



SECCHI EUVI Status

SECCHI Consortium Meeting, Dublin 2010

3/22/2010

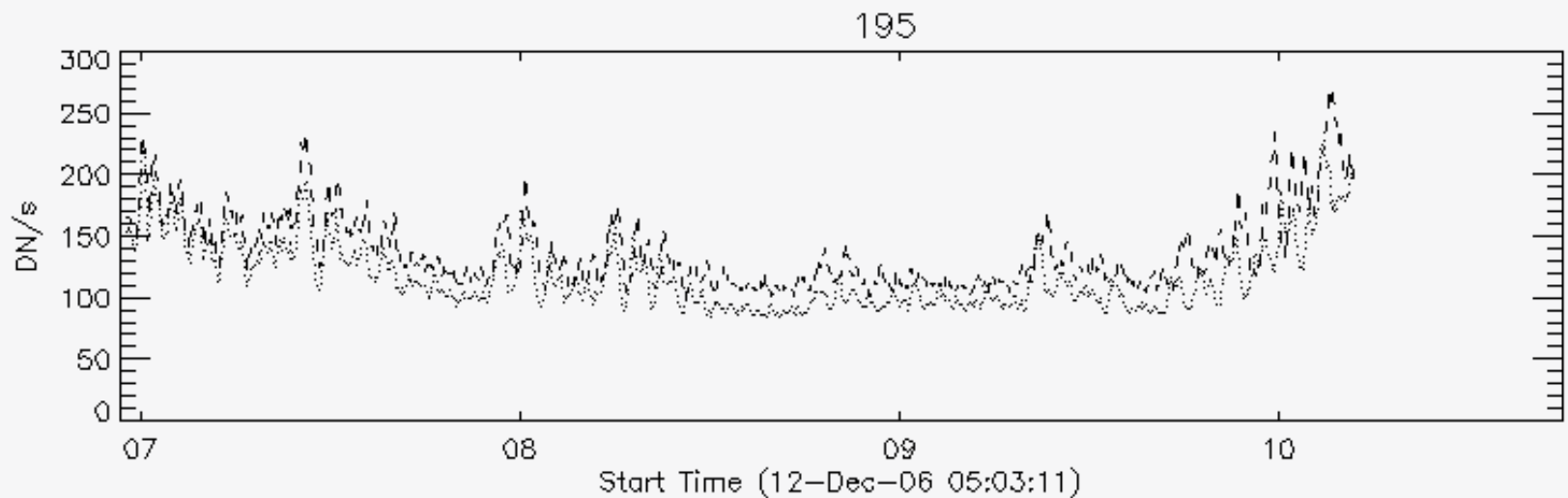
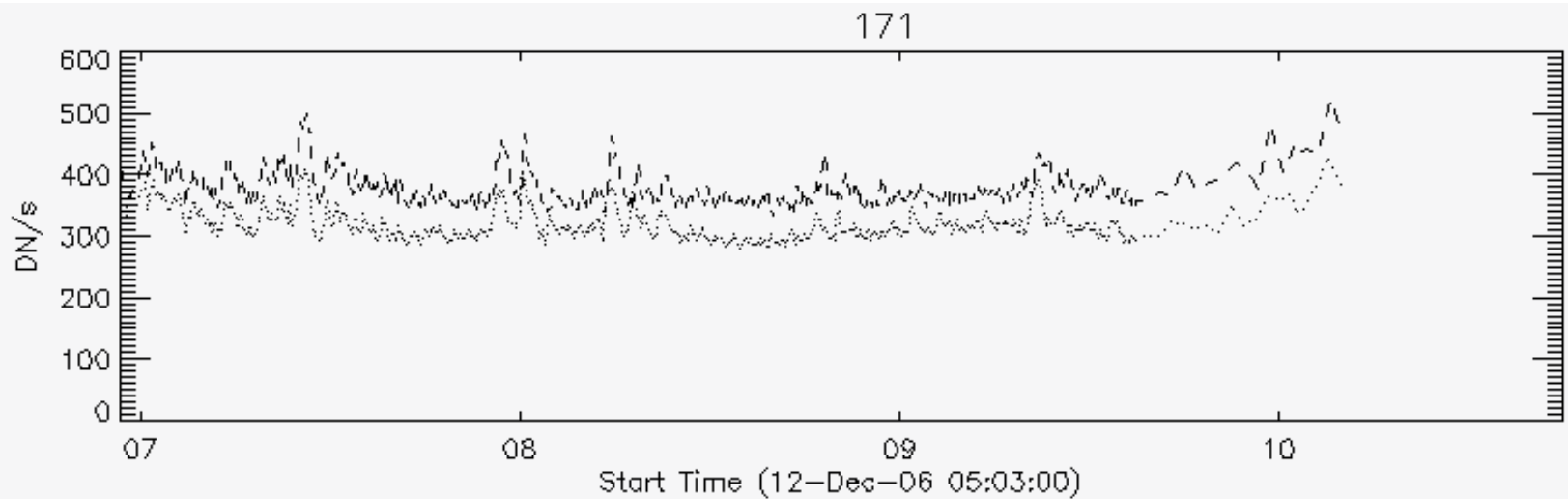
Jean-Pierre Wuelser

LMSAL

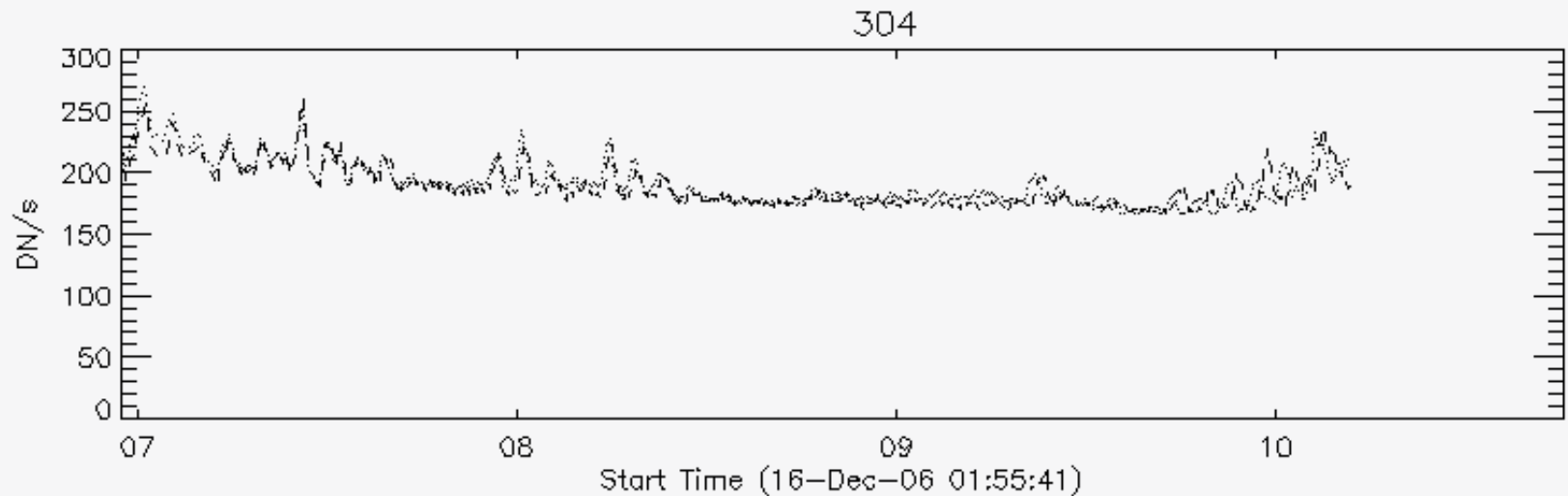
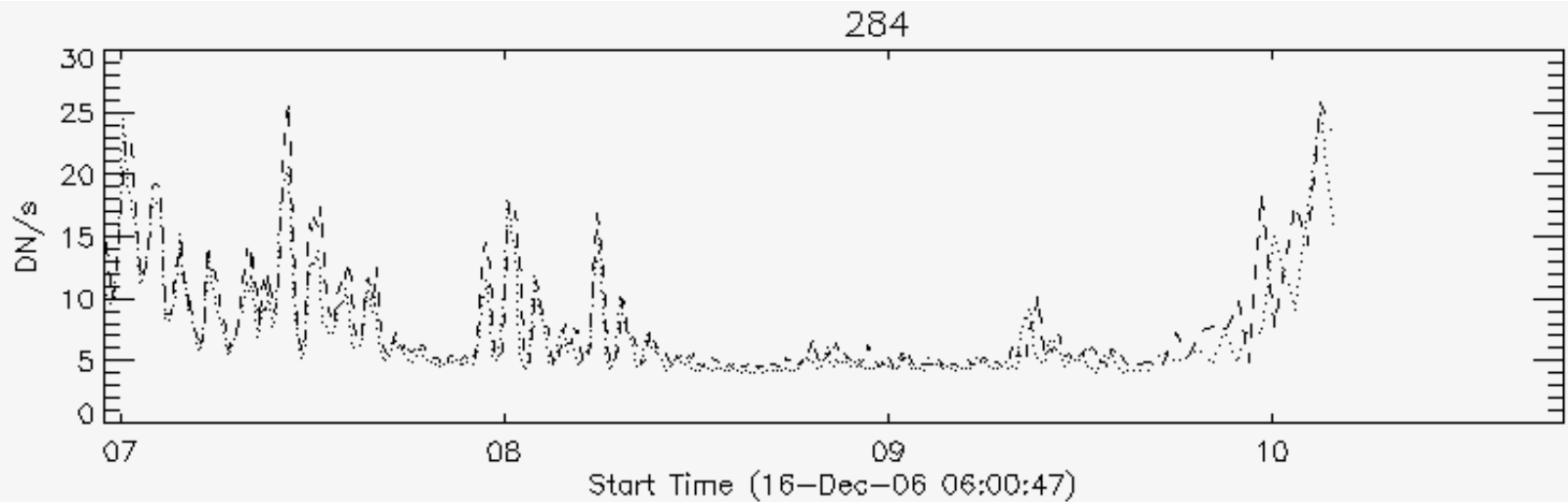
EUVI Status

- **Both EUVI telescopes perform extremely well**
 - **No hardware issues, no noticeable degradations**
- Sensitivity
 - Flux curves reflect evolution of solar activity
- Entrance filter status
 - All entrance filters show some light leaks, mostly at very low levels
 - Light leak levels through entrance filters have no impact on quality of normal observations
 - Standard filter in filter wheel completely suppresses residual white light
 - Exception: 284 on Behind: faint static stray light pattern below S pole, can be subtracted out
- Pointing / Attitude information
 - Both EUVIs show a ~ 2 pixel pointing drift relative to the GT
 - Empirical correction to FITS header is being worked on

EUVI Flux Trends – 171 & 195

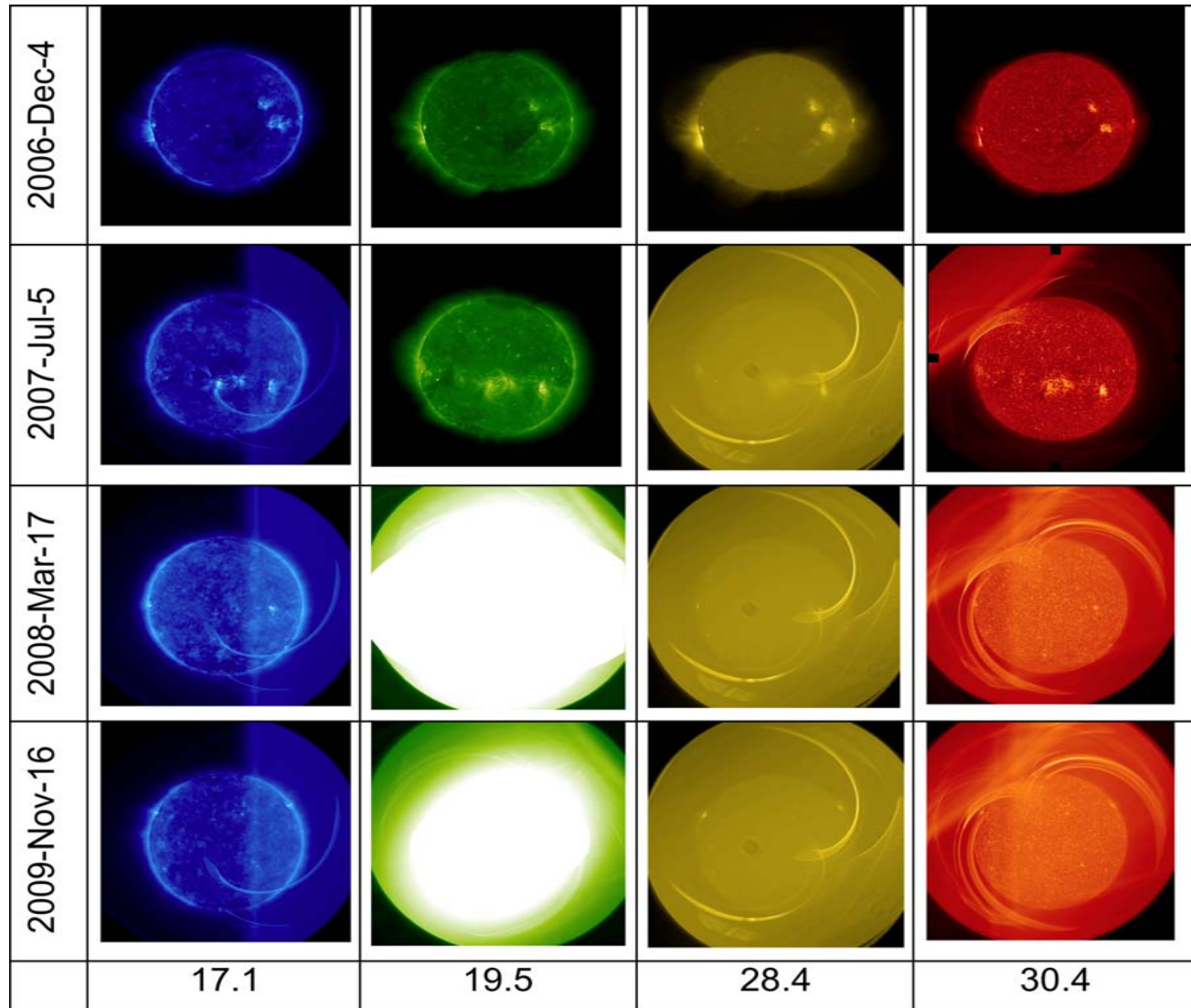


EUVI Flux Trends – 284 & 304



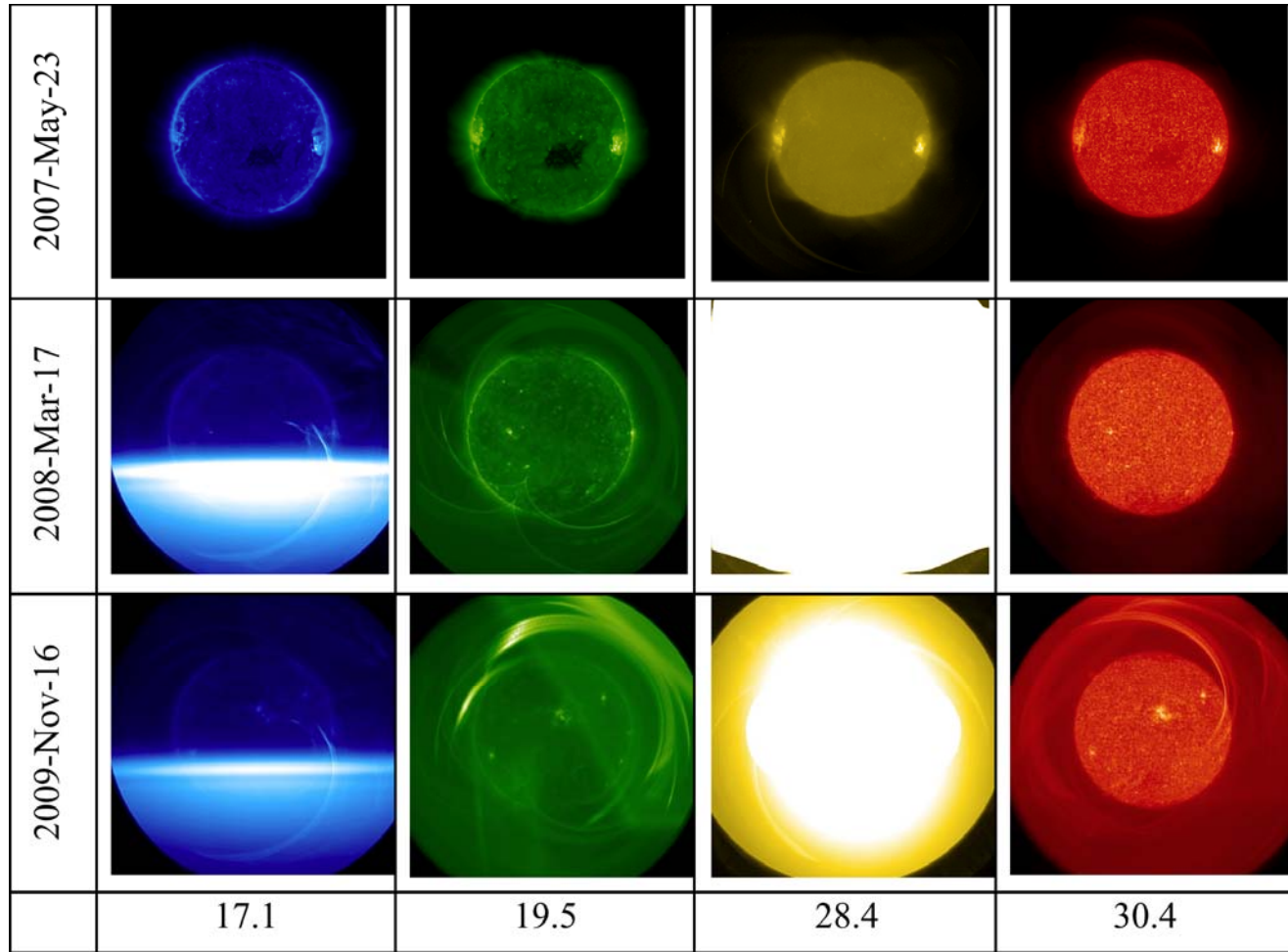
Entrance Filter Trends - Ahead

EUVI-A

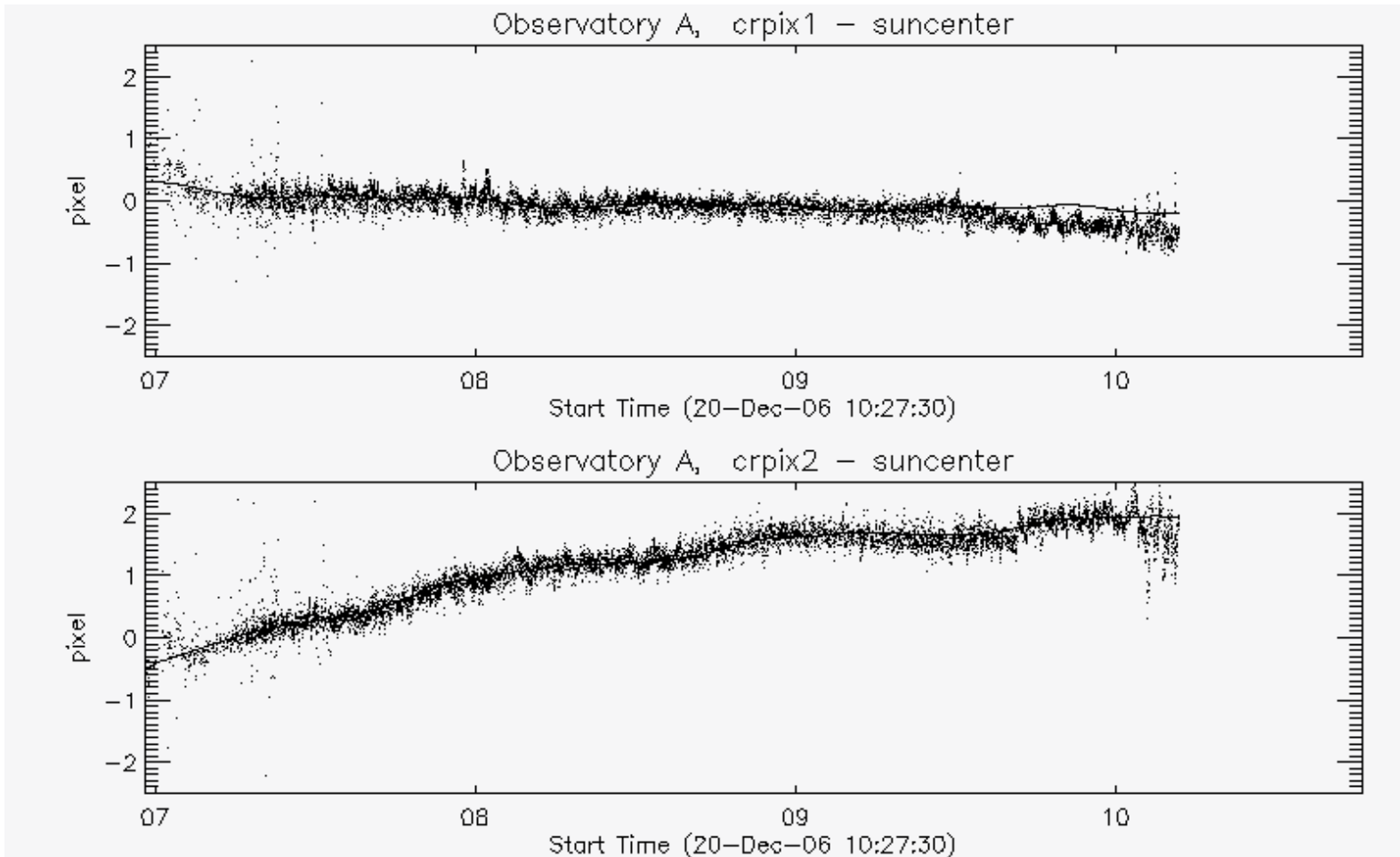


Entrance Filter Trends - Behind

EUVI-B

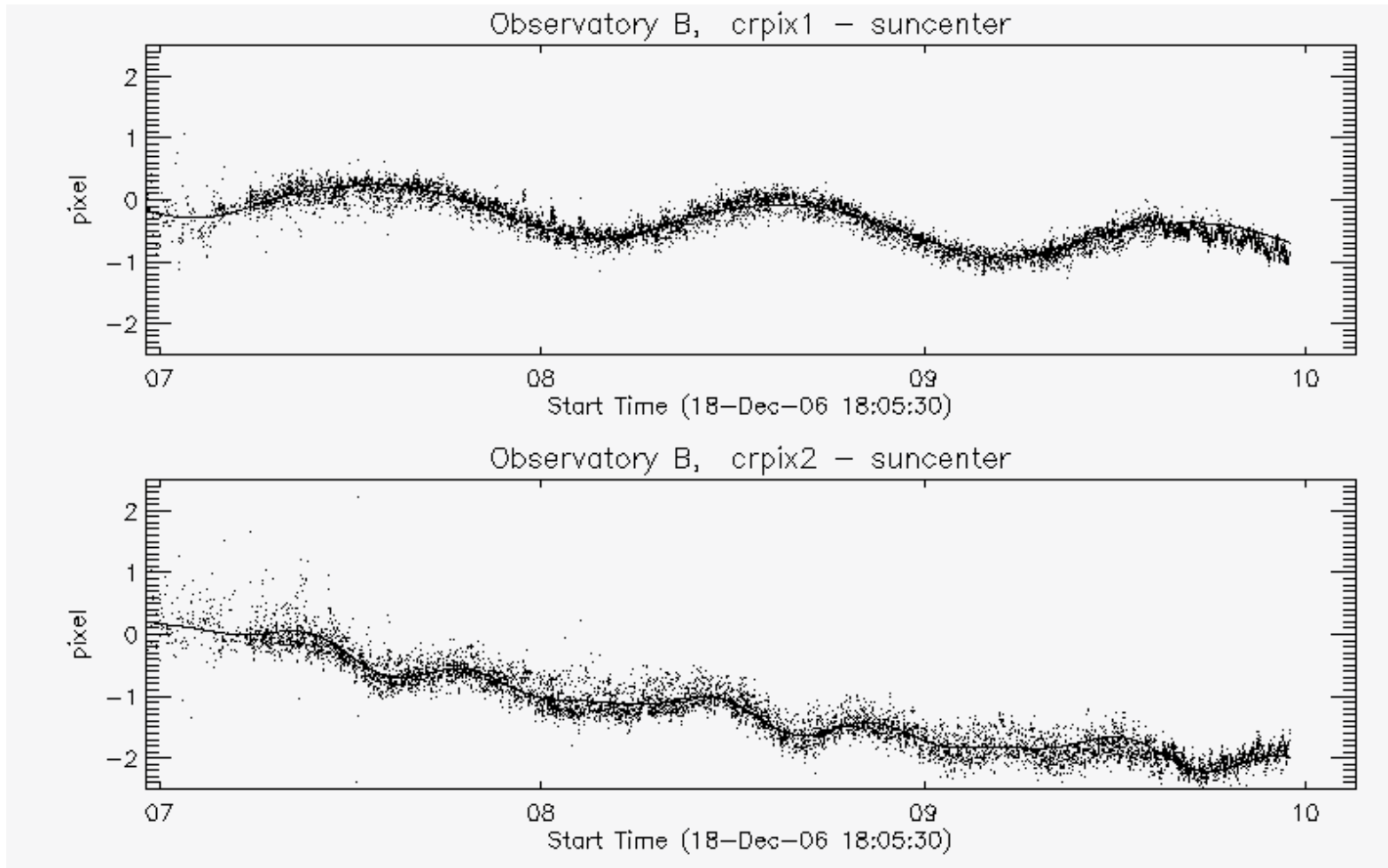


Attitude Data Trends - Ahead



Solid curve: best-fit through April 2009, extrapolation through March 2010

Attitude Data Trends - Behind



Solid curve: best-fit through April 2009, extrapolation through March 2010

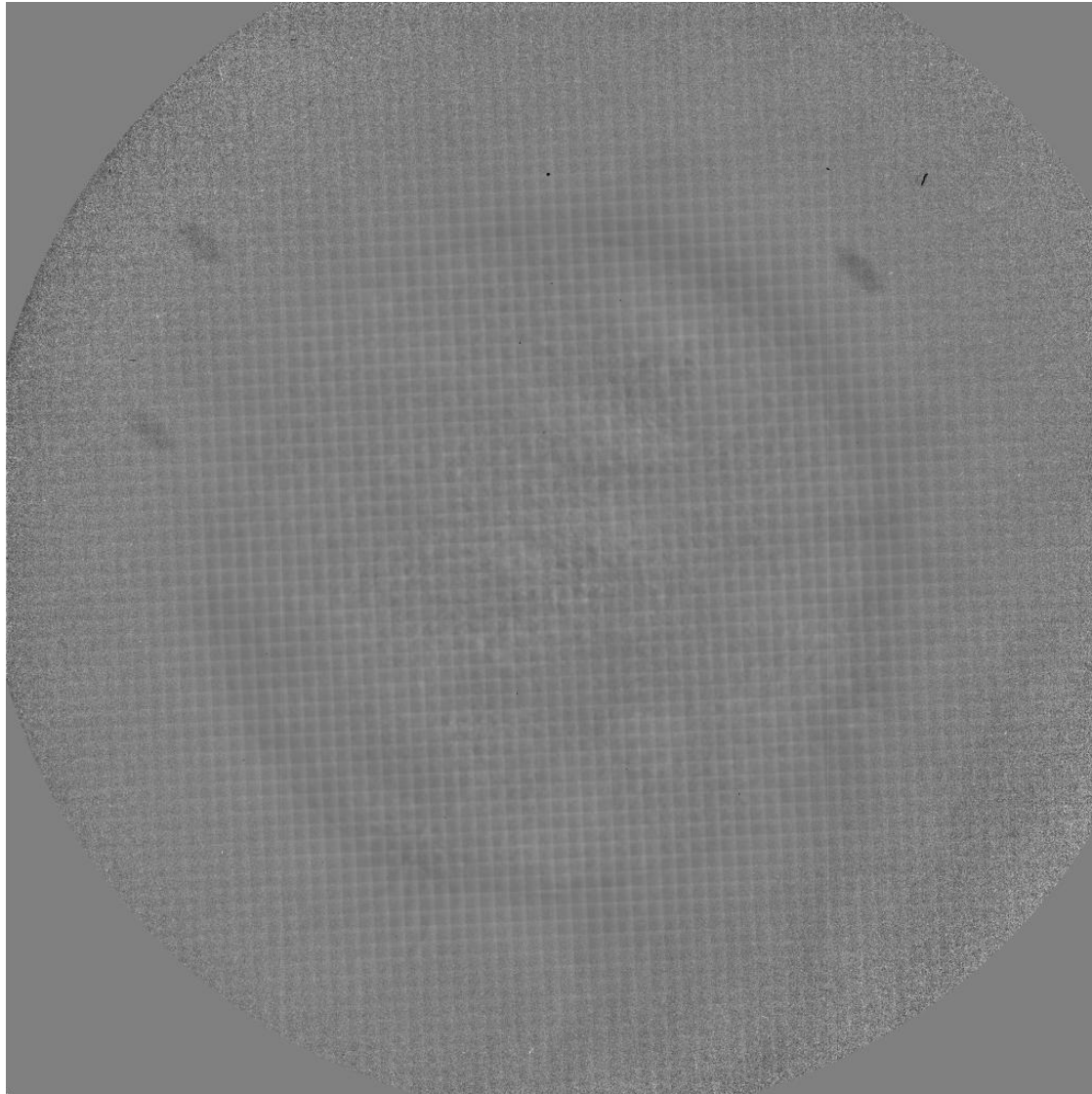
Spectral Response

- Available in SolarSoft:
 - Spectral response / effective area curves
 - Temperature response prediction (based on Chianti)
 - For details see “EUVI Software Notes” on the EUVI website (<http://secchi.lmsal.com/EUVI/>)
- Spectral response data based on:
 - Prelaunch synchrotron calibration of mirror pairs (IAS)
 - Prelaunch calibration of CCDs and entrance filters
 - On-orbit calibration of filter wheel filters
 - Response of B adjusted for observed ratios A/B in all 4 channels
 - Required adjustments were small: between +4% and -19%
 - Plan to cross calibrate with SDO-EVE in the future

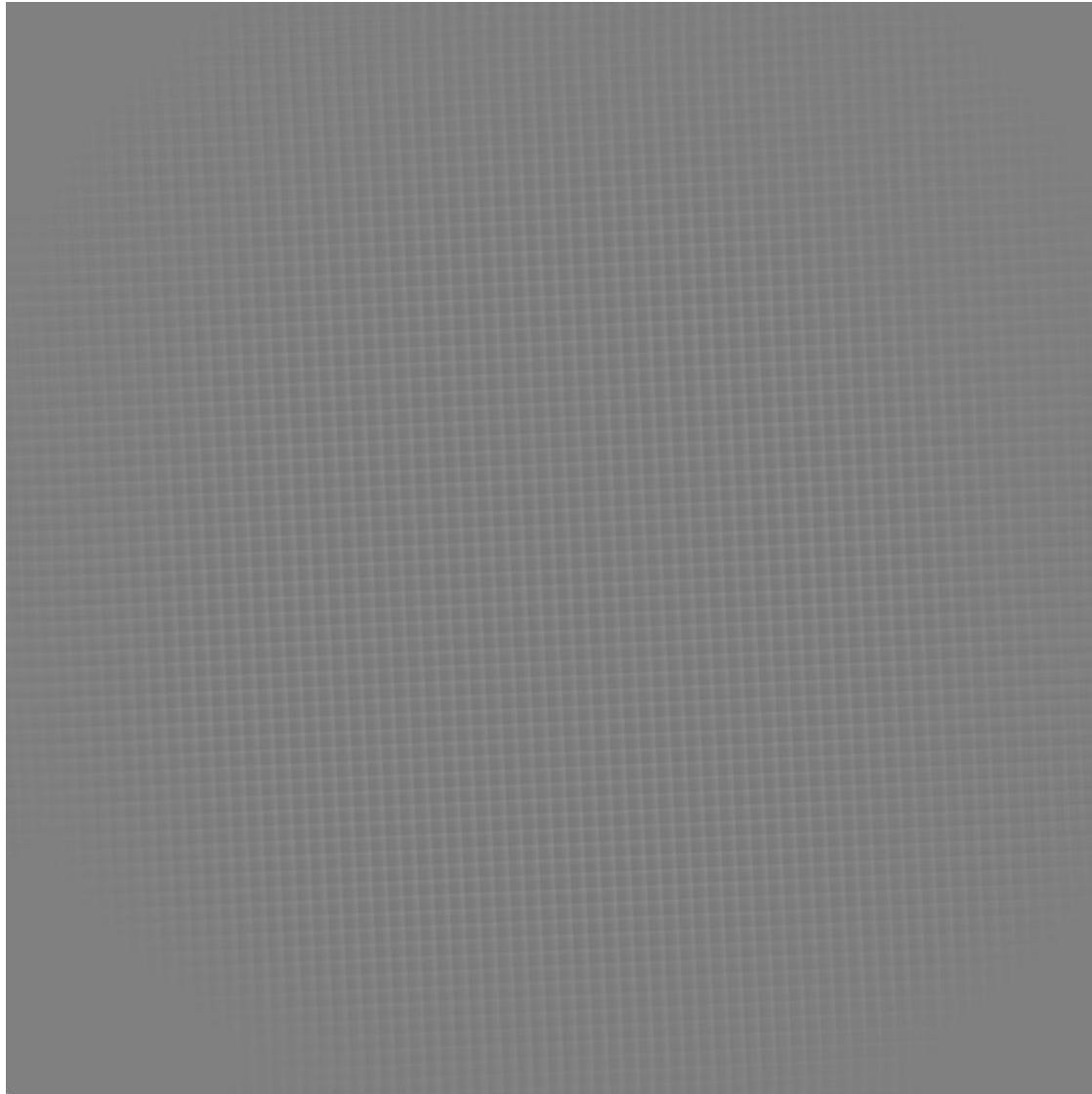
Flat Fielding

- Flat data in SolarSoft:
 - “Raw” flats (171 and 304)
 - Based on 14 images taken at pseudo-random offpoint locations
 - Show residual solar image and noise near edge of field
 - Processed flats (171 and 304)
 - Show only shadowing by mesh in filter wheel filter
 - Flats for 195 and 284 not yet distributed
 - For details see “EUVI Software Notes” on the EUVI website
- Flat fielding may not be needed in most cases
 - Peak-peak amplitude: 4% of signal (\ll than EIT)
 - Raw flats may add fixed pattern noise

“Raw” Flat (EUVI-B @ 171)



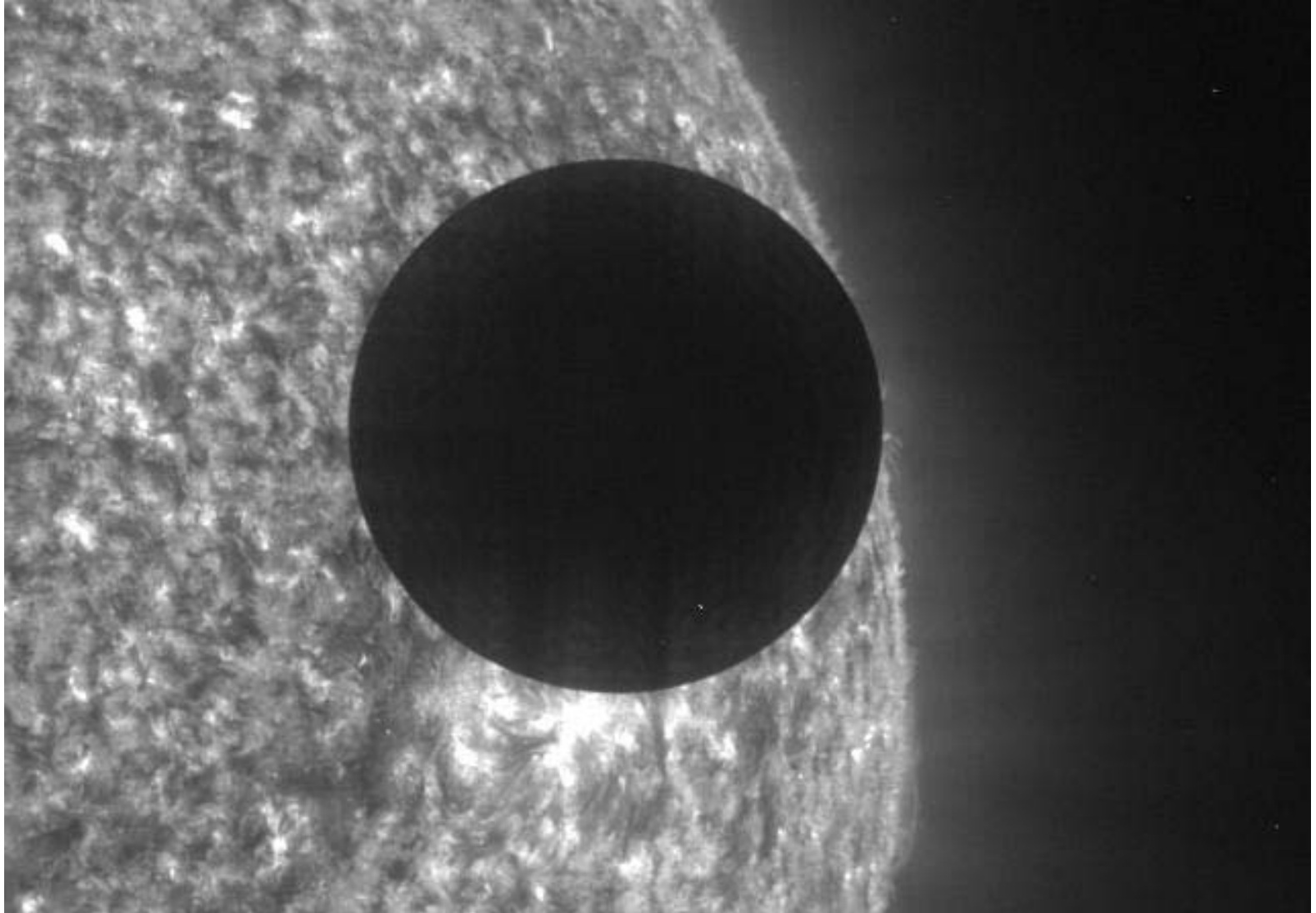
Processed: Mesh-Shadowing Only



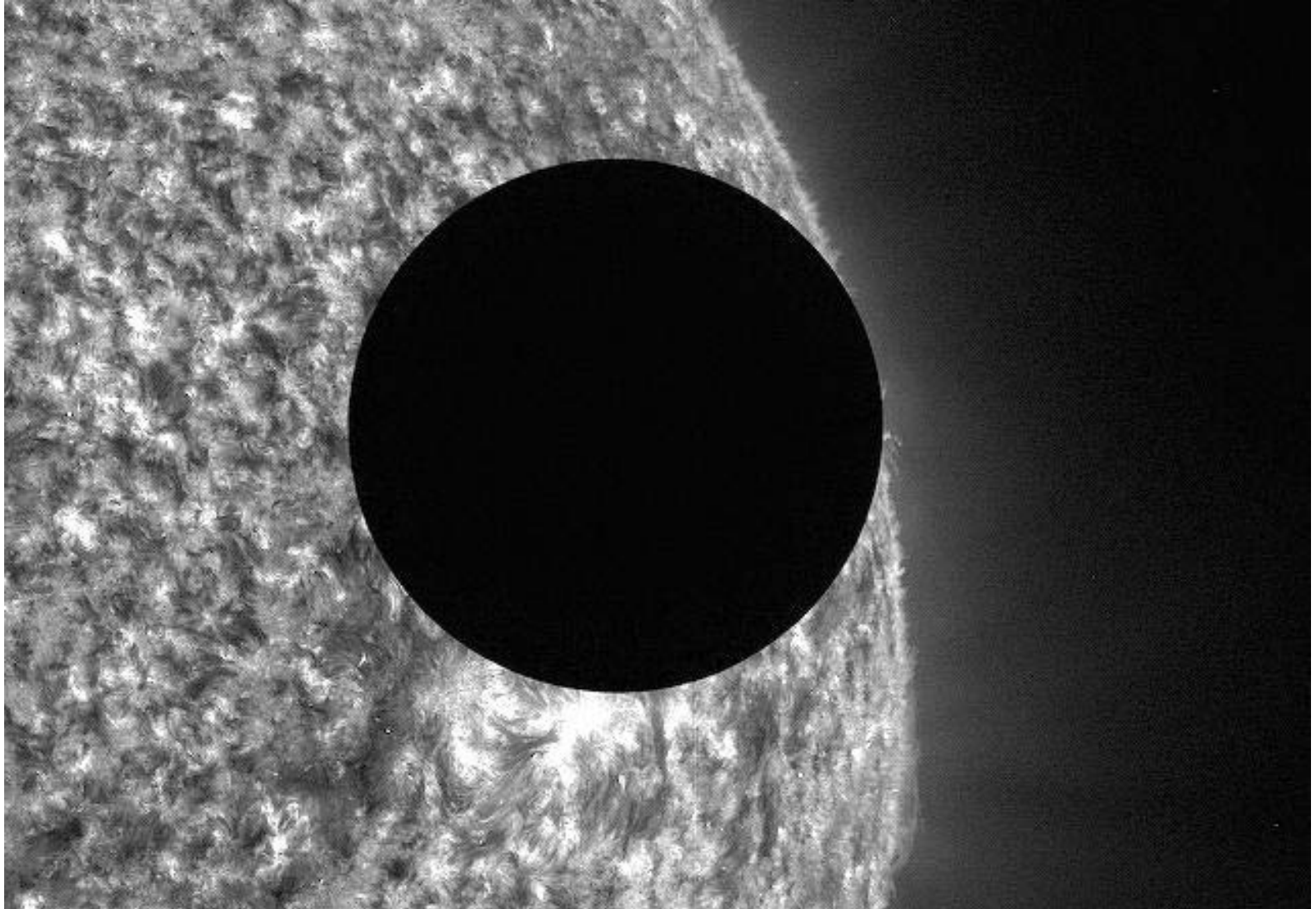
Point Spread Function

- EUVI_PSF.PRO
 - Best-estimate PSF for each wavelength and telescope
 - Available in SolarSoft
 - PSF properties based on fit to observations
 - PSF Voigt core determined via lunar transit observations
 - Diffraction at entrance filter determined via flare observations
- PSF successfully used to deconvolve EUVI images
 - Improves sharpness and contrast
 - Direct deconvolution works reasonably well
 - Even on ICER compressed data
 - MEM deconvolution for best results
 - Also removes cosmic rays

PSF - Lunar transit EUVI-B @ 304



304 Image Deconvolved with PSF



Synoptic Observing Program

- Current synoptic program (24 hours/day):
 - 195: 8-16 sec exp. 2.5–5 min cadence ICER5
 - 304: 4 sec exp. 10 min cadence ICER5
 - Every 2 hours:
 - Deep (16 sec) 171 exposure, ICER4
 - 284 exposure, 32 sec, ICER6
 - Future downlink rate reductions may require elimination of frequent 304 images
- Special campaign observations possible
 - Limited options due to reduced downlink rates

Event Triggered Observing Program

- High cadence observations still possible
 - Into ring buffer (SSR2), overwritten every 3-4 hours
 - Buffer frozen via CME trigger on Cor2 image
- Successful CME event trigger on 2010 February 7
 - Ahead observatory only (synoptic data on Behind)
 - Excellent coverage of CME onset and evolution in Cor1
 - Cadences:
 - 75 sec in 171
 - 5 min in 195
 - 5 min in 284
 - 2.5 min in 304
 - 5 min in Cor1 (Total and Polarized Brightness)

