

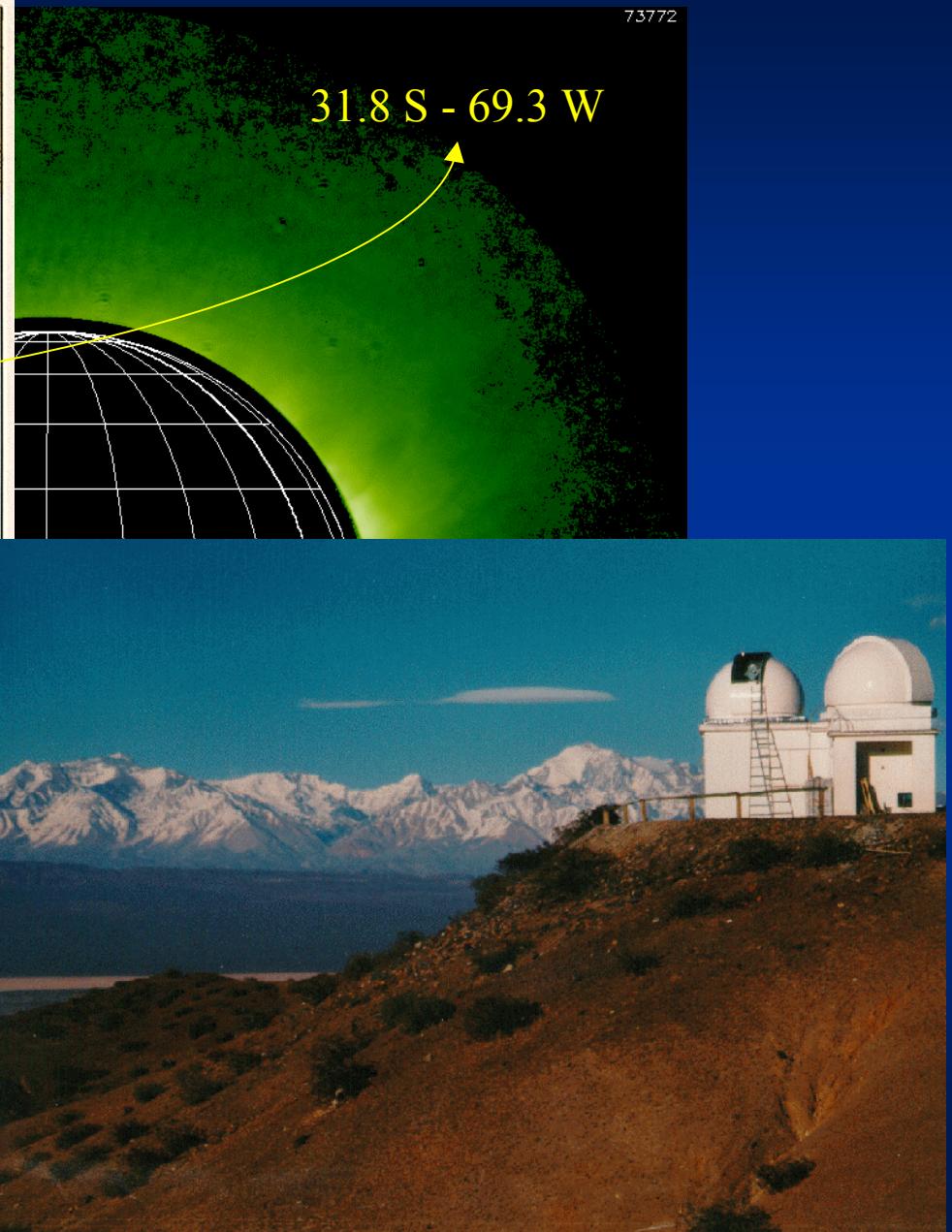
Solar flare observations from SOHO, MICA and YOHKOH in relation with a coronal shock wave

G. Stenborg
D. E. Innes
R. Schwenn

**Max Planck Institut für Aeronomie
Katlenburg-Lindau**



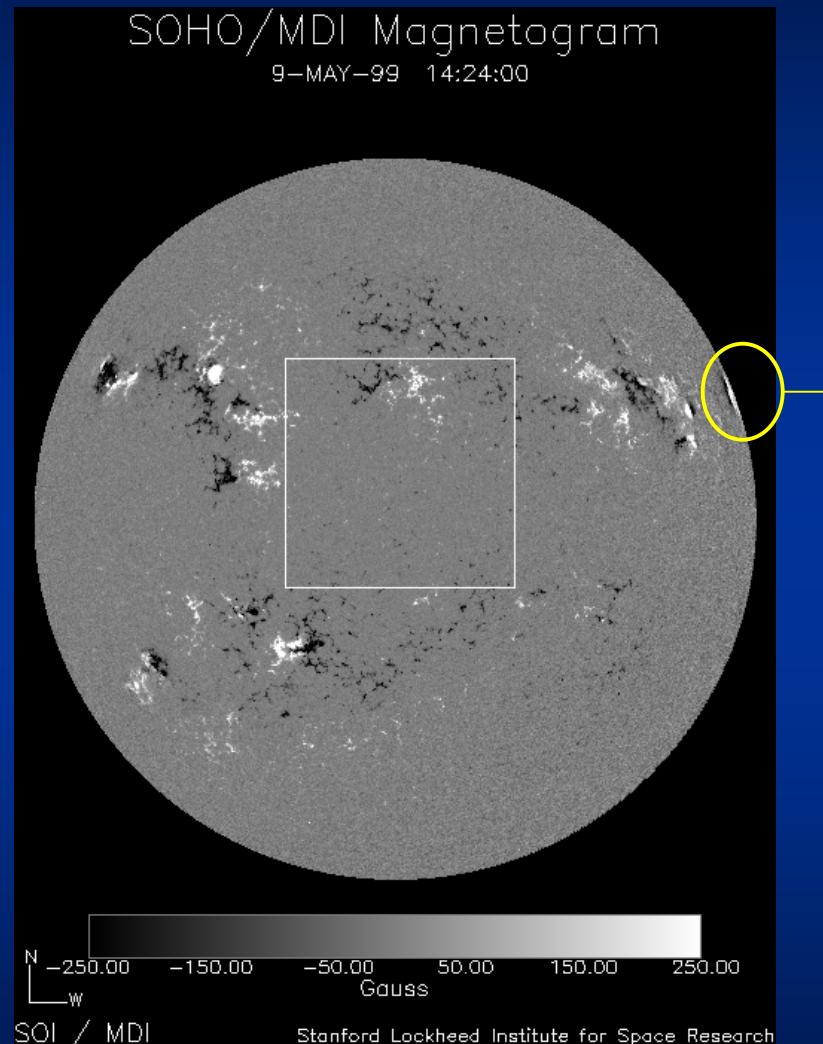
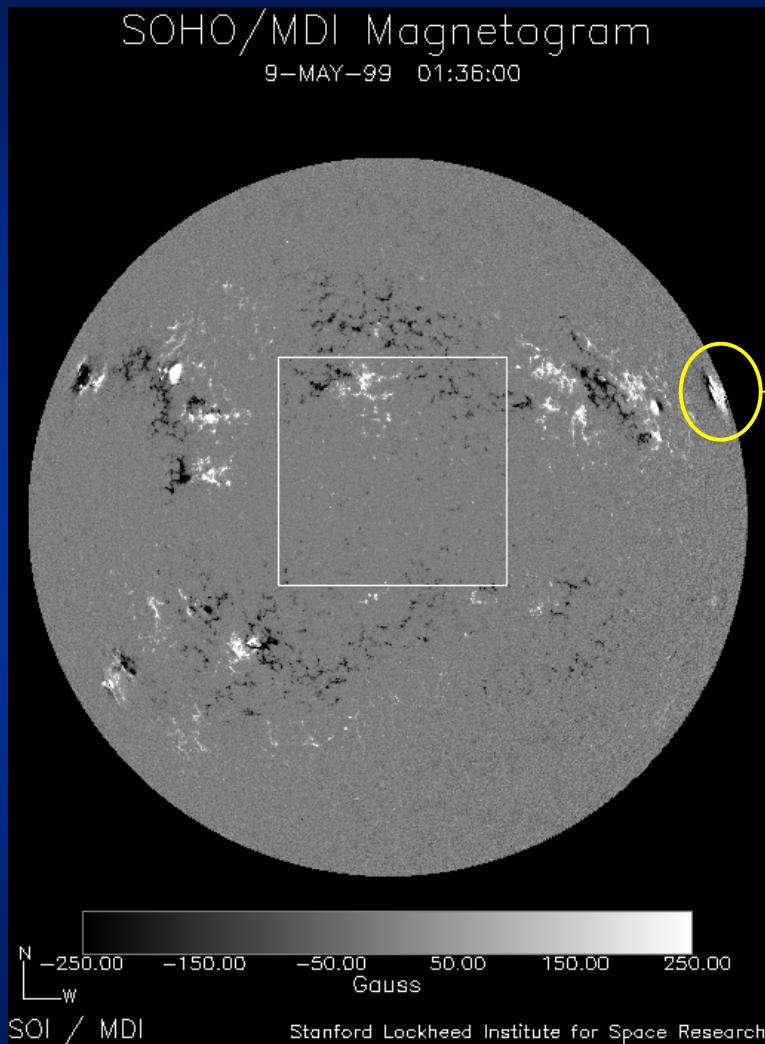
MICA: The MIrror Coronagraph for Argentina



Nr of Observ.: 7
13:54:32 to 14:01:50

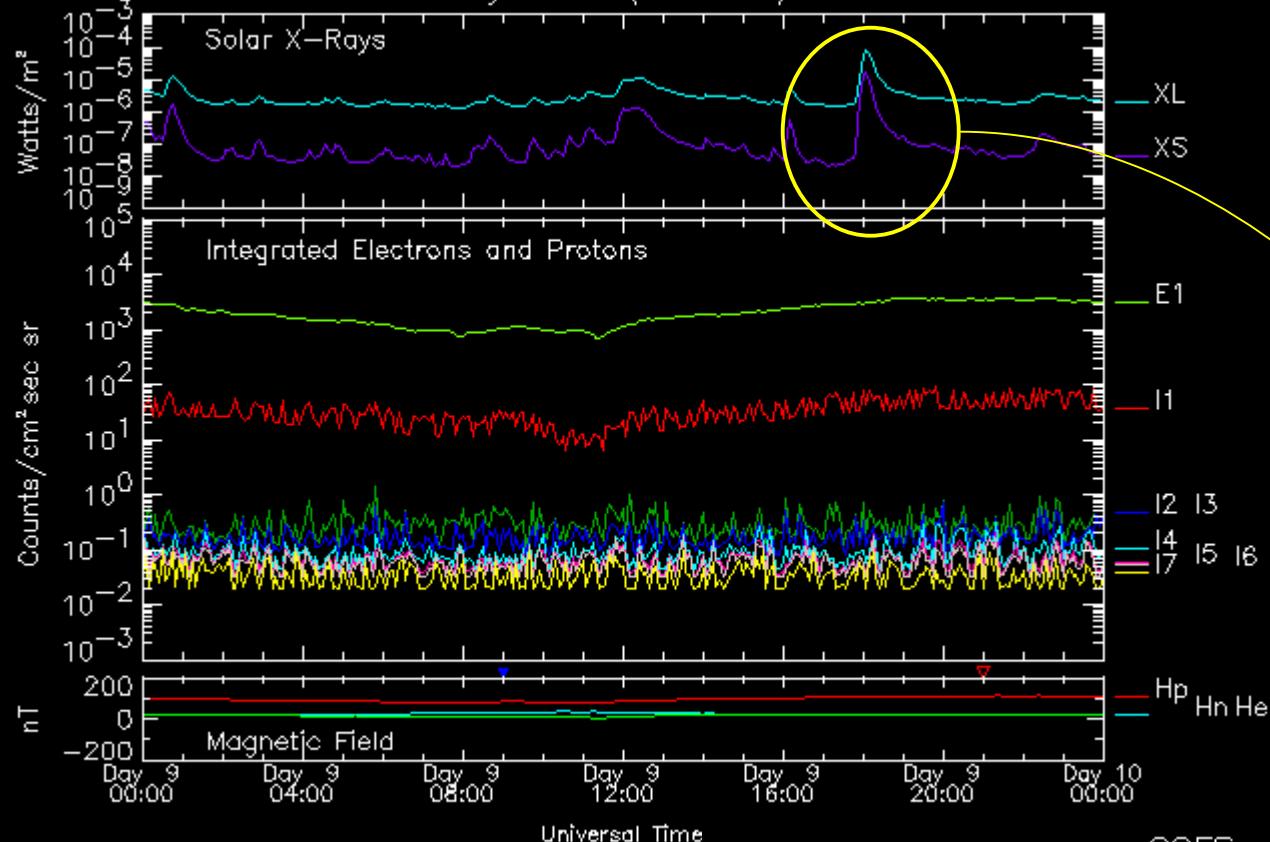
1998/12/06

WHERE ?



NOAA AR 8537

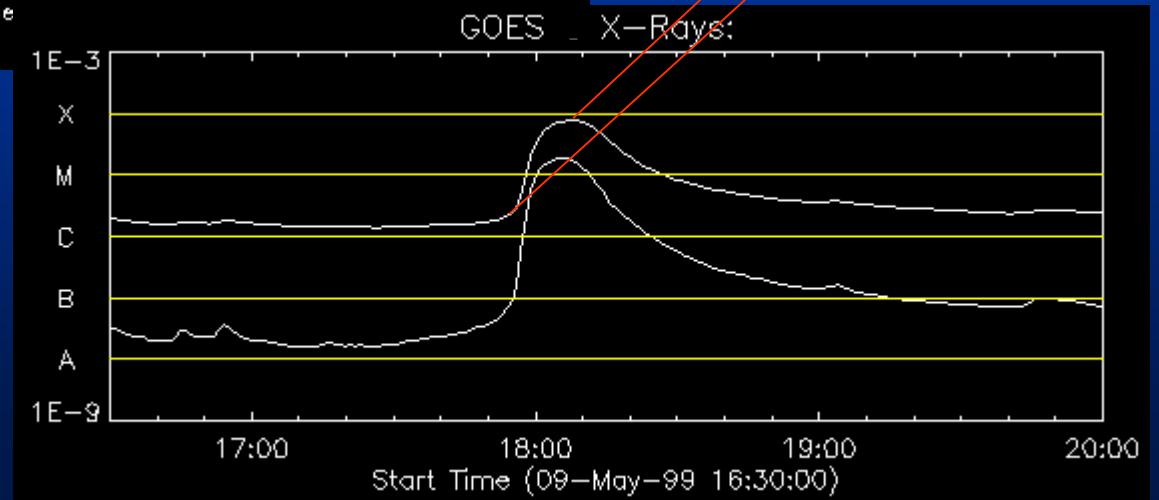
GOES-10 Space Environment Monitor (5-Min Averages)
May 1999 (135.4°W)



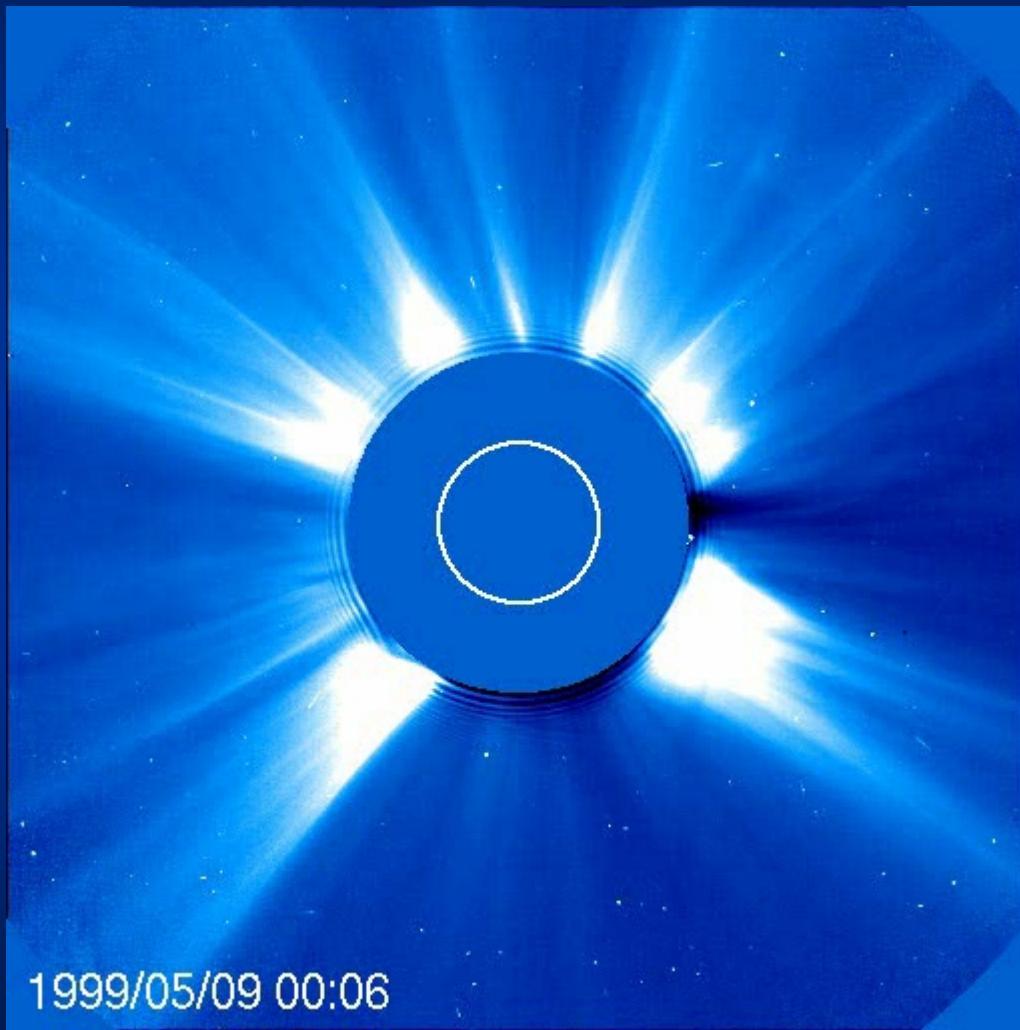
WHAT
happened ?

18:07 UT
17:53 UT

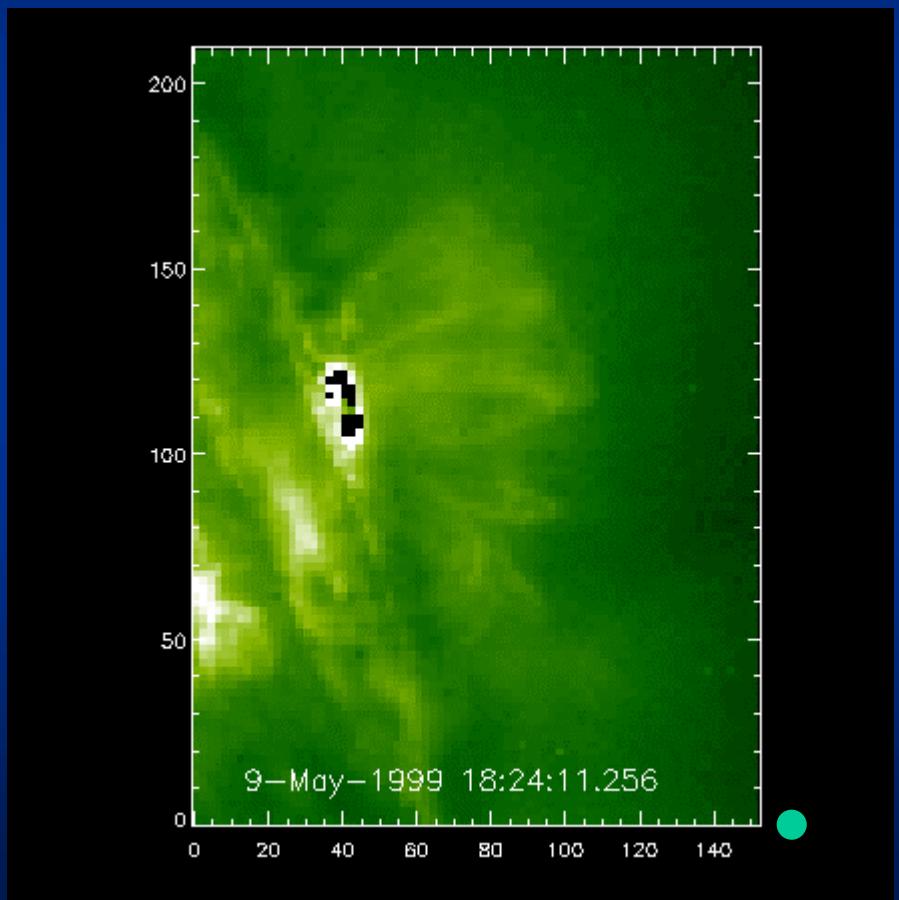
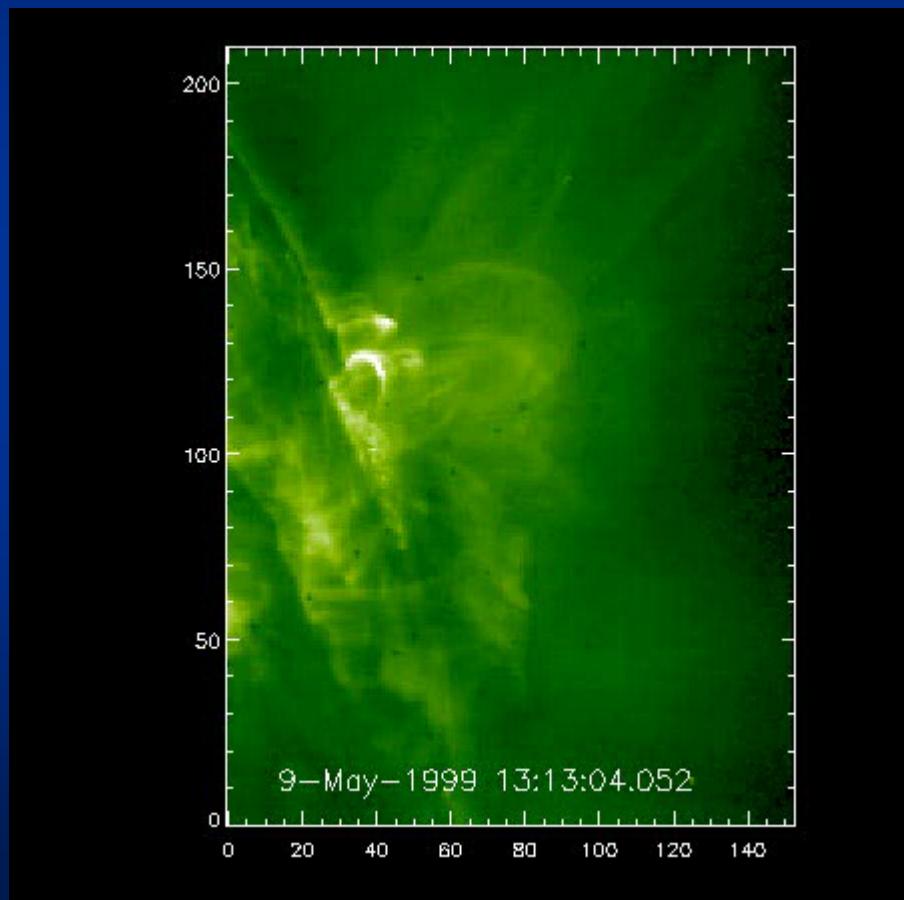
GOES M7.6 flare



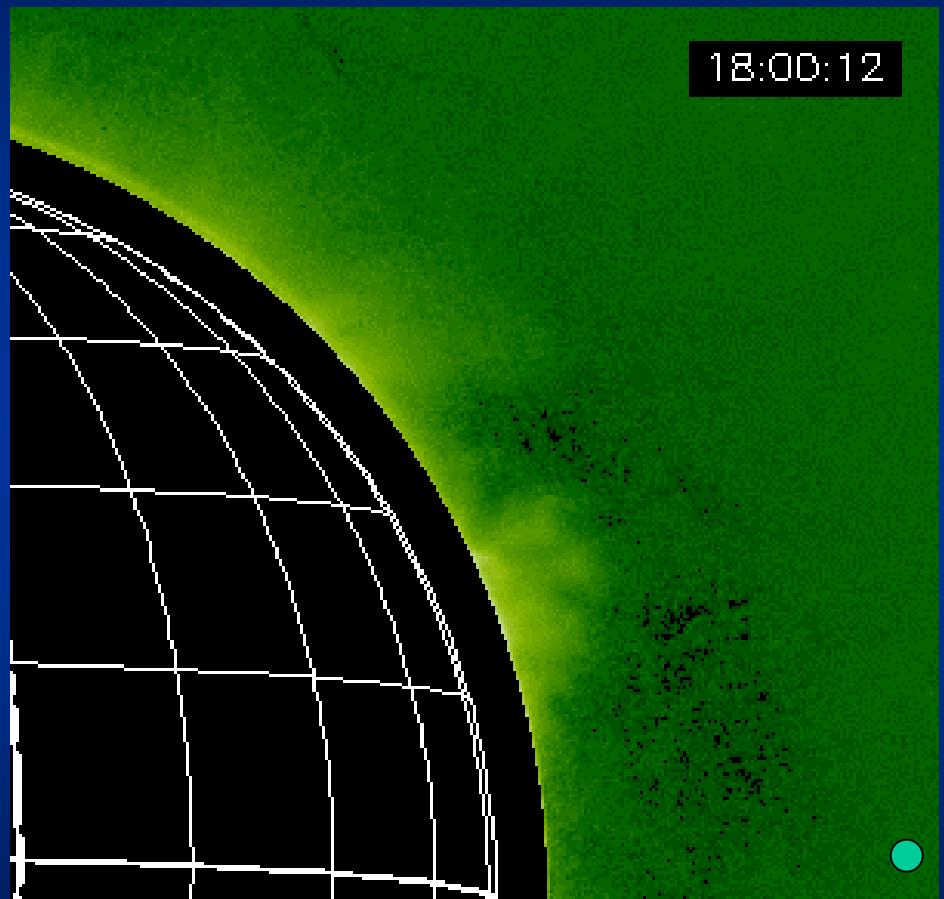
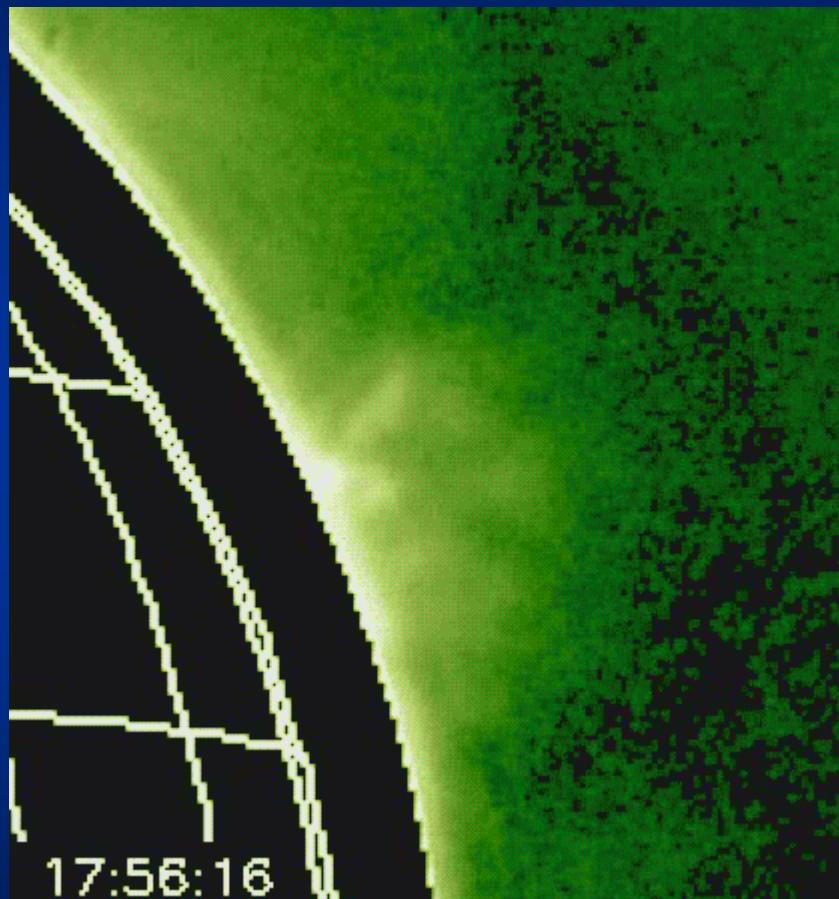
LASCO-C2/SOHO
on 09.05.99 between 00:00 UT- 23:59 UT



**Fe XII EIT/SOHO
on 09.05.99 between
13:13 UT - 18:48 UT**

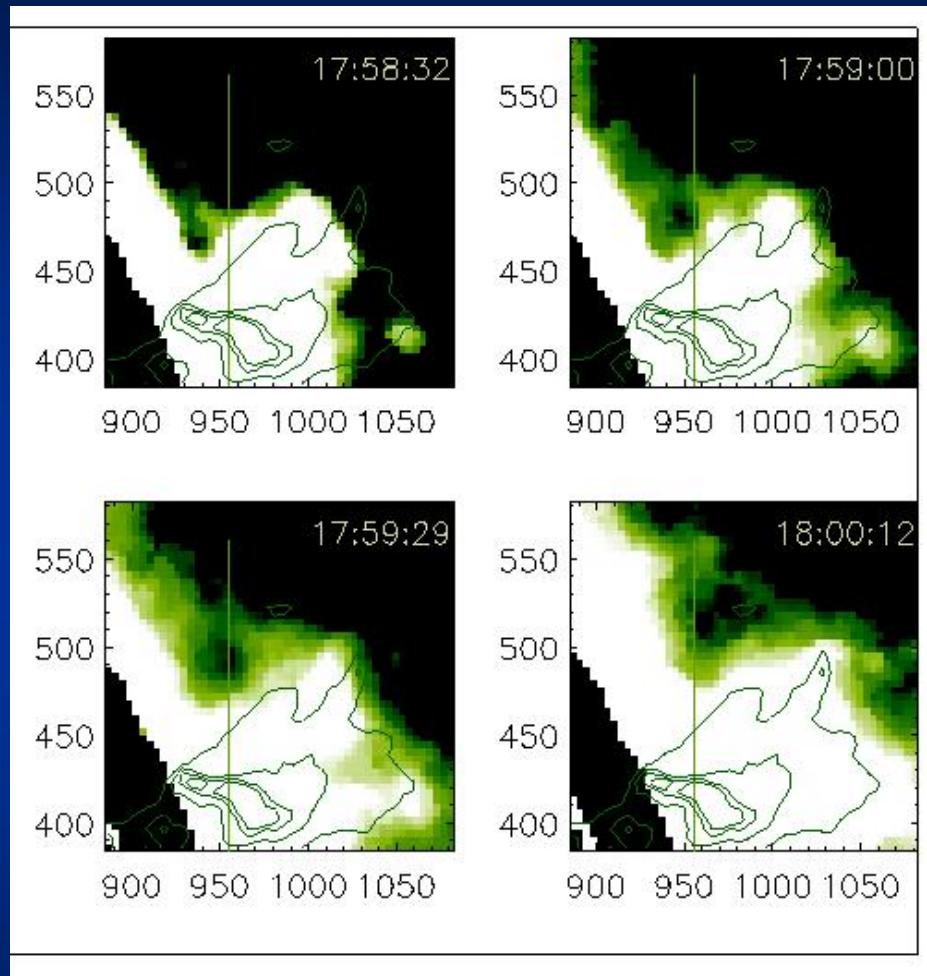


**Fe XIV MICA
on 09.05.99 between 17:21 UT- 18:12 UT**

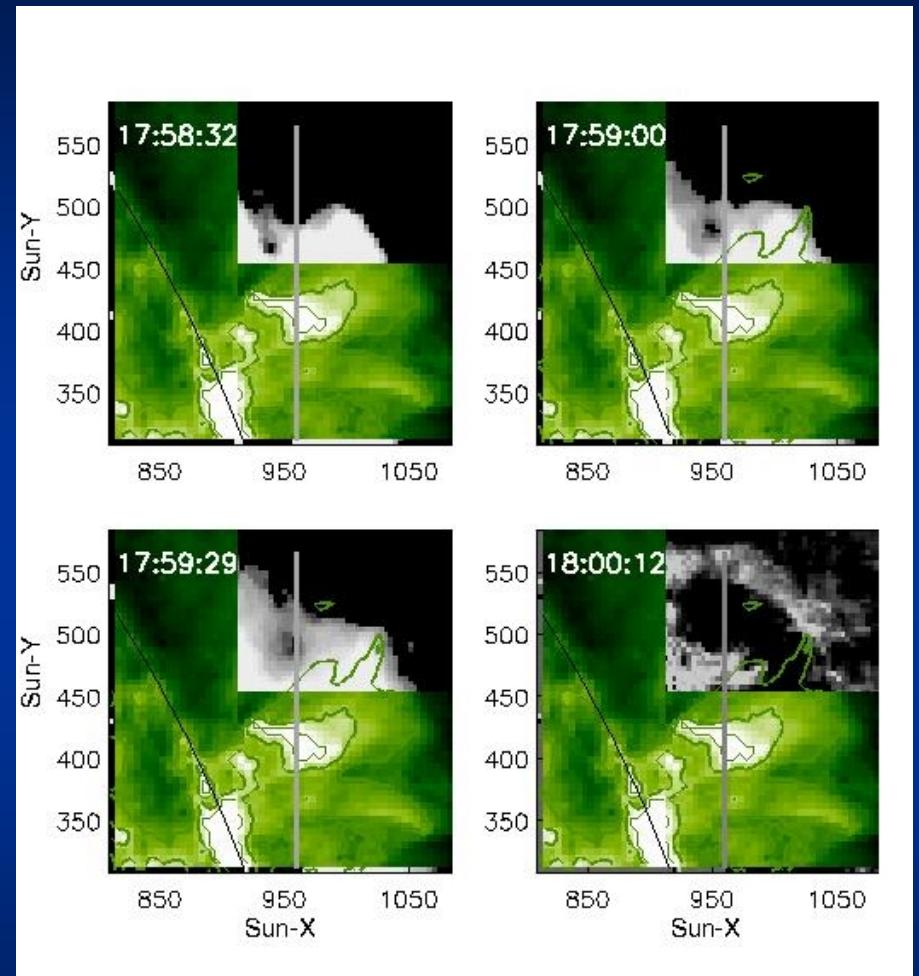


MICA (optical) front

Images of the fast optical emission front

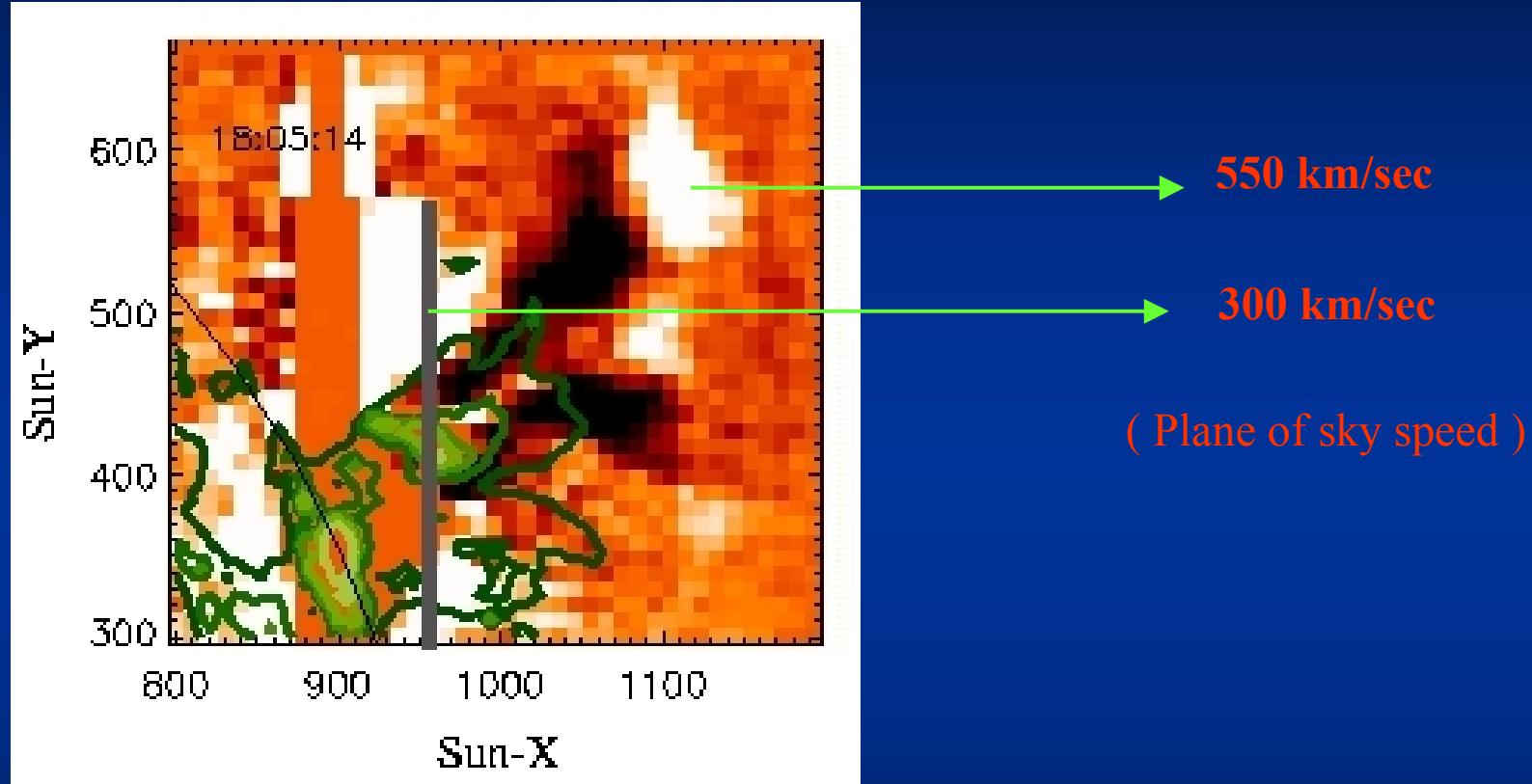


- Contours
Fe XII (EIT) at 18:00:11 UT
Background (20 sec exp)
Fe XIV + continuum emission (MICA)



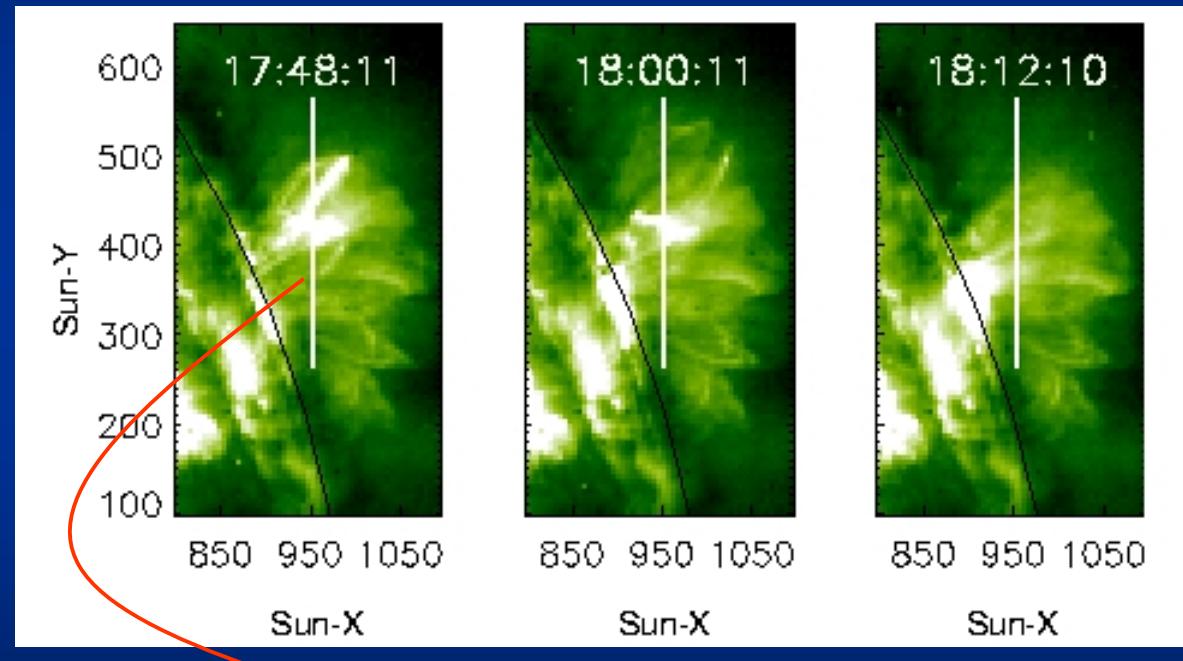
- Contours + Background
Fe XII EIT at 18:00:11 UT
- Grey
Fe XIV+continuum emission (MICA)

Ejection of soft X-ray plasma from arcade top



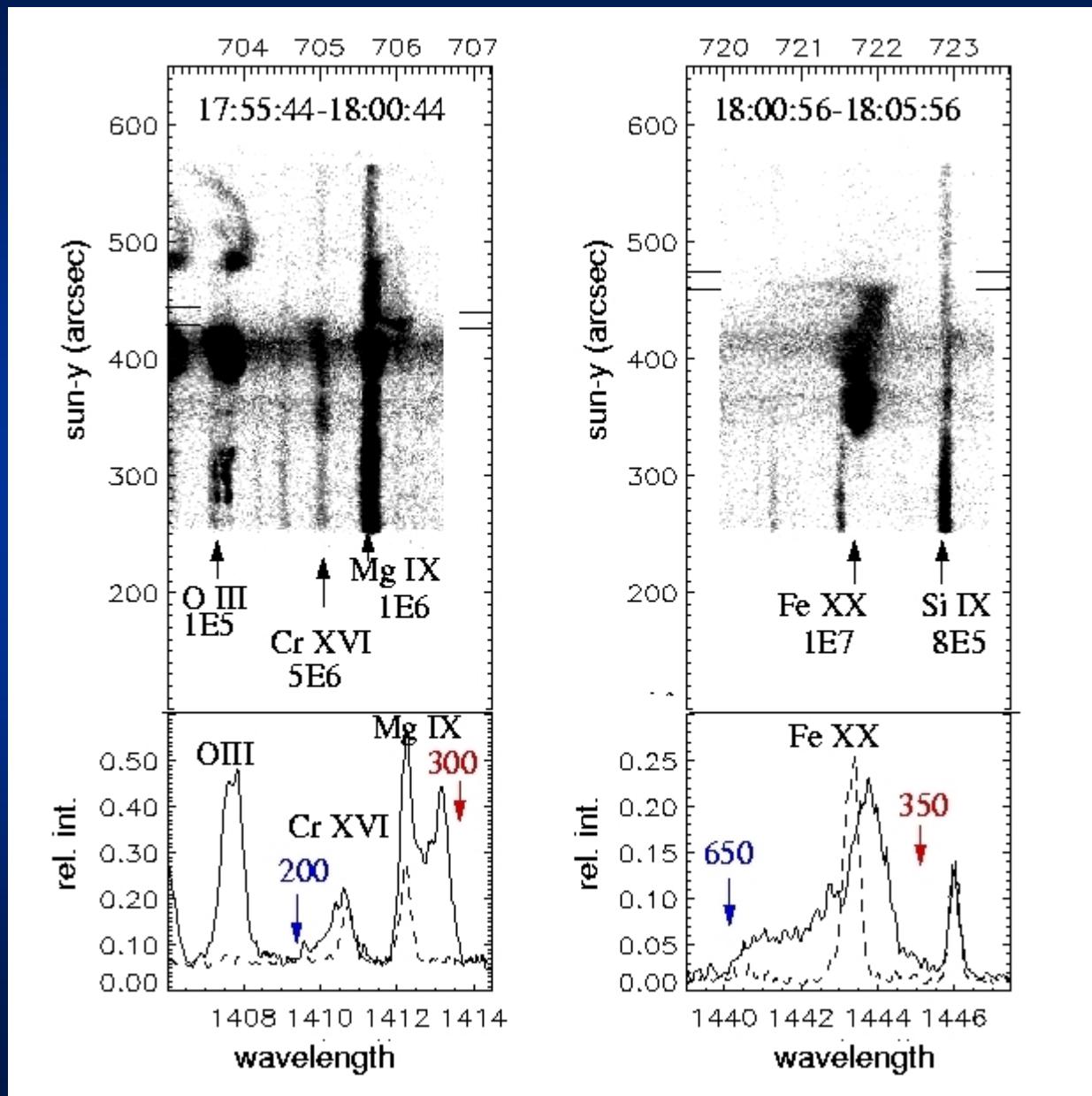
- Contours: Fe XII/EIT at 18:00:11 UT
- Background: SXT/YOHKOH
- Image difference (18:05:14 UT - 18:04:14 UT)

Line-of-sight plasma flow observations SUMER spectra

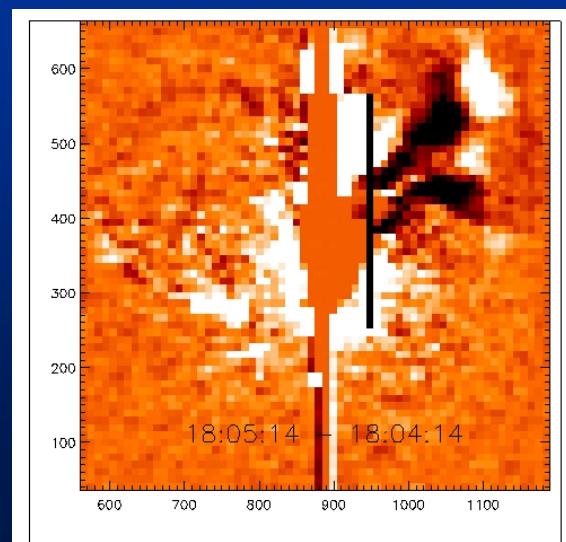
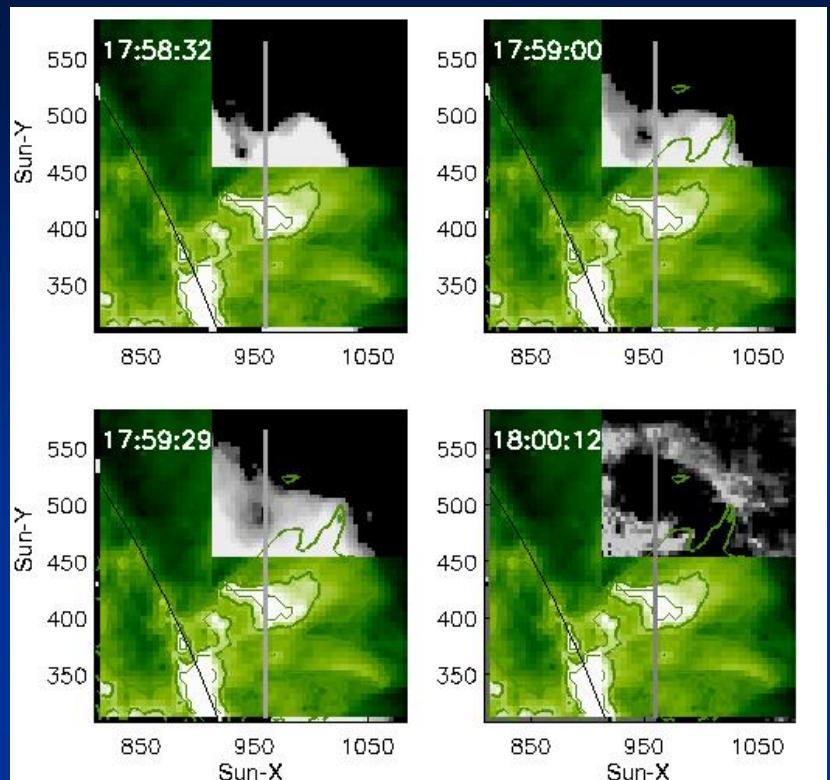
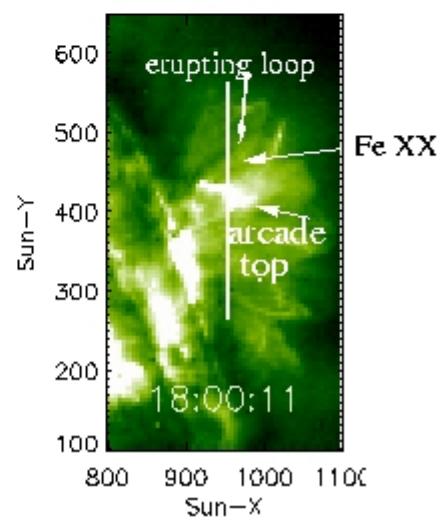
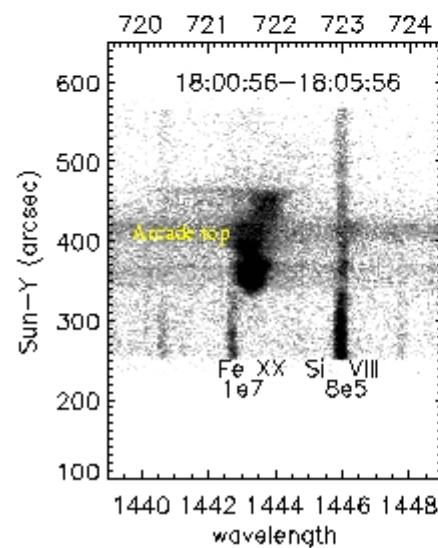
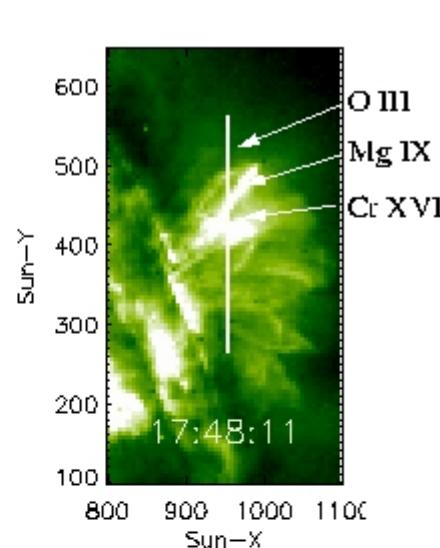
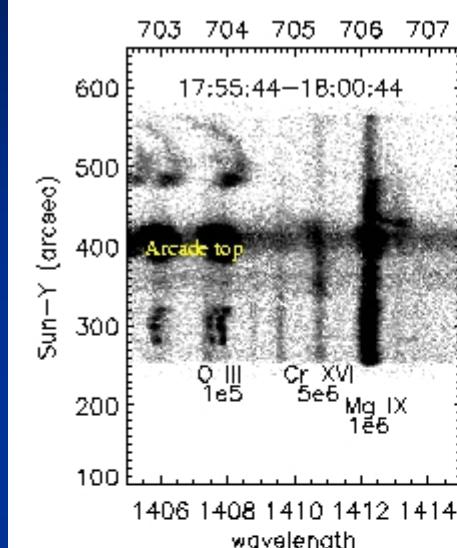


SUMER slit (1 sec x 300 sec)

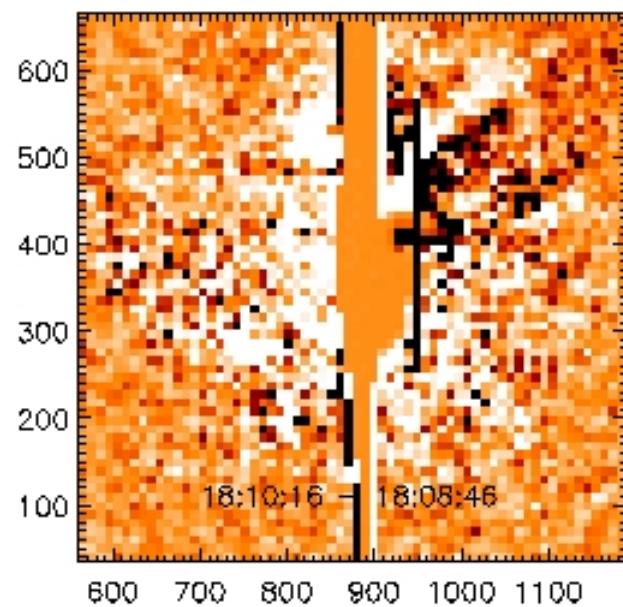
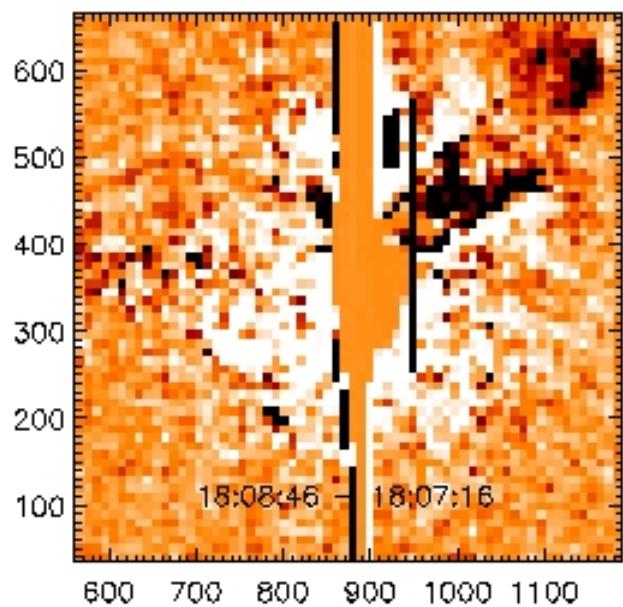
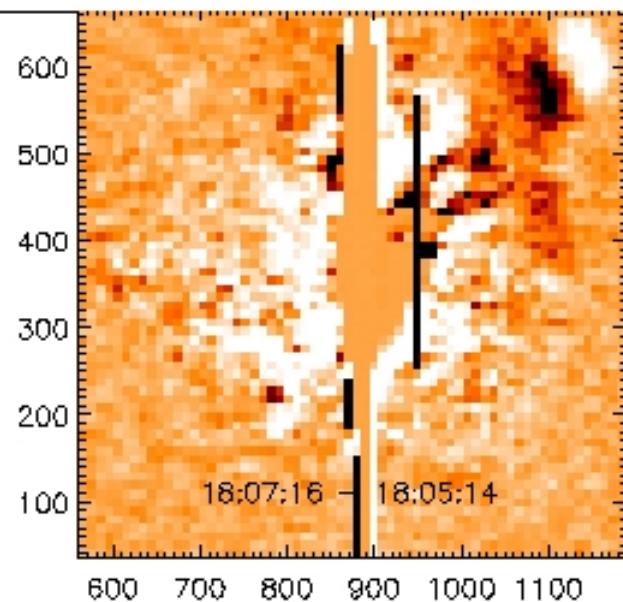
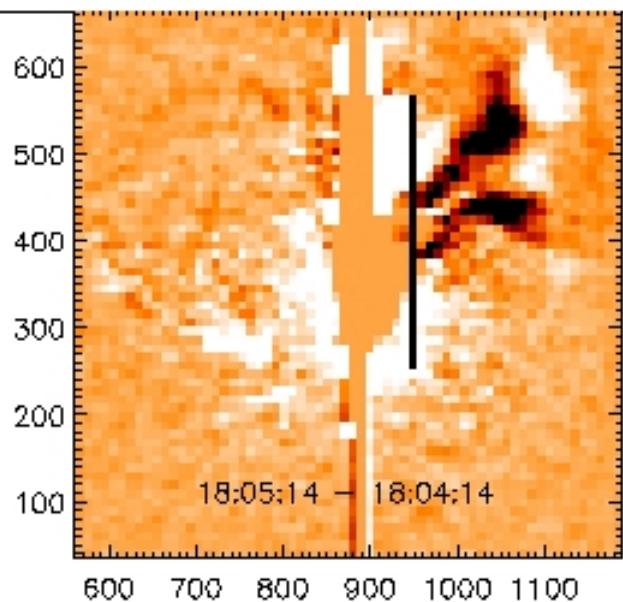
SUMER spectra



Line-of-sight plasma flow observations SUMER spectra

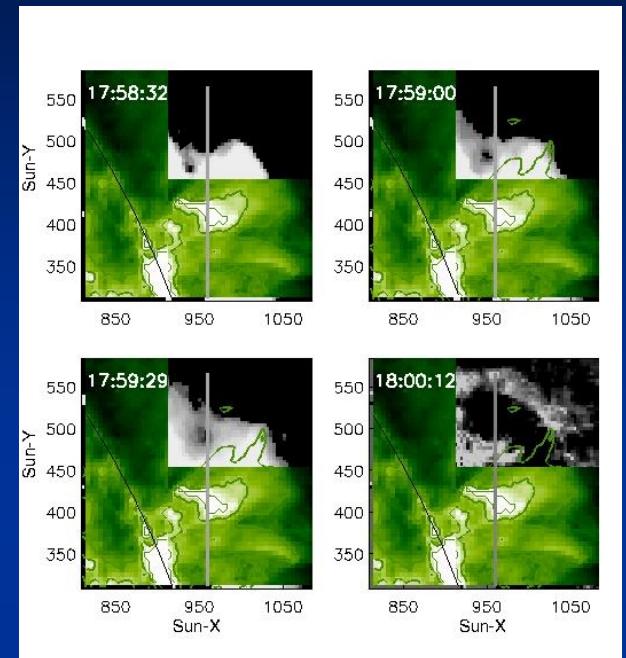


YOHKOH difference images



Extrapolated height of fast optical front (MICA)

Observation	Time (UT)	Height
First MICA	17:58:32	95×10^3 km
Hard X-ray peak	17:57:40	70×10^3 km
Hard X-ray begin	17:57:00	50×10^3 km
	17:55:30	0 km
Soft X-ray begin	17:53	



- If the hard X-ray brightening and optical front (MICA) form simultaneously
→ flare site is in the corona.
- If the hard X-ray brightening is more than two minutes after optical front formed
→ flare site may be in the chromosphere or below.

Interpretation

- **3-D plasma motion:**
explosive energy release at the site
- **Fast moving optical emission front:**
density enhancement behind fast shock
- **X-ray plasmoid ejection:**
as loop top is overtaken by shockwave

