WG 1

IRIS/RHESSI +WGs 3 & 6

WG 1 : Of hot and cold flares

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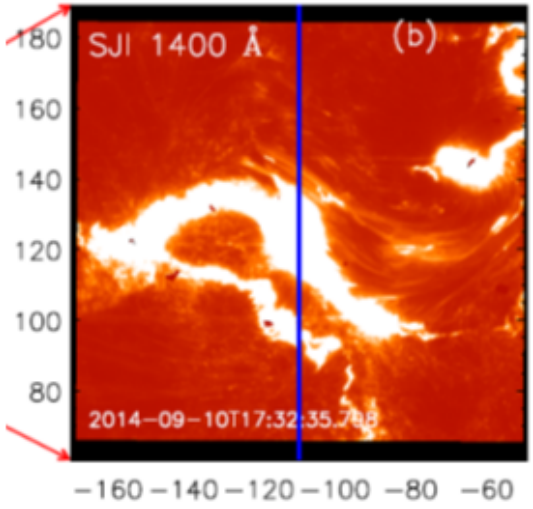
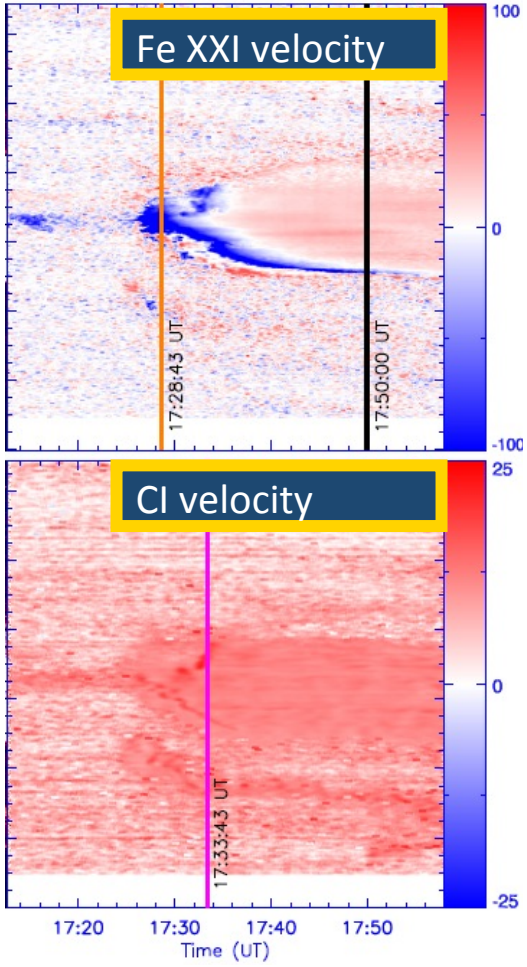
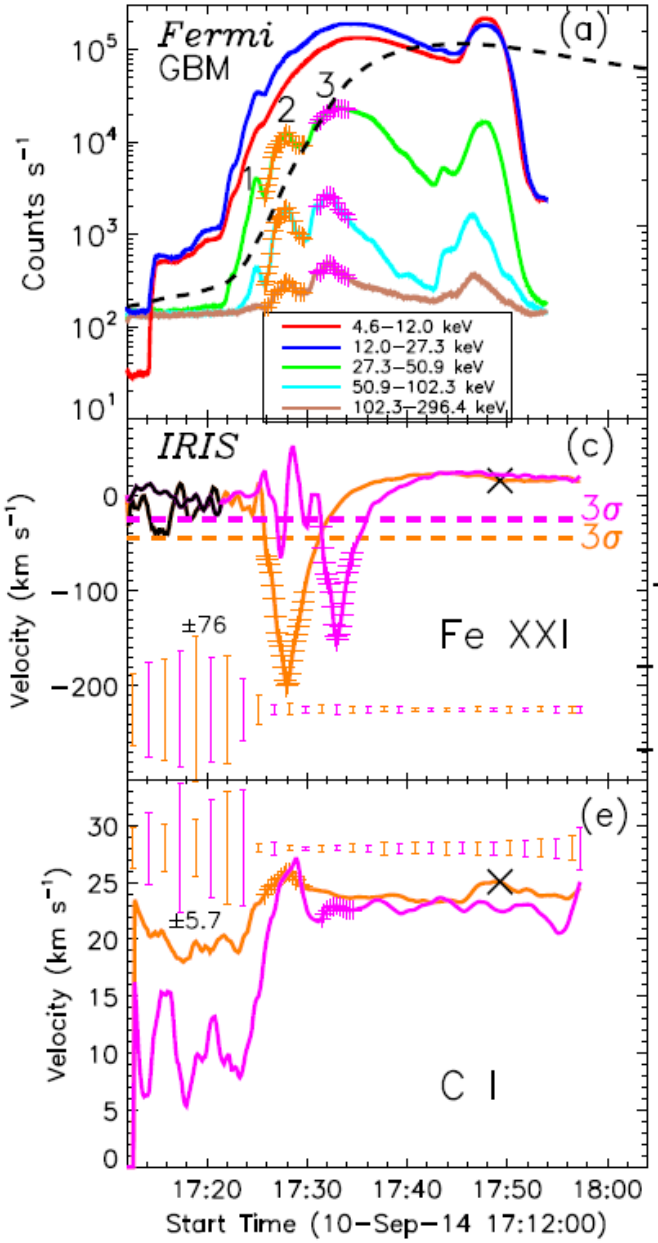
Chromospheric evaporation

It's electrons beams!



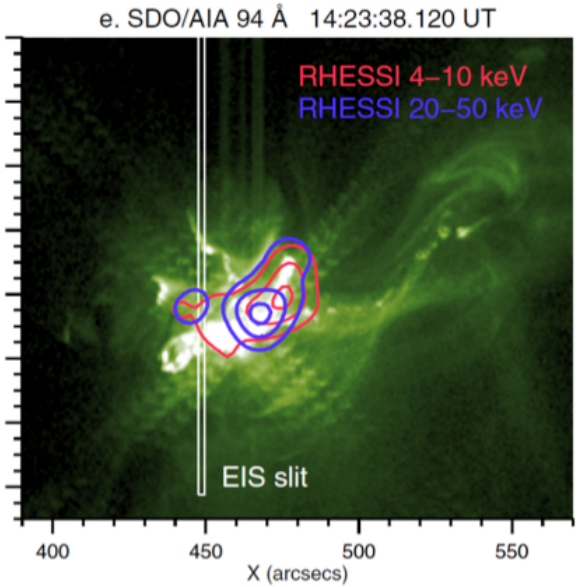


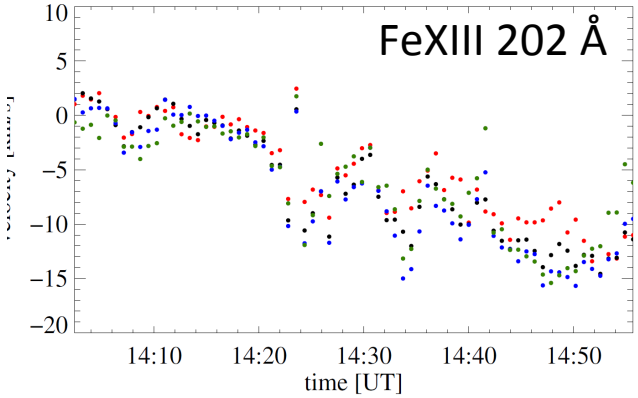


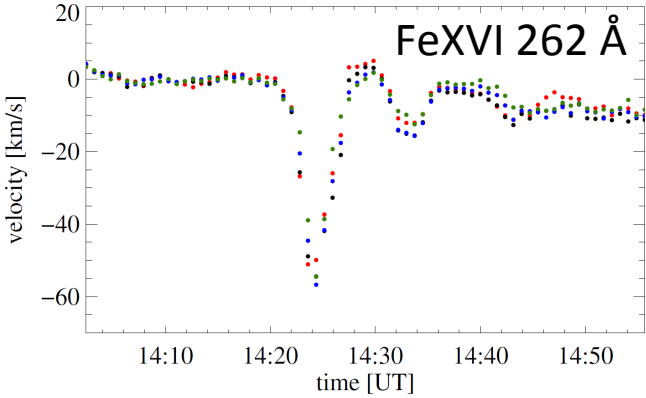
- 2 HXR peaks
- FeXXI velocity negatively correlated with HXR flux
- CI velocity positively correlated with HXR flux

Chromospheric evaporation

It's electron beams – but beware Fisher 1985!





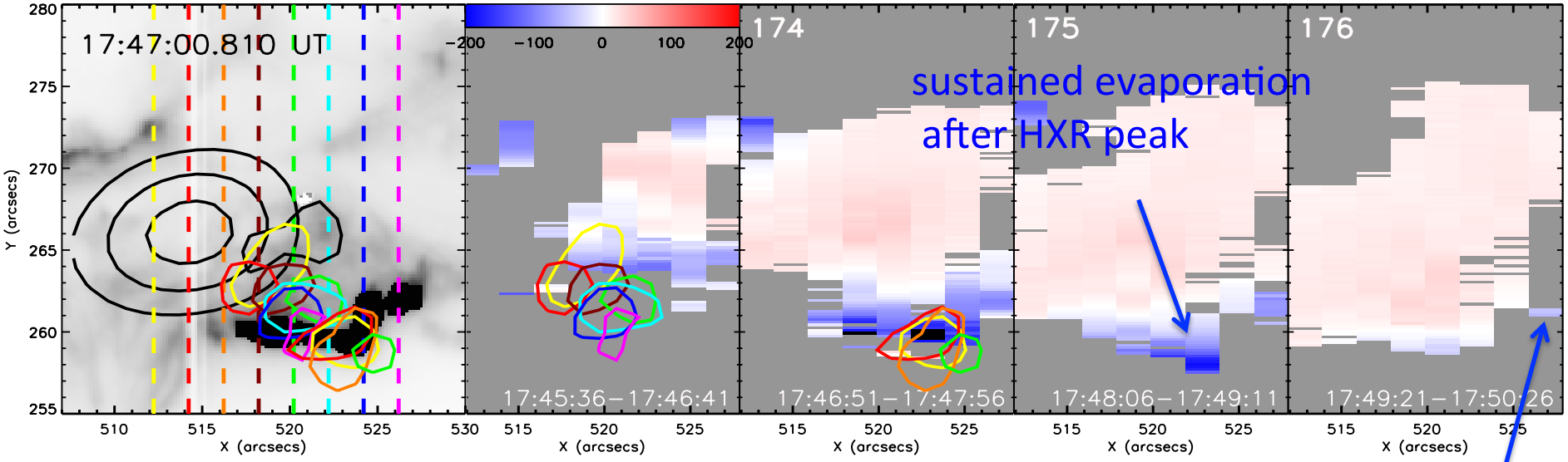


Hinode/EIS doppler-shifts at different temperatures → explosive evaporation
RHESSI non-thermal beam power: 1.34×10^{10} erg s^{-1} cm^{-2}

But: explosive evaporation threshold is dependent on the cut-off energy (Reep et al. 2015)
→ threshold could be lower for lower energy cut-offs →supported by these observations

Chromospheric evaporation

It's not (always or entirely) electron beams!



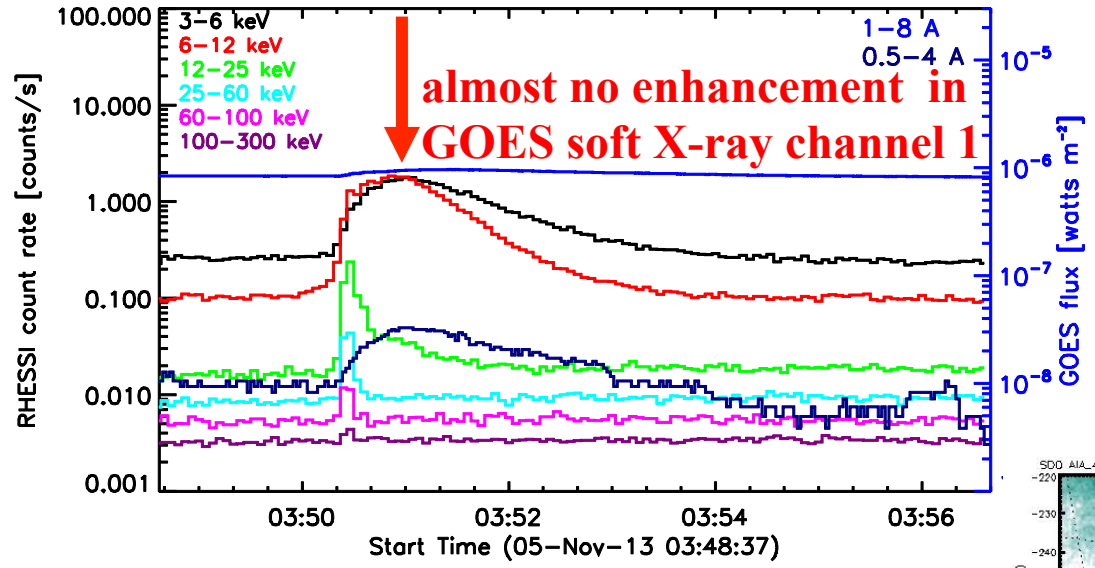
IRIS FeXXI and RHESSI observations of 29.3.2014 flare:

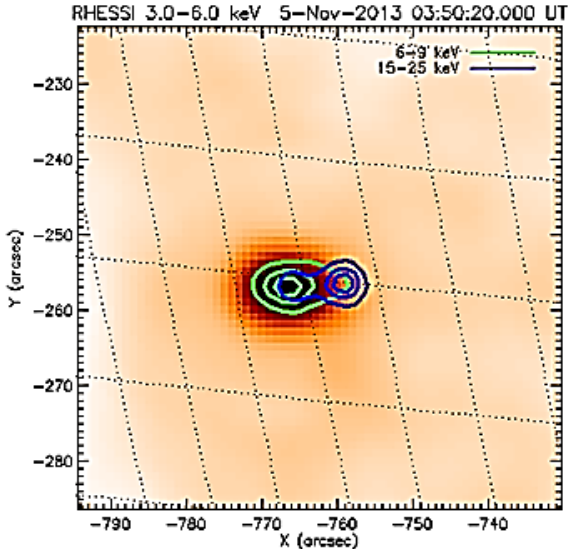
evaporation at location not associated with HXR

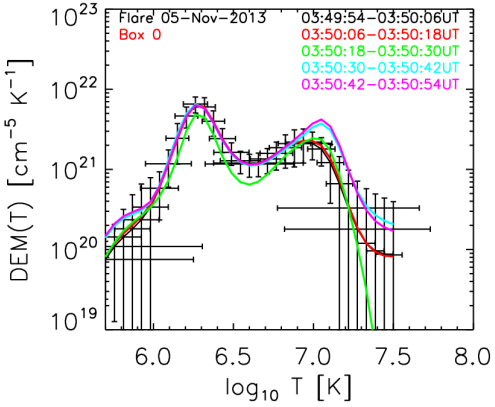
Electron beams are dominant means of energy input during the flare peak **but** cannot explain the whole observation → energy input by thermal conduction equally important

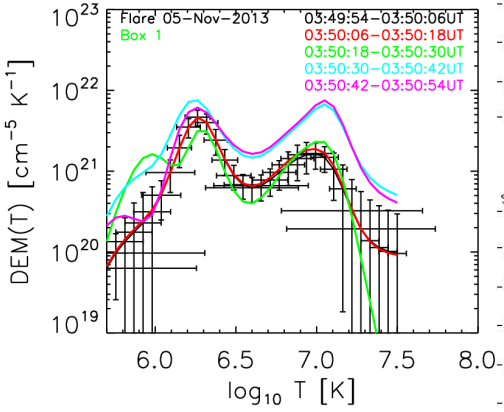
Cold flares

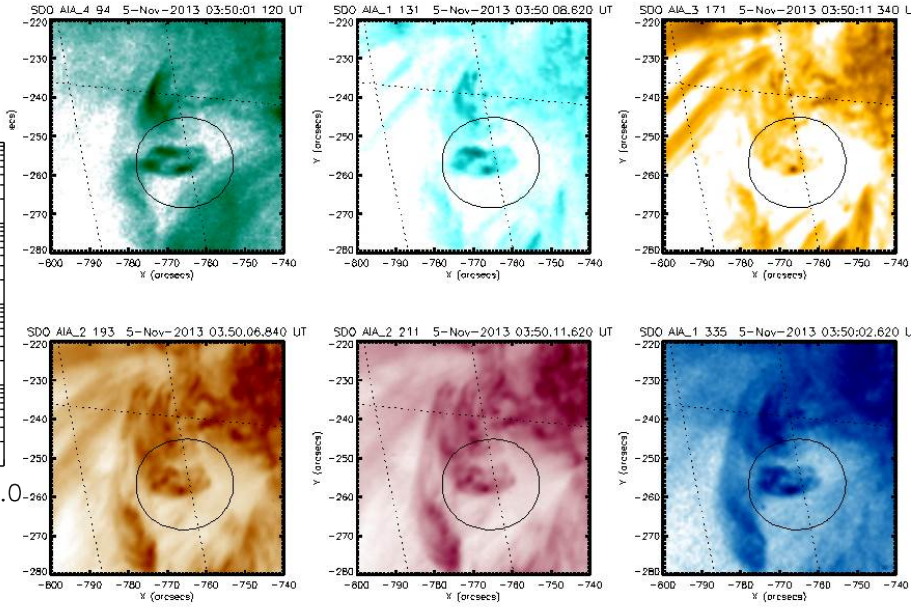
It's not even always heating!











Cold flares

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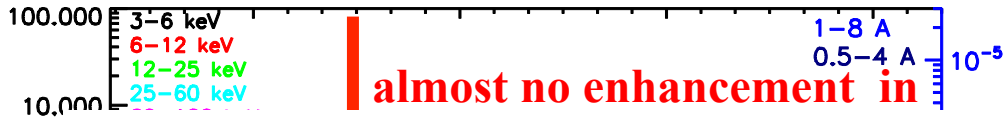

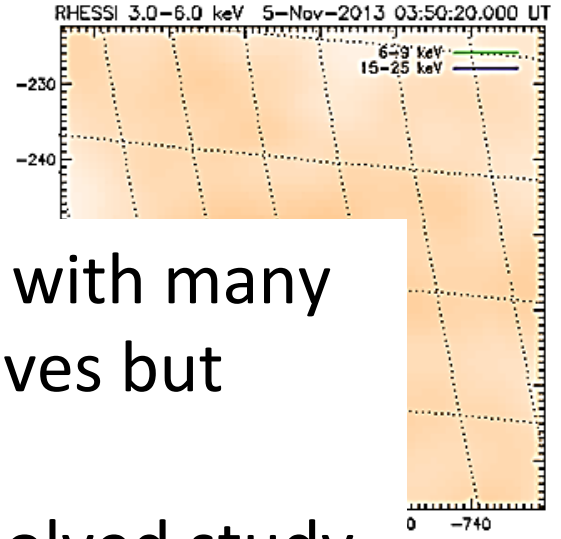

RHESSI count rate [counts/s]

So far, cold flares have been observed with many instruments in X-rays and microwaves but not EUV

→ AIA is ideal for detailed, spatially resolved study of the thermal evolution of such flares