

Monthly Progress Report
SPIRE Test Facility and Scientific Support

Contract Number: 9F007-020251/001/SR
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Date: March 3, 2004
Period: February 2004

Part 1

1. Is the project on schedule? **Yes.**
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.**

Contract Amendment #3 has been initiated to (a) include a public outreach component, (b) adapt the spending profile for the forthcoming project duration, (c) adapt the overall amount to the changing spending profile, (d) purchase a camera system for an imaging FTS system to be built at the University of Lethbridge, and (e) develop two high-precision calibration weather stations.

Part 2

Task 3.1: Provide SPIRE Test Facility FTS

- This activity is complete.

Task 3.2: Provide SPIRE Data Analysis Software

- The recently completed test campaign at RAL allowed the data processing toolkit to be used for the first time on real detector data. Based on that experience Trevor Fulton, the SPIRE software engineer at the University of Lethbridge, has identified a number of areas of improvement and is currently preparing the release of version 1.1 which is expected for mid-March.
- Peter Davis, local SPIRE project manager, traveled to Cardiff University and RAL in mid February to meet with a variety of groups who are involved in the development of the three software work packages the University of Lethbridge is responsible for. A travel report with further details was submitted earlier. As a result from these meetings, he is currently preparing technical notes on the work packages. Close collaboration with Jean-Paul Baluteau's group at Marseille, France, has been initiated.
- Software development for the Instrument Control Centre (ICC) is coordinated through Imperial College, London, and a first kick-off telecom has been scheduled for March 12. A meeting of developers is planned for April 6 –7 and Trevor Fulton has been identified as a key person to attend this meeting.
- A job ad has been posted at the University of Lethbridge to find a computer science student to support the development of the software packages during the summer 2004.

Task 3.3: Canadian SPIRE Team Support

- The official call for participation for the SPIRE Science Team Meeting at Imperial College, London, UK, April 14 – 16, 2004 has been issued. James Di Francesco, Peter Martin, David Naylor, and Christine Wilson plan to attend. It is also anticipated that either Mark Halpern or Douglas Scott from the University of British Columbia will attend.

Task 3.4: SPIRE ITT and ICC Support

- The test team at the Rutherford Appleton Laboratory (RAL) has completed its first, very successful test campaign on a SPIRE instrument model. Over a period of two weeks much effort was expended by the test team in evaluating the performance of the long wavelength photometer array. The Test Facility FTS was used to qualify the response of individual bolometers in the Photometer Long Wavelength array (see figure 1). The Test Facility FTS operated flawlessly and was used to shine the first outside light onto the detector array as the infrared laser proved to be unstable. Results will be published by Locke Spencer, graduate student from the University of Lethbridge and currently deployed at RAL, et al. at the SPIE conference in Glasgow, UK, late June 2004.

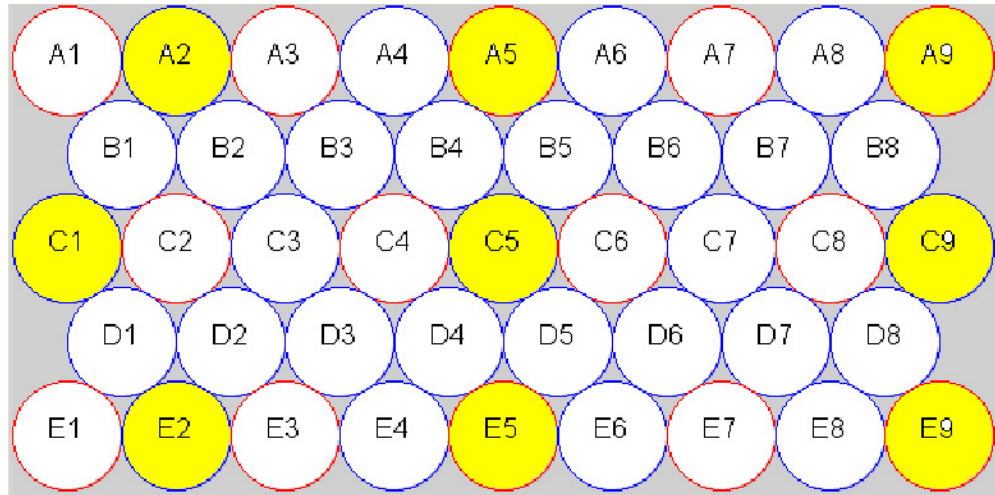


Figure 1: Pixels of the Photometer Long Wavelength array that have been tested during the recent test campaign at RAL are highlighted in yellow and include the central, edge, and corner pixels

- As control system operator, Asier Abreu, the Canadian member of the SPIRE ICC at RAL, has played an essential part in the test campaign. He is currently rewriting the software to store test data in a common data format.
- Samuel Ronayette, the Canadian member of the SPIRE Instrument Test Team (ITT) at RAL, was in charge of the optical interfaces between the infrared-laser, the Test Facility FTS, and the telescope simulator. He also made sure that the beampath was going through a minimum water vapor atmosphere.
- With the help of Trevor Fulton, software engineer at the University of Lethbridge, Locke Spencer processed the resulting data (see figure 2 for a sample). Detailed interpretation to draw conclusions for the next test campaign and the design of the detectors is currently on-going. Locke Spencer is currently collaborating with staff at RAL on these issues.

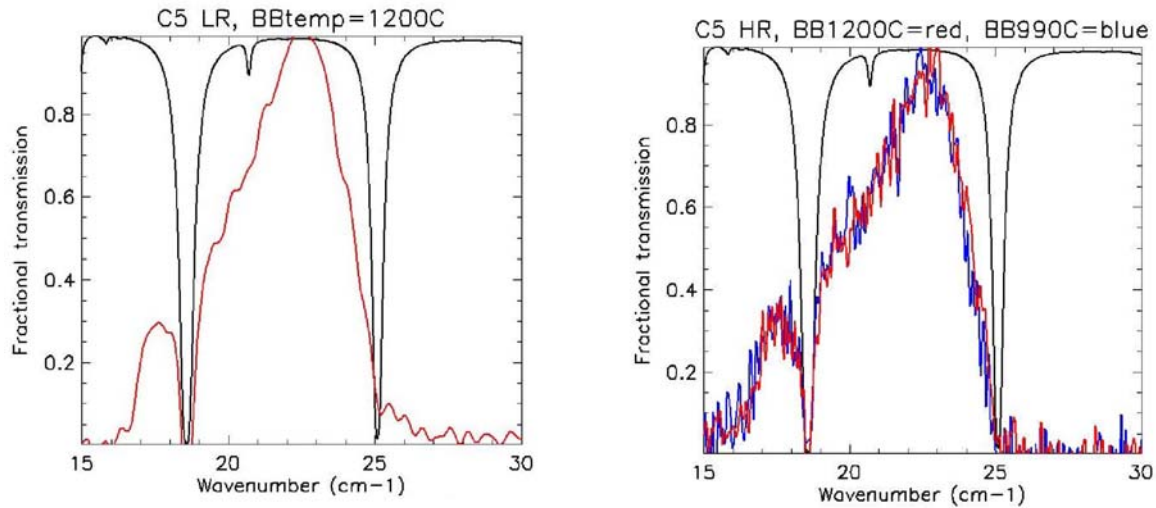


Figure 2: Low and high resolution spectra from the central pixel C5, shown against a model of water vapour in the atmosphere

- John Lindner, the second graduate student from the University of Lethbridge currently deployed at RAL, is preparing software to simulate the SPIRE instrument. He is currently developing individual components for the simulator including the stage and the pointing behaviour of the telescope. Results will be published by Locke Spencer et al. at the SPIE conference in Glasgow, UK, late June 2004.

Public Outreach

- A film crew under contract by the Science Alberta Foundation came to Lethbridge to take footage with members of the Astronomical Instrumentation Group to feature in a job profile on their kid-oriented website <http://www.wonderville.ca>
- Dave Low, an applied study student, is developing hands-on activities for the Lethbridge Astronomy Society to feature the Herschel mission and explain basic concepts related to infrared astronomy to students from grade 6, 9 and adults.

Weather Station

- An integrated layout for a circuit board has been designed for the weather station to be delivered to RAL for the next test campaign which is currently scheduled to start April 13, 2004. Components have been ordered and a first prototype is expected to be available in early March.