

SECCHI Operations Update

1 Mar 2012

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SECCHI Operations Lead

SECCHI Notable Events 4/15/11 – 3/1/12 (1 of 2)

Description	A	B
Calibration Rolls	7	4
COR1/2 closed door cals (momentum dump)	9	9
Mechanism spin-timer tests	4	5
HI LED Calibration sequences	3	4
HI Linearity Calibration sequences	5	5

SECCHI Notable Events 4/15/11 – 3/1/12

(2 of 2)

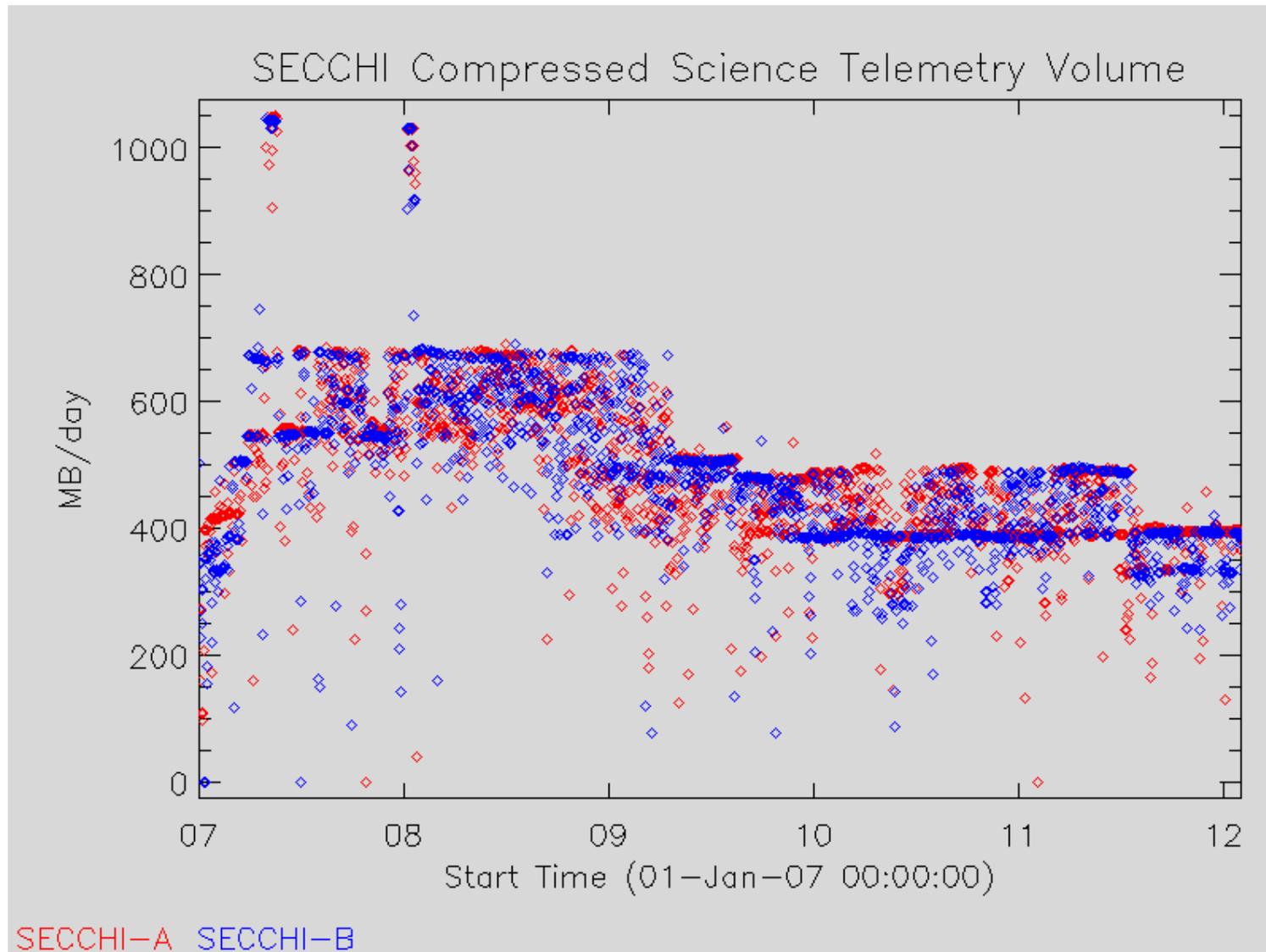
- **2011/04/25** Behind New stray light feature
- **2011/07/08** Ahe/Beh Start use of reduced size COR2 (1024x1024) and summed COR1 Total Brightness, when downlink requires it
- **2011/05/12** Behind Restarted CEB and SEB to clear interference pattern which turned out to be a ground processing artifact
- **2011/08/01-11** Behind Daily 135 deg roll of S/C for 2 hr to observe Comet Elenin in HI1 and HI2
- **2011/10/26** Ahead Change delay setting of Quadrant Selector motor
- **2011/12/15-16** Ahe/Beh EUVI subfield observations of Comet Lovejoy
- **2012/02/01** Behind Start CCW spintime tests on COR1 polarizer
- **2011/11/08 (Beh) & 2011/11/29 (Ahe)** Lossless EUVI images during calibration roll

Onboard CME Detection

Detection of CME in COR2 controlled by schedule of type DOUBLE exposures (30 min. cadence) and settings in threshold tables.

For year ending	Adet	Bdet	Acap	Bcap	Simdet
2008/03/01	6	6	0	0	4
2009/03/01	3	0	0	0	0
2010/03/01	3	0	1	0	0
2011/03/01	13	2	12	2	2
2012/03/01	108	50	64	36	45
Total thru 2012/03/01	133	58	77	38	51
Remainder thru 2012/03/21	7	11	6	6	6

SECCHI Science Telemetry Volume



SECCHI Image Statistics

- Totals by telescope, 2011/03/01-2012/03/01:

	Cor1A	Cor1B	Cor2A	Cor2B	EuviA	EuviB	Hi1A	Hi1B	Hi2A	Hi2B
N Images (not incl. SPWX)	334422	340852	60521	60894	248099	258721	13284	13436	4671	4717
Size (Raw GB)	33	33	29	27	68	71	22	22	10	10
Size (FITS GB)	172	175	407	388	1963	2045	54.3	54.8	20.4	20.5

Mission Totals (all telescopes):

Images: 7,137,507

FITS volume: 35.8 TB

Telemetry volume: 1019 GB

- For specific information about SECCHI telemetry statistics, use
IDL> sccgetinfo in SolarSoft

FSW Updates

- **FSW (unprotek) modified 1 time between April 11, 2011 and Mar 1, 2012:**
 - **5.16.03 (2012-01-31) B only: Required updates to COR1 polarizer spintimer script and autonomy rule set point. Also updated expostbb.igz, threshb.igz, imagetbl.igz to current versions.**
- **Table updates between April 11, 2011 and Mar 1, 2012:**
 - **Image processing table 2 updates: imagetbl.img,v 1.149 (2011/04/19)**
 - **Exposure table 2 updates: expostba.img,v 1.32 (2011/10/19) expostbb.img,v 1.44 (2011/10/18)**
 - **Event-detect threshold table 2 updates: thresha.img,v 1.47 and threshb.img,v 1.50 (2012/02/07)**
 - **Mask tables updated for one-time Comet Lovejoy observations (2011/12/14)**
 - **Autonomy rule table safettdb.img,v 1.12: COR1 zone 1 upper temperature limit raised from 45 to 55 deg to prevent potential trip during momentum dump.**

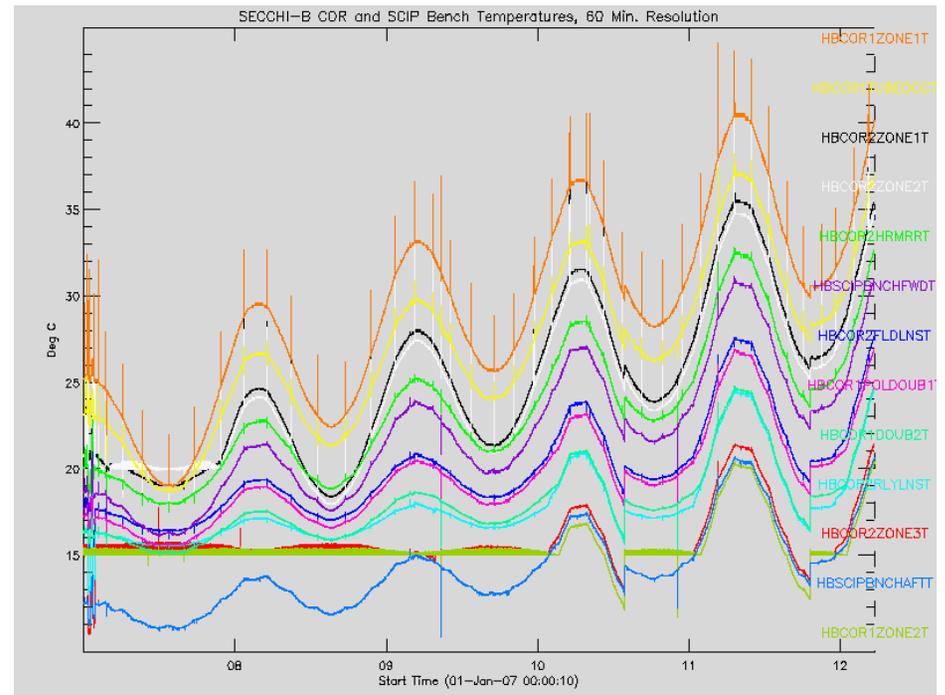
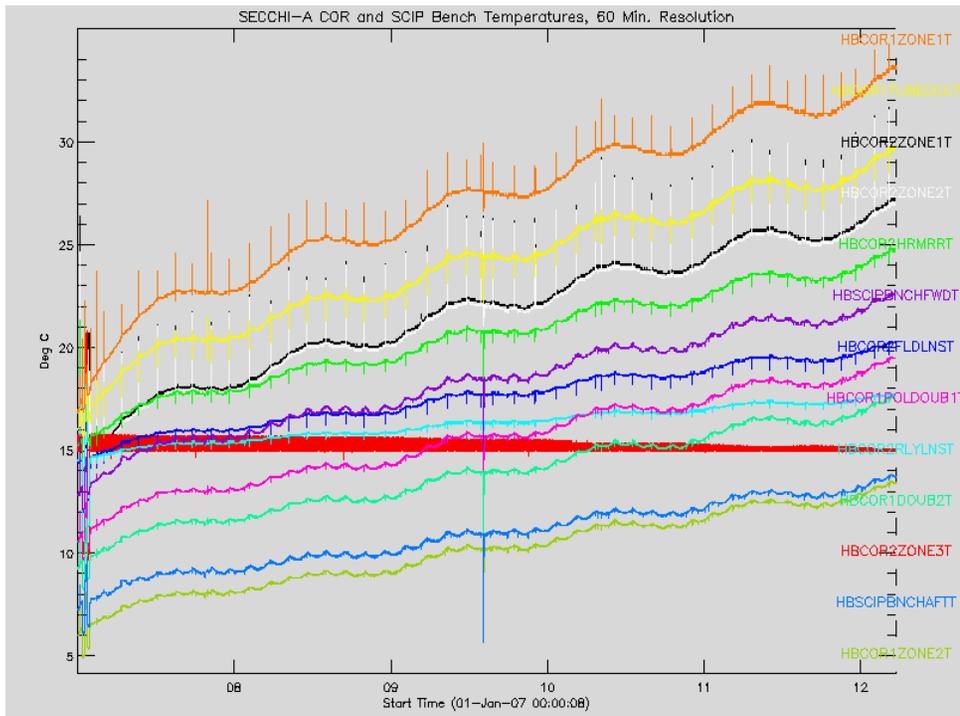
Processor Resets

- **SECCHI Electronics Box**

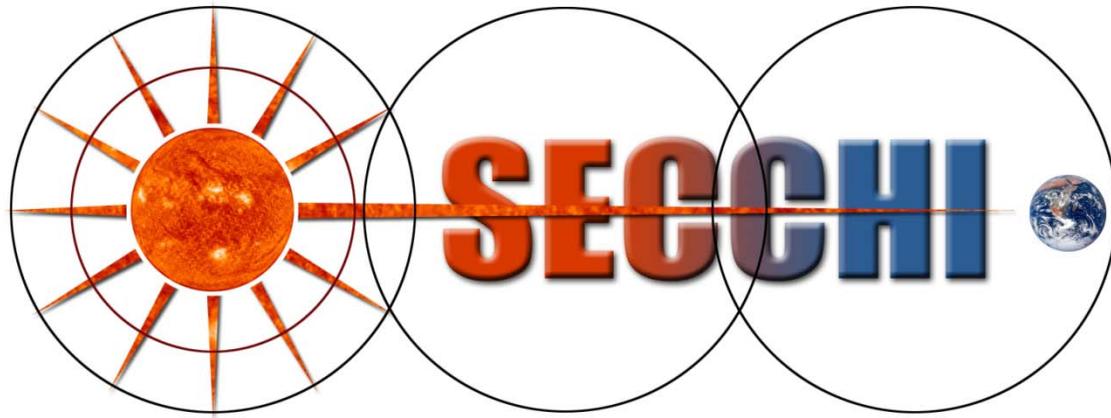
- **Watchdog Resets: “Random” resets of the 750 CPU of unknown origin, continue at approximately the same rate.**

For year	A	B
2007	5	4
2008	2	2
2009	8	5
2010	5	3
2011	5	1
Total thru 2012/01/01	25	15
Remainder thru 2012/03/21	2	0

Trends in Temperatures



- **Approximate 2-month periodicity of spikes in temperatures on both SECCHI-A and SECCHI-B corresponds to momentum dumps (door closures).**
- **Two trends apparent in most SCIP temperatures:**
 - **Annual variation (presumably) corresponding to solar distance (A: up to 1.5 deg, B: up to 9.4 deg)**

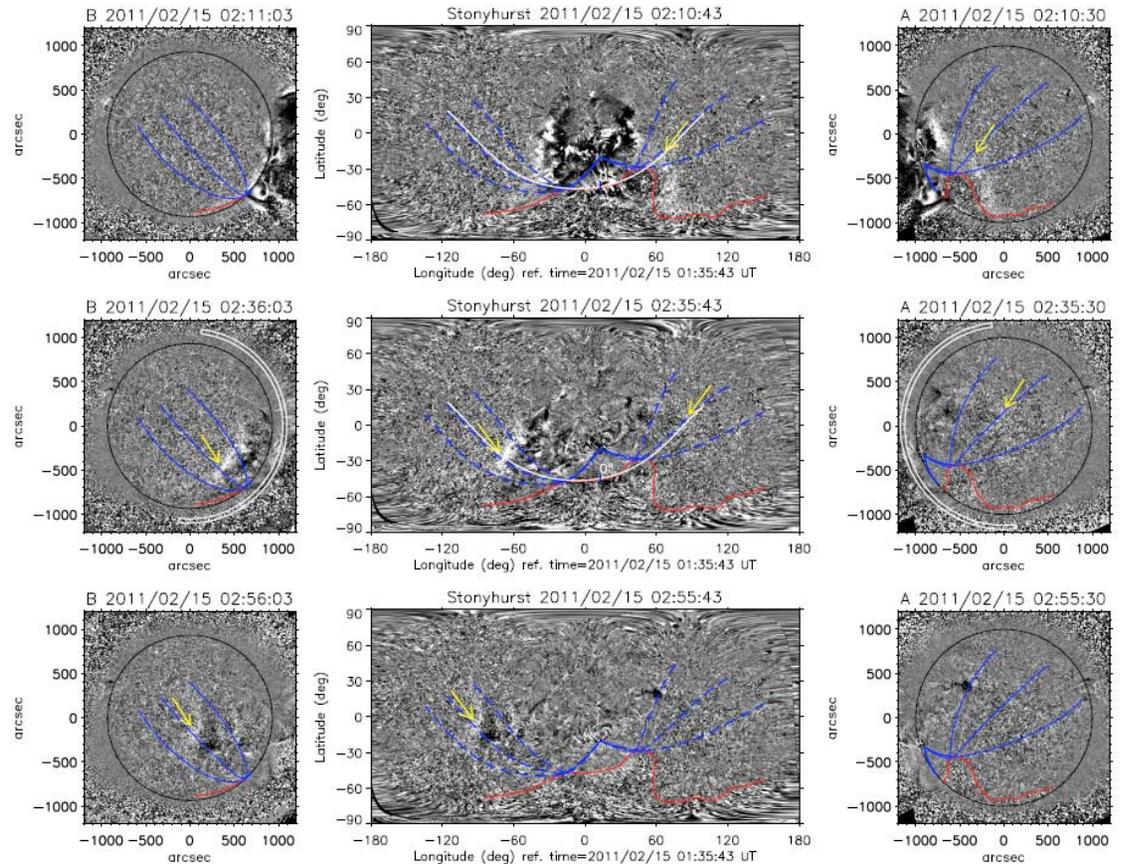


EUVI Status

Nariaki Nitta

Status

- The two EUVI telescopes continue to operate very well.
- The EUVI team is supporting the multi-team analysis on the Aug 1-5, 2010 events.
- Several EUV studies underway taking advantage of the full sun coverage.
- CME Trigger continues to work successfully.
 - The higher level of activity, and the successful operation of the event trigger has provided nice EUVI coverage of several events in spite of the lower telemetry rate in this phase of the mission.
- Great collection of EUV wave movies (AIA+EUVI) by N. Nitta: (http://www.lmsal.com/nitta/movies/AIA_Waves/)
 - Check it out!



360-deg view of an EUV wave. Both reflections at and transmission through the southern CH can be seen (Olmedo et al 2012).



COR1 Status

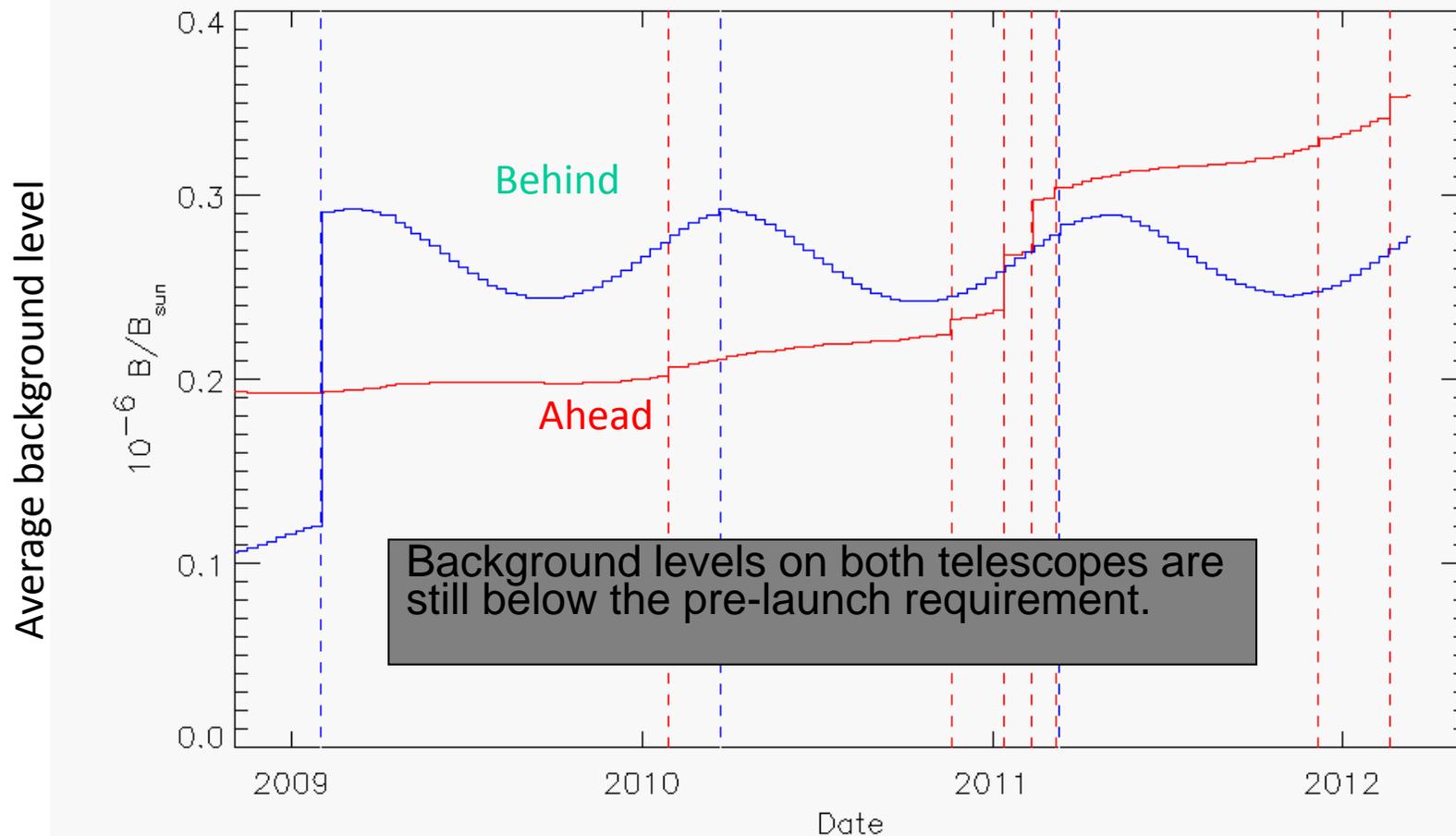
Bill Thompson

COR1 Operations

- *Standard operating mode is to bring down 3 polarizer angles (0°, 120°, 240°) to form both B and pB.*
- *Normal cadence is 5 minutes.*
- *Changed image format to 512×512 on 19 April 2009 due to decreasing telemetry rate (was 1024×1024).*
- *In July 2011, started bringing down some images as onboard summed B when telemetry volume is low.*
 - *Gives 5 minute cadence in B, 10 minute cadence in pB*
 - *Images are completely compatible—only difference in onboard summing.*
 - *Will be more common when telemetry rate is 120 kbps.*

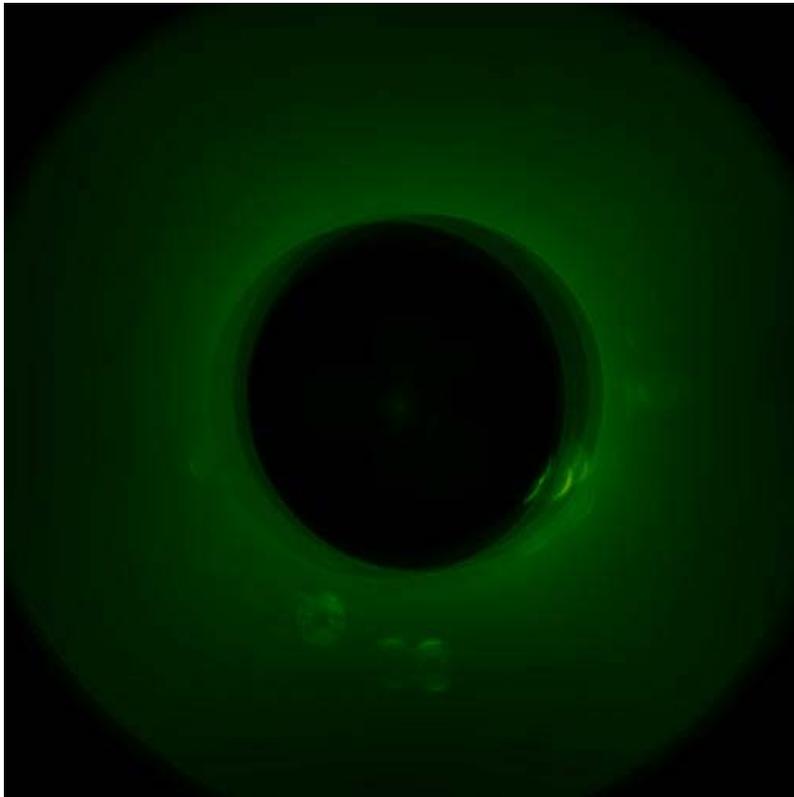
Particle events on COR1 objective

- There have been several events where new particles adhere to the COR1 front objective, changing the background level.
- This has happened twice recently on Ahead, plus two more very small events.



COR1-A Background Evolution

- A region in the background has been steadily growing since 2009.
- Only affects total brightness—pB is unaffected.
- Now understood to be caused by motion of the occulter, due to increased heating as it ages.



- Movie of COR1-A instrumental background from beginning of mission through end of 2011.
- Note motion of penumbral shadow of the occulter toward end of movie, coming out from behind focal plane mask.
- Exposure time adjusted from **1.7** to **1.5** on August 12, 2011
- Changed again to **1.0** seconds on March 16, 2012

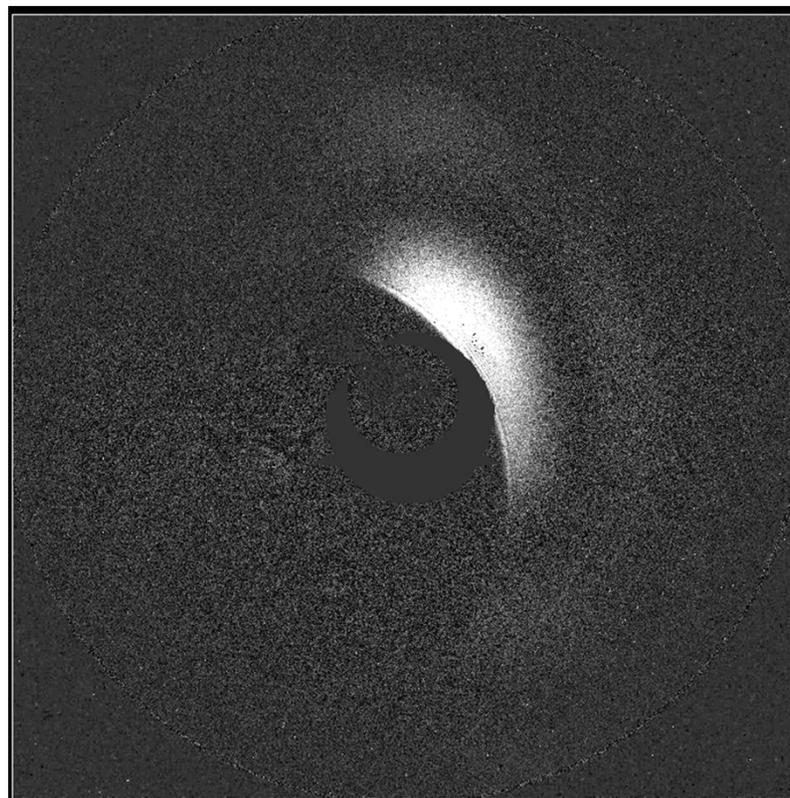


COR2 Status

Angelos Vourlidas

Instrument Status

- **Nominal**
 - Synoptic Observing Plan: 3 TB, 1 pB per hour
 - 2x2 binned (1024^2) images when telemetry is tight (starting on July 8, 2011).
- **Contamination Event #2:**
 - It occurred on 4/25/2011 18:24-18:39 UT.
 - Image is the ratio post/pre and is scaled between 1 and 1.02 (or 2%). The maximum increase is about 3% for some few pixels close to the occulter.
 - The particle must be somewhere close to the entrance aperture. There were no obvious particle or debris storms around that time.
 - This is the 2nd event for COR2-B. The first was on 1/25/2011.





HI-1/2 Status

C.J. Davis, A. Vourlidas

Status/ Research Highlights

- **Nominal**

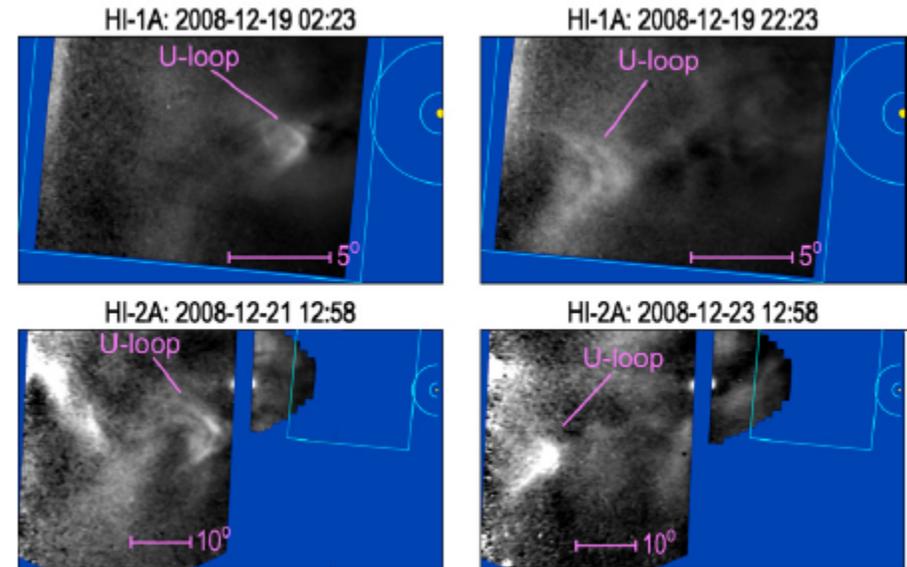
- Synoptic Observing Plan is unchanged.
- Photometric response stable to ~1% (Bewsher et al 2012).
- On-orbit photometric calibration for both HI1 is published (Halain et al 2012)

- **HI as a Space Weather tool.**

- CIR Arrival Prediction (Davis et al 2012):
 - HI j-maps can provide a prediction of CIR least 1 day ahead.
 - Such advanced warning can be provided from a spacecraft placed 40° ahead of Earth in its orbit.

- **HI and Open Magnetic Flux (DeForest et al 2012).**

- Disconnection rate of unsigned flux 6×10^{21} MX/yr.
- Corresponds to a change in the radial IMF at Earth of 0.2 nT/yr.



Programmatic - Other

- **New Data Products:**
 - Production of EUVI A-B wavelet-enhanced images for the whole mission under way (3/20/12 – 11/2009 as of 3/27/12).
 - AIA is now treated consistently within secchisoft.
 - Many enhancements in secchisoft routines, especially movie-making routines.
- **Science.**
 - Two NRC postdocs, one LWS Postdoc Fellow, and a part-time postdoc (shared with GSFC) at NRL.
 - Two students (high school, undergrad) supported last summer.
 - Rouillard left the SECCHI team for a permanent position in Toulouse.
 - SECCHI ops team continues to provide essential support in software development and maintenance.
- **Heliophysics In Situ Science Workshop (Sep 18-21, 2012 @ APL).**
 - Even more imaging/in-situ collaborative science opportunities. Don't miss it!