SECCHI Operations, Data Processing, and Archive Status

STEREO SWG
October 27, 2009
Meredith, NH

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And the rest of the NRL Team

Instrument Status

- **Mechanisms**
  - **A mechanism calibration is done every few months to check timing in performing standard operations.**
  - **All mechanisms are nominal.**
- **CCDs**
  - **Calibrations are done periodically (every few months).**
  - **No deviations from nominal performance**
- **SECCHI Electronics Box**
  - **Watchdog Resets: “Random” resets of the 750 CPU of unknown origin. S/C-A reset #12 occurred on 20 Aug 2009. B reset #10 on 19 Oct 2009.**
- **Flight SW**
  - **Current revision is 5.14.00 on both A and B, loaded August 2009 to improve beacon images from HI-2.**

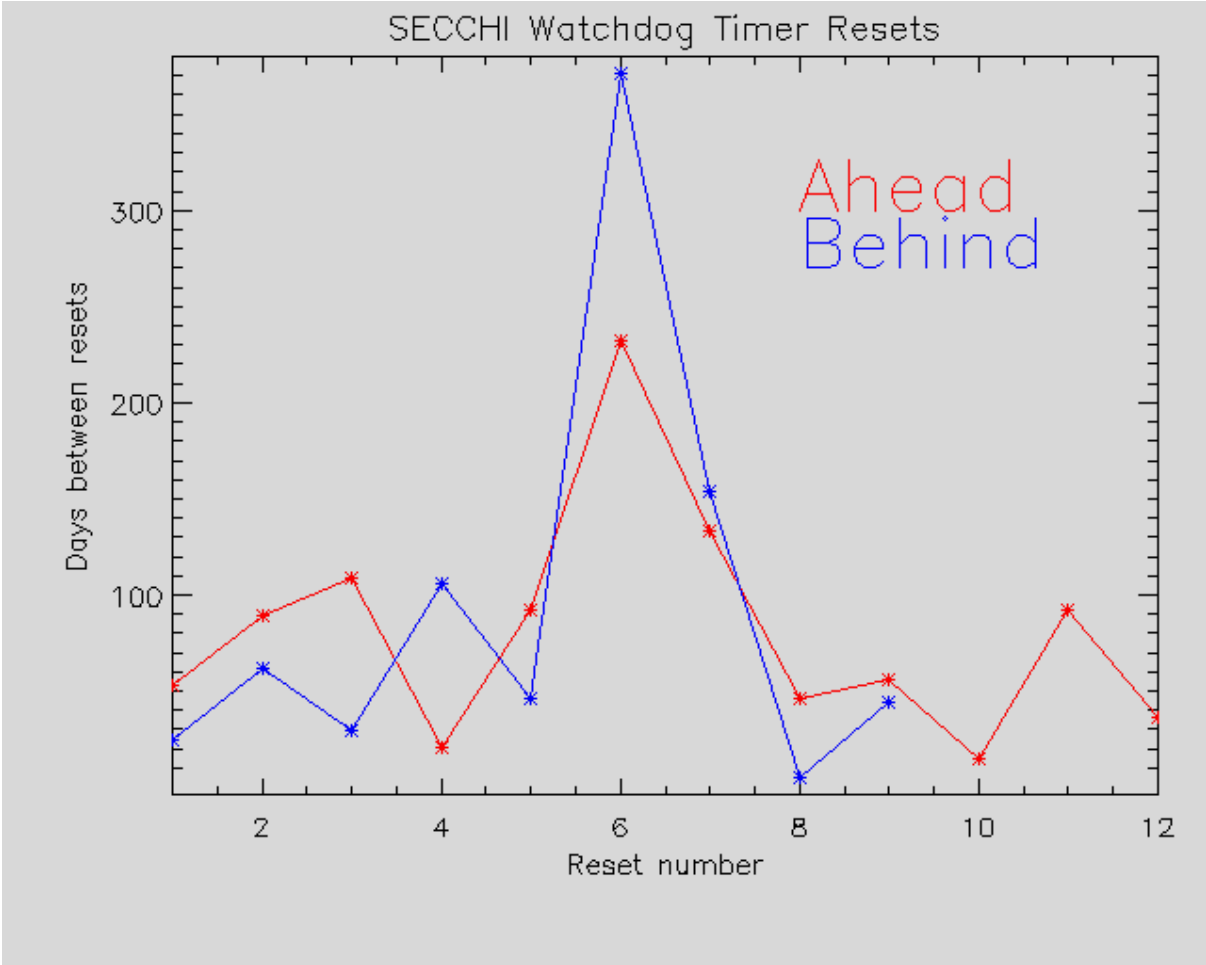
- **All 10 telescopes working well.**

FSW Updates

- FSW (unprotek) updated 24 times between Launch and 23Sep09:
  - 9 FSW code changes, 16 table changes only
- Since Oct. 2008:
  - 5.09.01 (Improve reset recovery with onboard scripts; HI1 ROI1 returns sunward 1/3 image)
  - 5.09.02 (New default schedule blocks for 480 kbps; misc. IP table updates; EUVI ROI3 returns North pole)
  - 5.14.00 (New HI SPW, HISAM functions in IP with corresponding table changes; new default schedule blocks for 360kbps)
- In development:
  - Auto-recovery to ops mode after Watchdog Timer Reset (see next)

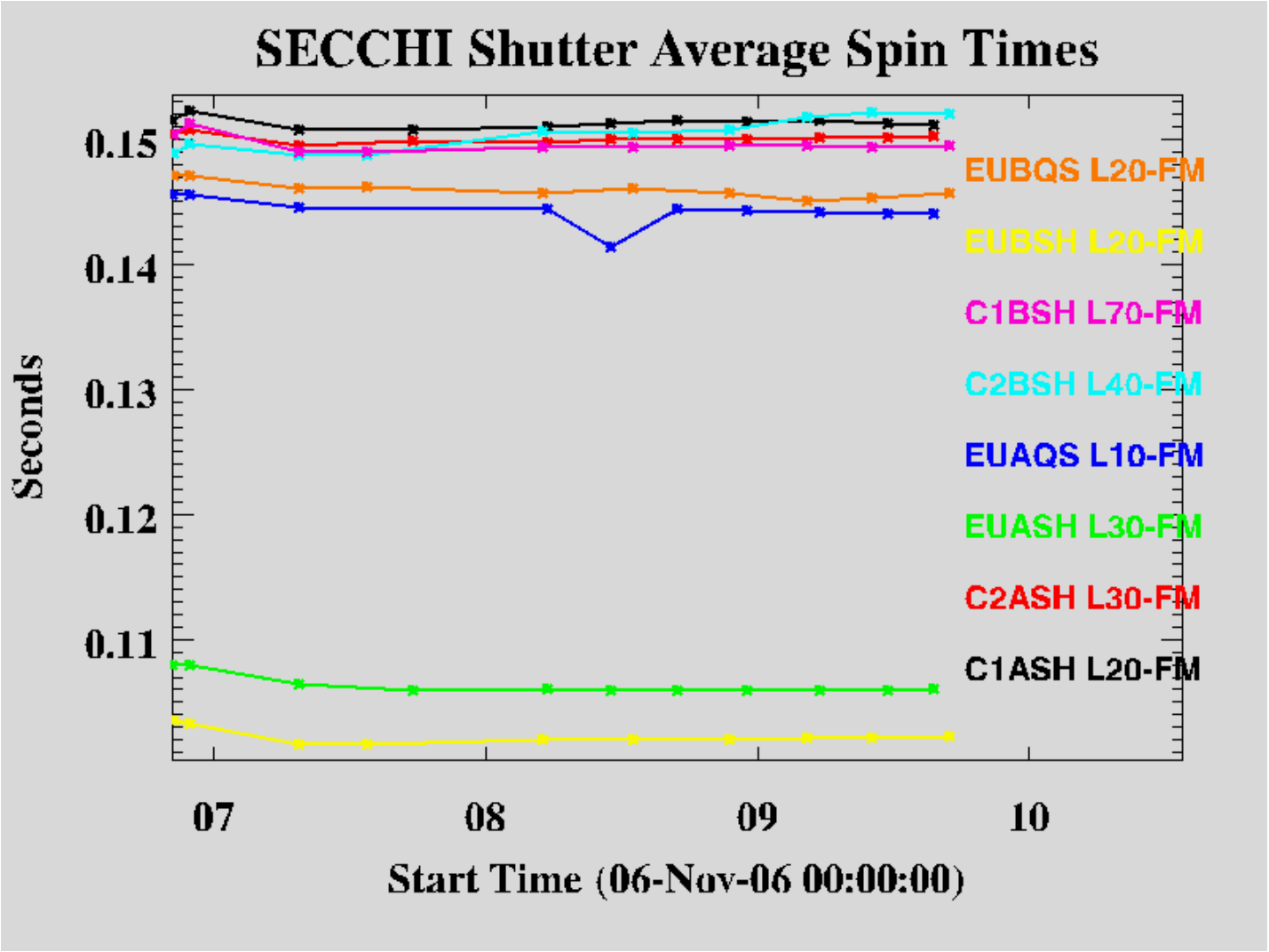
SECCHI Electronics Box

- **Watchdog Resets: “Random” resets of the 750 CPU of unknown origin. Number 12 on S/C-A occurred on 8/20/2009. Number 9 on S/C-B occurred on 8/12/2009.**

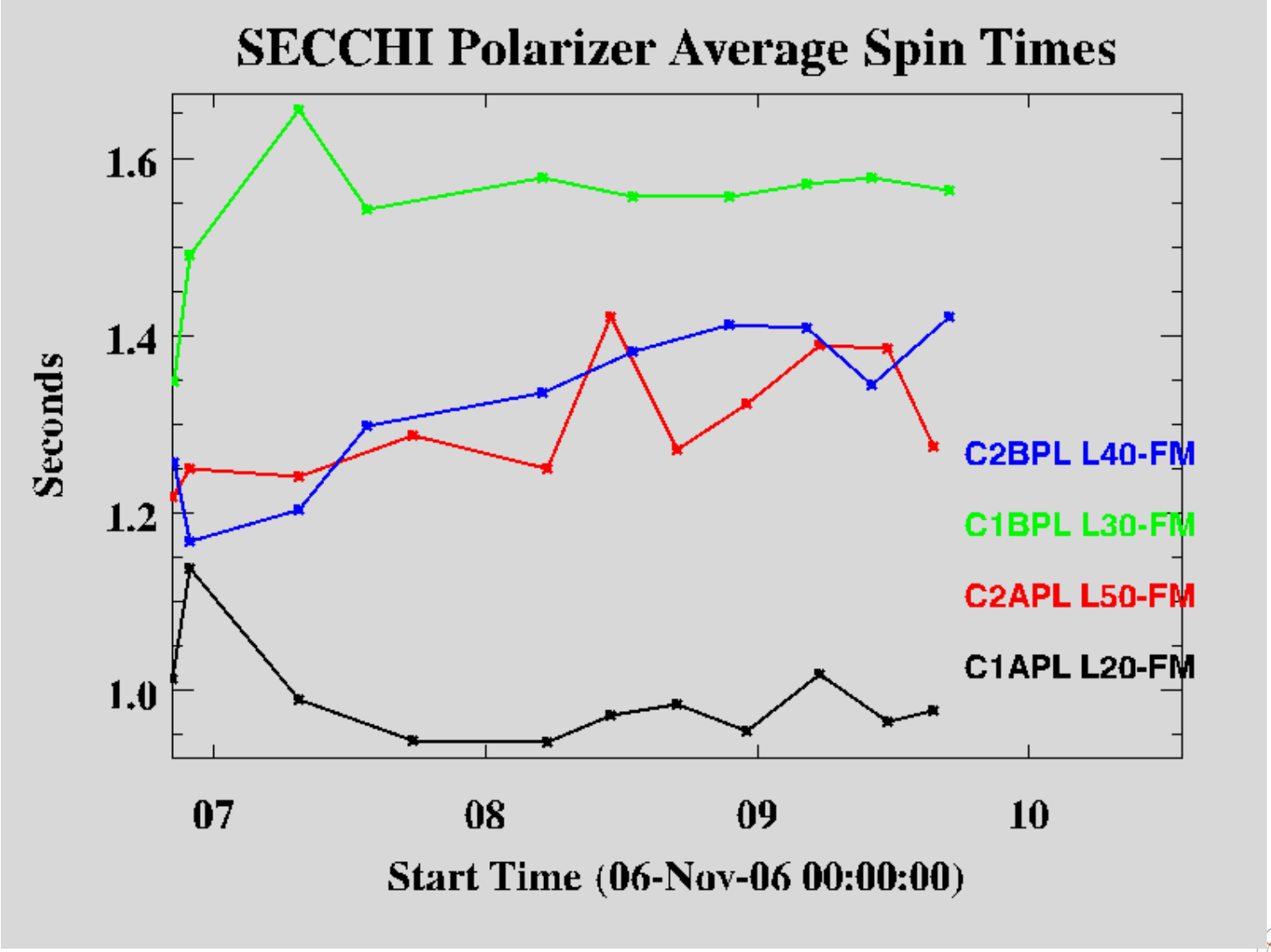


Shutter Mechanism Status

- **Spin-timer tests are conducted every few months to characterize mechanism performance:**



Polarizer Mechanism Status



SECCHI Image Statistics

- **As of 31 August 2009**

	Cor1A	Cor1B	Cor2A	Cor2B	EuviA	EuviB	Hi1A	Hi1B	Hi2A	Hi2B
N Images (not incl. SPWX)	581959	623797	173645	175662	1034128	1091072	33989	33733	12785	12430
% Raw telemetry	25.4	26.0	16.8	16.4	42.8	43.9	9.7	9.1	5.0	4.1
Size (FITS GB)	1001	1075	1420	1448	8203	8666	143	142	60	57

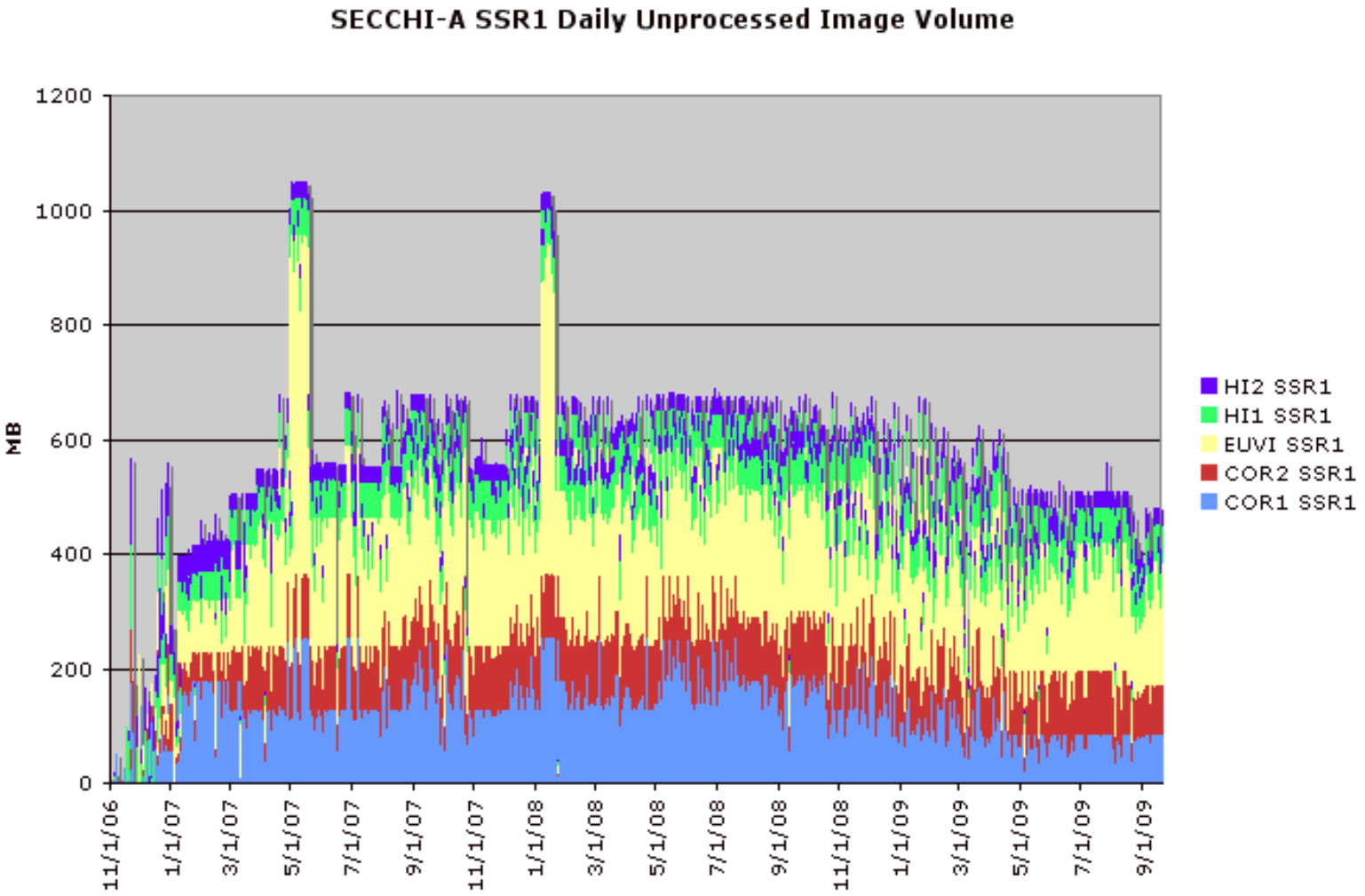
Totals

Images:	3,773,200
FITS volume:	21.7 TB
Raw img volume:	1204 GB

- **For specific statistics about SECCHI telemetry, use `IDL> getsccinfo` in SolarSoft.**

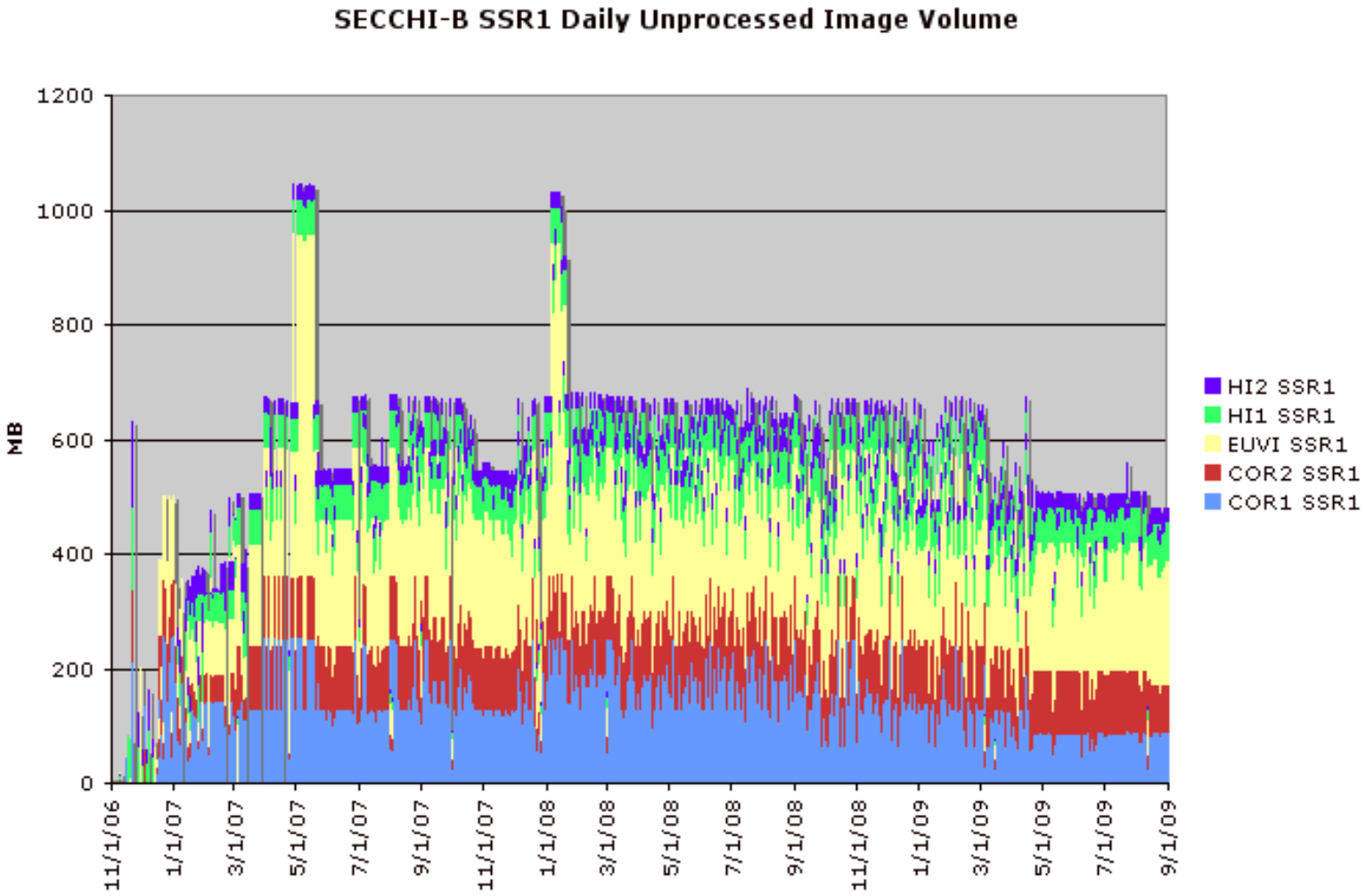
SECCHI-A Daily Image Telemetry Volume

(not incl. HK: ~16 MB)

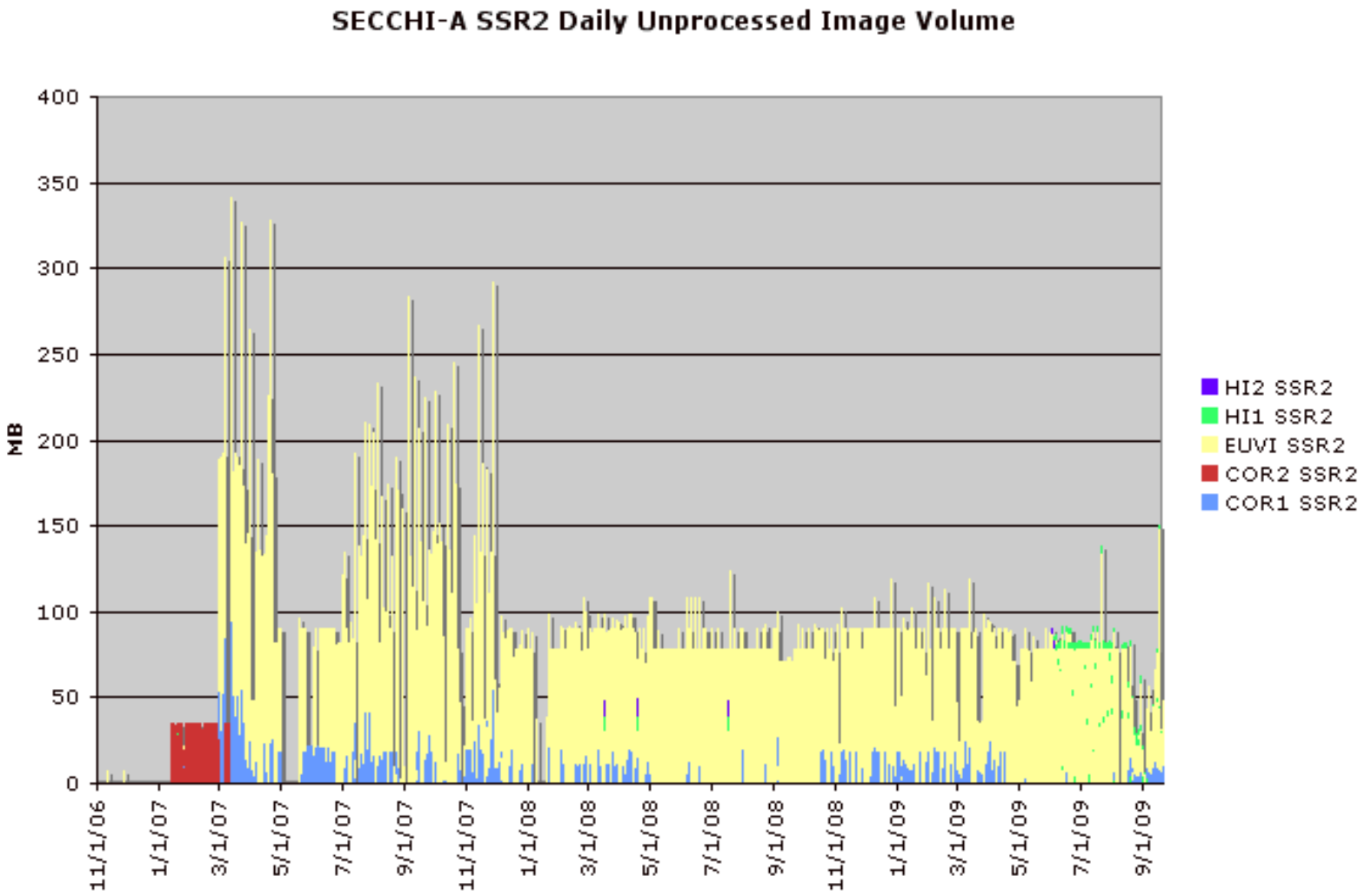


SECCHI-B Daily Image Telemetry Volume

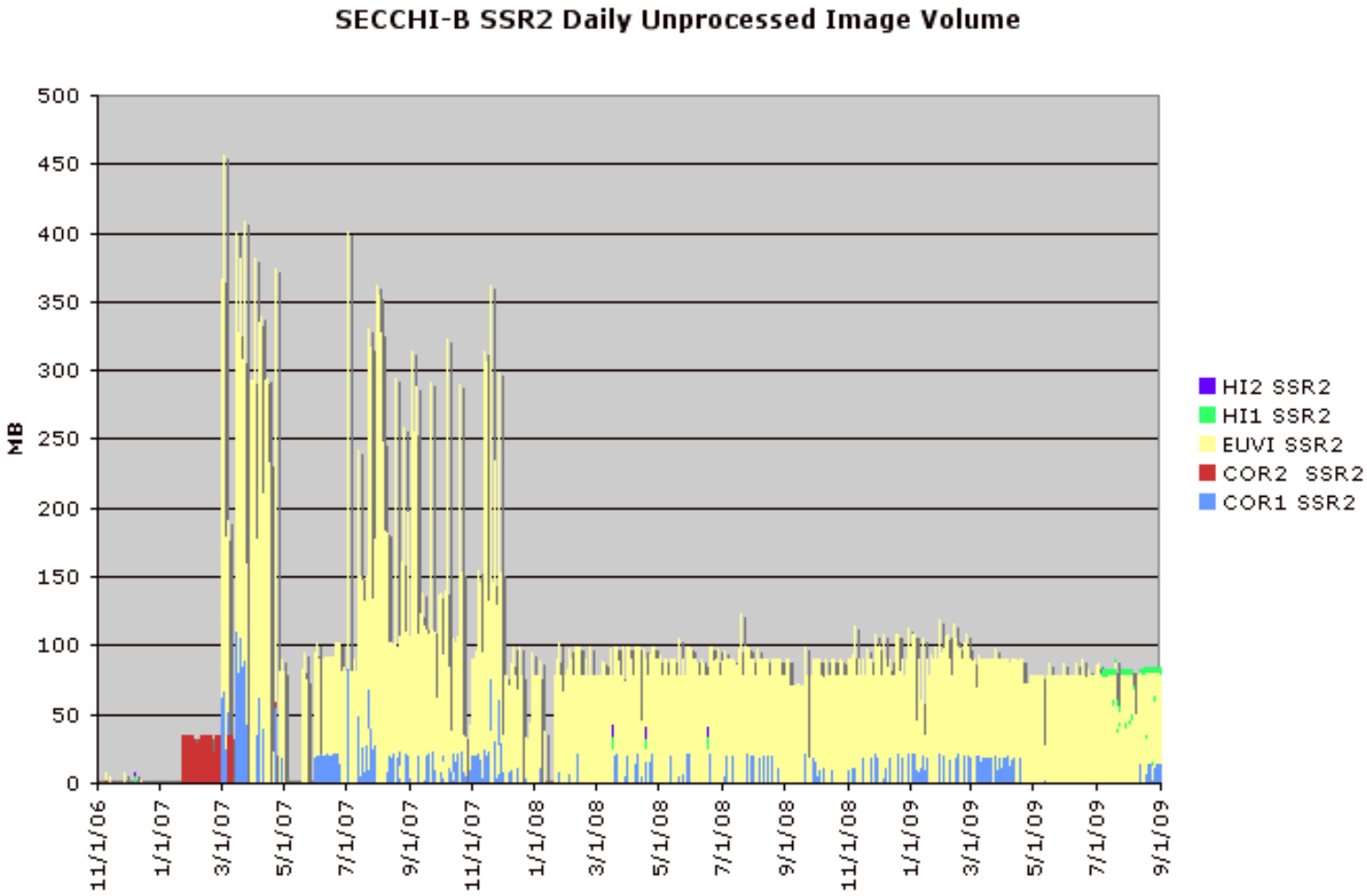
(not incl. HK: ~16 MB)



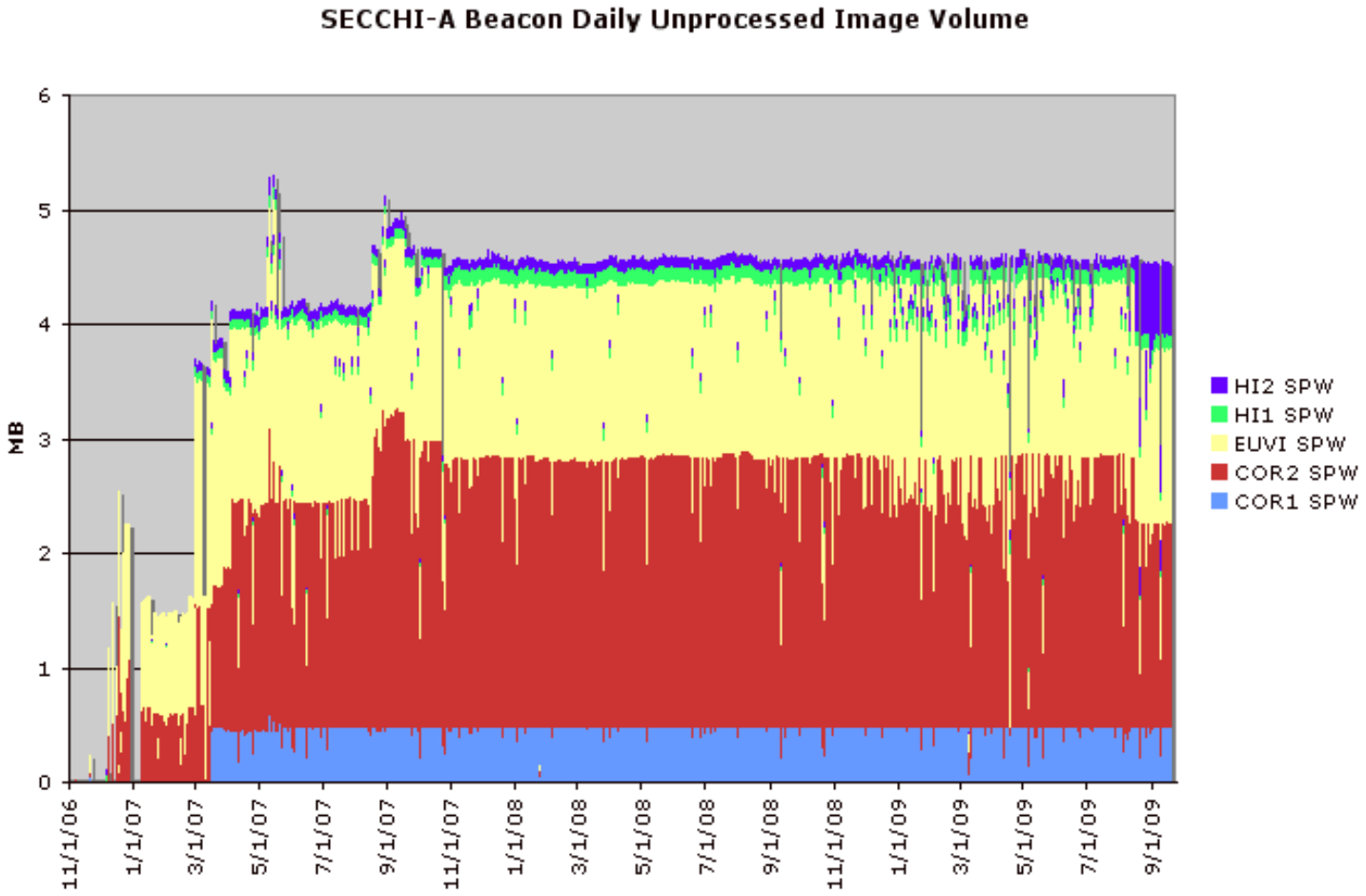
SECCHI-A Daily Image Telemetry Volume



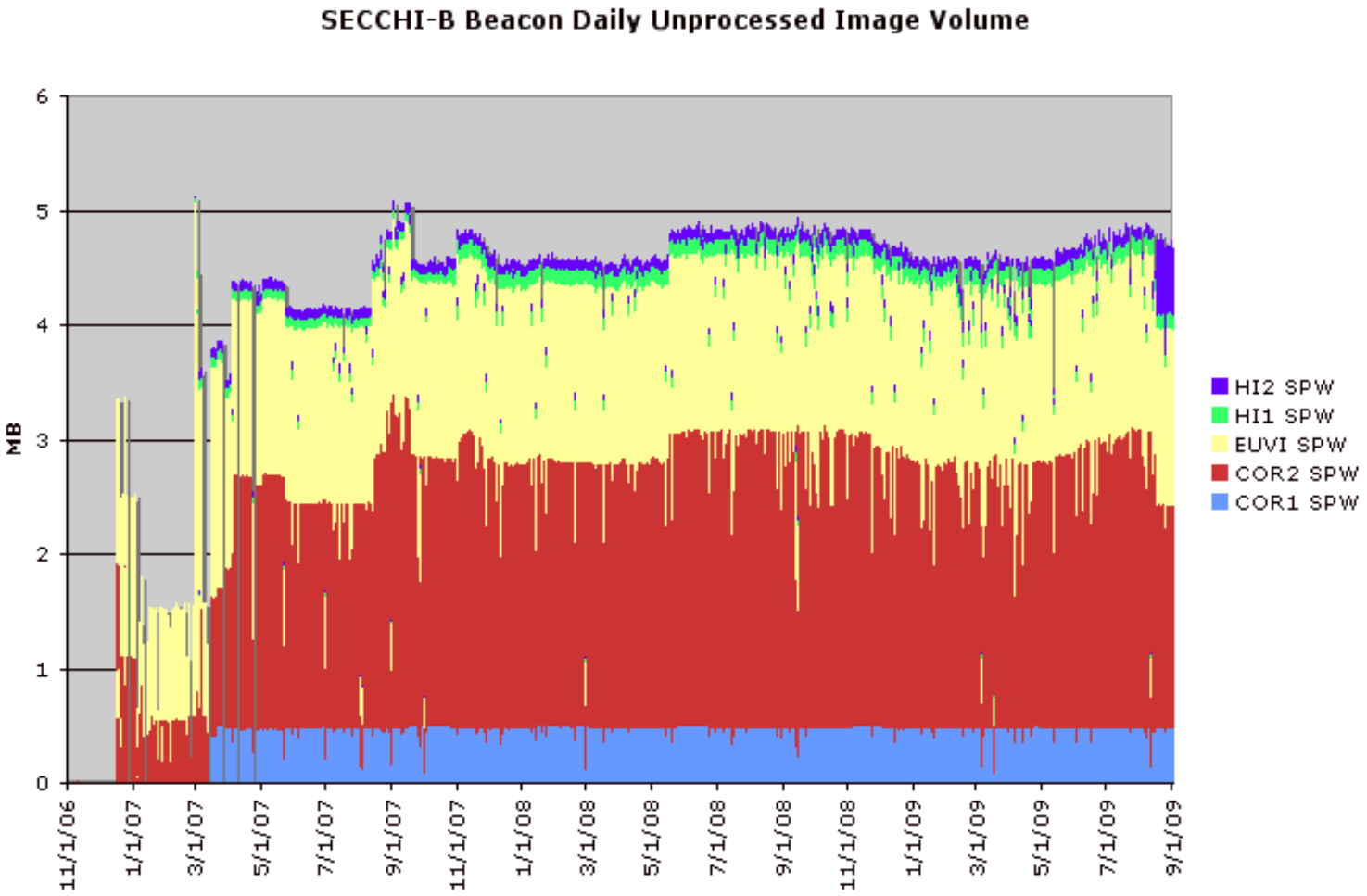
SECCHI-B Daily Image Telemetry Volume



SECCHI-A Daily Image Telemetry Volume



SECCHI-B Daily Image Telemetry Volume



Data Availability

- **SECCHI documentation is available in $SSW_SECCHI/doc and/or http://secchi.nrl.navy.mil/wiki**
- **We continue to make Level-0.5 FITS files available with about a 2-day latency.**
  - **Archives with local access to updated data set: NRL, SSC/GSFC, JPL, MPAe, IAS, LMSAL, RAL**
  - **Retrieve via http://stereo.nrl.navy.mil/secchi_database.html or http://virtualsolar.org or `IDL> secchi_vso_ingest`**
- **SECCHI HK Telemetry also available via http://stereo.nrl.navy.mil/secchi_database.html**
  - Retrieve as tables or plots
  - (NRL only) IDL> s=sqdb()
- **A/B Synoptic movies (MPEG) are up to date**
  - http://secchi.nrl.navy.mil/sccmovies/ (or at NRL: /net/earth/data3/secchi/movies/mpegs)
  - Duration ranges from 1 week (EUVI) to 4 weeks (HI2)

Data Availability (cont.)

- **Browse images (PNG or JPEG)**
  - http://secchi.nrl.navy.mil/sccimages (or at NRL: $SECCHI_JPG or $SECCHI_PNG)
  - 3 sizes: 1024, 512, 256
  - COR1 TBr, COR2 TBr, EUVI, EUVI3D (4 days in 2007 only), HI (either processed to enhance background/stars, or processed to enhance outflow)
- **Carrington maps by A. Thernisien:**
  - http://secchi.nrl.navy.mil/synomap (or at NRL: /net/earth/secchi/carrmaps)
  - **EUVI central meridian in 171A, 195A, 284A, 304A**
  - **EUVI limb in 171A, 195A, 304A**
  - **pB COR1, pB COR2**
  - **HI Carrington maps TBD**

Calibration Status

SECCHI Telescope Calibration Status (in SSW) and Source (since 2008-10-17)

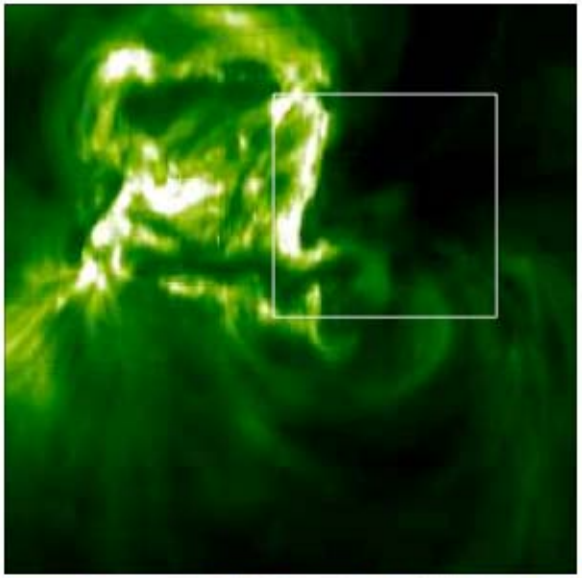
Calibration	EUVI	COR1	COR2	HI1	HI2
Shutterless readout correction	NA	NA	NA	hi_desmear .pro, v1.6, 2007/06/13	hi_desmear .pro, v1.6, 2007/06/13
Photometric calibration	get_calfac .pro, v1.1 2006/10/03	get_calfac .pro, v1.8 2008/02/13	get_calfac .pro, v1.9 2008/08/05	Publication imminent	Ongoing
Geometric distortion	NA	NA	Cor2_distortion.pro, v1.9 2008/08/06	get_hi_params.pro, v1.5 (PV2_1) 2008/07/28	get_hi_params .pro, v1.5 (PV2_1) 2008/07/28
Flat field + vignetting via get_calimg.pro	20060823_wav, 20080416_(grd,raw)	20071003_flatfd	20060929_vignet	20080129_flatfld	20080129_flatfld
Sun center	euvi_point .pro, v1.5 2007/05/08	cor1_point .pro, v1.9 2008/01/17	Cor2_point.pro, v1.1 2008/03/27	Hi_fix_pointing .pro, v1.1 2008/07/28	Hi_fix_pointing .pro, v1.1 2008/07/28

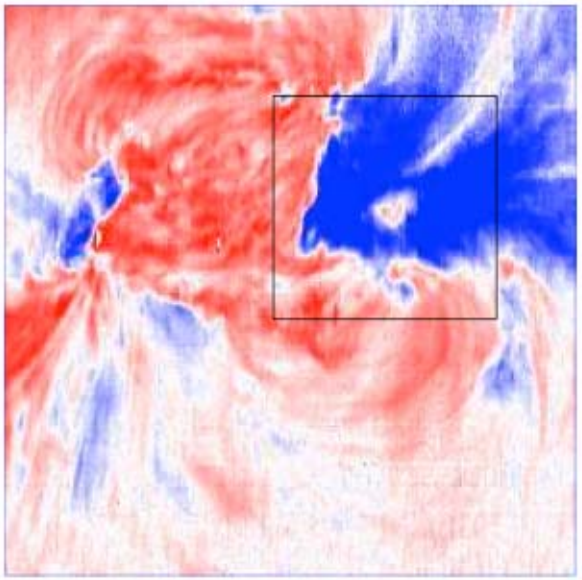
SECCHI Publications

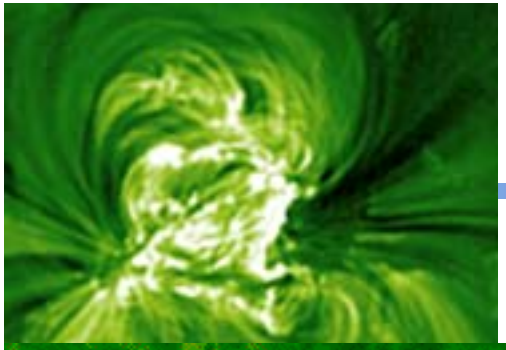
- 49 Publications in 2009 (so far)
- Approximate classifications:
  - 3D Modeling – 8
  - Calibration – 1
  - CIR – 2
  - IP CME – 10
  - CME – 12
  - Comets - 5
  - Coronal Structures – 1
  - Debris - 1
  - EUV Jets – 1
  - EUV Waves – 2
  - Magnetic Modeling - 2
  - Others – 4

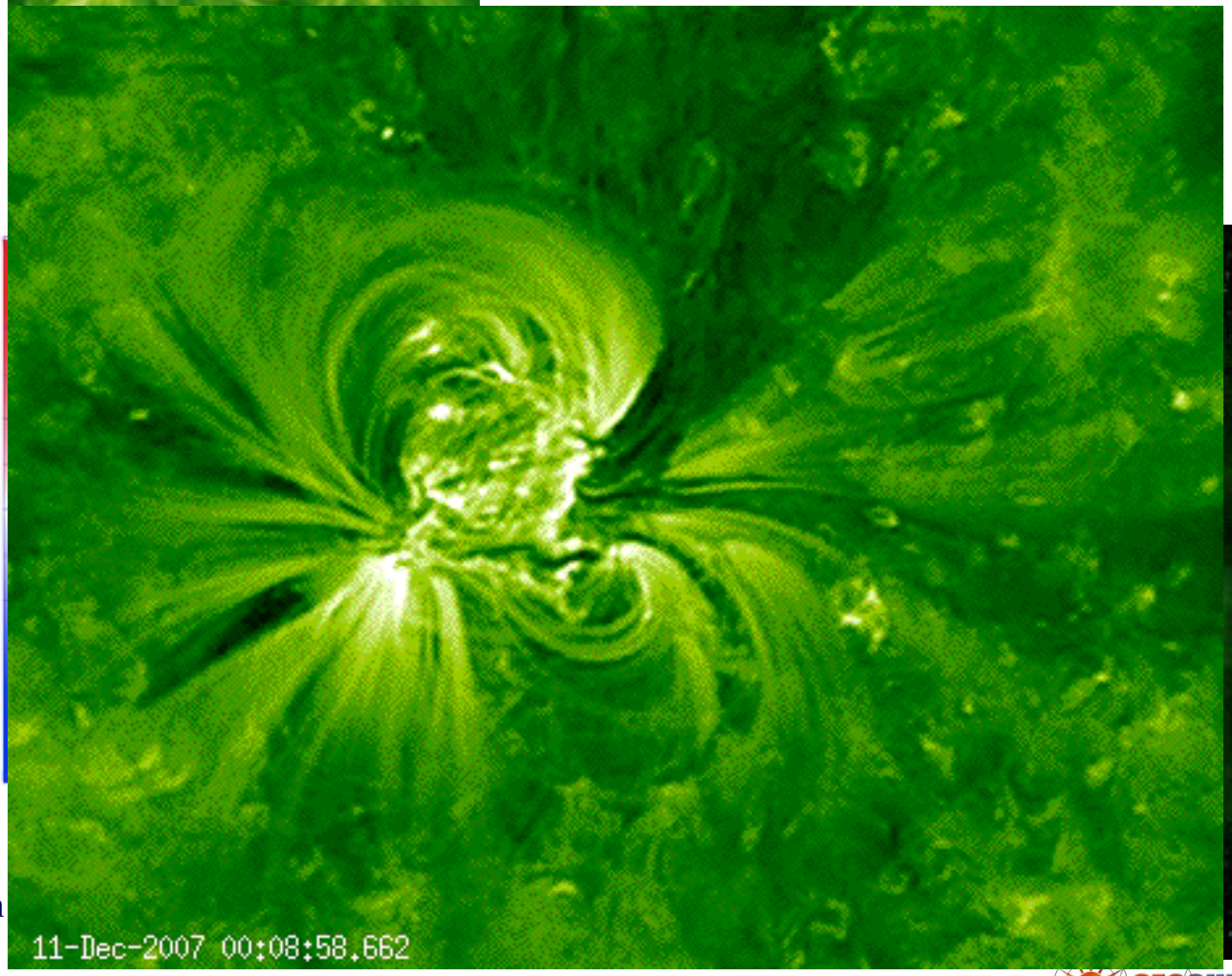
December 11, 2007

Also from
Doschek, et al., ***ApJ***, 686, 1362, 2008









Top: FeXII 195.12 A intensity

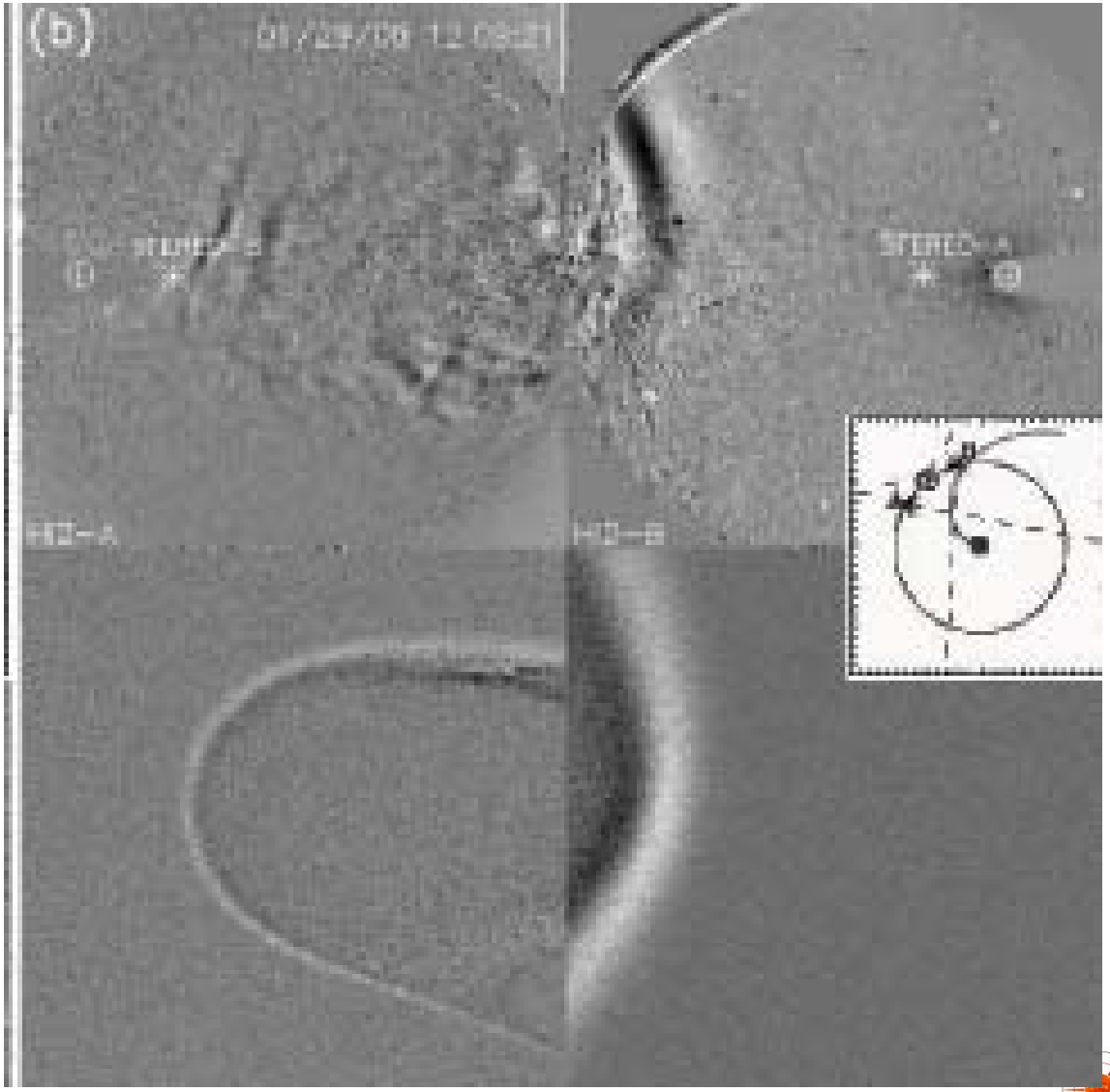
Bottom: Doppler Map (blue is towards the observer) obtained with the HINODE/EIS.

Wood – Modeling of CIRs

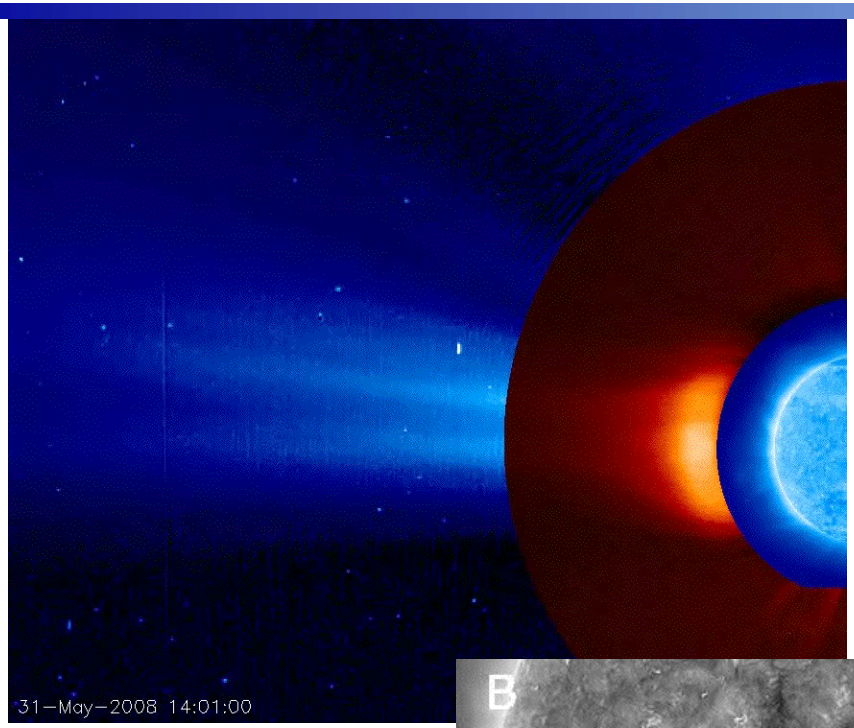
HI observations place constraints on empirical models.

Observations

Model



CMEs without Low Coronal Signatures



- A strong association of CMEs to EUV signatures was established during SOHO.
- The STEREO mission has enabled a more complete view of the solar disk which has revealed a “streamer blowout” CME with no EUV signature.
- Speed increased from 0 to ~300 km/s
- Robbrecht et al (2009)

- The GOES-10 X-ray response is very low (below A level) and flat