



Meetings

SORCE is planning a Science Team Meeting July 9, 10, 11 2001 at the Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado.

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

- Workshop on the Evolving Sun and its Influence on Planetary Environments June 2001 Granada, Spain.
- International Solar Cycle Studies 2001-Solar Variability, Climate and Spaceweather June 2001 Longmont, Colorado
- IAGA Session on Solar Variability August 2001 Hanoi, Vietnam

SORCE April 2001 Project Summary

The EOS SORCE Mission remains on schedule and within budget. However, virtually all slack time for build, spacecraft integration, and test is dwindling, as are contingency funds. All schedules, manufacturing costs and test facilities are carefully monitored and adjusted on a daily basis to meet the ongoing requirements of the SORCE program.

Happily, the extra vigilance and planning has alleviated some situations, and aided others.

On March 28, 2001, Dr. Doug Rabin, new SORCE Deputy Project NASA scientist, met with Dr. Gary Rottman, SORCE PI to discuss the progress of the SORCE program, and Dr. Rottman also met with Dr. Micheal King (NASA EOS Project Scientist) to discuss funding for SORCE for the years 2002 and beyond.

Dr. Myriam Adda, joined the LASP SORCE Mission Team April 23, 2001, as a Research Associate. Dr. Adda will be working with Dr. Jerry Harder on the calibration and characterization of the SIM (Spectral Irradiance Monitor) instrument. Dr. Adda worked on her Ph.D. at the French Space Agency. The objective of her Ph.D. was to design the on-board scientific software for a French satellite, COROT, which deals with stellar seismology and the search for new planets. To obtain this objective, Dr. Adda studied, documented and modeled the perturbations of the instrument, (attitude, stability, CCD sensors) and the instrument environment (thermal variations, diffused light, radiation effects). In addition, Dr. Adda developed the test bench used to test and characterize the CCD sensors for COROT.

SORCE Mission Operations Status

The SORCE Mission Operations Review (MOR) was successfully completed April 23-24, 2001. Eight RFA's (requests for action) resulted from the review.

Two RFA's were for Orbital and dealt with modes/states and the wiring of battery cells, one was directed to NASA regarding the completion of the Project Service Level Agreement, and three RFA's were directed to LASP/SORCE. The three dealt with launch critical assets, launch dispersion analysis, and a possible ICESat/SORCE launch conflict. Realistic launch dates must be obtained to enable smooth launch coordination and mission operation planning among other NASA missions, such as AQUA and ICESat, and mission control operations at LASP, who will control both SORCE and ICESat. Two RFA's were directed to LASP/Orbital and they dealt with the FOG (gyros) review and FDC (failure detection and correction). The SORCE Mission Operations security plan is accepted, security scans have been planned, and closed IO (input/output) connections should be available in early May, 2001. NASA continues to work on three PSLA issues, the costing of the FDF (flight dynamics facility), the price of voice and data lines and the statement of work for the USN (Universal Space Network). The USN site in Santiago, Chile has been removed from the SORCE LEOP (launch and early orbit phase) and routine operations plan. This will affect operating hours for receiving data from the SORCE satellite. It was stated, that considering the costs for "renting" USN facilities, perhaps SORCE/LASP should consider building a tracking station of their own. It appears that a cost comparison is worth investigation.

TIM Status

As was stated in last month's newsletter TIM saw "first light" March 29, 2001. All TIM "bugs" are reported, tracked and recorded. Everything but the vacuum doors seal, and the vacuum door assembly is being remachined to accommodate a larger O-ring, in hopes of gaining a solid seal. Thermal model refinements predict excessive solar heating so an MLI (multilayer insulation) heat shield is being installed in front of TIM. Electrical noise and gain testing is in progress and improvements have been made in grounding. The photodiodes were replaced with a superior set. TIM STIM has been tested. The TIM DSP and MU are in initial functional testing, learning curves on the generic channel interface and the digital signal processor have been overcome, and remaining performance glitches are being ironed out. TIM still needs to pass vacuum test, and temperature regulation (PID filter) coefficients for cone and heat sink need to be refined. TIM must undergo environmental testing and thermal vacuum testing with temperature regulation. Post thermal characterizations for noise, standard watt measurement, TIM STIM, and heliostat excitation are planned.



SIM Status

First light tests for SIM have been conducted. Spectrum was measured through all focal plane diodes. Further study is ongoing concerning the focal properties of the spectrometer. Wavelength calibration performed well in the prism and diodes and a mercury spectrum was obtained. Scans on the mercury spectrum will be repeated to check for stray light and compared to SOLSTICE mercury scans, for accuracy. The CCD failure has been resolved by Goddard Space Flight Center. GSFC could not duplicate the failure, and a malfunctioning resistor may have been the initial cause failure. The suspect CCD has been demoted to a flight backup because of excessive handling. CCD boards are at an outside vendor for fabrication. ESR (electrical substitution radiometer) characterization is a bit behind schedule. The SIM ESR code needs test, the calibrator system is ready for assembly, the sunshade is at NCAR for fabrication. Internal harnessing is underway, and work is ongoing for the vacuum feedthroughs, internal bus board, and mechanism flight wiring. The vacuum door is ready for assembly. Final work on the kinematic mounts is underway, and housekeeping thermistors need to be added to the case.

SOLSTICE Status

SOLSTICE is well into testing. Flight instrument assembly and alignment are complete. LASP optical mechanical functional testing, LASP pre-environmental test calibration, and SURF Calibration #1 "A" is finished. Instrument (mechanical, optical, grating drive and detector assemblies) end-to-end testing is complete and the instrument performance meets or exceeds requirements on the bench. Thermal/vacuum test to test alignment stability is complete. Characterization, loose ends resolution, and adjustments continue.

XPS Status

Last month XPS was essentially built, except for testing. Environmental test and FOV (field of view), tests are now done. XPS/MU interface testing is underway. It seems that some investigative work is needed on the FPGA (flight programmable gate array) due to a nonperforming component. A JPL tiger team has been assembled to evaluate the part, and recommend resolution.

SORCE Systems Status

A MIWG (Mission Integration Working Group) was held April 4-5, 2001 at the Pegasus Rocket facility in Chandler, Arizona. It was determined that a Stage 3 camera is too expensive to implement on SORCE. The SORCE fairing and avionics deck are in house at the Chandler Rocket facility.

The instrument module harness is 90% routed and the instrument module MGSE (mechanical ground support equipment) cradle is being fabricated at NCAR (National Center for Atmospheric Research) and Zimmerman, an outside vendor, and the EGSE (electrical ground support equipment) rack is in use. The thermal XPS status analysis is complete pending internal review, and the TIM analysis is in process. The SORCE FMEA (failure mode and effects analysis), FTA (fault tree analysis) and PRA, (probability risk assessment) have been delivered to the Aerospace Corporation for review. The Aerospace Corporation is the parent body of the SORCE Red Team. OASIS-CC development end-to-end testing has resulted in the complete verification of command and telemetry functionality. XPS testing is complete on the flight instrument, TIM testing is in progress, SIM, SOLSTICE, and MU CSTOL scripts and procedures are 80% complete. Functional testing will follow after end-to-end testing is complete. Module testing will follow functional testing. Additional requirements may become evident after the instrument functionals are complete. Power, mass and memory budgets are adequate, but instrument mass margin has been consumed. Measured values of power should be obtained in the near future, as well as mass measured values.

ORBITAL Status

Recent accomplishments include the fabrication of a new bench (due to damaged laminate) and bearing cups (due to a tolerancing error) and the successful completion of the primary structure. The APE EDU (attitude power electronics engineering development unit) was tested with the box EGSE (electrical ground support equipment) and the unit was delivered to Flat Sat (test flat satellite). Twenty-five of thirty-two flight cards are complete. A successful Solar Array CDR was held and solar array substrates have been sent to SpectroLab for cell population. Shock test of the EDU fine sun sensor was successful following rework for prior test failure. RWE (reaction wheel electronics) vibration failure has been resolved and corrective action is underway. Orbital hosted a TIM (technical interface meeting) with LASP to review the SORCE bus integration and test schedule in light of structure delays. Orbital has reduced their thermal vacuum test schedule from 18 1/2 cycles to 8 cycles to accommodate the late delivery of spacecraft components, and to meet I&T schedules. Flat Sat SDVF (software development and verification facility) is underway. Work has begun on the ECP (engineering change proposal) for spacecraft gyroless mode implementation.

Information Submission:

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