	SVM Bot -Z-Y	0.545	0.90	-	0.90
1605	SVM Bot -Z	0.663	0.90	-	0.90
1606	SVM Bot -Z-Y	0.545	0.90	-	0.90
1607	SVM Bot -Y	0.663	0.90	-	0.90
1608	SVM Bot +Z-Y	0.545	0.90	-	0.90
2001	Launcher Adapter Ring	0.053	0.15	-	0.05
2002	Launcher Adapter Ring	0.081	0.15	-	0.05
2003	Launcher Adapter Ring	0.053	0.15	-	0.05
2004	Launcher Adapter Ring	0.081	0.15	-	0.05
2005	Launcher Adapter Ring	0.053	0.15	-	0.05
2006	Launcher Adapter Ring	0.081	0.15	-	0.05
2007	Launcher Adapter Ring	0.053	0.15	-	0.05
2008	Launcher Adapter Ring	0.081	0.15	-	0.05
2011	Launcher Adapter Edge	0.074	0.15	-	0.05
2012	Launcher Adapter Edge	0.114	0.15	-	0.05
2013	Launcher Adapter Edge	0.074	0.15	-	0.05
2014	Launcher Adapter Edge	0.114	0.15	-	0.05
2015	Launcher Adapter Edge	0.074	0.15	-	0.05
2016	Launcher Adapter Edge	0.114	0.15	-	0.05
2017	Launcher Adapter Edge	0.074	0.15	-	0.05
2018	Launcher Adapter Edge	0.114	0.15	-	0.05
2021	Launcher Adapter Ring	0.036	0.92	-	0.86
2022	Launcher Adapter Ring	0.057	0.92	-	0.86
2023	Launcher Adapter Ring	0.036	0.92	-	0.86
2024	Launcher Adapter Ring	0.057	0.92	-	0.86
2025	Launcher Adapter Ring	0.036	0.92	-	0.86
2026	Launcher Adapter Ring	0.057	0.92	-	0.86
2027	Launcher Adapter Ring	0.036	0.92	-	0.86
2028	Launcher Adapter Ring	0.057	0.92	-	0.86
2101	Launcher Adapter Ring	0.053	0.15	-	0.05
2102	Launcher Adapter Ring	0.081	0.15	-	0.05
2103	Launcher Adapter Ring	0.053	0.15	-	0.05
2104	Launcher Adapter Ring	0.081	0.15	-	0.05
2105	Launcher Adapter Ring	0.053	0.15	-	0.05
2106	Launcher Adapter Ring	0.081	0.15	-	0.05
2107	Launcher Adapter Ring	0.053	0.15	-	0.05
2108	Launcher Adapter Ring	0.081	0.15	-	0.05
2111	Launcher Adapter Edge	0.074	0.15	-	0.05
2112	Launcher Adapter Edge	0.114	0.15	-	0.05
2113	Launcher Adapter Edge	0.074	0.15	-	0.05
2114	Launcher Adapter Edge	0.114	0.15	-	0.05
2115	Launcher Adapter Edge	0.074	0.15	-	0.05
2116	Launcher Adapter Edge	0.114	0.15	-	0.05
2117	Launcher Adapter Edge	0.074	0.15	-	0.05
2118	Launcher Adapter Edge	0.114	0.15	-	0.05

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
2121	Launcher Adapter Ring	0.036	0.15	-	0.05
2122	Launcher Adapter Ring	0.057	0.15	-	0.05
2123	Launcher Adapter Ring	0.036	0.15	-	0.05
2124	Launcher Adapter Ring	0.057	0.15	-	0.05
2125	Launcher Adapter Ring	0.036	0.15	-	0.05
2126	Launcher Adapter Ring	0.057	0.15	-	0.05
2127	Launcher Adapter Ring	0.036	0.15	-	0.05
2128	Launcher Adapter Ring	0.057	0.15	-	0.05
2201	RCS Panel	0.253	0.90	-	0.90
2202	RCS Panel	0.493	0.90	-	0.90
2203	RCS Panel	0.253	0.90	-	0.90
2204	RCS Panel	0.493	0.90	-	0.90
2205	RCS Panel	0.253	0.90	-	0.90
2206	RCS Panel	0.493	0.90	-	0.90
2207	RCS Panel	0.253	0.90	-	0.90
2208	RCS Panel	0.493	0.90	-	0.90
2251	MLI Launcher Adapter Ring	0.036	0.15	-	0.05
2252	MLI Launcher Adapter Ring	0.057	0.15	-	0.05
2253	MLI Launcher Adapter Ring	0.036	0.15	-	0.05
2254	MLI Launcher Adapter Ring	0.057	0.15	-	0.05
2255	MLI Launcher Adapter Ring	0.036	0.15	-	0.05
2256	MLI Launcher Adapter Ring	0.057	0.15	-	0.05
2257	MLI Launcher Adapter Ring	0.036	0.15	-	0.05
2258	MLI Launcher Adapter Ring	0.057	0.15	-	0.05
2401	RCS Panel	0.253	0.90	-	0.90
2402	RCS Panel	0.493	0.90	-	0.90
2403	RCS Panel	0.253	0.90	-	0.90
2404	RCS Panel	0.493	0.90	-	0.90
2405	RCS Panel	0.253	0.90	-	0.90
2406	RCS Panel	0.493	0.90	-	0.90
2407	RCS Panel	0.253	0.90	-	0.90
2408	RCS Panel	0.493	0.90	-	0.90
2501	SVM Cone +Z+Y	0.114	0.90	-	0.90
2502	SVM Cone +Y	0.187	0.90	-	0.90
2503	SVM Cone +Y-Z	0.114	0.90	-	0.90
2504	SVM Cone -Z	0.187	0.90	-	0.90
2505	SVM Cone -Z-Y	0.114	0.90	-	0.90
2506	SVM Cone -Y	0.187	0.90	-	0.90
2507	SVM Cone -Z+Y	0.114	0.90	-	0.90
2508	SVM Cone +Z	0.187	0.90	-	0.90
2511	SVM Cone +Z+Y	0.118	0.90	-	0.90
2512	SVM Cone +Y	0.194	0.90	-	0.90
2513	SVM Cone +Y-Z	0.118	0.90	-	0.90
2514	SVM Cone -Z	0.194	0.90	-	0.90
2515	SVM Cone -Z-Y	0.118	0.90	-	0.90
2516	SVM Cone -Y	0.194	0.90	-	0.90
2517	SVM Cone -Z+Y	0.118	0.90	-	0.90
2518	SVM Cone +Z	0.194	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
2521	SVM Cone +Z+Y	0.123	0.90	-	0.90
2522	SVM Cone +Y	0.202	0.90	-	0.90
2523	SVM Cone +Y-Z	0.123	0.90	-	0.90
2524	SVM Cone -Z	0.202	0.90	-	0.90
2525	SVM Cone -Z-Y	0.123	0.90	-	0.90
2526	SVM Cone -Y	0.202	0.90	-	0.90
2527	SVM Cone -Z+Y	0.123	0.90	-	0.90
2528	SVM Cone +Z	0.202	0.90	-	0.90
2531	SVM Cone +Z+Y	0.128	0.90	-	0.90
2532	SVM Cone +Y	0.209	0.90	-	0.90
2533	SVM Cone +Y-Z	0.128	0.90	-	0.90
2534	SVM Cone -Z	0.209	0.90	-	0.90
2535	SVM Cone -Z-Y	0.128	0.90	-	0.90
2536	SVM Cone -Y	0.209	0.90	-	0.90
2537	SVM Cone -Z+Y	0.128	0.90	-	0.90
2538	SVM Cone +Z	0.209	0.90	-	0.90
2541	SVM Cone +Z+Y	0.132	0.90	-	0.90
2542	SVM Cone +Y	0.217	0.90	-	0.90
2543	SVM Cone +Y-Z	0.132	0.90	-	0.90
2544	SVM Cone -Z	0.217	0.90	-	0.90
2545	SVM Cone -Z-Y	0.132	0.90	-	0.90
2546	SVM Cone -Y	0.217	0.90	-	0.90
2547	SVM Cone -Z+Y	0.132	0.90	-	0.90
2548	SVM Cone +Z	0.217	0.90	-	0.90
2601	SVM Cone +Z+Y	0.114	0.90	-	0.90
2602	SVM Cone +Y	0.187	0.90	-	0.90
2603	SVM Cone +Y-Z	0.114	0.90	-	0.90
2604	SVM Cone -Z	0.187	0.90	-	0.90
2605	SVM Cone -Z-Y	0.114	0.90	-	0.90
2606	SVM Cone -Y	0.187	0.90	-	0.90
2607	SVM Cone -Z+Y	0.114	0.90	-	0.90
2608	SVM Cone +Z	0.187	0.90	-	0.90
2611	SVM Cone +Z+Y	0.118	0.90	-	0.90
2612	SVM Cone +Y	0.194	0.90	-	0.90
2613	SVM Cone +Y-Z	0.118	0.90	-	0.90
2614	SVM Cone -Z	0.194	0.90	-	0.90
2615	SVM Cone -Z-Y	0.118	0.90	-	0.90
2616	SVM Cone -Y	0.194	0.90	-	0.90
2617	SVM Cone -Z+Y	0.118	0.90	-	0.90
2618	SVM Cone +Z	0.194	0.90	-	0.90
2621	SVM Cone +Z+Y	0.123	0.90	-	0.90
2622	SVM Cone +Y	0.202	0.90	-	0.90
2623	SVM Cone +Y-Z	0.123	0.90	-	0.90
2624	SVM Cone -Z	0.202	0.90	-	0.90
2625	SVM Cone -Z-Y	0.123	0.90	-	0.90
2626	SVM Cone -Y	0.202	0.90	-	0.90
2627	SVM Cone -Z+Y	0.123	0.90	-	0.90
2628	SVM Cone +Z	0.202	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
2631	SVM Cone +Z+Y	0.128	0.90	-	0.90
2632	SVM Cone +Y	0.209	0.90	-	0.90
2633	SVM Cone +Y-Z	0.128	0.90	-	0.90
2634	SVM Cone -Z	0.209	0.90	-	0.90
2635	SVM Cone -Z-Y	0.128	0.90	-	0.90
2636	SVM Cone -Y	0.209	0.90	-	0.90
2637	SVM Cone -Z+Y	0.128	0.90	-	0.90
2638	SVM Cone +Z	0.209	0.90	-	0.90
2641	SVM Cone +Z+Y	0.132	0.90	-	0.90
2642	SVM Cone +Y	0.217	0.90	-	0.90
2643	SVM Cone +Y-Z	0.132	0.90	-	0.90
2644	SVM Cone -Z	0.217	0.90	-	0.90
2645	SVM Cone -Z-Y	0.132	0.90	-	0.90
2646	SVM Cone -Y	0.217	0.90	-	0.90
2647	SVM Cone -Z+Y	0.132	0.90	-	0.90
2648	SVM Cone +Z	0.217	0.90	-	0.90
3001	Rad +Z	0.061	0.80	-	0.80
3002	Rad +Z	0.061	0.80	-	0.80
3003	Rad +Z	0.061	0.80	-	0.80
3004	Rad +Z	0.061	0.80	-	0.80
3005	Rad +Z	0.061	0.80	-	0.80
3006	Rad +Z	0.061	0.80	-	0.80
3007	Rad +Z	0.061	0.80	-	0.80
3008	Rad +Z	0.061	0.80	-	0.80
3009	Rad +Z	0.061	0.80	-	0.80
3010	Rad +Z	0.061	0.80	-	0.80
3011	Rad +Z	0.061	0.80	-	0.80
3012	Rad +Z	0.061	0.80	-	0.80
3013	Rad +Z	0.061	0.80	-	0.80
3014	Rad +Z	0.061	0.80	-	0.80
3015	Rad +Z	0.061	0.80	-	0.80
3016	Rad +Z	0.061	0.80	-	0.80
3101	Rad +Y+Z	0.061	0.80	-	0.80
3102	Rad +Y+Z	0.061	0.80	-	0.80
3103	Rad +Y+Z	0.061	0.80	-	0.80
3104	Rad +Y+Z	0.061	0.80	-	0.80
3105	Rad +Y+Z	0.061	0.80	-	0.80
3106	Rad +Y+Z	0.061	0.80	-	0.80
3107	Rad +Y+Z	0.061	0.80	-	0.80
3108	Rad +Y+Z	0.061	0.80	-	0.80
3109	Rad +Y+Z	0.061	0.80	-	0.80
3110	Rad +Y+Z	0.061	0.80	-	0.80
3111	Rad +Y+Z	0.061	0.80	-	0.80
3112	Rad +Y+Z	0.061	0.80	-	0.80
3113	Rad +Y+Z	0.061	0.80	-	0.80
3114	Rad +Y+Z	0.061	0.80	-	0.80
3115	Rad +Y+Z	0.061	0.80	-	0.80
3116	Rad +Y+Z	0.061	0.80	-	0.80

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
3117	Rad +Y+Z	0.061	0.80	-	0.80
3118	Rad +Y+Z	0.061	0.80	-	0.80
3119	Rad +Y+Z	0.061	0.80	-	0.80
3120	Rad +Y+Z	0.061	0.80	-	0.80
3121	Rad +Y+Z	0.061	0.80	-	0.80
3122	Rad +Y+Z	0.061	0.80	-	0.80
3123	Rad +Y+Z	0.061	0.80	-	0.80
3124	Rad +Y+Z	0.061	0.80	-	0.80
3201	Rad +Y	0.061	0.80	-	0.80
3202	Rad +Y	0.061	0.80	-	0.80
3203	Rad +Y	0.061	0.80	-	0.80
3204	Rad +Y	0.061	0.80	-	0.80
3205	Rad +Y	0.061	0.80	-	0.80
3206	Rad +Y	0.061	0.80	-	0.80
3207	Rad +Y	0.061	0.80	-	0.80
3208	Rad +Y	0.061	0.80	-	0.80
3209	Rad +Y	0.061	0.80	-	0.80
3210	Rad +Y	0.061	0.80	-	0.80
3211	Rad +Y	0.061	0.80	-	0.80
3212	Rad +Y	0.061	0.80	-	0.80
3213	Rad +Y	0.061	0.80	-	0.80
3214	Rad +Y	0.061	0.80	-	0.80
3215	Rad +Y	0.061	0.80	-	0.80
3216	Rad +Y	0.061	0.80	-	0.80
3301	Rad +Y-Z	0.030	0.80	-	0.80
3302	Rad +Y-Z	0.030	0.80	-	0.80
3303	Rad +Y-Z	0.030	0.80	-	0.80
3304	Rad +Y-Z	0.030	0.80	-	0.80
3305	Rad +Y-Z	0.030	0.80	-	0.80
3306	Rad +Y-Z	0.030	0.80	-	0.80
3307	Rad +Y-Z	0.030	0.80	-	0.80
3308	Rad +Y-Z	0.030	0.80	-	0.80
3309	Rad +Y-Z	0.030	0.80	-	0.80
3310	Rad +Y-Z	0.030	0.80	-	0.80
3311	Rad +Y-Z	0.030	0.80	-	0.80
3312	Rad +Y-Z	0.030	0.80	-	0.80
3313	Rad +Y-Z	0.030	0.80	-	0.80
3314	Rad +Y-Z	0.030	0.80	-	0.80
3315	Rad +Y-Z	0.030	0.80	-	0.80
3316	Rad +Y-Z	0.030	0.80	-	0.80
3317	Rad +Y-Z	0.030	0.80	-	0.80
3318	Rad +Y-Z	0.030	0.80	-	0.80
3319	Rad +Y-Z	0.030	0.80	-	0.80
3320	Rad +Y-Z	0.030	0.80	-	0.80
3321	Rad +Y-Z	0.030	0.80	-	0.80
3322	Rad +Y-Z	0.030	0.80	-	0.80
3323	Rad +Y-Z	0.030	0.80	-	0.80
3324	Rad +Y-Z	0.030	0.80	-	0.80

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
3325	Rad +Y-Z	0.030	0.80	-	0.80
3326	Rad +Y-Z	0.030	0.80	-	0.80
3327	Rad +Y-Z	0.030	0.80	-	0.80
3328	Rad +Y-Z	0.030	0.80	-	0.80
3329	Rad +Y-Z	0.030	0.80	-	0.80
3330	Rad +Y-Z	0.030	0.80	-	0.80
3331	Rad +Y-Z	0.030	0.80	-	0.80
3332	Rad +Y-Z	0.030	0.80	-	0.80
3333	Rad +Y-Z	0.030	0.80	-	0.80
3334	Rad +Y-Z	0.030	0.80	-	0.80
3335	Rad +Y-Z	0.030	0.80	-	0.80
3336	Rad +Y-Z	0.030	0.80	-	0.80
3337	Rad +Y-Z	0.030	0.80	-	0.80
3338	Rad +Y-Z	0.030	0.80	-	0.80
3339	Rad +Y-Z	0.030	0.80	-	0.80
3340	Rad +Y-Z	0.030	0.80	-	0.80
3341	Rad +Y-Z	0.030	0.80	-	0.80
3342	Rad +Y-Z	0.030	0.80	-	0.80
3343	Rad +Y-Z	0.030	0.80	-	0.80
3344	Rad +Y-Z	0.030	0.80	-	0.80
3345	Rad +Y-Z	0.030	0.80	-	0.80
3346	Rad +Y-Z	0.030	0.80	-	0.80
3347	Rad +Y-Z	0.030	0.80	-	0.80
3348	Rad +Y-Z	0.030	0.80	-	0.80
3401	Rad -Z	0.015	0.80	-	0.80
3402	Rad -Z	0.021	0.80	-	0.80
3403	Rad -Z	0.015	0.80	-	0.80
3404	Rad -Z	0.015	0.80	-	0.80
3405	Rad -Z	0.021	0.80	-	0.80
3406	Rad -Z	0.015	0.80	-	0.80
3407	Rad -Z	0.015	0.80	-	0.80
3408	Rad -Z	0.021	0.80	-	0.80
3409	Rad -Z	0.015	0.80	-	0.80
3410	Rad -Z	0.015	0.80	-	0.80
3411	Rad -Z	0.021	0.80	-	0.80
3412	Rad -Z	0.015	0.80	-	0.80
3413	Rad -Z	0.015	0.80	-	0.80
3414	Rad -Z	0.021	0.80	-	0.80
3415	Rad -Z	0.015	0.80	-	0.80
3416	Rad -Z	0.015	0.80	-	0.80
3417	Rad -Z	0.021	0.80	-	0.80
3418	Rad -Z	0.015	0.80	-	0.80
3419	Rad -Z	0.015	0.80	-	0.80
3420	Rad -Z	0.021	0.80	-	0.80
3421	Rad -Z	0.015	0.80	-	0.80
3422	Rad -Z	0.015	0.80	-	0.80
3423	Rad -Z	0.021	0.80	-	0.80
3424	Rad -Z	0.015	0.80	-	0.80

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
3425	Rad -Z	0.015	0.80	-	0.80
3426	Rad -Z	0.021	0.80	-	0.80
3427	Rad -Z	0.015	0.80	-	0.80
3428	Rad -Z	0.015	0.80	-	0.80
3429	Rad -Z	0.021	0.80	-	0.80
3430	Rad -Z	0.015	0.80	-	0.80
3431	Rad -Z	0.015	0.80	-	0.80
3432	Rad -Z	0.021	0.80	-	0.80
3433	Rad -Z	0.015	0.80	-	0.80
3434	Rad -Z	0.015	0.80	-	0.80
3435	Rad -Z	0.021	0.80	-	0.80
3436	Rad -Z	0.015	0.80	-	0.80
3437	Rad -Z	0.015	0.80	-	0.80
3438	Rad -Z	0.021	0.80	-	0.80
3439	Rad -Z	0.015	0.80	-	0.80
3440	Rad -Z	0.015	0.80	-	0.80
3441	Rad -Z	0.021	0.80	-	0.80
3442	Rad -Z	0.015	0.80	-	0.80
3443	Rad -Z	0.015	0.80	-	0.80
3444	Rad -Z	0.021	0.80	-	0.80
3445	Rad -Z	0.015	0.80	-	0.80
3446	Rad -Z	0.015	0.80	-	0.80
3447	Rad -Z	0.021	0.80	-	0.80
3448	Rad -Z	0.015	0.80	-	0.80
3449	Rad -Z	0.015	0.80	-	0.80
3450	Rad -Z	0.021	0.80	-	0.80
3451	Rad -Z	0.015	0.80	-	0.80
3452	Rad -Z	0.015	0.80	-	0.80
3453	Rad -Z	0.021	0.80	-	0.80
3454	Rad -Z	0.015	0.80	-	0.80
3501	Rad -Y-Z	0.030	0.80	-	0.80
3502	Rad -Y-Z	0.030	0.80	-	0.80
3503	Rad -Y-Z	0.030	0.80	-	0.80
3504	Rad -Y-Z	0.030	0.80	-	0.80
3505	Rad -Y-Z	0.030	0.80	-	0.80
3506	Rad -Y-Z	0.030	0.80	-	0.80
3507	Rad -Y-Z	0.030	0.80	-	0.80
3508	Rad -Y-Z	0.030	0.80	-	0.80
3509	Rad -Y-Z	0.030	0.80	-	0.80
3510	Rad -Y-Z	0.030	0.80	-	0.80
3511	Rad -Y-Z	0.030	0.80	-	0.80
3512	Rad -Y-Z	0.030	0.80	-	0.80
3513	Rad -Y-Z	0.030	0.80	-	0.80
3514	Rad -Y-Z	0.030	0.80	-	0.80
3515	Rad -Y-Z	0.030	0.80	-	0.80
3516	Rad -Y-Z	0.030	0.80	-	0.80
3517	Rad -Y-Z	0.030	0.80	-	0.80
3518	Rad -Y-Z	0.030	0.80	-	0.80

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
3519	Rad -Y-Z	0.030	0.80	-	0.80
3520	Rad -Y-Z	0.030	0.80	-	0.80
3521	Rad -Y-Z	0.030	0.80	-	0.80
3522	Rad -Y-Z	0.030	0.80	-	0.80
3523	Rad -Y-Z	0.030	0.80	-	0.80
3524	Rad -Y-Z	0.030	0.80	-	0.80
3525	Rad -Y-Z	0.030	0.80	-	0.80
3526	Rad -Y-Z	0.030	0.80	-	0.80
3527	Rad -Y-Z	0.030	0.80	-	0.80
3528	Rad -Y-Z	0.030	0.80	-	0.80
3529	Rad -Y-Z	0.030	0.80	-	0.80
3530	Rad -Y-Z	0.030	0.80	-	0.80
3531	Rad -Y-Z	0.030	0.80	-	0.80
3532	Rad -Y-Z	0.030	0.80	-	0.80
3533	Rad -Y-Z	0.030	0.80	-	0.80
3534	Rad -Y-Z	0.030	0.80	-	0.80
3535	Rad -Y-Z	0.030	0.80	-	0.80
3536	Rad -Y-Z	0.030	0.80	-	0.80
3537	Rad -Y-Z	0.030	0.80	-	0.80
3538	Rad -Y-Z	0.030	0.80	-	0.80
3539	Rad -Y-Z	0.030	0.80	-	0.80
3540	Rad -Y-Z	0.030	0.80	-	0.80
3541	Rad -Y-Z	0.030	0.80	-	0.80
3542	Rad -Y-Z	0.030	0.80	-	0.80
3543	Rad -Y-Z	0.030	0.80	-	0.80
3544	Rad -Y-Z	0.030	0.80	-	0.80
3545	Rad -Y-Z	0.030	0.80	-	0.80
3546	Rad -Y-Z	0.030	0.80	-	0.80
3547	Rad -Y-Z	0.030	0.80	-	0.80
3548	Rad -Y-Z	0.030	0.80	-	0.80
3601	Rad -Y	0.061	0.80	-	0.80
3602	Rad -Y	0.061	0.80	-	0.80
3603	Rad -Y	0.061	0.80	-	0.80
3604	Rad -Y	0.061	0.80	-	0.80
3605	Rad -Y	0.061	0.80	-	0.80
3606	Rad -Y	0.061	0.80	-	0.80
3607	Rad -Y	0.061	0.80	-	0.80
3608	Rad -Y	0.061	0.80	-	0.80
3609	Rad -Y	0.061	0.80	-	0.80
3610	Rad -Y	0.061	0.80	-	0.80
3611	Rad -Y	0.061	0.80	-	0.80
3612	Rad -Y	0.061	0.80	-	0.80
3613	Rad -Y	0.061	0.80	-	0.80
3614	Rad -Y	0.061	0.80	-	0.80
3615	Rad -Y	0.061	0.80	-	0.80
3616	Rad -Y	0.061	0.80	-	0.80
3701	Rad -Y+Z	0.061	0.80	-	0.80
3702	Rad -Y+Z	0.061	0.80	-	0.80

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
3703	Rad -Y+Z	0.061	0.80	-	0.80
3704	Rad -Y+Z	0.061	0.80	-	0.80
3705	Rad -Y+Z	0.061	0.80	-	0.80
3706	Rad -Y+Z	0.061	0.80	-	0.80
3707	Rad -Y+Z	0.061	0.80	-	0.80
3708	Rad -Y+Z	0.061	0.80	-	0.80
3709	Rad -Y+Z	0.061	0.80	-	0.80
3710	Rad -Y+Z	0.061	0.80	-	0.80
3711	Rad -Y+Z	0.061	0.80	-	0.80
3712	Rad -Y+Z	0.061	0.80	-	0.80
3713	Rad -Y+Z	0.061	0.80	-	0.80
3714	Rad -Y+Z	0.061	0.80	-	0.80
3715	Rad -Y+Z	0.061	0.80	-	0.80
3716	Rad -Y+Z	0.061	0.80	-	0.80
3717	Rad -Y+Z	0.061	0.80	-	0.80
3718	Rad -Y+Z	0.061	0.80	-	0.80
3719	Rad -Y+Z	0.061	0.80	-	0.80
3720	Rad -Y+Z	0.061	0.80	-	0.80
3721	Rad -Y+Z	0.061	0.80	-	0.80
3722	Rad -Y+Z	0.061	0.80	-	0.80
3723	Rad -Y+Z	0.061	0.80	-	0.80
3724	Rad -Y+Z	0.061	0.80	-	0.80
4001	MLI Rad +Z	0.061	0.92	-	0.86
4002	MLI Rad +Z	0.061	0.92	-	0.86
4003	MLI Rad +Z	0.061	0.92	-	0.86
4004	MLI Rad +Z	0.061	0.92	-	0.86
4006	MLI Rad +Z	0.061	0.92	-	0.86
4010	MLI Rad +Z	0.061	0.92	-	0.86
4101	MLI Rad +Y+Z	0.061	0.92	-	0.86
4102	MLI Rad +Y+Z	0.061	0.92	-	0.86
4103	MLI Rad +Y+Z	0.061	0.92	-	0.86
4104	MLI Rad +Y+Z	0.061	0.92	-	0.86
4105	MLI Rad +Y+Z	0.061	0.92	-	0.86
4106	MLI Rad +Y+Z	0.061	0.92	-	0.86
4107	MLI Rad +Y+Z	0.061	0.92	-	0.86
4108	MLI Rad +Y+Z	0.061	0.92	-	0.86
4109	MLI Rad +Y+Z	0.061	0.92	-	0.86
4112	MLI Rad +Y+Z	0.061	0.92	-	0.86
4113	MLI Rad +Y+Z	0.061	0.92	-	0.86
4114	MLI Rad +Y+Z	0.061	0.92	-	0.86
4115	MLI Rad +Y+Z	0.061	0.92	-	0.86
4118	MLI Rad +Y+Z	0.061	0.92	-	0.86
4119	MLI Rad +Y+Z	0.061	0.92	-	0.86
4120	MLI Rad +Y+Z	0.061	0.92	-	0.86
4121	MLI Rad +Y+Z	0.061	0.92	-	0.86
4122	MLI Rad +Y+Z	0.061	0.92	-	0.86
4123	MLI Rad +Y+Z	0.061	0.92	-	0.86
4124	MLI Rad +Y+Z	0.061	0.92	-	0.86

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
4213	MLI Rad +Y	0.061	0.92	-	0.86
4214	MLI Rad +Y	0.061	0.92	-	0.86
4215	MLI Rad +Y	0.061	0.92	-	0.86
4216	MLI Rad +Y	0.061	0.92	-	0.86
4350	MLI on SCC1 Rad +Y-Z	0.969	0.15	-	0.05
4351	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4356	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4357	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4362	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4363	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4368	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4369	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4374	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4375	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4380	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4381	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4386	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4387	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4392	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4393	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4398	MLI Int Rad +Y-Z	0.031	0.15	-	0.05
4450	MLI Rad -Z	0.973	0.15	-	0.05
4550	MLI on SCC2 Rad -Y-Z	0.969	0.15	-	0.05
4551	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4556	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4557	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4562	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4563	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4568	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4569	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4574	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4575	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4580	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4581	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4586	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4587	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4592	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4593	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4598	MLI Int Rad -Y-Z	0.031	0.15	-	0.05
4601	MLI Rad -Y	0.061	0.92	-	0.86
4602	MLI Rad -Y	0.061	0.92	-	0.86
4605	MLI Rad -Y	0.061	0.92	-	0.86
4606	MLI Rad -Y	0.061	0.92	-	0.86
4607	MLI Rad -Y	0.061	0.92	-	0.86
4608	MLI Rad -Y	0.061	0.92	-	0.86
4609	MLI Rad -Y	0.061	0.92	-	0.86
4610	MLI Rad -Y	0.061	0.92	-	0.86
4613	MLI Rad -Y	0.061	0.92	-	0.86

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
4614	MLI Rad -Y	0.061	0.92	-	0.86
4705	MLI Rad +Y+Z	0.061	0.92	-	0.86
4706	MLI Rad +Y+Z	0.061	0.92	-	0.86
4711	MLI Rad +Y+Z	0.061	0.92	-	0.86
4712	MLI Rad +Y+Z	0.061	0.92	-	0.86
4718	MLI Rad +Y+Z	0.061	0.92	-	0.86
4900	MLI Helium Tank +Z	0.636	0.15	-	0.05
4905	MLI Helium Tank +Y	0.636	0.15	-	0.05
4910	MLI Helium Tank -Z	0.636	0.15	-	0.05
4915	MLI Helium Tank -Y	0.636	0.15	-	0.05
4920	MLI Pr Tank +Y+Z Lower	1.605	0.15	-	0.05
4925	MLI Pr Tank -Z Lower	1.605	0.15	-	0.05
4930	MLI Pr Tank -Y+Z Lower	1.605	0.15	-	0.05
6001	Int Rad +Z	0.061	0.90	-	0.90
6002	Int Rad +Z	0.061	0.90	-	0.90
6003	Int Rad +Z	0.061	0.90	-	0.90
6004	Int Rad +Z	0.061	0.90	-	0.90
6005	Int Rad +Z	0.061	0.90	-	0.90
6006	Int Rad +Z	0.061	0.90	-	0.90
6007	Int Rad +Z	0.061	0.90	-	0.90
6008	Int Rad +Z	0.061	0.90	-	0.90
6009	Int Rad +Z	0.061	0.90	-	0.90
6010	Int Rad +Z	0.061	0.90	-	0.90
6011	Int Rad +Z	0.061	0.90	-	0.90
6012	Int Rad +Z	0.061	0.90	-	0.90
6013	Int Rad +Z	0.061	0.90	-	0.90
6014	Int Rad +Z	0.061	0.90	-	0.90
6015	Int Rad +Z	0.061	0.90	-	0.90
6016	Int Rad +Z	0.061	0.90	-	0.90
6051	Shear Web1 +Z-Y	0.095	0.90	-	0.90
6052	Shear Web1 +Z-Y	0.104	0.90	-	0.90
6053	Shear Web1 +Z-Y	0.113	0.90	-	0.90
6054	Shear Web1 +Z-Y	0.121	0.90	-	0.90
6055	Shear Web1 +Z-Y	0.130	0.90	-	0.90
6061	Shear Web1 +Z-Y	0.095	0.90	-	0.90
6062	Shear Web1 +Z-Y	0.104	0.90	-	0.90
6063	Shear Web1 +Z-Y	0.113	0.90	-	0.90
6064	Shear Web1 +Z-Y	0.121	0.90	-	0.90
6065	Shear Web1 +Z-Y	0.130	0.90	-	0.90
6071	Shear Web2 +Z-Y	0.095	0.90	-	0.90
6072	Shear Web2 +Z-Y	0.104	0.90	-	0.90
6073	Shear Web2 +Z-Y	0.113	0.90	-	0.90
6074	Shear Web2 +Z-Y	0.121	0.90	-	0.90
6075	Shear Web2 +Z-Y	0.130	0.90	-	0.90
6081	Shear Web2 +Z-Y	0.095	0.90	-	0.90
6082	Shear Web2 +Z-Y	0.104	0.90	-	0.90
6083	Shear Web2 +Z-Y	0.113	0.90	-	0.90
6084	Shear Web2 +Z-Y	0.121	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
6085	Shear Web2 +Z-Y	0.130	0.90	-	0.90
6101	Int Rad +Y+Z	0.061	0.90	-	0.90
6102	Int Rad +Y+Z	0.061	0.90	-	0.90
6103	Int Rad +Y+Z	0.061	0.90	-	0.90
6104	Int Rad +Y+Z	0.061	0.90	-	0.90
6105	Int Rad +Y+Z	0.061	0.90	-	0.90
6106	Int Rad +Y+Z	0.061	0.90	-	0.90
6107	Int Rad +Y+Z	0.061	0.90	-	0.90
6108	Int Rad +Y+Z	0.061	0.90	-	0.90
6109	Int Rad +Y+Z	0.061	0.90	-	0.90
6110	Int Rad +Y+Z	0.061	0.90	-	0.90
6111	Int Rad +Y+Z	0.061	0.90	-	0.90
6112	Int Rad +Y+Z	0.061	0.90	-	0.90
6113	Int Rad +Y+Z	0.061	0.90	-	0.90
6114	Int Rad +Y+Z	0.061	0.90	-	0.90
6115	Int Rad +Y+Z	0.061	0.90	-	0.90
6116	Int Rad +Y+Z	0.061	0.90	-	0.90
6117	Int Rad +Y+Z	0.061	0.90	-	0.90
6118	Int Rad +Y+Z	0.061	0.90	-	0.90
6119	Int Rad +Y+Z	0.061	0.90	-	0.90
6120	Int Rad +Y+Z	0.061	0.90	-	0.90
6121	Int Rad +Y+Z	0.061	0.90	-	0.90
6122	Int Rad +Y+Z	0.061	0.90	-	0.90
6123	Int Rad +Y+Z	0.061	0.90	-	0.90
6124	Int Rad +Y+Z	0.061	0.90	-	0.90
6151	Shear Web3 +Z+Y	0.095	0.90	-	0.90
6152	Shear Web3 +Z+Y	0.104	0.90	-	0.90
6153	Shear Web3 +Z+Y	0.113	0.90	-	0.90
6154	Shear Web3 +Z+Y	0.121	0.90	-	0.90
6155	Shear Web3 +Z+Y	0.130	0.90	-	0.90
6161	Shear Web3 +Z+Y	0.095	0.90	-	0.90
6162	Shear Web3 +Z+Y	0.104	0.90	-	0.90
6163	Shear Web3 +Z+Y	0.113	0.90	-	0.90
6164	Shear Web3 +Z+Y	0.121	0.90	-	0.90
6165	Shear Web3 +Z+Y	0.130	0.90	-	0.90
6171	Shear Web4 +Z+Y	0.095	0.90	-	0.90
6172	Shear Web4 +Z+Y	0.104	0.90	-	0.90
6173	Shear Web4 +Z+Y	0.113	0.90	-	0.90
6174	Shear Web4 +Z+Y	0.121	0.90	-	0.90
6175	Shear Web4 +Z+Y	0.130	0.90	-	0.90
6181	Shear Web4 +Z+Y	0.095	0.90	-	0.90
6182	Shear Web4 +Z+Y	0.104	0.90	-	0.90
6183	Shear Web4 +Z+Y	0.113	0.90	-	0.90
6184	Shear Web4 +Z+Y	0.121	0.90	-	0.90
6185	Shear Web4 +Z+Y	0.130	0.90	-	0.90
6201	Int Rad +Y	0.061	0.90	-	0.90
6202	Int Rad +Y	0.061	0.90	-	0.90
6203	Int Rad +Y	0.061	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
6204	Int Rad +Y	0.061	0.90	-	0.90
6205	Int Rad +Y	0.061	0.90	-	0.90
6206	Int Rad +Y	0.061	0.90	-	0.90
6207	Int Rad +Y	0.061	0.90	-	0.90
6208	Int Rad +Y	0.061	0.90	-	0.90
6209	Int Rad +Y	0.061	0.90	-	0.90
6210	Int Rad +Y	0.061	0.90	-	0.90
6211	Int Rad +Y	0.061	0.90	-	0.90
6212	Int Rad +Y	0.061	0.90	-	0.90
6213	Int Rad +Y	0.061	0.90	-	0.90
6214	Int Rad +Y	0.061	0.90	-	0.90
6215	Int Rad +Y	0.061	0.90	-	0.90
6216	Int Rad +Y	0.061	0.90	-	0.90
6251	Shear Web5 -Z+Y	0.095	0.90	-	0.90
6252	Shear Web5 -Z+Y	0.104	0.90	-	0.90
6253	Shear Web5 -Z+Y	0.113	0.90	-	0.90
6254	Shear Web5 -Z+Y	0.121	0.90	-	0.90
6255	Shear Web5 -Z+Y	0.130	0.90	-	0.90
6261	Shear Web5 -Z+Y	0.095	0.90	-	0.90
6262	Shear Web5 -Z+Y	0.104	0.90	-	0.90
6263	Shear Web5 -Z+Y	0.113	0.90	-	0.90
6264	Shear Web5 -Z+Y	0.121	0.90	-	0.90
6265	Shear Web5 -Z+Y	0.130	0.90	-	0.90
6271	Shear Web6 -Z+Y	0.095	0.90	-	0.90
6272	Shear Web6 -Z+Y	0.104	0.90	-	0.90
6273	Shear Web6 -Z+Y	0.113	0.90	-	0.90
6274	Shear Web6 -Z+Y	0.121	0.90	-	0.90
6275	Shear Web6 -Z+Y	0.130	0.90	-	0.90
6281	Shear Web6 -Z+Y	0.095	0.90	-	0.90
6282	Shear Web6 -Z+Y	0.104	0.90	-	0.90
6283	Shear Web6 -Z+Y	0.113	0.90	-	0.90
6284	Shear Web6 -Z+Y	0.121	0.90	-	0.90
6285	Shear Web6 -Z+Y	0.130	0.90	-	0.90
6301	Int Rad +Y-Z	0.030	0.90	-	0.90
6302	Int Rad +Y-Z	0.030	0.90	-	0.90
6303	Int Rad +Y-Z	0.030	0.90	-	0.90
6304	Int Rad +Y-Z	0.030	0.90	-	0.90
6305	Int Rad +Y-Z	0.030	0.90	-	0.90
6306	Int Rad +Y-Z	0.030	0.90	-	0.90
6307	Int Rad +Y-Z	0.030	0.90	-	0.90
6308	Int Rad +Y-Z	0.030	0.90	-	0.90
6309	Int Rad +Y-Z	0.030	0.90	-	0.90
6310	Int Rad +Y-Z	0.030	0.90	-	0.90
6311	Int Rad +Y-Z	0.030	0.90	-	0.90
6312	Int Rad +Y-Z	0.030	0.90	-	0.90
6313	Int Rad +Y-Z	0.030	0.90	-	0.90
6314	Int Rad +Y-Z	0.030	0.90	-	0.90
6315	Int Rad +Y-Z	0.030	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
6316	Int Rad +Y-Z	0.030	0.90	-	0.90
6317	Int Rad +Y-Z	0.030	0.90	-	0.90
6318	Int Rad +Y-Z	0.030	0.90	-	0.90
6319	Int Rad +Y-Z	0.030	0.90	-	0.90
6320	Int Rad +Y-Z	0.030	0.90	-	0.90
6321	Int Rad +Y-Z	0.030	0.90	-	0.90
6322	Int Rad +Y-Z	0.030	0.90	-	0.90
6323	Int Rad +Y-Z	0.030	0.90	-	0.90
6324	Int Rad +Y-Z	0.030	0.90	-	0.90
6325	Int Rad +Y-Z	0.030	0.90	-	0.90
6326	Int Rad +Y-Z	0.030	0.90	-	0.90
6327	Int Rad +Y-Z	0.030	0.90	-	0.90
6328	Int Rad +Y-Z	0.030	0.90	-	0.90
6329	Int Rad +Y-Z	0.030	0.90	-	0.90
6330	Int Rad +Y-Z	0.030	0.90	-	0.90
6331	Int Rad +Y-Z	0.030	0.90	-	0.90
6332	Int Rad +Y-Z	0.030	0.90	-	0.90
6333	Int Rad +Y-Z	0.030	0.90	-	0.90
6334	Int Rad +Y-Z	0.030	0.90	-	0.90
6335	Int Rad +Y-Z	0.030	0.90	-	0.90
6336	Int Rad +Y-Z	0.030	0.90	-	0.90
6337	Int Rad +Y-Z	0.030	0.90	-	0.90
6338	Int Rad +Y-Z	0.030	0.90	-	0.90
6339	Int Rad +Y-Z	0.030	0.90	-	0.90
6340	Int Rad +Y-Z	0.030	0.90	-	0.90
6341	Int Rad +Y-Z	0.030	0.90	-	0.90
6342	Int Rad +Y-Z	0.030	0.90	-	0.90
6343	Int Rad +Y-Z	0.030	0.90	-	0.90
6344	Int Rad +Y-Z	0.030	0.90	-	0.90
6345	Int Rad +Y-Z	0.030	0.90	-	0.90
6346	Int Rad +Y-Z	0.030	0.90	-	0.90
6347	Int Rad +Y-Z	0.030	0.90	-	0.90
6348	Int Rad +Y-Z	0.030	0.90	-	0.90
6351	Shear Web7 -Z-Y	0.095	0.90	-	0.90
6352	Shear Web7 -Z-Y	0.104	0.90	-	0.90
6353	Shear Web7 -Z-Y	0.113	0.90	-	0.90
6354	Shear Web7 -Z-Y	0.121	0.90	-	0.90
6355	Shear Web7 -Z-Y	0.130	0.90	-	0.90
6361	Shear Web7 -Z-Y	0.095	0.90	-	0.90
6362	Shear Web7 -Z-Y	0.104	0.90	-	0.90
6363	Shear Web7 -Z-Y	0.113	0.90	-	0.90
6364	Shear Web7 -Z-Y	0.121	0.90	-	0.90
6365	Shear Web7 -Z-Y	0.130	0.90	-	0.90
6371	Shear Web8 -Z-Y	0.095	0.90	-	0.90
6372	Shear Web8 -Z-Y	0.104	0.90	-	0.90
6373	Shear Web8 -Z-Y	0.113	0.90	-	0.90
6374	Shear Web8 -Z-Y	0.121	0.90	-	0.90
6375	Shear Web8 -Z-Y	0.130	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
6381	Shear Web8 -Z-Y	0.095	0.90	-	0.90
6382	Shear Web8 -Z-Y	0.104	0.90	-	0.90
6383	Shear Web8 -Z-Y	0.113	0.90	-	0.90
6384	Shear Web8 -Z-Y	0.121	0.90	-	0.90
6385	Shear Web8 -Z-Y	0.130	0.90	-	0.90
6401	Int Rad -Z	0.015	0.90	-	0.90
6402	Int Rad -Z	0.021	0.90	-	0.90
6403	Int Rad -Z	0.015	0.90	-	0.90
6404	Int Rad -Z	0.015	0.90	-	0.90
6405	Int Rad -Z	0.021	0.90	-	0.90
6406	Int Rad -Z	0.015	0.90	-	0.90
6407	Int Rad -Z	0.015	0.90	-	0.90
6408	Int Rad -Z	0.021	0.90	-	0.90
6409	Int Rad -Z	0.015	0.90	-	0.90
6410	Int Rad -Z	0.015	0.90	-	0.90
6411	Int Rad -Z	0.021	0.90	-	0.90
6412	Int Rad -Z	0.015	0.90	-	0.90
6413	Int Rad -Z	0.015	0.90	-	0.90
6414	Int Rad -Z	0.021	0.90	-	0.90
6415	Int Rad -Z	0.015	0.90	-	0.90
6416	Int Rad -Z	0.015	0.90	-	0.90
6417	Int Rad -Z	0.021	0.90	-	0.90
6418	Int Rad -Z	0.015	0.90	-	0.90
6419	Int Rad -Z	0.015	0.90	-	0.90
6420	Int Rad -Z	0.021	0.90	-	0.90
6421	Int Rad -Z	0.015	0.90	-	0.90
6422	Int Rad -Z	0.015	0.90	-	0.90
6423	Int Rad -Z	0.021	0.90	-	0.90
6424	Int Rad -Z	0.015	0.90	-	0.90
6425	Int Rad -Z	0.015	0.90	-	0.90
6426	Int Rad -Z	0.021	0.90	-	0.90
6427	Int Rad -Z	0.015	0.90	-	0.90
6428	Int Rad -Z	0.015	0.90	-	0.90
6429	Int Rad -Z	0.021	0.90	-	0.90
6430	Int Rad -Z	0.015	0.90	-	0.90
6431	Int Rad -Z	0.015	0.90	-	0.90
6432	Int Rad -Z	0.021	0.90	-	0.90
6433	Int Rad -Z	0.015	0.90	-	0.90
6434	Int Rad -Z	0.015	0.90	-	0.90
6435	Int Rad -Z	0.021	0.90	-	0.90
6436	Int Rad -Z	0.015	0.90	-	0.90
6437	Int Rad -Z	0.015	0.90	-	0.90
6438	Int Rad -Z	0.021	0.90	-	0.90
6439	Int Rad -Z	0.015	0.90	-	0.90
6440	Int Rad -Z	0.015	0.90	-	0.90
6441	Int Rad -Z	0.021	0.90	-	0.90
6442	Int Rad -Z	0.015	0.90	-	0.90
6443	Int Rad -Z	0.015	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
6444	Int Rad -Z	0.021	0.90	-	0.90
6445	Int Rad -Z	0.015	0.90	-	0.90
6446	Int Rad -Z	0.015	0.90	-	0.90
6447	Int Rad -Z	0.021	0.90	-	0.90
6448	Int Rad -Z	0.015	0.90	-	0.90
6449	Int Rad -Z	0.015	0.90	-	0.90
6450	Int Rad -Z	0.021	0.90	-	0.90
6451	Int Rad -Z	0.015	0.90	-	0.90
6452	Int Rad -Z	0.015	0.90	-	0.90
6453	Int Rad -Z	0.021	0.90	-	0.90
6454	Int Rad -Z	0.015	0.90	-	0.90
6501	Int Rad -Y-Z	0.030	0.90	-	0.90
6502	Int Rad -Y-Z	0.030	0.90	-	0.90
6503	Int Rad -Y-Z	0.030	0.90	-	0.90
6504	Int Rad -Y-Z	0.030	0.90	-	0.90
6505	Int Rad -Y-Z	0.030	0.90	-	0.90
6506	Int Rad -Y-Z	0.030	0.90	-	0.90
6507	Int Rad -Y-Z	0.030	0.90	-	0.90
6508	Int Rad -Y-Z	0.030	0.90	-	0.90
6509	Int Rad -Y-Z	0.030	0.90	-	0.90
6510	Int Rad -Y-Z	0.030	0.90	-	0.90
6511	Int Rad -Y-Z	0.030	0.90	-	0.90
6512	Int Rad -Y-Z	0.030	0.90	-	0.90
6513	Int Rad -Y-Z	0.030	0.90	-	0.90
6514	Int Rad -Y-Z	0.030	0.90	-	0.90
6515	Int Rad -Y-Z	0.030	0.90	-	0.90
6516	Int Rad -Y-Z	0.030	0.90	-	0.90
6517	Int Rad -Y-Z	0.030	0.90	-	0.90
6518	Int Rad -Y-Z	0.030	0.90	-	0.90
6519	Int Rad -Y-Z	0.030	0.90	-	0.90
6520	Int Rad -Y-Z	0.030	0.90	-	0.90
6521	Int Rad -Y-Z	0.030	0.90	-	0.90
6522	Int Rad -Y-Z	0.030	0.90	-	0.90
6523	Int Rad -Y-Z	0.030	0.90	-	0.90
6524	Int Rad -Y-Z	0.030	0.90	-	0.90
6525	Int Rad -Y-Z	0.030	0.90	-	0.90
6526	Int Rad -Y-Z	0.030	0.90	-	0.90
6527	Int Rad -Y-Z	0.030	0.90	-	0.90
6528	Int Rad -Y-Z	0.030	0.90	-	0.90
6529	Int Rad -Y-Z	0.030	0.90	-	0.90
6530	Int Rad -Y-Z	0.030	0.90	-	0.90
6531	Int Rad -Y-Z	0.030	0.90	-	0.90
6532	Int Rad -Y-Z	0.030	0.90	-	0.90
6533	Int Rad -Y-Z	0.030	0.90	-	0.90
6534	Int Rad -Y-Z	0.030	0.90	-	0.90
6535	Int Rad -Y-Z	0.030	0.90	-	0.90
6536	Int Rad -Y-Z	0.030	0.90	-	0.90
6537	Int Rad -Y-Z	0.030	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
6538	Int Rad -Y-Z	0.030	0.90	-	0.90
6539	Int Rad -Y-Z	0.030	0.90	-	0.90
6540	Int Rad -Y-Z	0.030	0.90	-	0.90
6541	Int Rad -Y-Z	0.030	0.90	-	0.90
6542	Int Rad -Y-Z	0.030	0.90	-	0.90
6543	Int Rad -Y-Z	0.030	0.90	-	0.90
6544	Int Rad -Y-Z	0.030	0.90	-	0.90
6545	Int Rad -Y-Z	0.030	0.90	-	0.90
6546	Int Rad -Y-Z	0.030	0.90	-	0.90
6547	Int Rad -Y-Z	0.030	0.90	-	0.90
6548	Int Rad -Y-Z	0.030	0.90	-	0.90
6601	Int Rad -Y	0.061	0.90	-	0.90
6602	Int Rad -Y	0.061	0.90	-	0.90
6603	Int Rad -Y	0.061	0.90	-	0.90
6604	Int Rad -Y	0.061	0.90	-	0.90
6605	Int Rad -Y	0.061	0.90	-	0.90
6606	Int Rad -Y	0.061	0.90	-	0.90
6607	Int Rad -Y	0.061	0.90	-	0.90
6608	Int Rad -Y	0.061	0.90	-	0.90
6609	Int Rad -Y	0.061	0.90	-	0.90
6610	Int Rad -Y	0.061	0.90	-	0.90
6611	Int Rad -Y	0.061	0.90	-	0.90
6612	Int Rad -Y	0.061	0.90	-	0.90
6613	Int Rad -Y	0.061	0.90	-	0.90
6614	Int Rad -Y	0.061	0.90	-	0.90
6615	Int Rad -Y	0.061	0.90	-	0.90
6616	Int Rad -Y	0.061	0.90	-	0.90
6701	Int Rad -Y+Z	0.061	0.90	-	0.90
6702	Int Rad -Y+Z	0.061	0.90	-	0.90
6703	Int Rad -Y+Z	0.061	0.90	-	0.90
6704	Int Rad -Y+Z	0.061	0.90	-	0.90
6705	Int Rad -Y+Z	0.061	0.90	-	0.90
6706	Int Rad -Y+Z	0.061	0.90	-	0.90
6707	Int Rad -Y+Z	0.061	0.90	-	0.90
6708	Int Rad -Y+Z	0.061	0.90	-	0.90
6709	Int Rad -Y+Z	0.061	0.90	-	0.90
6710	Int Rad -Y+Z	0.061	0.90	-	0.90
6711	Int Rad -Y+Z	0.061	0.90	-	0.90
6712	Int Rad -Y+Z	0.061	0.90	-	0.90
6713	Int Rad -Y+Z	0.061	0.90	-	0.90
6714	Int Rad -Y+Z	0.061	0.90	-	0.90
6715	Int Rad -Y+Z	0.061	0.90	-	0.90
6716	Int Rad -Y+Z	0.061	0.90	-	0.90
6717	Int Rad -Y+Z	0.061	0.90	-	0.90
6718	Int Rad -Y+Z	0.061	0.90	-	0.90
6719	Int Rad -Y+Z	0.061	0.90	-	0.90
6720	Int Rad -Y+Z	0.061	0.90	-	0.90
6721	Int Rad -Y+Z	0.061	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
6722	Int Rad -Y+Z	0.061	0.90	-	0.90
6723	Int Rad -Y+Z	0.061	0.90	-	0.90
6724	Int Rad -Y+Z	0.061	0.90	-	0.90
7001	MLI SVM Top +Z	0.787	0.15	-	0.05
7002	MLI SVM Top +Z+Y	0.835	0.15	-	0.05
7003	MLI SVM Top +Y	0.787	0.15	-	0.05
7004	MLI SVM Top -Z+Y	0.835	0.15	-	0.05
7005	MLI SVM Top -Z	0.787	0.15	-	0.05
7006	MLI SVM Top -Z-Y	0.835	0.15	-	0.05
7007	MLI SVM Top -Y	0.787	0.15	-	0.05
7008	MLI SVM Top +Z-Y	0.835	0.15	-	0.05
7201	MLI SVM Top Disc +Y+Z	0.041	0.15	-	0.05
7202	MLI SVM Top Disc +Y+Z	0.048	0.15	-	0.05
7203	MLI SVM Top Disc +Y+Z	0.048	0.15	-	0.05
7204	MLI SVM Top Disc +Y+Z	0.081	0.15	-	0.05
7205	MLI SVM Top Disc +Y+Z	0.038	0.15	-	0.05
7206	MLI SVM Top Disc +Y+Z	0.041	0.15	-	0.05
7207	MLI SVM Top Disc +Y+Z	0.039	0.15	-	0.05
7208	MLI SVM Top Disc +Y+Z	0.030	0.15	-	0.05
7209	MLI SVM Top Disc +Y+Z	0.028	0.15	-	0.05
7210	MLI SVM Top Disc +Y+Z	0.026	0.15	-	0.05
7211	MLI SVM Top Disc +Y+Z	0.037	0.15	-	0.05
7212	MLI SVM Top Disc +Y+Z	0.031	0.15	-	0.05
7213	MLI SVM Top Disc +Y+Z	0.029	0.15	-	0.05
7214	MLI SVM Top Disc +Y+Z	0.051	0.15	-	0.05
7215	MLI SVM Top Disc +Y+Z	0.051	0.15	-	0.05
7216	MLI SVM Top Disc +Y+Z	0.058	0.15	-	0.05
7217	MLI SVM Top Disc +Y+Z	0.097	0.15	-	0.05
7218	MLI SVM Top Disc +Y+Z	0.049	0.15	-	0.05
7219	MLI SVM Top Disc +Y+Z	0.057	0.15	-	0.05
7220	MLI SVM Top Disc +Y+Z	0.049	0.15	-	0.05
7221	MLI SVM Top Disc +Y+Z	0.057	0.15	-	0.05
7222	MLI SVM Top Disc +Y+Z	0.058	0.15	-	0.05
7223	MLI SVM Top Disc +Y+Z	0.097	0.15	-	0.05
7224	MLI SVM Top Disc +Y+Z	0.051	0.15	-	0.05
7225	MLI SVM Top Disc +Y+Z	0.051	0.15	-	0.05
7226	MLI SVM Top Disc +Y+Z	0.031	0.15	-	0.05
7227	MLI SVM Top Disc +Y+Z	0.037	0.15	-	0.05
7228	MLI SVM Top Disc +Y+Z	0.033	0.15	-	0.05
7229	MLI SVM Top Disc +Y+Z	0.054	0.15	-	0.05
7230	MLI SVM Top Disc +Y+Z	0.044	0.15	-	0.05
7231	MLI SVM Top Disc +Y+Z	0.028	0.15	-	0.05
7232	MLI SVM Top Disc +Y+Z	0.030	0.15	-	0.05
7233	MLI SVM Top Disc +Y+Z	0.039	0.15	-	0.05
7234	MLI SVM Top Disc +Y+Z	0.038	0.15	-	0.05
7235	MLI SVM Top Disc +Y+Z	0.041	0.15	-	0.05
7236	MLI SVM Top Disc +Y+Z	0.048	0.15	-	0.05
7237	MLI SVM Top Disc +Y+Z	0.081	0.15	-	0.05

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
7238	MLI SVM Top Disc +Y+Z	0.041	0.15	-	0.05
7239	MLI SVM Top Disc +Y+Z	0.048	0.15	-	0.05
7245	SVM Top Disc MLI	1.749	0.15	-	0.05
7301	SVM Top Disc +Y+Z	0.041	0.90	-	0.90
7302	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7303	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7304	SVM Top Disc +Y+Z	0.081	0.90	-	0.90
7305	SVM Top Disc +Y+Z	0.038	0.90	-	0.90
7306	SVM Top Disc +Y+Z	0.041	0.90	-	0.90
7307	SVM Top Disc +Y+Z	0.039	0.90	-	0.90
7308	SVM Top Disc +Y+Z	0.030	0.90	-	0.90
7309	SVM Top Disc +Y+Z	0.028	0.90	-	0.90
7310	SVM Top Disc +Y+Z	0.026	0.90	-	0.90
7311	SVM Top Disc +Y+Z	0.037	0.90	-	0.90
7312	SVM Top Disc +Y+Z	0.031	0.90	-	0.90
7313	SVM Top Disc +Y+Z	0.029	0.90	-	0.90
7314	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7315	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7316	SVM Top Disc +Y+Z	0.058	0.90	-	0.90
7317	SVM Top Disc +Y+Z	0.097	0.90	-	0.90
7318	SVM Top Disc +Y+Z	0.049	0.90	-	0.90
7319	SVM Top Disc +Y+Z	0.057	0.90	-	0.90
7320	SVM Top Disc +Y+Z	0.049	0.90	-	0.90
7321	SVM Top Disc +Y+Z	0.057	0.90	-	0.90
7322	SVM Top Disc +Y+Z	0.058	0.90	-	0.90
7323	SVM Top Disc +Y+Z	0.097	0.90	-	0.90
7324	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7325	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7326	SVM Top Disc +Y+Z	0.031	0.90	-	0.90
7327	SVM Top Disc +Y+Z	0.037	0.90	-	0.90
7328	SVM Top Disc +Y+Z	0.033	0.90	-	0.90
7329	SVM Top Disc +Y+Z	0.054	0.90	-	0.90
7330	SVM Top Disc +Y+Z	0.044	0.90	-	0.90
7331	SVM Top Disc +Y+Z	0.028	0.90	-	0.90
7332	SVM Top Disc +Y+Z	0.030	0.90	-	0.90
7333	SVM Top Disc +Y+Z	0.039	0.90	-	0.90
7334	SVM Top Disc +Y+Z	0.038	0.90	-	0.90
7335	SVM Top Disc +Y+Z	0.041	0.90	-	0.90
7336	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7337	SVM Top Disc +Y+Z	0.081	0.90	-	0.90
7338	SVM Top Disc +Y+Z	0.041	0.90	-	0.90
7339	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7401	SVM Top Disc +Y+Z	0.041	0.90	-	0.90
7402	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7403	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7404	SVM Top Disc +Y+Z	0.081	0.90	-	0.90
7405	SVM Top Disc +Y+Z	0.038	0.90	-	0.90
7406	SVM Top Disc +Y+Z	0.041	0.90	-	0.90

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
7407	SVM Top Disc +Y+Z	0.039	0.90	-	0.90
7408	SVM Top Disc +Y+Z	0.030	0.90	-	0.90
7409	SVM Top Disc +Y+Z	0.028	0.90	-	0.90
7410	SVM Top Disc +Y+Z	0.026	0.90	-	0.90
7411	SVM Top Disc +Y+Z	0.037	0.90	-	0.90
7412	SVM Top Disc +Y+Z	0.031	0.90	-	0.90
7413	SVM Top Disc +Y+Z	0.029	0.90	-	0.90
7414	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7415	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7416	SVM Top Disc +Y+Z	0.058	0.90	-	0.90
7417	SVM Top Disc +Y+Z	0.097	0.90	-	0.90
7418	SVM Top Disc +Y+Z	0.049	0.90	-	0.90
7419	SVM Top Disc +Y+Z	0.057	0.90	-	0.90
7420	SVM Top Disc +Y+Z	0.049	0.90	-	0.90
7421	SVM Top Disc +Y+Z	0.057	0.90	-	0.90
7422	SVM Top Disc +Y+Z	0.058	0.90	-	0.90
7423	SVM Top Disc +Y+Z	0.097	0.90	-	0.90
7424	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7425	SVM Top Disc +Y+Z	0.051	0.90	-	0.90
7426	SVM Top Disc +Y+Z	0.031	0.90	-	0.90
7427	SVM Top Disc +Y+Z	0.037	0.90	-	0.90
7428	SVM Top Disc +Y+Z	0.033	0.90	-	0.90
7429	SVM Top Disc +Y+Z	0.054	0.90	-	0.90
7430	SVM Top Disc +Y+Z	0.044	0.90	-	0.90
7431	SVM Top Disc +Y+Z	0.028	0.90	-	0.90
7432	SVM Top Disc +Y+Z	0.030	0.90	-	0.90
7433	SVM Top Disc +Y+Z	0.039	0.90	-	0.90
7434	SVM Top Disc +Y+Z	0.038	0.90	-	0.90
7435	SVM Top Disc +Y+Z	0.041	0.90	-	0.90
7436	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7437	SVM Top Disc +Y+Z	0.081	0.90	-	0.90
7438	SVM Top Disc +Y+Z	0.041	0.90	-	0.90
7439	SVM Top Disc +Y+Z	0.048	0.90	-	0.90
7445	SVM Top Disc	1.749	0.90	-	0.90
7521	MLI on BEU	0.844	0.92	-	0.86
7522	MLI on PAU	0.523	0.92	-	0.86
7601	SVM Top +Z	0.787	0.90	-	0.90
7602	SVM Top +Z+Y	0.835	0.90	-	0.90
7603	SVM Top +Y	0.787	0.90	-	0.90
7604	SVM Top -Z+Y	0.835	0.90	-	0.90
7605	SVM Top -Z	0.787	0.90	-	0.90
7606	SVM Top -Z-Y	0.835	0.90	-	0.90
7607	SVM Top -Y	0.787	0.90	-	0.90
7608	SVM Top +Z-Y	0.835	0.90	-	0.90
8001	Solar Array vs. space -X	2.134	0.72	-	0.82
8002	Solar Array vs. space-X	2.134	0.72	-	0.82
8003	Solar Array vs. space -X	2.134	0.72	-	0.82
8004	Solar Array vs. space -X	2.134	0.72	-	0.82

NODE	LABEL	AREA	Alpha BOL	Alpha EOL	Epsilon
8051	Solar Array vs. space -X	2.134	0.72	-	0.82
8052	Solar Array vs. space +X	2.134	0.72	-	0.82
8053	Solar Array vs. space +X	2.134	0.72	-	0.82
8054	Solar Array vs. space +X	2.134	0.72	-	0.82
8101	MLI Solar Array vs. sate	2.217	0.15	-	0.05
8102	MLI Solar Array vs. sate	2.217	0.15	-	0.05
8103	MLI Solar Array vs. sate	2.217	0.15	-	0.05
8104	MLI Solar Array vs. sate	2.217	0.15	-	0.05
8301	Central Solar Array -X	1.200	0.72	-	0.82
8302	Central Solar Array -X	1.200	0.72	-	0.82
8303	Central Solar Array -X	1.200	0.72	-	0.82
8304	Central Solar Array -X	1.200	0.72	-	0.82
8351	Central Solar Array +X	1.200	0.72	-	0.82
8352	Central Solar Array +X	1.200	0.72	-	0.82
8353	Central Solar Array +X	1.200	0.72	-	0.82
8354	Central Solar Array +X	1.200	0.72	-	0.82
8401	MLI Central Solar Array	1.200	0.15	-	0.05
8402	MLI Central Solar Array	1.200	0.15	-	0.05
8403	MLI Central Solar Array	1.200	0.15	-	0.05
8404	MLI Central Solar Array	1.200	0.15	-	0.05
10001	Groove Shield	10.401	0.15	-	0.05
10002	Groove Shield	10.401	0.15	-	0.05

Table 4.1.1-1 PLANCK – Geometrical Nodes list

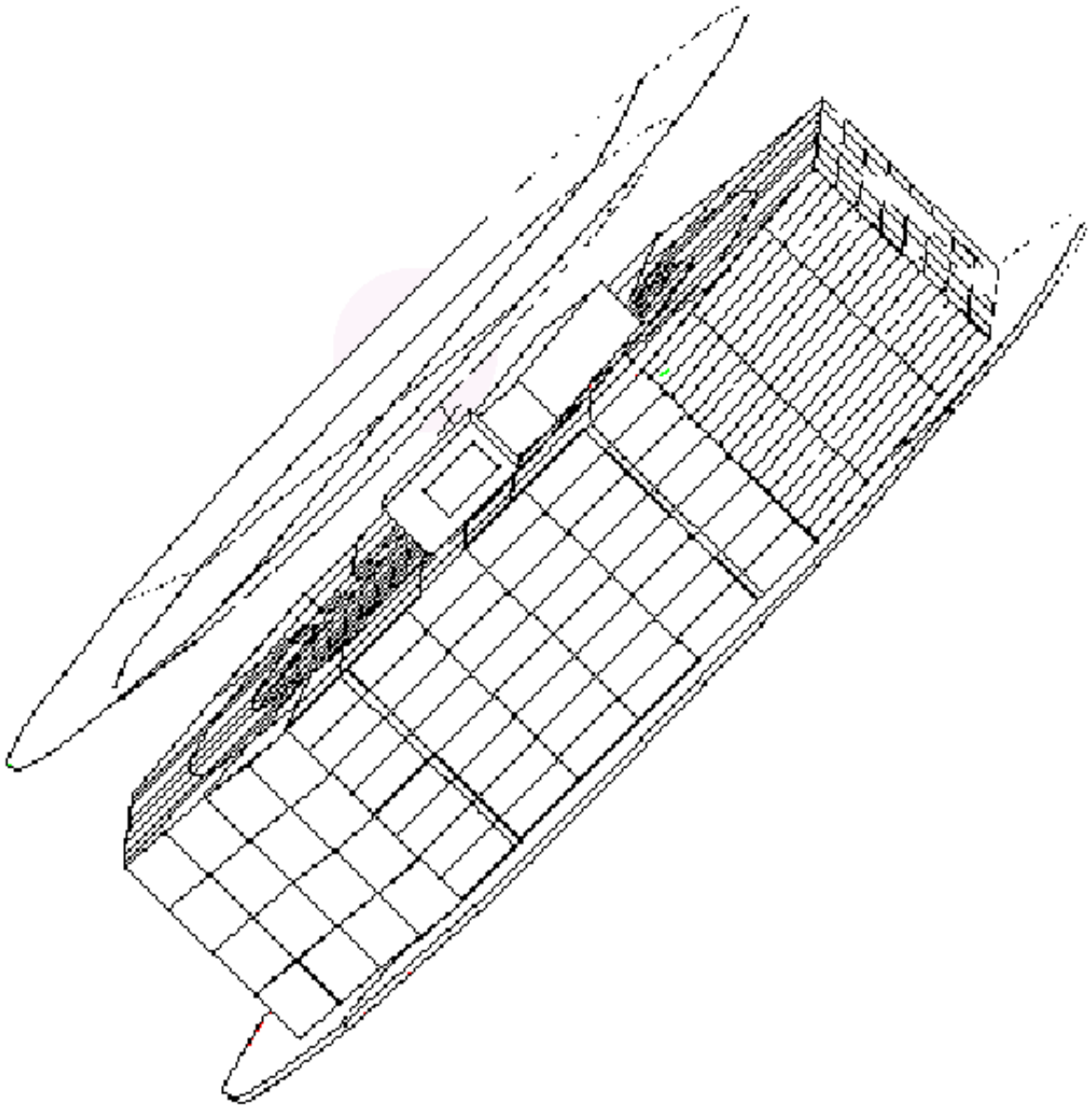


Figure 4.1.1-1 PLANCK – Overall View

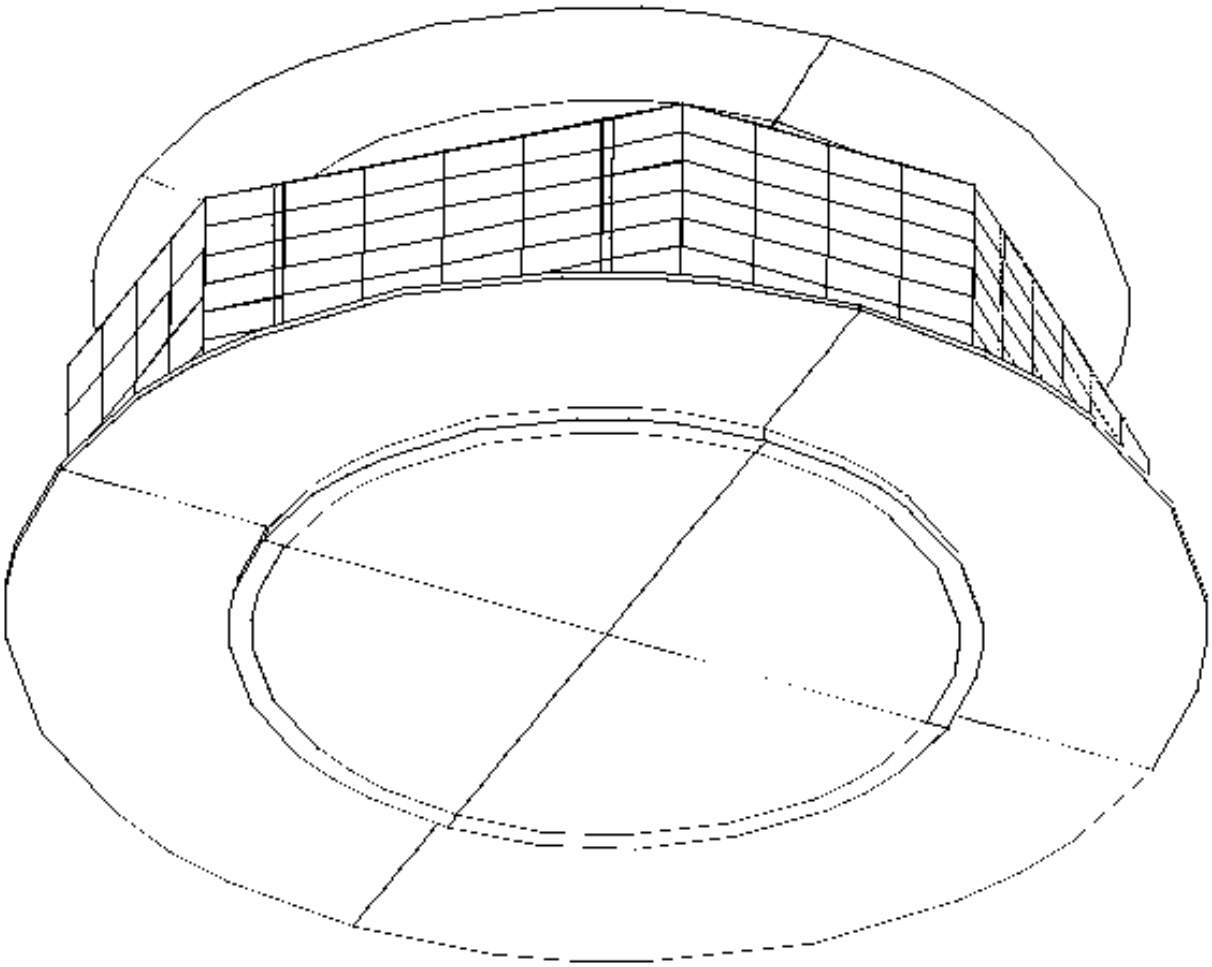


Figure 4.1.1-2 PLANCK – Overall View

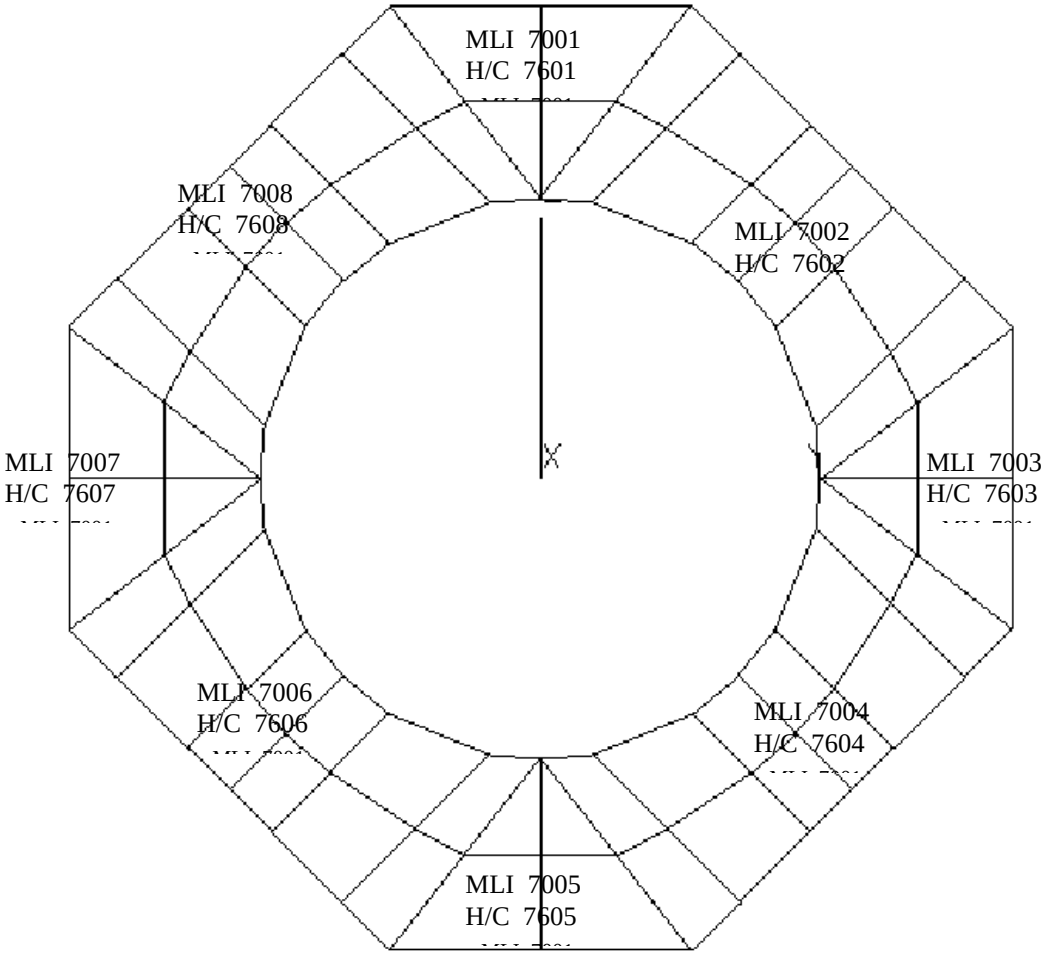
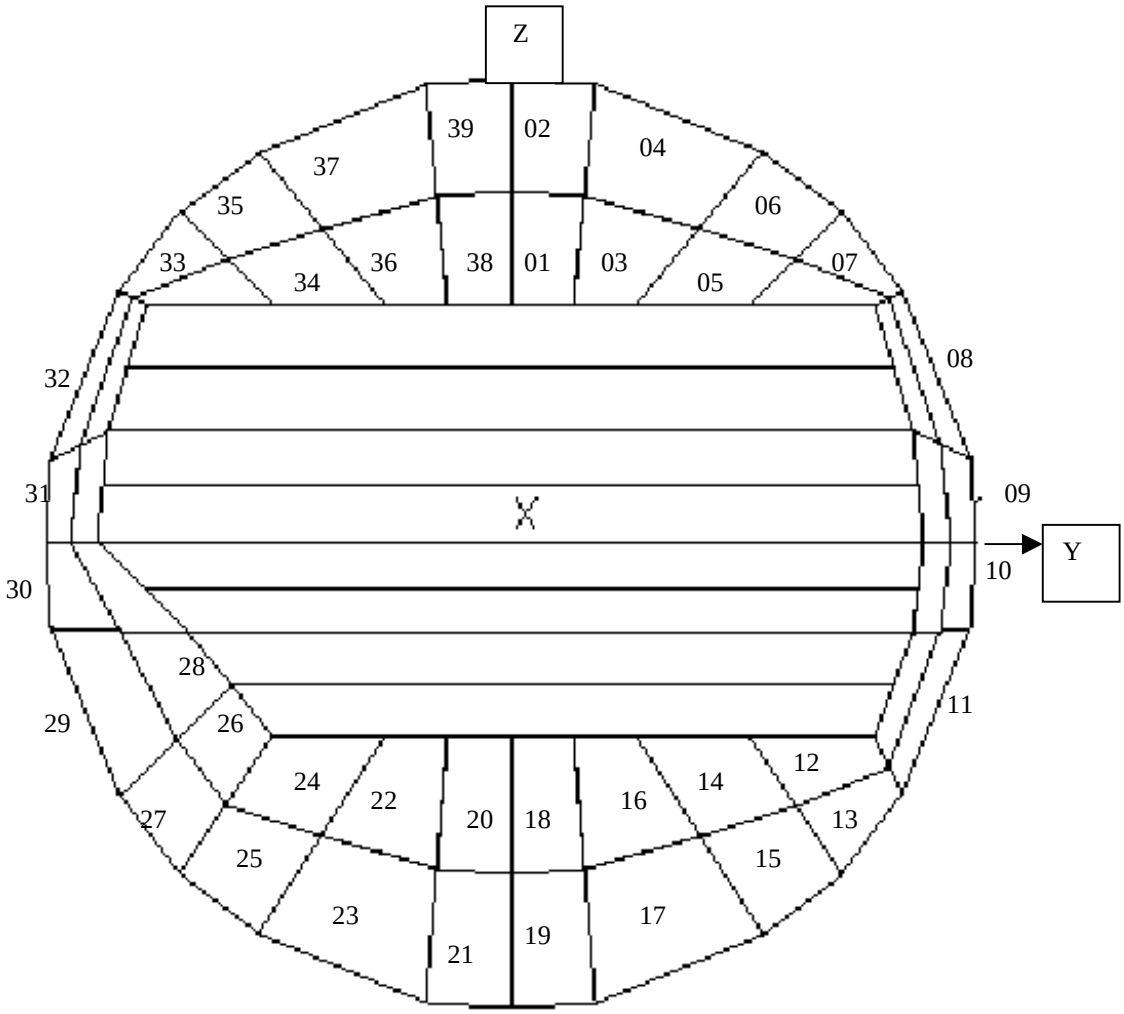


Figure 4.1.1-3 PLANCK – Upper Closure Panel



for MLI external nodes 72XX (add the number declared in figure)
for H/C external nodes 73XX (add the number declared in figure)
for H/C internal nodes 74XX (add the number declared in figure)

Figure 4.1.1-4 PLANCK –Subplatform Panel

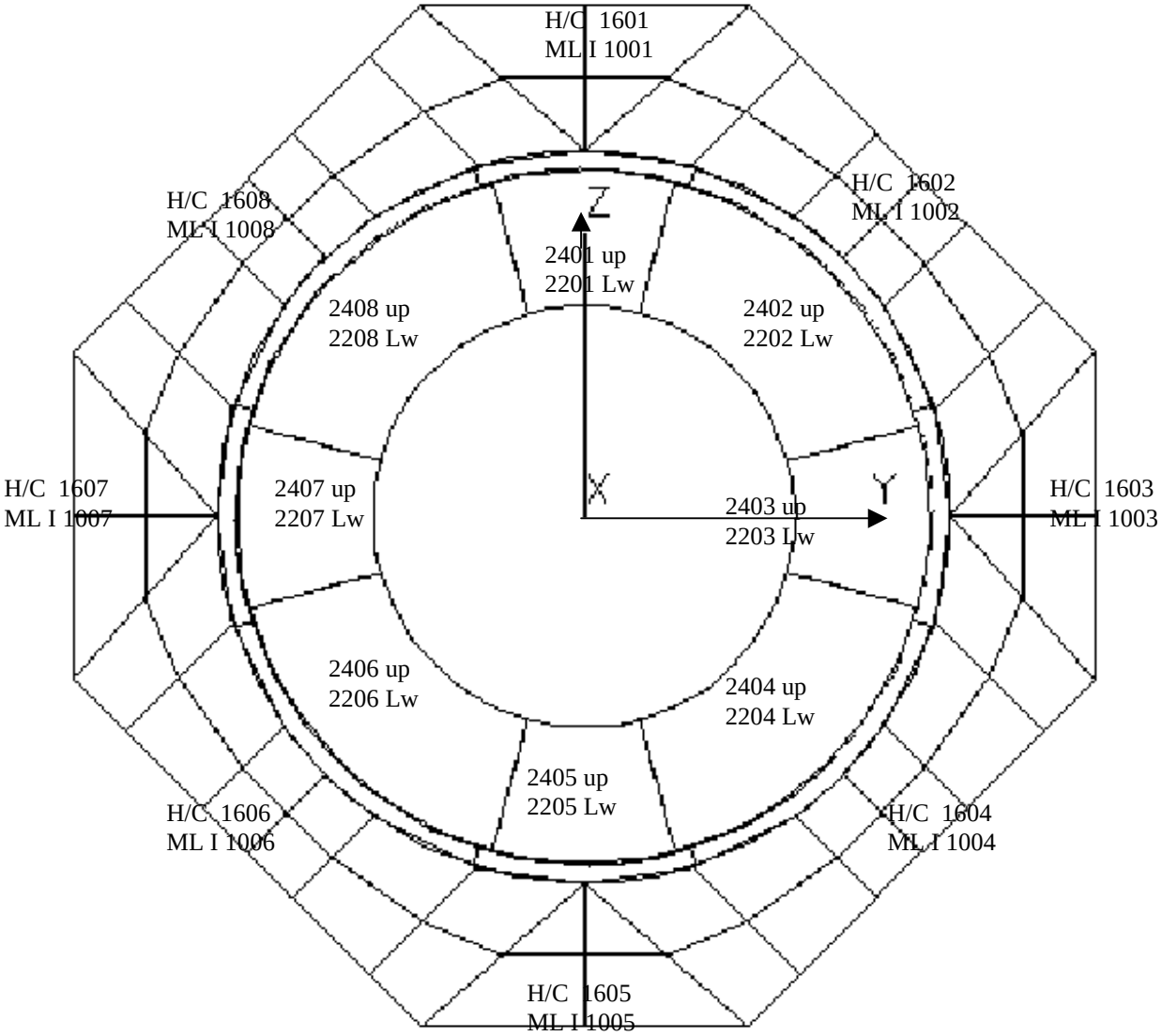


Figure 4.1.1-4 PLANCK – Lower Closure / RCS Panel Internal view

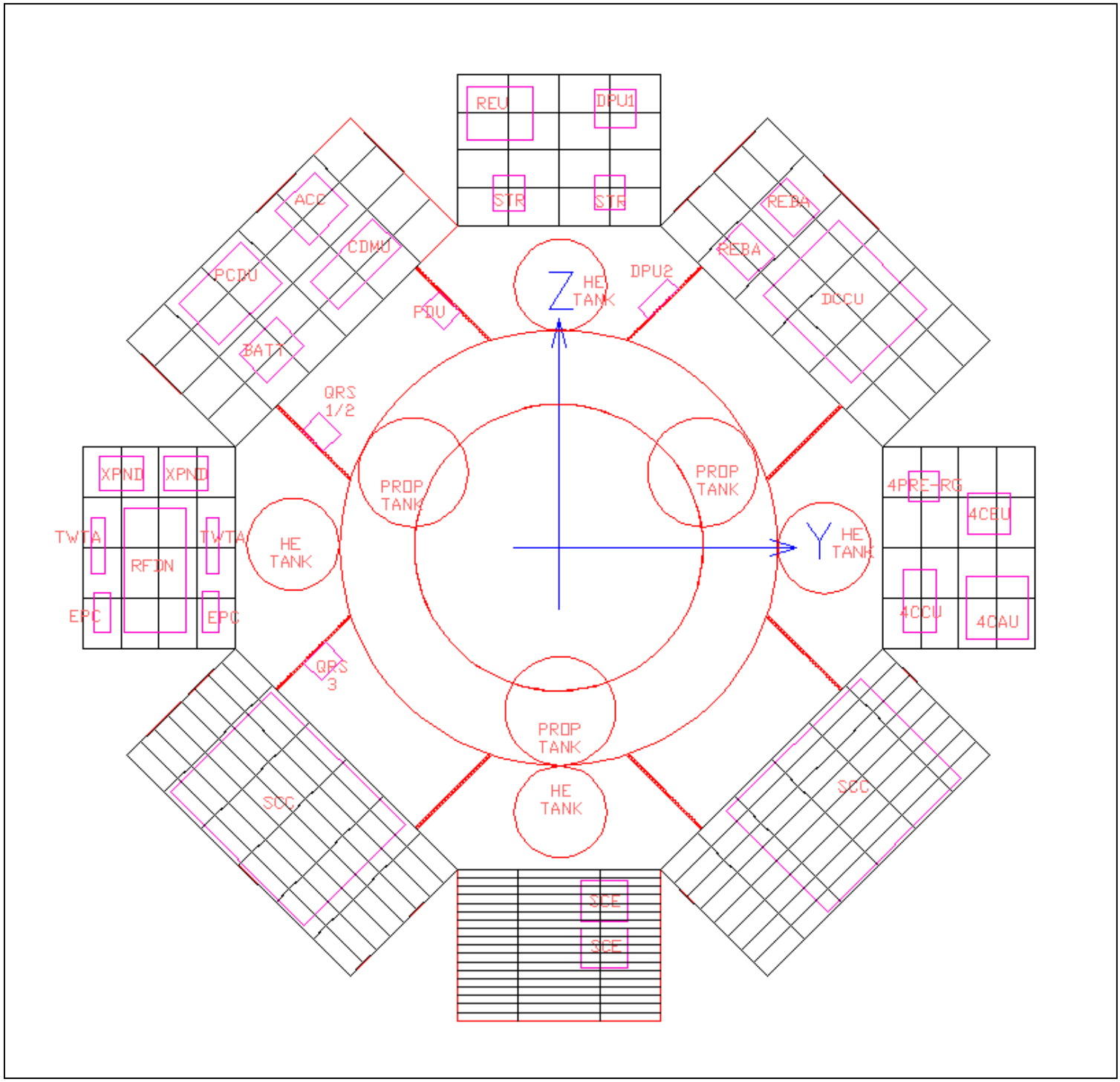


Figure 4.1.1-5 PLANCK – Internal view

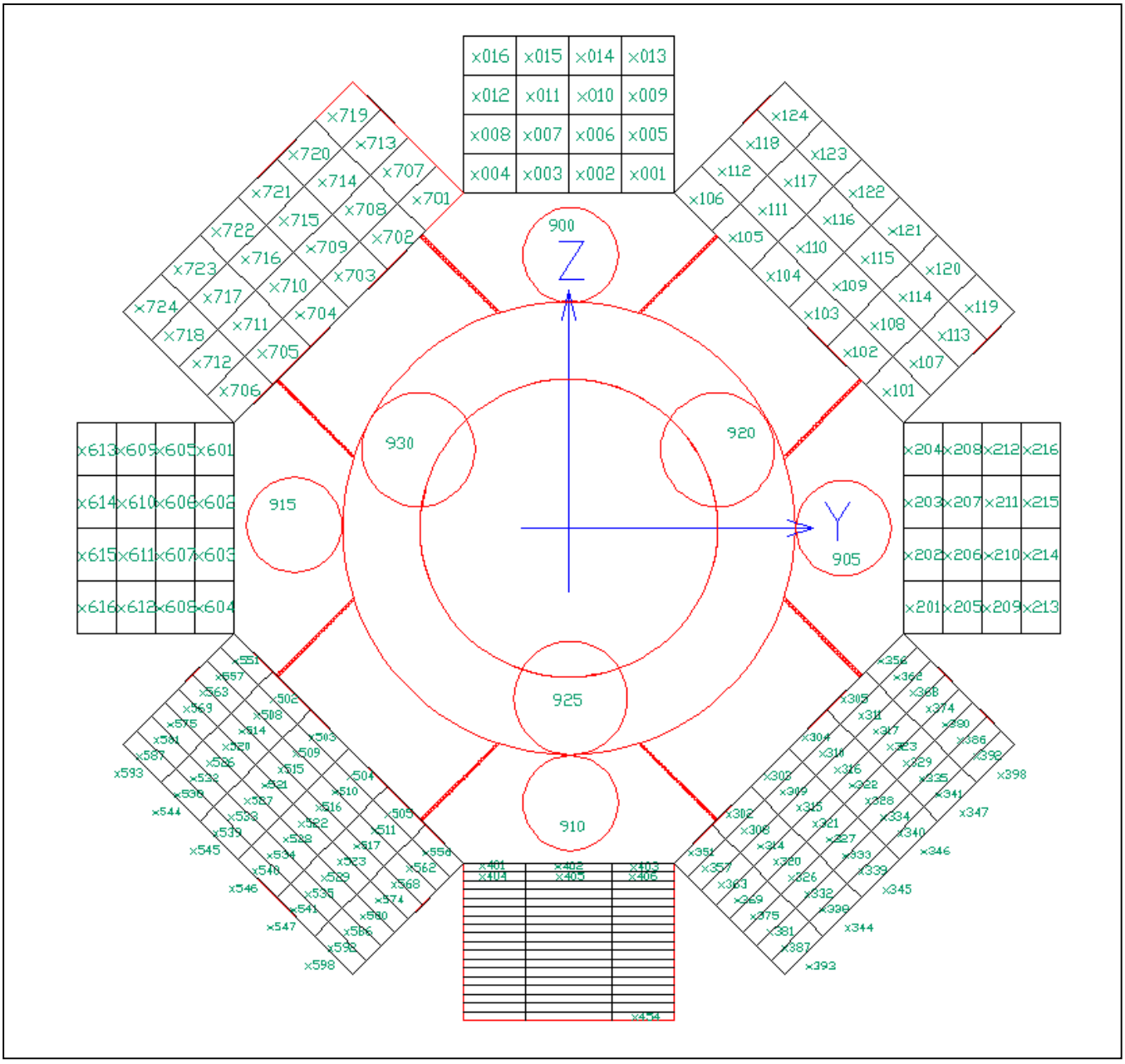
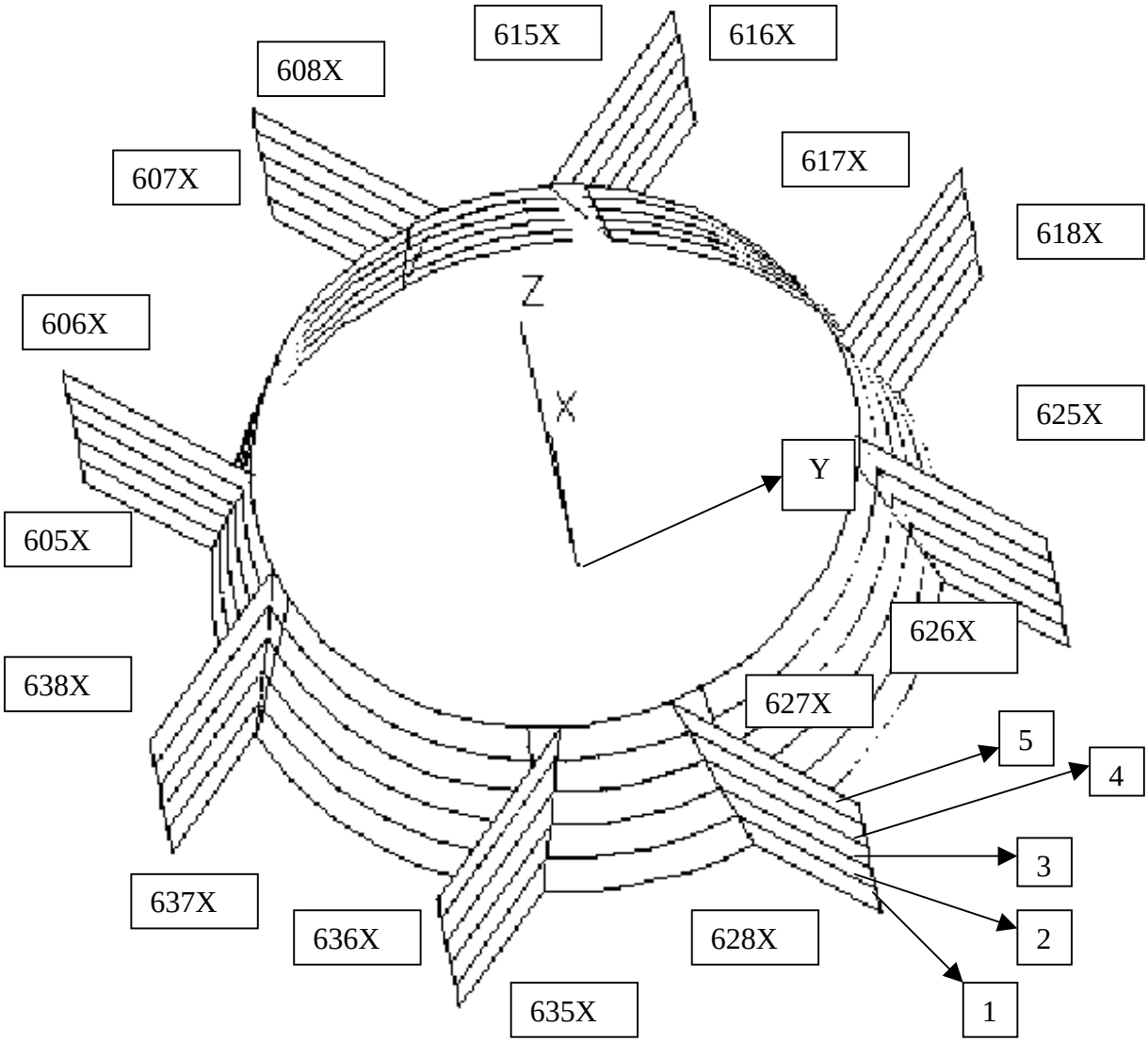


Figure 4.1.1-6 PLANCK – Lateral Panel Internal view

To obtain the list of nodes is necessary to change X number with these numbers:
External MLI nodes insert : 4
External Radiator nodes insert : 3
Internal Radiator nodes insert : 6
Internal SCC1 MLI radiator : for X351,X357, X363,X369, X375,X381 X387, X393, X356,X362, X368,X374, X380,X386, X392, X398 put 4 ; for the rimanent nodes put only one number of MLI node 4350.
Internal SCC2 MLI radiator : for X551,X557, X563,X569, X575,X581 X587, X593, X556,X562, X568,X574, X580,X586, X592, X598 put 4 ; for the rimanent nodes put only one number of MLI node 4550.
Internal SCE MLI radiator nodes : put for all nodes only one number of MLI node 4450.



To obtain all Shear panel nodes is sufficient to change the increasing number X , from 1 to 5 for all ones.

Figure 4.1.1-7 PLANCK – Shear Panel

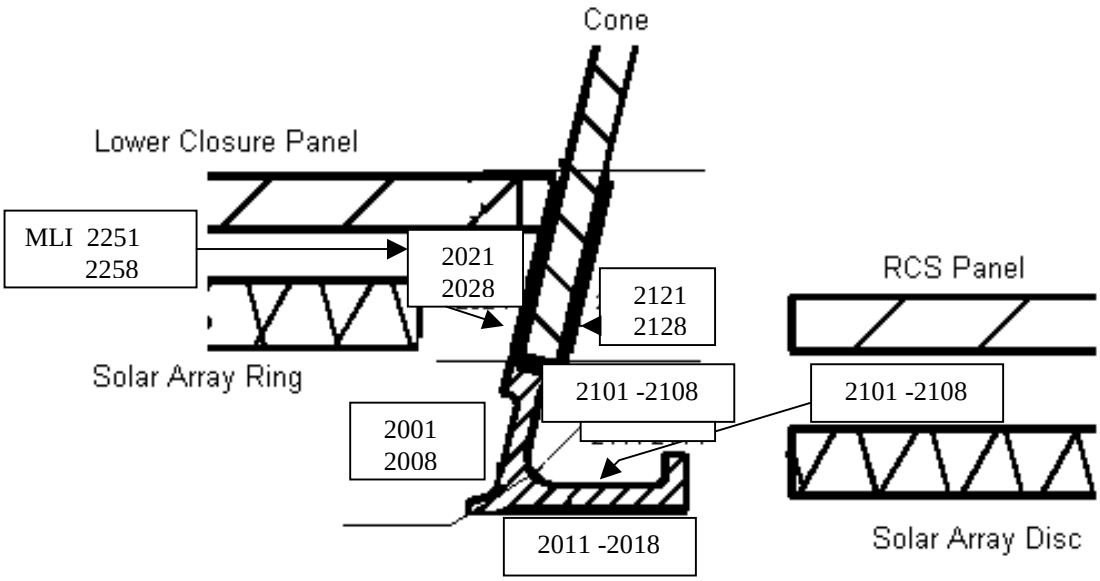


Figure 4.1.1-8 PLANCK – Adapter Ring Nodal division

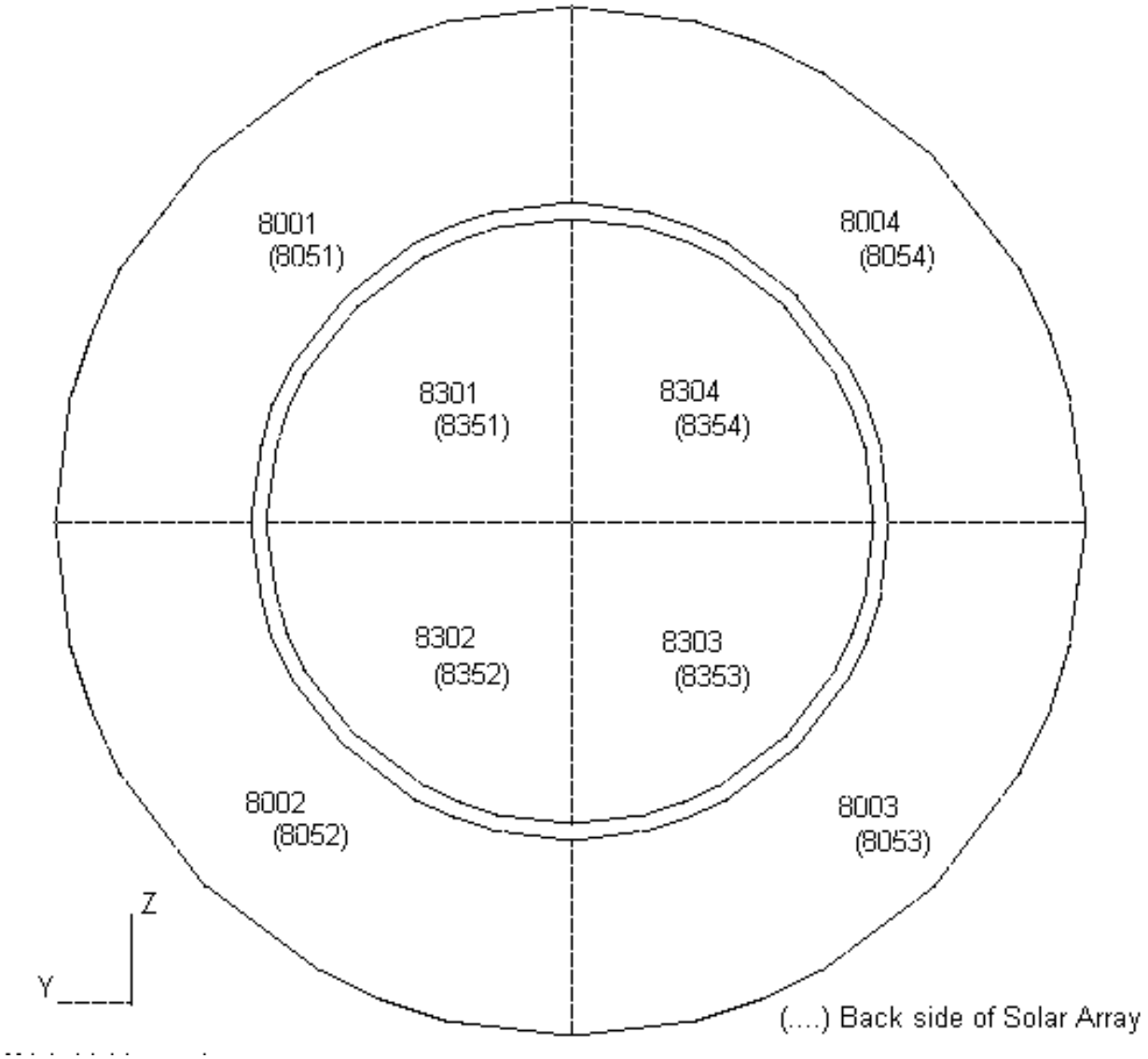


Figure 4.1.1-9 PLANCK – Solar Array External view

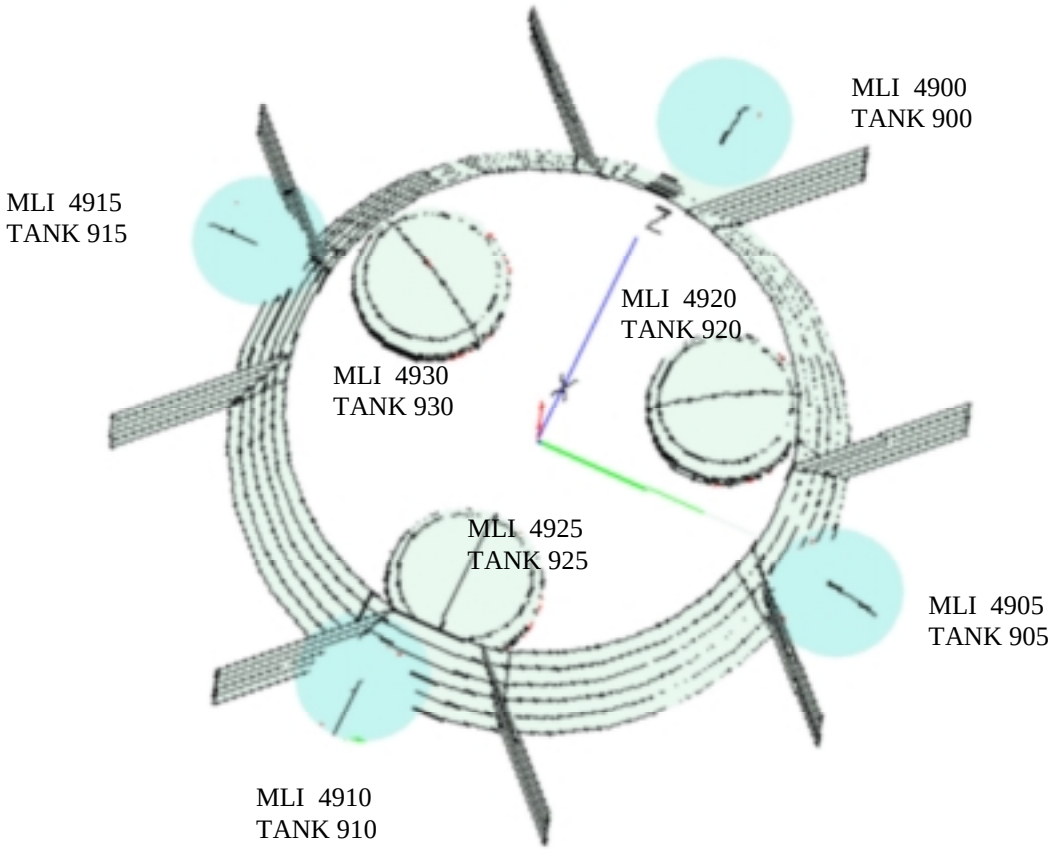
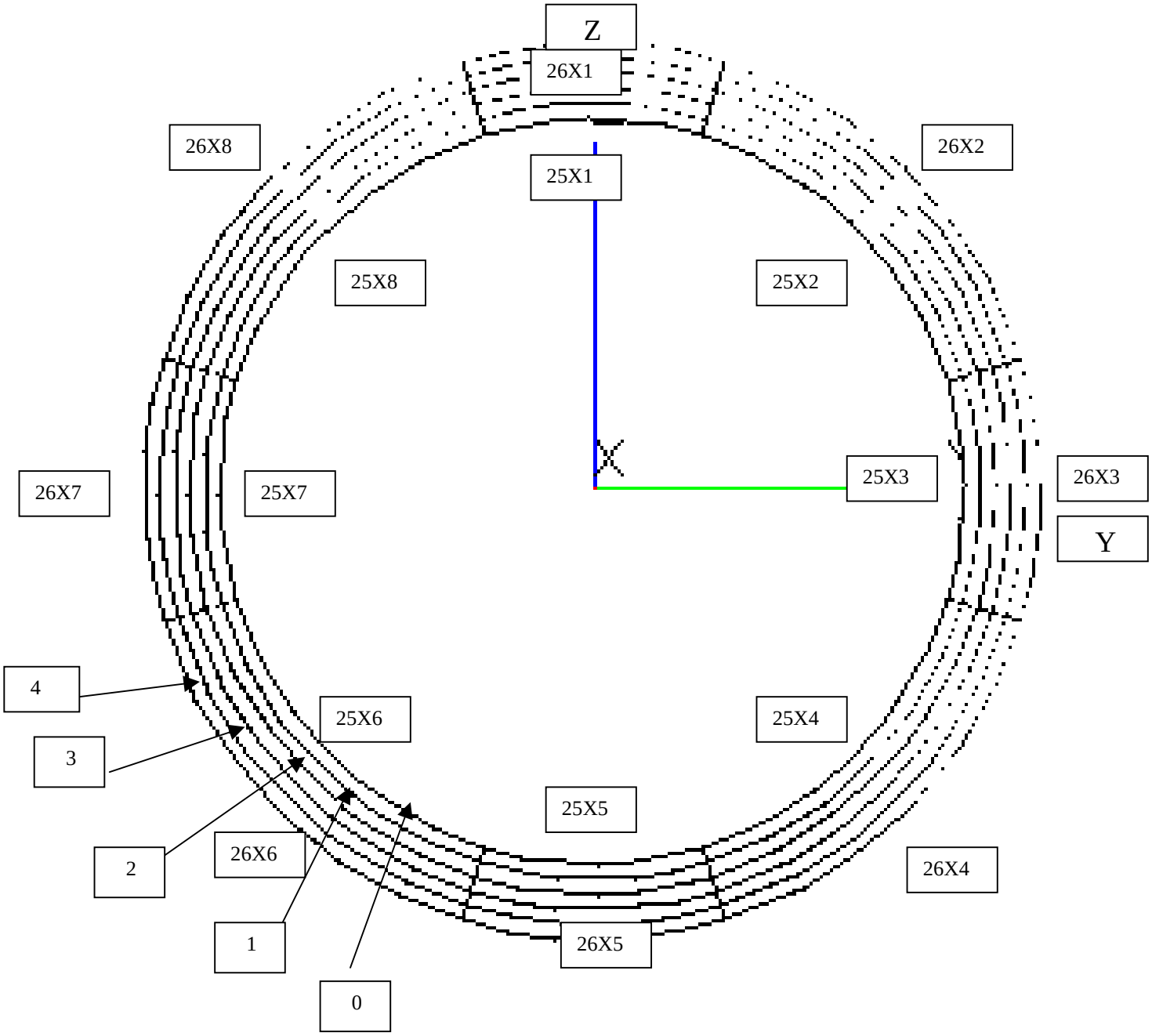


Figure 4.1.1-10 PLANCK – Helium and Propellant Tanks



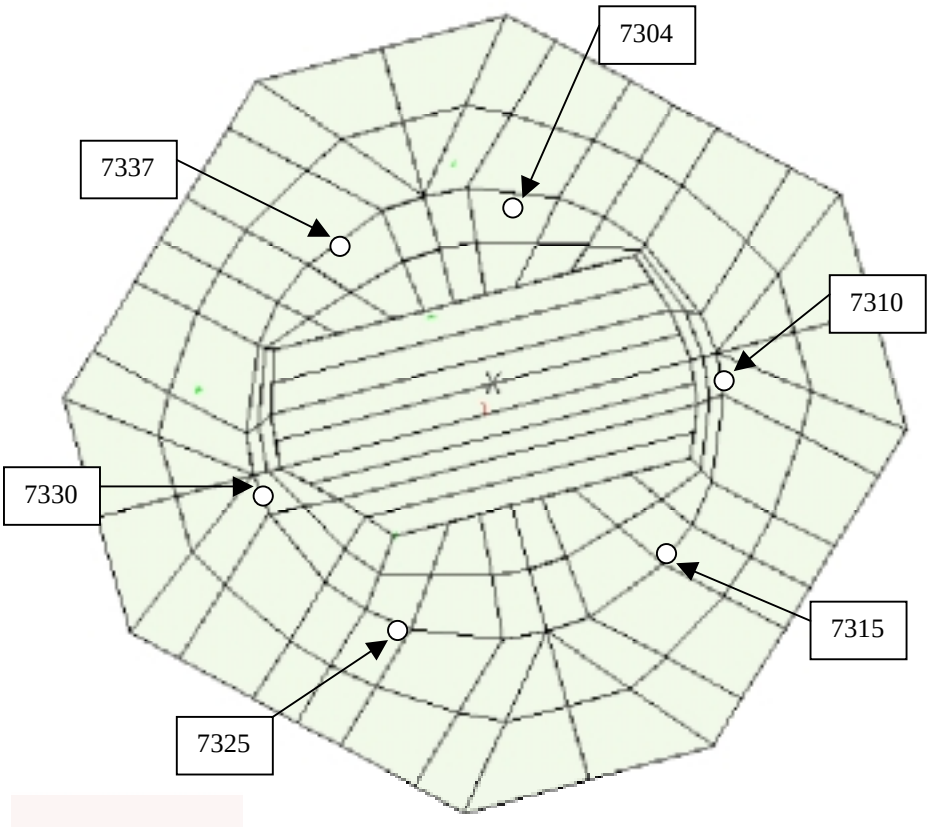
To obtain all CONE nodes is sufficient to change the increasing number X , from 0 to 4 for all ones.
(nodes 26X1 are relative to external face , instead 25X1 to internal one)

Figure 4.1.1-11 PLANCK – Internal Cone

4.1.2 Thermal Mathematical Model (TMM)

The Thermal Mathematical Model (TMM) has been prepared with Esatan software and contains the thermal node description, the thermal conductivity network and the unit and heater dissipation. It is composed by 1137 nodes describing the Service Module and the Groove Shield of the Payload Module.
Node 99999 defines the space with a temperature of –269 °C and node 99998 is an inactive node derived from the calculation of the radiative conductors.
The thermal conductivity network has been built with 3044 linear conductors and 13492 radiative conductors derived from Esarad computation.

There are 6 nodes that represent the I/F PLM points. They are connected to the Upper Payload Subplatform, the 6 nodes are listed hereafter:



The radiative and MLI areas obtained from the thermal analysis are shown in Fig. 4.1.2-1 and the amounts of paint area are reported in the Table 4.1.2-1.

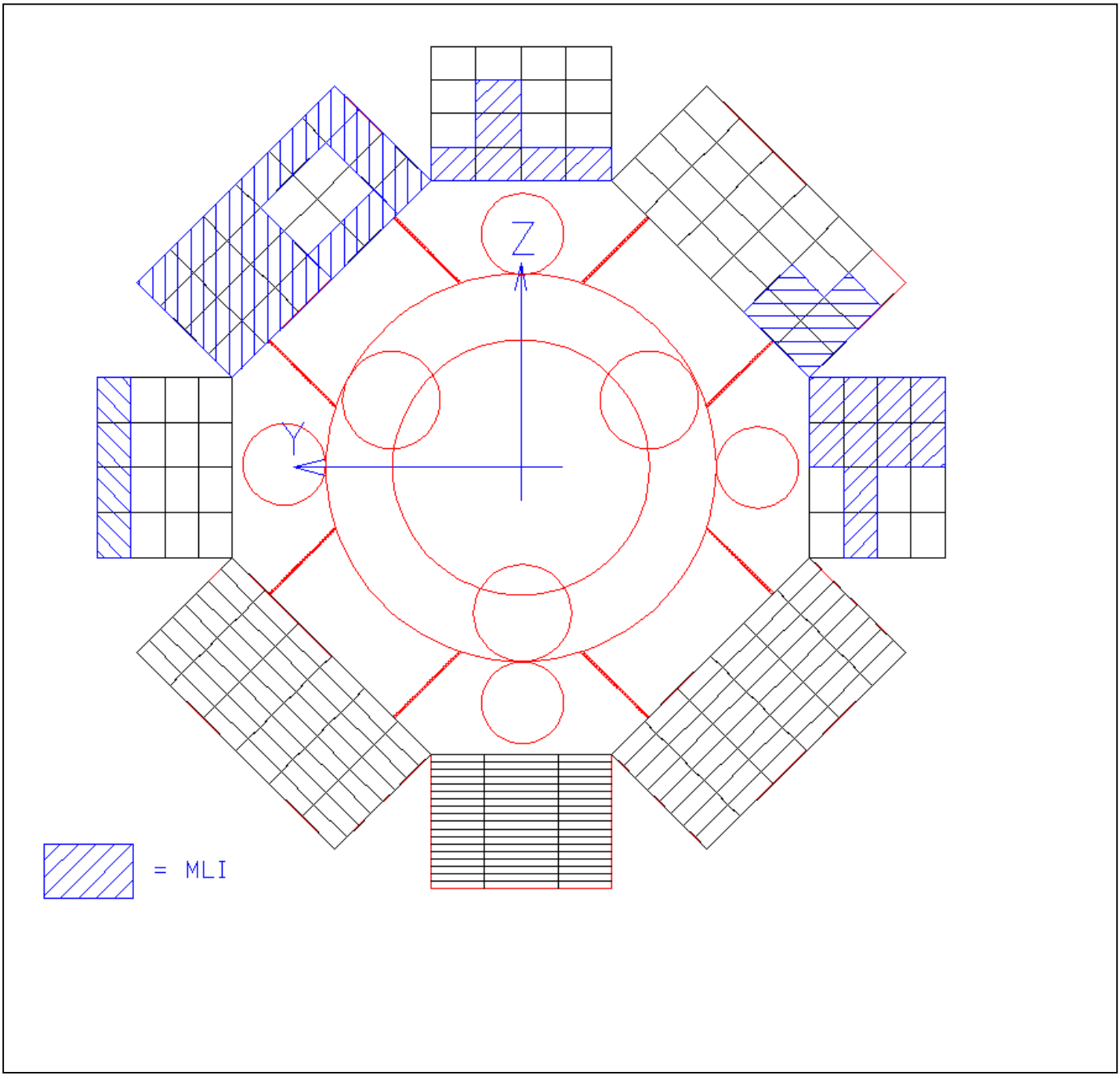


Figure 4.1.2-1 PLANCK - MLI and Radiative Areas

Panel	Paint Area [m²]
+Z	0.609
+Y +Z	0.241
+Y	0.73
+Y -Z	1.461
-Z	0.974
-Y –Z	1.461
-Y	0.364
-Y +Z	1.159
Total	6.999

Table 4.1.2-1 PLANCK – External Radiative Areas

A temperature variable conductor along the thickness represents the MLI blanket behaviour. The different MLI used in the TMM arereported in the following Tables 4.1.2-2 , 4.1.2-3 , 4.1.2-4:

MLI 20 layers on the Top/bottom of the Satellite (nodes 72XX and 70XX) facing to PLM:

Temperature [°C]	**Conductivity [W/m² °C]**
-100	0.0175
-90	0.0212
-80	0.0251
-70	0.0292
-60	0.0334
-50	0.0378
-40	0.0424
-30	0.0473
-20	0.0523
-10	0.0577
0	0.0633
10	0.0692
25	0.0786
30	0.0819
40	0.0888
50	0.0960
60	0.1036
70	0.1116
80	0.1200
90	0.1288
100	0.1381

Table 4.1.2-2 PLANCK – MLI 20 layers conductivity

MLI 07 layers on the internal panel of SCC, SCE and Tanks :

Temperature [°C]	Conductivity [W/m² °C]
-100	0.0314
-90	0.0362
-80	0.0413
-70	0.0468
-60	0.0527
-50	0.0590
-40	0.0659
-30	0.0733
-20	0.0812
-10	0.0898
0	0.0990
10	0.1088
25	0.1250
30	0.1308
40	0.1430
50	0.1560
60	0.1699
70	0.1848
80	0.2006
90	0.2174
100	0.2352

Table 4.1.2-3 PLANCK – MLI 07 layers conductivity

MLI 10 layers on all the other external surfaces:

Temperature [°C]	Conductivity [W/m² °C]
-100	0.0233
-90	0.0275
-80	0.0320
-70	0.0366
-60	0.0416
-50	0.0469
-40	0.0524
-30	0.0584
-20	0.0647
-10	0.0714
0	0.0785
10	0.0861
25	0.0984
30	0.1027
40	0.1118
50	0.1214
60	0.1317
70	0.1425
80	0.1540
90	0.1661
100	0.1789

Table 4.1.2-4 PLANCK – MLI 10 layers conductivity

The structural characteristcs and the evaluated conductivity of the various sandwich panels are hereafter reported:

Location	H/C Type	Skin Type	Thickness Skin [mm]	Thickness Core [mm]	KXY plane [W/m2K]	KZ axis [W/m2K]
Upper/Lower Closure Panel	3/16-5056-.0007	M18/G801	0.4	20	1.21	1.19
Equipment Panel	3/16-5056-.0007	AA7075T6	0.3	35	2.64	1.17
Subplatform	3/16-5056-.0007	AA7075T6	0.3	19.4	4.34	1.18
RCS panel	3/16-5056-.0007	M18/G801	0.3	20	1.03	1.18
Shear Web	3/16-5056-.001	M18/G969	0.76	15	2.43	1.78
Cone	3/16-5056-.001	M40/914	0.54	15	1.95	1.74
Reinforced Cone	1/8-5056-.002	M40/914	1.08	13.92	4.39	5.32

Table 4.1.2-5 PLANCK – SVM Sandwich thermal properties

In the thermal analysis performed the following part of the satellite have been set to a boundary temperature (see A.D. 2.10):

In the thermal analysis performed the following part of the satellite have been set to a boundary temperature :

- PLM Groove Shield BOL case : -193.15 °C
  EOL case : -113.15 °C
- Space node : -269 °C

In the thermal analysis we have no take in account the I/F Fluxes :

- Negative conductive loads from SVM uniformly distributed on each attachment point: .16 W

PLANCK - THERMAL ANALYSIS

4.1.3 Thermal Analysis Cases

4.1.3.1 Steady State

In according to AD2.10, the list of the orbital Steady State cases analysed is presented in the following table:

CASE	α Degradation	Sun on Panel	Solar Aspect Angle	Attitude	Solar Constant [W/m²]	Remarks
1	BOL	+Z	0	Rot X = 0 Rot Y = 0	1285	
3	BOL	+Z	10	Rot X = 0 Rot Y = +10	1285	
8	EOL	+Z	0	Rot X = 0 Rot Y = 0	1405	
Survival	BOL	+Z	10	Rot X = 0 Rot Y = +10	1285	

Table 4.1.3.1-1 PLANCK - Orbit Cases description

The spin of the satellite around its X-axis (1round per minute) has a negligible effect on the amount of solar fluxes on the sun-exposed surfaces, so it is not considered in the current analysis.

The Solar Constant has been defined by ALCATEL with the following value:

Cold Cases (BOL1,BOL3,Survival) : 1285 W/m², which correspond a temperature of the Sun of 5772 K
Hot Cases (EOL8) : 1405 W/m², which correspond a temperature of the Sun of 5792 K

4.1.3.2 Transient Cases

To verify the thermal stability requirement for the SCC Radiative Panels and the SVM/PLM I/F points a transient analysis has been performed taking into account the variation of SCC Power dissipation on each bed.
The analysed case is the following :

- Hot Transient (Case 1):
  Starting from S/S case EOL8 (Sun on -X , SAA= 0°).
  Ending to S/S case EOL3 (Sun on -X , SAA=+10°).
  Duration of change of attitude: 1200s
  Overall duration of transient case: 259200s (72 hours)

The working SCC has a dissipation profile of 667s, while the single bed has a whole cycle in 4002 s (6 time 667s).
Each SCC is composed of six thermal nodes for the Inner bed and six for the Outer shell, for each thermal node is considered the thermal capacity, the linear conductor and the power dissipation for each phase and has been utilised a simplified EOL thermal mathematical model reported in Table 4.1.3.2-1
In Table 4.1.3.2-2 are reported the value relative to Gas gap conductance for a period time of 1334 sec up to 2000 one .

4.1.3.3 Emergency case

(TBW)

Highly Simplified EOL Thermal Model of 20 K Sorption Cooler Compressor Assembly

(To be used by Alcatel to simulate compressor interface with radiator)

(Pradeep Bhandari, Mauro Prina, 11-15-2001) (Phone: 818-354-7597) Modified Model

Parameter	Location	Units	Phase 1 Heatup 0-667 s	Phase 2 Desorb 667-1334 s	Phase 3 Cool 1334-2000 s	Phase 4 Absorb 2001-2667 s	Phase 5 Absorb 2668-3333 s	Phase 6 Absorb 3335-4000 s
Therm. Mass	Inner Bed	MC_p (J/K)	800	3600	930	670	690	710
	Outer Shell	MC_p (J/K)	720	720	720	720	720	720
Conductance	(Inner Bed to Outer Shell)	W/K	0.02	0.03	***	6.53	6.53	6.53
Heat Input	Inner Bed	W	216	183	0	36	36	36
	Outer shell	W	46	46	7	7	7	7
	Total	W						519 Watts (EOL + Margin)

Phase / Cycle Time

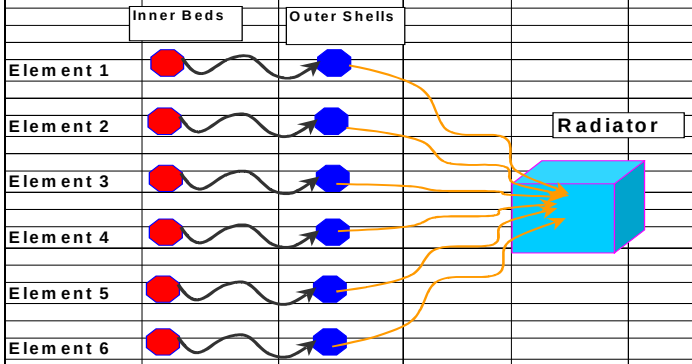
EOL Model

** see attached table

Use Table in "Gas-Gap Conductance" Workheet for values during Cool phase

Changed thermal capacitance from last model to get better heat balance

Notes:
1) The above values are for end of life (including margin)
2) The total cycle time is 667*6 = 4000 seconds.
3) There are 6 identical beds which are of phase, by one phase width of 667 sec., with respect to each other.
4) At any time one bed is heating up, one desorbing, one cooling, and three absorbing.
5) Outer shell is thermally and structurally connected to the radiator.
6) Additonal thermal masses for items outside of the compressor elements need to be accounted for to ensure that the radiator thermal oscillations are not excessive.



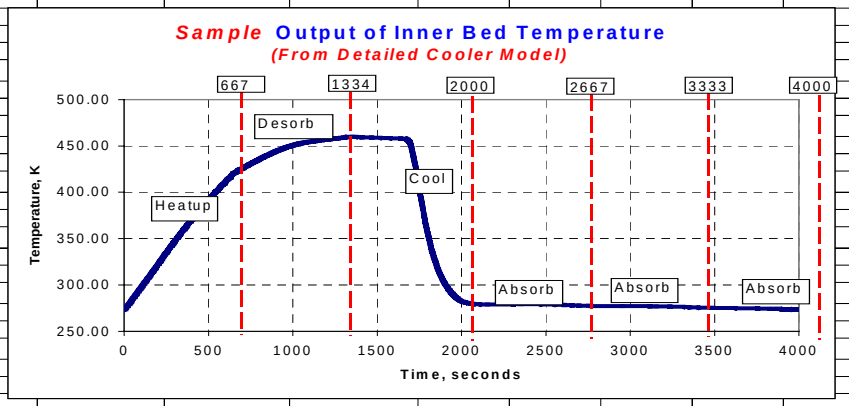


Table 4.1.3.2-1 PLANCK - Simplified SCC model

Time	Gas gap Conductance	Time	Gas gap Conductance	Time	Gas gap Conductance	Time	Gas gap Conductance
[s]	[W/K]	[s]	[W/K]	[s]	[W/K]	[s]	[W/K]
0	0.0313	341	2.3479	394	6.2940	447	6.5519
286	0.0314	342	2.6215	395	6.3069	448	6.5525
289	0.0316	343	2.8875	396	6.3187	449	6.5530
291	0.0318	344	3.1393	397	6.3307	450	6.5534
292	0.0319	345	3.3734	398	6.3420	451	6.5536
293	0.0321	346	3.5880	399	6.3526	452	6.5537
294	0.0325	347	3.7832	400	6.3634	453	6.5539
295	0.0329	348	3.9600	401	6.3728	454	6.5541
296	0.0331	349	4.2804	402	6.3824	455	6.5542
297	0.0337	350	4.4133	403	6.3914	667	6.5543
298	0.0344	351	4.5360	404	6.4003		
299	0.0352	352	4.6454	405	6.4086		
300	0.0359	353	4.7481	406	6.4171		
301	0.0368	354	4.8422	407	6.4247		
302	0.0383	355	4.9295	408	6.4321		
303	0.0397	356	5.0096	409	6.4391		
304	0.0414	357	5.0853	410	6.4456		
305	0.0434	358	5.1568	411	6.4516		
306	0.0459	359	5.2245	412	6.4578		
307	0.0487	360	5.2856	413	6.4636		
308	0.0519	361	5.3454	414	6.4689		
309	0.0558	362	5.4002	415	6.4738		
310	0.0602	363	5.4532	416	6.4793		
311	0.0653	364	5.5034	417	6.4837		
312	0.0709	365	5.5503	418	6.4887		
313	0.0775	366	5.5956	419	6.4932		
314	0.0849	367	5.6379	420	6.4971		
315	0.0934	368	5.6789	421	6.5009		
316	0.1029	369	5.7178	422	6.5049		
317	0.1137	370	5.7541	423	6.5083		
318	0.1258	371	5.7893	424	6.5119		
319	0.1393	372	5.8235	425	6.5151		
320	0.1546	373	5.8553	426	6.5183		
321	0.1716	374	5.8862	427	6.5214		
322	0.1908	375	5.9163	428	6.5242		
323	0.2123	376	5.9436	429	6.5264		
324	0.2366	377	5.9708	430	6.5291		
325	0.2641	378	5.9967	431	6.5315		
326	0.2956	379	6.0219	432	6.5335		
327	0.3317	380	6.0453	433	6.5356		
328	0.3735	381	6.0680	434	6.5373		
329	0.4224	382	6.0902	435	6.5393		
330	0.4799	383	6.1119	436	6.5409		
331	0.5482	384	6.1314	437	6.5423		
332	0.6297	385	6.1514	438	6.5436		
333	0.7276	386	6.1705	439	6.5450		
334	0.8556	387	6.1886	440	6.5463		
335	0.9855	388	6.2058	441	6.5473		
336	1.1518	389	6.2216	442	6.5480		
337	1.3457	390	6.2375	443	6.5488		
338	1.5667	391	6.2526	444	6.5497		
339	1.8118	392	6.2673	445	6.5505		
340	2.0749	393	6.2808	446	6.5512		

Table 4.1.3.2-2 PLANCK - Gas gap conductance

4.1.4 Power Dissipation

The power dissipation are shown in Table 4.1.4-1.
The values presented in the table have been considered the state of Scientific Observation as a cold case (BOL1,BOL3 and Survival).
The Telecom Phase instead has been considered as a hot case (EOL8).

		Scientific Observ.	Telecom Phase	Survival
NODE	LABEL	BOL	EOL	
		[W]	[W]	[W]
11	STR1	13.	13.	0
12	STR2	0.	0.	0
13	DPU1	32	32	0
14	DPU2 (on shear)	0	0	0
15	REU	92	92	0
101	DCCU + FV	19.	19.	0
102	REBA1	0.	0.	0
103	REBA2	41.5	41.5	0
201	4 CCU	60	60	0
202	4 CAU	15	15	0
203	4 PRE-REG	20	20	0
204	4 CEU	41	41	0
311	SCC1 - Outer Shell1	78.33	86.67	0
312	SCC1 - Outer Shell2	78.33	86.67	0
313	SCC1 - Outer Shell3	78.33	86.67	0
314	SCC1 - Outer Shell4	78.33	86.67	0
315	SCC1 - Outer Shell5	78.33	86.67	0
316	SCC1 - Outer Shell6	78.33	86.67	0
401	SCE1	110	110	0
402	SCE2	0	0	0
511	SCC2 - Outer Shell1	0	0	0
512	SCC2 - Outer Shell2	0	0	0
513	SCC2 - Outer Shell3	0	0	0
514	SCC2 - Outer Shell4	0	0	0
515	SCC2 - Outer Shell5	0	0	0
516	SCC2 - Outer Shell6	0	0	0
521	BEU	58.7	58.7	0
522	PAU	15	15	0
525	DAE Power unit	20	20	0
551	QRS3 (on shear)	0	0	0
601	TRANSX/B1	7	13	13
602	TRANSX/B2	7	7	7
603	TWTA1	0	0	0
604	TWTA2	0	38	38
605	RFDN	0	8	8

		Scientific Observ.	Telecom Phase	Survival
NODE	LABEL	BOL	EOL	
		[W]	[W]	[W]
606	EPC1	0	0	0
607	EPC2	9	9	9
701	CDMU	36	36	36
702	ACC	24	24	24
703	BATT	0	0	6
704	PCDU	153	127	126
705	QRS1 (on shear)	8	8	8
706	QRS2 (on shear)	0	8	8
707	PDU (on shear)	10	10	10
900	He TANK +Z			
905	He TANK +Y			
910	He TANK -Z			
915	He TANK -Y			
920	P TANK +Y+Z			
925	P TANK -Z			
930	P TANK -Y+Z			

Table 4.1.4-1 PLANCK - Unit Power Dissipation

4.1.5 Analysis Results

4.1.5.1 Steady state results

The temperature results hereafter presented, refer to the Steady State analysed cases reported in paragraph 4.1.3.1 The first Table 4.1.5.1-1 is a overall summary result of the thermal unit , the second Table 4.1.5.1-2 are reported overall temperatures.The values are inclusive of 7°C of uncertainty .

NODE	LABEL	Temp. Oper. [°C]		Temp. Non Oper. [°C]		BOL1 [°C]	BOL3 [°C]	EOL8 [°C]	SURV [°C]
11	STR1	-10	30	-20	40	8.7	8.4	24.6	-17.0
12	STR2	-10	30	-20	40	-1.4	-1.6	14.4	-17.1
13	DPU1	-10	40	-20	50	3.5	3.3	18.9	-17.3
14	DPU2 (on shear)	-10	30	-20	40	10.5	10.2	26.7	-14.2
15	REU	-20	30	-30	40	12.4	12.2	27.7	-17.4
101	DCCU + FV	-10	40	-20	50	12.9	12.5	29.4	-15.8
102	REBA1	-20	50	-30	70	3.4	3.1	19.7	-23.6
103	REBA2	-20	50	-30	70	27.1	26.8	42.9	-24.6
201	4 CCU	-10	40	-20	50	19.7	19.4	35.6	-17.2
202	4 CAU	-10	40	-20	50	3.5	3.2	19.7	-17.2
203	4 PRE-REG	-10	40	-20	50	0.2	-0.1	16.2	-17.2
204	4 CEU	-10	40	-20	50	20.4	20.1	36.4	-17.1
311	SCC1 - Outer shell	-13	7	-50	70	-7.7	-7.7	6.1	-28.5
312	SCC1 - Outer shell	-13	7	-50	70	-7.7	-7.7	6.1	-28.5
313	SCC1 - Outer shell	-13	7	-50	70	-7.7	-7.7	6.1	-28.5
314	SCC1 - Outer shell	-13	7	-50	70	-7.7	-7.7	6.1	-28.5
315	SCC1 - Outer shell	-13	7	-50	70	-7.7	-7.7	6.1	-28.5
316	SCC1 - Outer shell	-13	7	-50	70	-7.7	-7.7	6.1	-28.5
401	SCE1	-10	40	-20	50	-7.6	-7.6	2.9	-19.7
402	SCE2	-10	40	-20	50	-15.5	-15.5	-2.0	-19.6
511	SCC1 - Outer shell	-13	7	-50	70	-18.3	-18.3	-5.1	-31.6
512	SCC1 - Outer shell	-13	7	-50	70	-18.3	-18.3	-5.1	-31.6
513	SCC1 - Outer shell	-13	7	-50	70	-18.3	-18.3	-5.1	-31.6
514	SCC1 - Outer shell	-13	7	-50	70	-18.3	-18.3	-5.1	-31.6
515	SCC1 - Outer shell	-13	7	-50	70	-18.3	-18.3	-5.1	-31.6
516	SCC1 - Outer shell	-13	7	-50	70	-18.3	-18.3	-5.1	-31.6
521	BEU	-20	40	-30	50	23.3	22.9	39.8	-16.1
522	PAU	-20	40	-20	50	21.5	21.1	38.4	-10.3
525	DAE Power Unit	-20	45	-20	55	27.3	26.9	44.0	1.9
551	QRS3 (on shear)	-15	45	-25	65	12.9	12.5	30.6	-0.1
601	TRANSX/B1	-10	50	-20	60	17.4	17.1	34.5	10.1
602	TRANSX/B2	-10	50	-20	60	16.2	15.9	33.0	8.4
603	TWTA1	-15	50	-25	60	-4.8	-5.1	13.6	-11.8
604	TWTA2	-15	50	-25	60	25.9	25.6	43.0	19.6
605	RFDN	-40	70	-50	80	1.0	0.7	20.7	-5.2
606	EPC1	-15	45	-25	55	-21.9	-21.9	2.0	-19.0
607	EPC2	-15	45	-25	55	0.6	0.3	18.0	-6.7
701	CDMU	-10	45	-20	55	3.6	3.4	18.6	-6.2
702	ACC	-10	45	-20	55	1.8	1.5	16.1	-7.1
703	BATT1	0	35	-10	45	5.1	4.9	20.0	2.9
704	PCDU	-10	45	-20	55	31.8	31.6	41.2	18.8
705	QRS1	-15	45	-25	55	20.4	20.2	35.7	10.6
706	QRS2	-15	45	-25	55	16.4	16.1	34.2	8.9
707	PDU	-15	45	-25	55	15.1	14.9	30.2	-1.2
900	He TANK +Z	0	45	-10	55	10.0	9.7	25.9	3.0
905	He TANK +Y	0	45	-10	55	11.8	11.4	28.3	3.0
910	He TANK -Z	0	45	-10	55	16.9	16.3	34.1	3.0
915	He TANK -Y	0	45	-10	55	12.2	11.8	29.5	3.0
920	P TANK +Y+Z	0	45	-10	55	22.0	21.5	39.1	3.0
925	P TANK -Z	0	45	-10	55	22.5	22.0	39.9	3.0
930	P TANK -Y+Z	0	45	-10	55	21.8	21.4	38.7	4.4

Table 4.1.5.1-1 PLANCK - Unit Temperatures Results

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
11	STR1	8.68	8.42	24.55	-17.03
12	STR2	-1.39	-1.64	14.41	-17.10
13	DPU1	3.48	3.26	18.94	-17.30
14	DPU2	10.52	10.22	26.72	-14.16
15	REU	12.43	12.22	27.74	-17.36
101	DCCU	12.86	12.52	29.37	-15.83
102	REBA1	3.42	3.12	19.72	-23.63
103	REBA2	27.07	26.82	42.92	-24.55
201	4 CCU	19.66	19.36	35.64	-17.21
202	4 CAU	3.52	3.20	19.68	-17.21
203	4 PRE-REG	0.20	-0.08	16.24	-17.23
204	CEU	20.43	20.14	36.35	-17.13
311	SCC1 - Outer shell1	-7.71	-7.73	6.09	-28.47
312	SCC1 - Outer shell2	-7.71	-7.73	6.09	-28.47
313	SCC1 - Outer shell3	-7.71	-7.73	6.09	-28.47
314	SCC1 - Outer shell4	-7.71	-7.73	6.09	-28.47
315	SCC1 - Outer shell5	-7.71	-7.73	6.09	-28.47
316	SCC1 - Outer shell6	-7.71	-7.73	6.09	-28.47
331	SCC1 - Inner bed1	-7.00	-7.00	7.00	-7.00
332	SCC1 - Inner bed2	-7.00	-7.00	7.00	-7.00
333	SCC1 - Inner bed3	-7.00	-7.00	7.00	-7.00
334	SCC1 - Inner bed4	-7.00	-7.00	7.00	-7.00
335	SCC1 - Inner bed5	-7.00	-7.00	7.00	-7.00
336	SCC1 - Inner bed6	-7.00	-7.00	7.00	-7.00
401	SCE1	-7.64	-7.64	2.94	-19.66
402	SCE2	-15.49	-15.52	-2.01	-19.63
511	SCC2 - Outer shell1	-18.27	-18.29	-5.11	-31.58
512	SCC2 - Outer shell2	-18.27	-18.29	-5.11	-31.58
513	SCC2 - Outer shell3	-18.27	-18.29	-5.11	-31.58
514	SCC2 - Outer shell4	-18.27	-18.29	-5.11	-31.58
515	SCC2 - Outer shell5	-18.27	-18.29	-5.11	-31.58
516	SCC2 - Outer shell6	-18.27	-18.29	-5.11	-31.58
521	BEU	23.30	22.91	39.82	-16.11
522	PAU	21.49	21.06	38.35	-10.26
525	DAE Power Unit	27.30	26.88	43.95	1.91
531	SCC2 - Inner bed1	-7.00	-7.00	7.00	-7.00
532	SCC2 - Inner bed2	-7.00	-7.00	7.00	-7.00
533	SCC2 - Inner bed3	-7.00	-7.00	7.00	-7.00
534	SCC2 - Inner bed4	-7.00	-7.00	7.00	-7.00
535	SCC2 - Inner bed5	-7.00	-7.00	7.00	-7.00
536	SCC2 - Inner bed6	-7.00	-7.00	7.00	-7.00
551	QRS3	12.89	12.46	30.59	-0.11
601	XPND_1	17.44	17.14	34.48	10.10
602	XPND_2	16.19	15.90	32.99	8.37
603	TWTA_1	-4.78	-5.10	13.63	-11.76
604	TWTA_2	25.88	25.63	43.00	19.57
605	RFDN	1.02	0.70	20.74	-5.24

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
606	EPC1	-21.92	-21.92	2.04	-19.06
607	EPC2	0.57	0.29	18.04	-6.73
701	CDMU	3.58	3.35	18.59	-6.22
702	ACC	1.77	1.54	16.05	-7.10
703	BATT	5.14	4.87	19.98	2.88
704	PCDU	31.76	31.55	41.24	18.84
705	QRS1	20.44	20.16	35.69	10.64
706	QRS2	16.39	16.09	34.17	8.86
707	PDU	15.14	14.88	30.20	-1.24
801	HP1 Hor. SCC1	-15.46	-15.49	-2.03	-31.52
802	HP2 Hor. SCC1	-12.85	-12.87	-0.39	-27.60
803	HP3 Hor. SCC1	-12.77	-12.79	-0.34	-27.48
804	HP4 Hor. SCC1	-12.86	-12.88	-0.40	-27.59
805	HP5 Hor. SCC1	-15.46	-15.48	-2.07	-31.32
806	HP6 Hor. SCC1	-15.57	-15.59	-2.11	-27.58
807	HP7 Hor. SCC1	-15.58	-15.60	-2.11	-27.45
808	HP7 Hor. SCC1	-15.50	-15.53	-2.02	-27.37
811	HP11 Ver. SCC1	-9.77	-9.80	3.80	-28.47
812	HP12 Ver. SCC1	-9.77	-9.80	3.80	-28.47
813	HP13 Ver. SCC1	-9.77	-9.80	3.80	-28.47
814	HP14 Ver. SCC1	-9.77	-9.80	3.80	-28.47
815	HP15 Ver. SCC1	-9.77	-9.80	3.80	-28.47
816	HP16 Ver. SCC1	-9.77	-9.80	3.80	-28.47
817	HP17 Ver. SCC1	-9.77	-9.80	3.80	-28.47
818	HP18 Ver. SCC1	-9.77	-9.80	3.80	-28.47
819	HP19 Ver. SCC1	-9.77	-9.80	3.80	-28.47
820	HP20 Ver. SCC1	-9.77	-9.80	3.80	-28.47
821	HP21 Ver. SCC1	-9.77	-9.80	3.80	-28.47
822	HP22 Ver. SCC1	-9.77	-9.80	3.80	-28.47
823	HP23 Ver. SCC1	-9.77	-9.80	3.80	-28.47
824	HP24 Ver. SCC1	-9.77	-9.80	3.80	-28.47
825	HP25 Ver. SCC1	-9.77	-9.80	3.80	-28.47
851	HP51 Hor. SCC2	-18.44	-18.47	-5.16	-32.44
852	HP52 Hor. SCC2	-17.78	-17.81	-4.83	-31.36
853	HP53 Hor. SCC2	-17.76	-17.79	-4.83	-31.31
854	HP54 Hor. SCC2	-17.82	-17.85	-4.87	-31.38
855	HP55 Hor. SCC2	-18.66	-18.68	-5.41	-32.54
856	HP56 Hor. SCC2	-18.72	-18.74	-5.44	-31.38
857	HP57 Hor. SCC2	-18.71	-18.73	-5.42	-31.29
858	HP57 Hor. SCC2	-18.55	-18.58	-5.24	-31.14
861	HP61 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
862	HP62 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
863	HP63 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
864	HP64 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
865	HP65 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
866	HP66 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
867	HP67 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
868	HP68 Ver. SCC2	-18.28	-18.31	-5.12	-31.58

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
869	HP69 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
870	HP70 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
871	HP71 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
872	HP72 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
873	HP73 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
874	HP74 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
875	HP75 Ver. SCC2	-18.28	-18.31	-5.12	-31.58
900	Helium Tank +Z	10.00	9.72	25.93	2.99
905	Helium Tank +Y	11.78	11.39	28.32	2.99
910	Helium Tank -Z	16.85	16.32	34.09	3.00
915	Helium Tank -Y	12.15	11.81	29.52	3.02
920	Prop. Tank +Y+Z Lower	21.99	21.53	39.12	3.00
925	Prop. Tank -Z Lower	22.52	22.00	39.86	3.00
930	Prop. Tank -Y+Z Lower	21.80	21.35	38.74	4.38
1001	MLI SVM Bot +Z	-23.14	-21.94	-5.41	-30.55
1002	MLI SVM Bot +Z+Y	-20.25	-19.13	-2.41	-30.26
1003	MLI SVM Bot +Y	-21.91	-21.68	-3.98	-32.20
1004	MLI SVM Bot -Z-Y	-18.11	-18.87	-0.13	-27.92
1005	MLI SVM Bot -Z	-19.13	-19.92	-1.05	-27.64
1006	MLI SVM Bot -Z-Y	-18.83	-19.58	-0.39	-26.50
1007	MLI SVM Bot -Y	-22.45	-22.26	-4.03	-26.33
1008	MLI SVM Bot +Z-Y	-21.87	-20.81	-4.38	-25.48
1601	SVM Bot +Z	8.06	7.80	24.16	-11.81
1602	SVM Bot +Z+Y	14.54	14.21	31.22	-10.77
1603	SVM Bot +Y	11.47	11.10	28.03	-12.32
1604	SVM Bot -Z-Y	17.84	17.31	34.89	-1.20
1605	SVM Bot -Z	17.41	16.85	34.57	0.99
1606	SVM Bot -Z-Y	16.55	16.03	34.06	1.76
1607	SVM Bot -Y	8.95	8.60	26.99	1.02
1608	SVM Bot +Z-Y	10.57	10.29	26.08	1.20
2001	Launcher Adapter Ring	69.62	69.04	90.45	57.67
2002	Launcher Adapter Ring	73.29	72.77	94.43	60.64
2003	Launcher Adapter Ring	70.45	69.26	91.47	56.83
2004	Launcher Adapter Ring	74.10	72.12	95.43	60.88
2005	Launcher Adapter Ring	71.55	69.64	92.75	58.91
2006	Launcher Adapter Ring	73.97	72.11	95.43	62.56
2007	Launcher Adapter Ring	69.68	68.54	90.88	59.67
2008	Launcher Adapter Ring	72.63	72.02	93.67	63.04
2011	Launcher Adapter Edge	70.29	69.69	91.18	58.36
2012	Launcher Adapter Edge	74.19	73.64	95.41	61.58
2013	Launcher Adapter Edge	71.11	69.91	92.19	57.52
2014	Launcher Adapter Edge	74.98	73.00	96.39	61.81
2015	Launcher Adapter Edge	72.20	70.29	93.46	59.59
2016	Launcher Adapter Edge	74.86	73.00	96.40	63.49
2017	Launcher Adapter Edge	70.34	69.20	91.60	60.34
2018	Launcher Adapter Edge	73.54	72.90	94.66	63.95
2021	Launcher Adapter Ring	64.84	64.27	85.26	52.36
2022	Launcher Adapter Ring	67.97	67.46	88.66	54.57

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
2023	Launcher Adapter Ring	65.69	64.57	86.31	51.52
2024	Launcher Adapter Ring	68.90	67.06	89.79	55.27
2025	Launcher Adapter Ring	67.03	65.25	87.85	54.11
2026	Launcher Adapter Ring	68.71	66.99	89.75	56.97
2027	Launcher Adapter Ring	64.89	63.82	85.75	54.77
2028	Launcher Adapter Ring	67.21	66.62	87.75	57.38
2101	Launcher Adapter Ring	69.42	68.83	90.23	57.45
2102	Launcher Adapter Ring	72.99	72.46	94.09	60.32
2103	Launcher Adapter Ring	70.25	69.06	91.25	56.61
2104	Launcher Adapter Ring	73.79	71.83	95.08	60.57
2105	Launcher Adapter Ring	71.35	69.46	92.53	58.71
2106	Launcher Adapter Ring	73.67	71.83	95.09	62.26
2107	Launcher Adapter Ring	69.48	68.35	90.66	59.47
2108	Launcher Adapter Ring	72.33	71.71	93.34	62.72
2111	Launcher Adapter Edge	69.81	69.21	90.65	57.87
2112	Launcher Adapter Edge	73.45	72.90	94.59	60.83
2113	Launcher Adapter Edge	70.63	69.43	91.66	57.03
2114	Launcher Adapter Edge	74.23	72.27	95.56	61.07
2115	Launcher Adapter Edge	71.72	69.82	92.92	59.11
2116	Launcher Adapter Edge	74.12	72.28	95.58	62.75
2117	Launcher Adapter Edge	69.86	68.72	91.07	59.86
2118	Launcher Adapter Edge	72.80	72.17	93.84	63.20
2121	Launcher Adapter Ring	64.80	64.24	85.22	52.32
2122	Launcher Adapter Ring	67.93	67.42	88.61	54.52
2123	Launcher Adapter Ring	65.65	64.53	86.27	51.48
2124	Launcher Adapter Ring	68.85	67.02	89.74	55.23
2125	Launcher Adapter Ring	66.99	65.21	87.81	54.08
2126	Launcher Adapter Ring	68.67	66.95	89.70	56.93
2127	Launcher Adapter Ring	64.86	63.79	85.70	54.73
2128	Launcher Adapter Ring	67.17	66.58	87.70	57.34
2201	RCS Panel	25.29	24.83	42.45	7.02
2202	RCS Panel	25.62	25.14	42.89	6.41
2203	RCS Panel	25.29	24.76	42.73	6.27
2204	RCS Panel	26.20	25.60	43.68	7.66
2205	RCS Panel	26.95	26.31	44.62	10.07
2206	RCS Panel	25.76	25.17	43.36	8.79
2207	RCS Panel	24.96	24.43	42.58	9.42
2208	RCS Panel	25.27	24.79	42.33	9.68
2251	MLI Launcher Adapter Ring	-30.19	-28.64	-12.12	-33.74
2252	MLI Launcher Adapter Ring	-32.37	-30.88	-14.18	-37.06
2253	MLI Launcher Adapter Ring	-30.52	-30.19	-12.24	-36.35
2254	MLI Launcher Adapter Ring	-30.58	-31.52	-12.26	-37.17
2255	MLI Launcher Adapter Ring	-28.77	-29.76	-10.44	-34.72
2256	MLI Launcher Adapter Ring	-30.94	-31.85	-12.41	-36.18
2257	MLI Launcher Adapter Ring	-30.30	-30.05	-11.92	-33.27
2258	MLI Launcher Adapter Ring	-33.75	-32.38	-15.58	-35.76
2401	RCS Panel	25.04	24.58	42.17	6.72
2402	RCS Panel	25.38	24.91	42.62	6.12

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
2403	RCS Panel	25.05	24.52	42.46	5.98
2404	RCS Panel	25.95	25.36	43.41	7.37
2405	RCS Panel	26.73	26.10	44.38	9.83
2406	RCS Panel	25.52	24.93	43.09	8.53
2407	RCS Panel	24.70	24.18	42.30	9.17
2408	RCS Panel	25.01	24.55	42.05	9.42
2501	SVM Cone +Z+Y	17.94	17.58	34.22	-4.45
2502	SVM Cone +Y	17.88	17.49	34.65	-6.98
2503	SVM Cone +Y-Z	16.99	16.55	33.89	-5.26
2504	SVM Cone -Z	19.64	19.14	36.74	-1.87
2505	SVM Cone -Z-Y	19.06	18.56	36.17	-2.53
2506	SVM Cone -Y	18.86	18.37	36.21	0.32
2507	SVM Cone -Z+Y	17.22	16.79	34.47	3.15
2508	SVM Cone +Z	18.57	18.22	34.06	3.42
2511	SVM Cone +Z+Y	17.61	17.24	34.01	-4.05
2512	SVM Cone +Y	17.92	17.53	34.69	-6.66
2513	SVM Cone +Y-Z	17.34	16.89	34.28	-4.68
2514	SVM Cone -Z	19.92	19.41	37.06	-0.52
2515	SVM Cone -Z-Y	19.45	18.93	36.65	-0.21
2516	SVM Cone -Y	19.22	18.73	36.64	1.43
2517	SVM Cone -Z+Y	17.43	16.99	34.76	3.37
2518	SVM Cone +Z	18.30	17.95	33.86	3.67
2521	SVM Cone +Z+Y	16.91	16.53	33.36	-3.91
2522	SVM Cone +Y	17.98	17.59	34.81	-6.11
2523	SVM Cone +Y-Z	17.39	16.94	34.33	-4.49
2524	SVM Cone -Z	20.17	19.66	37.35	0.27
2525	SVM Cone -Z-Y	20.23	19.69	37.51	2.03
2526	SVM Cone -Y	19.44	18.94	36.88	2.24
2527	SVM Cone -Z+Y	17.02	16.58	34.45	3.32
2528	SVM Cone +Z	17.60	17.24	33.33	3.54
2531	SVM Cone +Z+Y	16.47	16.10	32.98	-3.49
2532	SVM Cone +Y	18.66	18.26	35.54	-4.56
2533	SVM Cone +Y-Z	17.66	17.21	34.58	-3.96
2534	SVM Cone -Z	20.76	20.23	37.96	1.35
2535	SVM Cone -Z-Y	21.47	20.90	38.81	4.13
2536	SVM Cone -Y	20.02	19.51	37.52	3.35
2537	SVM Cone -Z+Y	16.66	16.22	34.23	3.75
2538	SVM Cone +Z	17.36	16.99	33.39	3.87
2541	SVM Cone +Z+Y	21.83	21.45	38.69	4.01
2542	SVM Cone +Y	22.73	22.33	39.82	1.54
2543	SVM Cone +Y-Z	22.99	22.49	40.18	3.17
2544	SVM Cone -Z	24.84	24.21	42.24	6.75
2545	SVM Cone -Z-Y	26.69	26.00	44.26	10.75
2546	SVM Cone -Y	24.11	23.51	41.81	8.72
2547	SVM Cone -Z+Y	21.90	21.40	39.80	10.43
2548	SVM Cone +Z	20.85	20.47	37.32	8.56
2601	SVM Cone +Z+Y	17.89	17.53	34.16	-4.49
2602	SVM Cone +Y	17.84	17.45	34.60	-7.05

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
2603	SVM Cone +Y-Z	16.96	16.51	33.85	-5.31
2604	SVM Cone -Z	19.60	19.11	36.70	-1.89
2605	SVM Cone -Z-Y	19.04	18.55	36.15	-2.53
2606	SVM Cone -Y	18.82	18.33	36.17	0.31
2607	SVM Cone -Z+Y	17.19	16.76	34.44	3.15
2608	SVM Cone +Z	18.53	18.18	34.00	3.42
2611	SVM Cone +Z+Y	17.44	17.08	33.82	-4.21
2612	SVM Cone +Y	17.74	17.35	34.49	-6.93
2613	SVM Cone +Y-Z	17.20	16.75	34.12	-4.84
2614	SVM Cone -Z	19.77	19.27	36.90	-0.63
2615	SVM Cone -Z-Y	19.38	18.85	36.58	-0.24
2616	SVM Cone -Y	19.06	18.57	36.48	1.38
2617	SVM Cone -Z+Y	17.29	16.86	34.62	3.34
2618	SVM Cone +Z	18.14	17.80	33.64	3.64
2621	SVM Cone +Z+Y	16.72	16.34	33.15	-4.09
2622	SVM Cone +Y	17.78	17.39	34.59	-6.40
2623	SVM Cone +Y-Z	17.24	16.79	34.16	-4.66
2624	SVM Cone -Z	20.02	19.51	37.19	0.15
2625	SVM Cone -Z-Y	20.16	19.61	37.43	1.98
2626	SVM Cone -Y	19.28	18.77	36.71	2.17
2627	SVM Cone -Z+Y	16.86	16.43	34.29	3.28
2628	SVM Cone +Z	17.39	17.04	33.07	3.48
2631	SVM Cone +Z+Y	16.25	15.88	32.73	-3.70
2632	SVM Cone +Y	18.42	18.03	35.28	-4.89
2633	SVM Cone +Y-Z	17.48	17.03	34.38	-4.17
2634	SVM Cone -Z	20.60	20.08	37.79	1.20
2635	SVM Cone -Z-Y	21.37	20.80	38.70	4.05
2636	SVM Cone -Y	19.85	19.33	37.33	3.27
2637	SVM Cone -Z+Y	16.45	16.02	34.02	3.68
2638	SVM Cone +Z	17.08	16.72	33.06	3.76
2641	SVM Cone +Z+Y	21.54	21.17	38.37	3.73
2642	SVM Cone +Y	22.43	22.03	39.49	1.13
2643	SVM Cone +Y-Z	22.74	22.24	39.91	2.89
2644	SVM Cone -Z	24.62	24.00	42.01	6.54
2645	SVM Cone -Z-Y	26.53	25.84	44.09	10.62
2646	SVM Cone -Y	23.87	23.27	41.56	8.56
2647	SVM Cone -Z+Y	21.62	21.13	39.52	10.28
2648	SVM Cone +Z	20.47	20.09	36.88	8.35
3001	Rad +Z	7.12	6.86	22.98	-17.83
3002	Rad +Z	7.71	7.45	23.57	-17.14
3003	Rad +Z	-1.58	-1.83	14.22	-17.94
3004	Rad +Z	-2.21	-2.46	13.57	-18.20
3005	Rad +Z	-10.04	-10.25	5.46	-30.29
3006	Rad +Z	5.20	4.95	20.99	-18.50
3007	Rad +Z	-14.61	-14.82	0.80	-30.51
3008	Rad +Z	-16.15	-16.35	-0.76	-31.46
3009	Rad +Z	-8.86	-9.05	6.42	-27.13
3010	Rad +Z	2.39	2.18	17.86	-18.62

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
3011	Rad +Z	-1.87	-2.05	13.26	-26.62
3012	Rad +Z	-2.28	-2.45	12.84	-27.01
3013	Rad +Z	-8.98	-9.16	6.29	-27.13
3014	Rad +Z	-8.39	-8.58	6.86	-26.75
3015	Rad +Z	-3.03	-3.20	12.08	-27.63
3016	Rad +Z	-3.13	-3.30	11.96	-27.81
3101	Rad +Y+Z	9.17	8.82	25.62	-15.04
3102	Rad +Y+Z	12.24	11.90	28.75	-15.72
3103	Rad +Y+Z	12.28	11.95	28.79	-15.89
3104	Rad +Y+Z	10.48	10.16	26.95	-17.24
3105	Rad +Y+Z	3.53	3.23	19.83	-23.27
3106	Rad +Y+Z	7.09	6.81	23.19	-16.78
3107	Rad +Y+Z	9.07	8.72	25.52	-15.63
3108	Rad +Y+Z	12.23	11.89	28.72	-16.08
3109	Rad +Y+Z	11.80	11.47	28.28	-16.55
3110	Rad +Y+Z	-2.61	-2.88	13.43	-26.82
3111	Rad +Y+Z	-5.19	-5.45	10.78	-30.08
3112	Rad +Y+Z	6.13	5.86	22.16	-18.81
3113	Rad +Y+Z	8.93	8.57	25.37	-16.62
3114	Rad +Y+Z	12.19	11.85	28.69	-16.14
3115	Rad +Y+Z	11.80	11.46	28.28	-16.61
3116	Rad +Y+Z	-1.88	-2.16	14.14	-27.08
3117	Rad +Y+Z	11.42	11.20	27.01	-31.08
3118	Rad +Y+Z	8.58	8.32	24.45	-19.20
3119	Rad +Y+Z	9.85	9.50	26.30	-16.02
3120	Rad +Y+Z	11.81	11.47	28.32	-15.98
3121	Rad +Y+Z	12.03	11.69	28.53	-16.42
3122	Rad +Y+Z	11.66	11.34	28.01	-19.32
3123	Rad +Y+Z	24.71	24.45	40.57	-24.40
3124	Rad +Y+Z	10.12	9.86	25.94	-18.52
3201	Rad +Y	-12.24	-12.49	3.42	-37.13
3202	Rad +Y	-12.30	-12.55	3.39	-37.20
3203	Rad +Y	-23.80	-24.05	-7.91	-42.70
3204	Rad +Y	-10.72	-10.97	5.08	-26.50
3205	Rad +Y	-12.73	-12.98	2.89	-37.04
3206	Rad +Y	-12.77	-13.01	2.86	-37.40
3207	Rad +Y	-20.83	-21.08	-5.07	-41.62
3208	Rad +Y	-9.71	-9.96	6.09	-25.71
3209	Rad +Y	-8.01	-8.29	7.84	-26.50
3210	Rad +Y	-9.54	-9.81	6.26	-28.63
3211	Rad +Y	6.23	5.98	21.90	-25.50
3212	Rad +Y	-17.50	-17.76	-1.69	-37.86
3213	Rad +Y	2.61	2.29	18.75	-18.03
3214	Rad +Y	3.57	3.25	19.71	-18.15
3215	Rad +Y	17.64	17.36	33.59	-17.80
3216	Rad +Y	5.12	4.78	21.40	-21.50
3301	Rad +Y-Z	-22.36	-22.39	-8.95	-36.60
3302	Rad +Y-Z	-22.45	-22.48	-9.06	-36.70

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
3303	Rad +Y-Z	-22.44	-22.47	-9.05	-36.70
3304	Rad +Y-Z	-22.47	-22.50	-9.08	-36.73
3305	Rad +Y-Z	-23.62	-23.65	-10.19	-37.75
3306	Rad +Y-Z	-53.30	-53.40	-38.91	-63.82
3307	Rad +Y-Z	-21.11	-21.13	-8.32	-34.51
3308	Rad +Y-Z	-21.23	-21.25	-8.45	-34.61
3309	Rad +Y-Z	-21.21	-21.23	-8.44	-34.59
3310	Rad +Y-Z	-21.25	-21.27	-8.48	-34.64
3311	Rad +Y-Z	-22.51	-22.53	-9.69	-35.77
3312	Rad +Y-Z	-55.36	-55.45	-41.11	-65.36
3313	Rad +Y-Z	-20.93	-20.95	-8.25	-34.16
3314	Rad +Y-Z	-21.06	-21.08	-8.40	-34.27
3315	Rad +Y-Z	-21.05	-21.07	-8.39	-34.26
3316	Rad +Y-Z	-21.09	-21.11	-8.43	-34.30
3317	Rad +Y-Z	-22.41	-22.43	-9.70	-35.50
3318	Rad +Y-Z	-57.41	-57.49	-43.27	-66.94
3319	Rad +Y-Z	-21.28	-21.29	-8.50	-34.55
3320	Rad +Y-Z	-21.40	-21.42	-8.64	-34.66
3321	Rad +Y-Z	-21.39	-21.41	-8.64	-34.65
3322	Rad +Y-Z	-21.43	-21.45	-8.68	-34.69
3323	Rad +Y-Z	-22.79	-22.81	-9.99	-35.91
3324	Rad +Y-Z	-58.56	-58.63	-44.43	-67.75
3325	Rad +Y-Z	-22.94	-22.97	-9.57	-36.52
3326	Rad +Y-Z	-23.08	-23.10	-9.73	-36.63
3327	Rad +Y-Z	-23.08	-23.10	-9.73	-36.63
3328	Rad +Y-Z	-23.11	-23.13	-9.76	-36.66
3329	Rad +Y-Z	-24.42	-24.45	-11.04	-37.83
3330	Rad +Y-Z	-58.97	-59.04	-44.77	-67.86
3331	Rad +Y-Z	-23.31	-23.33	-9.80	-34.56
3332	Rad +Y-Z	-23.45	-23.47	-9.95	-34.67
3333	Rad +Y-Z	-23.45	-23.47	-9.95	-34.67
3334	Rad +Y-Z	-23.48	-23.50	-9.98	-34.70
3335	Rad +Y-Z	-24.76	-24.78	-11.24	-35.89
3336	Rad +Y-Z	-58.58	-58.65	-44.32	-67.16
3337	Rad +Y-Z	-23.32	-23.35	-9.78	-34.09
3338	Rad +Y-Z	-23.46	-23.48	-9.93	-34.19
3339	Rad +Y-Z	-23.46	-23.49	-9.93	-34.20
3340	Rad +Y-Z	-23.49	-23.51	-9.96	-34.22
3341	Rad +Y-Z	-24.72	-24.75	-11.16	-35.39
3342	Rad +Y-Z	-57.11	-57.19	-42.77	-65.77
3343	Rad +Y-Z	-23.02	-23.05	-9.43	-33.76
3344	Rad +Y-Z	-23.16	-23.19	-9.59	-33.88
3345	Rad +Y-Z	-23.17	-23.20	-9.60	-33.89
3346	Rad +Y-Z	-23.19	-23.22	-9.62	-33.91
3347	Rad +Y-Z	-24.38	-24.41	-10.78	-35.04
3348	Rad +Y-Z	-55.46	-55.54	-41.05	-64.42
3401	Rad -Z	-31.58	-31.64	-17.85	-43.85
3402	Rad -Z	-31.04	-31.10	-17.28	-43.40

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
3403	Rad -Z	-31.50	-31.57	-17.76	-43.78
3404	Rad -Z	-29.62	-29.66	-16.01	-42.37
3405	Rad -Z	-29.01	-29.06	-15.40	-41.89
3406	Rad -Z	-29.53	-29.58	-15.93	-42.30
3407	Rad -Z	-25.43	-25.47	-12.03	-39.03
3408	Rad -Z	-24.74	-24.78	-11.33	-38.50
3409	Rad -Z	-25.38	-25.41	-11.97	-38.98
3410	Rad -Z	-24.77	-24.80	-11.65	-38.05
3411	Rad -Z	-24.12	-24.15	-11.01	-37.52
3412	Rad -Z	-24.71	-24.74	-11.59	-38.00
3413	Rad -Z	-22.51	-22.53	-9.68	-35.74
3414	Rad -Z	-21.86	-21.88	-9.05	-35.18
3415	Rad -Z	-22.47	-22.49	-9.65	-35.71
3416	Rad -Z	-23.16	-23.18	-10.40	-36.11
3417	Rad -Z	-22.58	-22.60	-9.84	-35.61
3418	Rad -Z	-23.14	-23.16	-10.38	-36.09
3419	Rad -Z	-21.95	-21.97	-9.26	-35.05
3420	Rad -Z	-21.36	-21.37	-8.69	-34.54
3421	Rad -Z	-21.93	-21.95	-9.24	-35.03
3422	Rad -Z	-23.10	-23.11	-10.35	-36.01
3423	Rad -Z	-22.54	-22.55	-9.81	-35.53
3424	Rad -Z	-23.06	-23.07	-10.31	-35.97
3425	Rad -Z	-22.28	-22.30	-9.48	-35.42
3426	Rad -Z	-21.69	-21.70	-8.90	-34.93
3427	Rad -Z	-22.25	-22.26	-9.44	-35.39
3428	Rad -Z	-24.03	-24.05	-10.95	-37.10
3429	Rad -Z	-23.51	-23.52	-10.43	-36.70
3430	Rad -Z	-23.99	-24.01	-10.90	-37.06
3431	Rad -Z	-23.71	-23.73	-10.39	-36.95
3432	Rad -Z	-23.21	-23.23	-9.88	-36.60
3433	Rad -Z	-23.69	-23.72	-10.37	-36.94
3434	Rad -Z	-24.98	-25.00	-11.54	-37.07
3435	Rad -Z	-24.52	-24.54	-11.08	-36.71
3436	Rad -Z	-24.97	-24.99	-11.53	-37.07
3437	Rad -Z	-24.14	-24.16	-10.64	-35.39
3438	Rad -Z	-23.64	-23.66	-10.14	-34.93
3439	Rad -Z	-24.13	-24.15	-10.64	-35.39
3440	Rad -Z	-25.21	-25.24	-11.68	-35.95
3441	Rad -Z	-24.75	-24.77	-11.22	-35.52
3442	Rad -Z	-25.21	-25.23	-11.68	-35.94
3443	Rad -Z	-24.27	-24.30	-10.73	-34.94
3444	Rad -Z	-23.76	-23.79	-10.22	-34.48
3445	Rad -Z	-24.27	-24.30	-10.73	-34.94
3446	Rad -Z	-25.40	-25.43	-11.83	-35.83
3447	Rad -Z	-24.92	-24.95	-11.35	-35.41
3448	Rad -Z	-25.40	-25.43	-11.83	-35.83
3449	Rad -Z	-24.63	-24.66	-11.03	-35.15
3450	Rad -Z	-24.11	-24.14	-10.52	-34.69

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
3451	Rad -Z	-24.63	-24.66	-11.03	-35.15
3452	Rad -Z	-26.39	-26.43	-12.70	-36.66
3453	Rad -Z	-25.97	-26.00	-12.28	-36.29
3454	Rad -Z	-26.39	-26.43	-12.70	-36.66
3501	Rad -Y-Z	-56.67	-56.75	-41.68	-62.97
3502	Rad -Y-Z	-26.55	-26.59	-13.14	-38.88
3503	Rad -Y-Z	-25.41	-25.44	-12.04	-37.95
3504	Rad -Y-Z	-25.38	-25.41	-12.02	-37.93
3505	Rad -Y-Z	-25.38	-25.41	-12.02	-37.93
3506	Rad -Y-Z	-25.27	-25.30	-11.89	-37.84
3507	Rad -Y-Z	-59.13	-59.21	-44.30	-65.42
3508	Rad -Y-Z	-26.63	-26.65	-13.44	-38.68
3509	Rad -Y-Z	-25.39	-25.41	-12.27	-37.65
3510	Rad -Y-Z	-25.36	-25.38	-12.24	-37.62
3511	Rad -Y-Z	-25.37	-25.40	-12.25	-37.63
3512	Rad -Y-Z	-25.32	-25.35	-12.19	-37.60
3513	Rad -Y-Z	-60.36	-60.43	-45.70	-66.75
3514	Rad -Y-Z	-26.73	-26.75	-13.60	-38.72
3515	Rad -Y-Z	-25.44	-25.46	-12.36	-37.63
3516	Rad -Y-Z	-25.41	-25.43	-12.34	-37.61
3517	Rad -Y-Z	-25.42	-25.44	-12.34	-37.61
3518	Rad -Y-Z	-25.29	-25.31	-12.20	-37.50
3519	Rad -Y-Z	-61.02	-61.09	-46.46	-67.47
3520	Rad -Y-Z	-26.91	-26.94	-13.76	-38.91
3521	Rad -Y-Z	-25.61	-25.63	-12.50	-37.81
3522	Rad -Y-Z	-25.58	-25.60	-12.47	-37.78
3523	Rad -Y-Z	-25.59	-25.61	-12.48	-37.79
3524	Rad -Y-Z	-25.45	-25.47	-12.32	-37.67
3525	Rad -Y-Z	-61.26	-61.33	-46.75	-67.72
3526	Rad -Y-Z	-27.47	-27.49	-14.13	-39.54
3527	Rad -Y-Z	-26.18	-26.20	-12.88	-38.45
3528	Rad -Y-Z	-26.15	-26.17	-12.85	-38.43
3529	Rad -Y-Z	-26.15	-26.17	-12.85	-38.42
3530	Rad -Y-Z	-26.00	-26.02	-12.68	-38.29
3531	Rad -Y-Z	-60.97	-61.03	-46.46	-67.36
3532	Rad -Y-Z	-27.59	-27.61	-14.20	-38.93
3533	Rad -Y-Z	-26.31	-26.34	-12.96	-37.84
3534	Rad -Y-Z	-26.28	-26.31	-12.93	-37.81
3535	Rad -Y-Z	-26.29	-26.31	-12.94	-37.82
3536	Rad -Y-Z	-26.13	-26.16	-12.77	-37.69
3537	Rad -Y-Z	-59.90	-59.97	-45.37	-66.28
3538	Rad -Y-Z	-27.51	-27.53	-14.09	-38.68
3539	Rad -Y-Z	-26.28	-26.30	-12.91	-37.62
3540	Rad -Y-Z	-26.24	-26.27	-12.88	-37.60
3541	Rad -Y-Z	-26.24	-26.27	-12.87	-37.60
3542	Rad -Y-Z	-26.10	-26.13	-12.71	-37.48
3543	Rad -Y-Z	-57.74	-57.81	-43.14	-64.17
3544	Rad -Y-Z	-27.08	-27.11	-13.62	-38.26

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
3545	Rad -Y-Z	-25.91	-25.94	-12.50	-37.26
3546	Rad -Y-Z	-25.87	-25.90	-12.46	-37.23
3547	Rad -Y-Z	-25.88	-25.91	-12.46	-37.23
3548	Rad -Y-Z	-25.78	-25.81	-12.35	-37.16
3601	Rad -Y	15.62	15.32	32.70	8.32
3602	Rad -Y	-3.46	-3.78	14.93	-10.50
3603	Rad -Y	-14.32	-14.60	3.72	-20.22
3604	Rad -Y	-26.98	-27.02	-4.63	-25.49
3605	Rad -Y	16.34	16.04	33.40	9.04
3606	Rad -Y	1.62	1.29	20.95	-4.87
3607	Rad -Y	-0.97	-1.28	18.52	-7.17
3608	Rad -Y	-3.04	-3.33	16.77	-8.63
3609	Rad -Y	15.27	14.98	32.11	7.54
3610	Rad -Y	2.87	2.55	22.16	-3.48
3611	Rad -Y	-9.32	-9.60	9.40	-14.73
3612	Rad -Y	-11.78	-12.05	6.87	-17.24
3613	Rad -Y	15.72	15.43	32.51	7.95
3614	Rad -Y	22.48	22.22	39.70	16.10
3615	Rad -Y	7.46	7.24	24.20	2.06
3616	Rad -Y	-9.45	-9.70	7.64	-15.81
3701	Rad -Y+Z	-27.23	-27.41	-11.77	-40.32
3702	Rad -Y+Z	-9.88	-10.08	5.05	-18.42
3703	Rad -Y+Z	-9.11	-9.31	5.80	-17.25
3704	Rad -Y+Z	-0.88	-1.13	14.31	-5.19
3705	Rad -Y+Z	-7.21	-7.41	6.54	-12.94
3706	Rad -Y+Z	-12.84	-13.02	0.58	-18.83
3707	Rad -Y+Z	-28.74	-28.92	-13.46	-42.08
3708	Rad -Y+Z	-8.90	-9.10	5.95	-17.52
3709	Rad -Y+Z	-8.09	-8.29	6.71	-16.39
3710	Rad -Y+Z	0.87	0.62	15.56	-3.23
3711	Rad -Y+Z	-1.93	-2.13	11.21	-8.71
3712	Rad -Y+Z	-10.57	-10.75	2.65	-17.12
3713	Rad -Y+Z	-24.40	-24.58	-9.51	-37.58
3714	Rad -Y+Z	-10.67	-10.86	3.66	-18.87
3715	Rad -Y+Z	-9.39	-9.59	4.62	-17.35
3716	Rad -Y+Z	12.15	11.98	22.98	2.05
3717	Rad -Y+Z	12.50	12.31	24.13	2.62
3718	Rad -Y+Z	-8.29	-8.47	4.95	-15.69
3719	Rad -Y+Z	-22.76	-22.94	-7.93	-36.26
3720	Rad -Y+Z	-10.31	-10.51	3.97	-18.55
3721	Rad -Y+Z	-9.07	-9.27	4.87	-17.10
3722	Rad -Y+Z	12.36	12.19	23.04	1.95
3723	Rad -Y+Z	11.47	11.30	22.32	1.20
3724	Rad -Y+Z	-11.25	-11.44	2.80	-18.78
4001	MLI Rad +Z	-160.19	-159.74	-143.78	-165.68
4002	MLI Rad +Z	-159.12	-158.65	-142.10	-164.44
4003	MLI Rad +Z	-161.23	-160.76	-143.97	-164.56
4004	MLI Rad +Z	-162.57	-162.15	-145.08	-165.92

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
4006	MLI Rad +Z	-168.54	-168.36	-152.75	-175.21
4010	MLI Rad +Z	-174.25	-174.24	-158.13	-181.24
4101	MLI Rad +Y+Z	-158.48	-158.02	-142.12	-163.67
4102	MLI Rad +Y+Z	-156.72	-156.24	-140.82	-162.59
4103	MLI Rad +Y+Z	-156.15	-155.65	-139.45	-161.98
4104	MLI Rad +Y+Z	-156.15	-155.63	-138.59	-161.80
4105	MLI Rad +Y+Z	-158.11	-157.58	-140.84	-163.50
4106	MLI Rad +Y+Z	-159.15	-158.67	-142.51	-164.26
4107	MLI Rad +Y+Z	-167.34	-167.18	-151.90	-174.25
4108	MLI Rad +Y+Z	-164.61	-164.39	-148.72	-172.08
4109	MLI Rad +Y+Z	-164.06	-163.81	-148.15	-171.38
4112	MLI Rad +Y+Z	-168.27	-168.09	-152.50	-175.31
4113	MLI Rad +Y+Z	-170.60	-170.58	-155.42	-178.60
4114	MLI Rad +Y+Z	-168.66	-168.59	-153.49	-177.21
4115	MLI Rad +Y+Z	-168.33	-168.24	-152.96	-176.78
4118	MLI Rad +Y+Z	-170.88	-170.83	-155.81	-179.63
4119	MLI Rad +Y+Z	-171.99	-172.04	-157.03	-180.56
4120	MLI Rad +Y+Z	-170.61	-170.63	-155.46	-179.56
4121	MLI Rad +Y+Z	-170.05	-170.04	-154.72	-179.06
4122	MLI Rad +Y+Z	-170.32	-170.31	-154.99	-180.18
4123	MLI Rad +Y+Z	-166.54	-166.53	-151.62	-182.34
4124	MLI Rad +Y+Z	-171.58	-171.59	-156.50	-180.97
4213	MLI Rad +Y	-175.94	-176.05	-159.62	-183.26
4214	MLI Rad +Y	-175.61	-175.72	-159.01	-183.30
4215	MLI Rad +Y	-170.91	-171.00	-154.72	-183.18
4216	MLI Rad +Y	-175.08	-175.20	-158.67	-184.52
4350	MLI on SCC1 Rad +Y-Z	11.11	10.71	27.40	-9.02
4351	MLI Int Rad +Y-Z	8.40	7.97	24.72	-8.57
4356	MLI Int Rad +Y-Z	-1.89	-2.23	14.42	-23.87
4357	MLI Int Rad +Y-Z	8.78	8.36	24.90	-8.10
4362	MLI Int Rad +Y-Z	-2.17	-2.51	14.10	-24.63
4363	MLI Int Rad +Y-Z	8.70	8.29	24.80	-8.27
4368	MLI Int Rad +Y-Z	-2.72	-3.06	13.53	-25.22
4369	MLI Int Rad +Y-Z	8.51	8.10	24.62	-8.54
4374	MLI Int Rad +Y-Z	-3.55	-3.89	12.69	-25.23
4375	MLI Int Rad +Y-Z	7.86	7.45	24.14	-9.43
4380	MLI Int Rad +Y-Z	-4.20	-4.54	12.06	-25.10
4381	MLI Int Rad +Y-Z	7.63	7.22	23.93	-9.06
4386	MLI Int Rad +Y-Z	-4.83	-5.18	11.47	-24.97
4387	MLI Int Rad +Y-Z	7.44	7.03	23.74	-9.22
4392	MLI Int Rad +Y-Z	-4.75	-5.09	11.56	-24.83
4393	MLI Int Rad +Y-Z	7.36	6.95	23.66	-9.29
4398	MLI Int Rad +Y-Z	-4.24	-4.59	12.06	-24.64
4450	MLI Rad -Z	4.81	4.46	20.24	-9.64
4550	MLI on SCC2 Rad -Y-Z	7.81	7.42	24.38	-7.35
4551	MLI Int Rad -Y-Z	-7.03	-7.35	10.93	-15.64
4556	MLI Int Rad -Y-Z	7.63	7.20	24.05	-8.28
4557	MLI Int Rad -Y-Z	-8.26	-8.58	9.85	-16.86

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
4562	MLI Int Rad -Y-Z	7.55	7.13	23.90	-8.29
4563	MLI Int Rad -Y-Z	-8.07	-8.39	9.96	-17.03
4568	MLI Int Rad -Y-Z	7.51	7.09	23.86	-8.38
4569	MLI Int Rad -Y-Z	-7.93	-8.26	10.06	-17.15
4574	MLI Int Rad -Y-Z	7.30	6.88	23.63	-8.65
4575	MLI Int Rad -Y-Z	-7.71	-8.04	10.19	-17.10
4580	MLI Int Rad -Y-Z	6.96	6.54	23.34	-9.10
4581	MLI Int Rad -Y-Z	-7.01	-7.34	10.65	-16.67
4586	MLI Int Rad -Y-Z	6.66	6.25	23.05	-9.26
4587	MLI Int Rad -Y-Z	-6.31	-6.64	11.13	-16.08
4592	MLI Int Rad -Y-Z	6.39	5.98	22.77	-9.59
4593	MLI Int Rad -Y-Z	-5.24	-5.57	12.05	-15.13
4598	MLI Int Rad -Y-Z	6.38	5.97	22.75	-9.71
4601	MLI Rad -Y	-158.28	-157.92	-142.07	-159.82
4602	MLI Rad -Y	-161.12	-160.79	-144.07	-162.54
4605	MLI Rad -Y	-166.99	-166.92	-151.08	-169.07
4606	MLI Rad -Y	-169.69	-169.65	-153.14	-171.54
4607	MLI Rad -Y	-169.19	-169.28	-152.45	-171.14
4608	MLI Rad -Y	-172.13	-172.30	-154.06	-174.02
4609	MLI Rad -Y	-169.77	-169.78	-154.04	-172.15
4610	MLI Rad -Y	-173.96	-173.99	-156.67	-175.99
4613	MLI Rad -Y	-171.54	-171.63	-155.47	-174.12
4614	MLI Rad -Y	-169.24	-169.32	-152.60	-171.40
4705	MLI Rad +Y+Z	-159.80	-159.29	-143.00	-160.76
4706	MLI Rad +Y+Z	-163.64	-163.13	-146.97	-164.66
4711	MLI Rad +Y+Z	-167.94	-167.67	-150.98	-169.57
4712	MLI Rad +Y+Z	-173.22	-173.01	-157.80	-174.99
4718	MLI Rad +Y+Z	-175.85	-175.76	-160.98	-178.15
4900	MLI Helium Tank +Z	10.09	9.81	25.98	-8.01
4905	MLI Helium Tank +Y	11.88	11.50	28.38	-7.40
4910	MLI Helium Tank -Z	16.98	16.45	34.16	0.69
4915	MLI Helium Tank -Y	12.26	11.91	29.64	3.01
4920	MLI Pr Tank +Y+Z Lower	22.00	21.53	39.13	1.94
4925	MLI Pr Tank -Z Lower	22.52	22.00	39.86	2.26
4930	MLI Pr Tank -Y+Z Lower	21.80	21.35	38.75	4.42
6001	Int Rad +Z	7.94	7.68	23.82	-17.24
6002	Int Rad +Z	8.20	7.94	24.07	-16.91
6003	Int Rad +Z	-1.09	-1.34	14.72	-17.36
6004	Int Rad +Z	-1.52	-1.77	14.28	-17.57
6005	Int Rad +Z	-3.43	-3.66	12.24	-25.54
6006	Int Rad +Z	6.08	5.83	21.89	-17.94
6007	Int Rad +Z	-8.80	-9.02	6.77	-25.80
6008	Int Rad +Z	-10.24	-10.46	5.30	-26.67
6009	Int Rad +Z	-1.35	-1.55	14.08	-21.38
6010	Int Rad +Z	3.20	2.98	18.67	-17.87
6011	Int Rad +Z	7.00	6.80	22.26	-20.75
6012	Int Rad +Z	6.66	6.47	21.91	-21.02
6013	Int Rad +Z	-1.31	-1.51	14.10	-21.31

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
6014	Int Rad +Z	-1.10	-1.30	14.29	-21.14
6015	Int Rad +Z	5.42	5.22	20.66	-21.89
6016	Int Rad +Z	5.22	5.03	20.44	-22.07
6051	Shear Web1 +Z-Y	10.68	10.36	27.23	2.26
6052	Shear Web1 +Z-Y	12.23	11.92	28.59	3.75
6053	Shear Web1 +Z-Y	18.82	18.53	34.31	9.33
6054	Shear Web1 +Z-Y	16.37	16.07	33.31	8.01
6055	Shear Web1 +Z-Y	15.84	15.54	32.82	7.33
6061	Shear Web1 +Z-Y	10.76	10.44	27.24	2.29
6062	Shear Web1 +Z-Y	12.31	12.00	28.61	3.80
6063	Shear Web1 +Z-Y	19.34	19.06	34.74	9.74
6064	Shear Web1 +Z-Y	16.58	16.29	33.57	8.25
6065	Shear Web1 +Z-Y	16.13	15.84	33.12	7.64
6071	Shear Web2 +Z-Y	6.63	6.36	22.32	-8.24
6072	Shear Web2 +Z-Y	6.09	5.82	21.63	-9.76
6073	Shear Web2 +Z-Y	7.65	7.39	23.01	-9.18
6074	Shear Web2 +Z-Y	11.39	11.13	26.55	-5.64
6075	Shear Web2 +Z-Y	13.80	13.55	28.86	-2.87
6081	Shear Web2 +Z-Y	6.44	6.17	22.14	-8.66
6082	Shear Web2 +Z-Y	5.93	5.67	21.49	-10.12
6083	Shear Web2 +Z-Y	7.53	7.27	22.91	-9.56
6084	Shear Web2 +Z-Y	11.14	10.89	26.33	-6.21
6085	Shear Web2 +Z-Y	13.44	13.18	28.52	-3.59
6101	Int Rad +Y+Z	9.36	9.00	25.82	-14.84
6102	Int Rad +Y+Z	12.51	12.17	29.03	-15.57
6103	Int Rad +Y+Z	12.56	12.22	29.08	-15.69
6104	Int Rad +Y+Z	11.25	10.91	27.74	-16.67
6105	Int Rad +Y+Z	3.86	3.55	20.17	-23.11
6106	Int Rad +Y+Z	7.41	7.12	23.52	-16.44
6107	Int Rad +Y+Z	9.23	8.88	25.69	-15.46
6108	Int Rad +Y+Z	12.49	12.15	28.99	-15.95
6109	Int Rad +Y+Z	12.24	11.90	28.73	-16.26
6110	Int Rad +Y+Z	4.80	4.50	21.09	-21.67
6111	Int Rad +Y+Z	1.51	1.22	17.73	-25.22
6112	Int Rad +Y+Z	6.43	6.15	22.46	-18.52
6113	Int Rad +Y+Z	9.05	8.69	25.50	-16.53
6114	Int Rad +Y+Z	12.46	12.12	28.96	-16.00
6115	Int Rad +Y+Z	12.23	11.90	28.73	-16.30
6116	Int Rad +Y+Z	5.43	5.13	21.70	-21.85
6117	Int Rad +Y+Z	21.68	21.43	37.47	-26.35
6118	Int Rad +Y+Z	8.79	8.52	24.67	-18.88
6119	Int Rad +Y+Z	10.08	9.72	26.53	-15.85
6120	Int Rad +Y+Z	12.05	11.71	28.57	-15.81
6121	Int Rad +Y+Z	12.27	11.93	28.77	-16.22
6122	Int Rad +Y+Z	12.11	11.79	28.48	-18.88
6123	Int Rad +Y+Z	25.90	25.64	41.77	-24.23
6124	Int Rad +Y+Z	10.14	9.88	25.96	-18.25
6151	Shear Web3 +Z+Y	11.17	10.86	27.51	-12.55

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
6152	Shear Web3 +Z+Y	10.68	10.37	26.91	-14.02
6153	Shear Web3 +Z+Y	10.94	10.63	27.17	-14.07
6154	Shear Web3 +Z+Y	12.89	12.58	29.05	-14.32
6155	Shear Web3 +Z+Y	12.57	12.27	28.68	-14.25
6161	Shear Web3 +Z+Y	11.36	11.05	27.73	-12.50
6162	Shear Web3 +Z+Y	10.84	10.53	27.10	-13.96
6163	Shear Web3 +Z+Y	11.21	10.91	27.47	-14.04
6164	Shear Web3 +Z+Y	13.15	12.84	29.34	-14.29
6165	Shear Web3 +Z+Y	12.84	12.53	28.98	-14.20
6171	Shear Web4 +Z+Y	12.10	11.74	28.66	-12.69
6172	Shear Web4 +Z+Y	11.60	11.25	28.14	-13.60
6173	Shear Web4 +Z+Y	11.55	11.19	28.07	-14.13
6174	Shear Web4 +Z+Y	11.92	11.56	28.44	-14.15
6175	Shear Web4 +Z+Y	12.34	11.98	28.86	-13.86
6181	Shear Web4 +Z+Y	11.89	11.54	28.44	-12.78
6182	Shear Web4 +Z+Y	11.40	11.05	27.93	-13.69
6183	Shear Web4 +Z+Y	11.36	11.01	27.87	-14.22
6184	Shear Web4 +Z+Y	11.76	11.41	28.27	-14.23
6185	Shear Web4 +Z+Y	12.19	11.83	28.70	-13.93
6201	Int Rad +Y	-5.06	-5.33	10.78	-32.32
6202	Int Rad +Y	-4.95	-5.22	10.93	-32.30
6203	Int Rad +Y	-18.36	-18.65	-2.30	-38.77
6204	Int Rad +Y	-3.18	-3.46	12.82	-20.49
6205	Int Rad +Y	-5.68	-5.95	10.11	-32.45
6206	Int Rad +Y	-5.53	-5.80	10.27	-32.73
6207	Int Rad +Y	-15.58	-15.85	0.35	-37.92
6208	Int Rad +Y	-1.67	-1.95	14.34	-19.09
6209	Int Rad +Y	-0.41	-0.72	15.65	-20.54
6210	Int Rad +Y	-2.59	-2.89	13.41	-23.12
6211	Int Rad +Y	16.96	16.68	32.84	-19.01
6212	Int Rad +Y	-12.19	-12.47	3.80	-34.14
6213	Int Rad +Y	3.20	2.87	19.35	-17.56
6214	Int Rad +Y	3.99	3.67	20.16	-17.64
6215	Int Rad +Y	18.78	18.49	34.74	-17.30
6216	Int Rad +Y	5.90	5.56	22.22	-20.85
6251	Shear Web5 -Z+Y	13.94	13.50	30.68	-8.52
6252	Shear Web5 -Z+Y	13.83	13.39	30.56	-8.71
6253	Shear Web5 -Z+Y	13.65	13.21	30.40	-8.48
6254	Shear Web5 -Z+Y	13.40	12.96	30.16	-8.32
6255	Shear Web5 -Z+Y	13.05	12.62	29.78	-8.90
6261	Shear Web5 -Z+Y	14.27	13.82	31.05	-8.03
6262	Shear Web5 -Z+Y	14.12	13.68	30.89	-8.27
6263	Shear Web5 -Z+Y	13.94	13.50	30.73	-8.09
6264	Shear Web5 -Z+Y	13.69	13.25	30.49	-7.97
6265	Shear Web5 -Z+Y	13.36	12.92	30.13	-8.53
6271	Shear Web6 -Z+Y	17.69	17.15	34.77	-0.46
6272	Shear Web6 -Z+Y	17.65	17.13	34.74	-0.74
6273	Shear Web6 -Z+Y	17.16	16.64	34.22	-1.45

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
6274	Shear Web6 -Z+Y	16.87	16.36	33.92	-1.94
6275	Shear Web6 -Z+Y	16.62	16.11	33.66	-2.35
6281	Shear Web6 -Z+Y	17.63	17.09	34.71	-0.42
6282	Shear Web6 -Z+Y	17.60	17.08	34.69	-0.69
6283	Shear Web6 -Z+Y	17.11	16.59	34.17	-1.41
6284	Shear Web6 -Z+Y	16.82	16.31	33.87	-1.89
6285	Shear Web6 -Z+Y	16.57	16.06	33.61	-2.30
6301	Int Rad +Y-Z	-17.84	-17.87	-4.41	-33.13
6302	Int Rad +Y-Z	-17.96	-17.99	-4.55	-33.27
6303	Int Rad +Y-Z	-17.96	-17.99	-4.55	-33.27
6304	Int Rad +Y-Z	-17.97	-18.00	-4.56	-33.28
6305	Int Rad +Y-Z	-18.79	-18.83	-5.36	-34.01
6306	Int Rad +Y-Z	-50.76	-50.86	-36.33	-61.77
6307	Int Rad +Y-Z	-16.18	-16.20	-3.53	-30.43
6308	Int Rad +Y-Z	-16.33	-16.35	-3.71	-30.57
6309	Int Rad +Y-Z	-16.33	-16.35	-3.71	-30.56
6310	Int Rad +Y-Z	-16.35	-16.37	-3.73	-30.58
6311	Int Rad +Y-Z	-17.26	-17.28	-4.61	-31.41
6312	Int Rad +Y-Z	-53.13	-53.22	-38.86	-63.53
6313	Int Rad +Y-Z	-16.01	-16.03	-3.46	-30.14
6314	Int Rad +Y-Z	-16.17	-16.19	-3.64	-30.28
6315	Int Rad +Y-Z	-16.17	-16.19	-3.64	-30.28
6316	Int Rad +Y-Z	-16.19	-16.21	-3.66	-30.30
6317	Int Rad +Y-Z	-17.16	-17.18	-4.59	-31.17
6318	Int Rad +Y-Z	-55.38	-55.46	-41.23	-65.26
6319	Int Rad +Y-Z	-16.27	-16.29	-3.64	-30.45
6320	Int Rad +Y-Z	-16.43	-16.44	-3.82	-30.58
6321	Int Rad +Y-Z	-16.43	-16.44	-3.82	-30.58
6322	Int Rad +Y-Z	-16.45	-16.46	-3.84	-30.60
6323	Int Rad +Y-Z	-17.44	-17.45	-4.79	-31.48
6324	Int Rad +Y-Z	-56.55	-56.62	-42.41	-66.09
6325	Int Rad +Y-Z	-18.33	-18.36	-4.96	-33.11
6326	Int Rad +Y-Z	-18.49	-18.52	-5.14	-33.25
6327	Int Rad +Y-Z	-18.49	-18.52	-5.15	-33.25
6328	Int Rad +Y-Z	-18.51	-18.54	-5.16	-33.27
6329	Int Rad +Y-Z	-19.47	-19.49	-6.10	-34.11
6330	Int Rad +Y-Z	-56.95	-57.02	-42.74	-66.18
6331	Int Rad +Y-Z	-18.61	-18.64	-5.13	-30.45
6332	Int Rad +Y-Z	-18.77	-18.80	-5.31	-30.58
6333	Int Rad +Y-Z	-18.77	-18.80	-5.31	-30.58
6334	Int Rad +Y-Z	-18.79	-18.82	-5.32	-30.59
6335	Int Rad +Y-Z	-19.73	-19.75	-6.24	-31.46
6336	Int Rad +Y-Z	-56.56	-56.64	-42.28	-65.45
6337	Int Rad +Y-Z	-18.62	-18.65	-5.11	-30.08
6338	Int Rad +Y-Z	-18.78	-18.80	-5.29	-30.20
6339	Int Rad +Y-Z	-18.78	-18.81	-5.29	-30.21
6340	Int Rad +Y-Z	-18.80	-18.82	-5.30	-30.22
6341	Int Rad +Y-Z	-19.69	-19.72	-6.18	-31.06

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
6342	Int Rad +Y-Z	-54.90	-54.99	-40.53	-63.90
6343	Int Rad +Y-Z	-18.23	-18.26	-4.67	-29.71
6344	Int Rad +Y-Z	-18.39	-18.42	-4.85	-29.85
6345	Int Rad +Y-Z	-18.40	-18.43	-4.85	-29.86
6346	Int Rad +Y-Z	-18.41	-18.44	-4.87	-29.87
6347	Int Rad +Y-Z	-19.27	-19.30	-5.70	-30.68
6348	Int Rad +Y-Z	-52.94	-53.04	-38.50	-62.33
6351	Shear Web7 -Z-Y	17.25	16.72	34.58	1.25
6352	Shear Web7 -Z-Y	17.12	16.60	34.43	0.91
6353	Shear Web7 -Z-Y	16.67	16.15	33.96	0.27
6354	Shear Web7 -Z-Y	16.39	15.88	33.68	-0.26
6355	Shear Web7 -Z-Y	15.88	15.37	33.13	-1.01
6361	Shear Web7 -Z-Y	17.25	16.72	34.60	1.31
6362	Shear Web7 -Z-Y	17.12	16.60	34.44	0.95
6363	Shear Web7 -Z-Y	16.66	16.15	33.97	0.30
6364	Shear Web7 -Z-Y	16.40	15.89	33.70	-0.22
6365	Shear Web7 -Z-Y	15.89	15.39	33.16	-0.96
6371	Shear Web8 -Z-Y	11.07	10.64	29.08	-0.60
6372	Shear Web8 -Z-Y	11.19	10.76	29.21	-0.70
6373	Shear Web8 -Z-Y	11.14	10.72	29.09	-0.98
6374	Shear Web8 -Z-Y	12.48	12.06	30.20	-0.28
6375	Shear Web8 -Z-Y	12.85	12.42	30.51	-0.09
6381	Shear Web8 -Z-Y	10.64	10.22	28.67	-0.74
6382	Shear Web8 -Z-Y	10.80	10.38	28.84	-0.83
6383	Shear Web8 -Z-Y	10.79	10.38	28.77	-1.08
6384	Shear Web8 -Z-Y	12.31	11.89	30.04	-0.30
6385	Shear Web8 -Z-Y	12.65	12.22	30.32	-0.10
6401	Int Rad -Z	-28.56	-28.63	-14.78	-41.32
6402	Int Rad -Z	-27.87	-27.95	-14.07	-40.76
6403	Int Rad -Z	-28.48	-28.55	-14.69	-41.26
6404	Int Rad -Z	-26.53	-26.58	-12.94	-39.92
6405	Int Rad -Z	-25.80	-25.85	-12.18	-39.34
6406	Int Rad -Z	-26.43	-26.48	-12.83	-39.83
6407	Int Rad -Z	-18.88	-18.91	-5.48	-34.04
6408	Int Rad -Z	-17.95	-17.98	-4.54	-33.34
6409	Int Rad -Z	-18.85	-18.88	-5.44	-34.01
6410	Int Rad -Z	-20.94	-20.97	-7.88	-34.98
6411	Int Rad -Z	-20.14	-20.17	-7.09	-34.33
6412	Int Rad -Z	-20.87	-20.90	-7.81	-34.92
6413	Int Rad -Z	-16.02	-16.04	-3.41	-30.32
6414	Int Rad -Z	-15.14	-15.16	-2.57	-29.57
6415	Int Rad -Z	-15.99	-16.01	-3.39	-30.30
6416	Int Rad -Z	-19.32	-19.34	-6.66	-32.96
6417	Int Rad -Z	-18.61	-18.63	-5.98	-32.35
6418	Int Rad -Z	-19.30	-19.31	-6.64	-32.94
6419	Int Rad -Z	-15.71	-15.73	-3.19	-29.91
6420	Int Rad -Z	-14.90	-14.91	-2.40	-29.24
6421	Int Rad -Z	-15.69	-15.70	-3.16	-29.89

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
6422	Int Rad -Z	-19.29	-19.31	-6.65	-32.89
6423	Int Rad -Z	-18.57	-18.59	-5.95	-32.29
6424	Int Rad -Z	-19.23	-19.25	-6.58	-32.84
6425	Int Rad -Z	-15.92	-15.94	-3.33	-30.17
6426	Int Rad -Z	-15.09	-15.11	-2.53	-29.47
6427	Int Rad -Z	-15.90	-15.91	-3.30	-30.15
6428	Int Rad -Z	-20.33	-20.35	-7.31	-34.19
6429	Int Rad -Z	-19.66	-19.68	-6.65	-33.68
6430	Int Rad -Z	-20.28	-20.30	-7.25	-34.14
6431	Int Rad -Z	-18.00	-18.02	-4.65	-32.88
6432	Int Rad -Z	-17.30	-17.32	-3.94	-32.43
6433	Int Rad -Z	-17.99	-18.01	-4.64	-32.87
6434	Int Rad -Z	-21.37	-21.39	-7.94	-34.14
6435	Int Rad -Z	-20.79	-20.81	-7.36	-33.68
6436	Int Rad -Z	-21.36	-21.38	-7.94	-34.14
6437	Int Rad -Z	-18.26	-18.29	-4.80	-30.14
6438	Int Rad -Z	-17.54	-17.57	-4.08	-29.46
6439	Int Rad -Z	-18.26	-18.28	-4.79	-30.14
6440	Int Rad -Z	-21.57	-21.59	-8.06	-32.81
6441	Int Rad -Z	-20.97	-20.99	-7.47	-32.27
6442	Int Rad -Z	-21.56	-21.59	-8.06	-32.81
6443	Int Rad -Z	-18.33	-18.35	-4.83	-29.83
6444	Int Rad -Z	-17.59	-17.61	-4.10	-29.19
6445	Int Rad -Z	-18.32	-18.35	-4.83	-29.83
6446	Int Rad -Z	-21.71	-21.73	-8.16	-32.69
6447	Int Rad -Z	-21.09	-21.12	-7.55	-32.15
6448	Int Rad -Z	-21.71	-21.73	-8.16	-32.69
6449	Int Rad -Z	-18.45	-18.48	-4.92	-29.89
6450	Int Rad -Z	-17.68	-17.70	-4.15	-29.23
6451	Int Rad -Z	-18.45	-18.48	-4.92	-29.89
6452	Int Rad -Z	-22.69	-22.74	-8.98	-33.54
6453	Int Rad -Z	-22.15	-22.20	-8.44	-33.07
6454	Int Rad -Z	-22.69	-22.74	-8.97	-33.54
6501	Int Rad -Y-Z	-54.26	-54.35	-39.20	-60.76
6502	Int Rad -Y-Z	-21.82	-21.85	-8.44	-35.05
6503	Int Rad -Y-Z	-20.99	-21.02	-7.66	-34.39
6504	Int Rad -Y-Z	-20.97	-21.01	-7.64	-34.38
6505	Int Rad -Y-Z	-20.97	-21.01	-7.64	-34.37
6506	Int Rad -Y-Z	-20.83	-20.86	-7.48	-34.26
6507	Int Rad -Y-Z	-57.21	-57.29	-42.32	-63.68
6508	Int Rad -Y-Z	-21.80	-21.82	-8.72	-34.69
6509	Int Rad -Y-Z	-20.90	-20.92	-7.86	-33.95
6510	Int Rad -Y-Z	-20.88	-20.91	-7.85	-33.93
6511	Int Rad -Y-Z	-20.89	-20.91	-7.85	-33.94
6512	Int Rad -Y-Z	-20.83	-20.85	-7.78	-33.89
6513	Int Rad -Y-Z	-58.40	-58.47	-43.70	-64.99
6514	Int Rad -Y-Z	-21.84	-21.87	-8.81	-34.69
6515	Int Rad -Y-Z	-20.91	-20.93	-7.91	-33.90

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
6516	Int Rad -Y-Z	-20.89	-20.91	-7.90	-33.89
6517	Int Rad -Y-Z	-20.89	-20.92	-7.90	-33.89
6518	Int Rad -Y-Z	-20.72	-20.75	-7.71	-33.74
6519	Int Rad -Y-Z	-59.07	-59.14	-44.47	-65.72
6520	Int Rad -Y-Z	-21.98	-22.00	-8.92	-34.84
6521	Int Rad -Y-Z	-21.03	-21.05	-8.01	-34.04
6522	Int Rad -Y-Z	-21.02	-21.04	-7.99	-34.03
6523	Int Rad -Y-Z	-21.02	-21.04	-7.99	-34.03
6524	Int Rad -Y-Z	-20.84	-20.87	-7.80	-33.88
6525	Int Rad -Y-Z	-59.32	-59.39	-44.77	-65.99
6526	Int Rad -Y-Z	-22.65	-22.67	-9.35	-35.67
6527	Int Rad -Y-Z	-21.71	-21.73	-8.45	-34.88
6528	Int Rad -Y-Z	-21.69	-21.72	-8.43	-34.87
6529	Int Rad -Y-Z	-21.69	-21.71	-8.43	-34.87
6530	Int Rad -Y-Z	-21.52	-21.54	-8.23	-34.71
6531	Int Rad -Y-Z	-59.02	-59.09	-44.48	-65.62
6532	Int Rad -Y-Z	-22.74	-22.77	-9.41	-34.84
6533	Int Rad -Y-Z	-21.82	-21.84	-8.51	-34.05
6534	Int Rad -Y-Z	-21.80	-21.83	-8.50	-34.04
6535	Int Rad -Y-Z	-21.80	-21.83	-8.50	-34.04
6536	Int Rad -Y-Z	-21.63	-21.65	-8.30	-33.89
6537	Int Rad -Y-Z	-57.92	-57.99	-43.35	-64.50
6538	Int Rad -Y-Z	-22.68	-22.71	-9.33	-34.64
6539	Int Rad -Y-Z	-21.79	-21.81	-8.46	-33.87
6540	Int Rad -Y-Z	-21.77	-21.79	-8.45	-33.86
6541	Int Rad -Y-Z	-21.77	-21.79	-8.44	-33.86
6542	Int Rad -Y-Z	-21.60	-21.63	-8.26	-33.72
6543	Int Rad -Y-Z	-55.28	-55.36	-40.63	-61.94
6544	Int Rad -Y-Z	-22.16	-22.19	-8.75	-34.14
6545	Int Rad -Y-Z	-21.32	-21.35	-7.94	-33.43
6546	Int Rad -Y-Z	-21.29	-21.32	-7.92	-33.41
6547	Int Rad -Y-Z	-21.30	-21.33	-7.92	-33.41
6548	Int Rad -Y-Z	-21.18	-21.22	-7.79	-33.33
6601	Int Rad -Y	16.20	15.90	33.27	8.87
6602	Int Rad -Y	-3.56	-3.88	14.85	-10.65
6603	Int Rad -Y	-7.83	-8.13	10.53	-14.43
6604	Int Rad -Y	-22.31	-22.33	1.01	-20.31
6605	Int Rad -Y	16.90	16.60	33.93	9.58
6606	Int Rad -Y	1.70	1.38	21.11	-4.78
6607	Int Rad -Y	-0.04	-0.36	19.53	-6.31
6608	Int Rad -Y	-1.78	-2.08	18.01	-7.61
6609	Int Rad -Y	15.68	15.39	32.48	7.89
6610	Int Rad -Y	2.46	2.15	21.89	-3.88
6611	Int Rad -Y	-2.72	-3.02	16.59	-8.67
6612	Int Rad -Y	-4.84	-5.15	14.35	-10.85
6613	Int Rad -Y	15.89	15.60	32.68	8.07
6614	Int Rad -Y	23.80	23.54	40.98	17.40
6615	Int Rad -Y	17.74	17.49	34.77	11.66

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
6616	Int Rad -Y	-2.04	-2.32	15.35	-9.15
6701	Int Rad -Y+Z	-21.99	-22.19	-6.40	-36.23
6702	Int Rad -Y+Z	-2.48	-2.70	12.54	-11.82
6703	Int Rad -Y+Z	-2.04	-2.26	12.96	-11.09
6704	Int Rad -Y+Z	1.83	1.57	16.96	-2.69
6705	Int Rad -Y+Z	2.57	2.30	17.65	-1.25
6706	Int Rad -Y+Z	1.32	1.05	16.86	-3.69
6707	Int Rad -Y+Z	-23.81	-24.02	-8.41	-38.32
6708	Int Rad -Y+Z	-1.10	-1.33	13.85	-10.57
6709	Int Rad -Y+Z	-0.69	-0.91	14.23	-9.95
6710	Int Rad -Y+Z	3.71	3.46	18.35	-0.46
6711	Int Rad -Y+Z	4.18	3.92	18.90	0.78
6712	Int Rad -Y+Z	3.09	2.83	18.06	-1.82
6713	Int Rad -Y+Z	-18.66	-18.86	-3.70	-33.04
6714	Int Rad -Y+Z	-3.29	-3.51	11.05	-12.24
6715	Int Rad -Y+Z	-2.42	-2.64	11.62	-11.16
6716	Int Rad -Y+Z	22.88	22.69	33.11	11.25
6717	Int Rad -Y+Z	22.85	22.64	33.41	11.39
6718	Int Rad -Y+Z	13.05	12.84	25.41	3.34
6719	Int Rad -Y+Z	-16.88	-17.08	-1.97	-31.65
6720	Int Rad -Y+Z	-2.82	-3.04	11.49	-11.82
6721	Int Rad -Y+Z	-1.98	-2.20	12.00	-10.81
6722	Int Rad -Y+Z	22.82	22.63	32.99	10.99
6723	Int Rad -Y+Z	21.77	21.57	32.12	10.11
6724	Int Rad -Y+Z	-4.55	-4.77	9.58	-12.82
7001	MLI SVM Top +Z	-80.52	-80.68	-64.31	-95.77
7002	MLI SVM Top +Z+Y	-76.74	-76.95	-59.87	-94.47
7003	MLI SVM Top +Y	-79.59	-79.82	-62.89	-95.33
7004	MLI SVM Top -Z+Y	-73.24	-73.54	-56.18	-86.68
7005	MLI SVM Top -Z	-67.39	-67.71	-50.64	-81.42
7006	MLI SVM Top -Z-Y	-70.74	-71.04	-53.55	-82.39
7007	MLI SVM Top -Y	-79.00	-79.21	-61.76	-85.12
7008	MLI SVM Top +Z-Y	-76.17	-76.10	-60.71	-83.86
7201	MLI SVM Top Disc +Y+Z	-67.98	-68.23	-50.69	-83.82
7202	MLI SVM Top Disc +Y+Z	-68.45	-68.70	-51.27	-84.10
7203	MLI SVM Top Disc +Y+Z	-69.05	-69.30	-51.61	-84.18
7204	MLI SVM Top Disc +Y+Z	-69.56	-69.82	-52.28	-84.54
7205	MLI SVM Top Disc +Y+Z	-71.01	-71.27	-53.39	-85.02
7206	MLI SVM Top Disc +Y+Z	-71.74	-71.99	-54.13	-85.99
7207	MLI SVM Top Disc +Y+Z	-72.83	-73.08	-55.21	-87.21
7208	MLI SVM Top Disc +Y+Z	-73.19	-73.45	-55.60	-87.67
7209	MLI SVM Top Disc +Y+Z	-73.13	-73.41	-55.43	-86.94
7210	MLI SVM Top Disc +Y+Z	-72.49	-72.79	-54.81	-86.14
7211	MLI SVM Top Disc +Y+Z	-71.36	-71.66	-53.67	-86.56
7212	MLI SVM Top Disc +Y+Z	-70.32	-70.61	-52.82	-87.44
7213	MLI SVM Top Disc +Y+Z	-70.13	-70.39	-52.89	-92.08
7214	MLI SVM Top Disc +Y+Z	-69.70	-70.00	-52.11	-86.02
7215	MLI SVM Top Disc +Y+Z	-70.05	-70.35	-52.56	-86.21

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
7216	MLI SVM Top Disc +Y+Z	-66.06	-66.27	-49.00	-89.55
7217	MLI SVM Top Disc +Y+Z	-62.91	-63.16	-45.92	-85.78
7218	MLI SVM Top Disc +Y+Z	-64.27	-64.46	-47.39	-88.26
7219	MLI SVM Top Disc +Y+Z	-46.65	-46.90	-30.05	-74.12
7220	MLI SVM Top Disc +Y+Z	-64.30	-64.49	-47.44	-88.21
7221	MLI SVM Top Disc +Y+Z	-46.74	-46.99	-30.14	-74.07
7222	MLI SVM Top Disc +Y+Z	-65.71	-65.92	-48.72	-88.34
7223	MLI SVM Top Disc +Y+Z	-61.18	-61.45	-44.21	-80.60
7224	MLI SVM Top Disc +Y+Z	-67.34	-67.60	-50.12	-87.31
7225	MLI SVM Top Disc +Y+Z	-62.44	-62.72	-45.55	-82.87
7226	MLI SVM Top Disc +Y+Z	-67.59	-67.86	-50.50	-87.17
7227	MLI SVM Top Disc +Y+Z	-66.19	-66.47	-49.22	-86.01
7228	MLI SVM Top Disc +Y+Z	-70.70	-71.01	-52.98	-83.67
7229	MLI SVM Top Disc +Y+Z	-71.06	-71.37	-53.41	-83.46
7230	MLI SVM Top Disc +Y+Z	-71.88	-72.18	-54.08	-82.44
7231	MLI SVM Top Disc +Y+Z	-72.88	-73.15	-55.11	-82.64
7232	MLI SVM Top Disc +Y+Z	-73.01	-73.25	-55.86	-82.84
7233	MLI SVM Top Disc +Y+Z	-72.64	-72.87	-55.54	-82.94
7234	MLI SVM Top Disc +Y+Z	-70.99	-71.24	-53.68	-82.99
7235	MLI SVM Top Disc +Y+Z	-71.76	-72.00	-54.69	-82.91
7236	MLI SVM Top Disc +Y+Z	-68.87	-69.13	-51.51	-83.47
7237	MLI SVM Top Disc +Y+Z	-69.74	-69.99	-52.54	-83.61
7238	MLI SVM Top Disc +Y+Z	-68.04	-68.29	-50.64	-83.82
7239	MLI SVM Top Disc +Y+Z	-68.44	-68.68	-51.24	-84.00
7245	SVM Top Disc MLI	-166.36	-164.95	-139.02	-173.36
7301	SVM Top Disc +Y+Z	26.92	26.50	43.57	1.78
7302	SVM Top Disc +Y+Z	26.52	26.10	43.15	1.64
7303	SVM Top Disc +Y+Z	25.35	24.93	42.11	1.39
7304	SVM Top Disc +Y+Z	24.58	24.16	41.31	0.90
7305	SVM Top Disc +Y+Z	22.07	21.64	39.09	0.04
7306	SVM Top Disc +Y+Z	21.12	20.70	38.13	-1.30
7307	SVM Top Disc +Y+Z	19.42	19.00	36.49	-3.18
7308	SVM Top Disc +Y+Z	18.98	18.54	36.04	-3.77
7309	SVM Top Disc +Y+Z	19.06	18.58	36.20	-2.61
7310	SVM Top Disc +Y+Z	20.07	19.58	37.27	-1.37
7311	SVM Top Disc +Y+Z	21.65	21.15	38.80	-2.28
7312	SVM Top Disc +Y+Z	22.48	21.99	39.55	-4.38
7313	SVM Top Disc +Y+Z	22.91	22.49	39.64	-11.96
7314	SVM Top Disc +Y+Z	22.62	22.12	39.77	-2.74
7315	SVM Top Disc +Y+Z	22.32	21.81	39.50	-2.82
7316	SVM Top Disc +Y+Z	23.08	22.67	39.73	-13.43
7317	SVM Top Disc +Y+Z	22.67	22.24	39.46	-11.30
7318	SVM Top Disc +Y+Z	22.98	22.58	39.61	-13.98
7319	SVM Top Disc +Y+Z	22.83	22.43	39.45	-14.36
7320	SVM Top Disc +Y+Z	22.92	22.52	39.56	-13.89
7321	SVM Top Disc +Y+Z	22.78	22.38	39.42	-14.13
7322	SVM Top Disc +Y+Z	22.50	22.08	39.22	-12.44
7323	SVM Top Disc +Y+Z	21.43	20.96	38.53	-5.74

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
7324	SVM Top Disc +Y+Z	21.59	21.15	38.51	-9.29
7325	SVM Top Disc +Y+Z	21.49	21.05	38.44	-9.03
7326	SVM Top Disc +Y+Z	21.55	21.11	38.49	-8.77
7327	SVM Top Disc +Y+Z	21.47	21.03	38.41	-8.91
7328	SVM Top Disc +Y+Z	21.51	21.01	38.86	1.33
7329	SVM Top Disc +Y+Z	21.11	20.61	38.50	1.76
7330	SVM Top Disc +Y+Z	20.41	19.92	37.80	3.96
7331	SVM Top Disc +Y+Z	19.19	18.73	36.46	3.93
7332	SVM Top Disc +Y+Z	19.10	18.69	35.44	3.71
7333	SVM Top Disc +Y+Z	19.67	19.27	35.88	3.52
7334	SVM Top Disc +Y+Z	22.13	21.71	38.67	3.26
7335	SVM Top Disc +Y+Z	21.05	20.65	37.31	3.52
7336	SVM Top Disc +Y+Z	25.37	24.95	42.01	2.24
7337	SVM Top Disc +Y+Z	24.49	24.08	41.00	2.48
7338	SVM Top Disc +Y+Z	26.92	26.50	43.57	1.83
7339	SVM Top Disc +Y+Z	26.49	26.07	43.11	1.73
7401	SVM Top Disc +Y+Z	27.06	26.64	43.71	1.86
7402	SVM Top Disc +Y+Z	26.64	26.23	43.27	1.72
7403	SVM Top Disc +Y+Z	25.46	25.04	42.22	1.48
7404	SVM Top Disc +Y+Z	24.67	24.25	41.40	0.97
7405	SVM Top Disc +Y+Z	22.13	21.70	39.16	0.12
7406	SVM Top Disc +Y+Z	21.14	20.72	38.15	-1.30
7407	SVM Top Disc +Y+Z	19.50	19.08	36.57	-3.13
7408	SVM Top Disc +Y+Z	19.06	18.62	36.12	-3.72
7409	SVM Top Disc +Y+Z	19.13	18.66	36.28	-2.55
7410	SVM Top Disc +Y+Z	20.15	19.65	37.35	-1.28
7411	SVM Top Disc +Y+Z	21.71	21.21	38.88	-2.04
7412	SVM Top Disc +Y+Z	22.56	22.07	39.65	-4.00
7413	SVM Top Disc +Y+Z	22.81	22.37	39.63	-10.01
7414	SVM Top Disc +Y+Z	22.70	22.20	39.87	-2.45
7415	SVM Top Disc +Y+Z	22.39	21.88	39.59	-2.53
7416	SVM Top Disc +Y+Z	23.07	22.65	39.78	-12.23
7417	SVM Top Disc +Y+Z	22.63	22.19	39.48	-10.33
7418	SVM Top Disc +Y+Z	22.94	22.53	39.61	-13.12
7419	SVM Top Disc +Y+Z	22.68	22.27	39.35	-13.50
7420	SVM Top Disc +Y+Z	22.87	22.46	39.55	-13.00
7421	SVM Top Disc +Y+Z	22.61	22.20	39.30	-13.21
7422	SVM Top Disc +Y+Z	22.51	22.08	39.29	-11.31
7423	SVM Top Disc +Y+Z	21.49	21.02	38.63	-5.17
7424	SVM Top Disc +Y+Z	21.75	21.30	38.72	-8.33
7425	SVM Top Disc +Y+Z	21.58	21.13	38.59	-7.96
7426	SVM Top Disc +Y+Z	21.69	21.24	38.69	-7.63
7427	SVM Top Disc +Y+Z	21.54	21.09	38.54	-7.73
7428	SVM Top Disc +Y+Z	21.62	21.11	38.97	1.53
7429	SVM Top Disc +Y+Z	21.20	20.69	38.59	1.92
7430	SVM Top Disc +Y+Z	20.50	20.01	37.89	4.06
7431	SVM Top Disc +Y+Z	19.25	18.79	36.53	4.00
7432	SVM Top Disc +Y+Z	19.18	18.77	35.51	3.78

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
7433	SVM Top Disc +Y+Z	19.74	19.35	35.96	3.59
7434	SVM Top Disc +Y+Z	22.19	21.77	38.75	3.34
7435	SVM Top Disc +Y+Z	21.06	20.66	37.32	3.61
7436	SVM Top Disc +Y+Z	25.48	25.06	42.13	2.30
7437	SVM Top Disc +Y+Z	24.58	24.17	41.10	2.55
7438	SVM Top Disc +Y+Z	27.06	26.64	43.71	1.89
7439	SVM Top Disc +Y+Z	26.63	26.22	43.25	1.80
7445	SVM Top Disc	22.86	22.35	40.18	3.73
7521	MLI on BEU	-130.75	-130.60	-111.36	-146.27
7522	MLI on PAU	-137.54	-137.65	-118.05	-150.59
7601	SVM Top +Z	8.70	8.45	24.39	-15.19
7602	SVM Top +Z+Y	14.42	14.07	30.97	-13.56
7603	SVM Top +Y	10.24	9.87	26.71	-14.41
7604	SVM Top -Z+Y	16.46	15.97	33.50	-3.55
7605	SVM Top -Z	15.14	14.62	32.20	-2.44
7606	SVM Top -Z-Y	15.35	14.86	32.80	-0.54
7607	SVM Top -Y	10.80	10.46	28.27	1.55
7608	SVM Top +Z-Y	15.28	15.01	29.45	2.98
8001	Solar Array vs. space -X	93.23	92.56	115.56	92.30
8002	Solar Array vs. space-X	93.47	91.30	115.85	91.03
8003	Solar Array vs. space -X	93.38	91.26	115.76	91.06
8004	Solar Array vs. space -X	93.69	92.75	116.03	92.57
8011	HP11 vert vapor	-10.31	-10.33	3.21	-28.47
8012	HP12 vert vapor	-10.31	-10.33	3.21	-28.47
8013	HP13 vert vapor	-10.31	-10.33	3.21	-28.47
8014	HP14 vert vapor	-10.31	-10.33	3.21	-28.47
8015	HP15 vert vapor	-10.31	-10.33	3.21	-28.47
8016	HP16 vert vapor	-10.31	-10.33	3.21	-28.47
8017	HP17 vert vapor	-10.31	-10.33	3.21	-28.47
8018	HP18 vert vapor	-10.31	-10.33	3.21	-28.47
8019	HP19 vert vapor	-10.31	-10.33	3.21	-28.47
8020	HP20 vert vapor	-10.31	-10.33	3.21	-28.47
8021	HP21 vert vapor	-10.31	-10.33	3.21	-28.47
8022	HP22 vert vapor	-10.31	-10.33	3.21	-28.47
8023	HP23 vert vapor	-10.31	-10.33	3.21	-28.47
8024	HP24 vert vapor	-10.31	-10.33	3.21	-28.47
8025	HP25 vert vapor	-10.31	-10.33	3.21	-28.47
8051	Solar Array vs. space -X	93.04	92.37	115.35	92.09
8052	Solar Array vs. space +X	93.28	91.11	115.63	90.82
8053	Solar Array vs. space +X	93.18	91.07	115.54	90.86
8054	Solar Array vs. space +X	93.48	92.55	115.81	92.36
8061	HP61 vert vapor	-18.28	-18.31	-5.13	-31.59
8062	HP62 vert vapor	-18.28	-18.31	-5.13	-31.59
8063	HP63 vert vapor	-18.28	-18.31	-5.13	-31.59
8064	HP64 vert vapor	-18.28	-18.31	-5.13	-31.59
8065	HP65 vert vapor	-18.28	-18.31	-5.13	-31.59
8066	HP66 vert vapor	-18.28	-18.31	-5.13	-31.59
8067	HP67 vert vapor	-18.28	-18.31	-5.13	-31.59

NODE	LABEL	BOL1 [°C]	BOL3 [°C]	EOL3 [°C]	SURV3 [°C]
8068	HP68 vert vapor	-18.28	-18.31	-5.13	-31.59
8069	HP69 vert vapor	-18.28	-18.31	-5.13	-31.59
8070	HP70 vert vapor	-18.28	-18.31	-5.13	-31.59
8071	HP71 vert vapor	-18.28	-18.31	-5.13	-31.59
8072	HP72 vert vapor	-18.28	-18.31	-5.13	-31.59
8073	HP73 vert vapor	-18.28	-18.31	-5.13	-31.59
8074	HP74 vert vapor	-18.28	-18.31	-5.13	-31.59
8075	HP75 vert vapor	-18.28	-18.31	-5.13	-31.59
8101	MLI Solar Array vs. sate	-6.40	-3.44	12.84	-5.75
8102	MLI Solar Array vs. sate	-3.52	-4.73	15.43	-7.45
8103	MLI Solar Array vs. sate	-3.69	-4.87	15.40	-6.78
8104	MLI Solar Array vs. sate	-5.22	-2.51	13.87	-3.94
8301	Central Solar Array -X	94.11	92.69	116.54	92.37
8302	Central Solar Array -X	94.30	92.86	116.73	92.60
8303	Central Solar Array -X	94.12	92.69	116.55	92.41
8304	Central Solar Array -X	94.28	92.86	116.71	92.63
8351	Central Solar Array +X	93.91	92.49	116.32	92.12
8352	Central Solar Array +X	94.13	92.70	116.54	92.39
8353	Central Solar Array +X	93.92	92.49	116.34	92.17
8354	Central Solar Array +X	94.11	92.69	116.52	92.42
8401	MLI Central Solar Array	45.42	44.62	64.24	33.20
8402	MLI Central Solar Array	45.70	44.84	64.66	33.74
8403	MLI Central Solar Array	45.55	44.70	64.51	34.36
8404	MLI Central Solar Array	45.36	44.56	64.15	34.40
10001	Groove Shield	-193.15	-193.15	-113.15	-193.15
10002	Groove Shield	-193.15	-193.15	-113.15	-193.15
99999	Space node	-269.00	-269.00	-269.00	-269.00

Table 4.1.5.1-2 PLANCK – Steady State Analysis Results

4.1.5.2 Transient Temperature results

A summary of the results of the transient analysis is reported in the following pages. In Table 4.1.5.2-1 are reported the temperature fluctuation, every 325 s and every 7200 s , relative to external unit and internal one :

		Requirement	**Goal**	Results
NODE	UNIT	Delta Temp.	Delta Temp.	Temp. Variation / 7200 s
		/ 7200 s	/ 7200 s	Dtmax
		[K]	[K]	[K]
521	BEU	+/-3 K/hour	+/-0.2 K/hour	0.07 K/hour
522	PAU	+/-3 K/hour	+/-1.1 K/hour	0.12 K/hour

Table Table 4.1.5.2-1 PLANCK - Transient Analysis Results

In Table 4.1.5.2-2 has been calculated the flux incident on V-groove shield due to radiative flux :

NODE	UNIT	Requirement Flux	**Calculated Flux**
521	BEU	2.3 W	1.6 W
522	PAU	2.3 W	0.4 W

Table 4.1.5.2-2 PLANCK - Flux requirement

Incrementation of the flux is due to an increasing of the power dissipation of these units and relative radiative area in order to satisfy the thermal requirement.

NODE	RADIATIVE AREA [m*m]
521	.112
522	.030

The graphics presented in Figure 4.1.5.2-1 represent the temperature variation of the working SCC and Figure 4.1.5.2-2 the amplitude of each outer shell where is showing the satisfy limit declared below in Table 4.1.5.2-3:

SCC	Sorption Cooler Compressor	+/-3 K	(3K,1K,0.5K)**

Note (**) : +/- 3K for First adjacent element
+/- 1K for the Next adjacent element
+/- 0.5 for Next most element

Table 4.1.5.2-3 PLANCK - SCC reuirement

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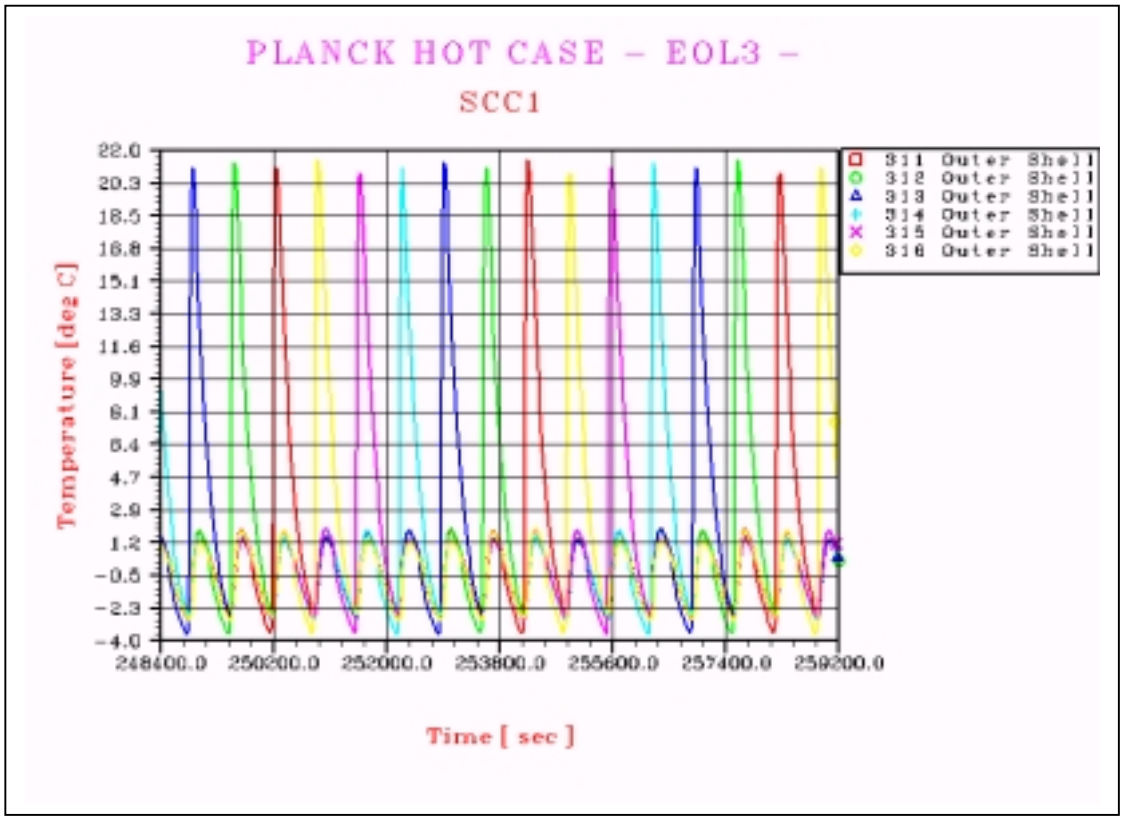


Figure 4.1.5.2-1 PLANCK – SCC Outer Shell's Temperature

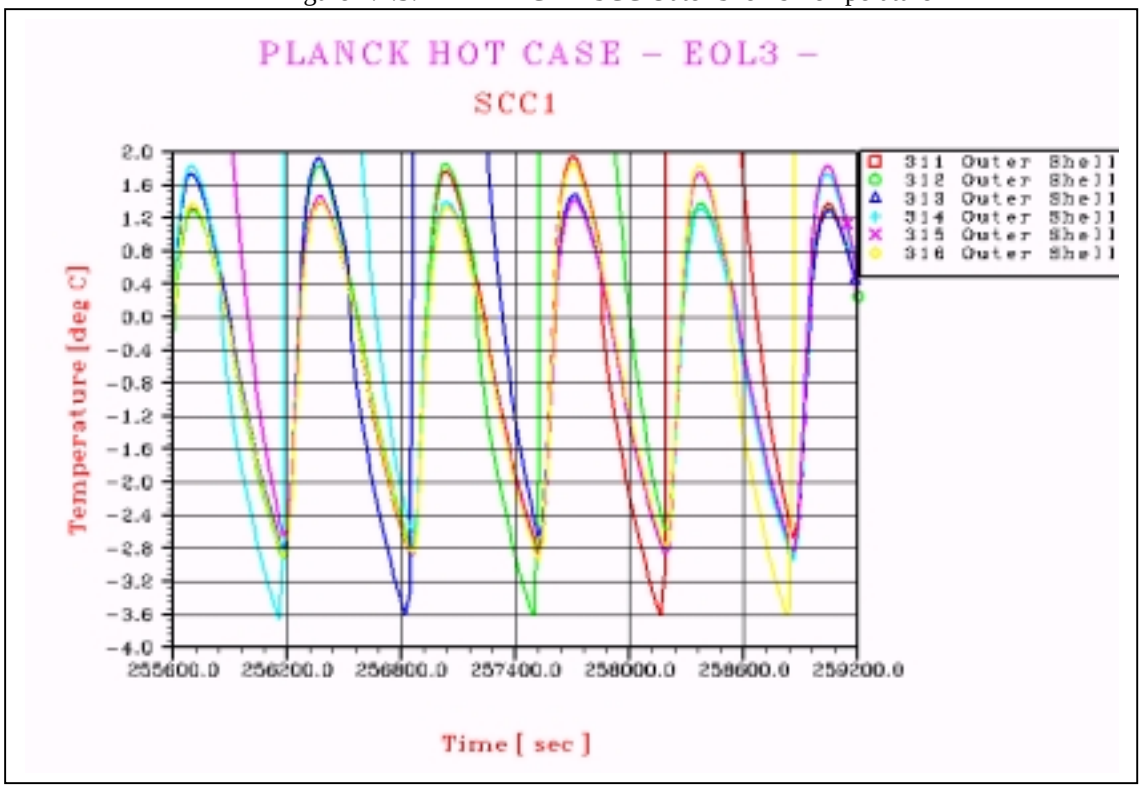


Figure Table 4.1.5.2-2 PLANCK – SCC Outer Shell's Temperature

For SCC panels and SVM/PLM interface points, the average value of all panel nodes temperature has been considered in the evaluation of the temperature variation with their respective limit requirements reporetd in Table 4.1.5.2-4, Table 4.1.5.2-5:
The spectral density has been calculated with one measurement every 20 sec , 7200 sec before the end of transient duration .

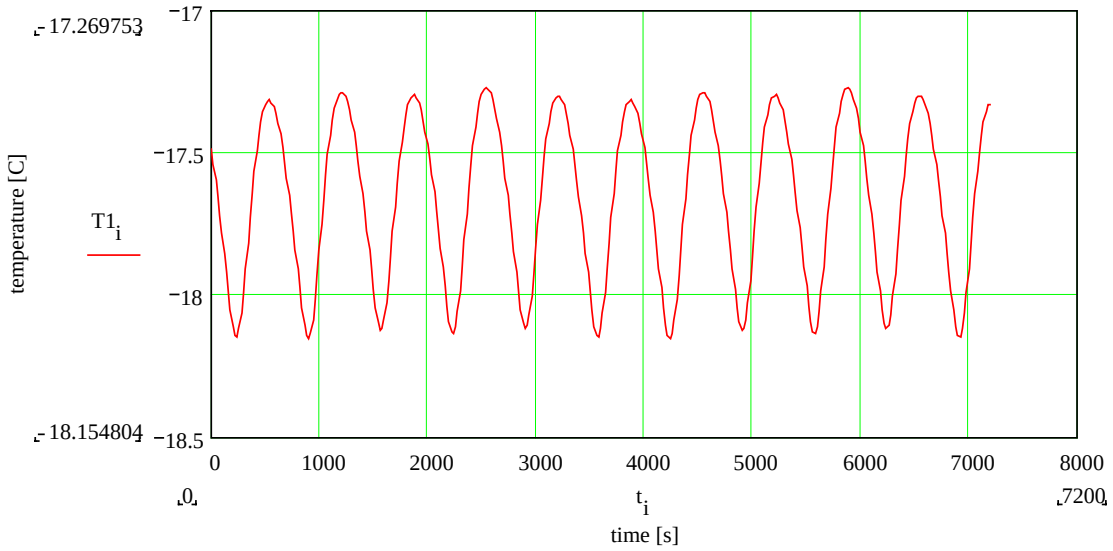
node	description	Requirement 1/60 Hz	Results $K/Hz^{1/2}$
3001-16	L/P +Z	0.01	1.63 e-6
3101-24	L/P +Z,+Y	0.01	2.93 e-6
3201-16	L/P +Y	0.01	1.70 e-5
3301-24	L/P -Z,+Y	0.01	0.128
3401-16	L/P -Z	0.01	0.105
3501-24	L/P -Z,-Y	0.01	0.05
3601-16	L/P -Y	0.01	4.62 e-6
3701-24	L/P +Z,-Y	0.01	2.18 e-6

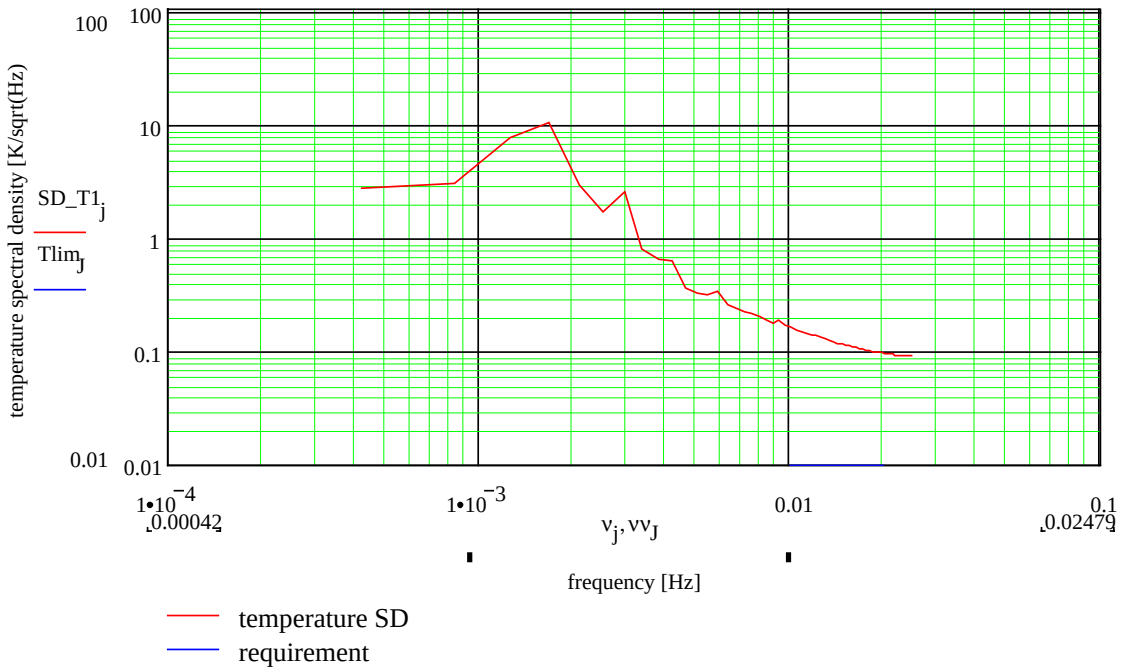
Table 4.1.5.2-4 PLANCK - SCC requirement results

nodes	description	Requirement 1/60 Hz	Results $K/Hz^{1/2}$
7304	I/F SVM	T.B.D.	2.46 e-6
7310	I/F SVM	T.B.D.	1.25 e-5
7315	I/F SVM	T.B.D.	1.27 e-5
7325	I/F SVM	T.B.D.	6.20 e-6
7330	I/F SVM	T.B.D.	1.13 e-5
7337	I/F SVM	T.B.D.	4.62 e-6

Table 4.1.5.2-5 PLANCK - I/F SVM/PLM requirement results

Typical spectral density calculation:





The software used is MathCad and the Fourier transform is computed as follow :

$$S_j = \frac{1}{\sqrt{N+1}} \sum_{k=0}^{N} s_K e^{\frac{2\pi i j k}{(N+1)}}$$

(Note: the normalization

$$\frac{1}{\sqrt{N+1}}$$

is that utilized by MathCad for the computation of the discrete Fourier trasform.)

The PSD_{sj} is computed as follow:

$$PSD_{sj} = 2\frac{|S_j|^2}{N+1} t_{\max} = 2N\Delta t \frac{|S_j|^2}{N+1}$$

and consequently the SD_{sj} is:

$$SD_{sj} = \sqrt{PSD_{s,j}} = \sqrt{2N\Delta t} \frac{|S_j|}{\sqrt{N+1}}$$

4.1.5.3 Heater Power Summary

The following table shows the Peak and the Average heater power need for the various analysed cases.

NODE	LABEL	BOL1 Peak [W]	BOL1 Average [W]	BOL3 Peak [W]	BOL3 Average [W]	SURVIVAL Peak [W]	SURVIVAL Average [W]
11	STR1					2.61	1.7
12	STR2					10.41	9.7
13	DPU1					30.19	29.7
14	DPU2 (on shear)					35.7	-
15	REU						
101	DCCU + FV PANEL						
102	REBA1						
103	REBA2						
201	4 CCU					20.64	19.4
202	4 CAU					20.67	17.8
203	4 PRE-REG					23.2	21.2
204	4 CEU					12.96	12.3
	SCC1 + SCE1	63.79				265.7	265.2
	SCC2 + SCE2					263.4	262.9
511	SCC2 - Outer Shell1						
512	SCC2 - Outer Shell2						
513	SCC2 - Outer Shell3						
514	SCC2 - Outer Shell4						
515	SCC2 - Outer Shell5						
516	SCC2 - Outer Shell6						
521	BEU						
522	PAU						
523	DAE Power Unit						
551	QRS3 (on shear)						
601	TRANSX/B1	6.					
602	TRANSX/B2						
603	TWTA1						
604	TWTA2	38					
605	RFDN						
606	EPC1						
607	EPC2	9					

NODE	LABEL	BOL1 Peak [W]	BOL1 Average [W]	BOL3 Peak [W]	BOL3 Average [W]	SURVIVAL Peak [W]	SURVIVAL Average [W]
701	CDMU						
702	ACC					9.96	5.53
703	BATT1					12.23	11.62
704	PCDU						
705	QRS1						
706	QRS2						
707	PDU						
900	He TANK +Z					0.72	.46
905	He TANK +Y					0.68	
910	He TANK -Z					0.16	
915	He TANK -Y						
920	P TANK +Y+Z					0.18	
925	P TANK -Z					0.13	
930	P TANK -Y+Z						
Total Heater need [W]:		116.79				709.54	657.51

Table 4.1.5.3-1 PLANCK – Heater Power need

4.1.6 Conclusions

Steady State Analyses
All units are within the required temperature range. The goal requirement is not met for:

- **BEU/DAE:** T= 39.8 °C vs 28 °C as goal
- **PAU:** T= 38.4 °C vs 30 °C as goal
- **DAE POWER UNIT:** T= 44.0 °C vs 28 °C as goal

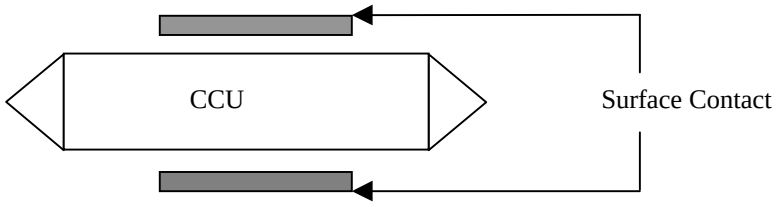
The analysis results show that **Solar Array** temperature is 116.3 °C.
S.A. temperature requirement to be verified when the supplier would be selected.

Transient analyses
All units are within specification.

For the SCC Panels average temperature see table 4.1.5.2-4.
Analysis has been performed besed on a requirement received in the last issue of the draft I/F Specification. Dedicated agreement on how to interpretate the requirement and the method of calculation to be apllied must be reached before to state a non-compliance.

Specific open point

Thermal dissipation of the 4CCU has increased; this unit is mounted on the +Y panel with a very low linear conductor due to a very reduced contact area (112.5 cm^2) as shown in the sketch.



Its power dissipation value is now 60 Watt.
To reject the heat flux in hot case, an over-sizing of the external radiator has been realized. During the cold case is necessary a large amount of heater power to maintain the item mounted on this panel within the temperature requirement.
As written in MoM- Planck configuration (H-P-MI-AI-0096), Alenia request to improve the baseplate contact area between the 4CCU and the panel (a possible proposal solution as shown hereafter) in order to optimize the thermal design and consequently reduce the heater power dissipation