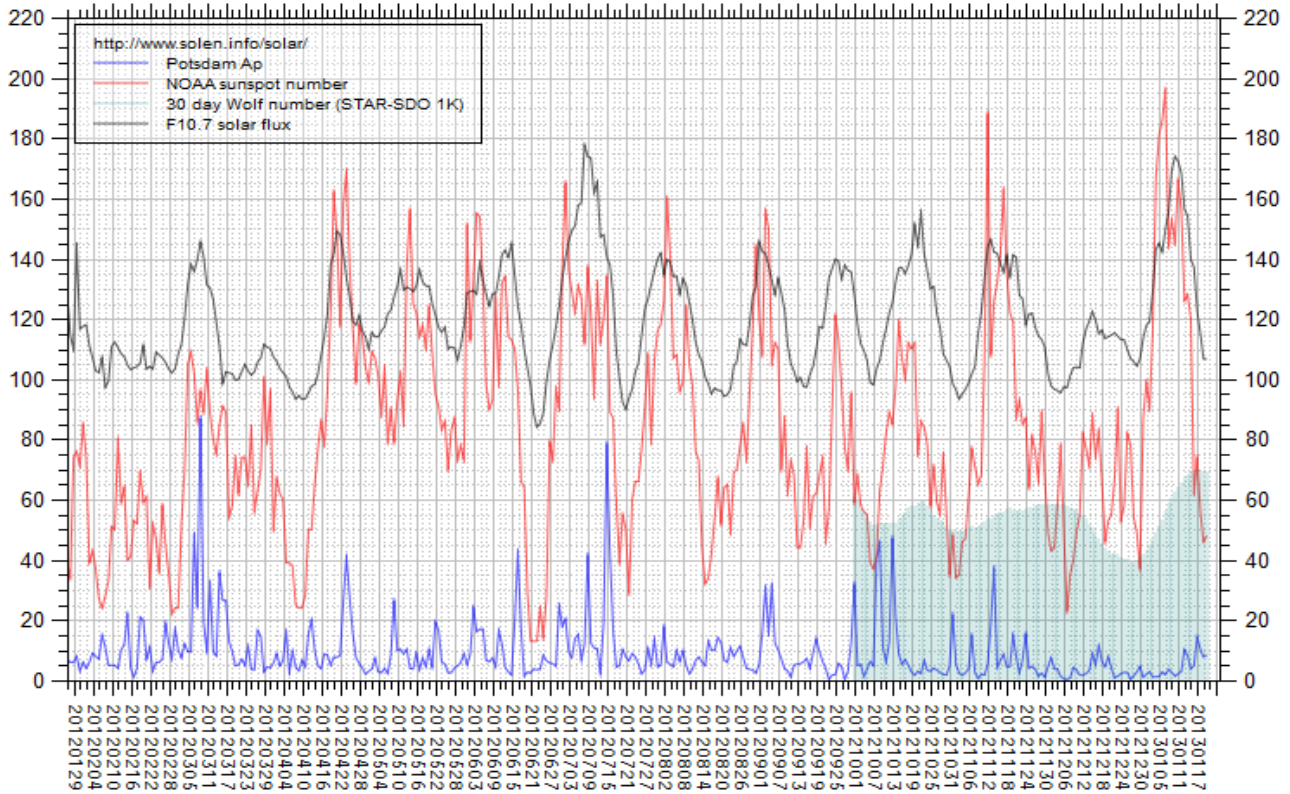
The

Solar Terrestrial Activity Report

www.solen.info/solar/

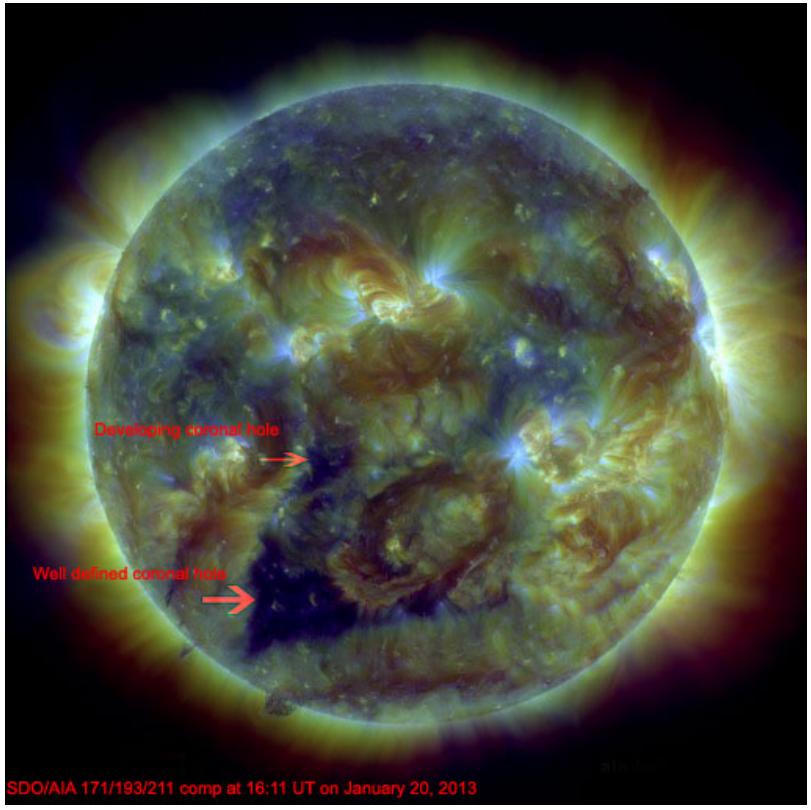


History

- ~1995 – monthly report (paper)
- 1997 – daily reports (Internet)
- 2002 – detailed sunspot analysis
- 2002 – archive of daily reports
- 2002 – Coronal hole numbering and archive
- 2010 – Switch from SOHO to SDO as image source
- 2010 – Sunspot number using 2K SDO continuum images
- 2011 – Sunspot analysis using polarity overlays
- 2012 – Added 1K SDO sunspot number. Sunspot image documentation at 1, 2 and 4K resolution

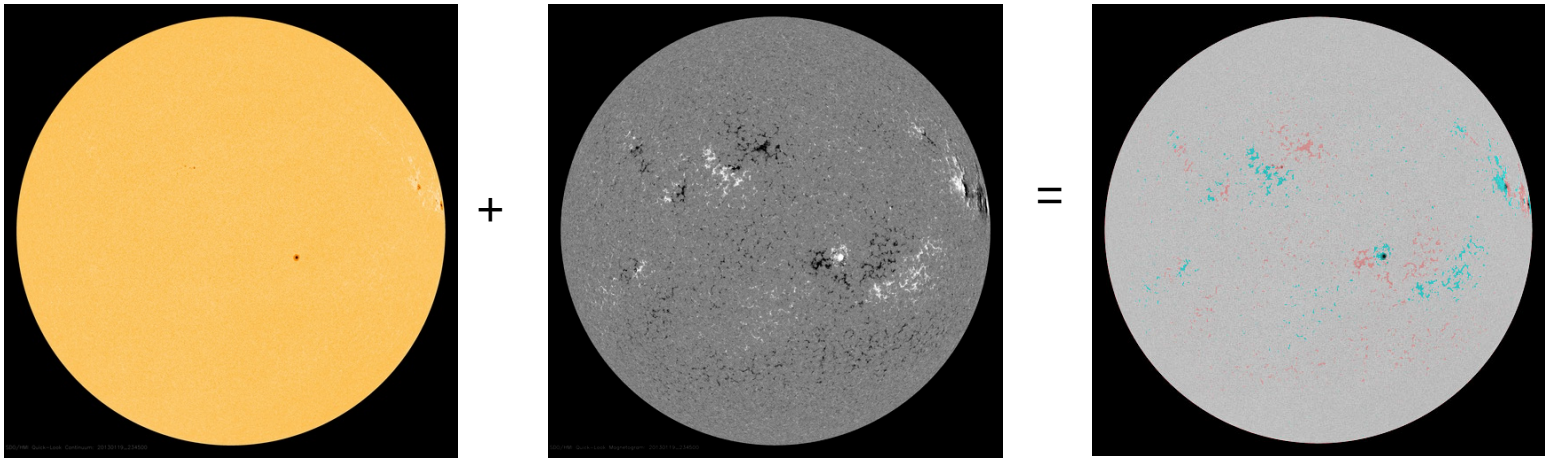
Coronal holes

- Visible disk observations
- Inferred (behind the limbs)



Sunspots – image creation

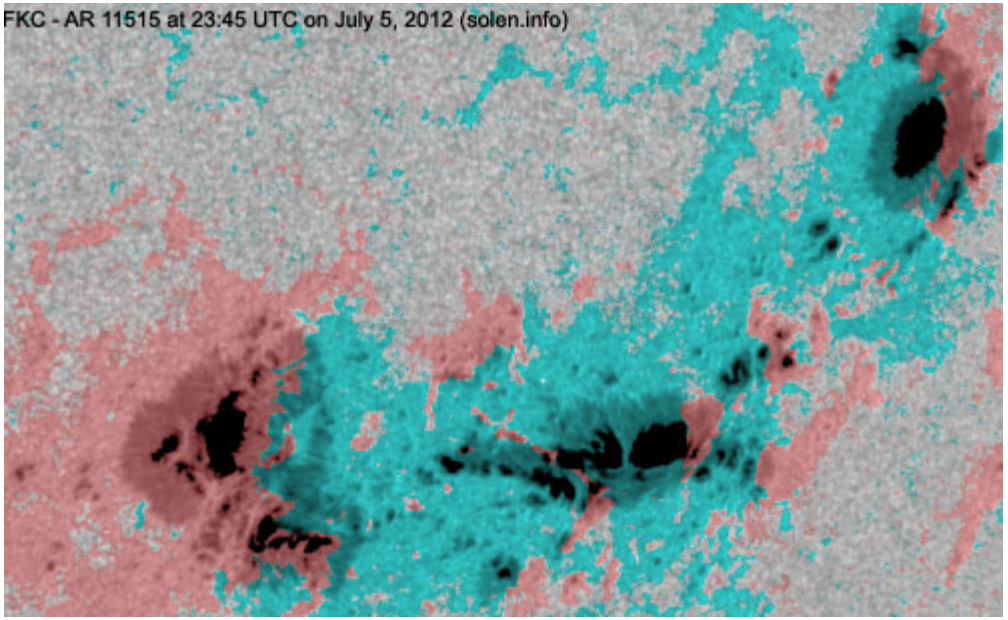
- Using magnetic overlays greatly aids spot analysis – both at the overview and detailed level



The transformation from 2 images to the magnetic overlay image only requires a few steps. Easily done in Gimp or Photoshop

Sunspots – magnetic deltas

- Quickly detect magnetic delta structures

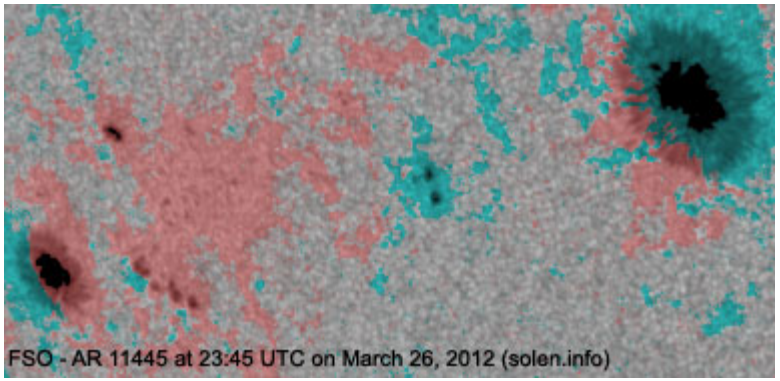


AR 11515 developed many magnetic delta structures in early July 2012

AR 11515 produced 1 X and 6 M class flares on July 6

Sunspots – group boundaries

- Using magnetic boundaries instead of longitudinal separation when determining possible splits

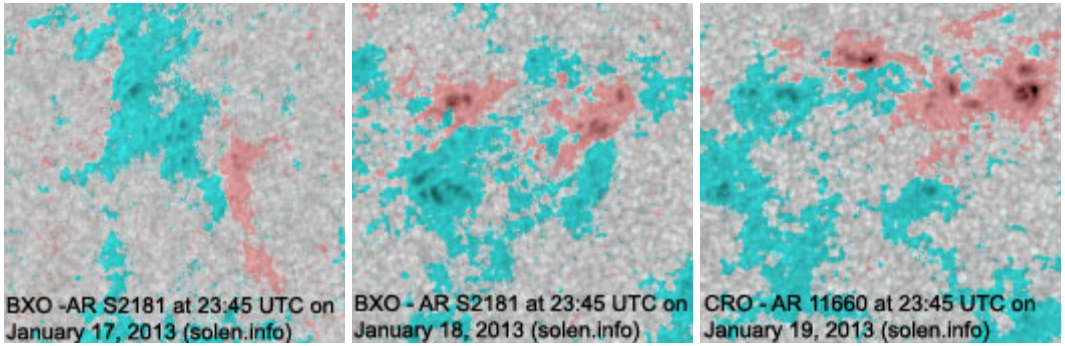


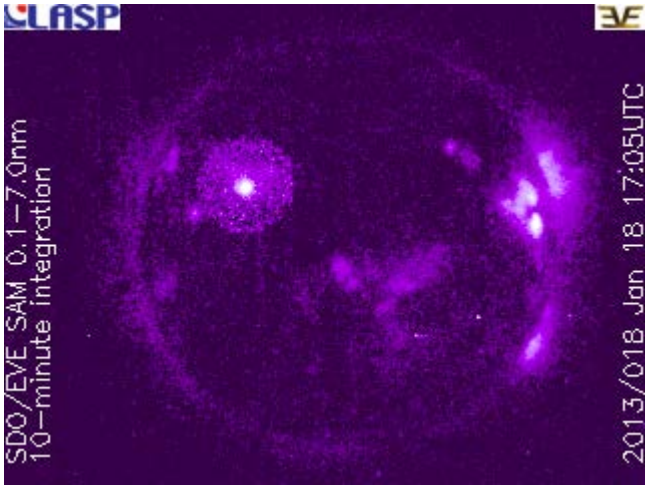
Magnetically one group

Locarno split into 2 groups (77/78), presumably because of longitudinal separation of spots, see http://www.specola.ch/drawings/2012/loc-d20120326.JPG

Sunspots – early detection

- Early detection improves quality of related solar data

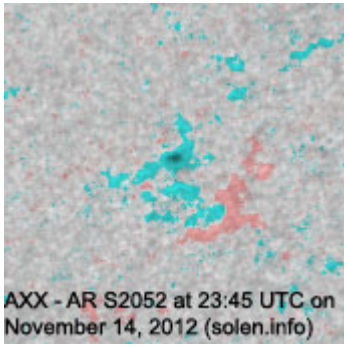




NOAA recorded a C5.8 flare at 17:07 UTC on January 18 and attributed it to AR 11654.

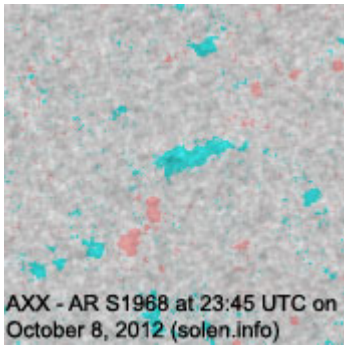
SDO/EVE SAM confirms that the flare occurred in AR S2181 (now 11660)

Sunspots – high latitude obs.



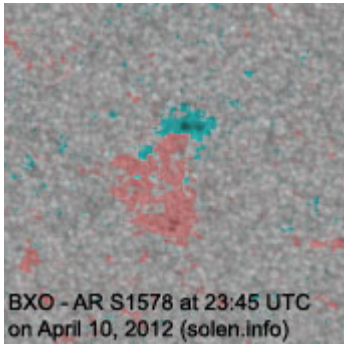
AR S2052, location: N42E30

Easily observed in 1K resolution on Nov.14, 2012



AR S1968, location: N51E04

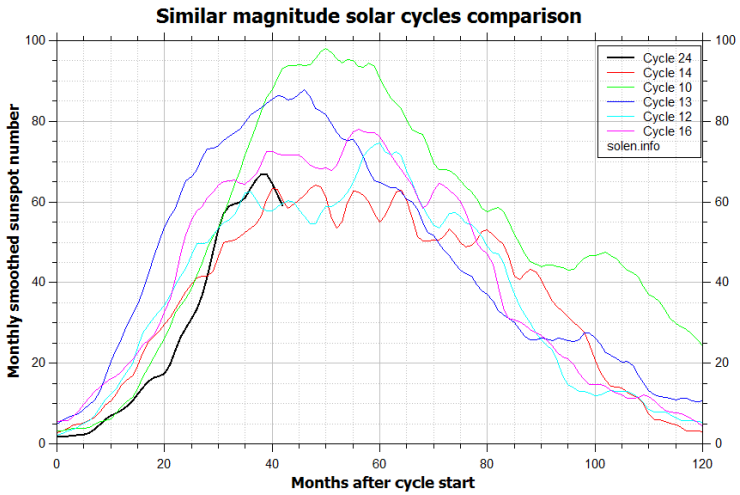
Poorly defined spot, observed in 2K on October 8, 2012



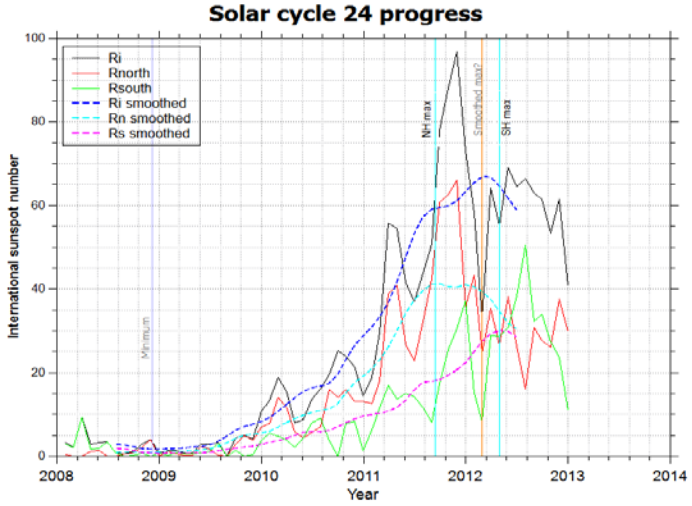
AR S1578, location: S41E22

Several spots in 2K, one in 1K resolution. Observed on April 10, 2012

Solar cycle charts



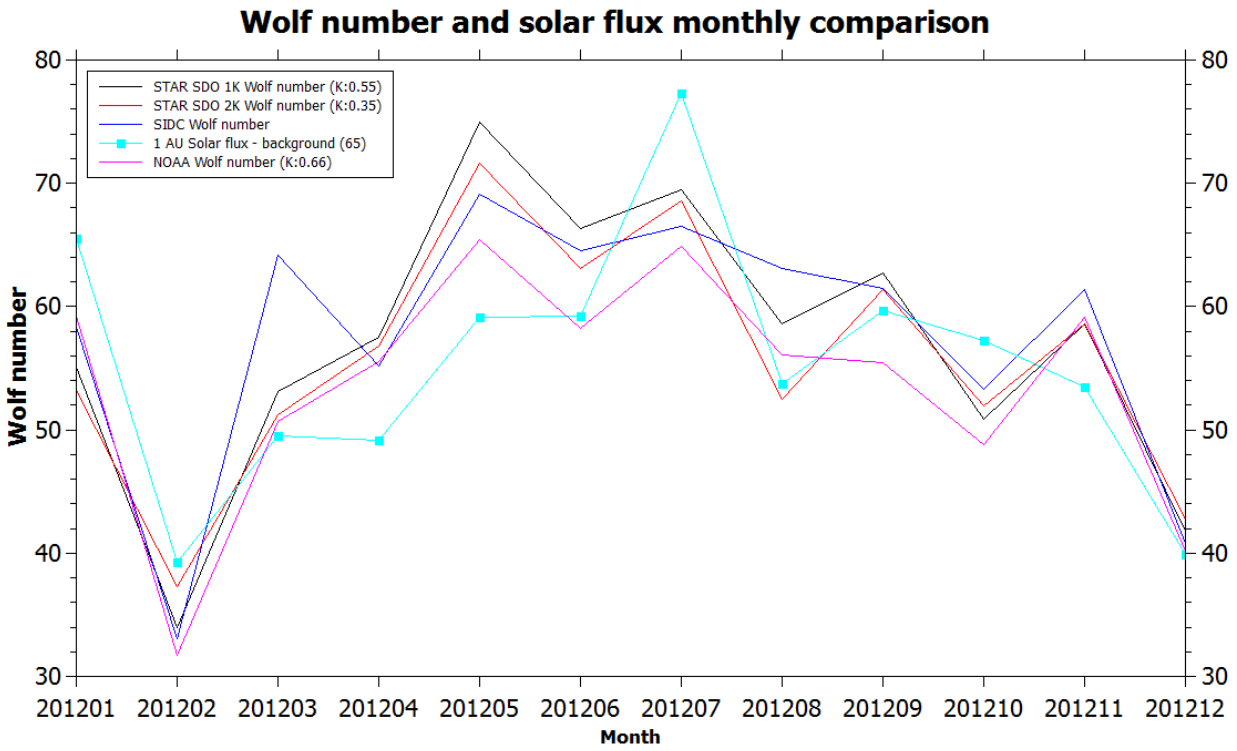
Comparison with similar cycles



Cycle 24 progress, current status
Smoothed max in Feb.’12: 66.9
NH smoothed max in Sept.’11: 41.3
SH smoothed max in April ’12: 30.1

Performance of STAR-SDO sunspot numbers in 2012

- Similar development as SIDC and NOAA



Monthly K factors in 2012

- Peak in March for STAR-SDO and NOAA