

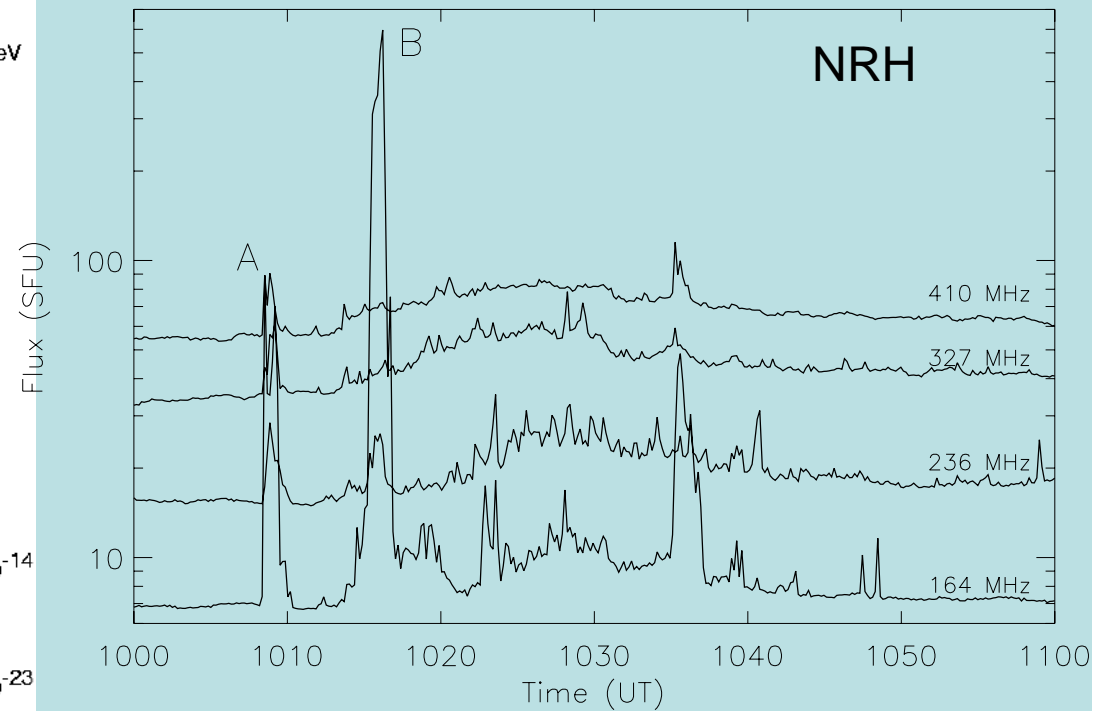
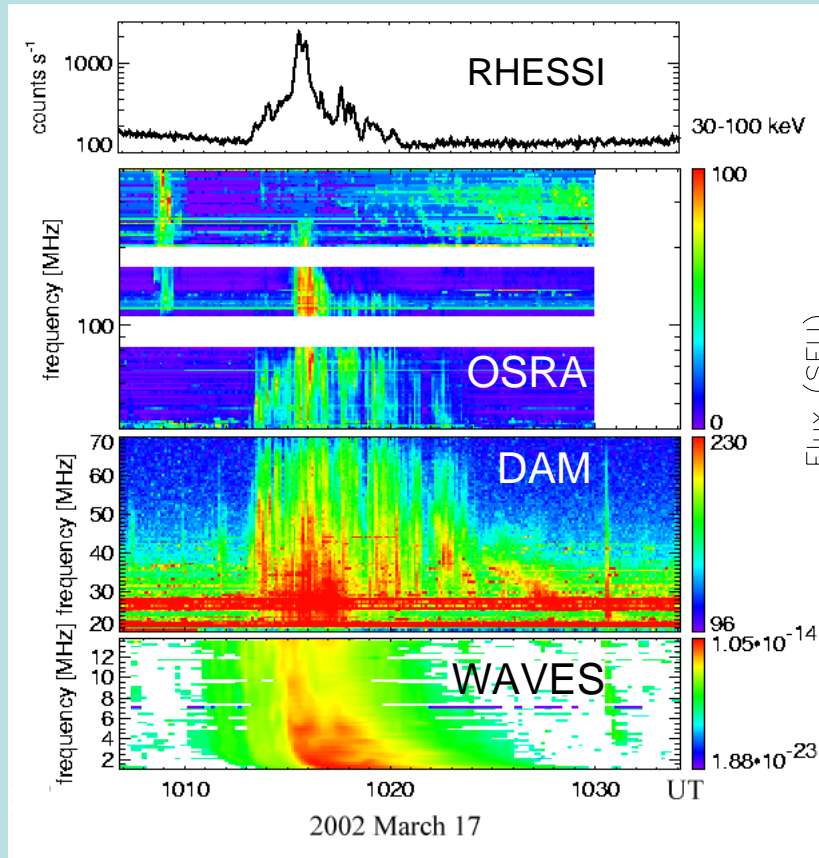
Radio bursts and CME's

Monique Pick

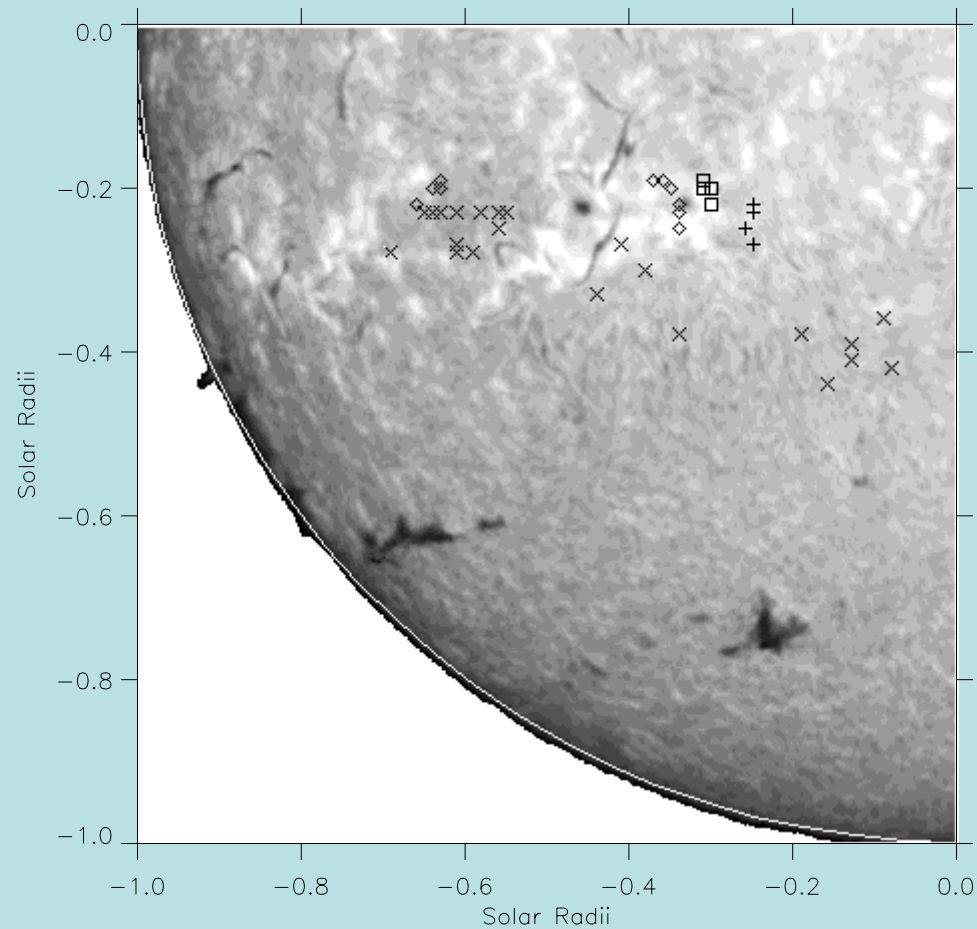
RHESSI workshop 5-8 April 2006

17 March 2002

Y. Yan, M. Pick, M. Wang, S. Krucker, A. Vourlidas



17 March 2002 Event A



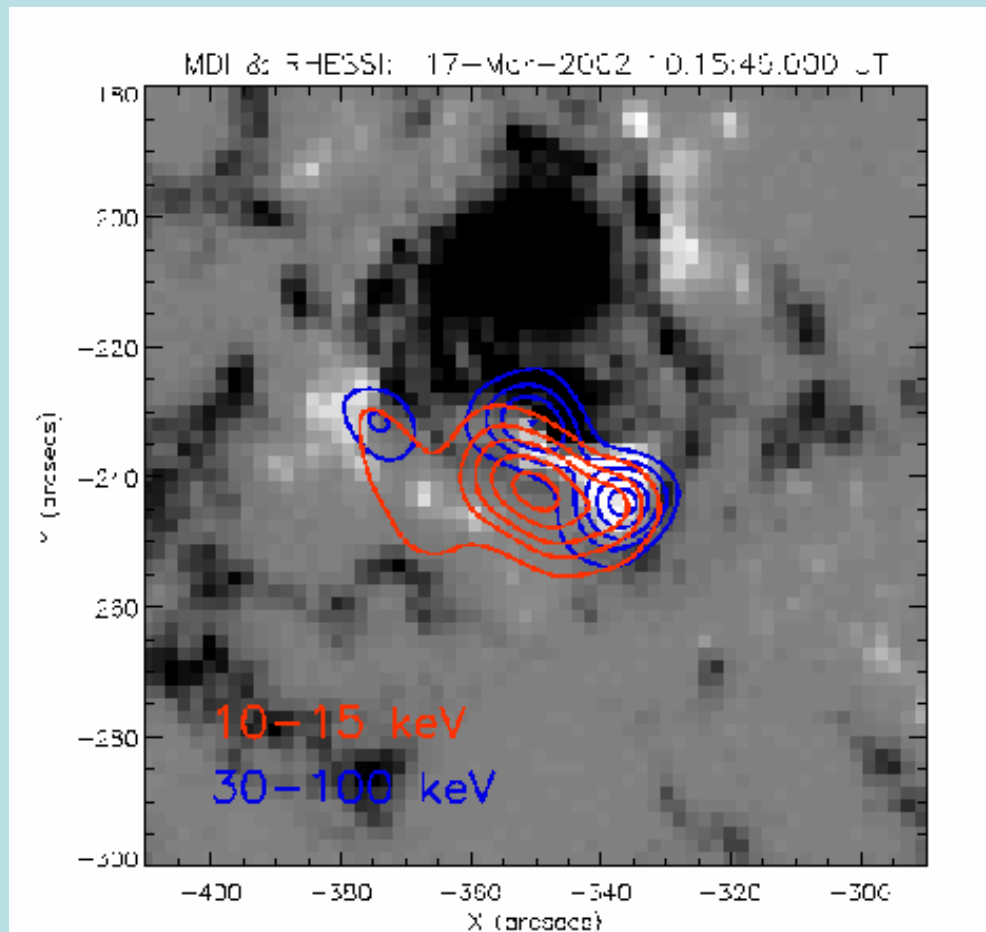
AR 9871

4 NRH frequencies

- X 164 MHz, 236 MHz
- West more bursty
- Type III > 164 MHz

17 March 2002 Event B

RHESSI



HXR

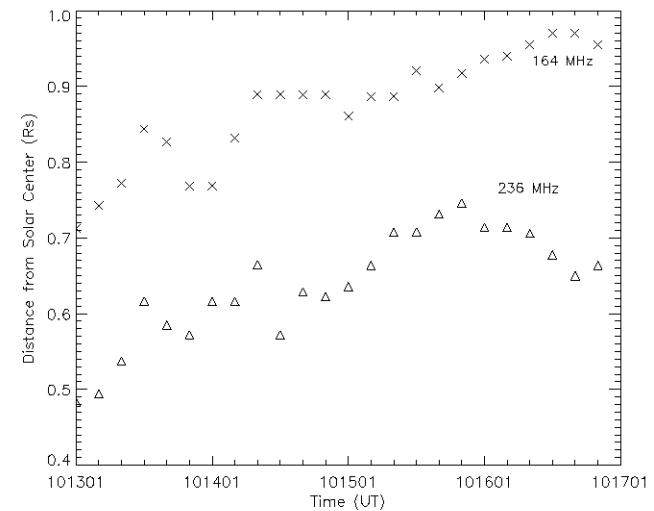
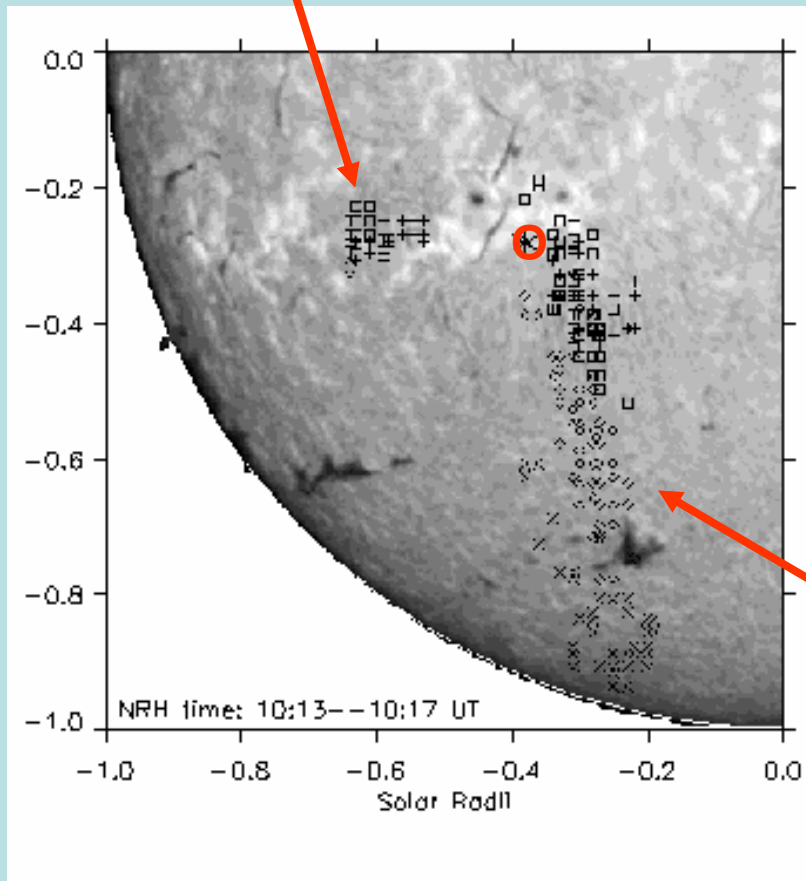
West source + polarity
East and middle sources mixed polarity

SXR

Outline 2 adjacent loops
3 HXR sources at foot points

17 March 2002 Event B

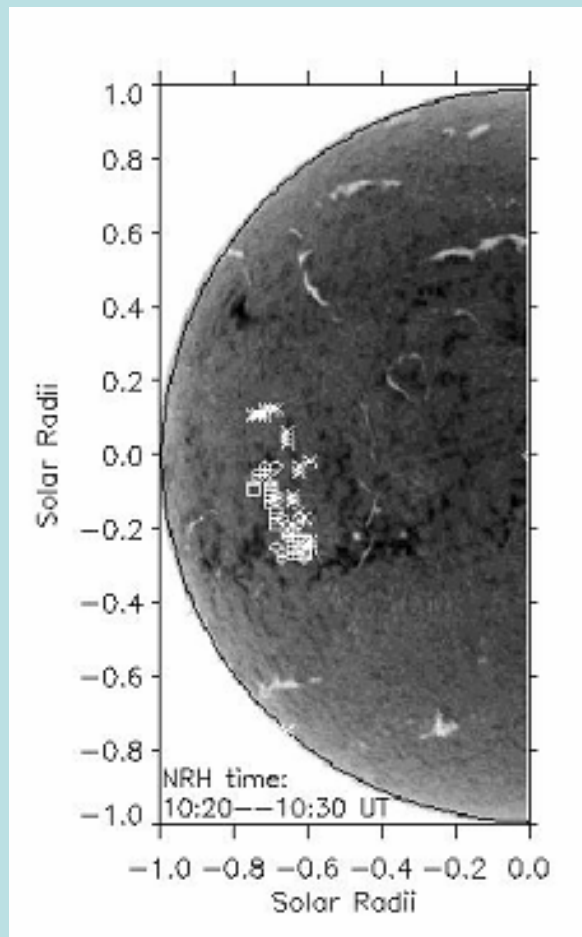
Continuum



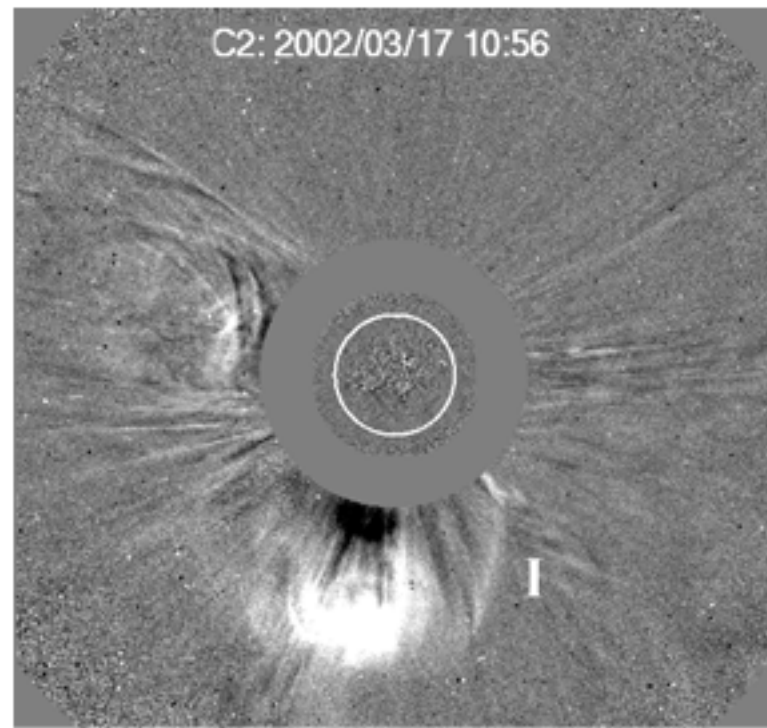
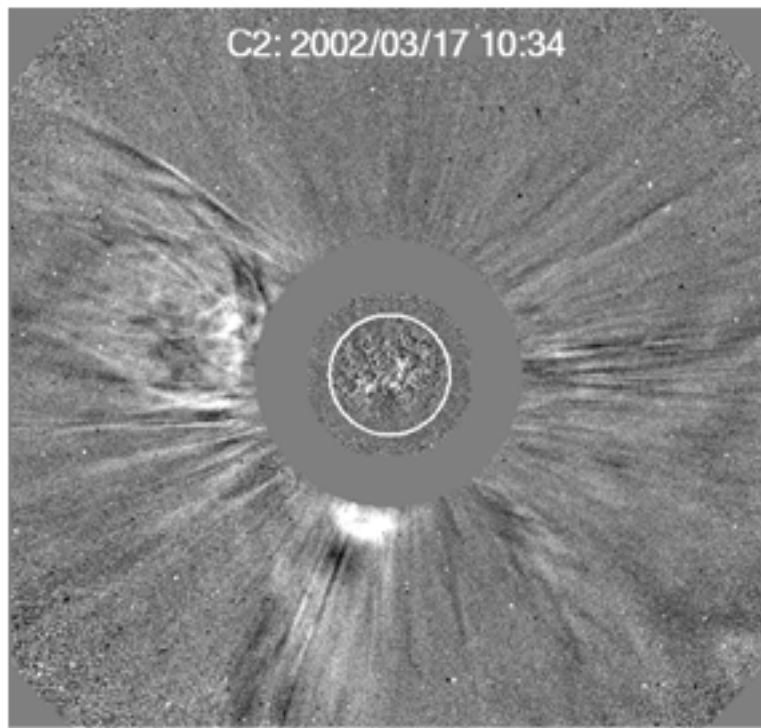
236 MHz
Cadence 1s 600 km/s

Type III's

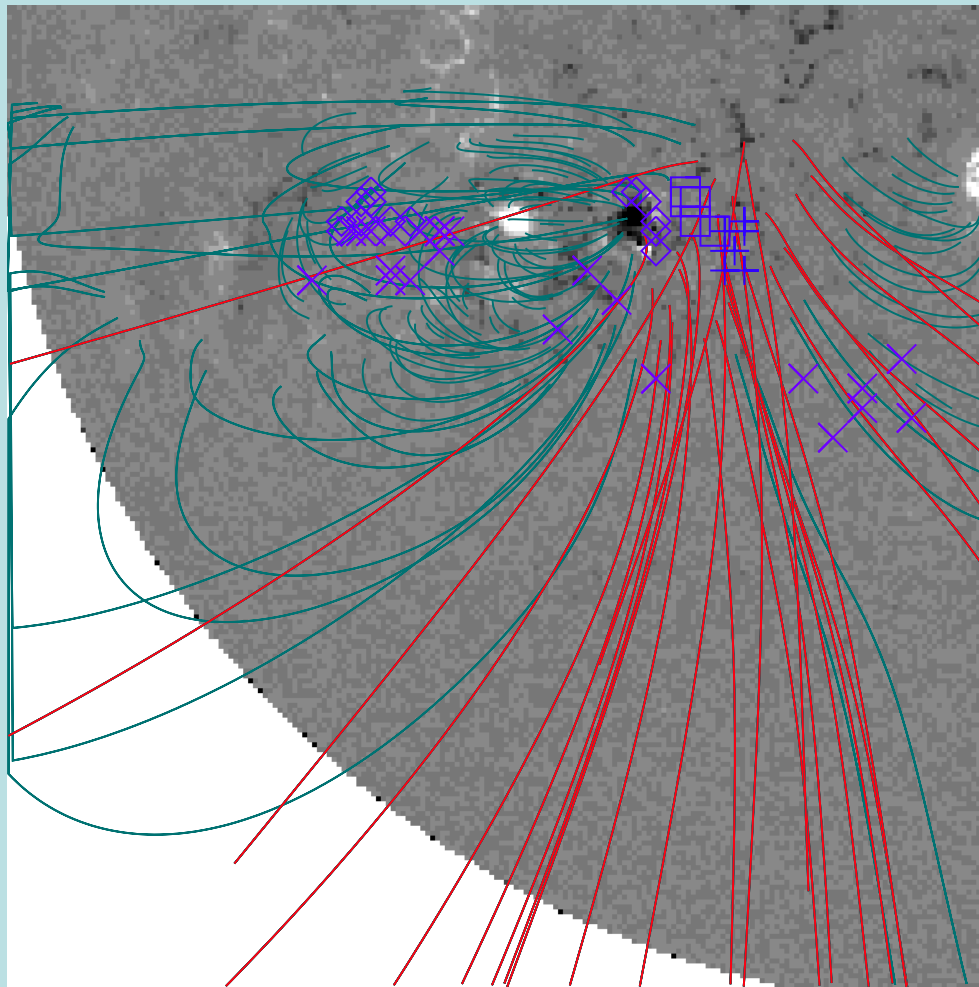
17 March 2002 Event B



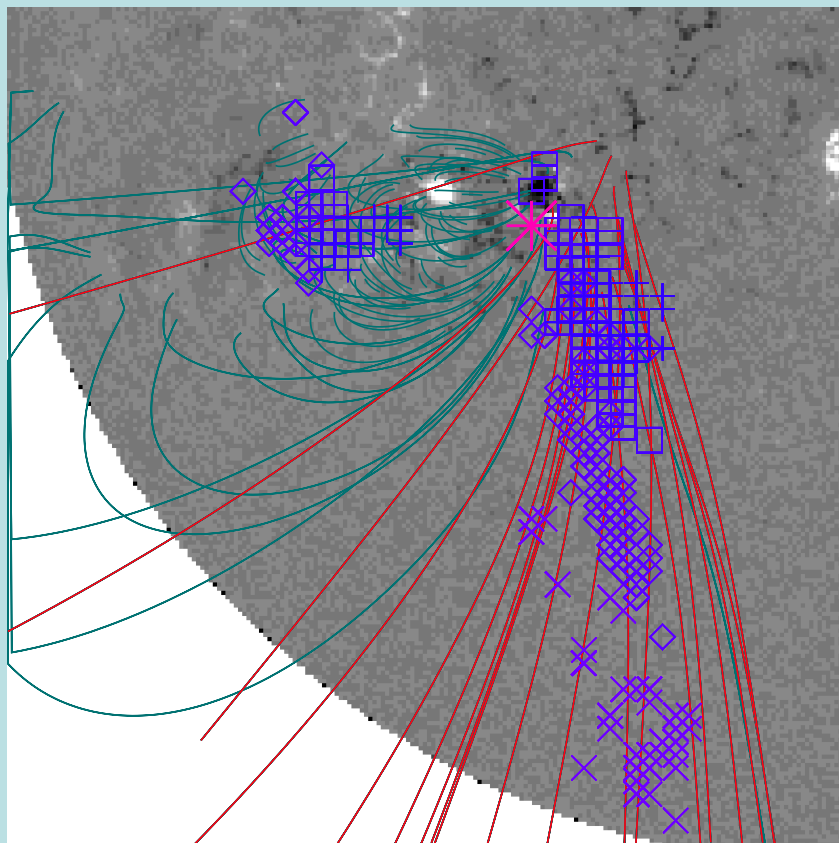
Continuum



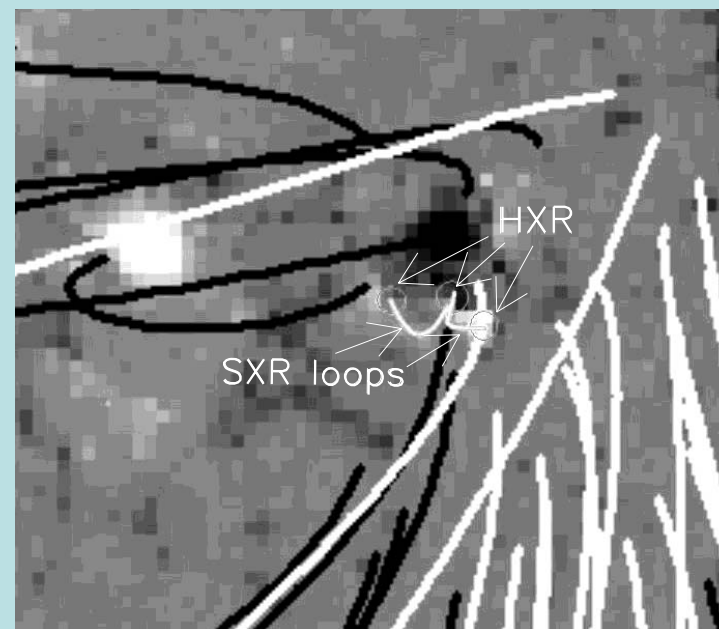
17 March 2002 Event A
Potential magnetic field extrapolation
(Yan, 2005)



17 March 2002 Event B



- AR 9871 inside old remnant region
- Inclusion of small interacting loops
- CME above large extrapolated S loops



HXR

- West source + polarity
- East and middle sources mixed polarity

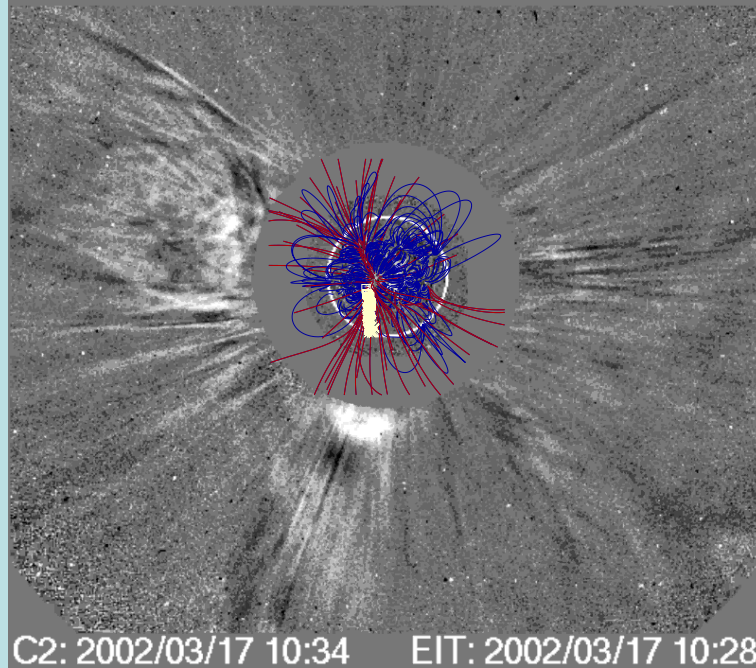
SXR

- Outline 2 adjacent loops « W » shape

HXR and Radio: Temporal relationship

Sprangle & Vlahos, 1993 EM excited by unstable electron distribution inside the flaring loop and excite electrons along Open fields.

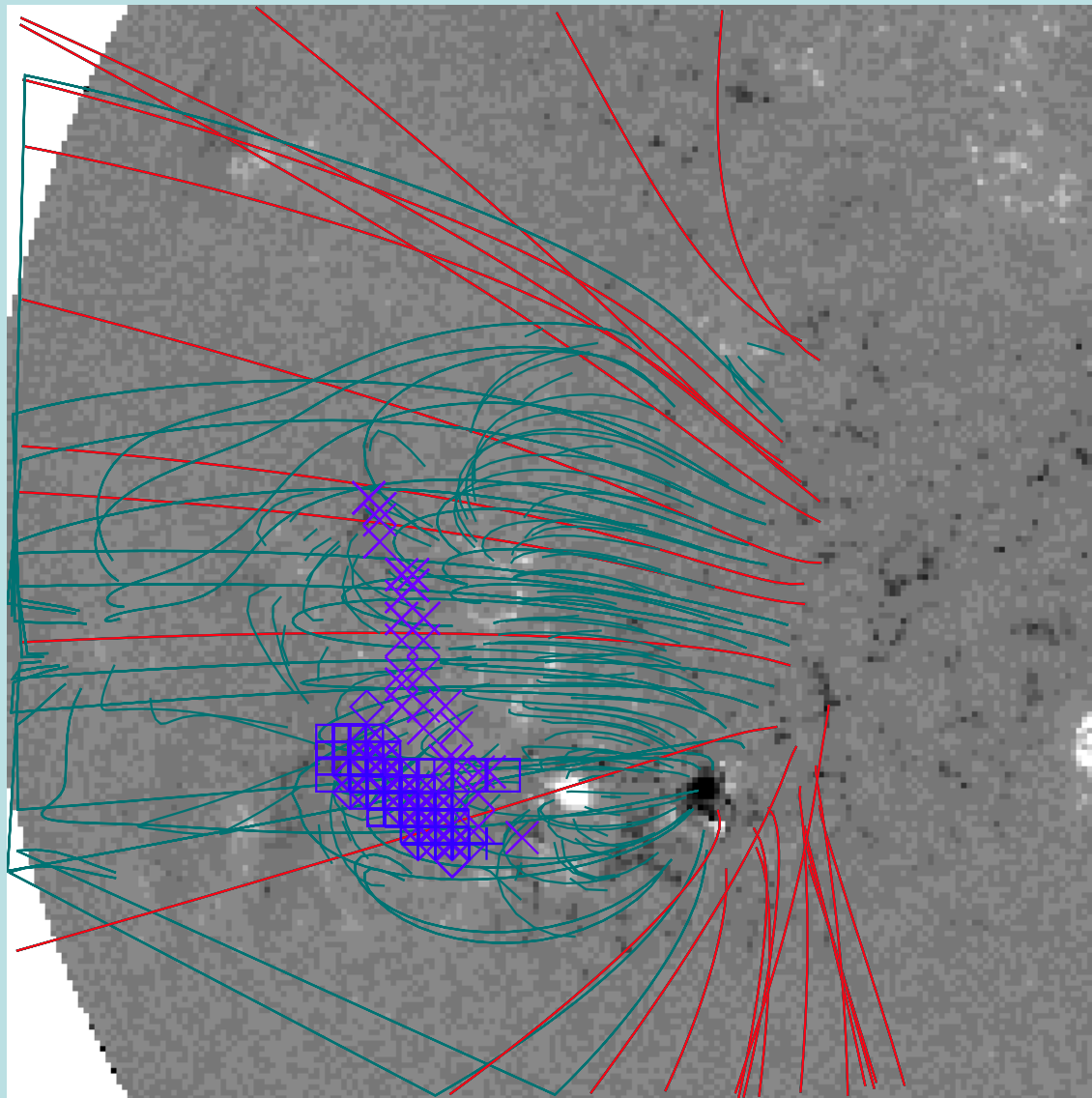
Potential Field from MDI syn. Mag.
NRH 10:13–10:17

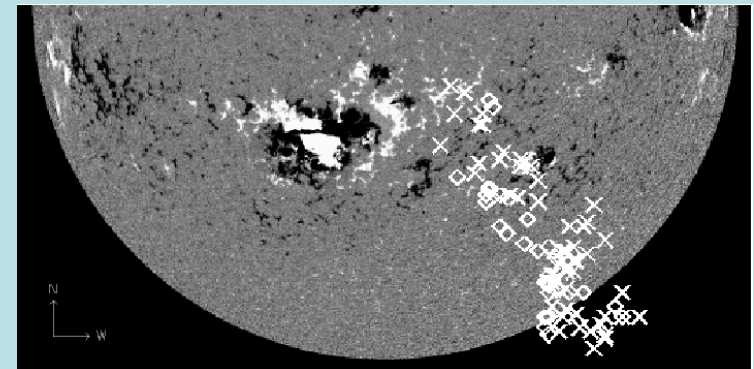
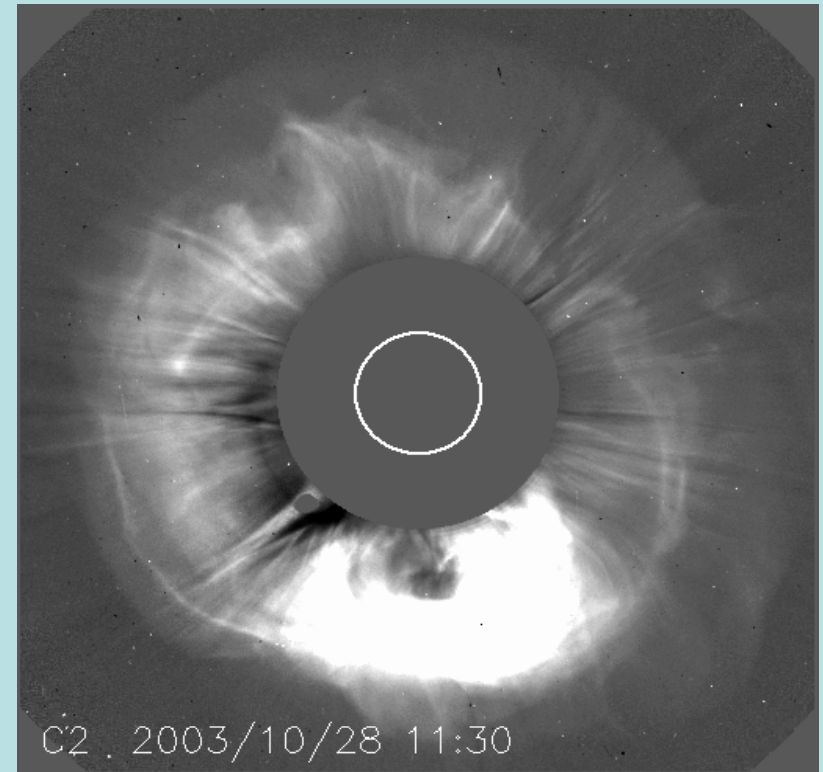
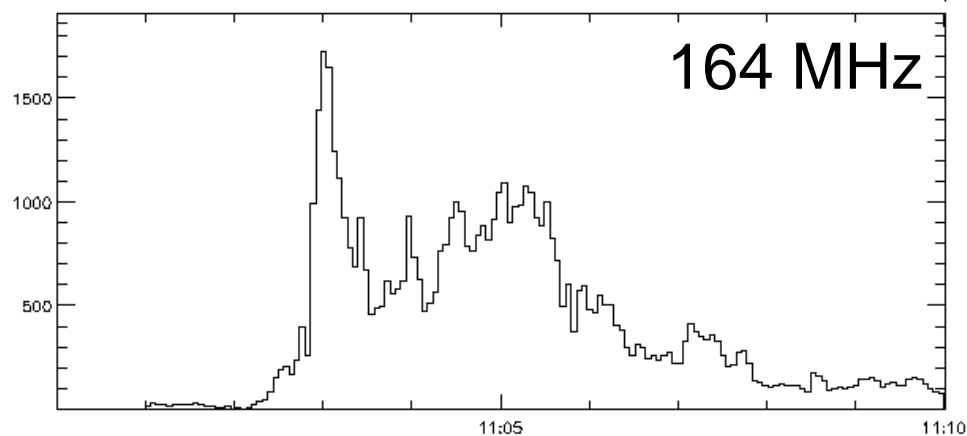
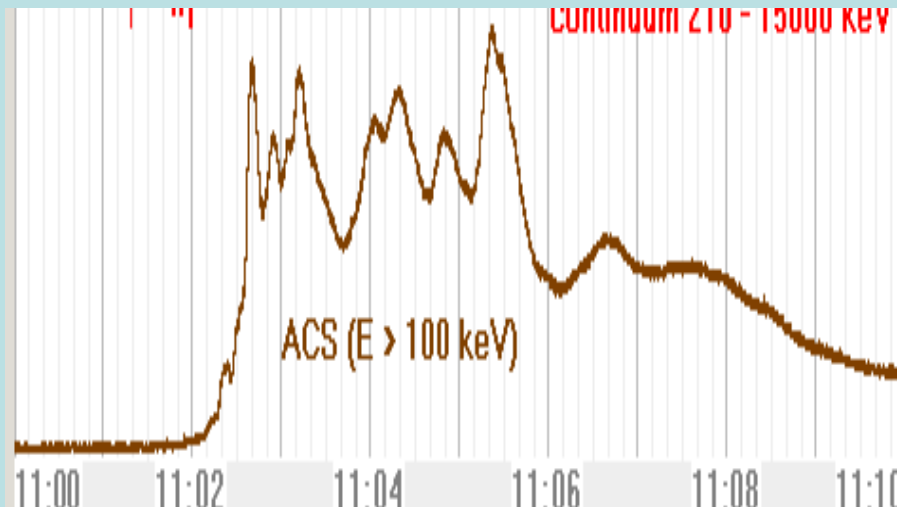


17 March 2002 Event B

HXR and Type III same electron population

- Small loops emerge(1 or 2) interact with surrounding open field lines
- HXR produced by electrons propagating downward
- Outward electron beams propagate in the interface region between the ascending CME and the neighboring open field lines
- Development of CME this region becomes highly compressed
- Type III 2fp → starting and ending altitudes at each frequency
- Apparent motions of type III bursts → increase in density 10 (4 at 164 MHz) Newkirk model





- Electrons trace the expansion of the arch system (~2500 km/sec)
- Coronal wave develops along flank of CME in lateral expansion

