



SWAP

FIRST SCIENCE RESULTS

David Berghmans on behalf of the SWAP team.

PROBA2 Workshop ☀ ESTEC Noordwijk ☀ June 22, 2010

david.berghmans@sidc.be



PROBA2 Science Center @
Royal Observatory of Belgium





SWAP

FIRST SCIENCE RESULTS

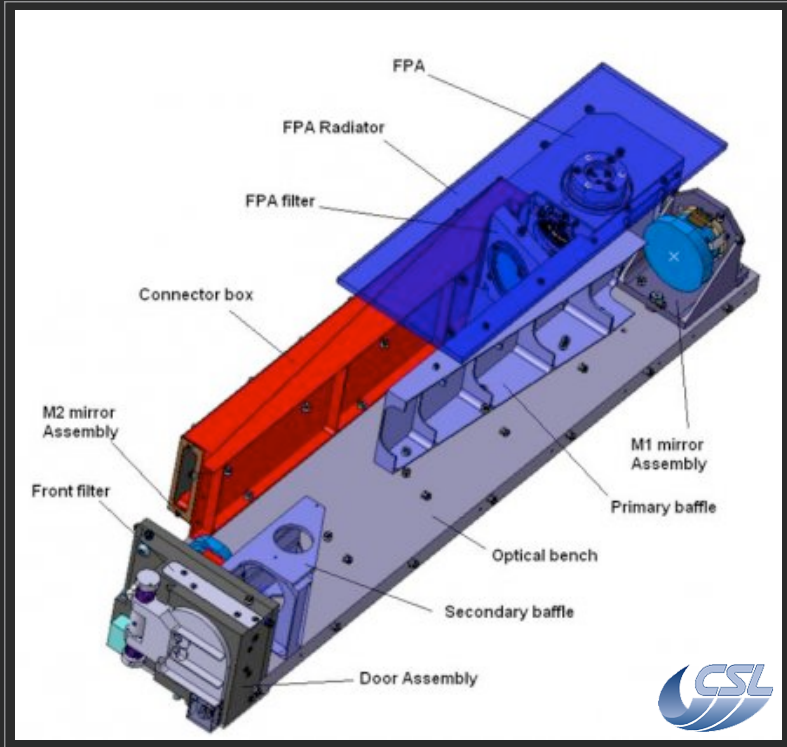
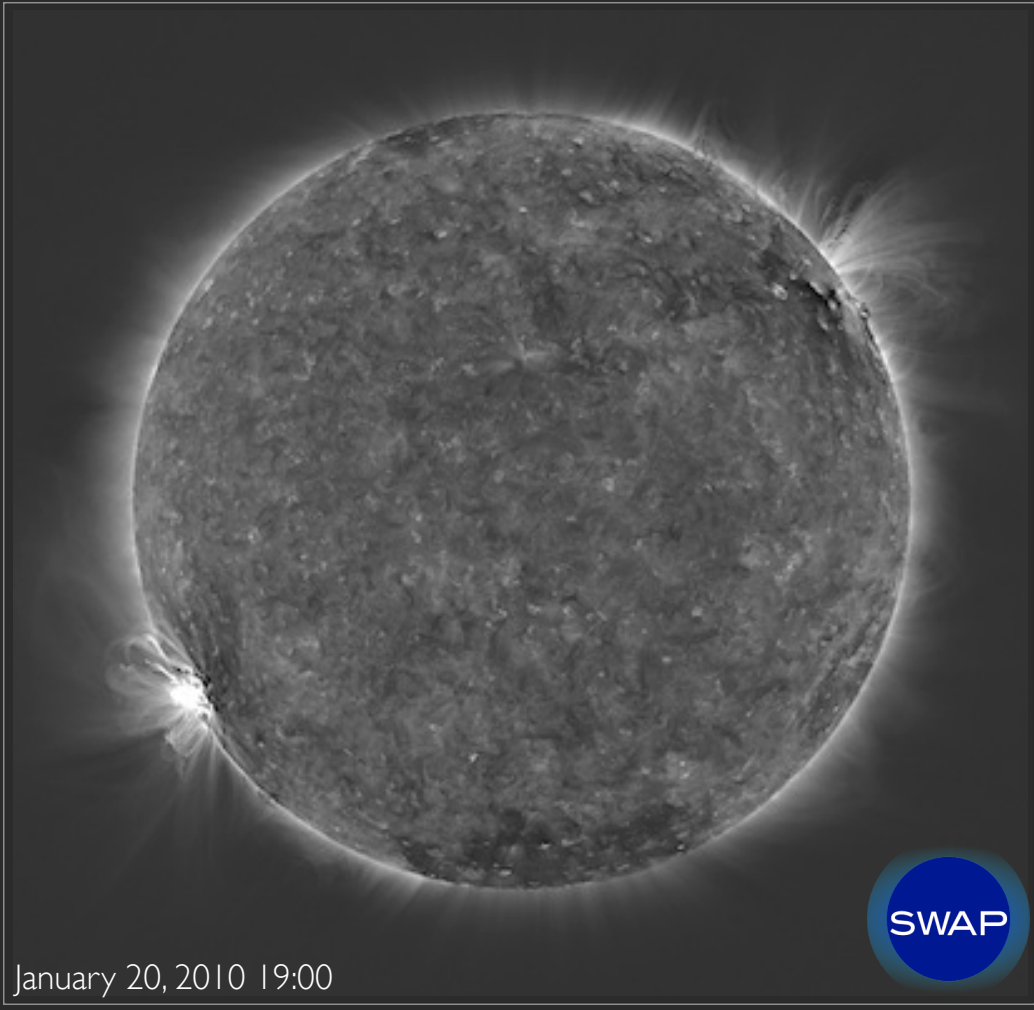
The following presentation is a summary of results presented on June 14-15 at the PROBA2 Science Working Team (La Roche, Belgium).

Special thanks to Dan Seaton & Anik De Groof



PROBA2 Science Center @
Royal Observatory of Belgium



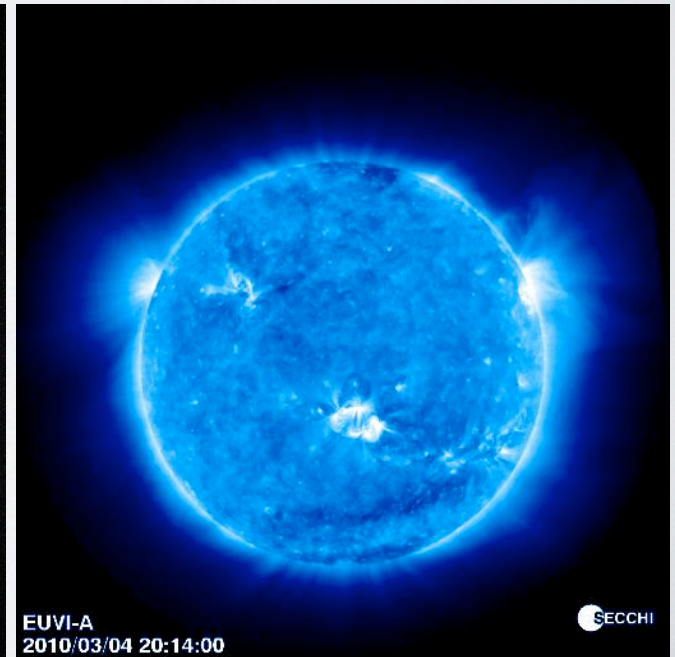
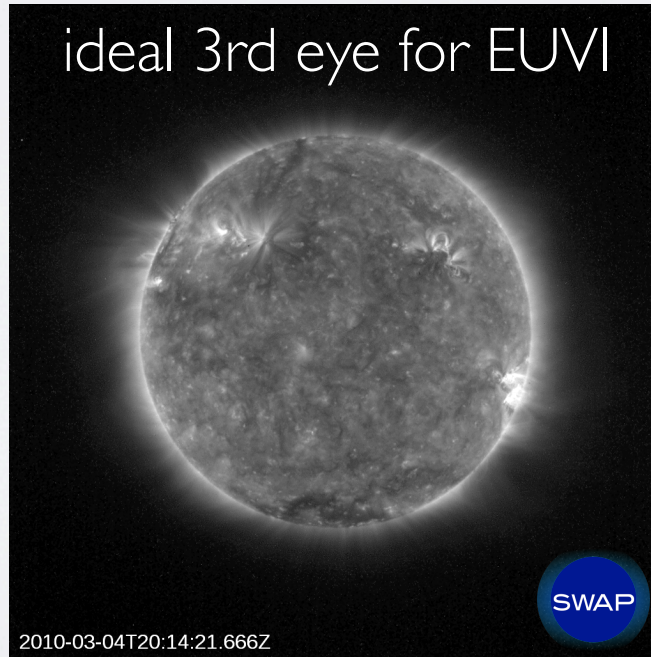
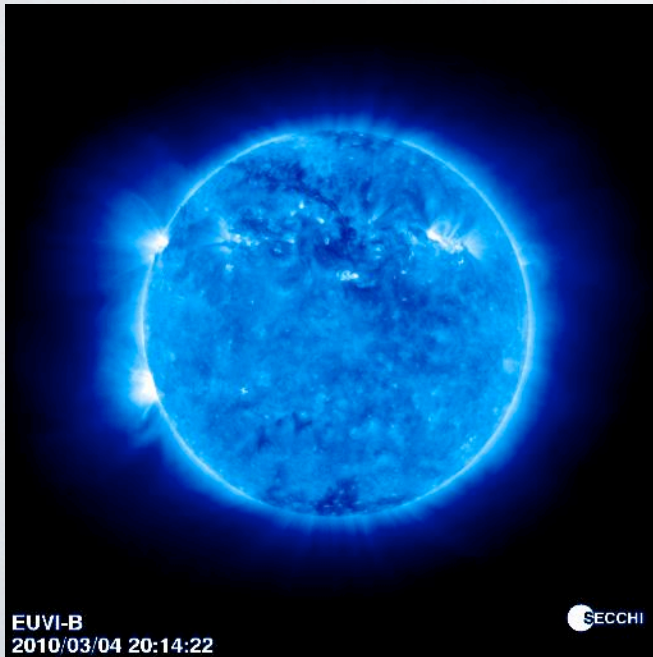
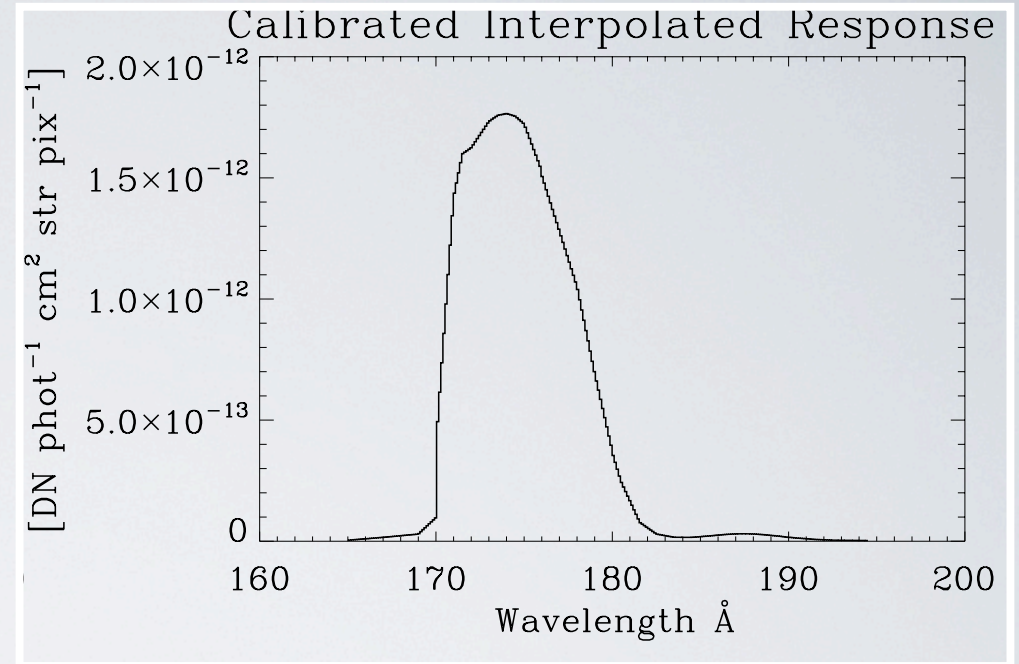


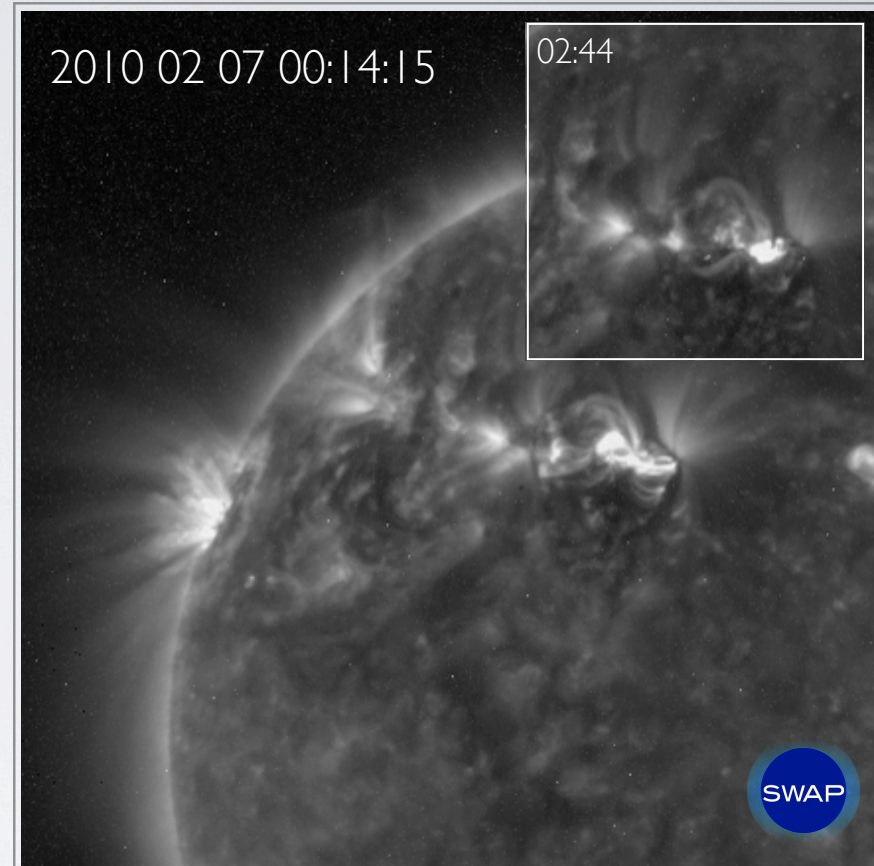
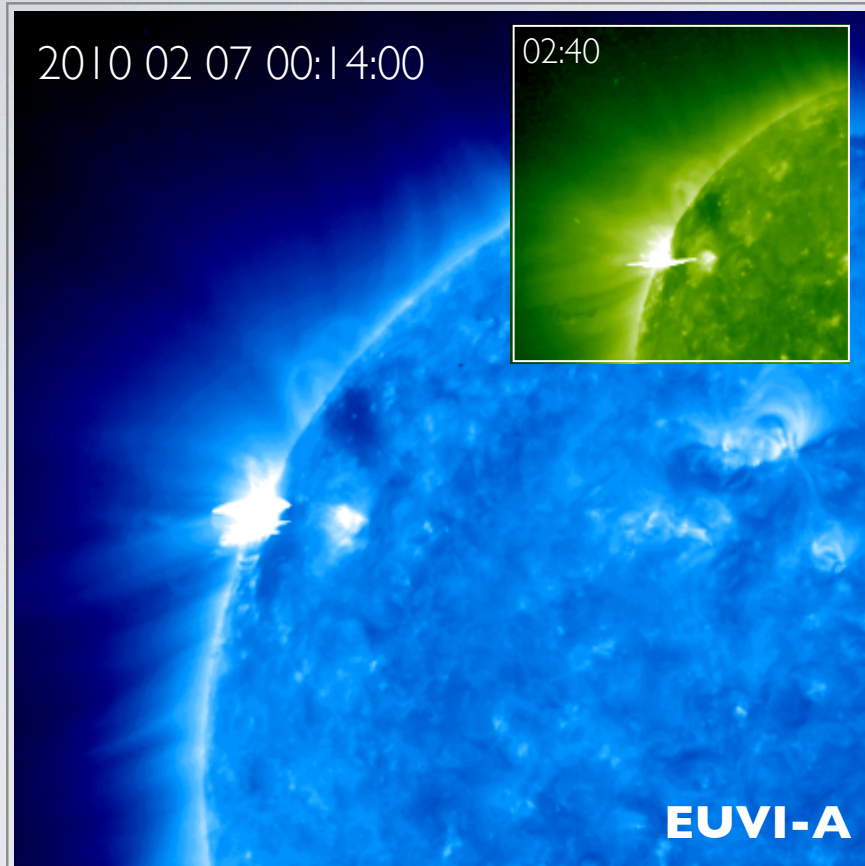
SWAP EUV IMAGER

Observes the 1 million degree corona in EUV light

SPECTRAL RESPONSE

Peak at 17.4nm
Similar to EIT & STEREO/EUVI

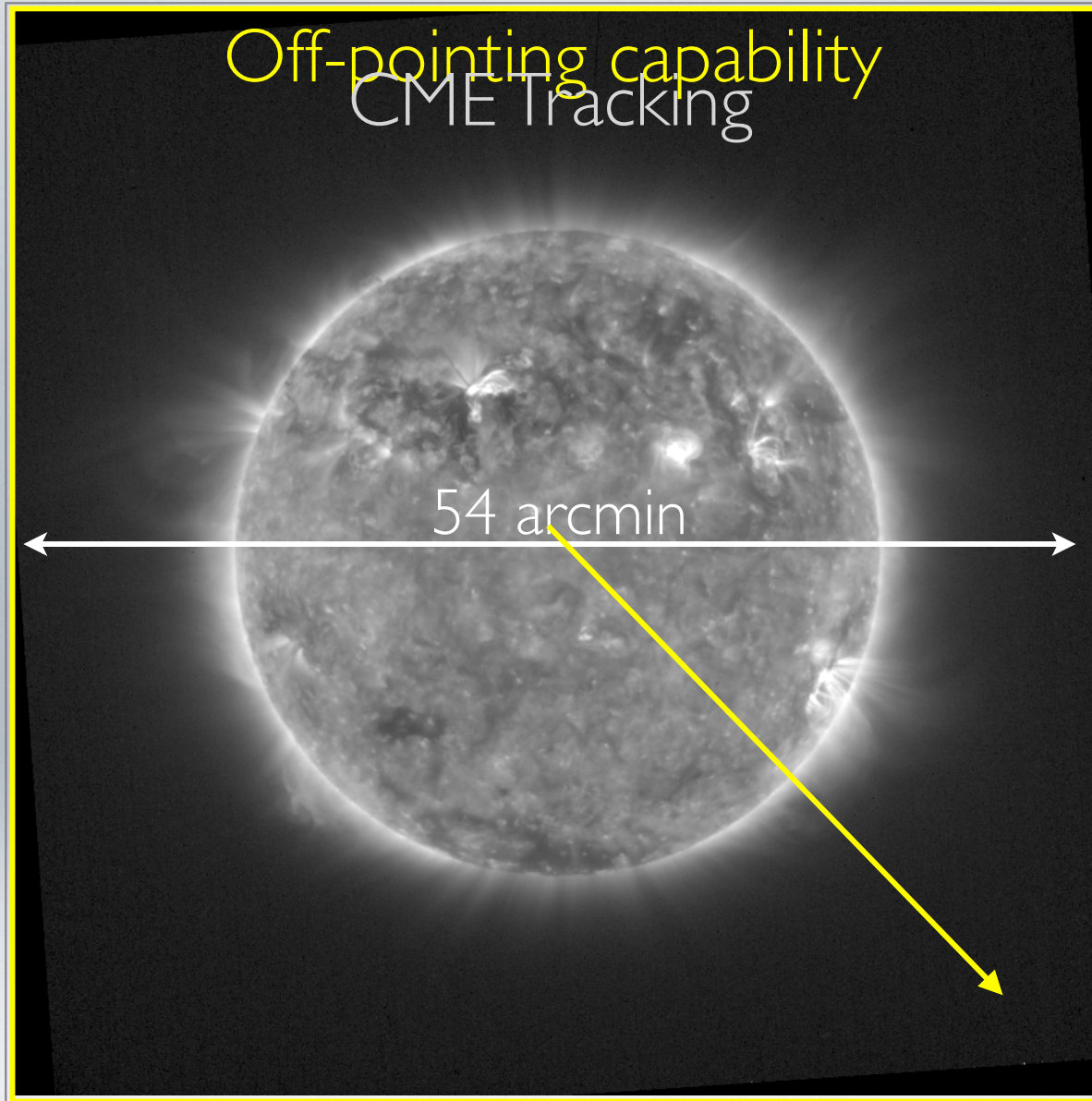




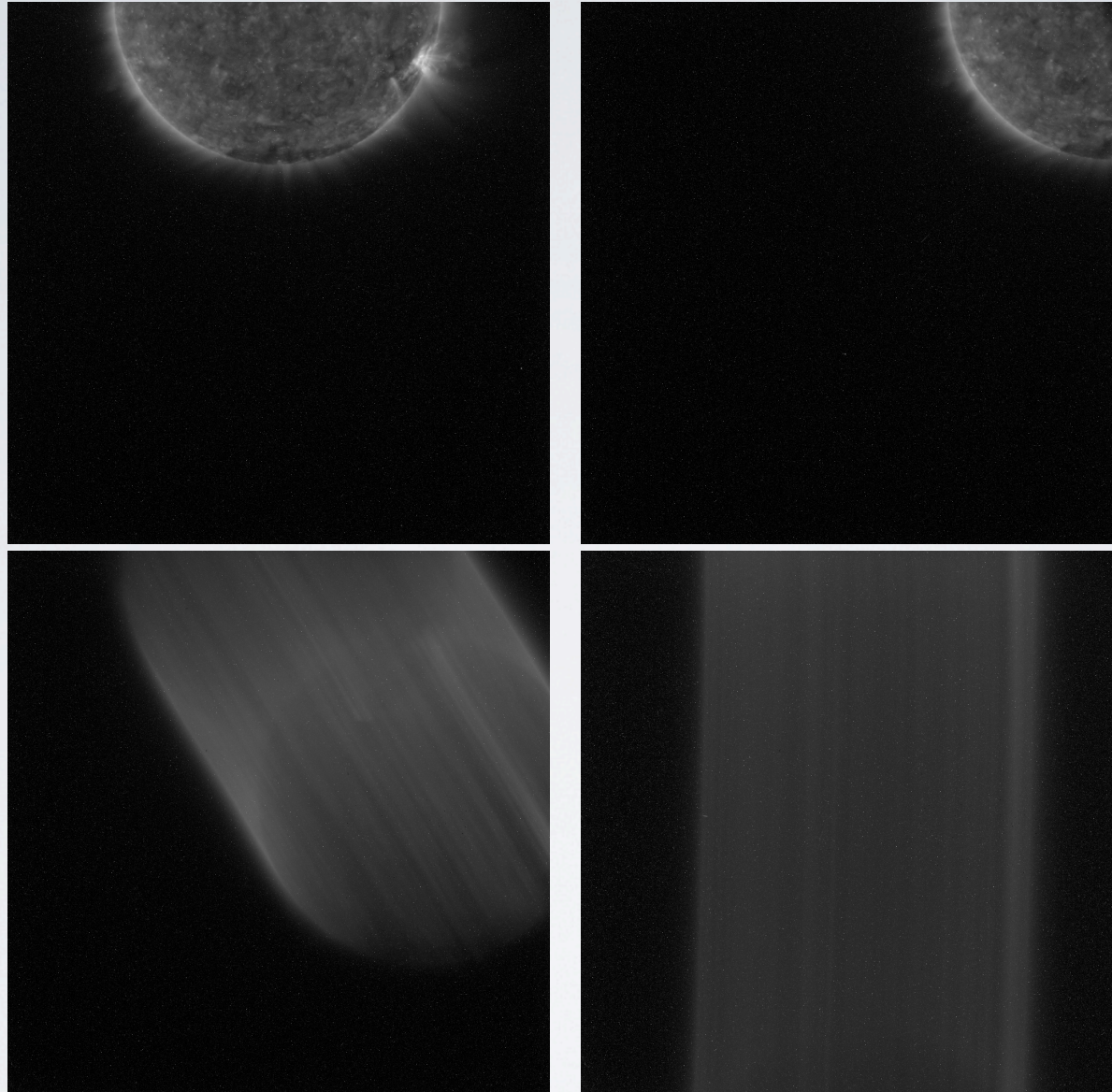
SOLAR FLARES

limited blooming due to CMOS detector
high cadence up to 18s

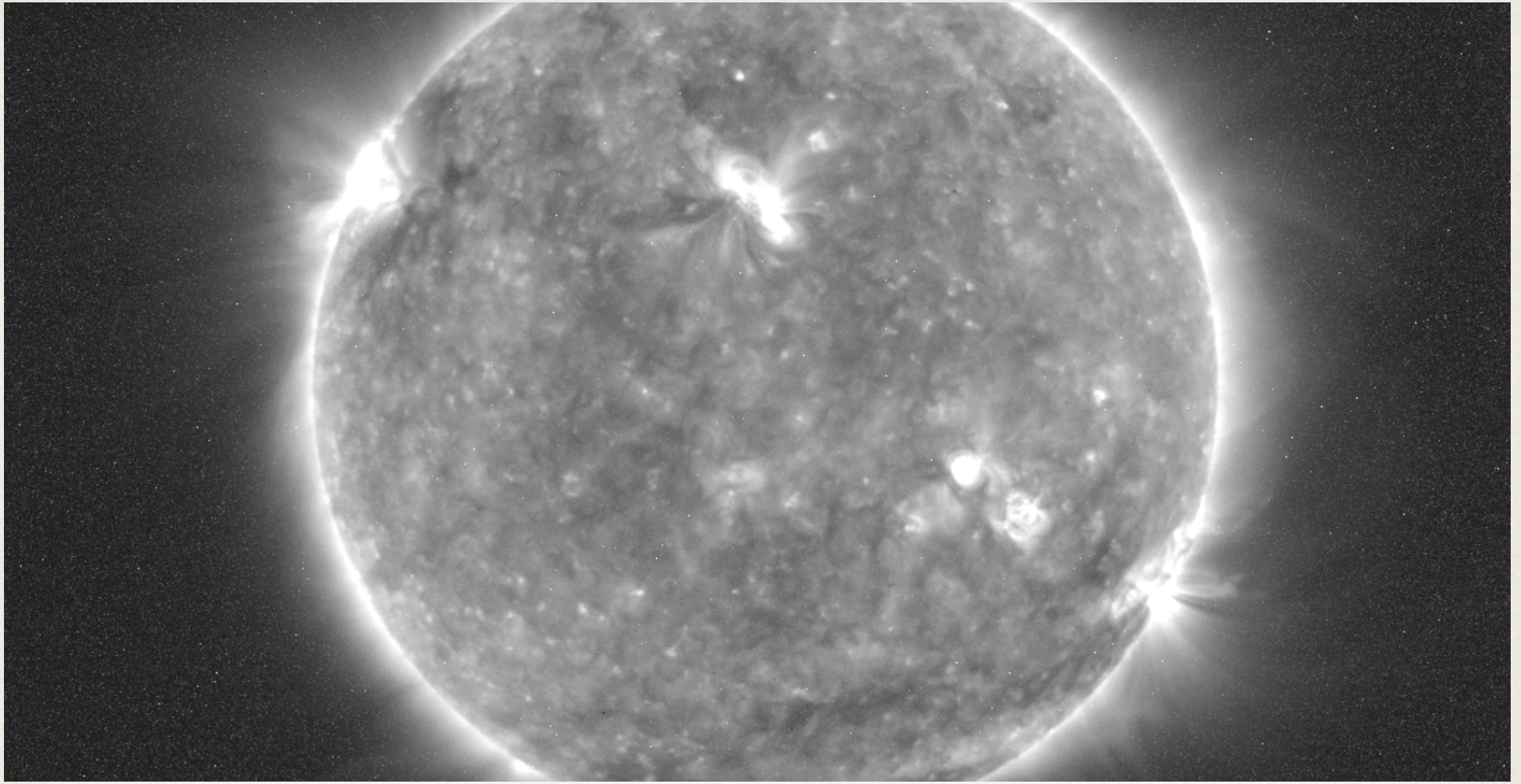
Off-pointing capability
CME Tracking



SWAP vs AIA ON SDO

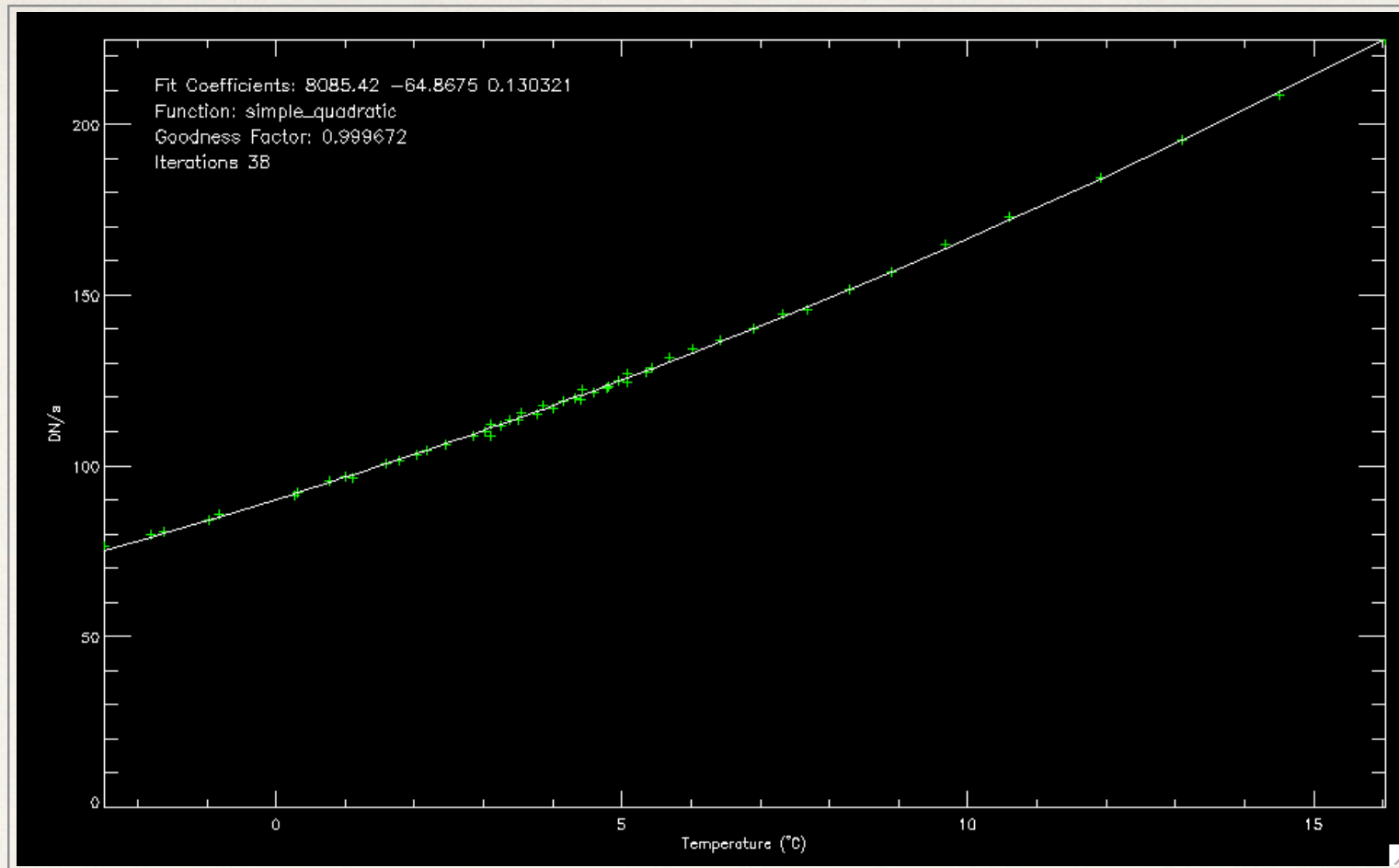


OFF-POINTING



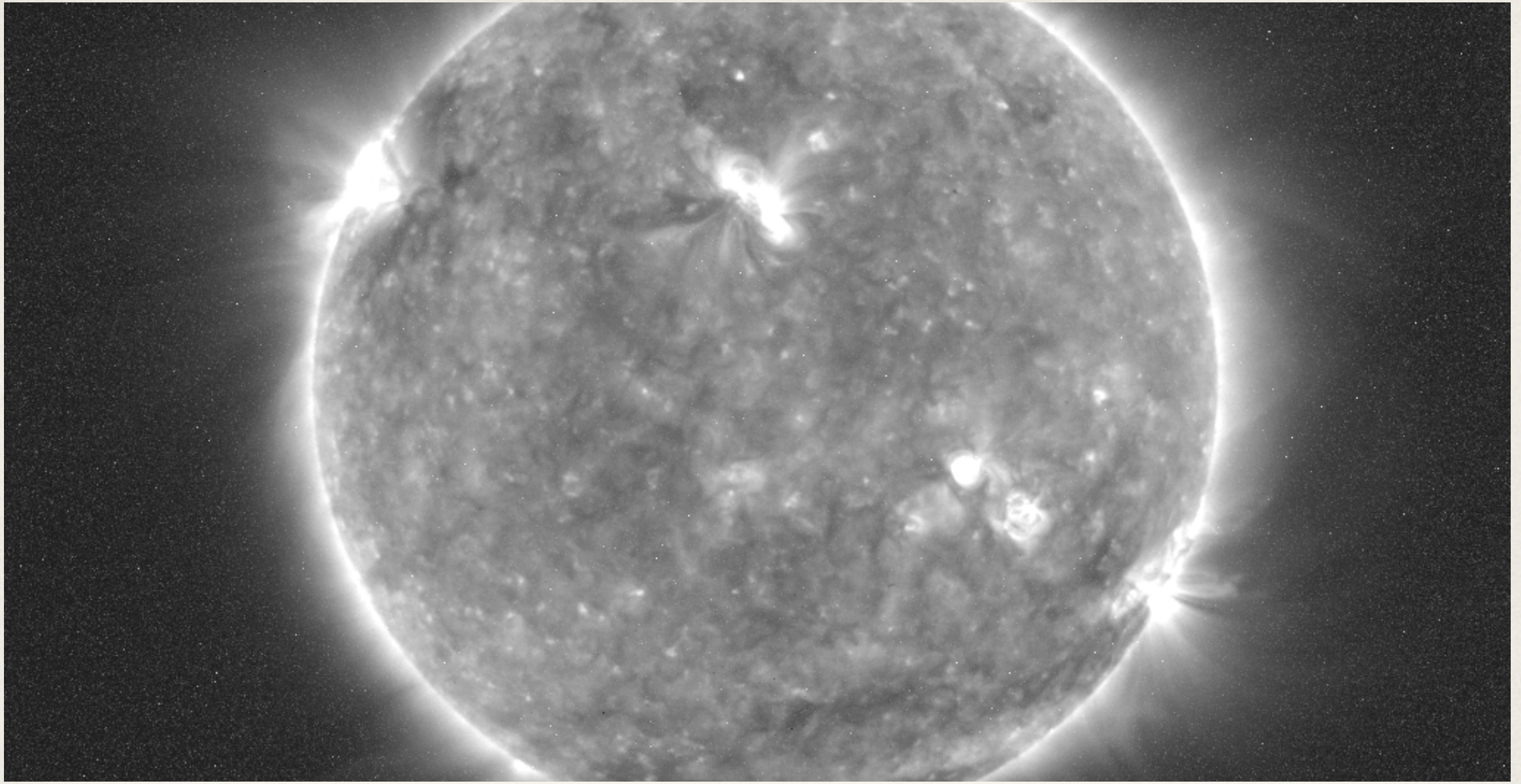
Dark current in images

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Dark current modeled per pixel

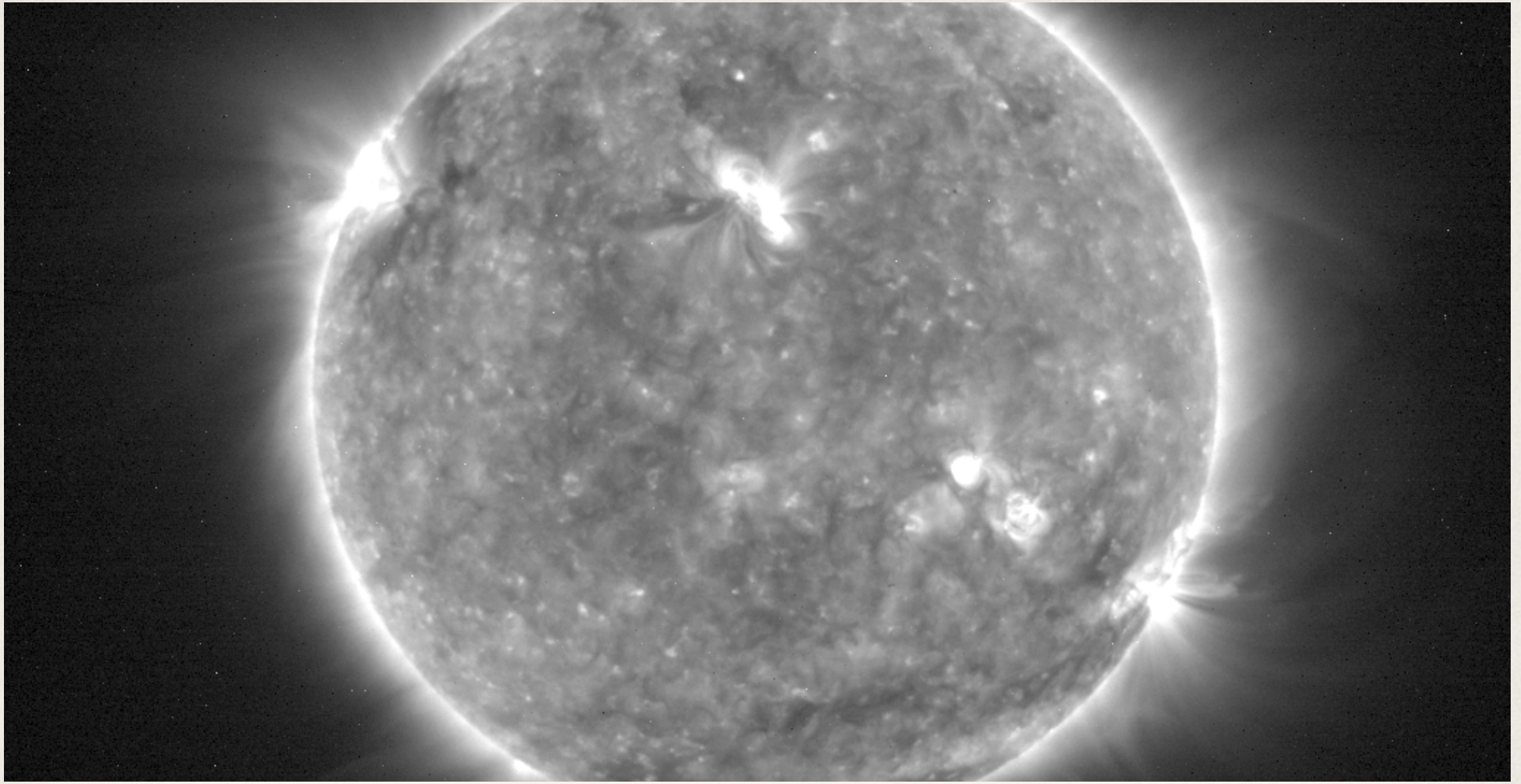
Dark current is fit with a polynomial function



Dark Subtraction

Dark subtraction removes most image noise

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Dark Subtraction

Dark subtraction removes most image noise

Proba2 Science Working Team - 14 June 2010

Image Alignment & Scaling

Telescope Effects

1. Spacecraft-Ecliptic Alignment
2. Sun Centering
3. Spacecraft Roll
4. Non-isotropic Pixel Scale

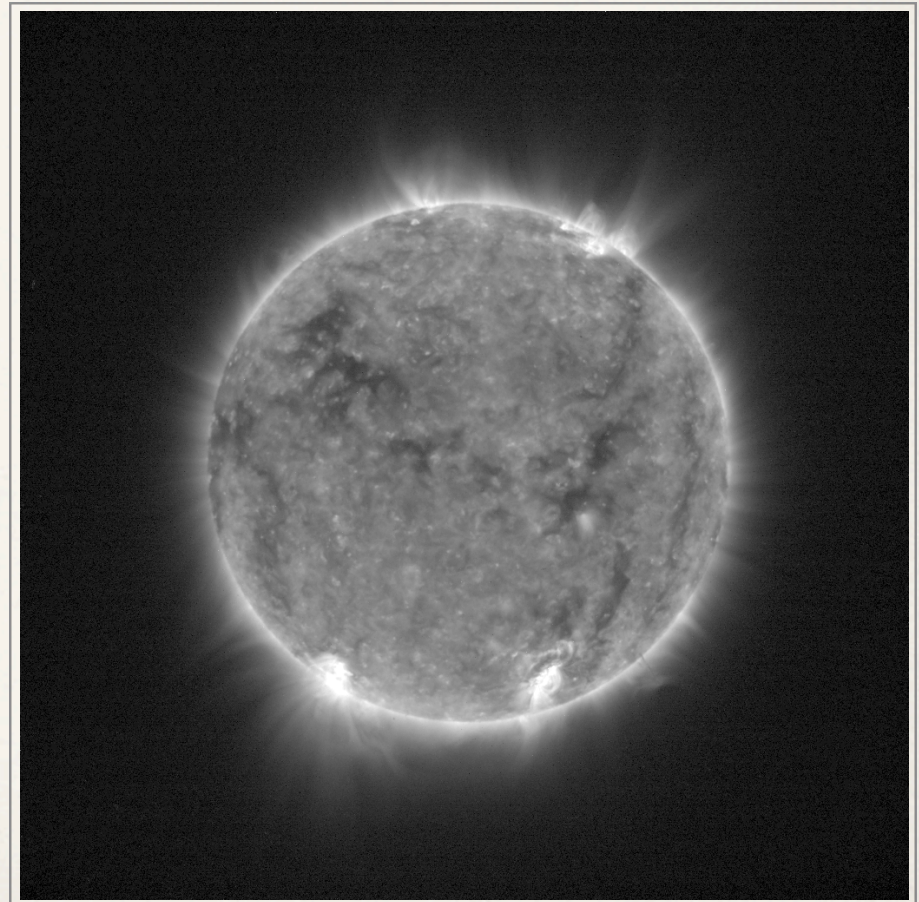


Image Alignment & Scaling

Telescope Effects

1. Spacecraft-Ecliptic Alignment
2. Sun Centering
3. Spacecraft Roll
4. **Non-isotropic Pixel Scale**

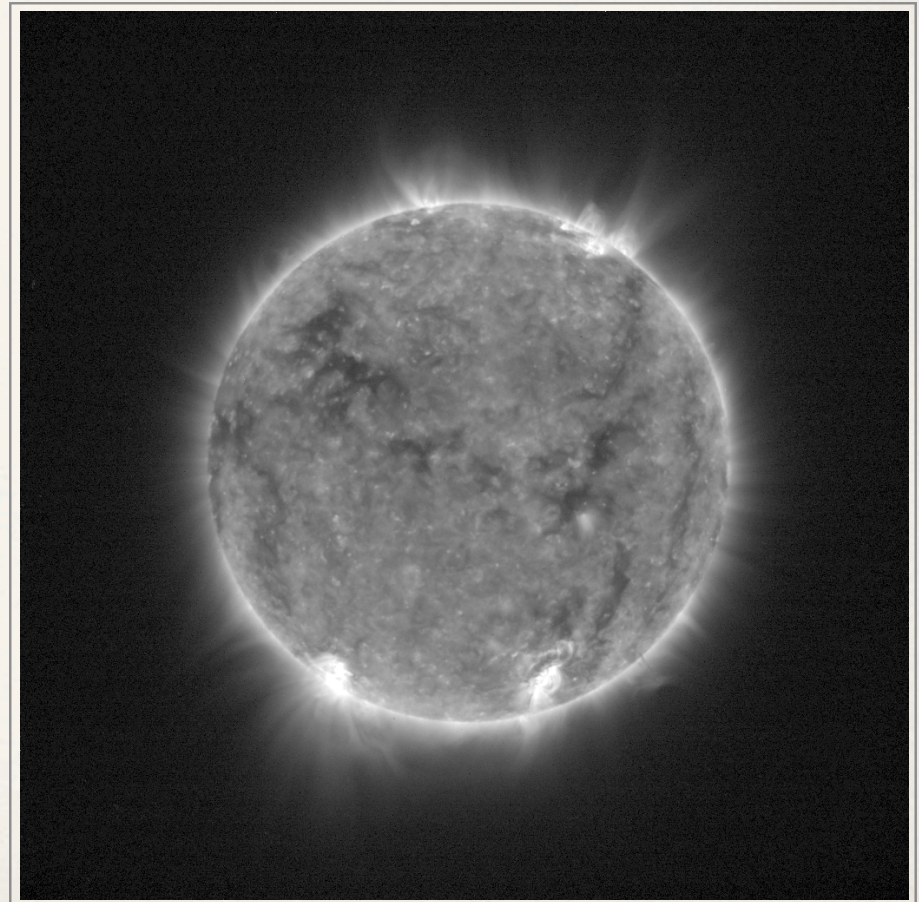


Image Alignment & Scaling

Telescope Effects

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- 3. Spacecraft Roll**
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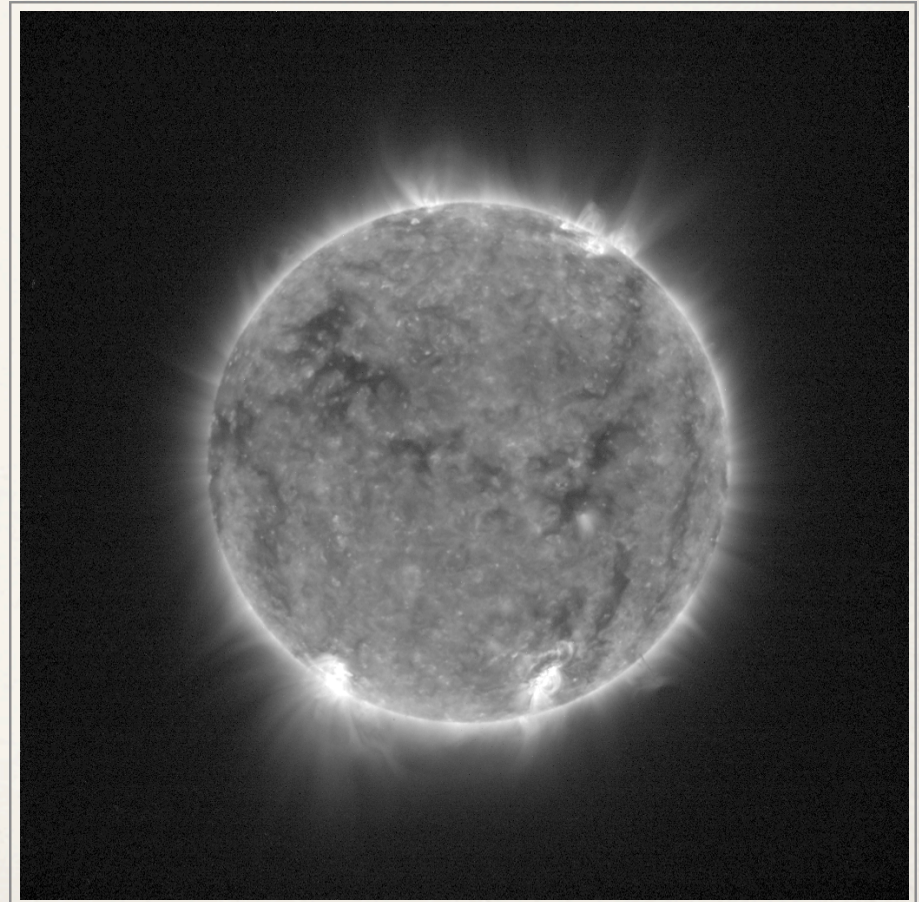


Image Alignment & Scaling

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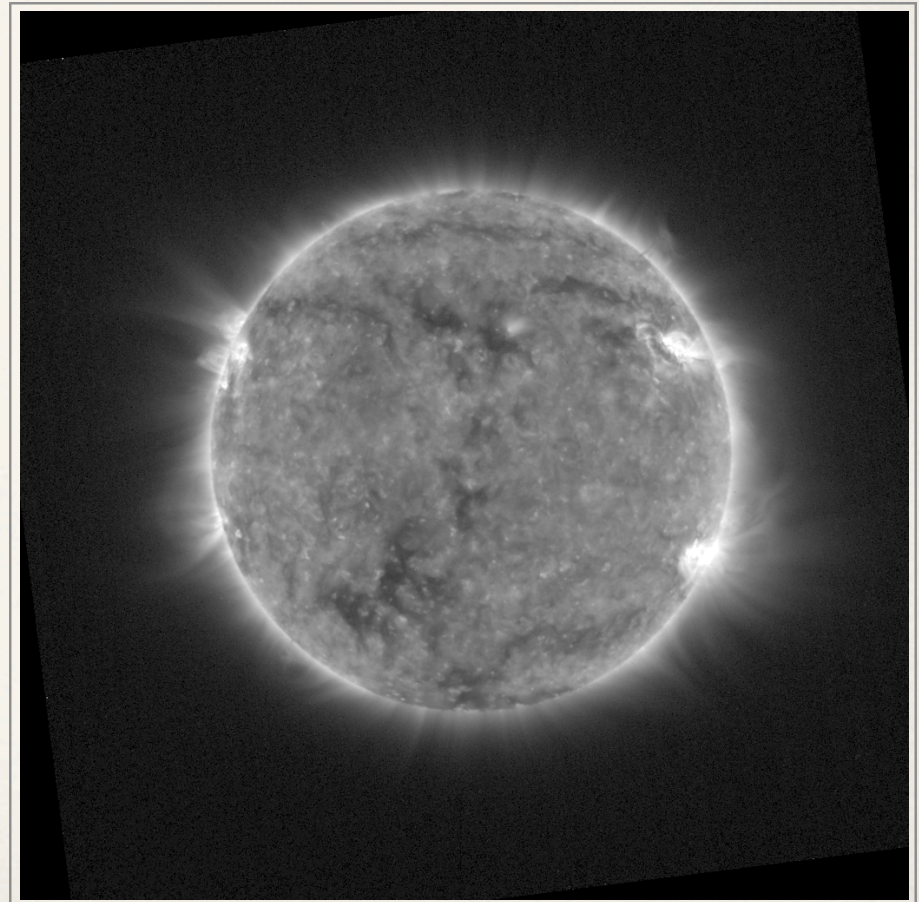


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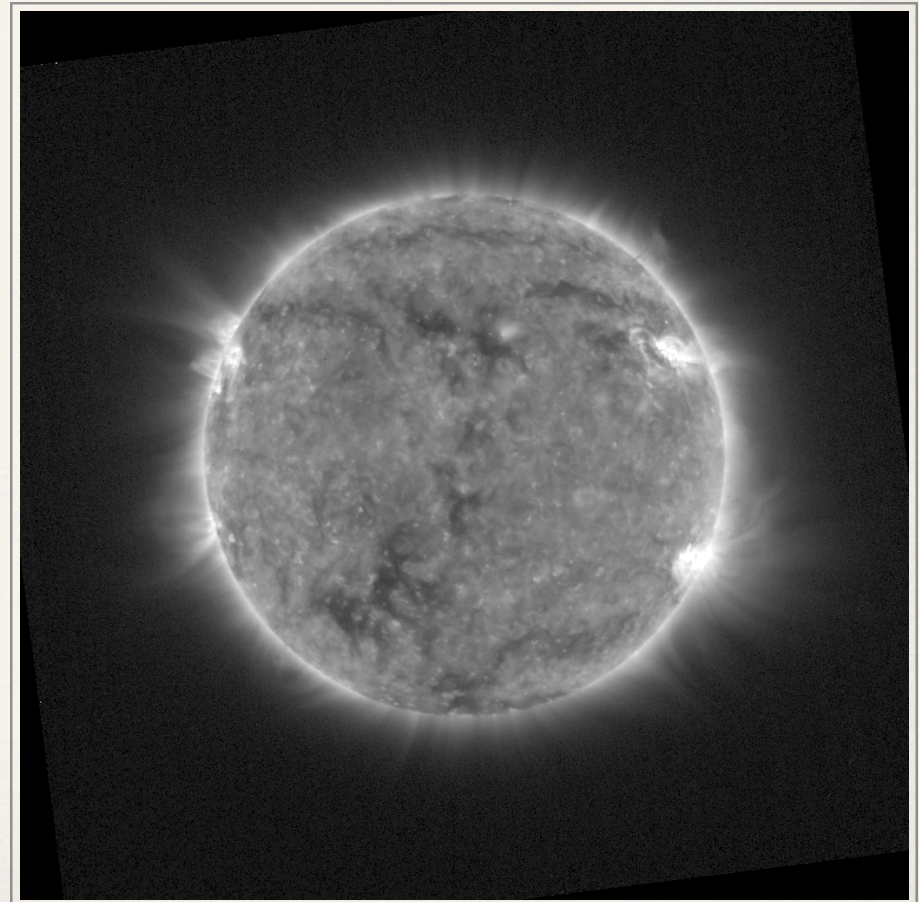
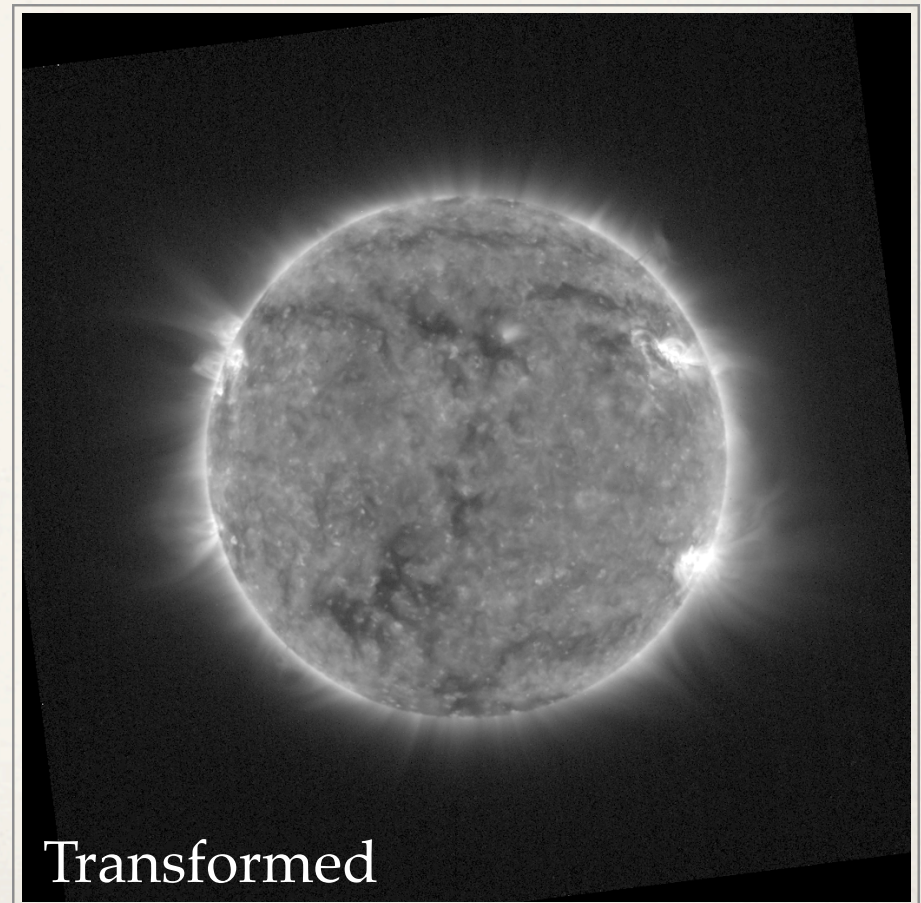
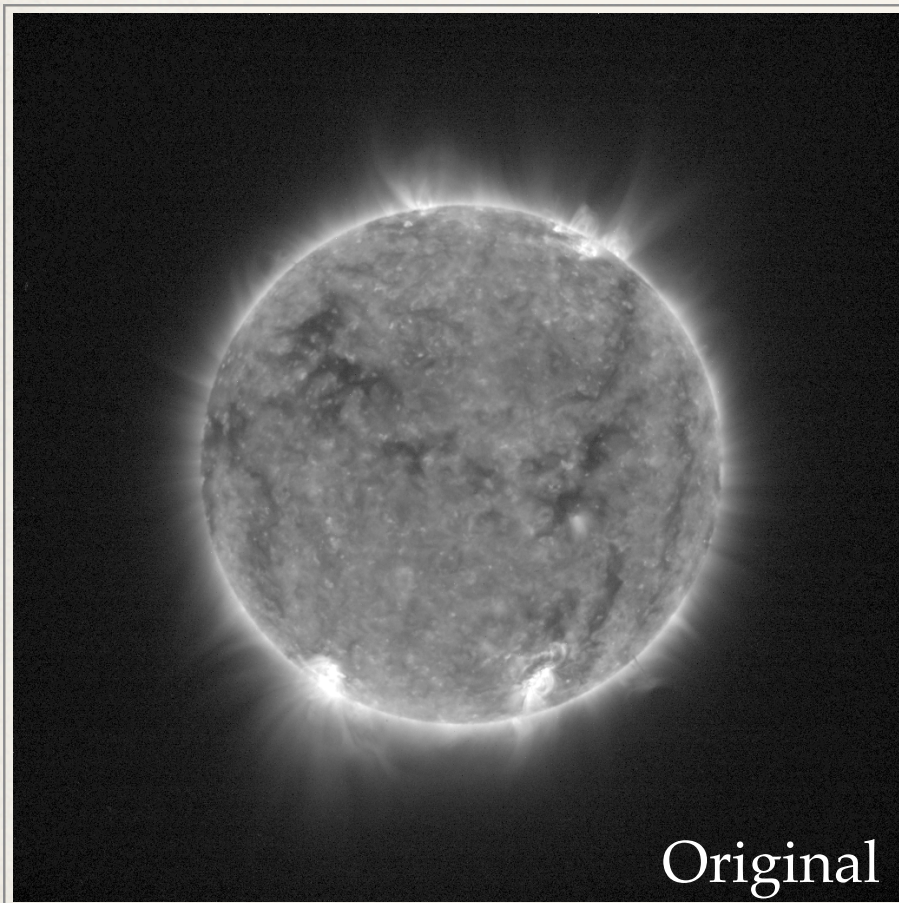


Image Alignment & Scaling



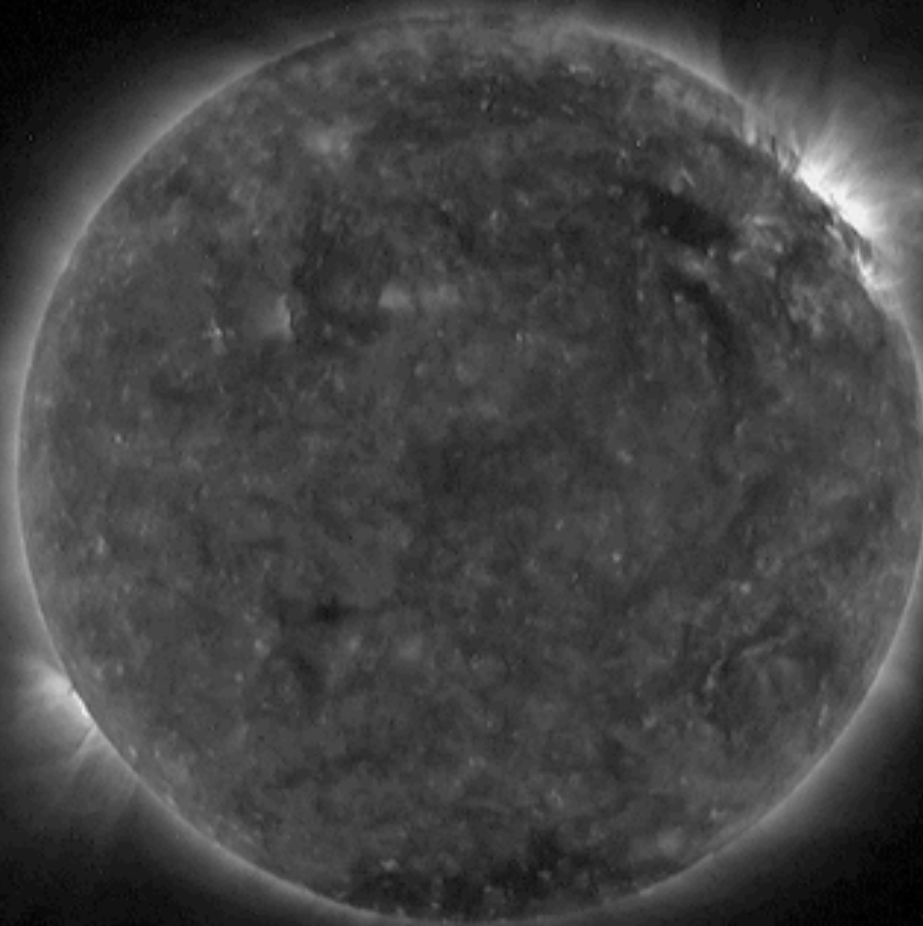
ANNULAR SOLAR ECLIPSE



January 15, 2010, 06:00 UTC



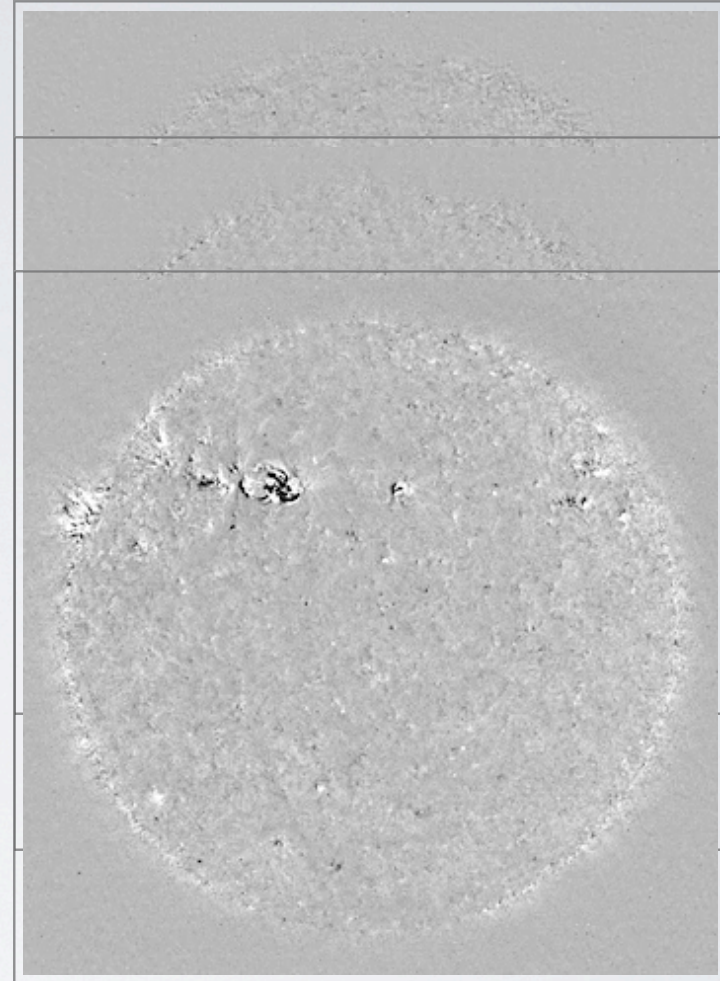
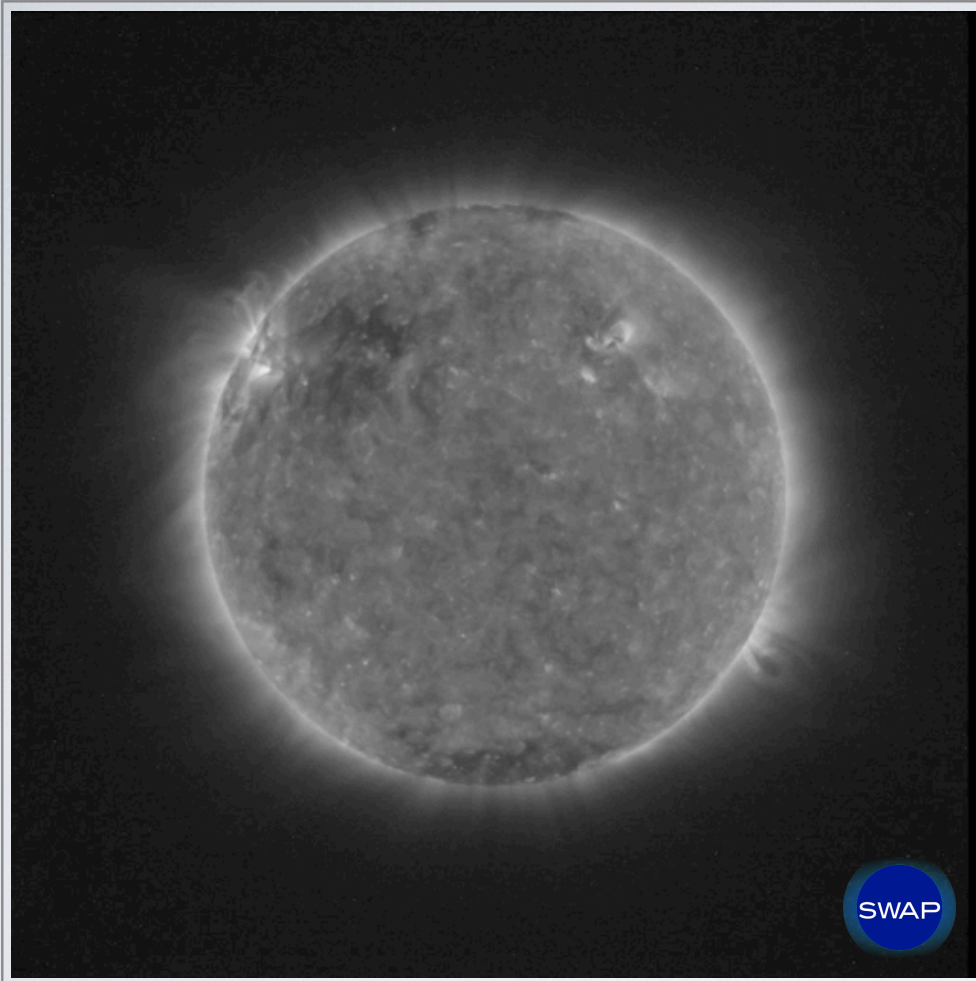
ACTIVE REGIONS & FLARES



1st M-flare
of new
cycle

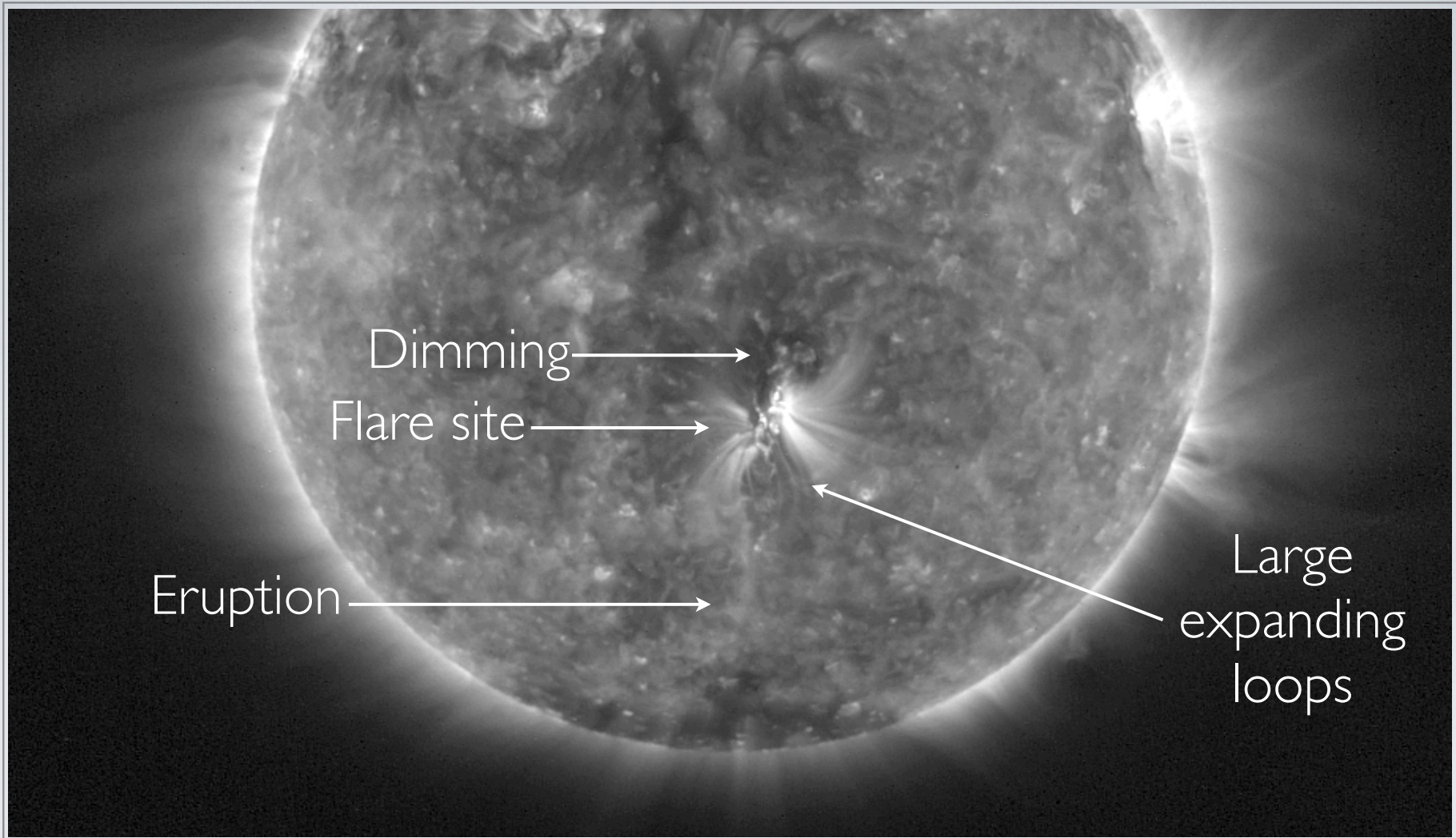
January 18-21, 2010





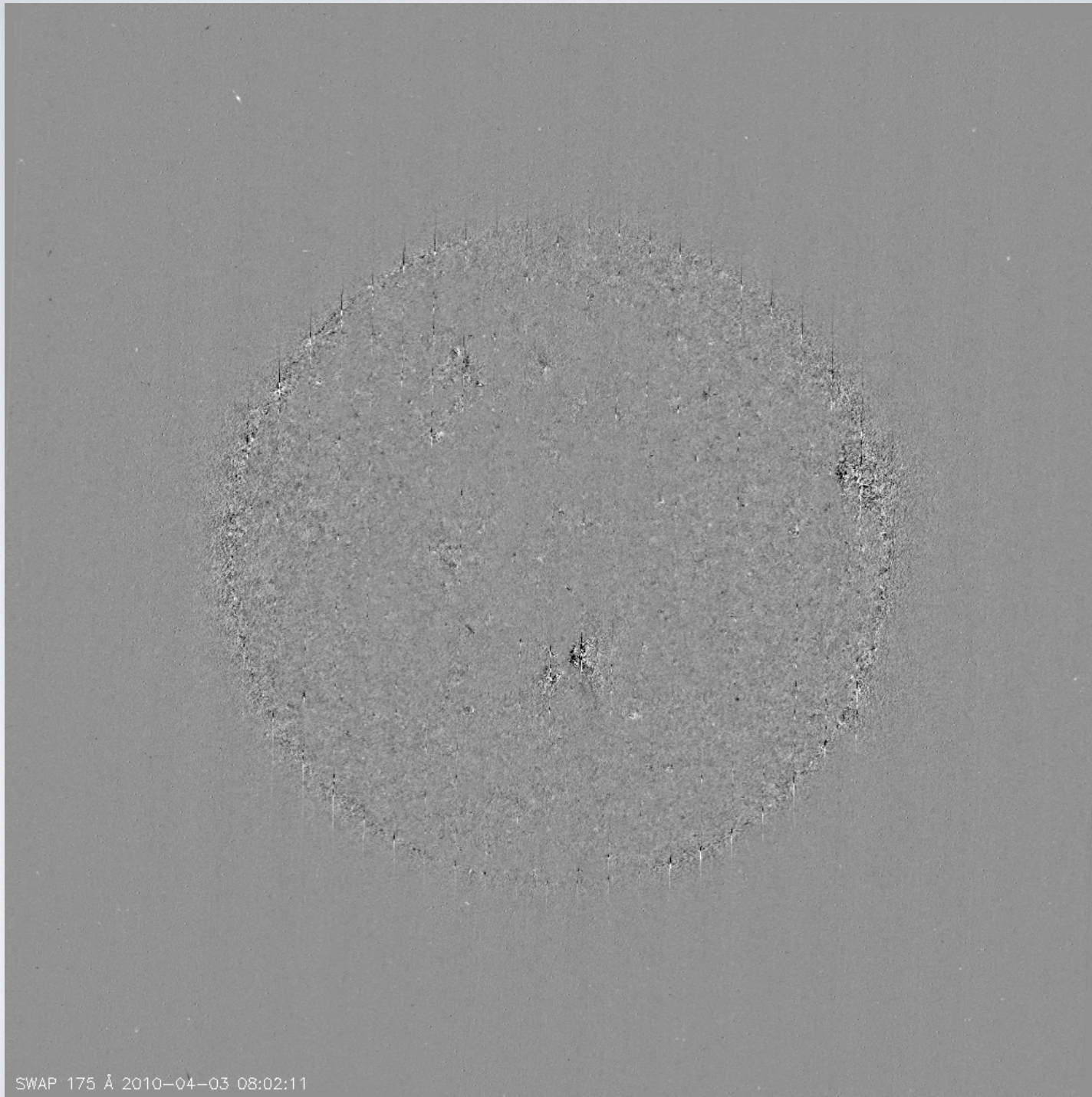
EIT WAVES

several waves associated with the flares of Feb. 5-6, 2010

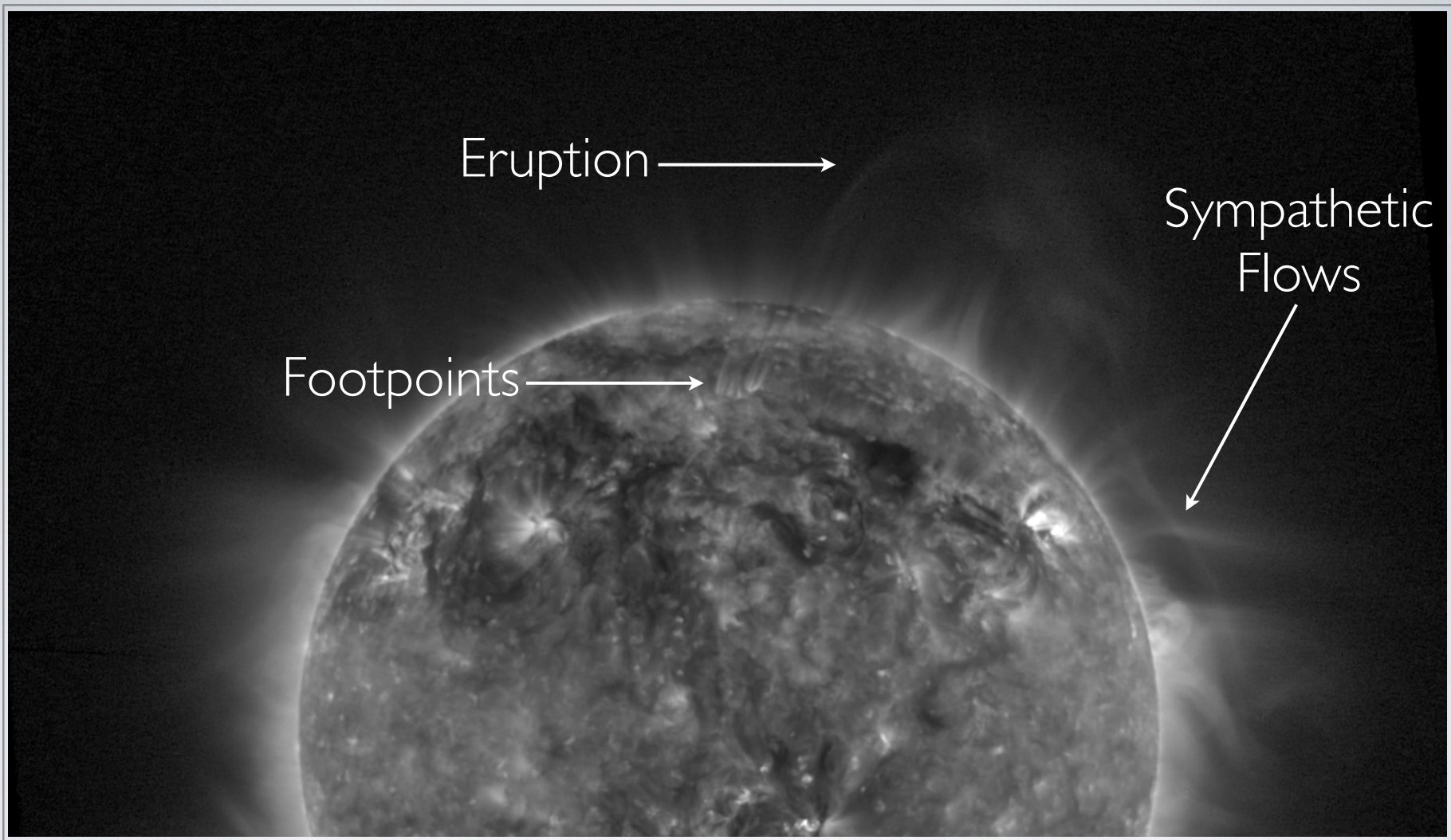


ERUPTION & FLARE

3 April 2010, 09:30 UTC ☀ B7.4 Flare ☀ Geoeffective CME

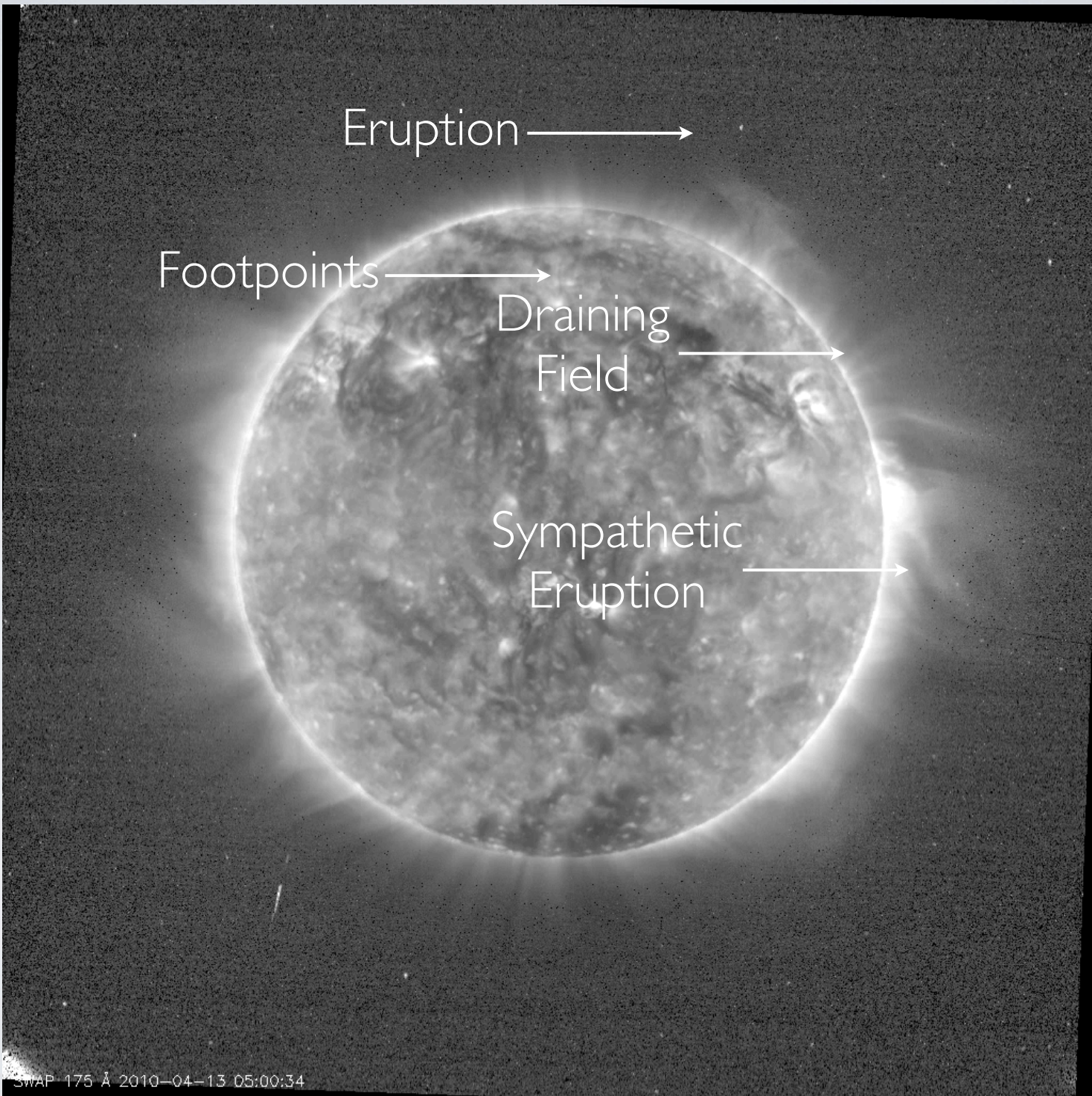


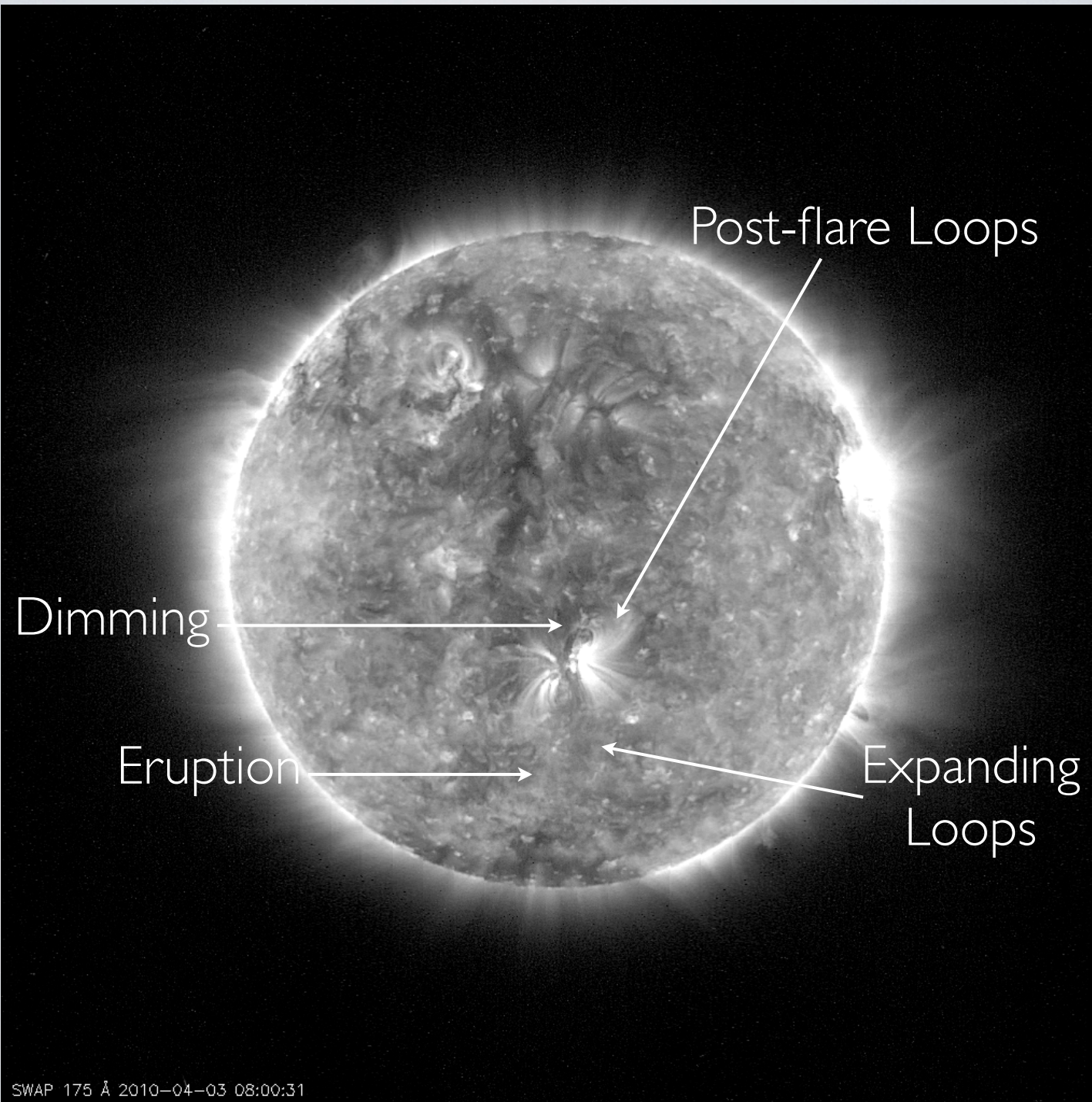
SWAP 175 Å 2010-04-03 08:02:11



PROMINENCE ERUPTION

13 April 2010, 09:30 UTC



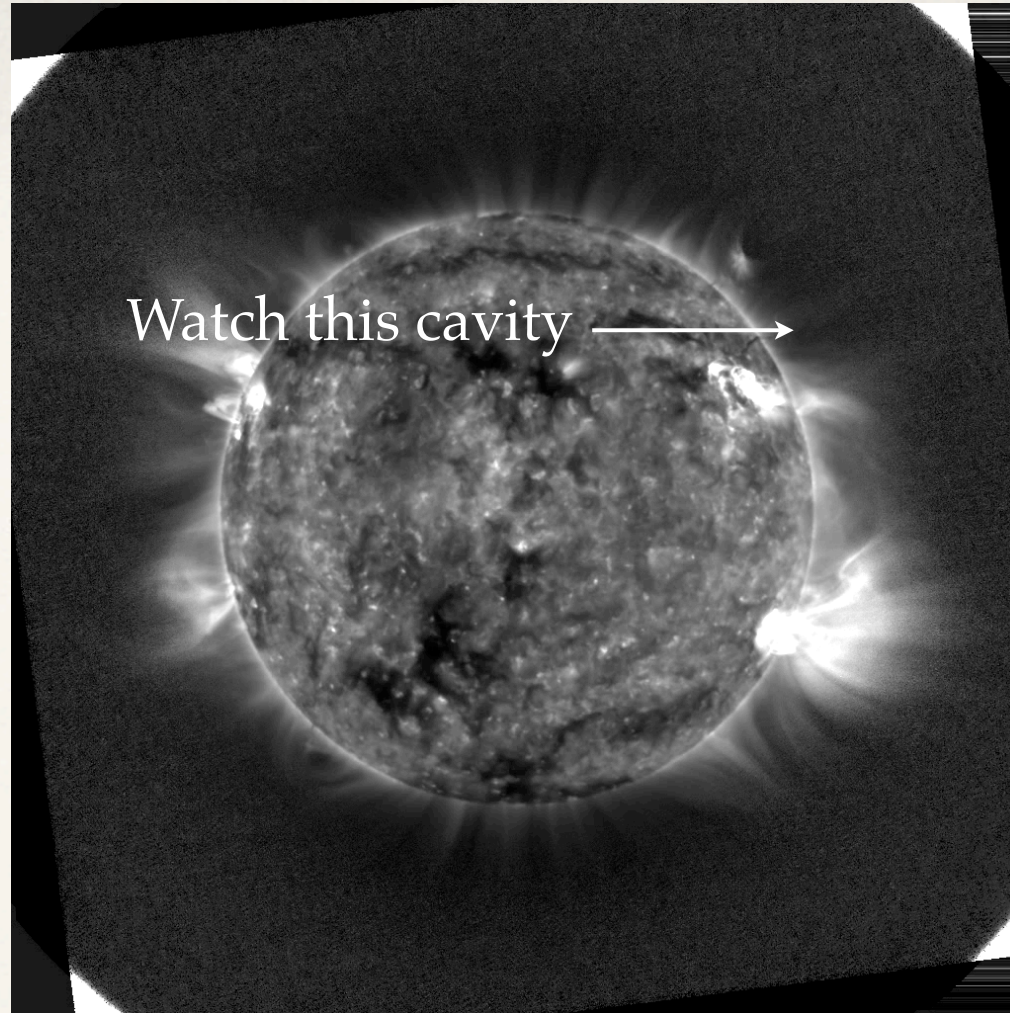


Dimming

Post-flare Loops

Eruption

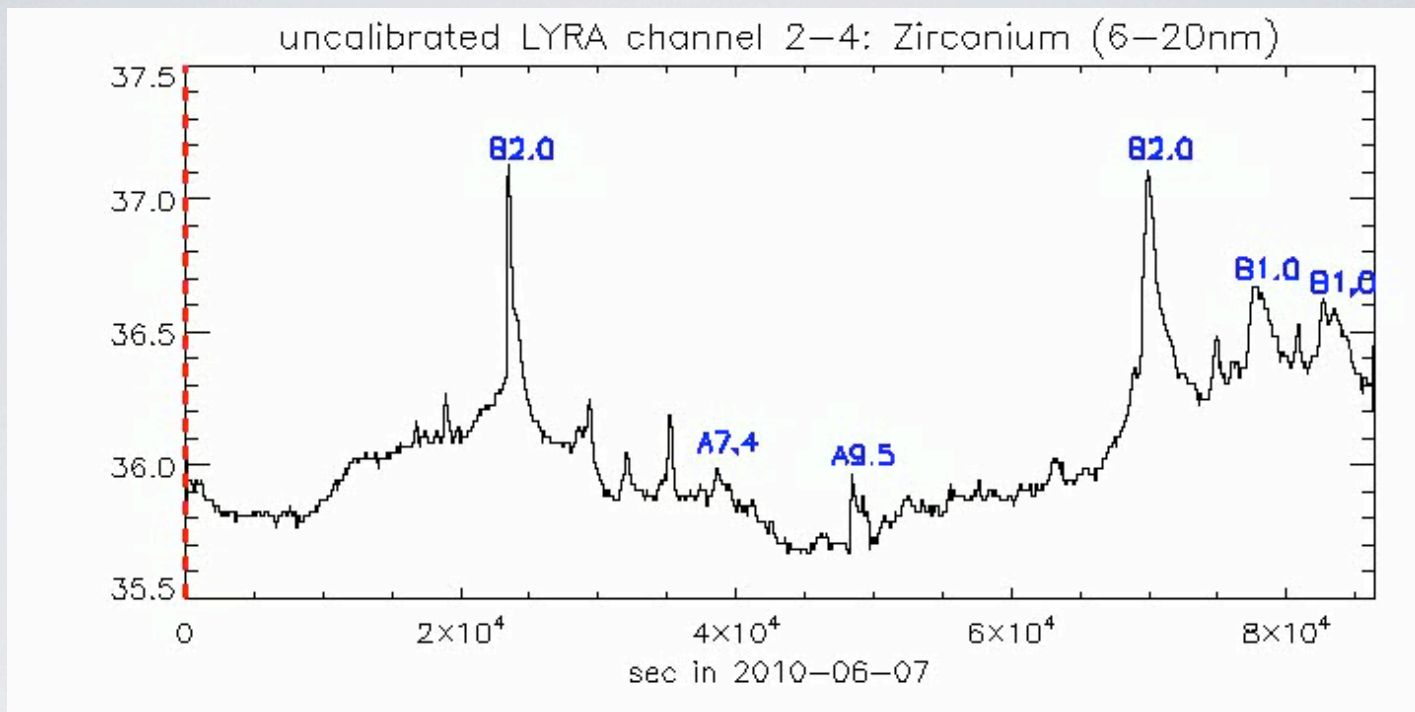
Expanding
Loops



Off-limb signal

Prominence Cavity Eruption - 13 June 2010, UT 03:00:00-10:00:00

Proba2 Science Working Team - 14 June 2010



FOR MORE INFORMATION

<http://proba2.sidc.be/>

The image shows two screenshots of a web browser displaying the PROBA2 Science Center website. The top screenshot shows the main homepage, and the bottom screenshot shows a data download page.

Top Screenshot: PROBA2 Science Center Homepage

- Browser:** Safari, Fri Jun 11 17:19. Address bar: <http://proba2.oma.be/index.html/>
- Page Title:** [PROBA2 SCIENCE CENTER]
- Navigation:** Home, About, SWAP, LYRA, Data, Community, Meetings, Outreach, Gallery
- Header:** PROBA2 SCIENCE CENTER
- Content:**
 - >Welcome to the PROBA2 science center.
 - Image: A photograph of the Moon with timestamp 2010-04-17T17:16:51.538Z. Below it: [Watch the latest SWAP image](#)
 - Figure: LYRA short-wavelength channels (1 minute averages). The figure contains two line graphs:
 - Top graph: LYRA short-wavelength channels (1 minute averages). Y-axis: Unsubtracted Signal / Hz (14.0 to 12.0). X-axis: Time / h UTC, 14 Apr 2010. Subplots: Channel 2-3 (Aluminum Filter, 17-80nm (nominal) + Xray), Channel 2-4 (Strontium Filter, 6-20nm (nominal) + Xray).
 - Bottom graph: LYRA short-wavelength channels (1 minute averages). Y-axis: Unsubtracted Signal / Hz (4.6 to 3.8). X-axis: Time / h UTC, 15 Apr 2010. Subplots: Channel 2-3 (Aluminum Filter, 17-80nm (nominal) + Xray), Channel 2-4 (Strontium Filter, 6-20nm (nominal) + Xray).
- Right Sidebar:**
 - Latest news:
 - 21 January 2010: PROBA2 Press Event (26 January 2010)
 - 18 December 2009: SWAP First Light!
 - 12 November 2009: PROBA2 Passes First Health Checks
 - Best picture: Image of a person in a white protective suit holding a tray.
 - Best movie: Video thumbnail of a person.

SWAP & LYRA Guest Investigators



- Austria: 1 (p5)
- Belgium: 1 (p9)
- China: 1 (p13)
- France: 5 (p1,3,8,9,15)

- Germany: 2 (p6, p16)
- Greece: 1 (p11)
- India: 3 (p1,4,12)
- Iran: 1 (p8)

- Russia: 4 (p2,3,7,9)
- UK: 1 (p2)
- US: 1 (p10,12,14)