

Monthly Status Report
Robert Stobie Prime Focus Imaging Spectrograph
September 2010

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This monthly report summarizes the RSS status as of October 8, 2010.

Optics and Testing

- Polarizing beamsplitter. The repaired calcite wedges have been assembled into the mosaic by Pilot Group. They report:
 - Alignment has been completed except for one final wedge, which drifted out of spec. They are waiting for stresses to settle out before doing a final tweak.
 - They have been monitoring for bubbles. None so far.
- Fabry-Perot calibration.
 - The HR etalon is back at SALT, awaiting calibration, which is scheduled for early November.

Mechanical.

- During testing of articulation at extreme tilts, an unexpected deviation from smooth motion was observed, where the camera displaced downward by about 2 stations for about 1 second before picking up the commanded motion to an “uphill” station. It is possible that this has always been the case, and that it was not previously noticed since it only occurs in extreme gravity situations. There is some concern that this behavior is placing loads on the mechanism that could lead to long-term damage. The mechanical nature of this “play” is being further investigated, and some tests with the control system are being devised for the November UW engineering time.
- New endplates for the MR etalon were shipped from UW to SALT and installed. These provide added margin in clearance of the etalon with the grating mechanism. Similar endplates for the HR etalon are being fabricated at UW.
- Slitmask/ Filter mechanisms. A replacement lead screw obtained by UW has been installed in the filter mechanism, after some rework required by a manufacturer design change. The mechanism is now working well, with no evidence of squealing, so signs are positive that this problem has been fixed.
- Grating rotator. A grating rotator modification designed to greatly reduce the cross-dispersion flexure has been finished at UW and shipped to SALT. Assembly is underway.

- Baffling. A design has been completed for baffling modifications to be installed on RSS before lift. Machining of parts is underway. Assembly onto RSS is scheduled for the UW engineering time at SALT in November.
- New measurements of the “rho-ring” mounting surface for RSS have indicated that it is now about ± 0.2 mm out of planarity. If left as is, there is likely to be a distortion of the RSS structure during rotation during a track which could cause image motion during an exposure. An estimate of the image motion, and its implications, are under investigation. First indications are that this distortion would be improved by going from the current 12-point semi-kinematic mount to a 3-point kinematic mount, so that this is a possible fall-back if the non-planarity is not corrected. This is still likely to worsen the flexure performance of the instrument, but may be acceptable as a temporary fix.

Control/ PIPT

- RSS proposal tool/ simulator.
 - An atlas of RSS arc lamp spectra is being assembled, starting with the spectra documented by Alexei Kniazev in SALT2115AA0100, plus additional spectra covering the full wavelength coverage of RSS for most of the six arc lamps. These will be used to establish a table of arc lamp settings to be used by the OCS to automatically implement standard on-sky arc spectra for each RSS configuration.

Management

- Schedule. A schedule of RSS tasks through Acceptance is attached to this report. The scheduled RSS lift date has been left at 13 Dec, 2010, the date currently indicated in the latest SALT commissioning schedule. The engineering parts of the “UW-prelift” activities are now scheduled for the first 2 weeks in November. The commissioning team would return when SALT is ready for the RSS lift.
- Documentation.
 - Work proceeds on a Pneumatics Control System document.
 - A document and a PIPT proposal is being prepared describing the short-form “Functional Testing” procedure that is to be used pre- and post-lift to indicate readiness.

Activities for next month

- Optics
 - Finish alignment of UV calcite beamsplitter. Monitor for lens fluid bubbles. (Pilot Group)
- Mechanical
 - Install and test grating stage modifications. (SALT)
 - Finish machining parts for baffling improvements. (UW)
 - Analyze implication of possible rho-ring non-planarity. (UW)
 - Investigate articulation “play”. (SALT, UW)
- Control
 - Test the new PCON/ TCS high-level control software. (SALT)
 - Continue testing new high-level software on the instrument. (SALT)
 - Implement fine control of the etalons. (SALT)
 - Work on control documentation improvements. (UW, SALT)
- Management
 - Continue work on Arc Lamp, Functional Testing and Pneumatics Control documents. (UW)

