

SDO EVE Science Workshop Summary

The SDO EVE Science Workshop was held November 9-11, 2005 in Warner Springs, California and was attended by twenty-five SDO team members. The primary objectives for this workshop were:

- 1) review the EVE calibration plan and discuss cross-calibrations between AIA and EVE channels,
- 2) review EVE data products and refinement of these products based on space weather research and operation needs,
- 3) discuss status and future plans of EVE-related solar irradiance and Earth's atmospheric models, and
- 4) discuss EVE's education and public outreach (EPO) program and how to involve the EVE science team in EPO activities.

The following is a summary of the presentations and discussions, and the detailed presentations can be downloaded from EVE's website (lasp.colorado.edu/eve/). There are 15 action items resulting from this workshop.



The group enjoyed horseback riding at Darrell Judge's 40-acre ranch near Warner Springs one morning.

Frank Eparvier and Andrew Jones presented the calibration plans for the MEGS and ESP channels, respectively. Karel Schrijver and Paul Boerner presented AIA data products and calibration plan and concepts for EVE-AIA cross calibrations. Rock Bush discussed the spacecraft maneuvers planned for HMI/AIA calibrations. One action item was to plan an Irradiance Validation Workshop in spring 2007 to discuss rocket EVE measurements, and seven

other action items were assigned concerning EVE calibrations, irradiance algorithms, and operations.

Don Woodraska presented the plans for the EVE science data processing and resulting data products. Much of the data product discussion concerned the EVE space weather data products. Chris Smithtro and Tim Fuller-Rowell presented ionospheric and thermospheric model plans for space weather operations and their needs for near-realtime solar EUV irradiance. In addition, Rodney Viereck and Kent Tobiska presented plans for solar EUV irradiance measurements and modeling for NOAA and Air Force space weather operations. Through these discussions, it was determined that the EVE space weather data product should be the solar irradiance with 1-min cadence with one set of files being the irradiance over a 24-hour period and another set being the irradiance for the last 15 minutes. There was also extended discussion about the EVE SAM data products that are not currently well defined. Five action items were identified concerning data products, including two affecting the SDO project about meta-data definitions and solar event log files.



Don Woodraska from LASP, University of Colorado.

Mark McCaffrey presented the philosophy and concepts for EVE's EPO program and distributed a written survey to collect information about how individual scientists would like to participate in EPO activities. The general census was that EVE's EPO program should focus on a few fundamental concepts concerning space weather, such as light, magnetic field, the Sun, and atmospheric response to solar variability. The action item for the EPO staff is to identify these specific concepts before the EPO program development begins in 2007.



Mark McCaffrey from CIRES, University of Colorado.

The final session on Friday morning concerned modeling and coordinated research between the SDO teams. Harry Warren presented the NRLEUV model and plans for coordinated research between EVE, AIA, and HMI using this solar EUV irradiance model. Kent Tobiska presented the SOLAR2000 model, plans on improving the solar EUV irradiance input for NOAA and Air Force space weather operations, and concepts for having common platform (server and file format) for the irradiance data sets. Frank Eparvier presented an overview of Phil Chamberlin's new irradiance model called Flare Irradiance Spectral Model (FISM). Leonid Didkovsky presented his analysis of extracting solar proton flux and energy from the particle noise in the SOHO-EIT CCDs and discussed how similar analysis could be done for all of the SDO CCDs. Frank Eparvier led the discussion about other coordinated research efforts planned for the SDO teams. These research efforts include understanding the magnetic field and its affect on the irradiance variations, improving the understanding of the center-to-limb variations for the EUV emissions,

Kent Tobiska presented the SOLAR2000 model, plans on



Kent Tobiska from Space Environ. Technologies, Palisades, CA.

developing new, improved forecast tools for the solar irradiance, and comparison of EVE and AIA results. This later item is addressed by the action item to develop the algorithms to derive the full-disk differential emission measure (DEM) from the EVE spectra, for which this DEM would be used by the NRLEUV model and for comparison to DEM results from AIA.

The workshop attendees also had an exciting team-building experience with a visit to Darrell Judge's ranch that includes a solar array farm, vineyard, and several horses. We toured the ranch on horses, by jeep, and on a hay-wagon ride, and the ranch visit concluded with a BBQ lunch before returning to Warner Springs for afternoon and evening workshop sessions.



Left to right: Mike Anfinson and Tom Woods, Frank Eparvier and Dean Pesnell, and the hayriders.

The workshop was very successful in answering outstanding questions about EVE's calibration plan and data product content and in establishing better understanding of irradiance modeling and research plans between EVE, AIA, and HMI. We look forward to the SDO science team meeting and the HMI-AIA Workshop in February 2006 when we can further develop coordinated research plans.

Some future EVE science meetings include the EVE Irradiance Validation Workshop in spring 2007, irradiance modeling session as part of the LWS Workshop in March 2007, and atomic spectroscopy for solar modeling as part of a national Cool Star Workshop.



The LASP Data Processing Team – Karen Bryant, Don Woodraska, and Brian Templeman.