

## SORCE Weekly Status Report – 8/20/2009 to 8/26/2009

### 1. Introduction

This status report addresses the performance of the SORCE spacecraft, instruments, and ground assets during the week of Thursday, August 20, through Wednesday, August 26, 2009.

### 2. Spacecraft Summary (submitted by Deb McCabe, August 27)

08/20	08/21	08/22	08/23	08/24	08/25	08/26
232	233	234	235	236	237	238

On 2009/231, AGO declared that their connection to the MOC was down, and no real-time telemetry monitoring or commanding could be performed. The spacecraft was commanded in the blind through TDRSS to dump the VR's to the AGO station twice, after the first AGO pass was blown. Additional TDRSS contacts were scheduled to load the ATS and IM products.

The daily plots for EPS from the data on DOY 230 indicated that bus voltage minimums were oscillating unexpectedly. Upon further investigation, CPV4 was found to have degraded significantly over the previous 10 days, starting on ~2009/220, and it was only noticeable after enough degradation occurred. The additional TDRSS contacts occurred in full eclipse, and given the high eclipse duration, the lowest voltage reached was 23.04V. This is 0.04V away from the new UV2 limit in TMON 42/49, 23.0V. This was set per SOACR-535 on 2009/226. Below is a more detailed sequence of events surrounding the near-UV2 event.

2009/232-00:00:04 – Eclipse enter  
2009/232-00:02:59 – RTS 101 commanded from the MOC to turn on the TX in low-rate configuration  
2009/232-00:03:16 – AOS with TDRSS (1 of 2)  
2009/232-00:24:00 – LOS with TDRSS (1 of 2)  
2009/232-00:28:20 – AOS with TDRSS (2 of 2)  
2009/232-00:34:49 – Bus voltage reaches value of 23.08V  
2009/232-00:34:54 – Bus voltage reaches value of 23.04V  
2009/232-00:34:55 – Eclipse exit  
2009/232-00:35:03 – TX Emergency Off button pressed by CC in MOC, LOS with TDRSS (2 of 2)

Given the above sequence of events, SORCE was 0.04V and approximately 10 seconds away from a UV2 incident. The TX Emergency Off would likely not have prevented UV2. If the eclipse had been a few seconds longer, UV2 would have occurred. CPV4 degradation is being monitored and Under Voltage risk mitigation efforts are being investigated.

There is a gap in the spacecraft housekeeping data between 2009/233-22:36:47 and 2009/233-22:47:28 due to VR2 being filled.

There were five MU read zero event this week.

2009/232-00:18:55  
2009/233-03:17:16  
2009/234-02:02:21  
2009/234-20:10:41  
2009/238-08:06:58

GCI lockups:

Instrument	Lockup Time	Response Time	Duration	Lat	Lon
solstice_a	2009/232-19:13:24	2009/232-19:58:01	44.62	-37.8	-52.6
solstice_a	2009/233-16:05:38	2009/233-17:00:26	54.80	-24.1	-47.0
solstice_a	2009/234-16:26:03	2009/234-17:17:06	51.05	-32.9	-40.4
solstice_a	2009/236-10:26:12	2009/236-11:22:03	55.85	-28.7	28.5
solstice_a	2009/236-20:29:30	2009/236-21:04:45	35.25	-31.0	-31.8
solstice_a	2009/237-13:57:02	2009/237-14:53:05	56.05	-31.1	-26.4
solstice_a	2009/237-17:14:22	2009/237-18:07:19	52.95	-35.8	-63.2
solstice_a	2009/237-19:04:46	2009/237-19:44:27	39.68	-35.6	-29.7
solstice_b	2009/232-15:49:35	2009/232-16:43:42	54.12	-22.5	-39.0
solstice_b	2009/234-13:07:27	2009/234-14:02:48	55.35	-25.1	-6.4
solstice_b	2009/234-16:22:15	2009/234-17:17:01	54.77	-26.3	-53.8
solstice_b	2009/234-21:39:39	2009/234-22:08:21	28.70	-23.8	-22.5
solstice_b	2009/236-11:58:47	2009/236-12:59:05	60.30	-20.1	-10.0
solstice_b	2009/236-13:36:51	2009/236-14:36:12	59.35	-22.2	-31.8
solstice_b	2009/236-22:08:27	2009/236-22:41:48	33.35	-27.6	-49.7
solstice_b	2009/237-15:40:44	2009/237-16:30:07	49.38	-38.9	-24.2
solstice_b	2009/238-14:10:45	2009/238-15:09:53	59.13	-28.1	-42.8
sim_a	2009/232-14:07:01	2009/232-14:34:24	27.38	-10.4	-29.8
sim_a	2009/232-17:32:58	2009/232-17:48:40	15.70	-34.0	-41.4
sim_a	2009/233-16:01:37	2009/233-16:28:33	26.93	-15.6	-58.8
sim_a	2009/233-17:41:45	2009/233-18:05:41	23.93	-22.0	-74.8
sim_a	2009/233-21:19:04	2009/233-21:50:11	31.12	-33.2	-30.3
sim_a	2009/234-14:40:18	2009/234-15:08:30	28.20	-16.3	-43.7
sim_a	2009/234-16:23:34	2009/234-16:45:39	22.08	-28.8	-49.3
sim_a	2009/234-21:37:11	2009/234-22:06:51	29.67	-28.6	-30.7
sim_a	2009/235-20:14:26	2009/235-20:17:11	2.75	-30.6	-20.6
sim_a	2009/236-13:34:00	2009/236-14:05:54	31.90	-16.0	-40.1
sim_a	2009/237-15:40:07	2009/237-16:00:34	20.45	-38.6	-26.4
sim_b	2009/232-19:13:49	2009/232-19:25:53	12.07	-38.2	-50.8
sim_b	2009/232-21:10:34	2009/232-21:33:37	23.05	-20.4	3.2
sim_b	2009/233-17:44:08	2009/233-18:05:46	21.63	-27.0	-66.9
sim_b	2009/233-19:27:56	2009/233-19:42:54	14.97	-37.0	-66.4
sim_b	2009/234-13:07:52	2009/234-13:31:27	23.58	-25.7	-5.3
sim_b	2009/234-14:41:58	2009/234-15:08:35	26.62	-19.9	-38.9
sim_b	2009/234-18:06:54	2009/234-18:22:53	15.98	-37.6	-49.8
sim_b	2009/235-00:53:16	2009/235-01:21:11	27.92	-24.9	-73.7
sim_b	2009/235-16:42:12	2009/235-17:02:57	20.75	-34.0	-47.8
sim_b	2009/235-23:29:06	2009/235-23:31:35	2.48	-29.4	-67.5
sim_b	2009/236-15:18:50	2009/236-15:43:09	24.32	-31.4	-39.9
sim_b	2009/237-13:51:58	2009/237-14:23:29	31.52	-21.7	-42.9
sim_b	2009/237-19:03:38	2009/237-19:15:00	11.37	-36.8	-33.8
sim_b	2009/237-22:24:49	2009/237-22:29:21	4.53	-25.9	-57.2
sim_b	2009/238-21:03:01	2009/238-21:09:53	6.87	-26.1	-43.3
tim	2009/232-01:46:33	2009/232-08:03:19	376.77	-19.8	-59.5
tim	2009/232-19:16:03	2009/232-19:23:13	7.17	-39.5	-40.9
tim	2009/233-17:44:50	2009/233-18:03:06	18.27	-28.2	-64.7
tim	2009/234-16:25:09	2009/234-16:43:05	17.93	-31.6	-43.5
tim	2009/236-22:10:01	2009/236-22:41:43	31.70	-24.7	-44.8
tim	2009/237-12:12:21	2009/237-12:43:38	31.28	-16.0	-25.9
tim	2009/237-13:52:30	2009/237-14:20:49	28.32	-22.7	-41.4
tim	2009/237-15:31:45	2009/237-15:57:59	26.23	-27.0	-59.2
XPS	2009/232-22:45:32			-24.6	-27.7
XPS	2009/236-15:15:55			-26.1	-50.2
XPS	2009/236-16:56:47			-32.7	-61.6
XPS	2009/237-13:51:18			-20.3	-44.9
XPS	2009/238-00:06:10			-16.8	-68.7
XPS	2009/238-12:29:31			-19.9	-31.2
XPS	2009/238-22:41:22			-23.5	-63.9

	SIM A	SIM B	SOL A	SOL B	TIM	XPS*
Week	11	15	8	9	8	7
Total	2084	2655	1439	1716	2307	2158

### 3. Ground Support / Contact Summary (submitted by D. McCabe)

Sixteen ground station contacts were performed over the past week, including three blind acquisitions. Five TDRSS contacts were performed as blind acquisitions to support the command sequence loading, and the recorder dumps.

VCDU statistics do not include the data that was lost on board the spacecraft. Statistics represent the data that was sent from the spacecraft and captured by the ground.

	Captured VCDUS	Recorded VCDUS	%
SC housekeeping	319201	319202	100
IM housekeeping	43931	43932	100
Science	316190	316192	100

### 4. Instrument Status

#### 4.1. TIM (submitted by Greg Kopp, 27 August)

##### TIM operations during previous week

- Normal Ops (TSI data w/ Cavity B)
- Cavity A&B comparisons
- Gain AB Calibration \*

##### Current work

- Normal operations
  - Version 9 data processing provides daily updated TSI values

##### TIM anomalies during previous week

- Missing data from 16 August in current release due to Data Processing problems to be resolved soon.
- \* Instrument lockup prevented Gain AB Calibration from returning useable data.

#### 4.2. SIM (submitted by Jerry Harder, August 27)

For days 2009/232 (Aug. 20) to 2009/239 (Aug. 27):

• Calibration Activities:	<u>SIM A</u>	<u>SIM B</u>
-- Prism Calibration A_cal_B	25	25
-- Prism Calibration B_cal_A	25	25
-- CCDDump	2	2
-- Image Dark	1	0
-- Image Light	1	1
-- Servo Gain 20 sec half cycle	2	2
-- Servo Gain 50 sec half cycle	1	1
-- Cruciform Scans	0	0
-- FOV Maps	0	0
• Science Activities:	<u>SIM A</u>	<u>SIM B</u>
-- ESR Full Scan Segments	0	0
-- ESR Table Scan Segments	7	0
-- 24-minute Scans	14	0
-- 24-minute Scans w/ HRT	1	1
-- IR scans	7	0

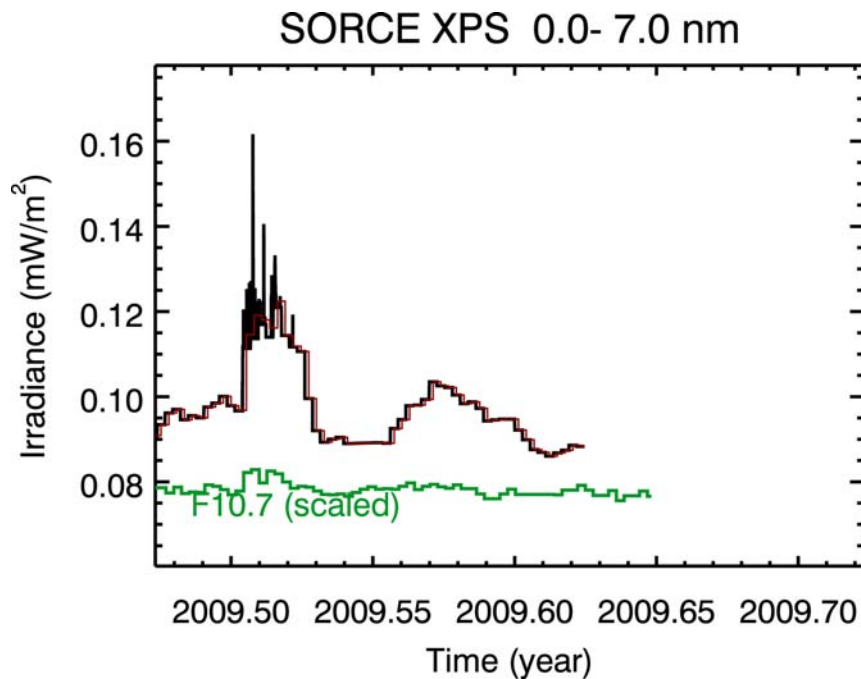
### 4.3. SOLSTICE

The SORCE database system is temporarily down while revisions are made to better handle the 2 terabytes of SORCE data. The system will be back up next week.

### 4.4. XPS (submitted by Tom Woods, 26 August)

For days 2009/226 (August 14) to 2009/237 (August 25):

- Number of XPS GCI errors: 13
- SORCE XPS Data Gaps: None
- SORCE XPS Calibration Experiment Duration:  
1121.00 sec (19 integrations) at 2009/226 12:20
- Flares: None above class M1.0



### 5. Planning (automated report submitted by Jay Kominek, August 27)

***Plans completed 20 August – 27 August:***

#### **SORCE Spacecraft**

<b>Activity</b>	<b>Total</b>	<b>Total Time</b>
Solar Rolls	408	12:57
Stellar Rolls	457	12:42
Ram Avoidance	0	0:00
Solar Alignment	4	1:09
Stellar Alignment	0	0:00
Field of View Maps	0	0:00
FSS Calibration	0	0:00
Station Contacts	17	3:13
GCI Checks	826	0:13
State Vector Upload	7	0:21
MU Checksum	1	0:12

### **SIM A (Primary)**

<b>Solar Activity</b>	<b>Total</b>	<b>Total Time</b>
ESR Mode	7	5:15
ESR Mode with HRT	0	0:00
IR Scan	7	7:12
Quick Scan	14	5:39
Quick Scan HRT	1	0:24
<b>Calibration Activity</b>		
Fixed Wavelength	0	0:00
Servo Gain Calibration	2	1:20
Solar Alignment	0	0:00
Field of View Map	0	0:00
Prism Calibration	0	0:00
Image Light	1	0:06
Image Dark	1	0:05
ESR Full Scan	0	0:00
Dark	30	0:22
<b>Special Activity</b>		
Power Cycle Checks	209	13:56

### **SIM B (Secondary)**

<b>Solar Activity</b>	<b>Total</b>	<b>Total Time</b>
ESR Mode	0	0:00
ESR Mode with HRT	0	0:00
IR Scan	0	0:00
Quick Scan	0	0:00
Quick Scan HRT	0	0:00
<b>Calibration Activity</b>		
Fixed Wavelength	0	0:00
Servo Gain Calibration	2	1:20
Solar Alignment	0	0:00
Field of View Map	0	0:00
Prism Calibration	0	0:00
Image Light	1	0:06
Image Dark	1	0:05
ESR Full Scan	0	0:00
Dark	2	0:01
<b>Special Activity</b>		
Power Cycle Checks	207	13:38

### **SOLSTICE A (MUV)**

<b>Solar Activity</b>	<b>Total</b>	<b>Total Time</b>
Normal Scan	93	74:43
Quick Scan	41	11:42
Mini Quick Scan	36	10:15
<b>Stellar Activity</b>		
Fixed Wavelength	0	0:00
Companion	0	0:00
Stellar Scan	0	0:00
Zero Order Scan	0	0:00
Number Unique Targets	0	0:00
<b>Calibration Activity</b>		
Filter Calibration	1	1:02
Fixed Wavelength	0	0:00
AB Comparison	1	1:01
Mini 64 Scan	7	7:12
MUV Solar Alignment	0	0:00
FUV Solar Alignment	0	0:00
MUV Stellar Alignment	0	0:00

FUV Stellar Alignment	0	0:00
MUV Field of View Map	0	0:00
FUV Field of View Map	0	0:00
<b>Special Activity</b>		
Power Cycle Checks	104	4:28
Step Response Test	1	0:02

### **SOLSTICE B (FUV)**

	<b>Total</b>	<b>Total Time</b>
<b>Solar Activity</b>		
Normal Scan	96	82:56
Quick Scan	42	7:59
Mini Quick Scan	35	6:48
<b>Stellar Activity</b>		
Fixed Wavelength	434	19:45
Companion	72	4:10
Stellar Scan	14	1:48
Zero Order Scan	418	12:20
Number Unique Targets	44	40:26
<b>Calibration Activity</b>		
Fixed Wavelength	0	0:00
AB Comparison	1	1:01
Mini 64 Seam	7	7:12
MUV Solar Alignment	0	0:00
FUV Solar Alignment	0	0:00
MUV Stellar Alignment	0	0:00
FUV Stellar Alignment	4	0:36
MUV Field of View Map	0	0:00
FUV Field of View Map	0	0:00
<b>Special Activity</b>		
Power Cycle Checks	104	4:37
Step Response Test	1	0:02

### **TIM**

	<b>Total</b>	<b>Total Time</b>
<b>Solar Activity</b>		
Normal Solar	99	103:07
Normal Eclipse	101	53:17
<b>Calibration Activity</b>		
Degradation A	1	1:05
Degradation C	1	1:05
Aliveness D	0	0:00
Gain Calibration AB	1	6:00
Gain Calibration CD	0	0:00
Solar Alignment	2	1:12
Field of View Map	0	0:00
<b>Special Activity</b>		
Power Cycle Checks	201	8:39

### **XPS**

<b>Calibration Activity</b>		
Calibration	0	0:00

Since December 2005, XPS is activated for a continuous 1-min integration at filter wheel position 6 (0.1-18 nm range) and only has a monthly calibration experiment.

## 6. Data Processing Summary

**TIM** (submitted by Doug Lindholm, 20 Aug 2009)

- Status
  - Version 9 routine processing is ongoing.
  - Version 9 TSI data are available on LISIRD, the SORCE web site, and the GES DISC with the new LASP ASCII file format.
  - Dark irradiances have been processed and are being evaluated
- Work in progress
  - Preparing for version 10 reprocessing.
  - Code modifications (generalizations) to support Glory TIM data processing.
- Future Plans
  - Field of view analysis and pointing correction.

**SOLSTICE** (submitted by Doug Lindholm, 20 Aug 2009)

- Status
  - Version 10 reprocessing is underway, applying the new degradation corrections to the version 9 level 2 data.
  - Routine data processing is producing version 9 level 3 FUV and MUV SOLSTICE data products. These are available on the SORCE web site and LISIRD.
  - MgII index is being produced routinely and is available on the SORCE web site.
- Work in Progress
  - Debugging shift in wavelength correction.
  - Evaluating tasks for version 11 reprocessing.
  - Filter experiment analysis to Improve dead time correction and filter transmission.
- Future Plans
  - Analysis of instrument misalignment calibration.
  - Analysis of level 3 uncertainties.
  - Improved Jan 2006 slit anomaly correction.
  - Improvement of field of view maps.

**SIM** (submitted by Doug Lindholm, 31 July 2009)

- Status
  - The routine processing of version 17 data is ongoing.
  - The level 3 data products are available on the SORCE web site and LISIRD.
- Work in Progress
  - Calibration to improve the quality of early mission data.
  - Testing of new SIM exposure time algorithm.
- Future Plans
  - Process SIM B.
  - Investigate UV degradation.
  - Consider field of view correction for data affected by the filter wheel anomaly.

**XPS** (submitted by Brian Templeman, 20 Aug 2009)

- Version 9 XPS data are being routinely reprocessed and released.
- The safe-hold events in January did not appear to affect data quality.
- SORCE XPS Data Processing Statistics for 2009/208 to 2009/214
  - Total level 1b Observations Processed: 21583
  - Percent used in level 2 Processing: 67.9007
  - Total level 3 Observations Processed: 14655