



#### Meetings

SORCE is tentatively scheduling a Science Meeting July 9, 10, 11 2001 at the Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado. We would like feedback from SORCE Science Team Members on the proposed dates for the meeting. Please contact [kathy.lozier@lasp.colorado.edu](mailto:kathy.lozier@lasp.colorado.edu)  
Gary Rottman, Tom Woods, and Greg Kopp, attended an EOS IWG meeting in Ft. Lauderdale, Florida on January 30 to February 1. The SORCE QED (Quarterly Executive Dialog) was held at LASP January 30, 2001, and resulted in a positive evaluation for SORCE.

#### SORCE January 2001 Project Summary

Visitors from TRW Corporation attended the SORCE January Monthly Review to obtain an overview of the SORCE experiment and the LASP working environment, in order to evaluate possible future joint endeavors with LASP.

The EOS SORCE mission is scheduled for a launch date of July 2002. The SORCE program is on schedule and within budget. No mission descopes are envisioned at this time.

The SORCE Red Team has been redefined, and the Aerospace Corporation will now assume the role. The Red Team will attend all major SORCE reviews and make recommendations to SORCE based on their observations. SORCE and the Aerospace Corporation met January 23-24 to develop SORCE FTA (fault tree analysis), FMEA (failure modes and effects analysis) and PRA (probability risk assessment) documents. The Aerospace Corporation was favorably impressed with the SORCE program's electrical engineering, design redundancy, and ability to acquire science data.

SORCE continues to closely monitor and adjust schedules for instrument fabrication to respond to changing priorities and availability of facilities during fabrication and test. There are currently two major delays to spacecraft development, one is the 3 to 6 week delay in the delivery of the instrument bench, and the other is a 2 to 4 month delay in the SORCE receiving transponder. SORCE Team Members attended the Alenia Transceiver Critical Design Review in early February and so far, the late delivery of the transceiver has not directly impacted the bus I & T schedule.

The SORCE budget contingency continues to be depleted, largely due to the high cost of parts and outside electronic board manufacture. To date, SORCE contingency has been able to accommodate these rising costs.

Schedule slack time in the SORCE program is an ongoing concern. SOLSTICE slack has dissipated, due to the late delivery of flight subassemblies. The calibration plan for SOLSTICE is undergoing reevaluation, and rescheduling may recover time. SIM schedule slack is also small. An effort is un-

derway to acquire additional calibration support for SIM. All aspects of SIM manufacture are monitored daily.

The overcrowding of test facilities for all SORCE instruments is a problem. SORCE has scheduled testing facilities at Ball Aerospace, reworked testing schedules and purchased additional bench test equipment in order to alleviate this situation. The question of IFOG (gyros) for the spacecraft is still an issue. The IFOG manufacture and reliability has been considered a risk to mission success. Orbital has constructed a study to determine ACS control system performance in the absence of IFOGs. It appears that the SORCE spacecraft could still fly with the ACS system if the IFOGs failed or were removed from the spacecraft. Mass models of SIM, SOLSTICE A and B, and TIM have been shipped to Orbital.

#### TIM Status

Excellent progress has been made on TIM. All TIM parts are at LASP except for the kinematic mounts. TIM apertures are flyable, but measurements do not yet have an absolute accuracy of 25 ppm. Continued work on stray light scattering and internal reflections is ongoing.

#### SIM Status

SIM is being readied for flight build and will require 8 weeks for completion. A build plan has been devised and partial assembly and testing has begun.

#### SOLSTICE Status

The SOLSTICE instrument is also in the processes of integration, calibration and testing. Mechanical/optical integration is complete and imaging performance meets or exceeds requirements. Flight detector integration and GCI integration is finished. Flight grating drive shortterm repeatability and accuracy exceed requirements, but the grating drive exhibits sensitivity to external disturbances, and fixes are under consideration.

#### SORCE Data System Status

SORCE database traceability and reproducibility model has been completed. The managed data product software layer is nearly completed, and is now being used by other programmers as the basis for developing data product code. The Java Database interface layer has been enhanced in the last month, and is now utilized for algorithm development. The direct IDL interface of the Sybase database is complete and in the maintenance cycle. Telemetry ingest is undergoing initial testing. The conversion of SOLSTICE algorithms from UARS is almost finished. Ancillary services development is nearly done. SORCE has ongoing monthly telecons with ESDIS (Earth Science Data and Information System). The Memo-randum of Understanding between SORCE and



ESDIS has been officially signed off. The SORCE-ESDIS Interface Control Document draft has been submitted, and a final version will be submitted in the coming months. Earth science data type and data product short names have been submitted to DAAC for review and Level 4 (modeled 1nm irradiances) data product will be added to the interface control document for delivery to DAAC.

SORCE OASIS PS (operations and science instruments support planning and scheduling) is still ahead of schedule. A functional SORCE OASIS PS application exists and is capable of generating partial science plans. Generic planning capabilities are complete and tested as well as design and requirement of expert schedulers and constraint checkers. The Operations Concept Document is maturing in parallel with OASIS-PS development activities.

#### Mission Operations Status

Mission Operations are moving into high gear. An updated RF ICD has been received from GSFC and more comments are due 2/14/01. An initial draft of the PSLA has been received and the next draft release is 2/15/01. OASIS-CC development continues and is ready and for initial MU command testing. The computer security plan documents were sent to Goddard review the first week of February and evaluation meetings are scheduled at GSFC for the week of February 21, 2001. The first set of C and T Database Transfer files has been received from Orbital and ingested into the SORCE database.

#### Microprocessor Unit Status

The SSI (standard serialized interface) command for the FPGA (field programmable gate array) has been partially completed and delivered for software test. The final design should be released to software testing by February 23, 2001. The SSI telemetry FPGA design is in process and should be delivered to software test by March 16, 2001. The MU power distribution board engineering model has been delayed but work is progressing and full integration into the engineering model is expected by the end of February 2001. The flight unit parts are in house and flight testing should be complete by March 15, 2001. The GCI (generic channel interface) engineering model boards are complete and tested. Flight board fabrication has begun. Flight Software PCIIO hardware integration is underway, 1553 communications are on flight hardware, and the instrument commands and telemetry will follow. The GCI software

driver is complete and ready for test. The inflight patch mechanism design is on the SORCE website for review. The implementation of command/telemetry items has begun.

#### Digital Signal Processor Status

The DSP (digital signal processor) SOLSTICE grating drive control is fully functional. The PID (proportional integral derivative) is being fine tuned for operational agility and robustness. The DSP (digital signal processor) code has been fully tested. The interface between the FPD (Fery prism drive) and the DSP board is working on SIM.

#### Spacecraft Systems

Spacecraft system progress is good. The MICD, (mechanical interface control document), required for fairing fabrication, has been signed. Payload handling, site facilities and processes, and hydrocarbon monitoring at storage and hot pad facilities have been reviewed. An integrated thermal model of the spacecraft bus and the SORCE instruments is in process, as well as the operational constraint analysis. The routing and stuffing of the SORCE instrument module harness is underway at Orbital and LASP. Power, mass, bandwidth and memory budgets have adequate margins.

#### Orbital News

Developments from Orbital on the spacecraft bus follow. The CEU EDU (Central Electronics Unit Engineering Development Unit) was delivered to flatsat and test is being repeated on the CEU EDU. This test had been previously run on GALEX hardware. The battery CPV's have been bought off and the APE EDU (attitude power electronics engineering development unit) has completed test. The bus harness mockup is complete and the preliminary CDR transceiver material was reviewed Feb. 7, 8, 2001. Avionics production delays are starting to require work-arounds in order to meet schedule. The EDU fine sun sensor head failed shock test. A redesign is in work. A GALEX (Galaxy Evolution Explorer) battery is not available to SORCE and other options are being researched. PRE (power regulator electronics) evaluation is still ongoing per NASA request.

#### Information Submission:

Each month SNS will present mission progress, highlights, and news. If you have any information to distribute to the SORCE Team, contact [Kathy.Lozier@lasp.colorado.edu](mailto:Kathy.Lozier@lasp.colorado.edu), and we will include it in the next month's issue of SNS.