Beam Steering Mirror Sub-System
Detailed Design Review

UK ATC

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Ken Wilson,	Project Technician

UK
Astronomy Technology Centre

Agenda

Time	Item	Who	Min
9.00	1. Project Introduction	GSW	5
9:05	2. Review Aims	Chair	10
9:15	3. Documentation overview (what's what)	IP	5
9:20	4. Specification Overview	IP	15
		Discuss	*5*
9:40	5. Design Description walk-through		
	5.1 Mechanical Design	IP	15
		Discuss	*10*
	5.2 Thermal Design	IP	10
		Discuss	*10*
10:25	5.3 Optical Design	PTP	10
		Discuss	*10*
10:45	Coffee		10
10:55	5.4 Electronics Design	BS	25
		Discuss	*15*
11:35	5.5 Reliability & FMECA	IP,GSW	10
		Discuss	*10*

Agenda

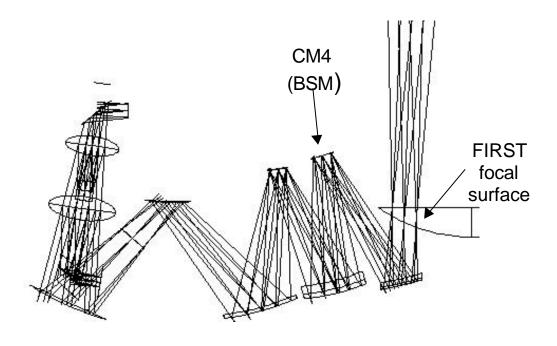|			
11:55	**5.6 Interfaces**	**IP**	**15**
		Discuss	*10*
12:20	**Lunch**	**45-60**	
13:20	**5.7 AIV & compliance matrix**	**IP**	**20**
		Discuss	*10*
13:30	**Coffee available**		
13:50	**6. Prototype results & Test Plan**	**GSW**	**20**
		Discuss	*10*
14:20	**7. PA Plan**	**IP**	**15**
		Discuss	*10*
14:45	**8. Schedule Overview**	**IP**	**10**
		Discuss	*10*
15:05	**9. Panel Questions**	**Chair**	**30**
15:35	**10. Panel Discussions**	**Chair**	**30**
15:55	**11. Panel Feedback, Actions review etc**	**Chair**	**30**
16:25	**Close (room available to 18:00)**		

Project Introduction

Dr. Gillian Wright

- **SPIRE is one of 3 instruments on the Herschel Space Observatory**

- **SPIRE consisists of a 3-channel imager and an FTS**

  - simultaneous imaging in 3 bands covering 200 - 500 μm

  - 200 - 670 μm low resolution spectroscopy with imaging FTS

- **The ATC hardware responsibility is to design, build and qualify the Beam Steering Mirror (BSM)**

- **The BSM is used to move the field of the photometer and spectrometer arrays in two orthogonal directions on the sky.**

  - to obtain fully sampled images
    - the SPIRE bolometer arrays are hexagonal close packed Fλ feedhorns
    - a 64 position jiggle pattern is required to create a fully sampled image in all 3 bands
    - 7 point jiggle for accurate photometry of point sources
    - fully sampled spectral mapping with the FTS too.

  - to modulate the bolometer signal and remove 1/f noise
    - "classic chopping" , requires movement in one axis only (the chop axis).

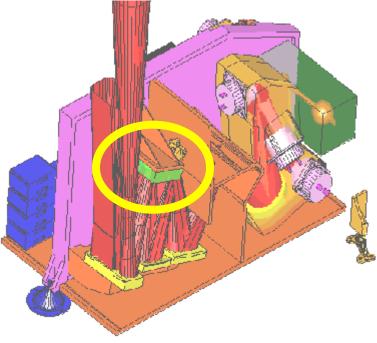 - it may be used to chop and jiggle simultaneously (chop at a jiggle position).

BSM location

CM4
(BSM)

FIRST
focal
surface

- **The BSM work includes :**
  - **The mechanism and its structural interface and the mirror itself**
    - BSMm , and BSMs
    - mirror is integral part of mechanism
    - appropriate "dummies" of these for other tests
  - **Design the electronics / control system for the mechansism**
    - BSMe
    - warm electronics actually being built at LAM as part of integrated system that also controls the FTS
    - Models of mechanism reponse for LAM to carry out tests
    - control algorthims/software for delivery to LAM
  - **Optical interfaces**
    - baffle
  - **Pcal interfaces**
    - calibration source is mounted through a hole in the BSM mirror

Review Aims

Dr. Doug Griffin

Review Aims

- ## DDR Rationale

  – *We are now at the stage where the SPIRE subsystems designs are maturing rapidly and it will soon be necessary to start manufacturing of the first deliverable models in order to meet the project schedule milestones.*

  – *In order to go ahead each subsystem is required to undergo a Detailed Design Review in order to get approval from the Project Team to enter the manufacturing phase.*

  – *A summary of the results of these reviews will be presented to ESA at the Instrument Baseline Design Review (IBDR), which will be held on 1st Nov 2001(TBC)*

Review Aims

- ## DDR Review Objectives

    1. Freeze the subsystem requirements specification.

    2. Freeze the subsystem (Baseline) design and release for manufacture of subsystem Structural Thermal Model (STM), Avionics Model (AVM) and Cryogenic Qualification Model (CQM)

    3. Freeze any subsystem MGSE, OGSE and EGSE design and release for manufacture of these items

    4. Freeze any subsystem software requirements and design

    Following the review, it is expected that the 'Baseline design' of the subsystem will be put under configuration control by the responsible institute, and the Project.