COSPAR MOSCOW 2014
COSMOS
40th SCIENTIFIC ASSEMBLY
Russia, Moscow, 2-10 August 2014

Analysis of selected microflares observed by SphinX over the last minimum of solar activity

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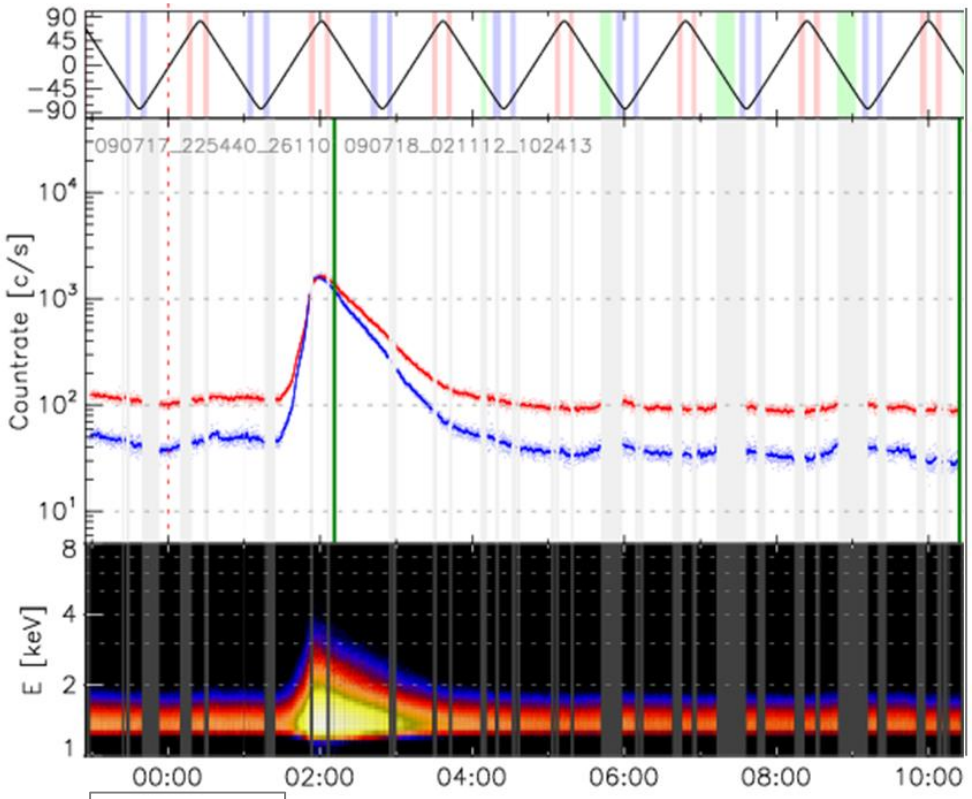
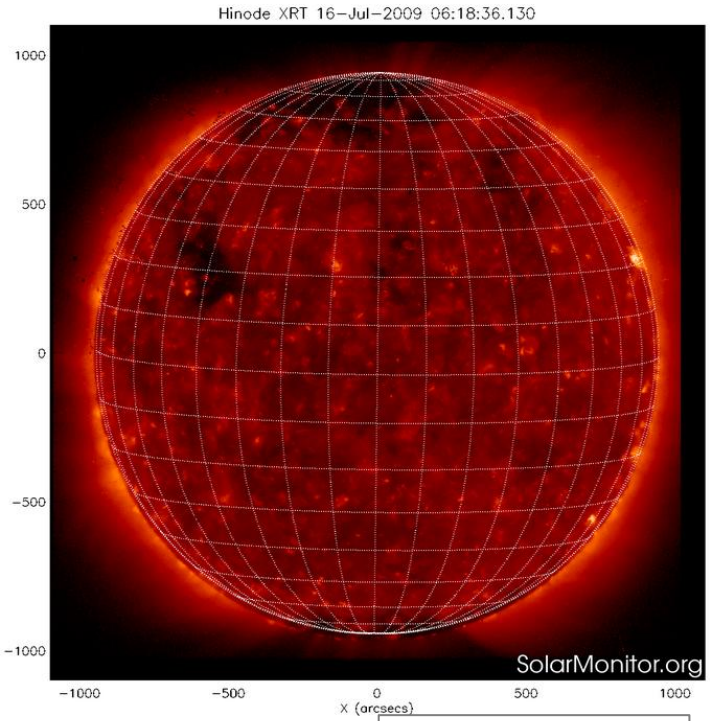
[2]Astronomical Institute, University of Wroclaw, Poland

18 July 2009 flare A9 class



SphinX

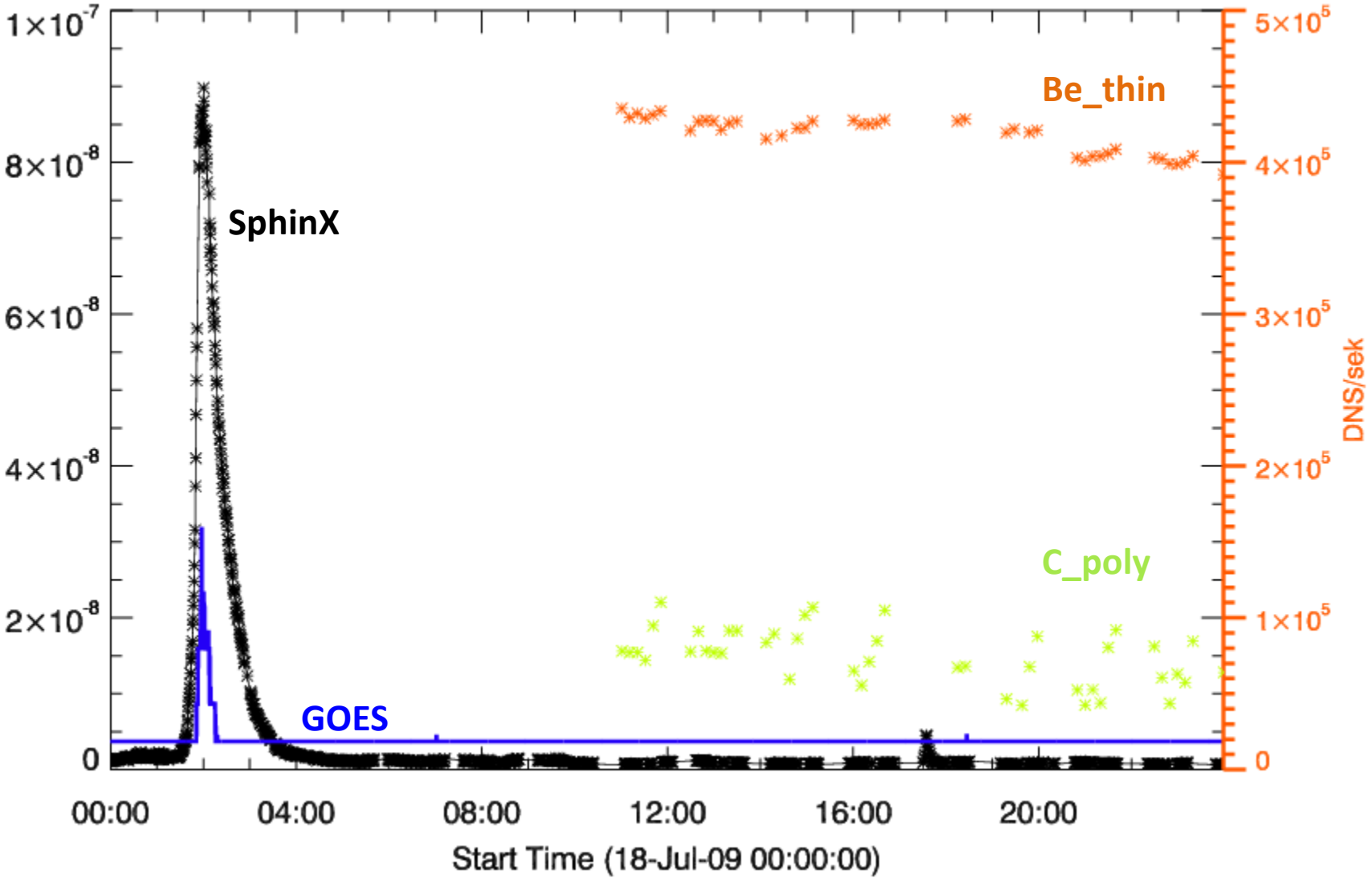


XRT/Hinode

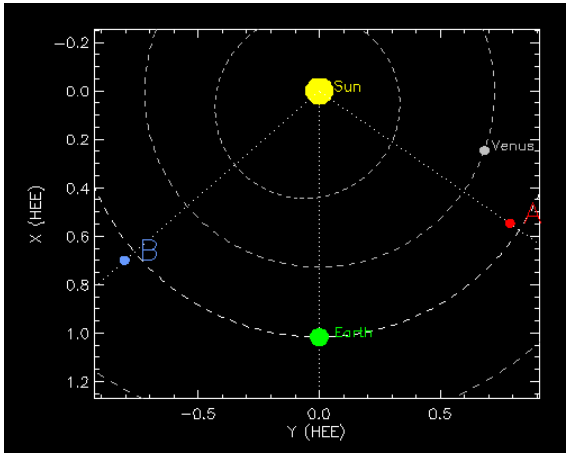
http://156.17.94.1/sphinx_l1_catalogue/SphinX_cat_main.html

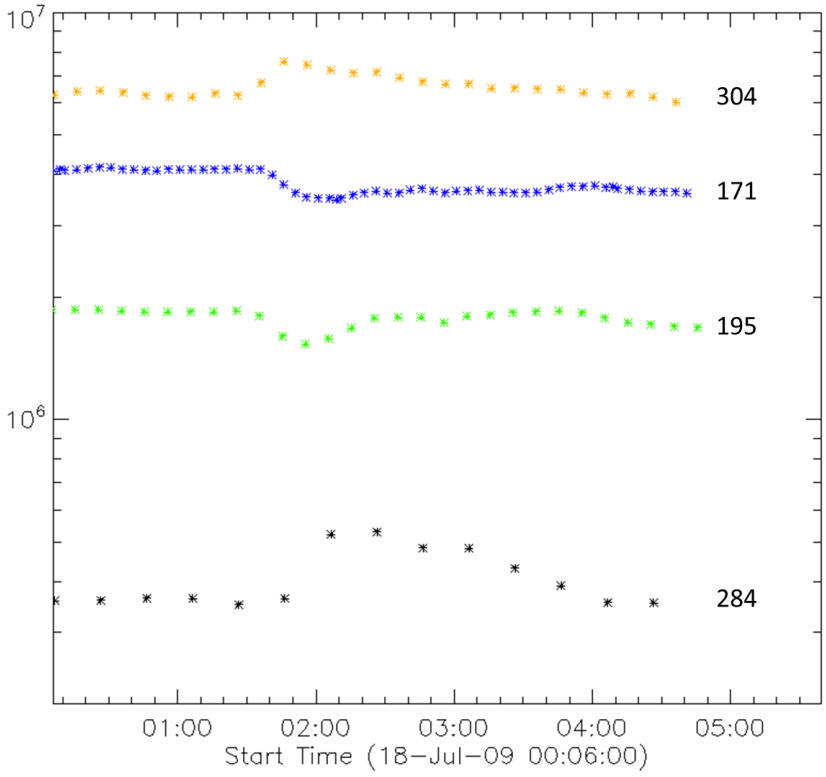
18 July 2009 flare A9 class

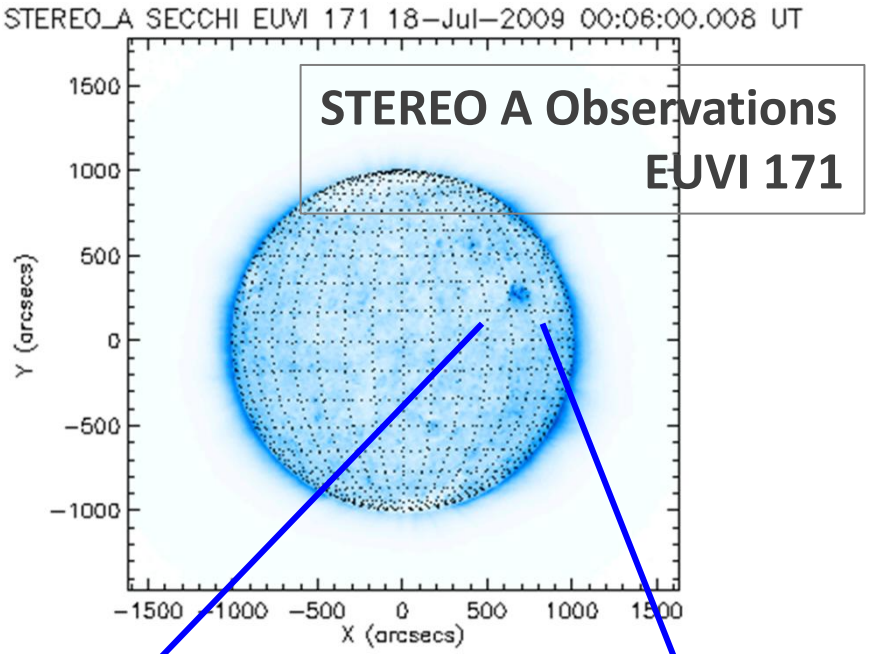
SphinX, XRT/Hinode and GOES Observations

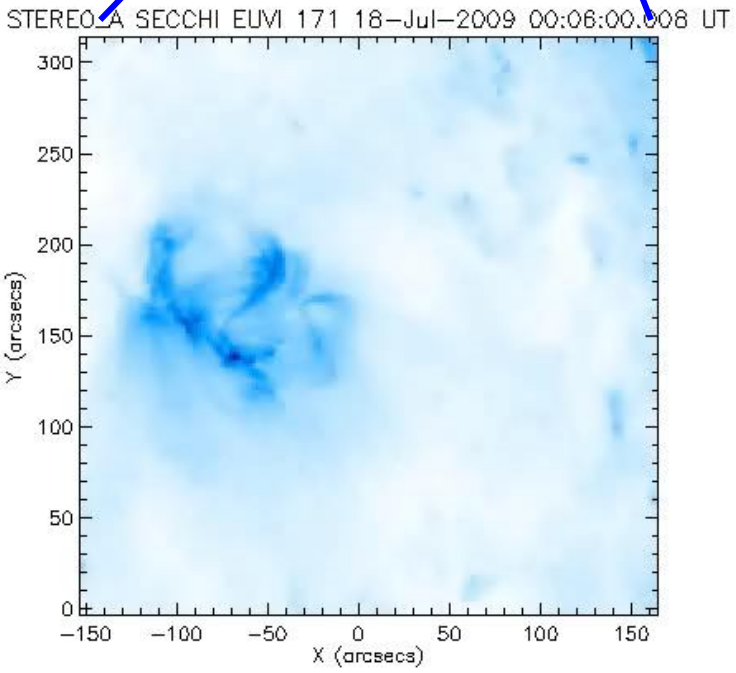


18 July 2009 flare









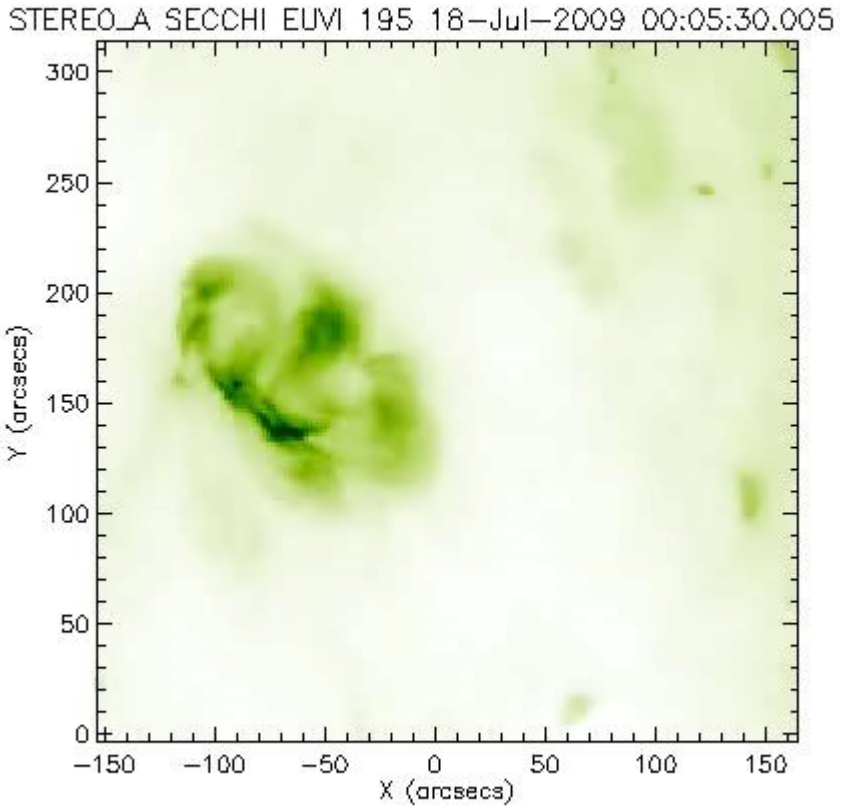
18 July 2009 flare

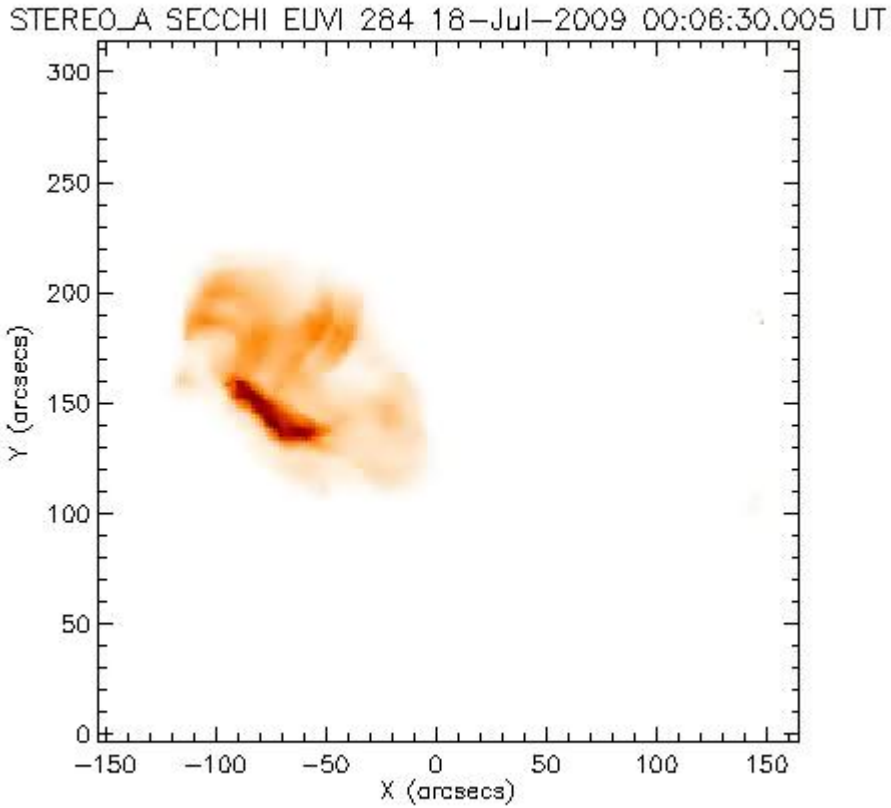
STEREO A Observations

EUVI Extreme Ultraviolet Imager

195 1.4 MK

284 2.2 MK





STEREO A Observations

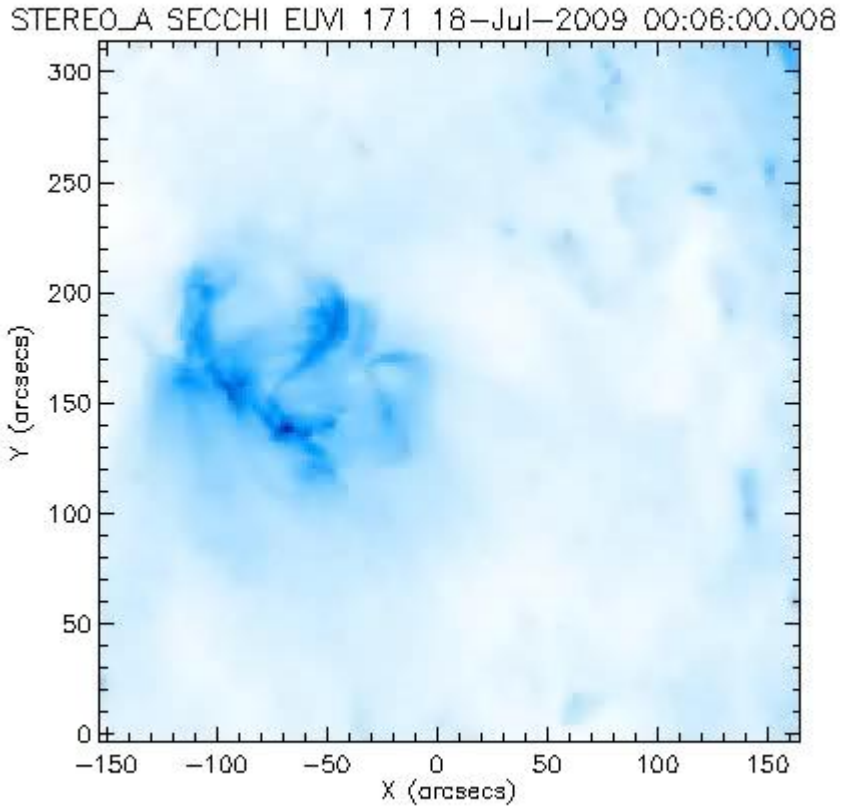
18 July 2009 flare

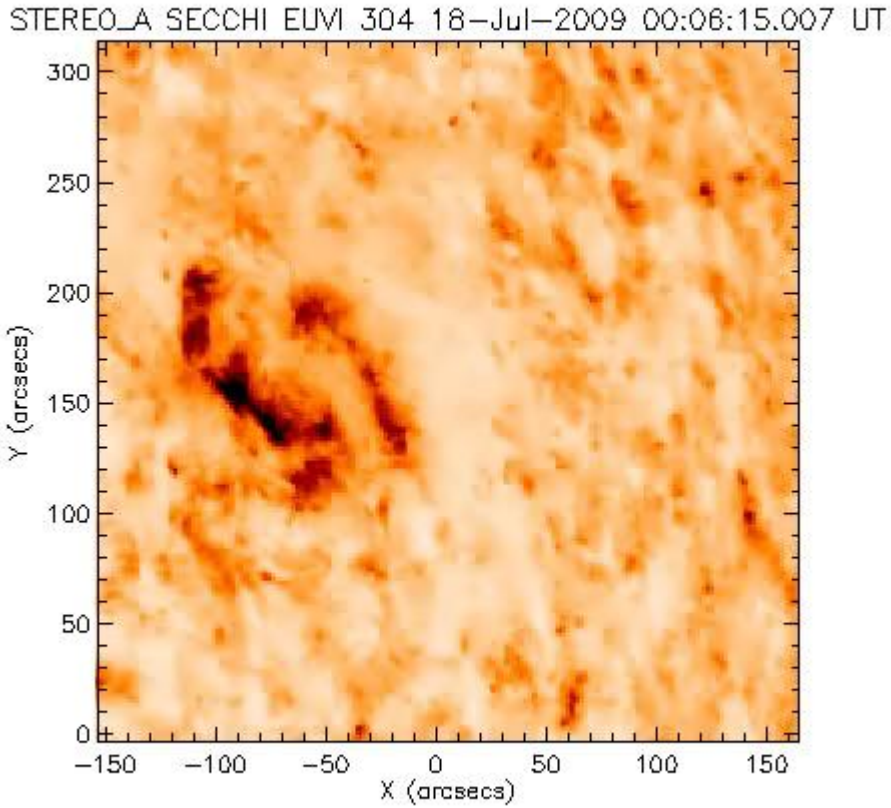
EUVI Extreme Ultraviolet Imager

171 1.0 MK

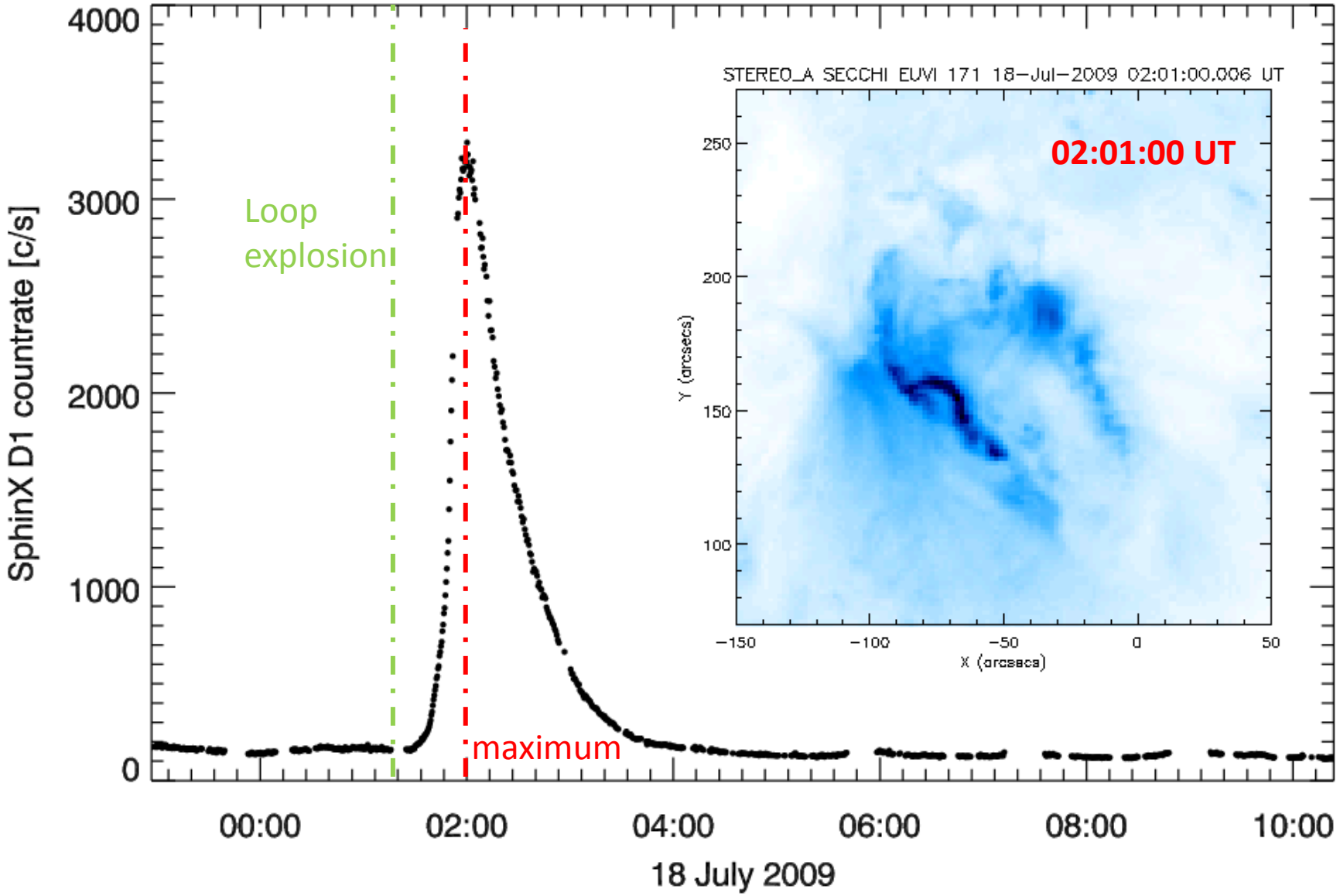
304 80000 K

Loop explosion ~ 01:40 UT

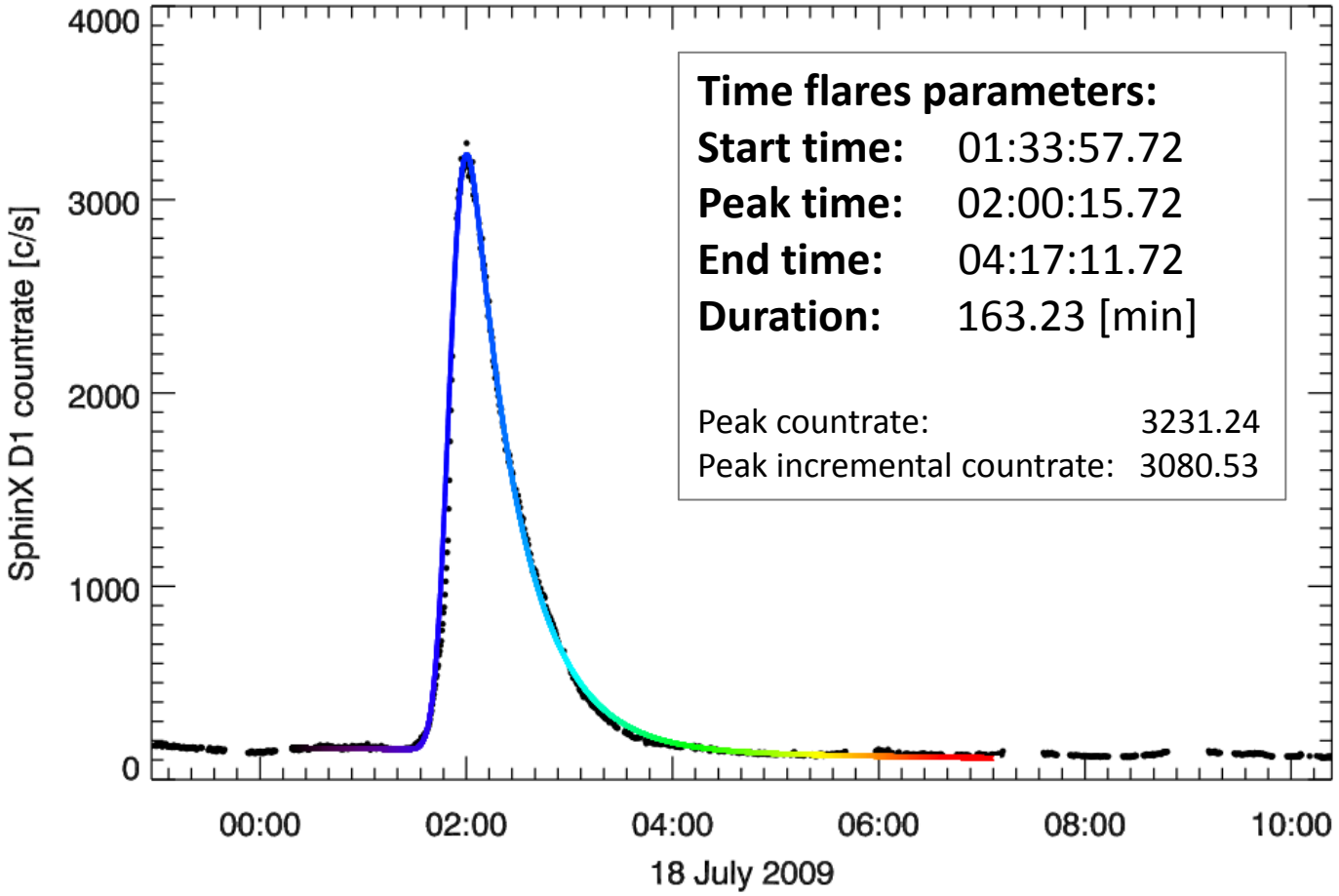




18 July 2009 flare



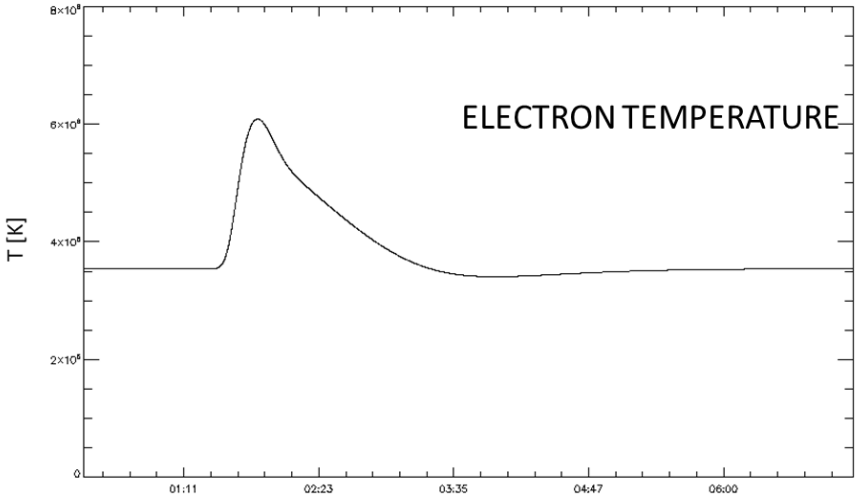
18 July 2009 flare

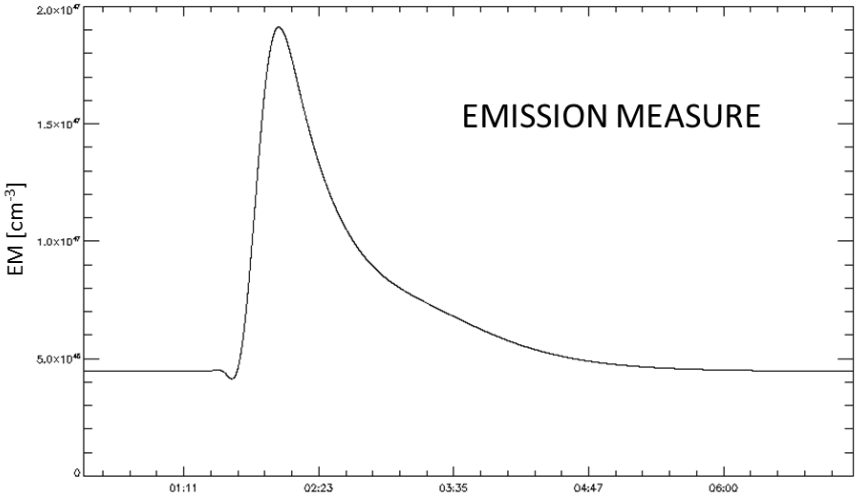


Flaring plasma diagnostics with SphinX data

- ✓ **Background subtracted method**
- ✓ **Isothermal aproximation**

Evolution of flaring plasma

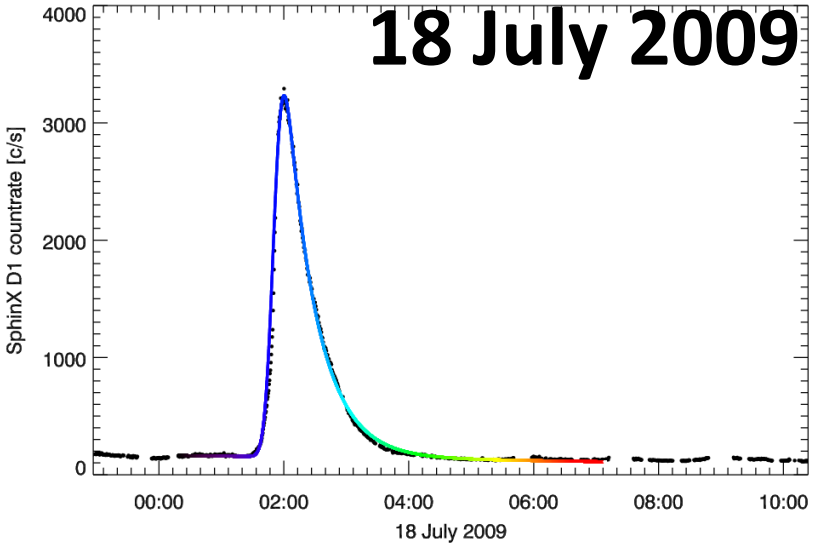


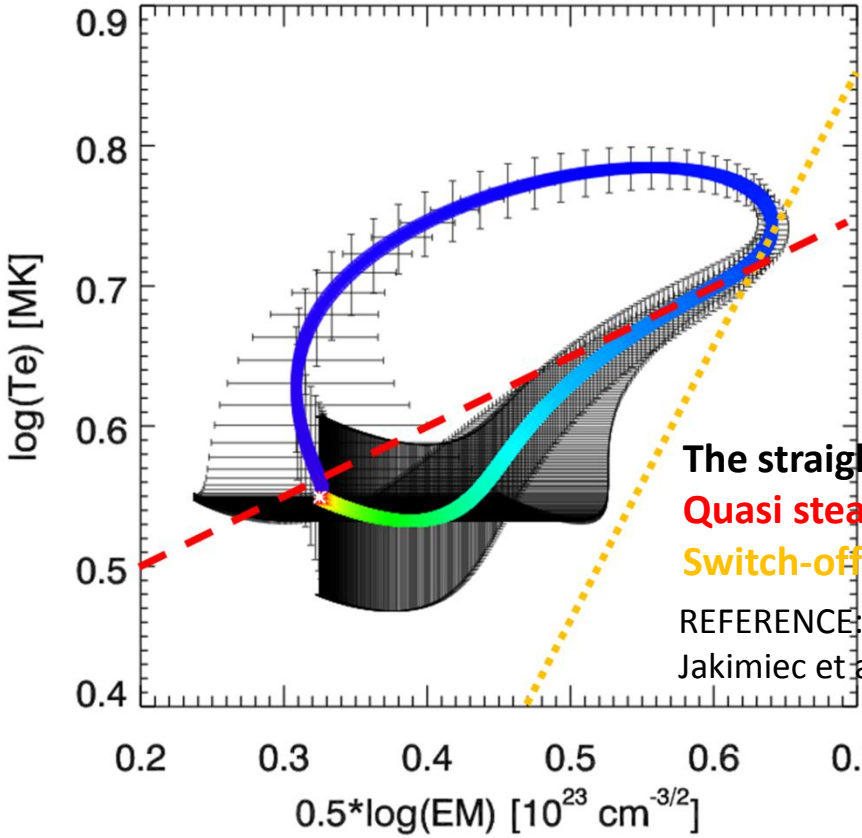


RESULTS:

max T	**6.09 [MK]**
max EM	**1.9 x 10^{47} [cm^{-3}]**

18 July 2009 flare





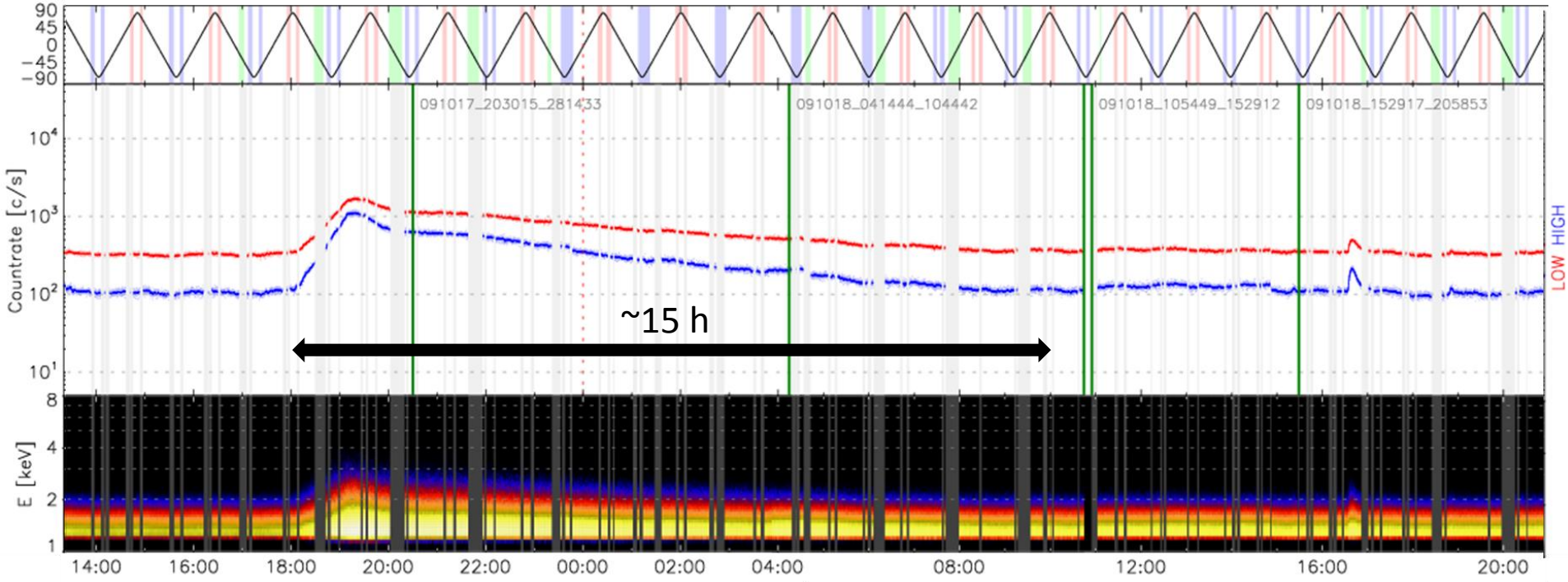
The straight lines:

Quasi steady state

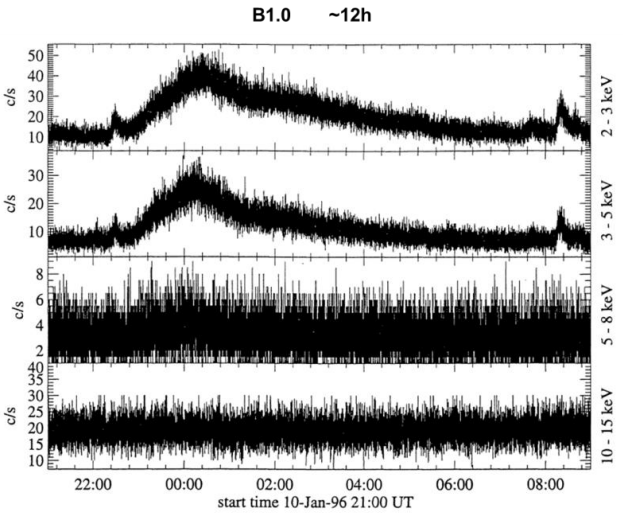
Switch-off heating

REFERENCE:
Jakimiec et al., (1992)

17 October 2009 flares A7 class



http://156.17.94.1/sphinx_l1_catalogue/SphinX_cat_main.html



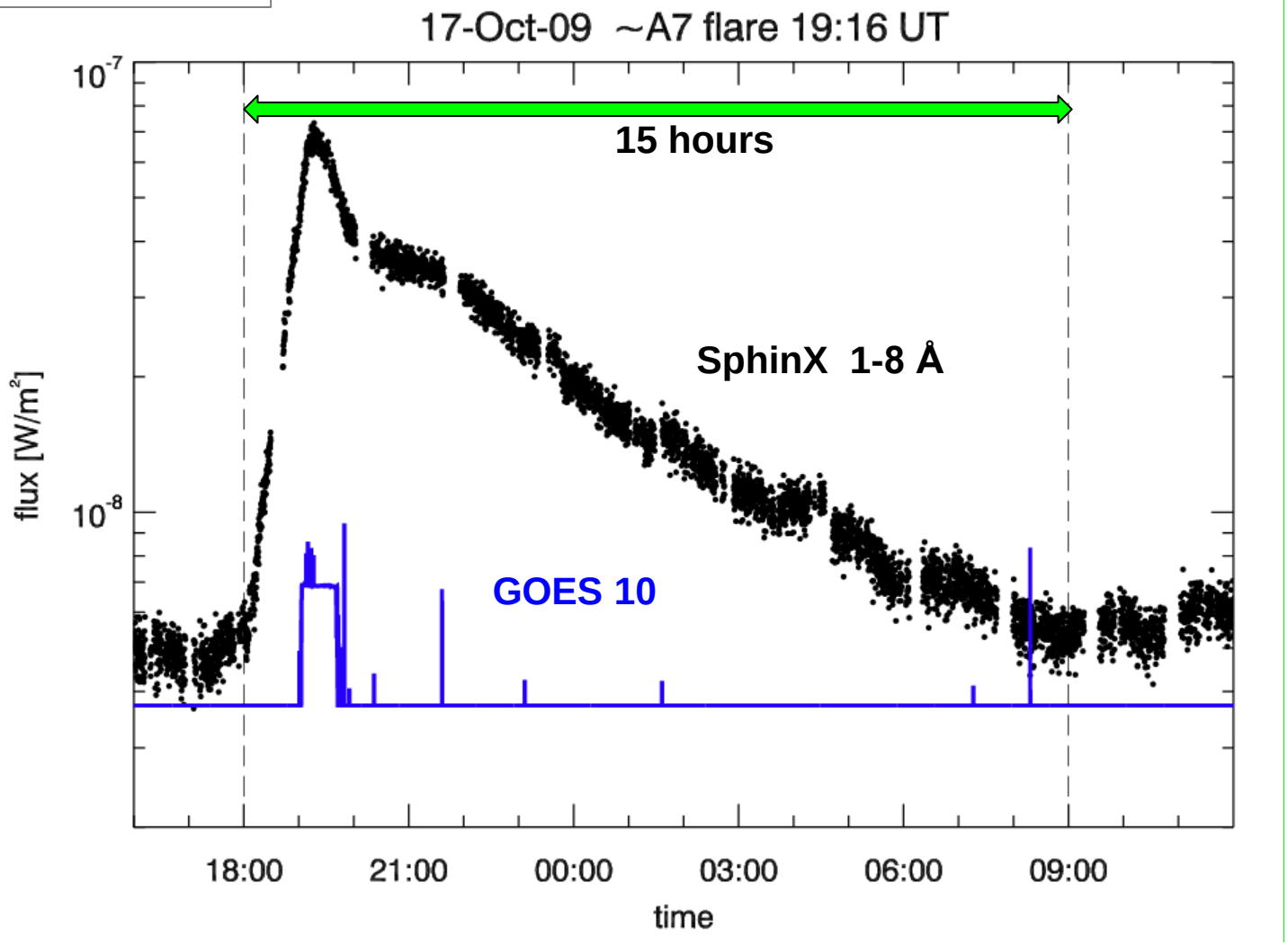
LONG DURATION EVENT

LDE, Hybrid flare ?
Svestka, Solar Phys. 1989, 121, 399

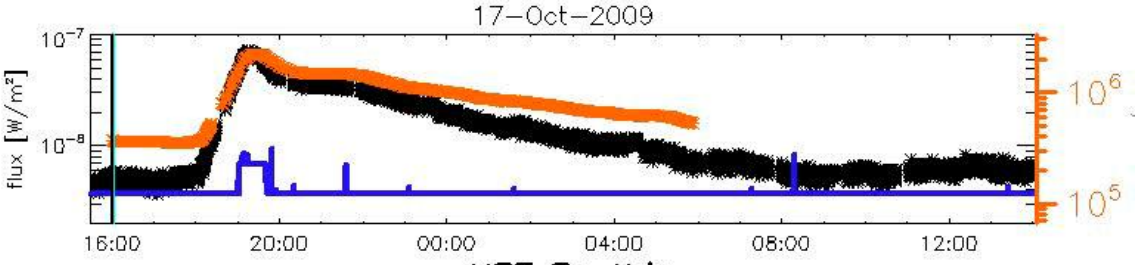
Interball RF15I
11-Jan-96 LDE

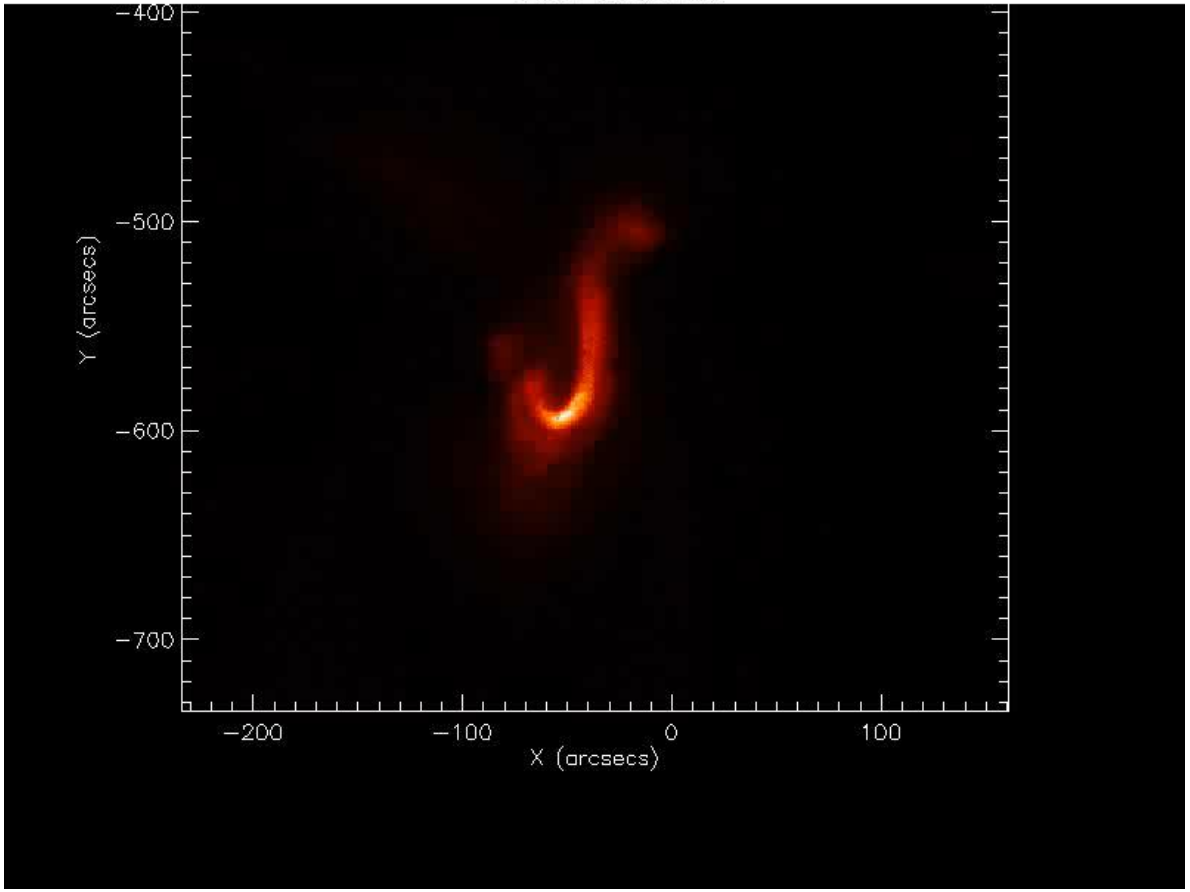
17 October 2009 flares A7 class

GOES Observations

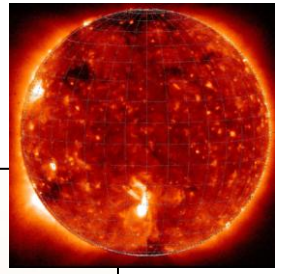


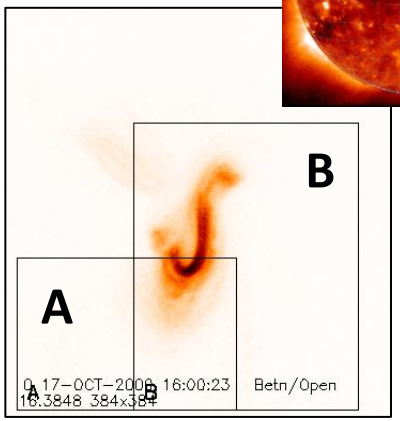
17 October 2009 flares

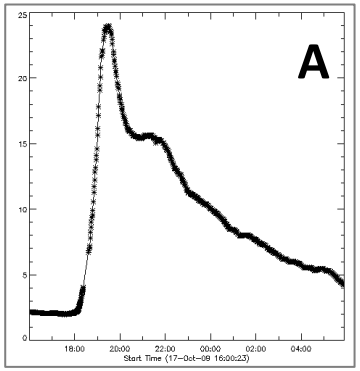


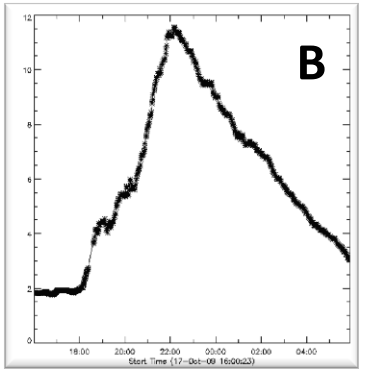


Be_thin filter

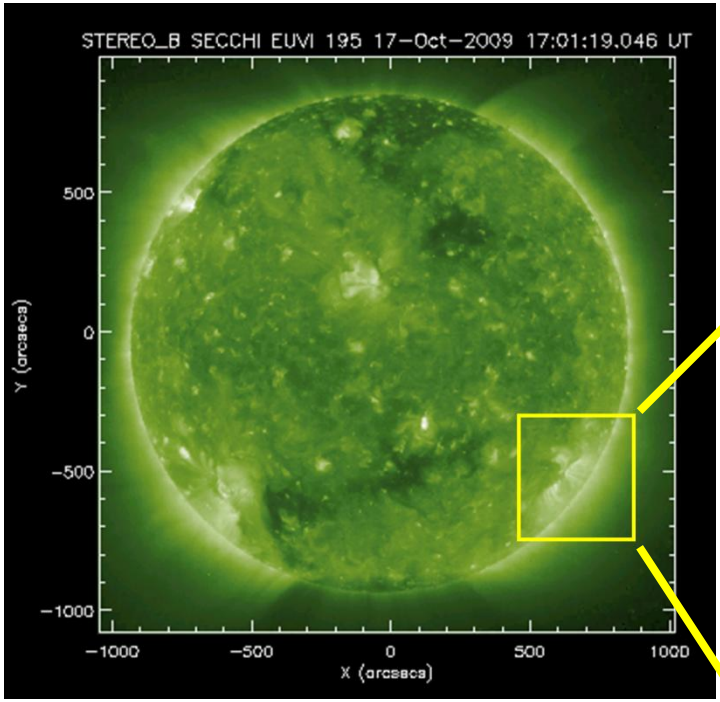


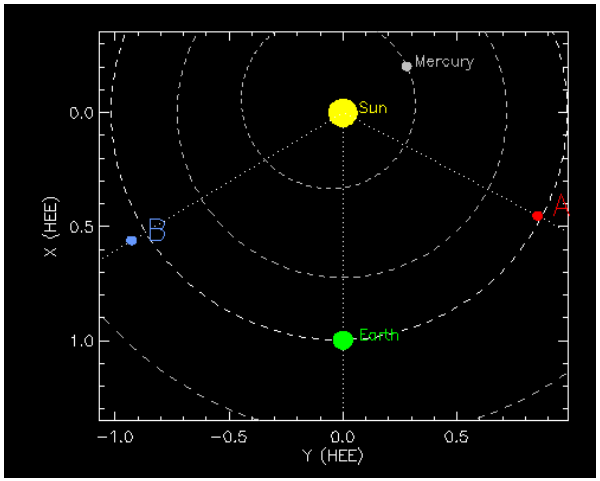


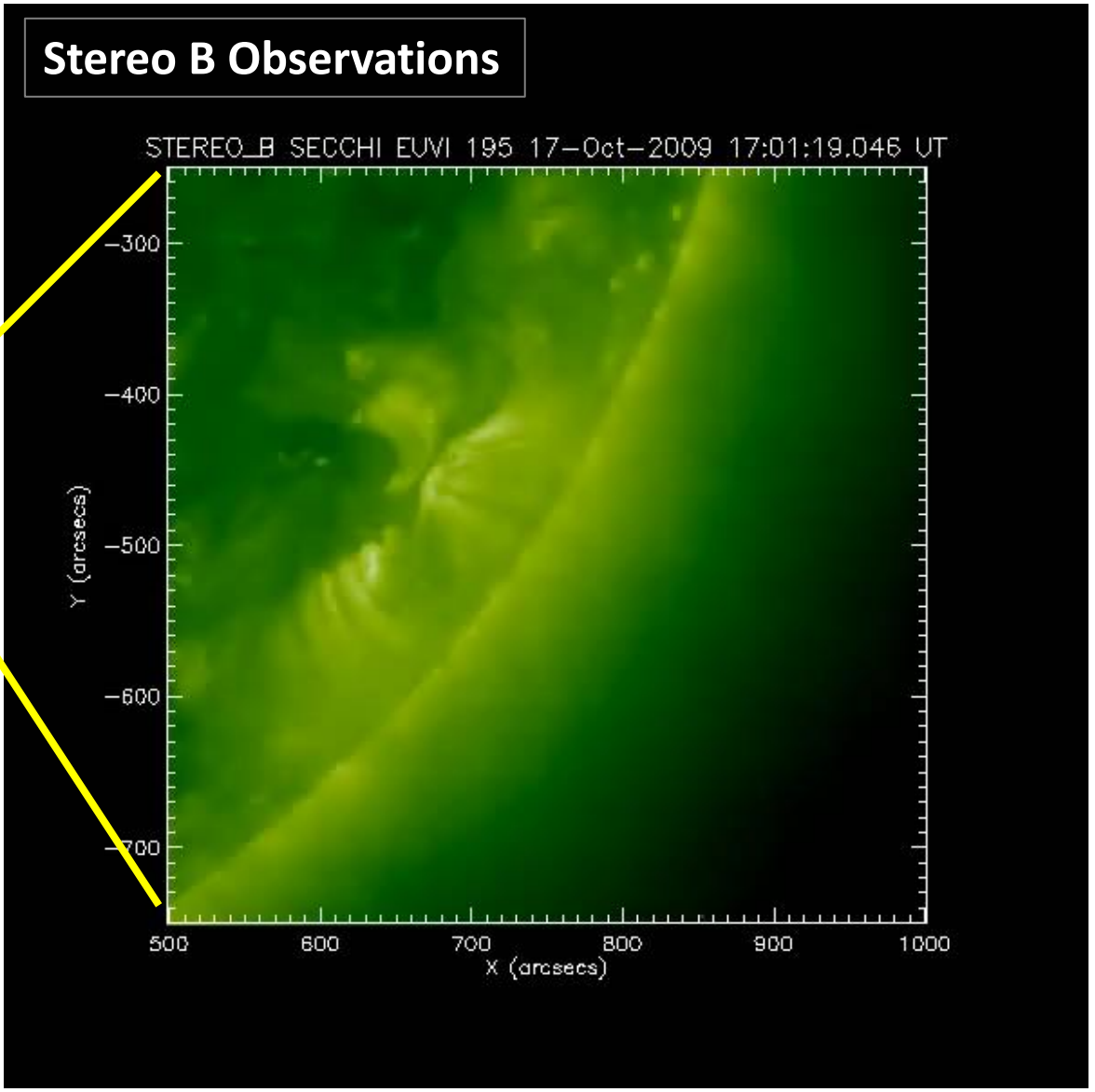




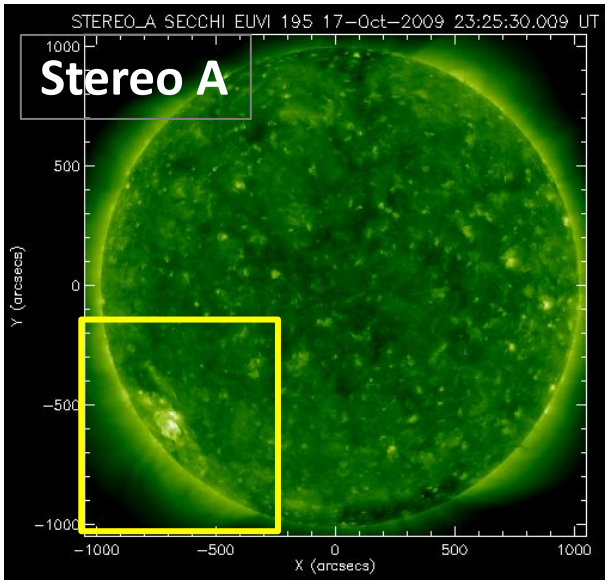
17 October 2009 flares

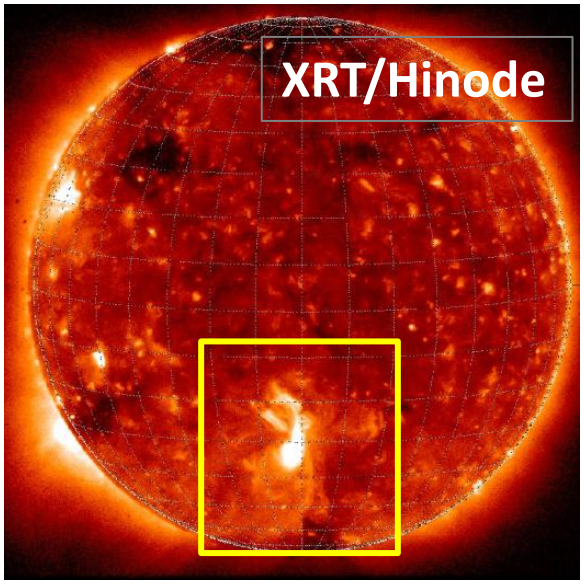


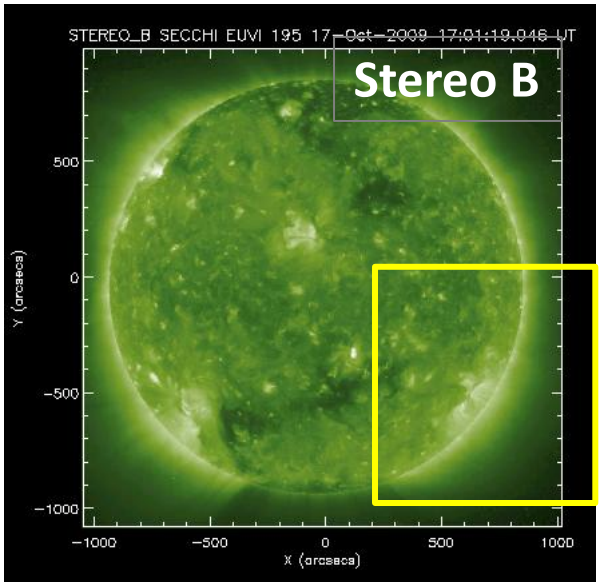


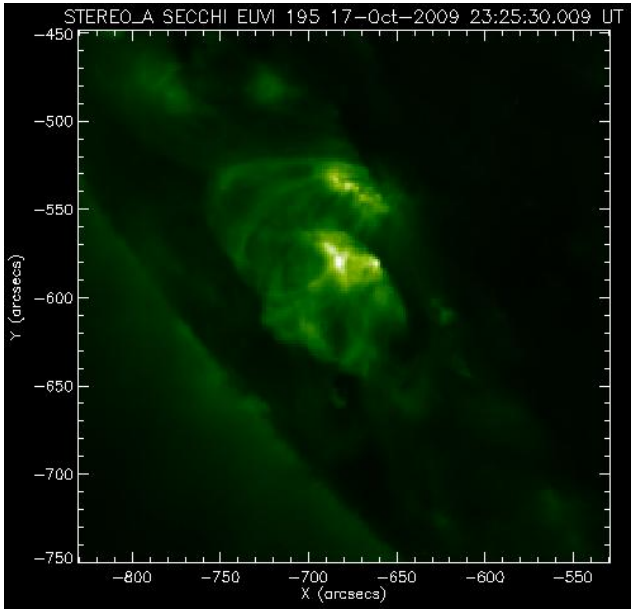


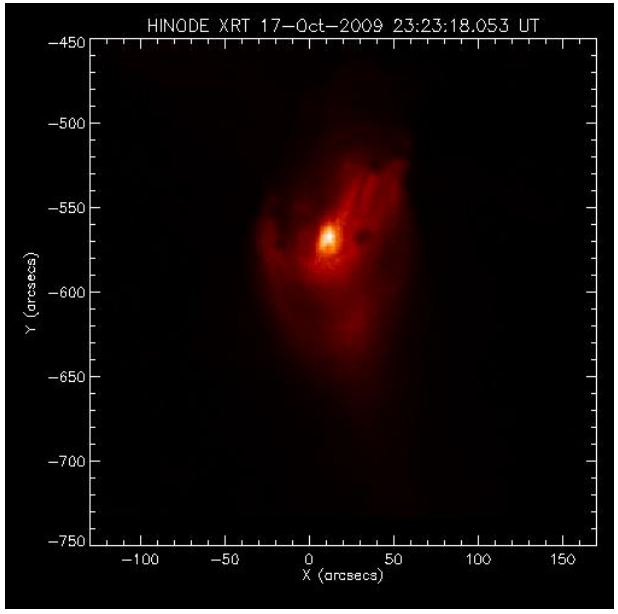
17 October 2009 flares – complex view

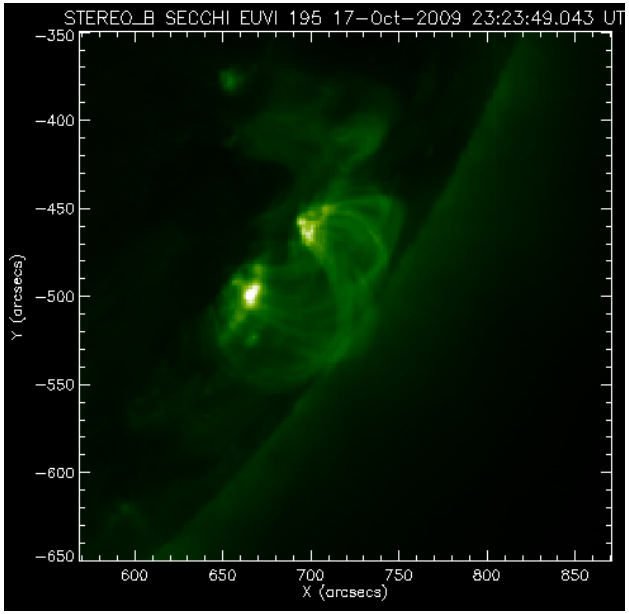






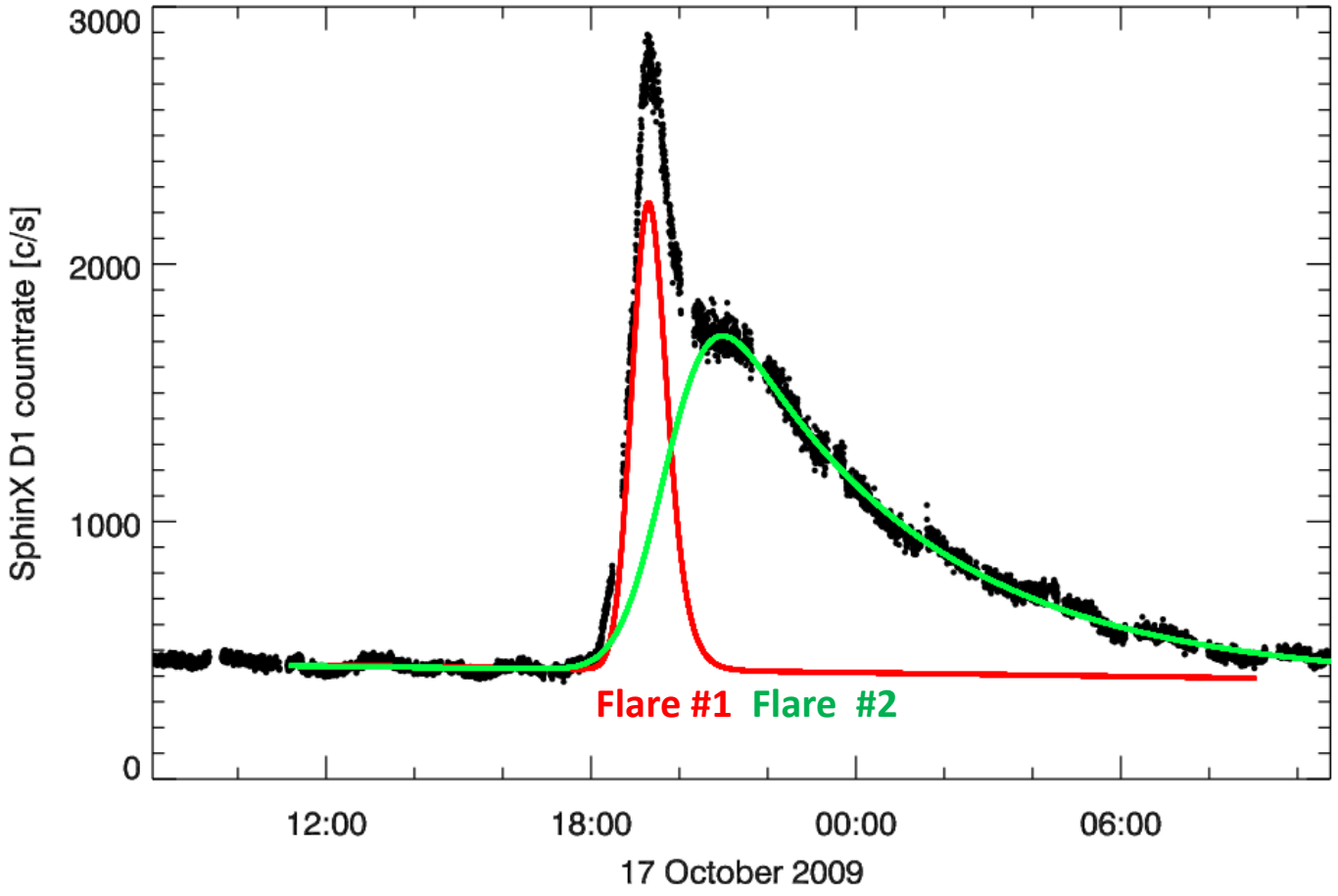




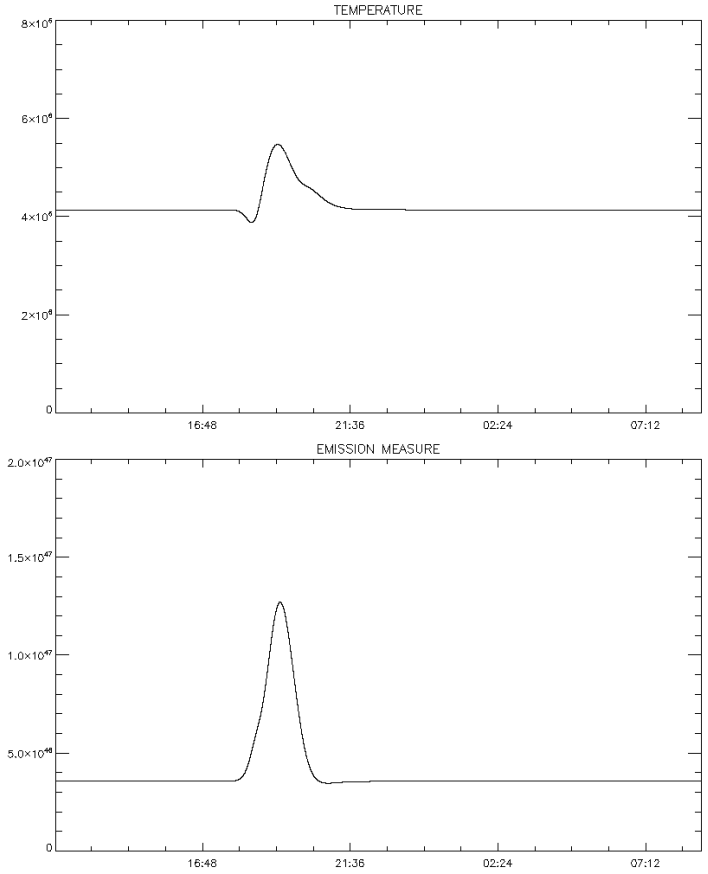


17 October 2009 flares

Elementary flare time profile optimal fits



Flare #1

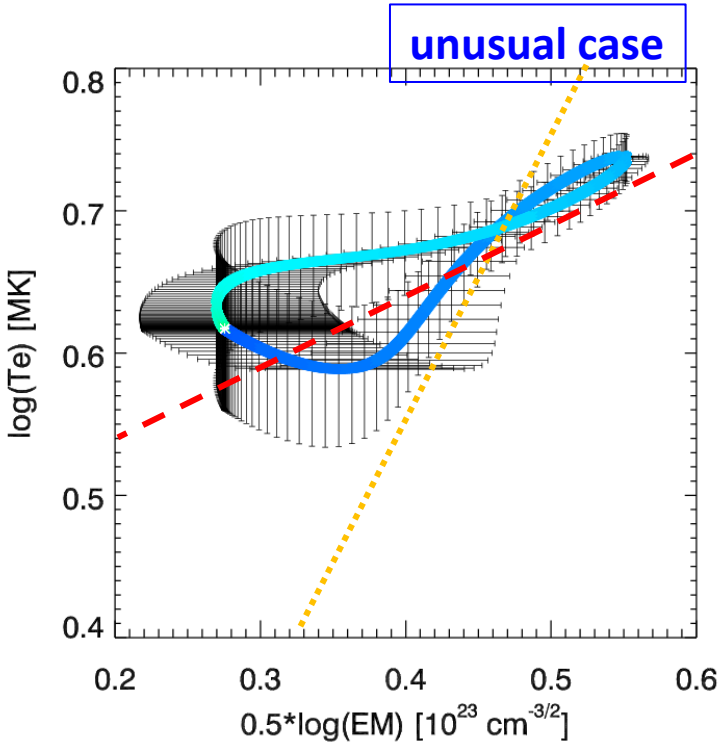


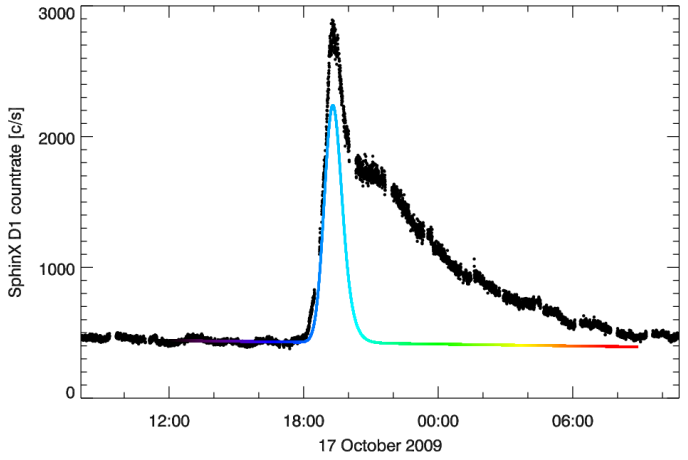
RESULTS:

max T **5.48 [MK]**

max EM **1.23 x 10^{47} [cm^{-3}]**

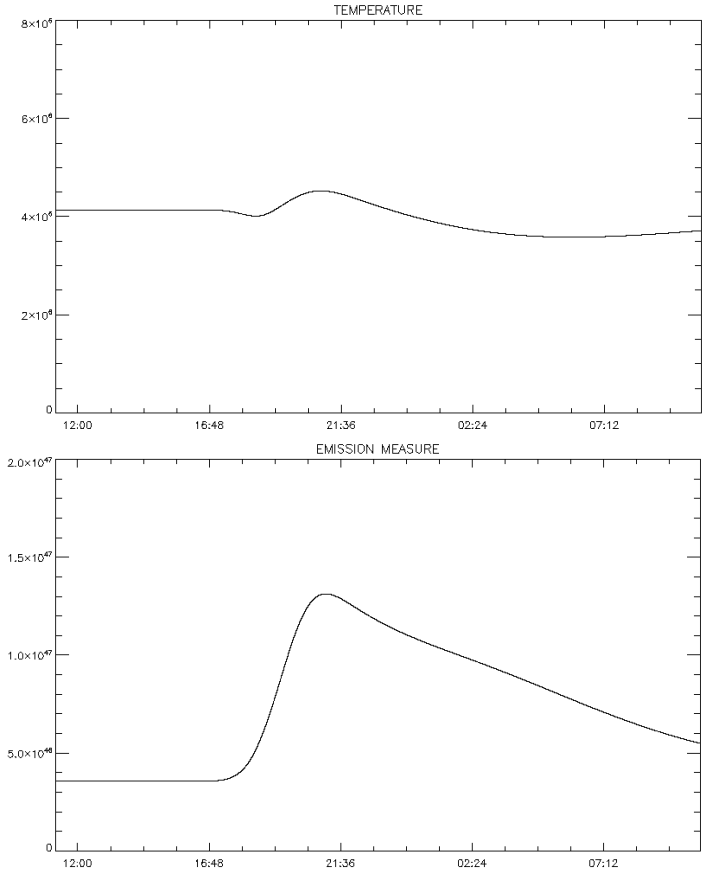
17 October 2009 flares

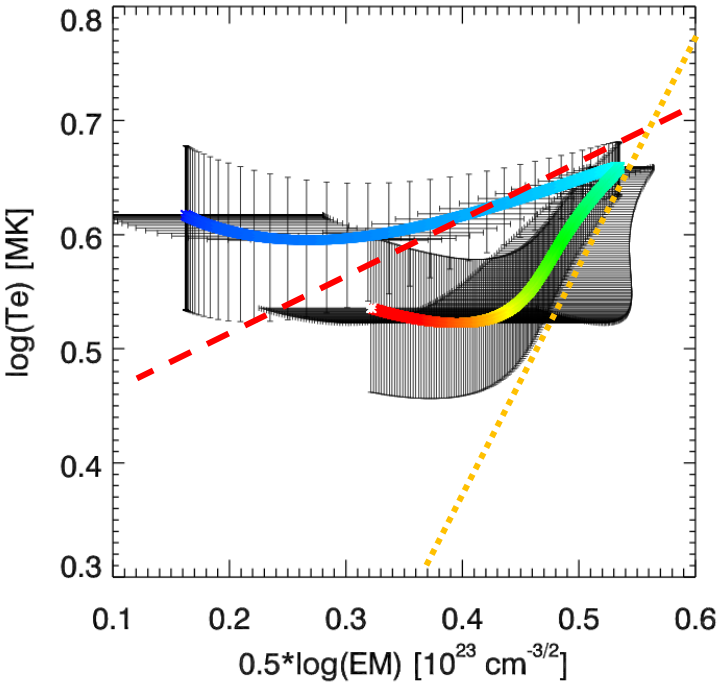


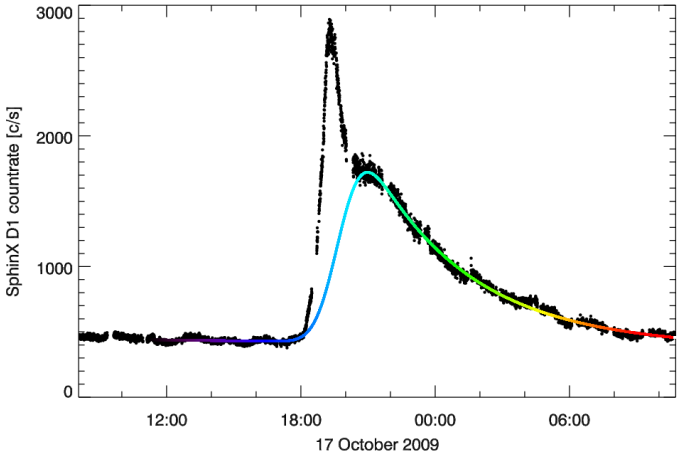


17 October 2009 flares

Flare #2







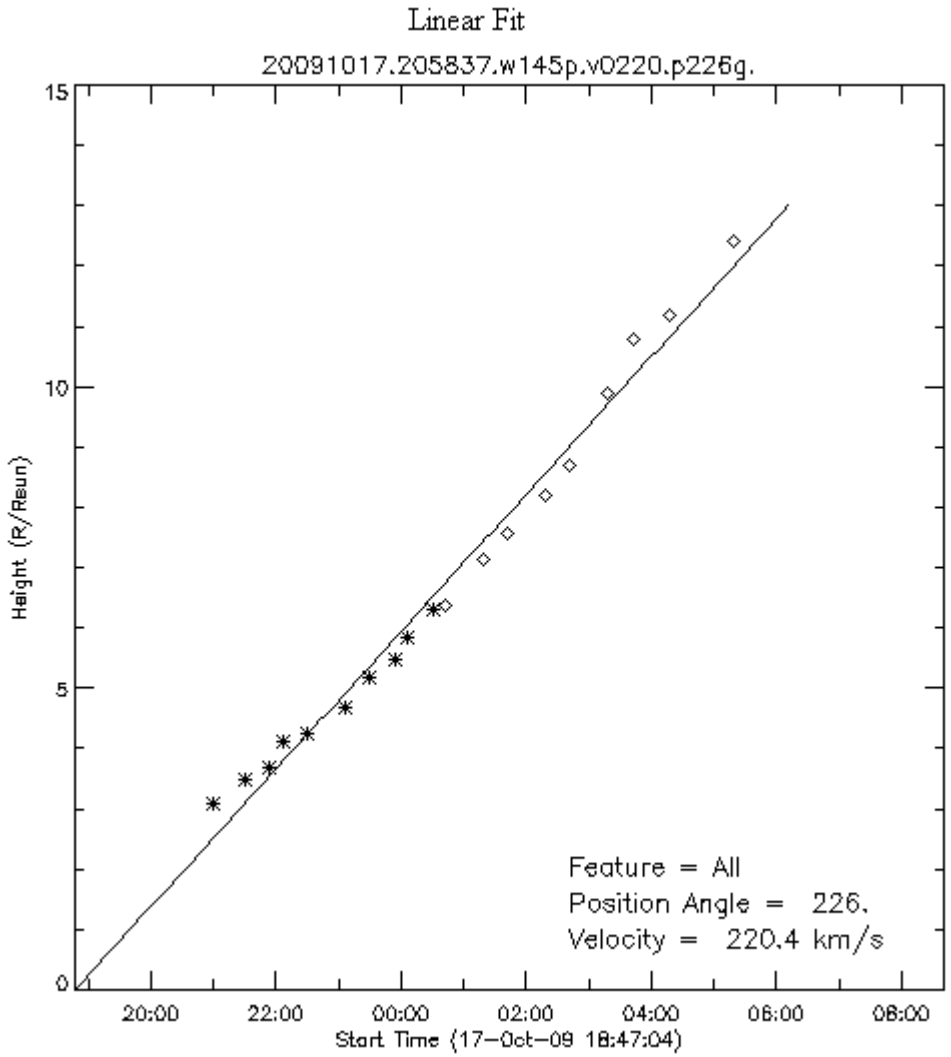
RESULTS:

max T	**4.57 [MK]**
max EM	**1.17 x 10^{47} [cm^{-3}]**

17 October 2009 flares & CME asocciated with

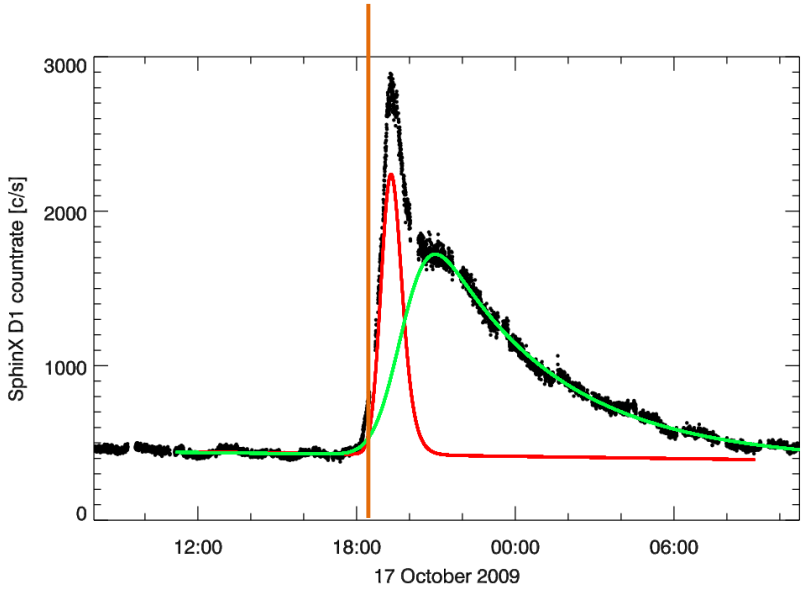
CME event

'Very Poor Event; Partial Halo' (SOHO LASCO CME CATALOGUE)



Determinations based on **LASCO data**

~ 18:47



Conclusions

Analysed flares:

18 July	2009	A9 class
17 October	2009	A7 class

- Small flares differ from large ones only on scales (of size, Te, EM etc.)
- Morphology of small flare can be as complicated as larger ones
- Even small flares can be associated with ejection phenomena (CME) - flares lightcurves deconvolution allow for determination of exact start and end times of event

Thank You
for your kind attention