



Meetings

Conferences attended by SORCE scientists during June 2001 were:

- Greg Kopp: Joint AGU Meeting and AAS Solar Physics Division Meeting, May -June 2001 Boston, Massachusetts (posters presented)
- Greg Kopp, George Lawrence, Chris Pankratz, Tom Woods: International Solar Cycle Studies 2001-Solar Variability, Climate and Spaceweather June 2001 Longmont, Colorado (papers and posters presented)
- Tom Woods: Third Thermospheric/Ionospheric Geospheric Research (Tiger) Symposium, June 12, 2001 LASP, University of Colorado, Boulder, CO (co-chair)
- Gary Rottman: Workshop on the Evolving Sun and Its Influence on Planetary Environments June 2001 Granada, Spain (papers and posters presented)

SORCE Science Team Meeting July 9, 10, 11, 2001 at the Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado has been postponed.

HESSI Launch, initially scheduled for June 7, Kennedy Space Center, was postponed indefinitely. SORCE plans to attend the rescheduled HESSI launch to learn and prepare for the future SORCE launch.

The SORCE Fairing Fit Check, originally scheduled for June 18, Chandler, Arizona has been rescheduled for July 10-11, 2001.

FOG ACS Review, June 28, Orbital, Dulles, Virginia

SORCE scientists plan to present papers or attend the following 2001 meetings:

- IAGA Session on Solar Variability August 2001 Hanoi, Vietnam
Calcon 2001 September 2001 Logan, Utah
- NewRAD October 22-25, 2001 Gaithersburg, Maryland.
- A SORCE Calibration Workshop will be held immediately following the NewRAD conference on October 26, 2001 in Gaithersburg, Maryland. Please contact Greg Kopp, greg.kopp@lasp.colorado.edu, phone: 303-735-0934 for information.

SORCE May 2001 Project Summary

The SORCE Program is on schedule and within budget. Launch is scheduled for July 31, 2002. Some scheduling slack is low and contingency funding as well, but both factors require careful monitoring. No descopes are required at this time, but removal of the IFOG "gyros" ACS component from the SORCE spacecraft is still under consideration. A review will be held June 28, 2001 at Orbital to evaluate the potential descope. The descope of the IFOG ACS components from the SORCE spacecraft may reduce mission risk.

The top nine concerns facing the SORCE program are defined below.

1. Spacecraft transceiver: Some time has been recovered in the late delivery of the spacecraft transceiver from Alenia, (an Italian company), as some essential export clearances and transceiver parts have been obtained earlier than promised. Despite these promising events, the transceiver will still be delivered 2 months late.
2. Instrument Integration. The instrument integration schedule has been reworked and workarounds employed to allow instrument integration to continue despite the lack of some key components to the build process. The spacecraft bench was received in May and installed on the Flotron in the LASP clean room. Instruments previously integrated on a flat temporary harness will soon be transferred to the SORCE spacecraft bench.
3. The XPS FPGA (Field Programmable Gate Array) issue has not yet been resolved. A total replacement of the FPGA may be required, and schedules are under development to meet this situation if needed. The cause of the FPGA failure may have been excessive voltage. Earlier speculation regarding the FPGA failure focused on faulty manufacture.
4. SIM slack is still very tight. Progress has been excellent, and daily monitoring of SIM status has allowed for quick scheduling response to the changing needs of the SIM build. The additional personnel and much overtime are helping to resolve the time situation on SIM. Extra efforts continue.
5. SORCE budget contingency has been used to maintain schedule and cover unforeseen electronics costs. GSFC and Bill Ochs, SORCE NASA Mission Manager, are helping to provide needed funds to the SORCE program. Cost estimates and schedules are being revised. Program descope evaluations are underway.
6. Test facilities are crowded. Additional facilities at Ball Aerospace have been rented, test schedules are constantly reworked, and additional bench test equipment has been purchased to remedy the situation. The Moby vacuum chamber in the LASP cleanroom has been upgraded and enlarged in response to this situation.
7. ACS IFOG descope evaluations are underway, as mentioned earlier in the newsletter. The removal of the IFOG from the SORCE spacecraft may help to reduce overall mission risk.
8. A potential launch conflict may develop between ICESat and SORCE launch dates. If the ICESat launch is delayed to within 4 months of the SORCE launch, LASP mission operations may be adversely affected. To alleviate potential staffing problems, additional LASP mission operations personnel are in training, and additional funds are being sought to upgrade and supplement current LASP Mission Operations equipment.



Risk scenarios are under development to plan for any consequences that could develop from the potential launch overlap.

9. A problem was discovered in the Interpoint 5V flight power converters. The converters deliver a 10V transient power spike at instrument turn on. This power spike may harm sensitive instrument electronic components. The faulty flight power converters seem to originate in a single manufacturer's lot. Flight power converters are long lead items to purchase and replacement could impact all instrument build schedules. GSFC is helping to evaluate the faulty parts, and the quoting and purchase of replacement parts is underway. The converter problem must be fully defined, affected parts must be identified, damaged and new parts must be tested, and, if necessary, replacement parts must be installed. This could prove to be a lengthy process. The faulty parts may have damaged SOL-STICE A and B, and the XPS instrument electronics.

Instrument Status

XPS is totally assembled and awaiting the outcome of the FPGA analysis. Faulty Interpoint 5V flight power converters may have affected XPS electronics. The instrument will undergo evaluation to determine the impact of the Interpoint 5v flight power converter to its functioning. The TIM instrument parts are 99% complete and all tests except environmental test have been completed. The faulty flight power converters did not affect TIM, because they had not yet been placed in TIM equipment. Further TIM testing may be delayed until different flight converters can be purchased, or a decision is made regarding the use of Interpoint 5v flight converters from a different lot. New TIM door motors are arriving from Ball Aerospace. In addition, TIM vacuum door seals must be perfected. New lubricants are being tested for superior sealing abilities, and a new and heavier door may be designed to replace the current TIM door, which bends under the pressure necessary to completely vacuum seal the door.



Tim Instrument

SIM mechanical parts are 98% fabricated. SIM electrical parts are 66% complete. The assembly of SIM is well under-way, and additional shifts may be added to meet assembly schedule demands.



SIM ESR Electrical Substitution Radiometer

SOLSTICE A and B electrical parts are 96% complete and electrical parts are 90% complete. The SOLSTICE instrument is basically complete except for the Interpoint 5V flight converter

problem. Additional research on the functionality of the SOLSTICE g-tube has been completed.



SOLSTICE Instrument

Microprocessor Unit (MU) progress has been good. 75% of the mechanical parts are complete, and 55% of the electrical parts are complete. MU Software Coding is well underway. The SIM task is 50% complete and little work remains on the SOLSTICE, TIM and XPS. An estimated 44 days of work remains for the completion of all coding processes.

The MU to the GCI (Generic Channel Interface) harness installation is complete. Final bonding should take place the week of June 26, 2001 and the integration with the EMU (Engineering Microprocessor Unit) as well. LPT's (Limited Performance Testing) with TIM, SOLSTICE and XPS should follow.

Systems Status

Aerospace Corporation delivered the SORCE FMEA/FTA/PRA (Failure Modes and Effects Analysis, Fault Tree Analysis, and Probabilistic Risk Assessment) final results. SORCE residual risks are acceptable. The minimum success probability is 93.2% at 1.5 years, and full mission success probability is 72.8% at 5 years. The most significant risk to the SORCE mission is the single string RAD 6000. The PRE (Power Regulator Electronics) shunt card is the most significant contributor of residual risk for the spacecraft bus.

MU and MUFWS Status

Overall progress has been good. The EMU has been fully integrated and is in software testing. Eliminations are in process to identify bugs and eliminate them. Most flight instrument boards are complete or nearly complete. Instrument interface testing will resume when the Interpoint 5V power converter problem has been resolved. The GCI (Generic Channel Interface) command telemetry accepts command and produces instrument and software status telemetry. The initial DSP loading is complete, but command and telemetry needs to be integrated. The MU analog/digital converter integration is complete and all PCIIO functionality is complete. RAD6000 exceptions and data can be trapped and recorded. Five days of PCIIO stress testing revealed bugs, PCIIO EEPROM read errors, and PCIIO command buffer bit flips. These problems were identified and isolated. A single hardware issue may be causing these glitches and the search for a common solution is underway. New CTSIM (Command and Telemetry Simulators) hardware are experiencing functional difficulties. Ongoing work with the CTSIM vendor should bring the units to operational status soon enabling further test. Despite tribulations, SORCE progress has advanced and we remain on schedule, and ready to circumvent setbacks with effort and solutions.

Please contact kathy.lozier@colorado.edu for information submission.