SOLIS Relocation Package Addendum

July 7, 2015

Answers to specific questions

*What is required to operate the site? How much observer time is needed? How much maintenance?*

SOLIS will be operated primarily by NSO from a remote location. It is anticipated that, for local site personnel, the main routine daily task will consist of monitoring operations using a dashboard displaying images and instrumental parameters and will take no more than 30-40 minutes per day in the case of nominal operations. In the event of failure of the motor for either the shelter roof or the VSM entrance window cover, then those items will need to be manually opened and closed at the start and end of observations until the motor is repaired. Regular maintenance tasks include checking coolant and helium/nitrogen levels and filling as needed, requiring 30 minutes every week. In the case of an instrumental failure, then local personnel may be asked to help troubleshoot and install spare electronics boards. Extreme failures will be handled by an NSO technical team that will travel to the site.

*What are the hour-angle limits of SOLIS?*

The limit of travel is 10 degrees above the horizon when the solar declination is 25 degrees. The hour angle limit is approximately ± 6 hours.

*What are the planned hardware changes?*

* VSM:
  + Installation of Ca II 8542 Stokes modulator
    - This will replace the VSM He 10830 capability
    - The FDP will still provide He 10830 images
  + Replacement of internal fans
  + Coupling of guider to mount declination axis
* FDP:
  + Visible Tunable Filter installation
* ISS:
  + Installation of new camera and data acquisition system
* Change overall mount and instrument control system to Linux
  + Replaces VxWorks
  + Replaces Galil motion control boards

*What are the science goals?*

VSM:

* Study 3D topology of magnetic field in the photosphere and chromosphere on moderate and large spatial scales and its long-term changes. This include flare-related changes in magnetic fields, evolution of polar fields, magnetic and current helicity, larger scale electric currents, large-scale connectivity and coupling of photospheric vector magnetic field to internal flows.
* Continue developing new data products to improve the space weather research and forecast (including improvements to synoptic maps, providing daily vector magnetic field synoptic maps on routine basis, providing data products derived from magnetic field measurements such as coronal magnetic field extrapolations).

ISS:

* Sun-As-A-Star spectral irradiance variations for studies on solar irradiance and solar-stellar research (including exoplanetary studies, solar and stellar cycles, solar and stellar flare activity).

FDP:

* High-cadence (up to 10 sec) narrow-band intensity observations in He 10830, H-α, Ca II K plus four additional wavelengths (390 to 660 nm) to be specified by the user community.