



Mission Update –

It has been three months since SORCE was launched! SORCE continues to make excellent daily solar and stellar observations, and the solar data are received two times each day. The biggest challenge currently is the task of verifying the four instruments calibrations and data processing software, so the measurements are truly valid and ready for the science community.

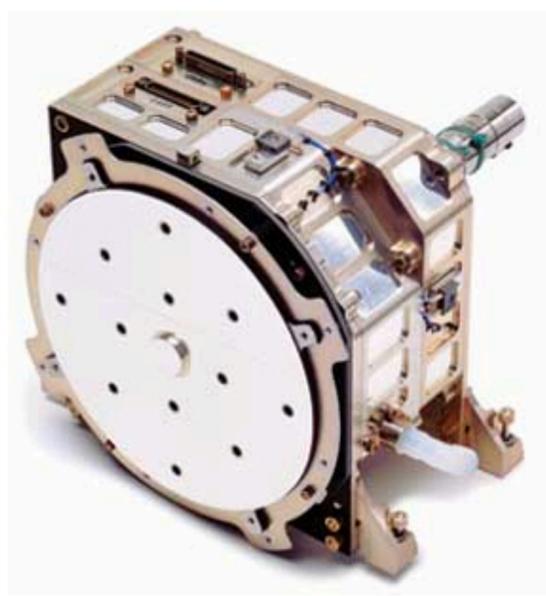
Instrument Status –

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.

As expected, each instrument is experiencing its own unique set of anomalies that requires further research. One step at a time, the instruments and data products are being fine-tuned to maturity, where the end result will be an accurate set of solar measurements.

A Closer Look at the XPS Instrument –

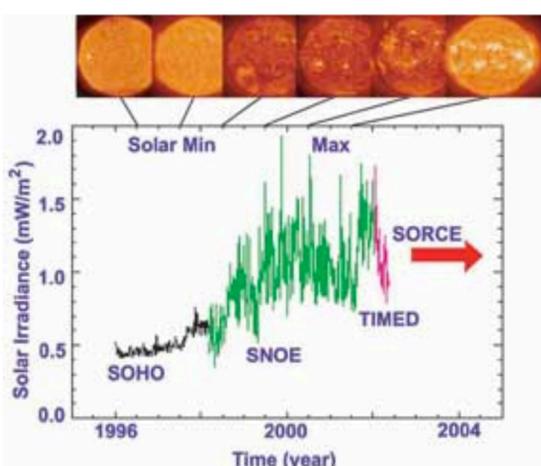
This newsletter explores the preliminary data results from the XPS (XUV Photometer System) instruments. The XPS measures the solar soft X-ray (XUV) irradiance from 1 to 34 nm and the bright hydrogen emission at Lyman- α (121.6 nm). The solar XUV radiation is emitted from the hot, highly-variable corona on the Sun, and these high-energy photons are a primary energy source for heating and



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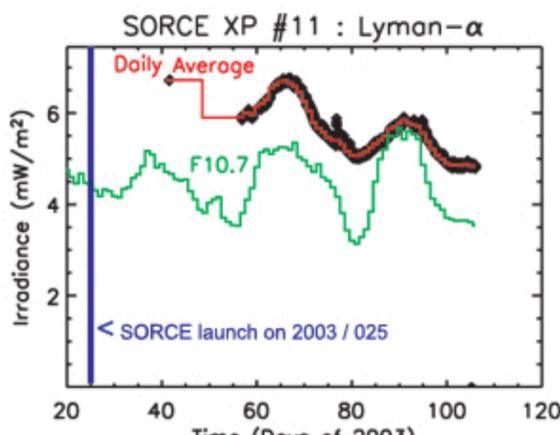


ionizing Earth's upper atmosphere. The following images and captions were submitted by Tom Woods, XPS Instrument Scientist.

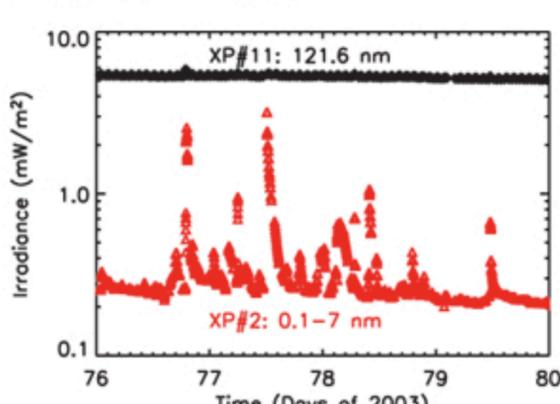


Time series of XUV radiation through the onset of solar cycle 23. Images at the top are obtained in bright helium emission at 30.4 nm by the SOHO EIT. These images indicate how different the Sun looks and behaves in the XUV compared to the visible. Sunspots, which are dark in the visible, are associated with strong magnetic fields that appear bright in the corona. Data shown here are from different wavelength bands, but scaled to SNOE 2-7 nm data. THE SORCE XPS measurements will continue this time series into the declining phase of the current solar cycle.

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There have been three solar rotations during the SORCE mission, of which the last two solar rotations have been observed continuously by the SORCE instruments. This figure shows the time series of the bright solar Lyman- α emission at 121.6 nm from the SORCE XPS and also shows the 10.7 cm radio flux (F10.7) that is often used as a proxy for the solar UV radiation. The XPS values are preliminary results as validation is still in progress.



The Sun was especially active between days 2003/076 and 2003/079 (Mar. 17-20) 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 changes are less, as expected, for the solar UV radiation, showing an increase of about 10% for the Lyman- α emission during the large flare on day 2003/076. 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.

Spacecraft Status –

All spacecraft systems are performing exceptionally well. The spacecraft is in its nominal Sun pointing mode.

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Mission/Science Operations Center –
The Operations Center has two contacts per day with SORCE between 8 a.m. and 10 p.m. Two staff people (one professional and one student) are on hand to receive the data and to make sure the outgoing commands are sent. The SORCE spacecraft and instruments generate approximately 120 Megabytes (MB) of raw telemetry data per day. Since the launch, these data are routinely delivered to the Goddard Space Flight Center for permanent archival. Delivery activities continue to operate smoothly, with minor adjustments being made to associated science data processing software to improve performance and diagnostic capabilities.

Weekly Status Report –
SORCE team members are producing a weekly SORCE Status Report to document progress during the mission. It summarizes the spacecraft activity, ground contacts, the instrument measurements, spacecraft and instrument planning, and data processing. This report is available on the SORCE web site at <http://lasp.colorado.edu/sorce>.

SORCE Team Member Retired –
It's official! George Lawrence celebrated his retirement with family, friends, and co-workers at a dinner in his honor on March 31st. Pictures from the evening are available on the LASP website at lasp.colorado.edu/general_information/lawrence_retirement.html. Fortunately for LASP, George is very interested in SORCE data analysis and we plan to see him back at LASP part-time after a relaxing break.



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SORCE Instrument and Data Validation Workshop –

A SORCE Instrument and Data Validation Workshop is set for April 28-30 in Boulder. Sessions will take place at LASP and at the NCAR Foothills Laboratory facilities. The workshop will focus on SORCE first results and plans to refine data processing and validate the irradiance data. Conveners, Greg Kopp and Jerry Harder have put together an exciting program where scientists will be reviewing the SORCE instrument data and validation methods along with concurrent mission instrument activities. Speakers are scheduled to present talks on the data collection for ACRIM III, DIARAD, ERBE, SOLSPEC, SBUV/2, SUSIM, UARS, and TIMED. Through collaboration on validation campaigns, attendees will ensure the solar irradiance measurements are making the most significant contribution possible towards the universal use of these important data products. In addition, an overview of SORCE data availability and access will be given so that other mission scientists will have access to SORCE results.

Upcoming Meetings

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

- SORCE Instrument and Data Validation Workshop, April 28-30, Boulder, Colorado
- AAS, Solar Physics Division, June 16-20, APL, Laurel, Maryland
- 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, Fall 2003, location – tbd
- AGU Fall Meeting, Dec. 8-12, San Francisco, California

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