

The National Solar Observatory (NSO) Users Committee Report

To: Dr. Valentin Martinez Pillet, Director National Solar Observatory, the NSO Users Committee (UC)

A follow up telecon was held on November 12 2019 to discuss the specific item of SOLIS relocation.

From our 2019 report

- **NISP should consider more prioritization of their many tasks.**

“We look forward to a successful SOLIS installation at Big Bear. We would like to receive ongoing status reports and updates from Dr Hill on any events that may change the date for when a User can expect to obtain data from SOLIS at BBSO.”

On the telecon, Dr Martinez Pillet requested specific recommendations from the Users Committee on the following items

“1. Gap in SOLIS/VSM data is three years. Which instruments do you prioritize of the following list?”

- + Fe I 6302 longitudinal & vector
- + Ca II 8542 Longitudinal
- + Ca II 8542 Vector (vs He I 10830 slit spectrograph data)
- + ISS
- + FDP (which can have He I 10830)

2. If bringing SOLIS back on-line at BBSO becomes impractical (expensive) and an alternate site was sought (creating a data gap of at least 4 years) do you think NSO should pursue such an option?

3. Evaluate as users the implications of a potential end to SOLIS operations.”

This report contains our recommendations on those three items as requested. The discussion of item 2 and the resulting recommendation was led by Dr Jess (Dr McAteer recused, due to potential conflict). The chair remains, as always, available to the Director to discuss any items at any time during the year.

Submitted on behalf of the NSO Users Committee this 25th day of November, 2019

on behalf of the NSO UC
Dr R.T. James McAteer (chair)

1. Gap in SOLIS/VSM data is three years. Which instruments do you prioritize of the following list?

- + Fe I 6302 longitudinal & vector
- + Ca II 8542 Longitudinal
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- + FDP (which can have He I 10830)

Recommendation: We recommend that Fe I and Ca II vector measurement be considered joint top priorities for SOLIS. The historical aspect of Fe I is worth noting, and as such, the longitudinal data still provides the most used data. But the Fe I vector data is the critical connection to a future GONG follow on and the space-based HMI data cannot be assumed to be always available in the future. The UC is not particularly concerned about the current underuse of the CaII dataset. It is not unusual for chromospheric diagnostics to be somewhat lagging in terms of community use, and we should look positively at the continuous progress made by the community towards the inversion of chromospheric lines - especially CaII 8542 - notably within NSO itself, as encompassed by the NSF-funded DKIST Level-2 data effort. We recommend FDP be considered a lower priority than the Fe I and Ca II components. The He I component is considered a very useful addition, in particular for coronal diagnostics (although He I 10830 slit spectrograph data would be more useful for this aspect, we still consider Ca II ranks higher)

We recommend that ISS spectra are of less interest to the solar physics community but are extremely important for some groups who study solar spectral irradiance. Ideally it could be descoped from main SOLIS and outsourced to others requiring these data.

2.If bringing SOLIS back on-line at BBSO becomes impractical (expensive) and an alternate site was sought (creating a data gap of at least 4 years) do you think NSO should pursue such an option?

Recommendation (Due to potential conflict of Interest, this section is chaired by David Jess): The Users Committee is worried by the lengthening delays encountered during the relocation to BBSO. Of particular concern are the challenges faced with growing costs linked to green energy generation (and the impact this may have on seeing conditions), and delays caused by ecological restrictions, as well as the potential difficulties in securing a competitive construction tender.

We stress that the lifespan of the SOLIS facility is more important than the moderate data gap currently in place. As a result, our recommendation is based on the long-term goal of ensuring SOLIS remains competitive and science-driven for years/decades to come.

We recommend that the financial feasibility of relocating to BBSO is re-examined prior to commencing large-scale construction. If the cost implications of adhering to BBSO/CA laws are found to be impractical and/or expensive, then we recommend that relocating SOLIS to Sunspot/NM becomes a priority. The Sacramento Peak site is fully functional, with staff available that can provide the necessary operational support. In addition, the re-commissioning of SOLIS would occur in late 2021, with less financial/legal risk associated with a move to NM. The Users Committee also stresses that the relocation of SOLIS to Sunspot would provide significant future (financial) leverage since the Sacramento Peak site is much more flexible for (re-)development.

3.Evaluate as users the implications of a potential end to SOLIS operations.

Recommendation: We remain strongly convinced that SOLIS is a vital component of the NSO portfolio and a critical contribution to solar physics. The User Committee reports going back over a decade summarize the need for this facility, and the need to secure its future as a priority. The longevity of this project outweighs the data gaps. An end to SOLIS operations would represent a failure of our community as a whole.