



### Mission Update –

Heading towards six months since launch, SORCE continues to make excellent daily solar observations, with nightly stellar observations for calibration. Scientists and engineers continue to verify the instrument calibrations and data processing software. As of the end of May, measurements are being validated, and some preliminary data are being distributed to the science community through the Goddard Space Flight Center DAAC.

### Spacecraft and Instrument Status –

All spacecraft systems continue to perform exceptionally well. The spacecraft is in its nominal Sun pointing mode, and is making two scheduled contacts each day. There are no plans to change spacecraft operations in the near future. The calibration process continues on all of the SORCE instruments, which are currently operating in normal mode. The preliminary data products generated are meticulously reviewed, and compared to earlier instrument expectations. The data are also compared with observations of similar instruments on other spacecrafts currently operating. After investigating the similarities and anomalies, scientists work towards data validation by improving data processing code. The weekly SORCE Status Report is available on the SORCE website at <http://lasp.colorado.edu/sorce>. It summarizes the spacecraft activity, ground contacts, the instrument measurements, spacecraft and instrument planning, and data processing.

### A Closer Look at the SOLSTICE Instrument –

This newsletter explores the preliminary data results from the SOLSTICE (Solar Stellar Irradiance Comparison Experiment) instruments. There are two identical SOLSTICE instruments onboard SORCE. They each measure ultraviolet solar and stellar radiation from 115 to 320 nm. SOLSTICE A and B are unique in that they also measure the irradiances from a group of 18 bright blue stars for calibration purposes. The intrinsic variability of these stars is insignificant making this precise calibration possible.

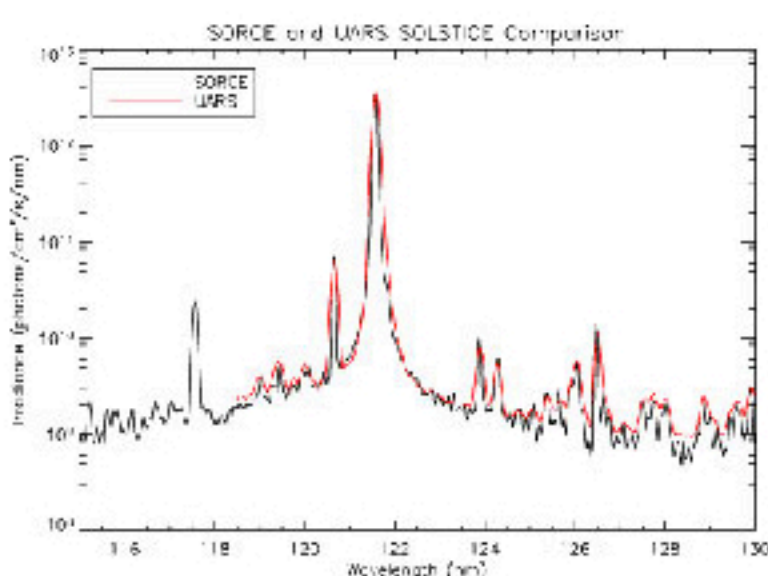


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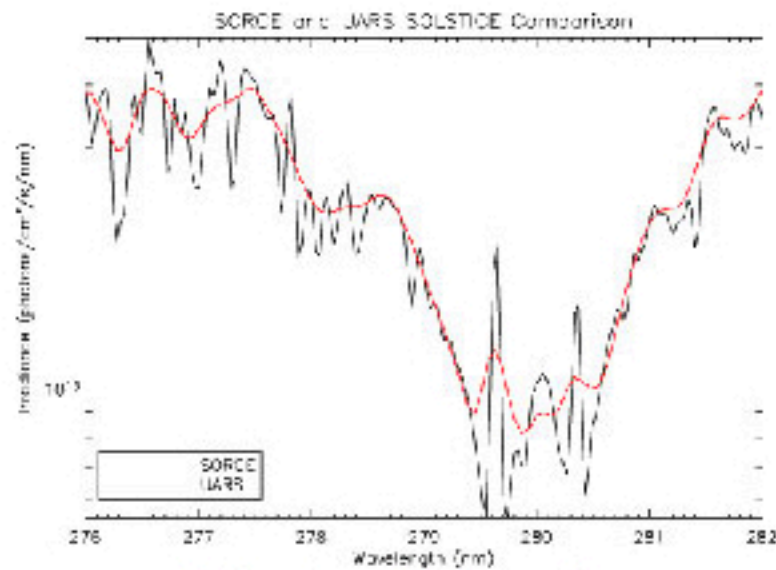


The SOLSTICE instruments are performing very well, collecting precise radiation measurements. Scientists are comparing the SOLSTICE measurements from SORCE to the measurements collected from the SOLSTICE instrument on board the UARS experiment, launched in 1991. The results are very similar, but the SORCE SOLSTICE has a better spectral resolution at all the wavelengths. Following are two plots comparing SORCE and UARS SOLSTICE measurements.



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*This plot shows that the wavelength measurements from the SORCE SOLSTICE (black line) extend to the left much further than the UARS SOLSTICE (red line). SORCE SOLSTICE wavelength range in FUV extends down to 115 nm.*



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*This plot shows that the measurements from the SORCE SOLSTICE (black line) have much better resolution than the UARS SOLSTICE (red line) measurements. At a first look you might conclude that the measurements are very different, but they are actually very similar when the SORCE SOLSTICE measurements are smoothed to the UARS resolution. Resolution in the MUV is doubled on SORCE SOLSTICE.*

### SORCE Science Meeting Planned for December 4-6 in Sonoma, California –

The next SORCE Science Meeting – Physical Processes Linking Solar Variability with Global Change – is scheduled for December 4 – 6, 2003 in Sonoma, California. The SORCE meeting dates have been selected to accommodate people wanting to attend the AGU meeting, which is the following week in San Francisco.

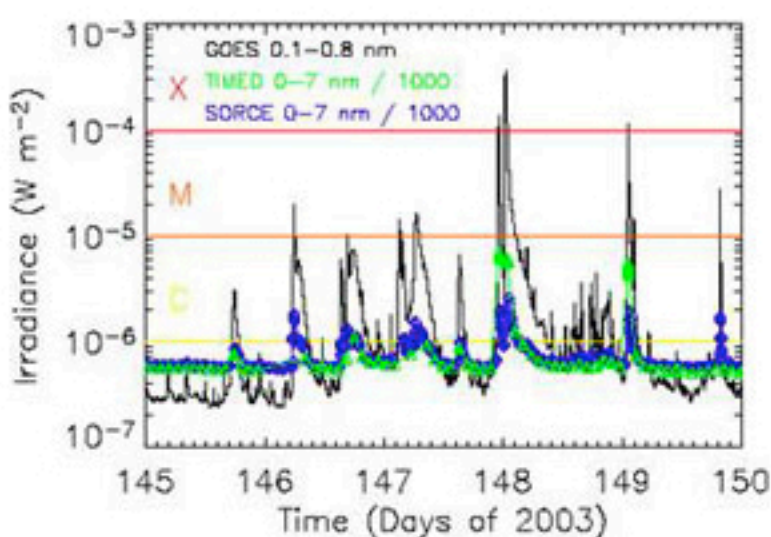
The meeting will be devoted to our understanding of the physical processes that connect the Sun's radiation and its variability to our terrestrial environment, including the processes that cause this solar forcing and the mechanisms that cause solar variations. The agenda will consist of both invited and contributed oral presentations and posters.

We encourage your attendance and hope that you will share this announcement with colleagues. It is available with additional information on the SORCE website at <http://lasp.colorado.edu/sorce/Dec03ScienceMeeting.html>. Final meeting information will be available in early August and will include an agenda, abstract forms, registration forms, and meeting logistics. If you are interested in receiving additional information on this meeting, please e-mail Vanessa George ([vanessa.george@lasp.colorado.edu](mailto:vanessa.george@lasp.colorado.edu)), so we can keep you informed.

### Solar Storm Occurred End of May –

On May 26 a series of solar storms began which lasted 5 days, peaking on May 27th, SORCE's 148th day in orbit. These storms produced a few X-class flares and halo coronal mass ejections (CMEs) sending significant energy to Earth. SORCE's XPS instrument is very valuable in measuring the short wavelength disturbances caused by these flares. Solar flares are classed as extreme (X), moderate (M), or smaller (A-C) where each class is an order of magnitude for the 0.1-0.8 nm irradiance. These particular flares were significantly larger than what has been seen in the past few years, measuring X3.6 on May 28. These large X-class flares occur only every few years. The last storm producing flares this large was on July 15, 2000. Solar storms and flares can ultimately affect our daily lives with disturbances to communication and navigation systems that rely on satellites and Earth's ionosphere for operation.

While most flares are only observed in the X-rays, there are some large flares that affect many UV emissions and are even observable in the visible. The XPS instrument detects the solar X-ray flares easily and serves as an indicator for when the other SORCE measurements might include flare information.



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*The Sun was especially active between days 146 and 151 (May 26-31, 2003) when several large flares occurred on the Sun. This figure shows that the solar X-ray radiation (0.1-7 nm) changed by more than a factor of 10 for a couple of these flares. The data include SORCE XPS 0.1-7 nm irradiance, TIMED SEE 0.1-7 nm irradiance, and GOES 0.1-0.8 nm irradiance. Most of this flare energy is absorbed in the atmosphere below 100 km, so the photochemistry affected by these flares include NO and H2O, which in turn affect the O3 chemistry in the mesosphere.*

### Upcoming Meetings

*SORCE scientists plan to present papers or attend the following 2003 meetings:*

- SCOSTEP Intl. Solar Cycle Studies Symposium 2003, June 23-28, Tatranska Lomnica, Slovakia
- IUGG Assembly 2003, June 30-July 11, Sapporo, Japan
- SPIE - Optical Science and Technology, Aug. 3-8, San Diego, California
- Radiometric Calibration Conference, Sept. 15-18, Logan, Utah
- SORCE Science Team Meeting, Dec. 4-6, Sonoma, California
- AGU Fall Meeting, Dec. 8-12, San Francisco, California

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