

Monthly Progress Report
SPIRE Test Facility and Scientific Support

Contract Number: 9F007-020251/001/SR
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Period: November 2004

Part 1

1. Is the project on schedule? **No.**

The launch for Herschel was delayed by the European Space Agency by half a year until August 2007. First data from the SPIRE imaging FTS will not be available until January 2005. This will cause serious problems since two key Canadian staff are funded only through December 2004. A proposal was presented to the CSA at the JCSA meeting in Winnipeg to extend the current contract and keep Trevor Fulton, the software engineer, and Peter Davis, the project manager employed for 9 months to complete Canada's work packages. CSA requested an updated statement of work and budget which was supplied. The implementation of contract amendment #4 has still not been completed.

2. Is the project within budget? **Yes.**

3. Is the project free of any areas of concern in which the assistance or guidance of Canada may be required? **No (see above).**

Peter Davis, SPIRE local project manager, and Trevor Fulton, SPIRE software engineer, spent one week, from November 29 through December 3, 2004 at the Laboratoire d'Astrophysique de Marseille. In addition to the Marseille group, which consists of Jean-Paul Baluteau, Christian Surace, Annie Zavagno, Kjetil Dohlen, and Christophe Ordenovic, Mattia Vaccari (Imperial College, London) and Pasquale Panuzzo (Padova University) participated in the meetings. Please refer to the submitted travel report for further details.

Part 2

Task 3.1: Provide SPIRE Test Facility FTS

- The Test Facility FTS has been delivered to the Rutherford Appleton Laboratory (RAL) in August 2003.
- A small format visible imaging FTS is currently under development to allow us to test the data analysis pipeline. The hardware design has been completed and the system assembled. The next step is to integrate the available control software to be able to efficiently operate the instrument.
- The first SPIRE Data Analysis Group meeting on the results from the post-vibration test campaign took place November 25. Samuel Ronayette presented the results from the Test Facility FTS. No conclusions could be drawn from those measurements. Samuel will measure the spectral characteristics of the lab environment with a test detector which can then be subtracted from the measurements with the instrument model.

Task 3.2: Provide SPIRE Data Analysis Software

- The University of Lethbridge is responsible for three work packages: Deglitching, Fourier Transformation, and Spectral Response.
- Andres Rebolledo, a computer science student from the University of Lethbridge, has completed version 1.0 of the task Fourier Transformation which provides the functionality to turn instrument timelines into spectra. This will become the main tool for reducing data from the test campaign with the Pre-Flight Model 1 (PFM1), scheduled for mid to late January 2005. A test report was prepared and presented to the group at the Laboratoire d'Astrophysique de Marseille. Some suggestions were made to improve the task and the issue of version 1.1 is anticipated before the end of the year.
- Trevor Fulton, the SPIRE software engineer, has implemented the sinc-Gauss interpolation for the interferograms in IDL. It shows good performance for small amounts of jitter. However, already at a level of 3% jitter, the routine shows intermittent behavior which has not been resolved. Much higher levels of jitter may occur on the SPIRE stage mechanism depending on the noise introduced by the Herschel telescope.
- Thee update version 1.1 of the Technical Note on Deglitching was released which focuses on qualifying the performance of various single pixel deglitching routines against the SPIRE operating modes.
- The updated schedule for the collaboration on spectrometer-related work packages is given below:

Time	Task	Progress
October 1	Model SPIRE case: decision on FT processing	For PFM1, a one-step interpolation with cubic spline and a sinc/Gauss convolution will be implemented. An iterative algorithm will follow next summer.
	Update note on Deglitching	Version 1.1 was issued November 17.
October 15	Finalize data product specifications	The data formats for the Spectrometer Detector Timeline and the Stage Mechanism Timeline have been finalized. Proposals for the Spectrum Dataset are under discussion.
	Detailed specifications of FT task	The required functionality for the WP FT has been defined.
	Define and prepare required test data	Astronomically motivated test data is available. John Lindner prepares the SPIRE Imaging FTS Simulator as part of his Master's thesis.
November 1	Integrate pre-/post-ambles from Marseille group into code	A revised version of the pre-/post-ambles is used for the FT task.

Time	Task	Progress
November 15	Have version 1.0 of FT task and detailed documentation available	Version 1.0 of the FT task was released November 17 along with documentation in Java-doc and a performance test report.
	Prepare code for PFM data analysis	The Engineering Data Processing task will supply converted data from the database to the FT task. Some improvements of th FT task remain to be implemented.
November 29 – December 3	Test meeting in Marseille	The meeting has been arranged. SPIRE developers from Padova, Italy and London, UK join this meeting.
December 20	Revise code and prepare version 1.1 of FT task	

Task 3.3: Canadian SPIRE Team Support

- The progress report of the project was submitted to the Joint Committee for Space Astronomy in preparation of the meeting on December 3, 2004.

Task 3.4: SPIRE ITT and ICC Support

- Asier Abreu, the Canadian member of the SPIRE instrument control team at RAL, is involved in the Instrument System Level testing of the SPIRE instrument that was delivered to the European Space Agency and is now tested in Ottobrunn, Germany.
- Samuel Ronayette, the Canadian member of the SPIRE test team at RAL, is analyzing and interpreting data from the post-vibration test campaign (beam scans, beam peak up, pupil scans). He also took more data with the Test Facility FTS and a test bolometer to characterize the laboratory environment.

Task 3.6: Public Outreach Program

- Peter Davis presented the SPIRE public outreach website and the Space Exploration Science Crate at the Alberta Teachers Association Science Council's conference on November 12 in Banff together with Cole Carlson from the Science Alberta Foundatino. The workshop "*Albertans in Space*" was fully booked.
- Mark Huff, an applied study student from the University of Lethbridge, is fleshing out the details of a stand-alone trifold on the Canadian contribution to Herschel/SPIRE and two programs for the Nature Centre in Lethbridge.