

Monthly Status Report
Robert Stobie Prime Focus Imaging Spectrograph
October 2010

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This monthly report summarizes the RSS status as of November 10, 2010.

Optics and Testing

- Fabry-Perot calibrations.
 - The repaired HR etalon is now installed on the new endplates.
 - The MR and HR etalons have been aligned to the LR.
 - The HR etalon was successfully calibrated at H α .
- Before removing the collimator for bubble removal, a baseline through-focus test was run using the $\lambda 6290$ filter and a slitmask with 12.5 μ pinholes. Compared to the same test run on June 29, 2009, lateral alignment was within six unbinned pixels, FWHM and tip/ tilt were within errors, and the focus position was higher by about 120 microns, about twice that expected (from the ZEMAX model) for a +10 $^{\circ}$ C temperature difference between the two data sets.
- The collimator bubble was successfully removed. Before removal, the bubble was of similar size to that observed last August. Some air was observed in the uphill fluid bladder, which likely explains where the air went when the bubble was observed to shrink during the last year.

Mechanical.

- Waveplates. The clearance problem which prevented rotation of the halfwave plate has been resolved and corrected. Screws fastening the upper retaining ring of the field lens were found to have been assembled by Pilot Group with an extra washer, causing an unplanned protrusion. After consultation with Alan Schier, the screws were removed one at a time, washer removed, and refit, using locktight to allow a mild compression which still retains the screw safely.
- During testing of articulation at extreme tilts, an unexpected deviation from smooth motion has been observed, where the camera displaced downward by about two stations for about one second before picking up the commanded motion to an “uphill” station. Some tests with the control system of possible fixes have been devised for the November UW engineering time.
- Slitmask/ Filter mechanisms. The filter and slitmask magazines have been operated extensively, with no repetition of the squealing which led to the replacement of the lead screws.

- Grating rotator. A grating rotator modification designed to greatly reduce the cross-dispersion flexure has been temporarily fit successfully, although a new mount plate needed to be machined to take into account a drawing error.
- Baffling. Assembly of the modified baffling onto RSS is underway.
- New measurements of the “rho-ring” mounting surface for RSS have indicated that it is now about ± 0.2 mm out of planarity, fixed in orientation relative to the hexapods. A (possibly temporary) fix is to go to a kinematic mount of RSS, so that the resulting distortion of the RSS mount plane during rotation would not be coupled into the RSS structure. A test of the concept is scheduled for November.

Control/ PIPT

- RSS proposal tool/ OCS scheduler. An atlas of RSS arc lamp spectra has been 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 have been used to establish a table of optimal arc lamp settings to be used by the OCS to automatically implement standard on-sky arc spectra for each RSS configuration.
- A spectrograph focus model has been developed, taking into account predicted temperature and color effects (from ZEMAX), and measured focus differences between the filters, gratings, and slits. An “auto-focus” feature has been incorporated into the PCON software, using this model to assemble a table of focus as a function of configuration, which is used to complete the configuration setup when a new configuration is requested by OCS.
- Initialization. RSS initialization requirements on power-up are being reviewed, updated, and documented. Messages advising hardware initialization and/ or mechanism homing are being implemented in the PCON software. A slight change in the definition of grating states has been implemented which will greatly reduce the likelihood of a software procedural lockup on power-up which results from a grating sagging into the holder after power-down.
- FP procedure. The Fabry Perot scan software procedure has been updated and tested. A second version, which will automatically set the etalon calibration coefficients appropriate for the scan, has been developed, and is being implemented.
- OCS Detector and Procedure GUI. The GUI tabs supporting definition of the detector configuration and observation procedure have been revised to resemble the mechanical configuration tab. This will complete the PCON operator interface to the OCS.

Management

- SALT Board meeting support. The RSS status was presented to the 28th meeting of the SALT Board on Nov 2, 2010.
- Schedule. A schedule of RSS tasks through Acceptance is attached to this report. The scheduled RSS lift date has been slipped to 12 Jan, 2011, the date currently indicated in the latest SALT commissioning schedule.
- Documentation.
 - Information is being gathered to form an “initialization” section of the mechanism control manual.
 - 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)
 - Verify alignment of optics after reassembly of collimator. (UW)

- Mechanical
 - Finish installing and test grating stage modifications. (SALT)
 - Finish assembling baffling improvements. (UW)
 - Test halfwave plate. (UW)
 - Adjust detector alignment. (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 Focus model, Arc Lamp, Functional Testing and Pneumatics Control documents. (UW)

