

**Minutes of Meeting**

Date: 02.12.2005

**Herschel**

Doc.-No.: HP-2-ASED-MN-1131

Meeting place:	EADS Astrium OTN	Chairman:	D. Hendry / S. Idler
Date/Time:	02.12.2005	Secretary	S. Idler
Agenda dated:	02.12.2005	Close of Meeting:	02.12.2005

Subject: SPIRE EMC Test Status Meeting

Participants:	D. Griffin (RAL) F. Marliani (ESA) S. Ilsen (ASED) C. Kalde (ASED) D. Hendry (ASED) S. Idler (ASED)	Additional Distribution:	ESA ASP
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Brief-Minutes (except following sheets)

Summary of Results of Sheets 2 till

Conclusion:

Retesting will commence on 12.12.2005. All facilities will be available. IABG has been informed of a 3 day test phase.



Reference	Results	Remarks
	<p data-bbox="286 368 439 405"><b>Agenda:</b></p> <ol data-bbox="338 485 936 679" style="list-style-type: none"><li data-bbox="338 485 555 512">1. Introduction</li><li data-bbox="338 539 936 566">2. Test steps performed and initial results</li><li data-bbox="338 593 685 620">3. Remaining test steps</li><li data-bbox="338 647 546 675">4. Conclusion</li></ol>	



Reference	Results	Remarks
	<p><b>1. Introduction</b></p> <p>This meeting is an interim review of the SPIRE EMC test. The test started on 28.11.2005 and could not be completed by 2.12.2005 due to problems with cryocover cooling (oscillations) and UTC instead of TAI time on EGSE QLA tool (ASED-NC-1672). It is now interrupted for 1 week due to other test programme (instruments thermal behaviour and straylight tests) and will be resumed on 12.12.2005. This is in accordance to the agreements in the TRR.</p> <p>The related TRR minutes are HP-2-ASED-MN-1127, dated 28.11.2005.</p> <p><b>2. Test steps performed and initial results</b></p> <p>The following measurements have already been performed:</p> <p><b>B-field</b></p> <p><u>Sweep injection</u>        Frequency step: 5% from 30Hz to 50kHz        Dwell time: 10sec        Modulation: 1Hz pulse, 86% duty cycle        Field level: 120dBpT up to 20kHz and 110dBpT above 20kHz.</p> <p>Major perturbations observed        260Hz, 366Hz and 467Hz rms noise increase, 1.43kHz noise increase, 2.98kHz noise increase, 20kHz noise increase, from 30kHz to 50kHz apparent rise in the signal (fall in the temperature)</p> <p><u>SPOT injection</u></p>	



Reference	Results	Remarks
	<p>Dwell time: 180sec            Modulation: 1Hz pulse, 86% duty cycle            Frequencies: 260, 366, 657, 1436, 2986, 20kHz, 48.17 and 50kHz            Field level: full level and 10dB attenuation.            Configuration: bolometer bias ON and OFF</p> <p>Major perturbations observed</p> <p>The low frequency susceptibilities were seen strongly on the R1 channel indicating that the EMI was probably coupling into the warm electronics. The high frequency susceptibilities were not observed on channel R1 indicating that there was direct EMI heating of the bolometers. This finding was also confirmed by running tests with the bolometer bias off.</p> <p>Preliminary susceptibility thresholds have been estimated. Maximum attenuation of 10dB was needed to make the perturbation disappear.</p> <p>Further analyses (FFT) will be carried out by SPIRE to refine the evaluations of the thresholds.</p> <p><b>E-field</b></p> <p><u>14kHz-30MHz</u>  <u>Sweep injection</u>            Dwell time: 10sec            Modulation: 1Hz pulse modulation (86% duty cycle), 30% AM modulation 1kHz            Field level: 2V/m vertical polarization</p> <p>Major perturbations observed            16MHz (weak) and second susceptibility ramping up to 30MHz (a major resonance was also found on other tests at 32.34MHz)</p>	



Reference	Results	Remarks
	<p><u>30MHz-1GHz (Horizontal)</u>  <u>Sweep injection</u>            Dwell time: 10sec            Modulation: 1Hz pulse modulation (86% duty cycle), 30% AM modulation 1kHz            Field level: 2V/m horizontal polarization</p> <p><u>SPOT frequencies</u>            Threshold estimation at many frequencies around the peak.            Field injected: 0.05mV/m, 0.1mV/m, 0.2mV/m, 0.5mV/m, 1V/m and 2V/m.</p> <p><u>Detailed sweep</u>            200-600MHz: No serious perturbations observed            30-40MHz: 30sec dwell time and 0.5% step</p> <p>Major perturbations observed            34.5MHz (strong) and some minor glitches that have been investigated with detailed sweeps and/or SPOT frequencies.</p> <p><u>30MHz-1GHz (Vertical)</u>  <u>Sweep injection:</u>            Dwell time: 10sec            Modulation: 1Hz pulse modulation (86% duty cycle), 30% AM modulation 1kHz            Field level: 2V/m</p> <p><u>SPOT frequencies</u>            Threshold estimation at many frequencies around the peak.            Field injected: 0.05mV/m, 0.1mV/m, 0.2mV/m, 0.5mV/m, 1V/m and 2V/m.</p>	



Reference	Results	Remarks
	<p><u>Detailed sweep</u>            30-40MHz with different amplitudes (0.1V/m, 0.2V/m, 0.5V/m and 1V/m)            60-90MHz with 20sec dwell time and 0.5% step</p> <p>Major perturbations observed            33.32MHz (strong) and some other glitches (minor) investigated with detailed sweeps and/or SPOT frequencies.</p> <p>The strength of the Vertical polarization susceptibility was stronger than the Horizontal at ~ 34MHz.</p> <p>SPIRE will estimate the susceptibility thresholds with detailed post-test analyses (FFT).</p> <p>The following NCR's have been raised</p> <ul style="list-style-type: none"> <li>• ASED-NC-1800: SPIRE EMC H-Fiels RS results</li> <li>• ASED-NC-1804: SPIRE E-field RS results non conformance</li> <li>• ASED-NC-1812: SPIRE detector chain partial failure</li> </ul> <p><b>4. Remaining work / test steps</b></p> <p>Tests yet to be completed:</p> <ul style="list-style-type: none"> <li>• Survey of 1-18GHz V and H Polarization (two positions)</li> <li>• Detailed survey of TM Notch with 10 V/m (two positions / two polarizations)</li> <li>• Investigation of test configuration for major 34MHz E-Field susceptibility</li> </ul>	

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Reference	Results	Remarks
	<p data-bbox="286 368 539 405"><b>5. Conclusion</b></p> <p data-bbox="286 448 1697 513">Retesting will commence on 12.12.2005. All facilities will be available. IABG has been informed of a 3 days test phase.</p>	

