

EVE and RHESSI

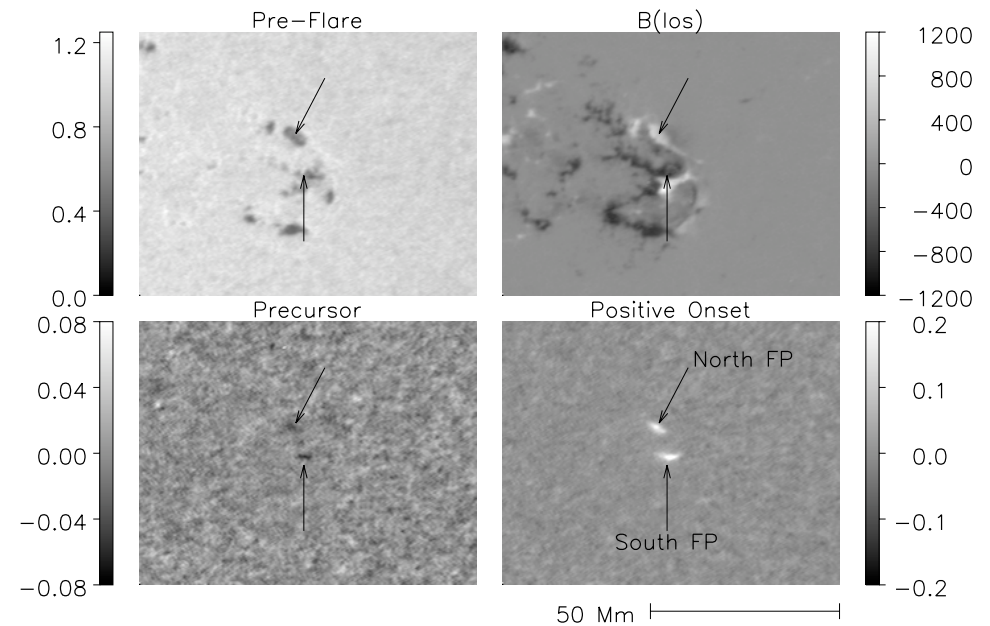
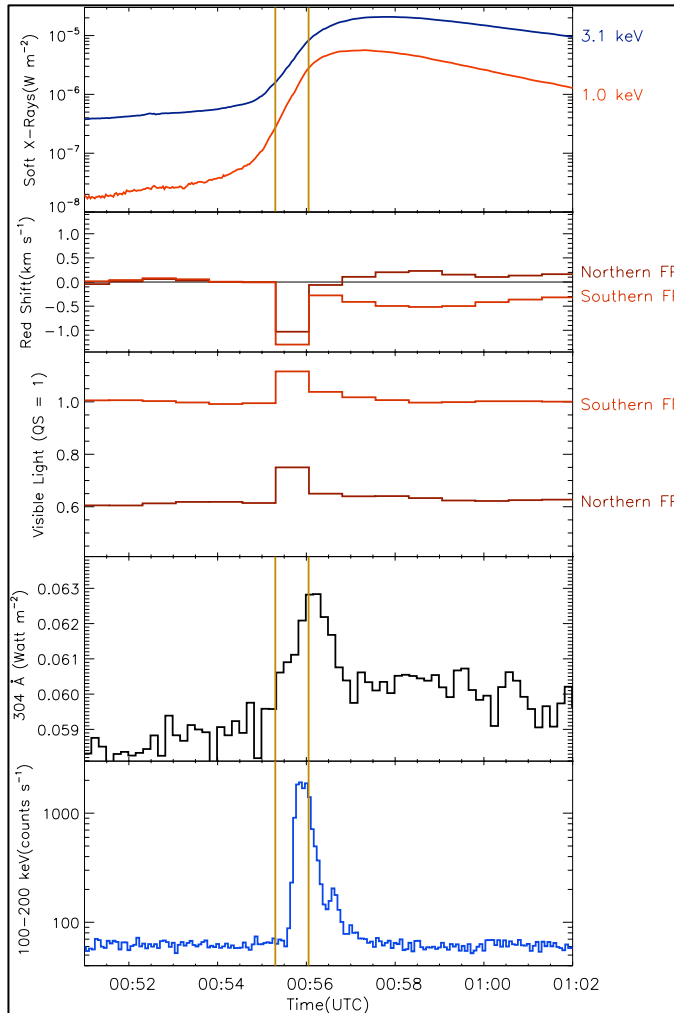
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Outline

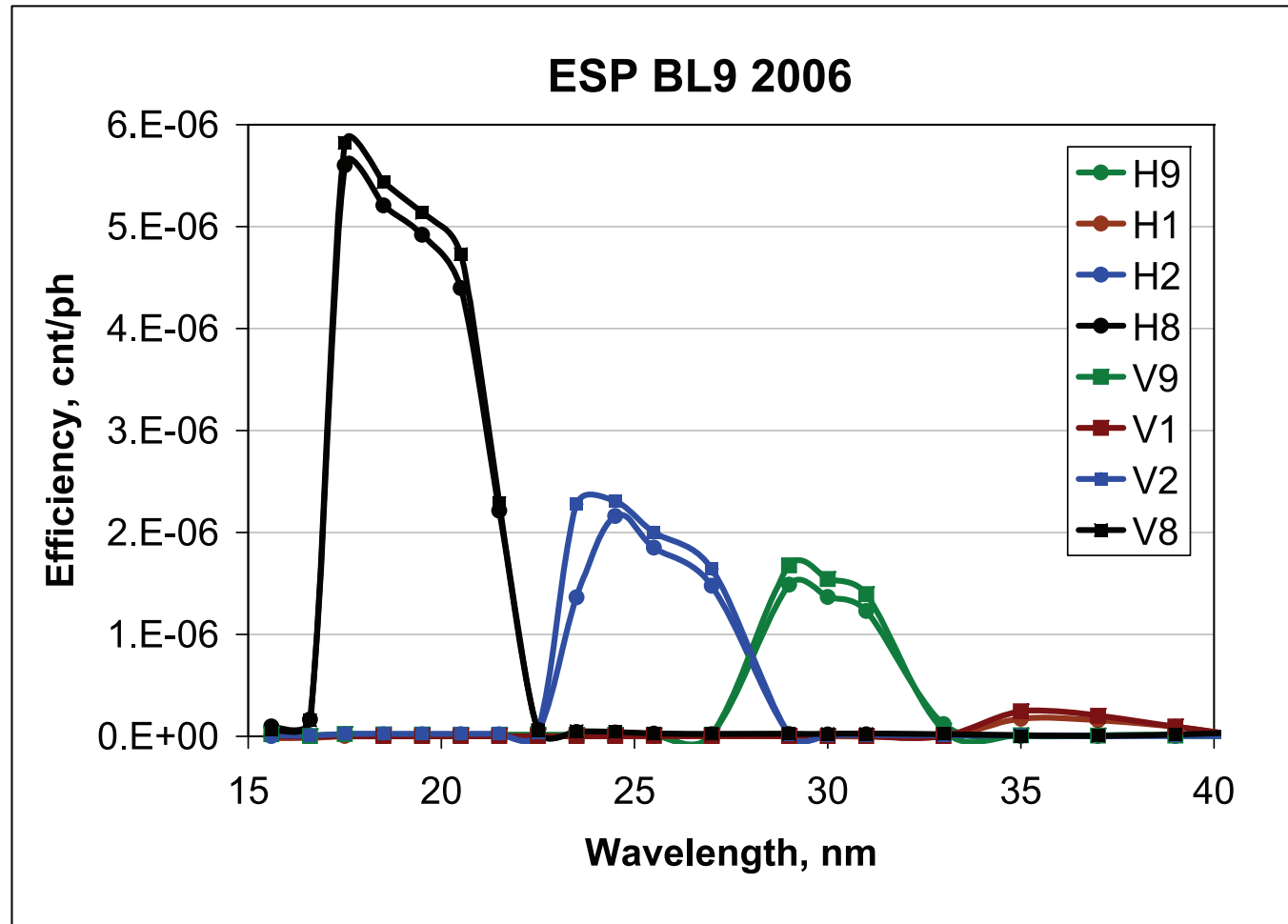
- 0) SOL2010-06-12T00:57 as seen by HMI
- 1) What is EVE?
- 2) How good is EVE?
- 3) What can we learn from EVE and RHESSI?

SOL2010-06-12T00:57 (HMI)

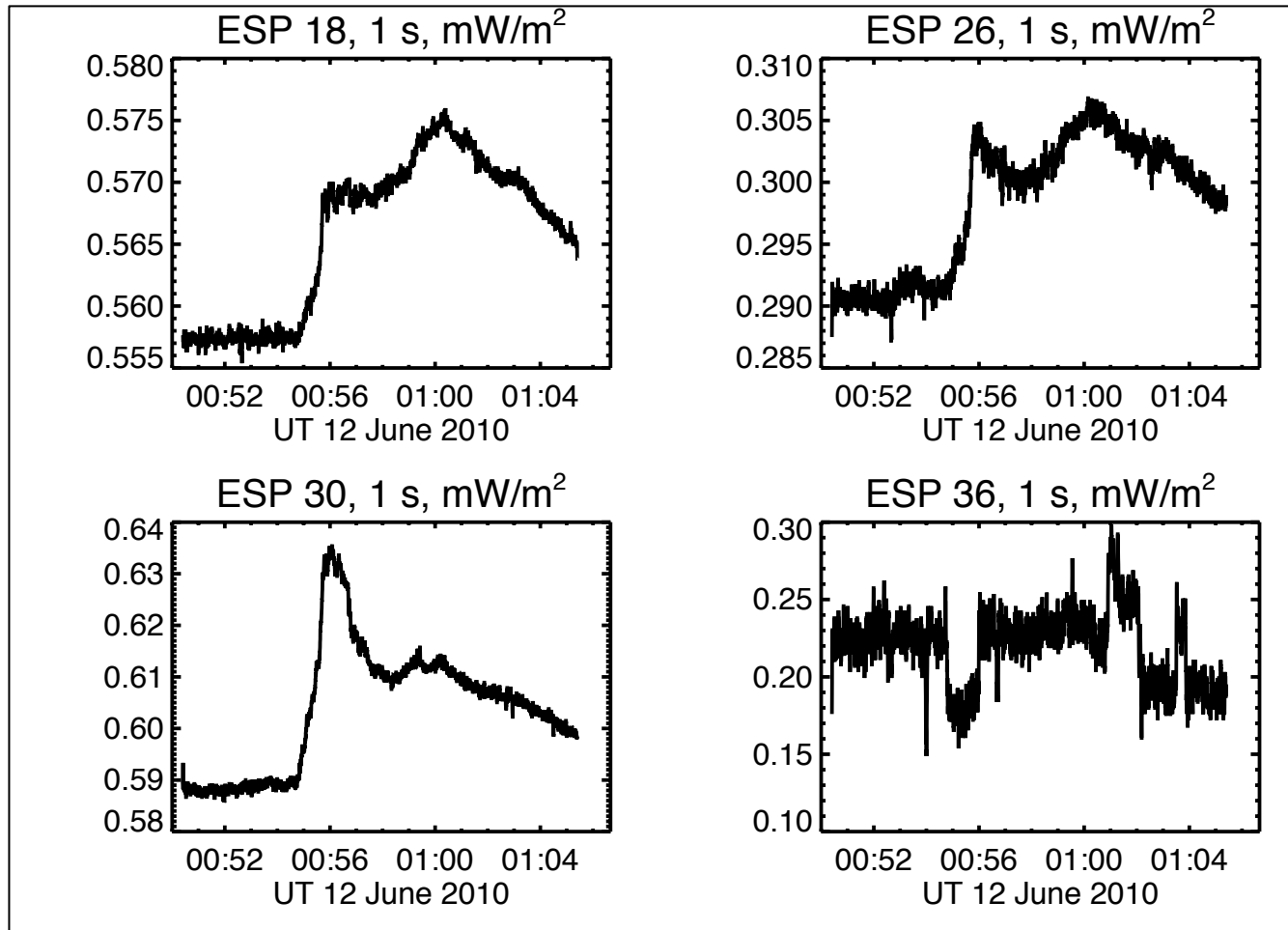


Martinez-Oliveros et al. 2011

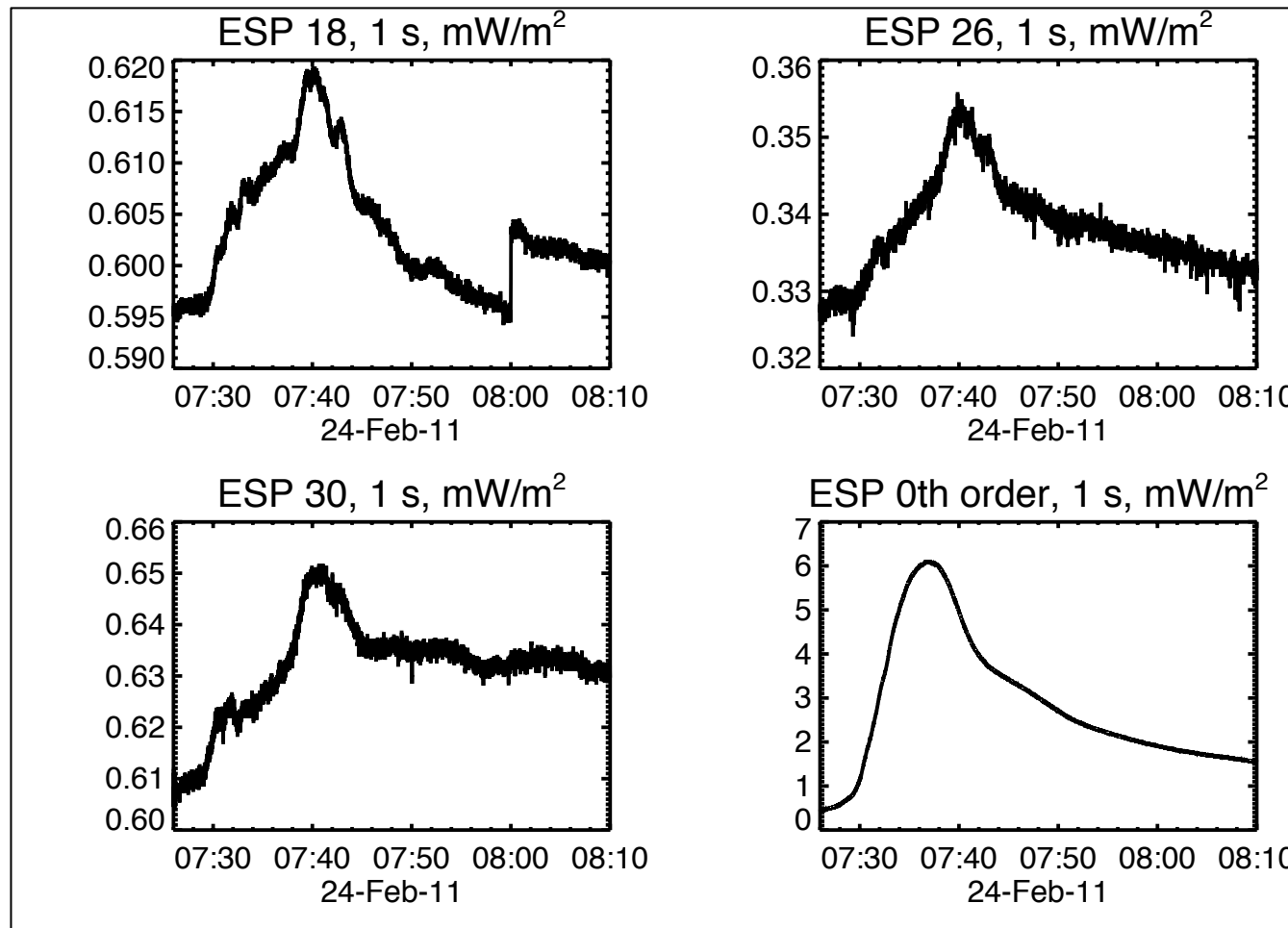
The ESP component of EVE



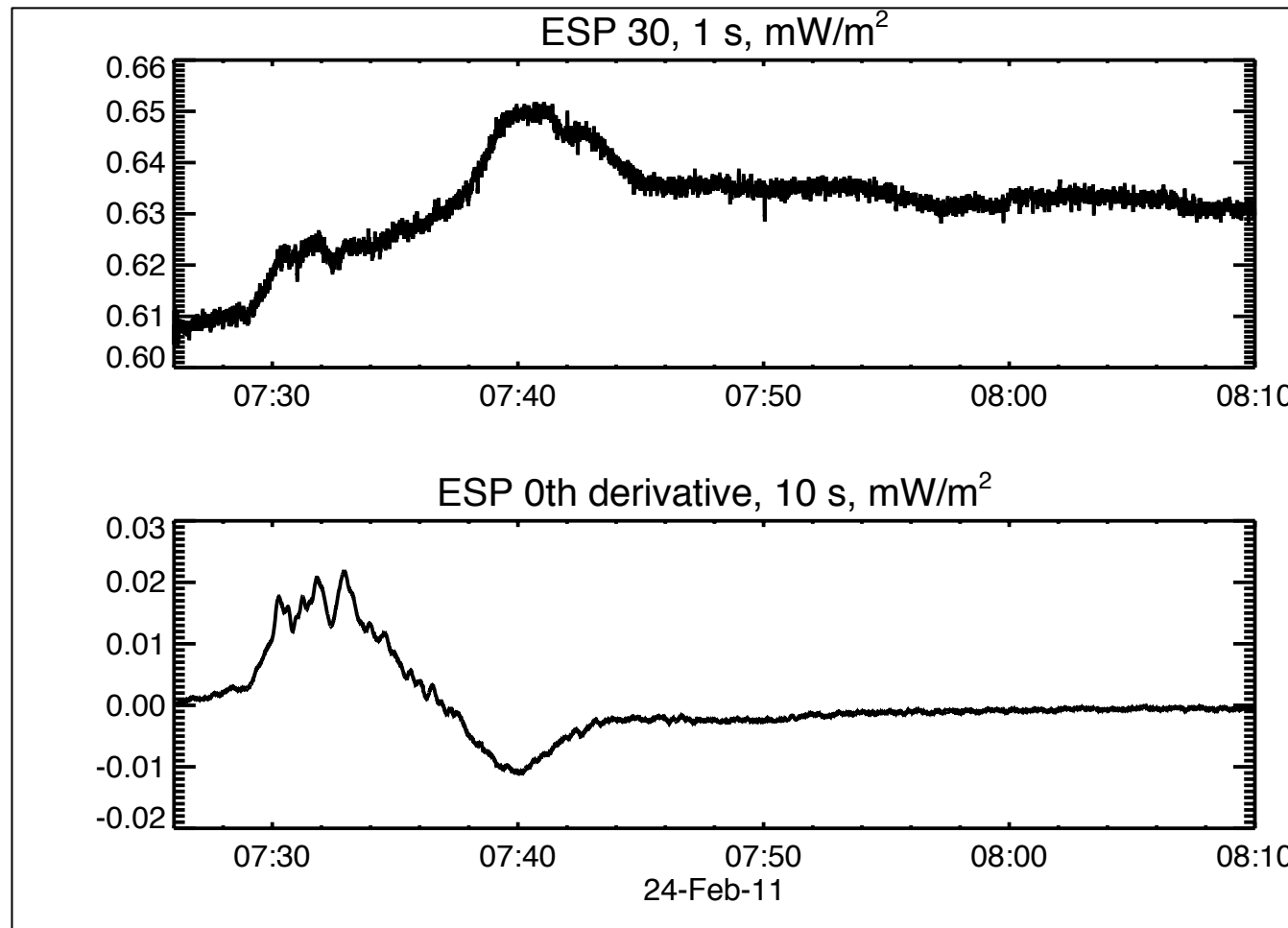
The ESP component of EVE



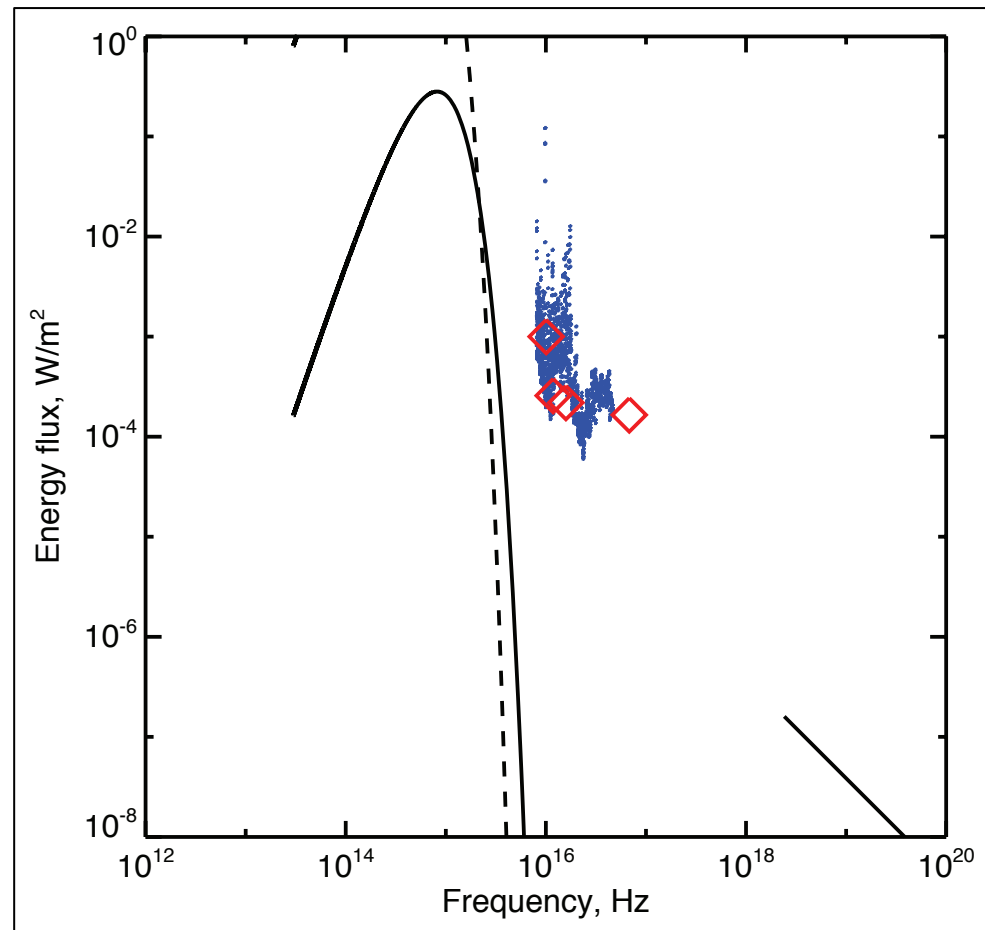
The ESP component of EVE



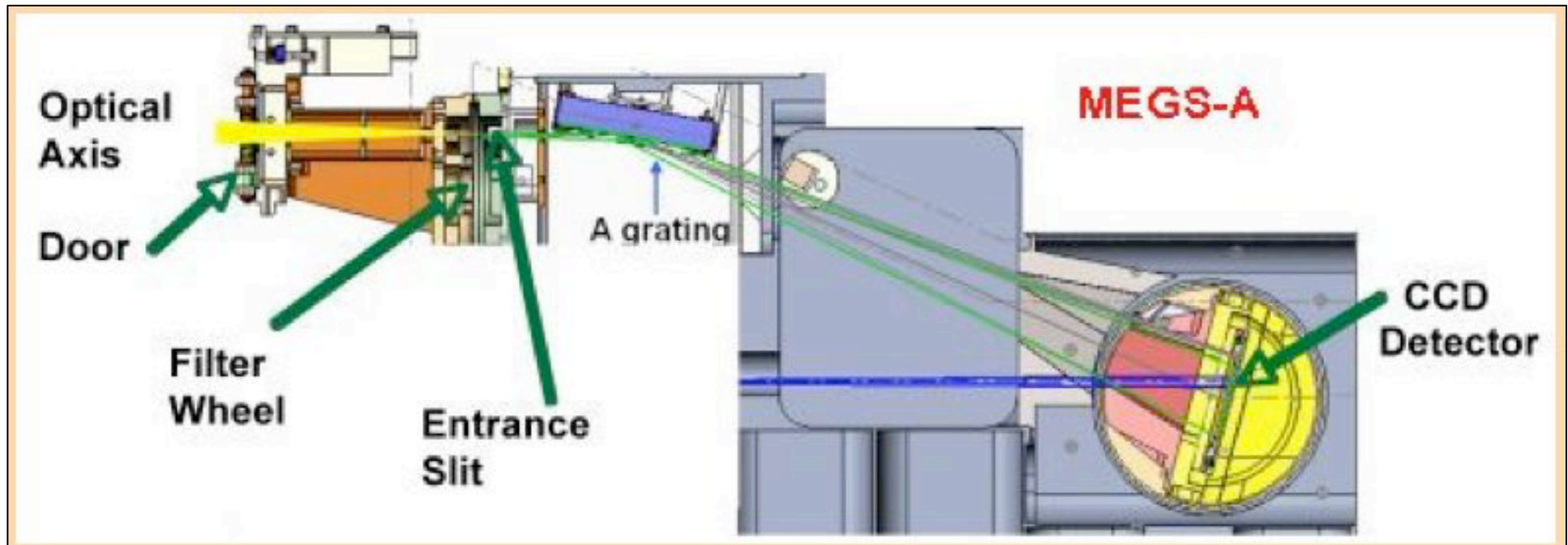
The ESP component of EVE



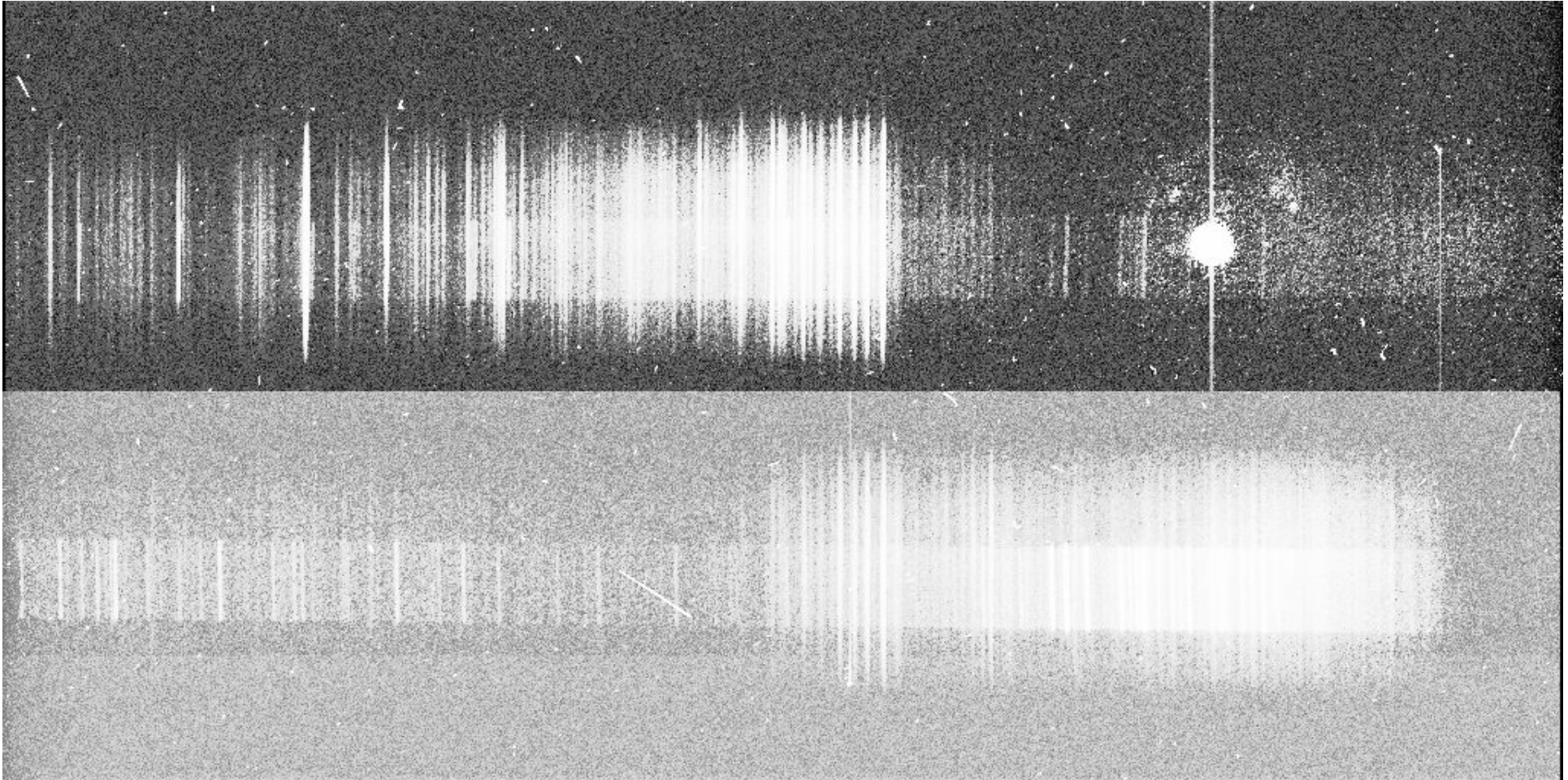
ESP fluxes for SOL2010-06-12



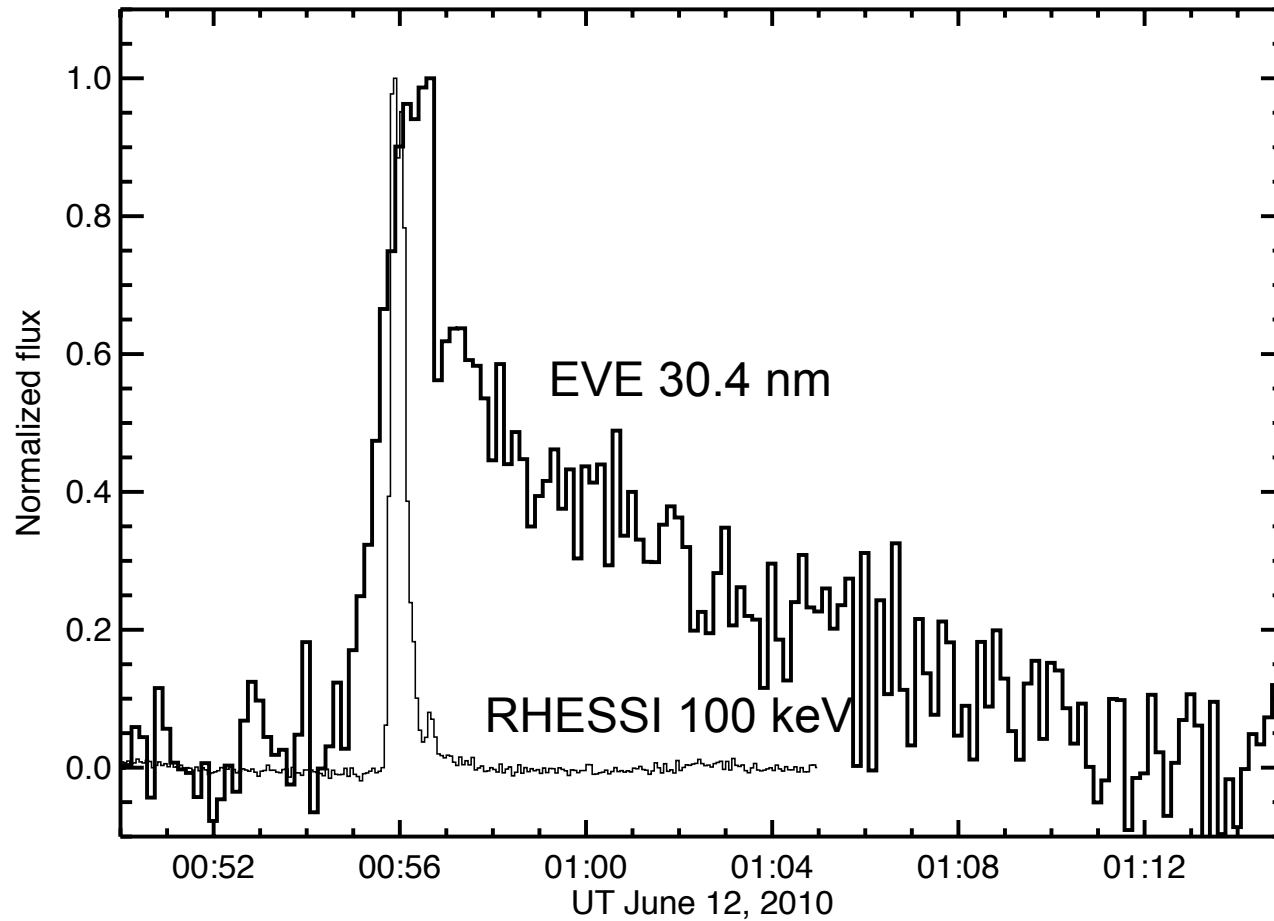
The MEGS component of EVE



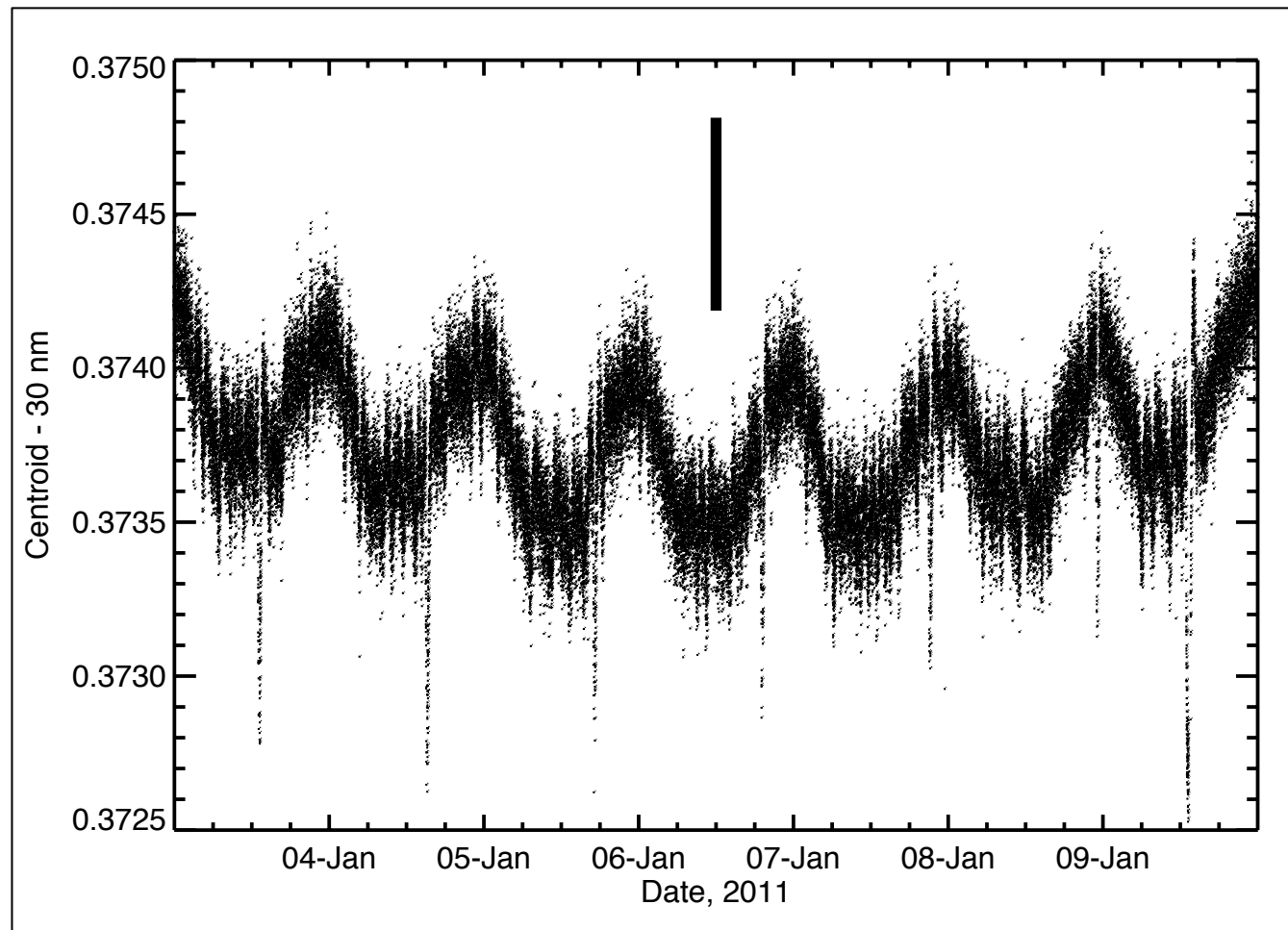
The MEGS component of EVE



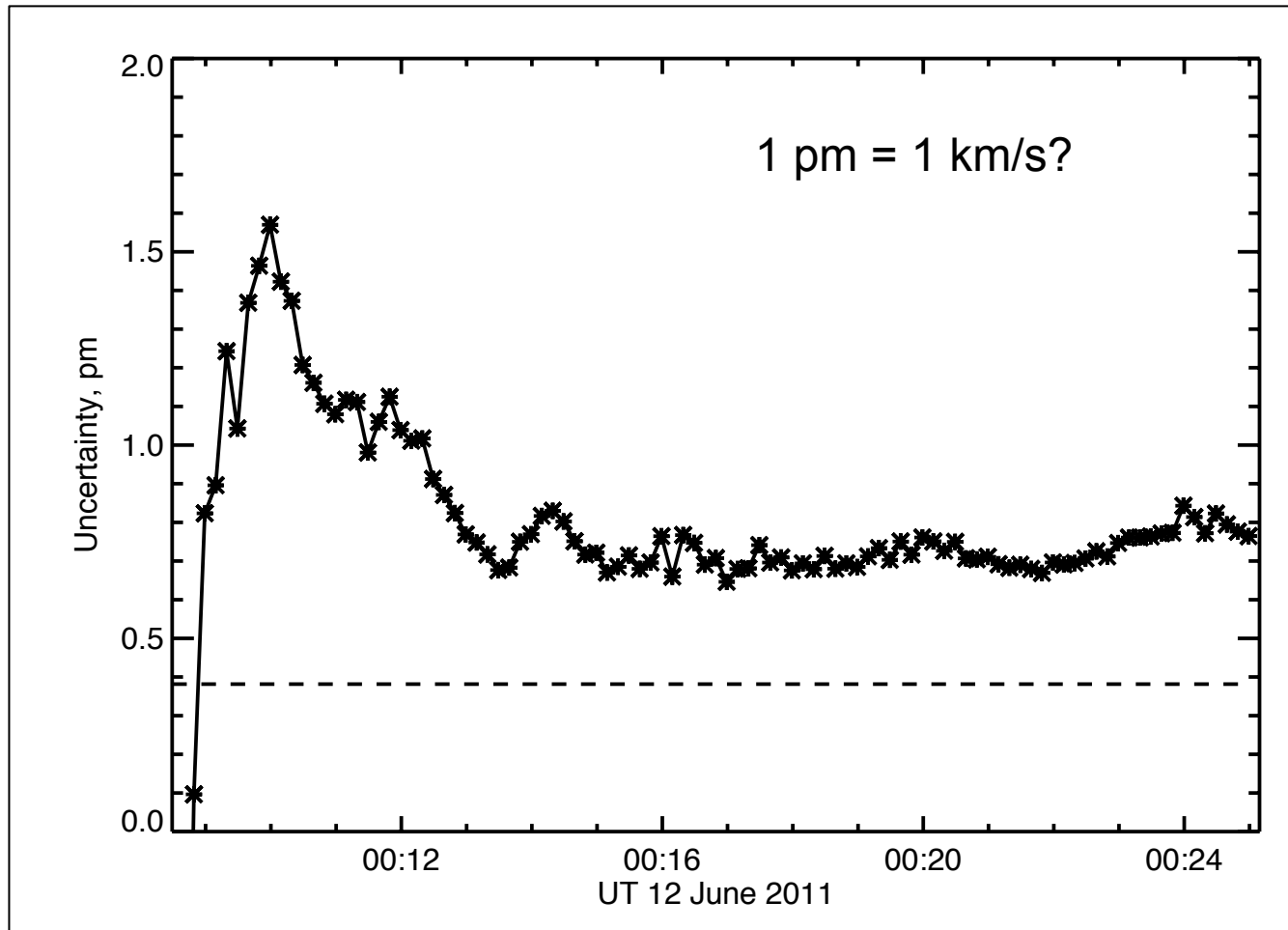
EVE 304A for SOL2010-06-12



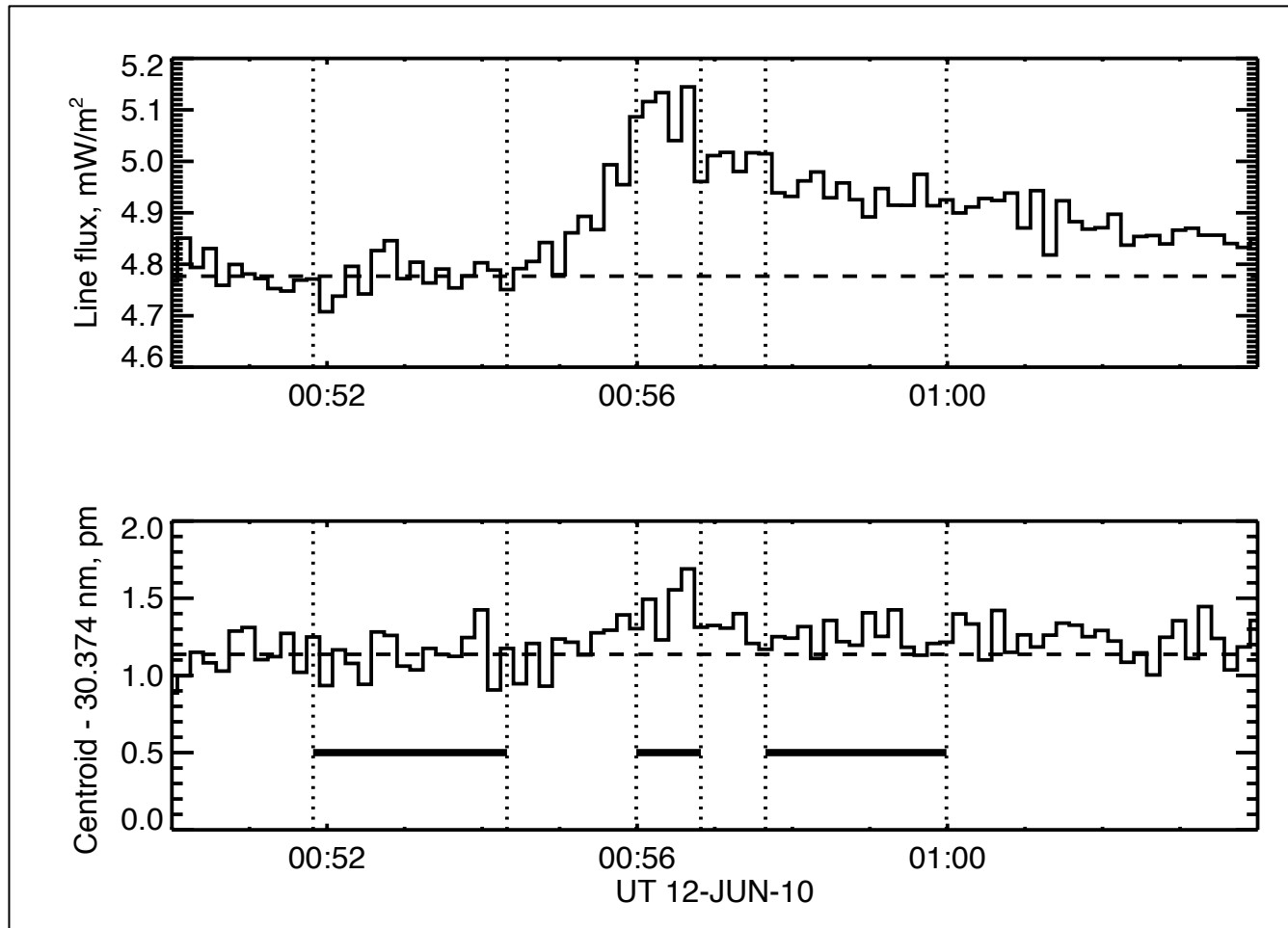
EVE 304A for SOL2010-06-12



EVE 304 Doppler sensitivity



EVE 304A for SOL2010-06-12



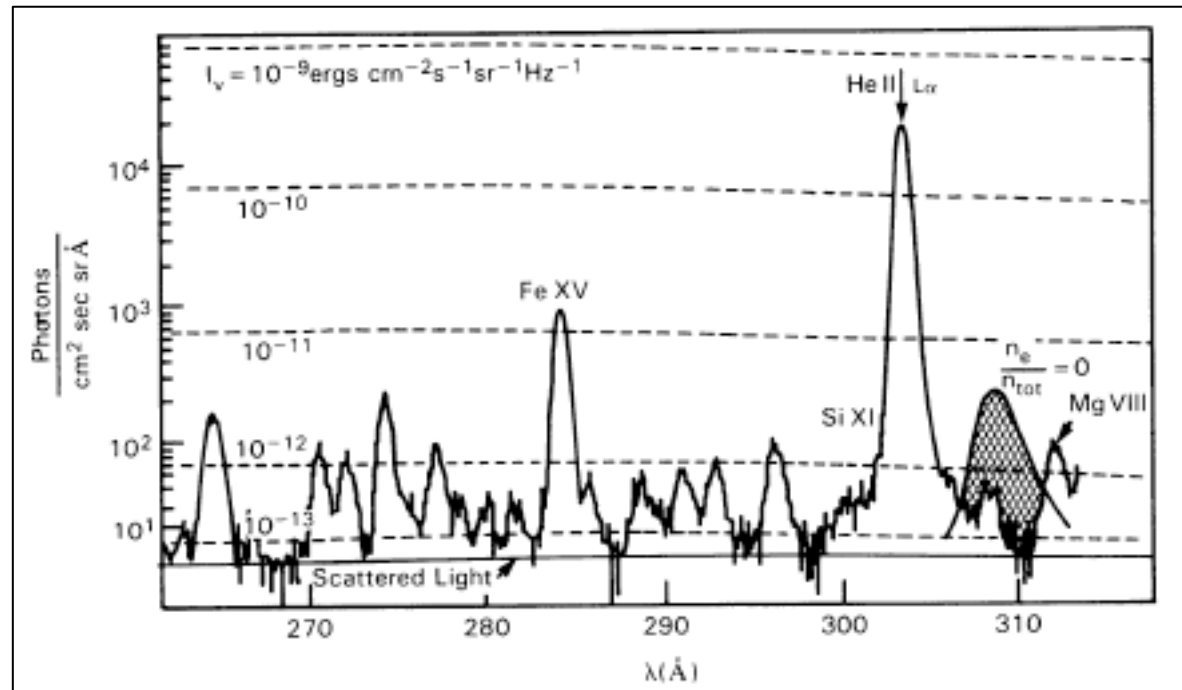
EVE 304A for SOL2010-06-12

Table 1: 30.4 nm Line Fits

| Flare Phase | Time range | Irradiance mW/m ² | Centroid nm | Width nm | Redshift km/s |
|-------------------|-------------------|---------------------------------|----------------|-------------|-------------------------|
| Preflare | 00:50:09-00:54:29 | 4.26 | 30.3751 | 0.0312 | |
| Impulsive | 00:55:59-00:56:49 | 4.45 | 30.3754 | 0.0313 | |
| Gradual | 00:56:59-00:58:09 | 4.40 | 30.3753 | 0.0312 | |
| Impulsive excess | | 0.197 | 30.3801 | 0.0322 | 48.88±2.49 ^a |
| Gradual excess | | 0.137 | 30.3784 | 0.0305 | 32.05±5.33 ^a |
| Impulsive-gradual | | | | | 16.8±5.9 ^a |

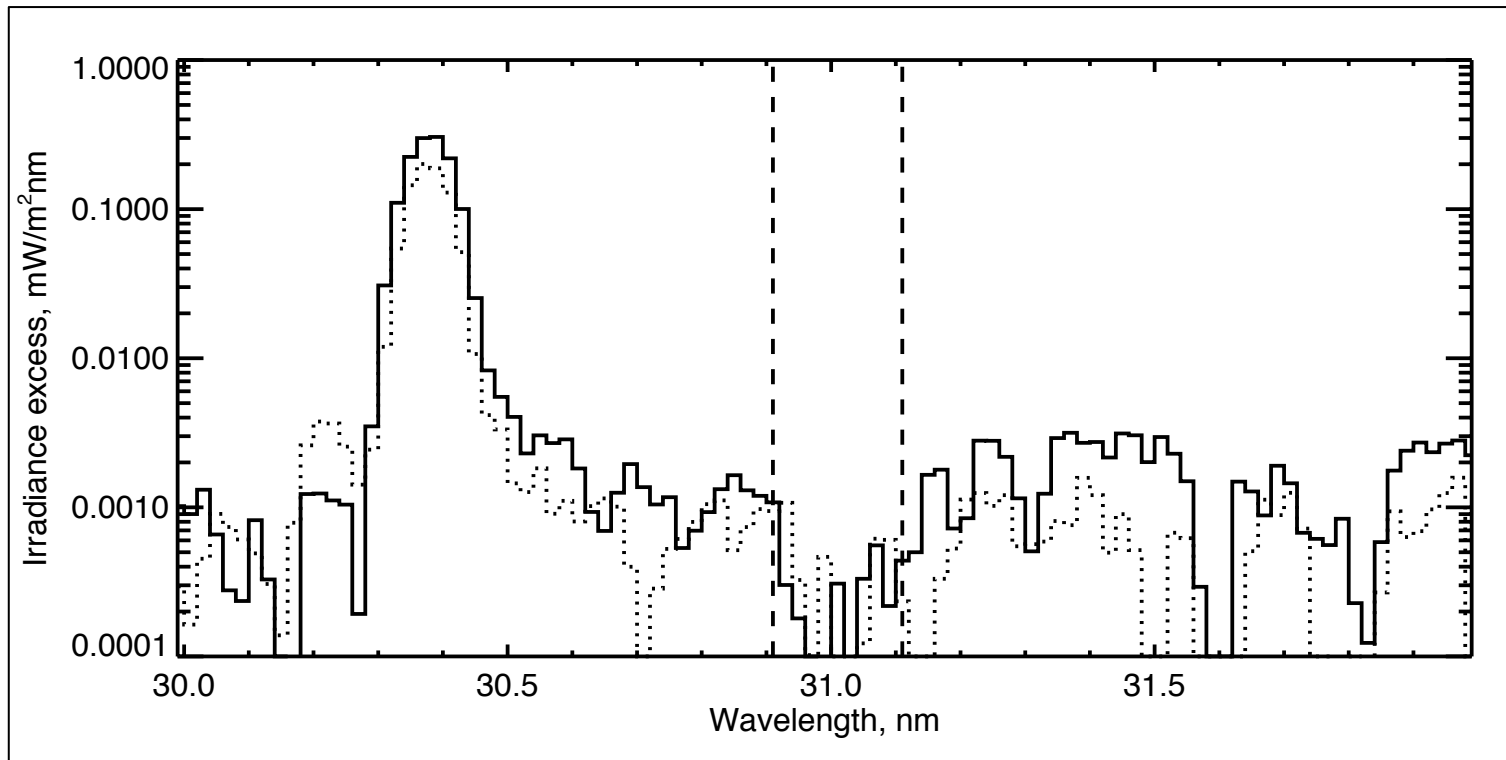
^aStatistical uncertainty

He 304 Charge Exchange

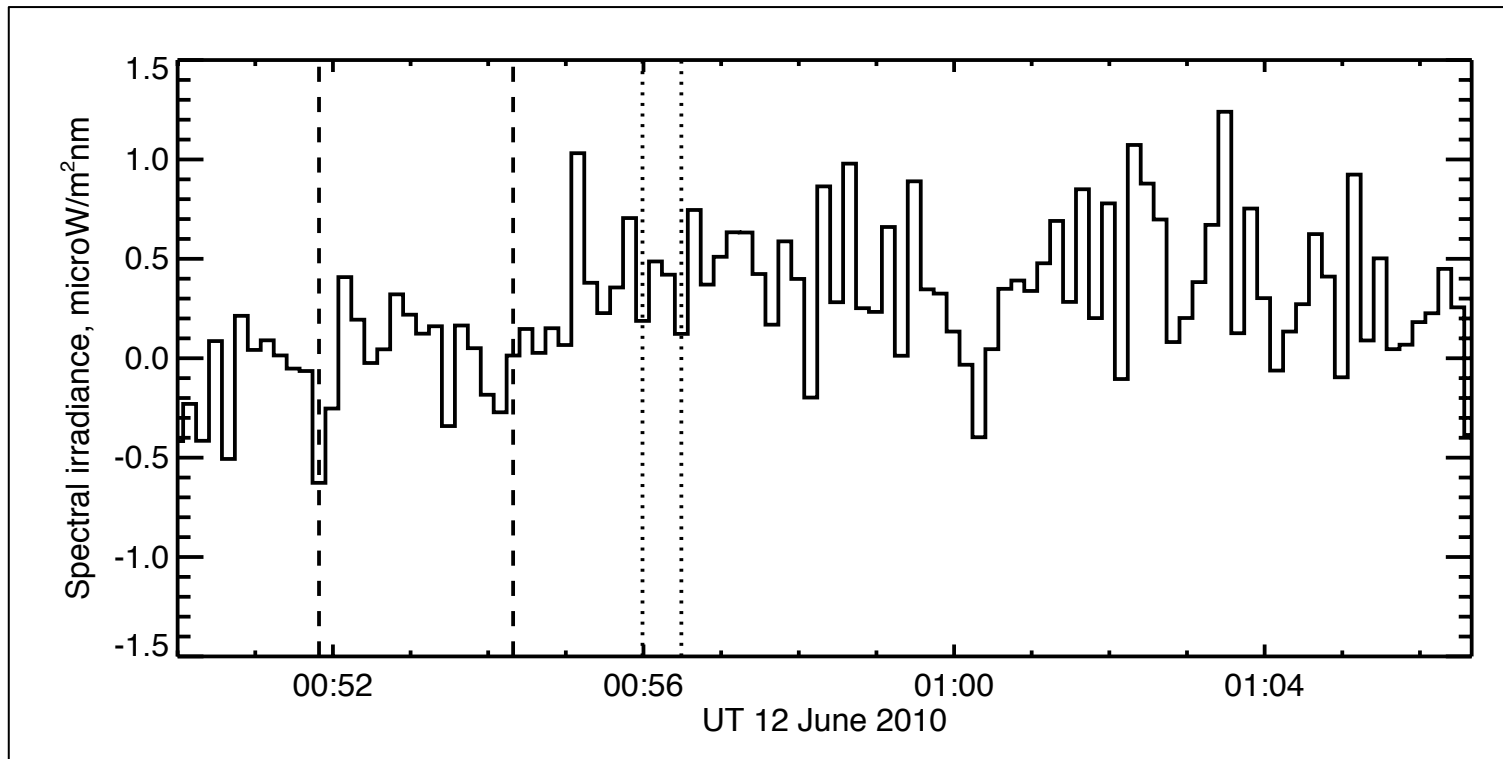


Peter et al. 1991

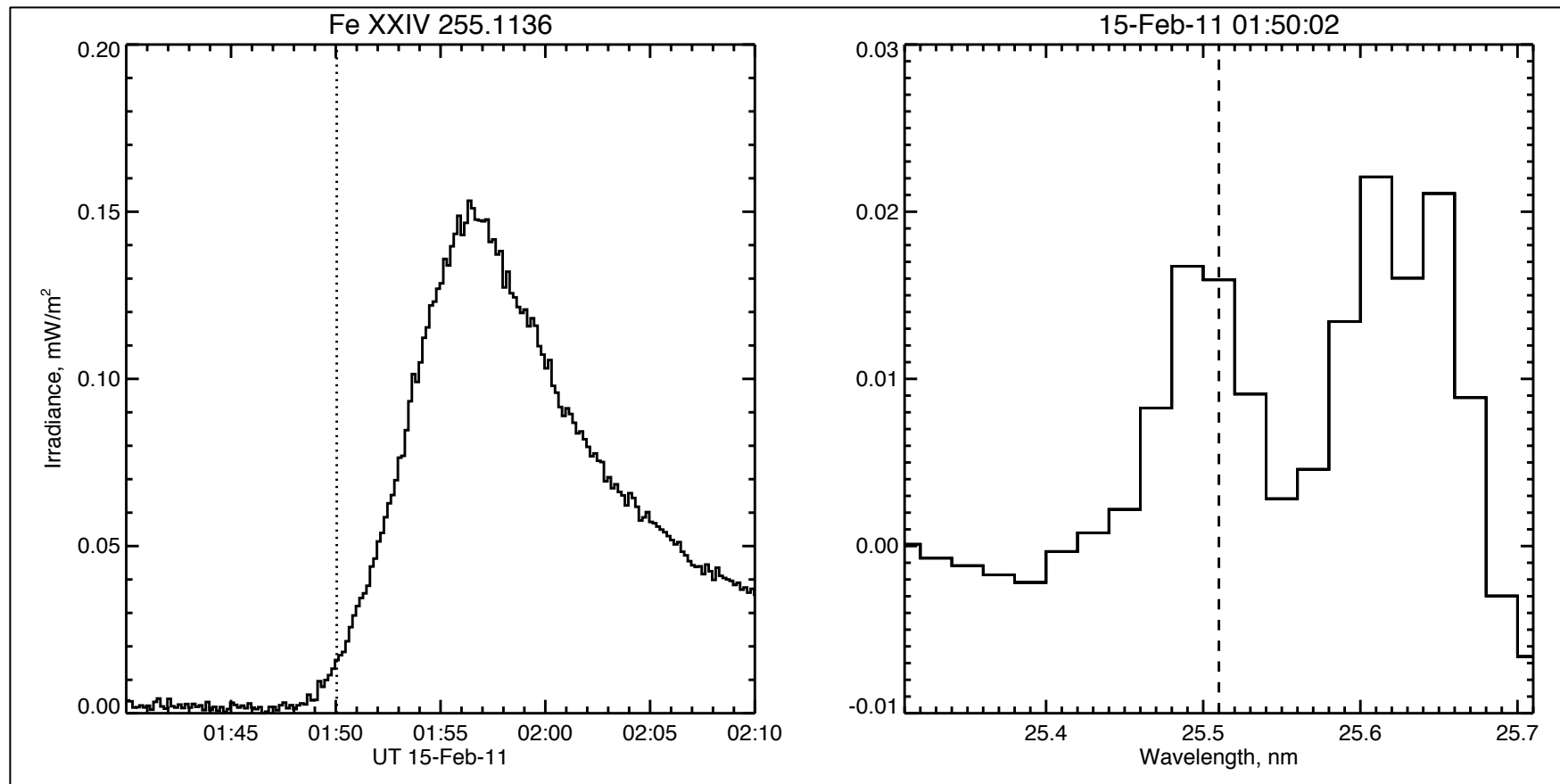
SOL2010-06-12 Charge Exchange



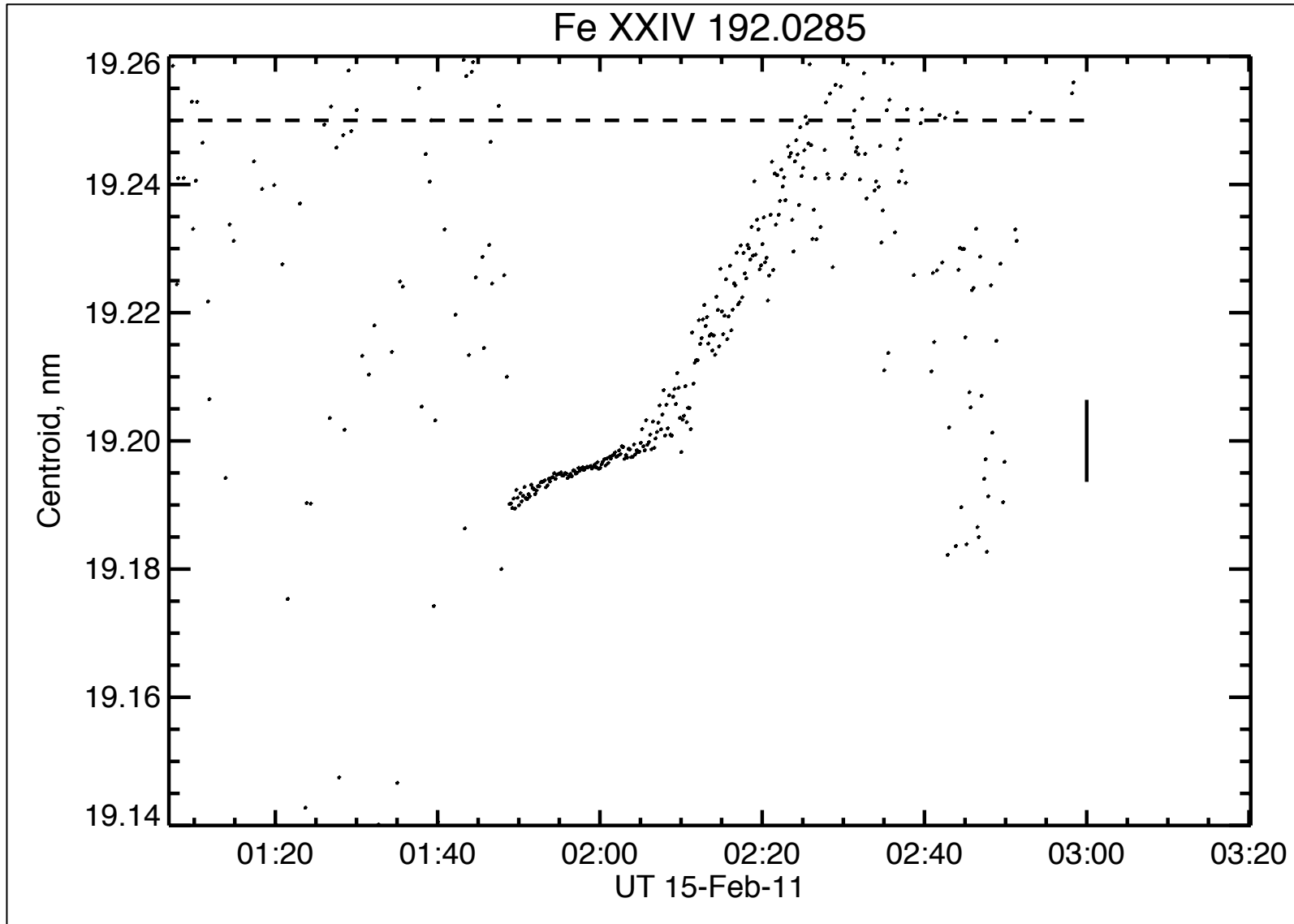
SOL2010-06-12 Charge Exchange



SOL2011-02-15 Fe XXIV



SOL2011-02-15 Fe XXIV



What can we learn from EVE and RHESSI?

- UV/EUV energy distribution for WLF/HXR
- Charge-exchange observations of α particles at .01-1 MeV/nucleon
- Transition-region explanation of 511 keV line width
- Flare dynamics, with big doses of imaging and modeling

Electrodynamic mapping of the solar interior to the corona

- Collisionality drops precipitously
- Hydrogen ionizes
- Plasma beta plummets
- Structurally important radiation escapes

- Vertical currents threading the photosphere carry the non-potential energy

Recall debate between Parker and Melrose in ApJ (1996)