Fluctuations

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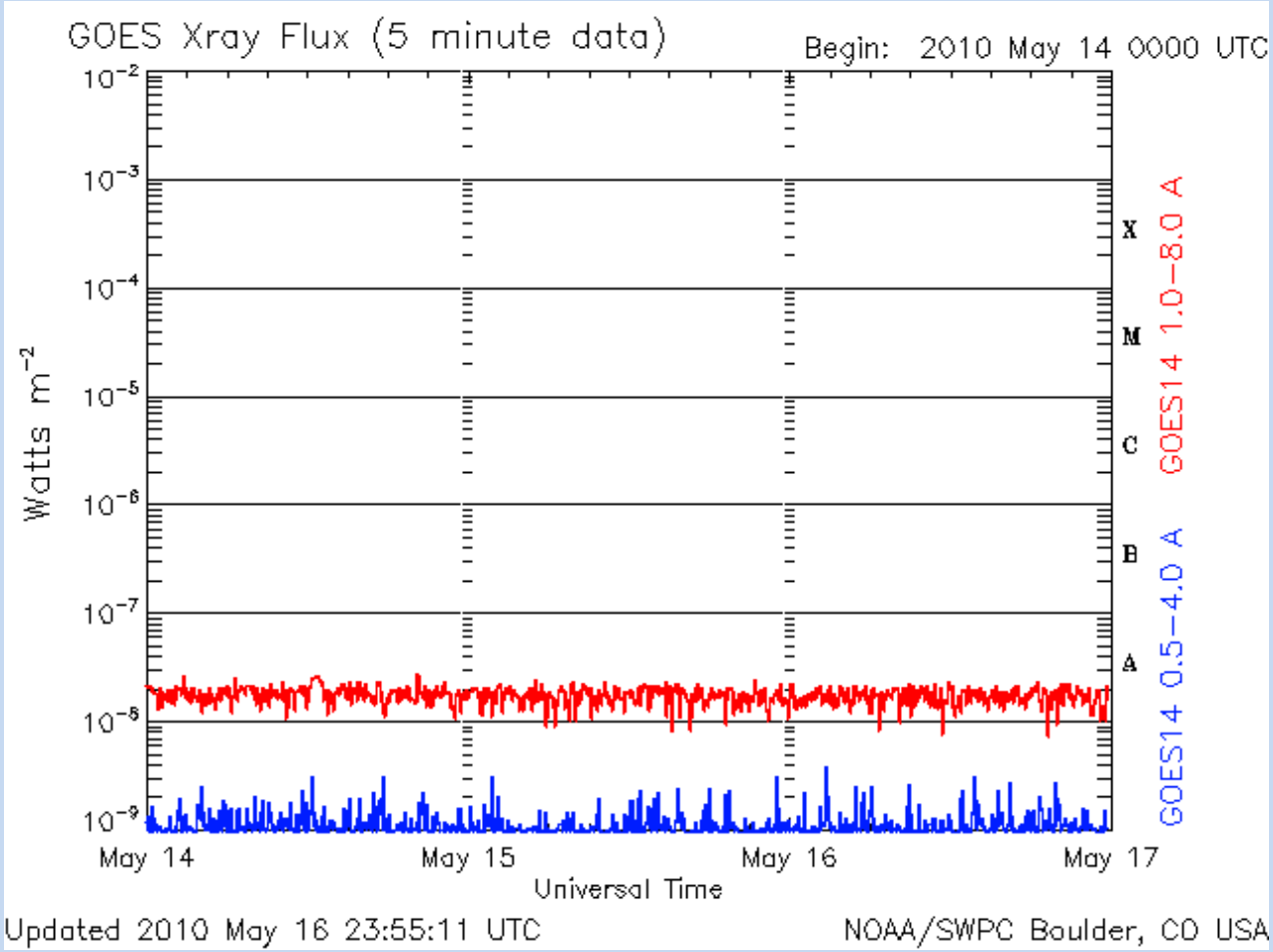
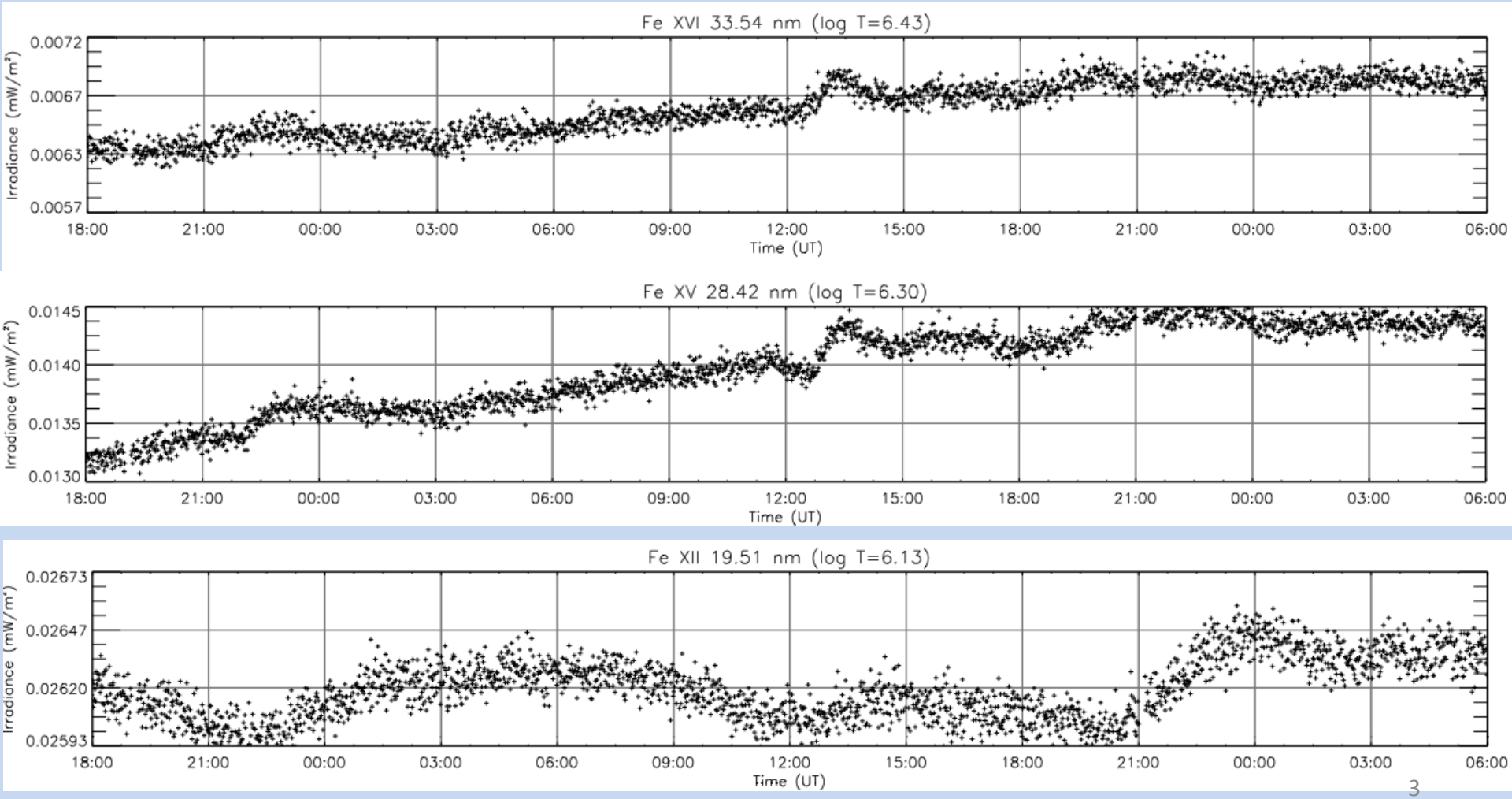
A Quiet Sun Day?

GOES X-Ray Sensor pretty much bottomed out for several days.



Not so Quiet in the EUV

Even on Quiet Days EVE sees coronal lines changing by a 5-10%

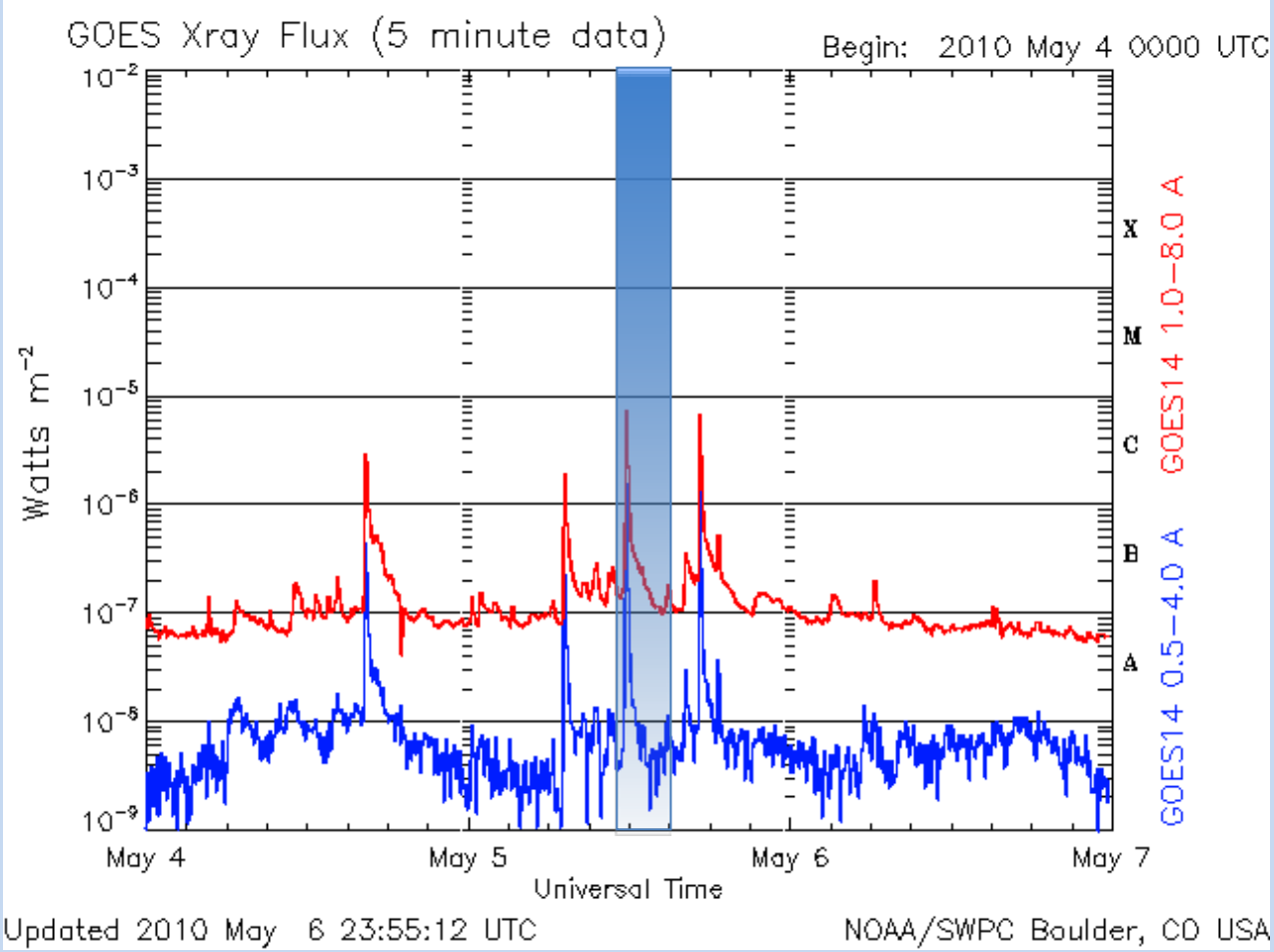


What's Causing QS Fluctuations?

- Magnetic structure of the Sun is constantly changing
- Especially true in and around active regions
- If there is an active region on the Sun, we see fluctuations in EUV on ~3-5 hour time scales

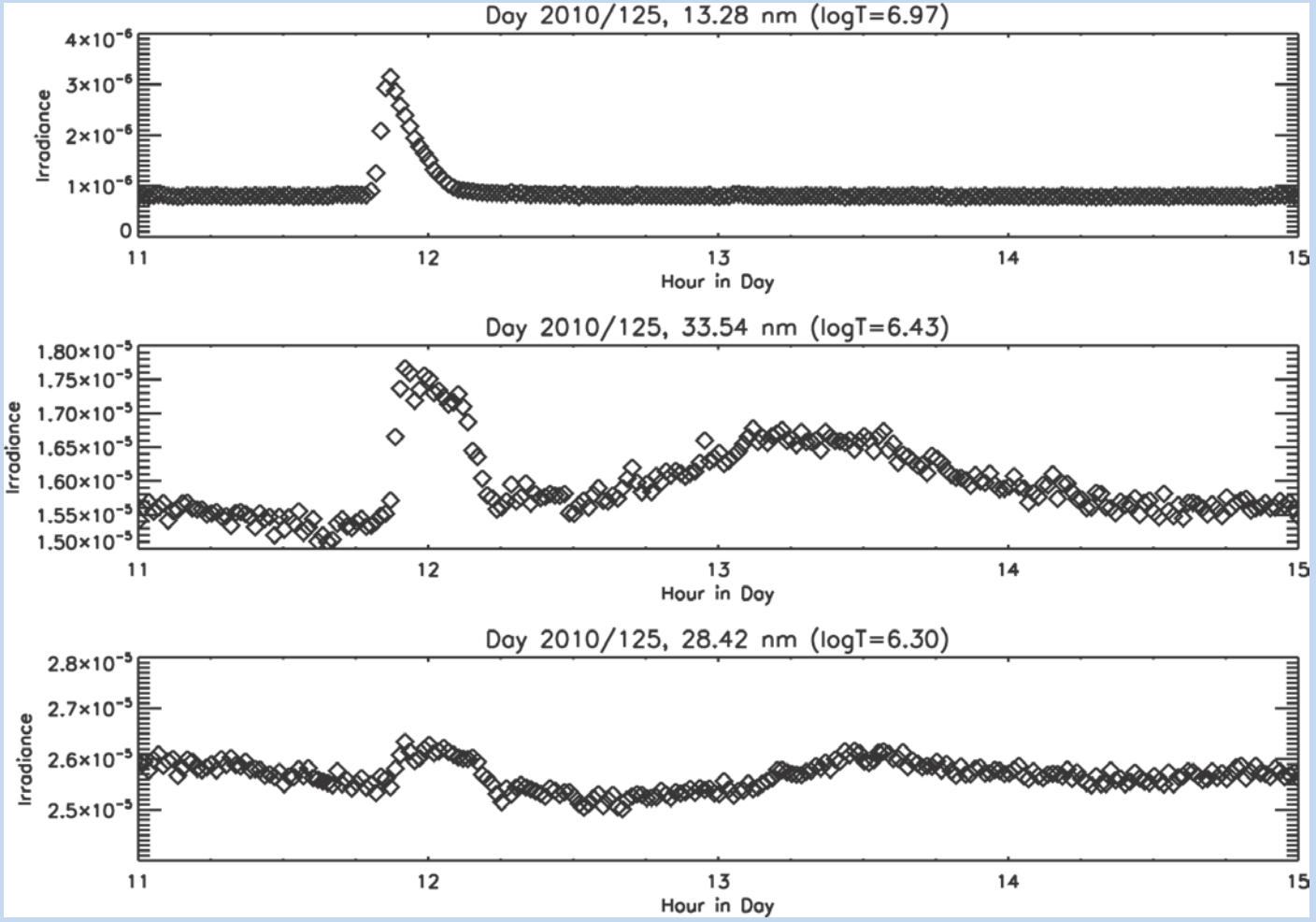
Fluctuations After a Flare

Let's look at the EUV lines after a flare. C8.8 class on May 5, 2010



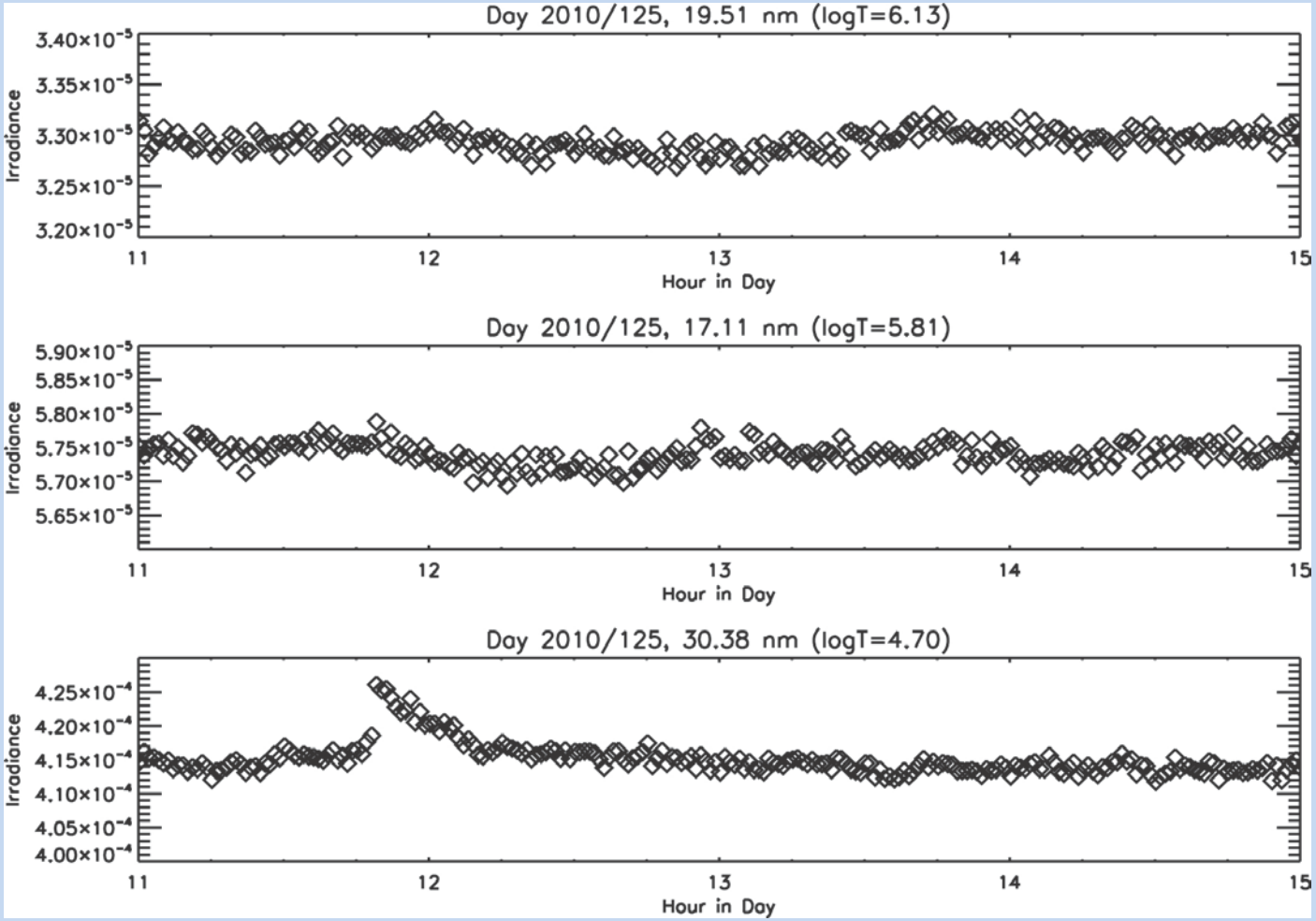
EVE Post-Flare Response

Some lines show significant fluctuations hours after the main flare.

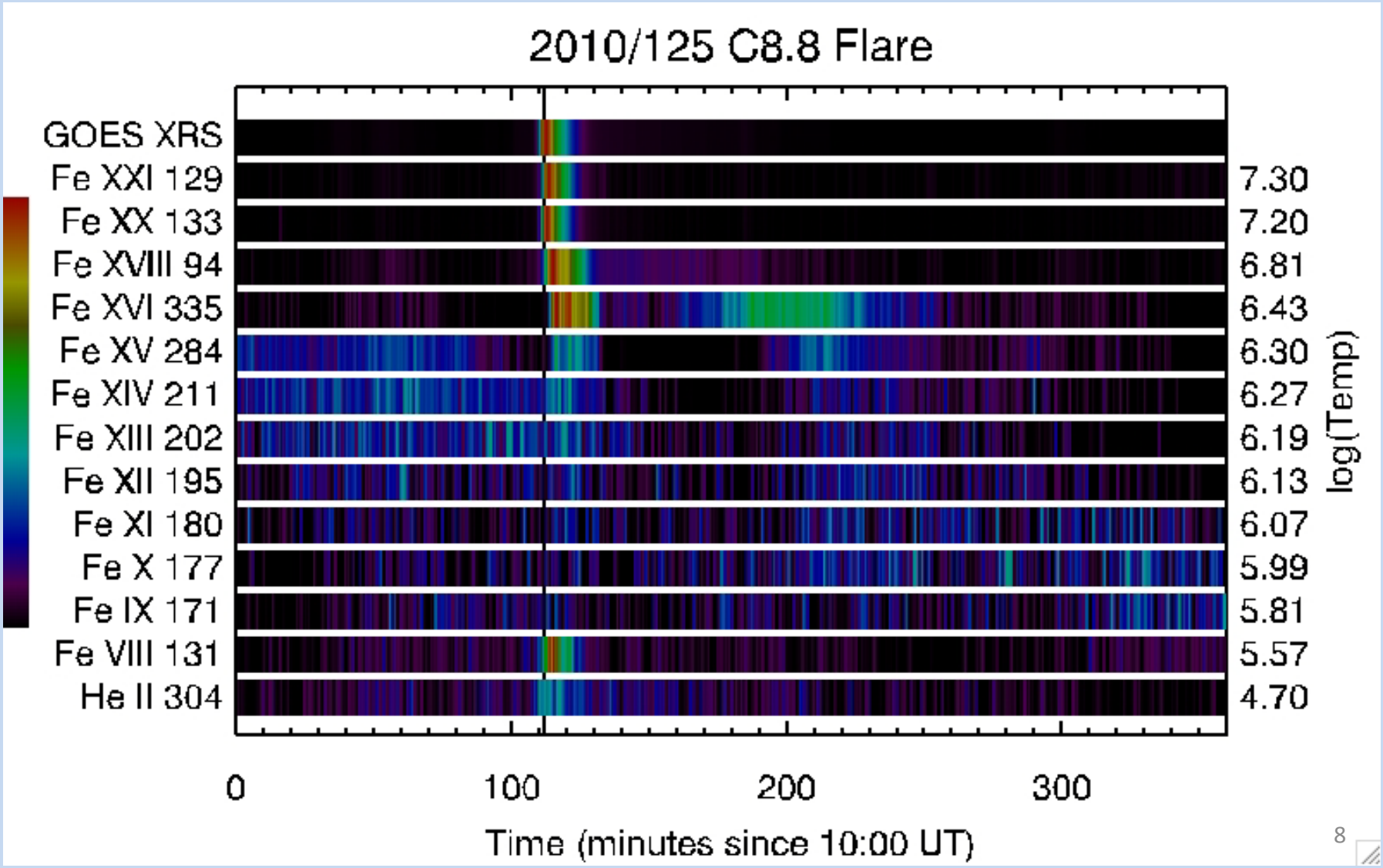


EVE Post-Flare Response

Other wavelengths only show dimming, or no later response.



Look at it by Temperature



What are these Post-Flare Fluctuations?

- Dimmings are most likely related to material being blown away during eruption
- Later brightenings occur as loops move back, reform, and hot material cools
- These are “not a big surprise” to solar physicists, but **have not been observed before**
- Lots of intense discussion going on right now

Takeaway Points

- EVE shows variability all the time
  - Even below XRS noise levels
  - No such thing as a “Quiet” Sun?
- Post flare dimmings and brightenings
  - Occur in hours following a flare
  - Depend on temperature of emission lines
  - Timing and amplitudes depend on flare itself
  - “Every flare is different”