

SPIRE Science Verification Review – Phase 1

Review Plan and Agenda

Matt Griffin, January 17 2006

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1. Introduction

This document outlines the plan for a review of the SPIRE instrument test results and programme, to take place at the end of January 2006, just prior to the next planned cooldown. This review will form a part of the ESA Science Verification Review (SVR). The current activities of the SDAG will be concentrated on preparing for this review.

2. Herschel Science Verification Reviews (SVRs)

The Herschel Science Team and the Herschel-Planck Project have agreed that a series of Science Verification Reviews should be held for each of the Herschel instruments, and for other relevant elements of the observatory (telescope and spacecraft). The formal procedure is currently being drafted and will be available shortly.

The overall objective of these reviews will be to ensure adequate scientific performance of the observatory, meeting the expectations based on the instrument designs and capabilities. A secondary objective is to provide the best possible assessments of actual performance at the times of the reviews, e.g. for the issue of the Key Projects AO.

The nominal ESA sequence is as follows (although for reasons explained below, SPIRE will follow a slightly different approach).

Phase 1: CQM ILT/EQM & FM ILT preparation review (timeframe: late 2005/early 2006)

This is to cover:

- Results from the CQM ILT
- Actions from the IQR
- Results from the EQM module-level tests at Ottobrun
- Identify and confirm FM ILT requirements and agree on the FM ILT plan, ensuring nothing is missed
- Currently estimated in-flight performance (to feed into the Key Project AO preparations)

Phase 2: FM ILT pre-completion review (timeframe: Q2 2006)

This is to cover:

- Preliminary results from FM ILT (what has been/is yet to be achieved?)
- Plan for final stage of FM ILT (to ensure that all essential tests are included)
- Currently estimated in-flight performance (to update documentation and tools prior to release of Key Project AO)

Phase 3: Instrument Performance Review (timeframe: Q3/4 2006)

This is to cover:

- Results from the completed FM ILT programme
- Updated estimated in-flight performance
- Timeframe after proper digestion of FM ILT results – Q3/Q4 2006
- Feeding into Herschel performance review (taking telescope/spacecraft into account) and a sequence of pre-flight mission reviews

In the case of SPIRE, we are more or less ready to have a Phase-2 review. Our plan (which assumes successful cold vibration) is to have an extended campaign of FM testing and calibration in the first half of 2006. We will want to hold some internal reviews and assessments during this period, but it will be appropriate to hold our first SVR just before the start of the next cooldown – so in January 2006.

3. Review dates and venue

Venue: RAL

Dates: January 26 and 27 2006 (Start:09:00 Jan. 26; end 15:30 Jan. 27)

4. SPIRE objectives

The SPIRE objectives, which are entirely compatible with the ESA objectives summarised above) are:

- (i) to assess CQM, FM, and EQM test results that are relevant to in-flight instrument scientific performance;
- (ii) to review the future FM test and calibration plan (including assessment of what can be done on the ground better than in flight);
- (iii) to define our requirements for system-level verification;
- (iv) to identify any measures needed to ensure delivery of well-tested and calibrated FM.

4.1 Constraints

This review will be held at a very busy time for the SPIRE team, and it will be important to use our limited effort effectively. This means that the organisation and scope of the review will be tailored to facilitating the essential work that needs to be done in this period, rather than adding to it unnecessarily.

Although it is a formal ESA review, it is agreed that it will be most effective as a working review rather than a “stand-up-and-give-a-good-impression” event.

The Herschel EQM programme is to be reviewed at a dedicated meeting at ESTEC on February 6 and 7. Preparation for this will be given higher priority than the SVR by the SPIRE team: a short summary of the current status and conclusions will be presented at the SVR. It is envisaged that information about the EQM review outcome will be available to the SVR Review Board in time for them to include any important conclusions in their report.

5. Review format

The review will consist of two parts:

- (i) review of the documentation package;
- (ii) a review meeting involving presentations, discussion, Review Board meeting, and feedback

During the review of the documentation, points to be clarified and discussed may be generated by the Review Board or any members of the consortium and forwarded to the instrument team.

6. Review Board

The Review Board will comprise:

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|-----------------------------|------------------------------------------------|
| • Göran Pilbratt (Chairman) | ESA Project Scientist |
| • Ray Carvell | PPARC representative |
| • Gerry Crone | ESA Payload Manager |
| • Helmut Feuchtgruber | PACS ILT expert |
| • Jackie Fischer | Mission Scientist |
| • Matt Griffin | PI |
| • Sarah Leeks | HSC SPIRE Instrument and Calibration Scientist |
| • Karine Mercier | CNES representative |
| • Hal Yorke | NASA representative |

The Review Board report will be produced as soon as possible after the meeting to ensure that it can be taken into account for the next FM cooldown.

6.1 Guidelines for presentations

- Assume that the Review Board will be familiar with the instrument system and subsystem designs as presented at a number of previous reviews.
- Emphasise key issues from the documentation and assist the Review Board in concentrating on the important aspects mentioned above.
- Focus on
 - key conclusions from tests that have a direct bearing on instrument scientific performance;
 - compliance with explicit system and subsystem requirements;
 - lessons learned and implications for future FM cold test campaigns.

7. List of documents issued for the review

SVR No.	Document
0	Review plan and agenda (this document)
Requirements and planning documents	
1	SPIRE Scientific Requirements SPIRE-UCF-PRJ-000064 (Version 3.0, Nov. 21 2000)
2	SPIRE: Instrument Requirements Document SPIRE-RAL-PRJ-000034 (Issue 1.3, 14 July 2005)
3	SPIRE: Calibration Requirements Document SPIRE-RAL-PRJ-001064 (Issue 1, 17 Jan. 2006)
4	SPIRE FM Calibration and Performance Test Plan SPIRE-RAL-DOC-002535 (Draft 0.1, 13 January 2006)
5	SPIRE Cryogenic Thermal Design Requirements SPIRE-RAL-PJR-002075 (Issue 1, 13 Jan. 2006)
6a	SPIRE EMC Control Plan (SPIRE-RAL-PRC-00852, Draft, Feb. 3 2002) SPIRE EQM EMC Test Procedure (SPIRE-RAL-PRC-002545, Issue 2.0 25 Nov. 2005)
6b	
7	<i>Document not available.</i>
Test reports	
8	Thermal performances SPIRE-RAL-REP-002557 (Issue 0.1, 13 Jan. 2006)
9	Instrument throughput SPIRE-RAL-REP-002564
10	BSM performance in PFM2 SPIRE-RAL-REP-002565 (Issue 1, 17 January 2006)
11	SMEC and spectrometer performance SPIRE-RAL-REP-002566 (Issue 1, 16 Jan. 2006)
12a	Photometer Calibrator (PCal) Performance in PFM2 SPIRE-UCF-REP-002567 (Issue 1; 16 Jan. 2006) Spectrometer Calibrator (SCal) Performance in PFM 1 SPIRE-UCF-REP-002568 (Issue 1; 16 Jan. 2006)
12b	
13a	Bolometer Array Performance Estimation from JPL EIDP Spreadsheets SPIRE-UCF-REP-002569 (Issue 1; 16 Jan. 2006) Bolometer Array Noise Performance in PFM1 and PFM2 Test Campaigns SPIRE-UCF-REP-002570 (Issue 1; 16 Jan. 2006) Bolometer Array Performance: Summary SPIRE-UCF-REP-002571 (Issue 1; 16 Jan. 2005)
13b	
13c	
14	Optical performance SPIRE-RAL-REP-002572 (Issue 1; 16 Jan. 2006)
15	<i>EQM test programme report Outline version to be available by Jan. 20.</i>
16	<i>Test facility performance and upgrade plans. To be available by Jan. 20.</i>
17	CQM performance test report SPIRE-RAL-REP-002083 (Draft, 14 July 2004) (seen at IQR)

8. Review meeting agenda

The draft agenda are given below.

SPIRE Science Verification Review (Phase 1)

RAL, 26, 27 January 2006
Conference Room 12, Building R68
Draft Agenda

Day 1 26th January

Start Time	End Time	Duration (Min.)		
			Introduction	
09:00	09:10	10	Welcome and logistics	King
09:10	09:20	10	Purpose and organisation of the review	M Griffin
09:20	09:30	10	Review Board perspective	Pilbratt
			Instrument models and test campaigns	
09:30	10:00	30	CQM, PFM 1, and PFM 2 description	Swinyard
10:00	10:30	30	Overview of test campaigns	Smith
10:30	10:45	15	Coffee	
			Review of ILT results	
10:45	11:15	30	Thermal performance	Goizel
11:15	11:45	30	Spectral passbands and throughput	Swinyard
11:45	12:15	30	BSM performance	Lim
12:15	13:30	75	Buffet lunch	
13:30	14:00	30	SMEC and spectrometer performance	Baluteau
14:00	14:30	30	Optical performance	Ferlet
14:30	15:00	30	Detector array performance	M Griffin
15:00	15:30	30	PCAL and SCAL performance	Hargrave
15:30	15:45	15	Coffee	
15:45	16:15	30	Test facility performance and upgrade plans	Smith
16:15	16:45	30	EQM programme report	D Griffin
16:45	17:15	30	Discussion	
17:15	18:15	60	Review Board meeting	
Evening			Relaxing social event	

Day 2 27th January

Start Time	End Time	Duration (Min.)		
			Future test plan	
09:00	10:00	60	PFM 3 test plan	Lim
10:00	10:15	15	Coffee	
			Instrument compliance and performance	
10:15	11:15	60	Compliance with Inst. Req. Doc.	Swinyard
11:15	12:15	60	Compliance with Sci. Req. Doc./sensitivity model	M Griffin
12:15	12:45	30	Problem areas and conclusions	M Griffin
12:45	13:15	30	Discussion	
13:15	15:30	135	Review Board meeting (with buffet lunch for Review Board only)	

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- 30-min presentations to include 10 minutes for questions
 - 60 minute presentations to include 15 minutes for questions