SDO HMI Internal Weekly On-Orbit Report

Week of Monday, March 14, 2011 through Sunday, March 20, 2011

Summary

HMI successfully performed their weekly calibrations on Tuesday, March 15th (flatfield observation mode-1) and on Wednesday, March 16th (flatfield calibration/observation mode-2, detune, reduced focus sweep) using timed scripts. The heater zone 7 temperature has been dropping a couple degrees lower than the other thermal zones during eclipses, so the lower deadband was raised in an attempt to stabilize the temperatures. However, it was found that the cycling in heater zone 7 caused by the tighter deadbands was detrimental to the instrument pointing, so the deadbands were widened back to their previous setpoints.

Eclipse season continued this week. During the eclipse on March 16th, the AIA ATA 3 ISS was updated to use the PZT MAX offset range. ATA 3 controls the spacecraft pointing, so this adjustment affected HMI's PZT voltages as the PZT legs were offset to accommodate the pointing shift. On March 17th, a leg adjustment was performed in order to bring the PZT voltages back within a safe range. HMI is performing nominally.

Calibrations

Calibration	Date/Time	Script	Ran by	Notes
Flat field (observation mode-1)	15-Mar-11 18:27 UT	2701	Timed Script	
Detune	16-Mar-11 18:27 UT	2703	Timed Script	
Flat field (observation mode-1)	16-Mar-11 18:35 UT	2701	Timed Script	
Flat field (calibration mode)	16-Mar-11 18:43 UT	2702	Timed Script	
Reduced Focus Sweep	16-Mar-11 18:51 UT	2704	Timed Script	

Loads

None

Thermal Adjustments

1. **Heater Zone 7 Deadband Adjustments**
   Summary:
   The zone 7 temperature has been dropping a couple degrees lower than the other thermal zones during eclipses, so the lower deadband was raised in an attempt to stabilize the

temperatures. However, it was found that the cycling in zone 7 caused by the tighter deadbands was detrimental to the instrument pointing, so the deadbands were widened back to their previous setpoints.

Details:
14-Mar-2011 at 21:27:06 UTC
Author: Zoe & Emma

Changed the deadband high and low values to 20.5C and 19.5C at around 18:15 UT for Zone 7 but noticed the heaters seemed to be cylcing. We increased the deadband high to 21.0C (about 21:10 UT).

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14-Mar-2011 at 23:32:21 UTC
Author: Emma Lehman

Looking back at pre-eclipse season temperatures, zone 7 was running about 0.5 degrees above the target temperature, at around 21 degrees, so I am bumping the deadband high up to 21.5 degrees to avoid overnight cycling. This is about 0.4 degrees higher than the max temperature for zone 7 in the last 24 hours.

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17-Mar-2011 at 22:30:55 UTC
Author: Emma Lehman

Widened heater zone 7 deadbands back out to [19,22] (but the STOL really sets them to [19.2, 22.4]

S/C Calibrations/Maneuvers
None

Additional Operations

2. Eclipses

Eclipse season began on Thursday, March 11 at 07:00 UT. See below for summaries of HMI eclipse operations. Full details can be found at https://hmi.lmsal.com/doc?cmd=vcur&proj_num=HMI02960.

UT Date	Temp raise [zone1, zone2, zone3]	Focus Sweeps
3/15/2011	[8,8,6]	None

UT Date	Temp raise [zone1, zone2, zone3]	Focus Sweeps
3/16/2011	[8,8,6]	None
3/17/2011	[8,8,6]	None
3/18/2011	[8,8,6]	full & reduced
3/19/2011	[8,8,6]	None
3/20/2011	[8,8,6]	None
3/15/2011	[8,8,6]	None

3. Script 8999 Testing

Summary:

During the eclipse on March 16, script 8999 was tested. This script covers camera upset recovery; it sets gains/offsets/DACs back to nominal, then restarts standard sequence.

Details:

16-Mar-2011 at 06:50:48 UTC
Author: Paul Boerner

Once the eclipse started:
- Turned off the limits on hmiioc-mon to avoid waking everyone up for funny camera offset values

- Stopped the sequencer using
/HMI_SQ_OP OP=ABORT

- On hmiioc-cmd, sent the commands:
/HMI_CA_SETTINGS CAMERA=1 ADDRESS=0X1A00 VALUE=527
/HMI_CA_SETTINGS CAMERA=2 ADDRESS=0X1A00 VALUE=527
(these bump the H offset on each camera to a previously-unused value. The H offset is the last of the 8 gains and offsets to be adjusted on each camera by script 8999.)

- Restarted the sequence using
/HMI_RUN SCRIPT=9000

- Called script 8999. It put everything on the camera screen back where it belonged, and restarted the sequencer.

- Turn the limits back on on hmiioc-mon

I believe that constitutes a successful test of script 8999 on HMI; everything appears to be running smoothly, so I'll transfer the command link over to AIA and try the same test there.

4. **PZT Leg Adjustment**
   During the eclipse on March 16, the AIA ATA 3 ISS was updated to use the MAX offset range. ATA 3 controls the spacecraft pointing, so this adjustment affected HMI's PZT voltages as the PZT legs were offset to accommodate the pointing shift. On March 17, a leg adjustment was performed in order to bring the PZT voltages back within a safe range.

Instrument Anomalies
None

Limit violations
None

Clock Adjustments

Date/Time (UT)	HMI WRT ground (ms)	Adjustment
03/14/11 @ 18:15	+28 ms	HMI from 0x800275 to 0x800273
03/14/11 @ 21:03	+30.5ms	HMI from 0x800273 to 0x800272

Long term Trends

1. **Corrupt Image FSN 469769216 (0x1C001C000)**
   Occurrences this week: None
   Occurrences to date: 27

2. **Corrupt Image FSN 9175180 (0x008C008C)**
   Occurrences this week: None
   Occurrences to date: 2

Other

1. **ISS Error Noise**
   There have been regular, small spikes in the ISS Y error signal, up to around 125 DN, for the last few weeks. The noise is still unexplained and is currently being investigated. On the 14th, a zero crossing of Rotation Wheel 4 right before the eclipse caused temporary noise in the Z error up to around 300 DN.

2. **Script System Reporting Anomaly**
   It was discovered that the script system does not echo commands of >95 bytes to the info messages. This affects the OH_CONTROL (heater) commands, which usually exceed 95 bytes. A workaround has been tested and used in the AIA eclipse scripts: splitting the commands into two lines allows the heater commands to be echoed to the info messages, which is useful for remote monitoring of eclipse operations. HMI scripts have not yet been updated with this workaround.

3. **Solar RFIs**
   There were 2 Solar RFIs on Wednesday and Thursday this week. AIA saw no data dropouts.