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Solar Radiation and Climate Experiment Monthly Newsletter **March 2004**

SORCE's SIM Team Moves Ahead –

Normal operations for SIM have been in place for about 1 year. At this point, the scientists are still refining measurement plans and looking at last year's results. Nonetheless, there are still plenty of new scientific activities and plans to show what we are learning from this new instrument.

The first scientific paper using SIM data, *The Signature of Solar Activity in the Infrared Spectral Irradiance*, by Fontenla, Harder, Rottman, Woods, and Davis is through the review process and will appear in the April 10, 2004 edition of Astrophysical Journal Letters. When reprints arrive, this article will be mailed to the SORCE science community.

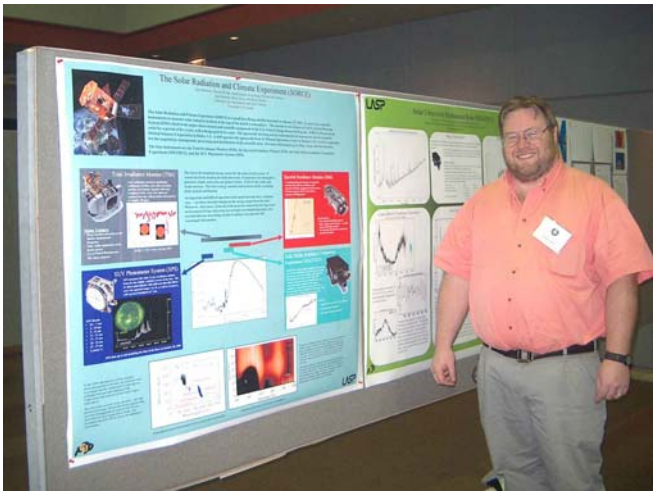
Gerard Thuillier from Service d'Aéronomie du CNRS in France.

Our French colleague Gerard Thuillier from Service d'Aeronomie du CNRS visited LASP for three days in late March to work with the SIM team. They discussed some of the current findings on the SIM instrument and are planning to write a joint paper comparing the solar irradiance measurements of the SIM instrument and the SOLSPEC and SOSP spectrometers that flew on the ATLAS and EURECA missions. Authors hope to have this paper completed by July, so more face-to-face discussions can take place during the COSPAR meeting in Paris at the end of July. This paper will concentrate on the 300-600 nm region with a subsequent paper to address the red visible and infrared part of the spectrum. Jerry Harder, the SIM science team leader, is very pleased and honored to have Dr. Thuiller as a collaborator on the SORCE mission.

Scientists met recently to review the SIM data collected over the last year. Shown left to right are: Jerry Harder (SIM Instrument Scientist), Juan Fontenla, Dick White, and Gerard Thuillier.

SORCE Mission Represented at LWS Workshop –

SOLSTICE scientist, Marty Snow, represented SORCE at the Living With a Star Workshop, *Connecting our Dynamic Sun to the Heliosphere and Geospace*, held March 23-26 in Boulder at NCAR. The SORCE presentations were part of the Solar Drivers of the Sun-Earth Connection session. Gary Rottman prepared an overall SORCE poster and Marty prepared a SOLSTICE presentation.



Marty Snow from LASP represented the SORCE mission with two posters at the LWS Workshop, March 23-26, 2004.

2004 SORCE Science Meeting in Planning Stages –

The groundwork is in place for another excellent SORCE Science Meeting in Fall 2004. The meeting -- ***Decadal Variability in the Sun and Climate*** – is set for October 27-29, 2004 in Meredith, New Hampshire, which is a small town on Lake Winnipesaukee. The agenda will consist of both invited and contributed oral presentations and posters. Everyone is encouraged to participate and we hope you will share this announcement with colleagues.

Discerning the role of the Sun in climate variations on time scales of decades is a challenging task. That climate forcing is well correlated with variations in the Sun's energy output is now relatively well established for total and UV irradiance using high-precision, space-based solar measurements spanning more than two decades. When the Sun is near the maximum of its activity cycle, it is about 0.1% brighter overall, with much greater changes at UV wavelengths. SORCE measures these variations with unprecedented accuracy, precision, and spectral coverage across the UV, visible, and IR. But the climate response to these measured solar variations presents a major puzzle. This SORCE Science Meeting seeks new understanding of the evidence for and mechanisms involved in decadal variability in the Sun and climate.

Widespread empirical evidence from the extensive Earth climate datasets suggests the presence of an 11-year solar signal of order 0.1K in surface, atmospheric, and ocean temperatures. But general circulation models (GCMs) underestimate this response by as much as a factor of five. The GCMs account primarily for direct forcing by changing incoming total radiation and assume that the response time for climate feedback processes to this external forcing is of order 100 years. Processes and pathways not included in the GCMs may help facilitate the larger than predicted climate response to decadal solar variability. Solar variations in the UV spectrum modulate stratospheric ozone concentrations, which may couple to climate via radiative and dynamical pathways. These pathways may involve the Northern and Southern annular modes, allowing a solar signal to be amplified and reach Earth's surface. Internal atmosphere-ocean oscillations such as the NAO and ENSO may also play a role. Clouds may expedite the feedback process, as they appear to also exhibit variability with the solar cycle. Stochastic climate variability may amplify the relatively small solar variations. Other, non-linear, climate processes are speculated.

Church Landing is a new facility at The Inn at Mill Falls, where the next SORCE Science Meeting will be held. The Inn's website is http://www.millfalls.com/.

At this SORCE Science Meeting we hope to relate current understanding of the solar variability with climate effects and potential climate response mechanisms. Topics will include:

- Decadal variability in the atmosphere and coupling to climate
- Decadal variability in the oceans as climate drivers
- Tropical climate variability modes (ENSO)
- High latitude climate variability modes (NAO/AO, PDO)
- Non-linear/stochastic climate response processes
- Mechanisms and modes of decadal solar variability

The science program organizing committee members are Mark Baldwin from NorthWest Research Associates, Inc., Bellevue, Washington; Greg Kopp from LASP, University of Colorado; and Judith Lean from Naval Research Laboratory, Washington, DC. The abstract deadline is September 10, but you might want to put this important date on your calendar now, as well as the actual meeting dates (October 27-29).

For additional information and updates on the meeting, please visit our website – http://lasp.colorado.edu/sorce/2004ScienceMeeting.html.

48,020

Hits to the SORCE Website

(Since 4/21/03, As of 3/26/04)

Upcoming Meetings / Talks –

SORCE scientists plan to present papers or attend the following 2004 meetings:

AGU / CGU Meeting, May 17-21, Montreal, Canada
AAS / Solar Physics Division, May 30-June 3,
Denver, Colorado
COSPAR Meeting, July 18-25, Paris, France
SORCE Science Meeting, October 27-29,
Meredith, New Hampshire
AGU Fall Meeting, Dec. 13-17,
San Francisco, California

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