X-ray and EUV Observations of GOES C8 Solar Flare Events

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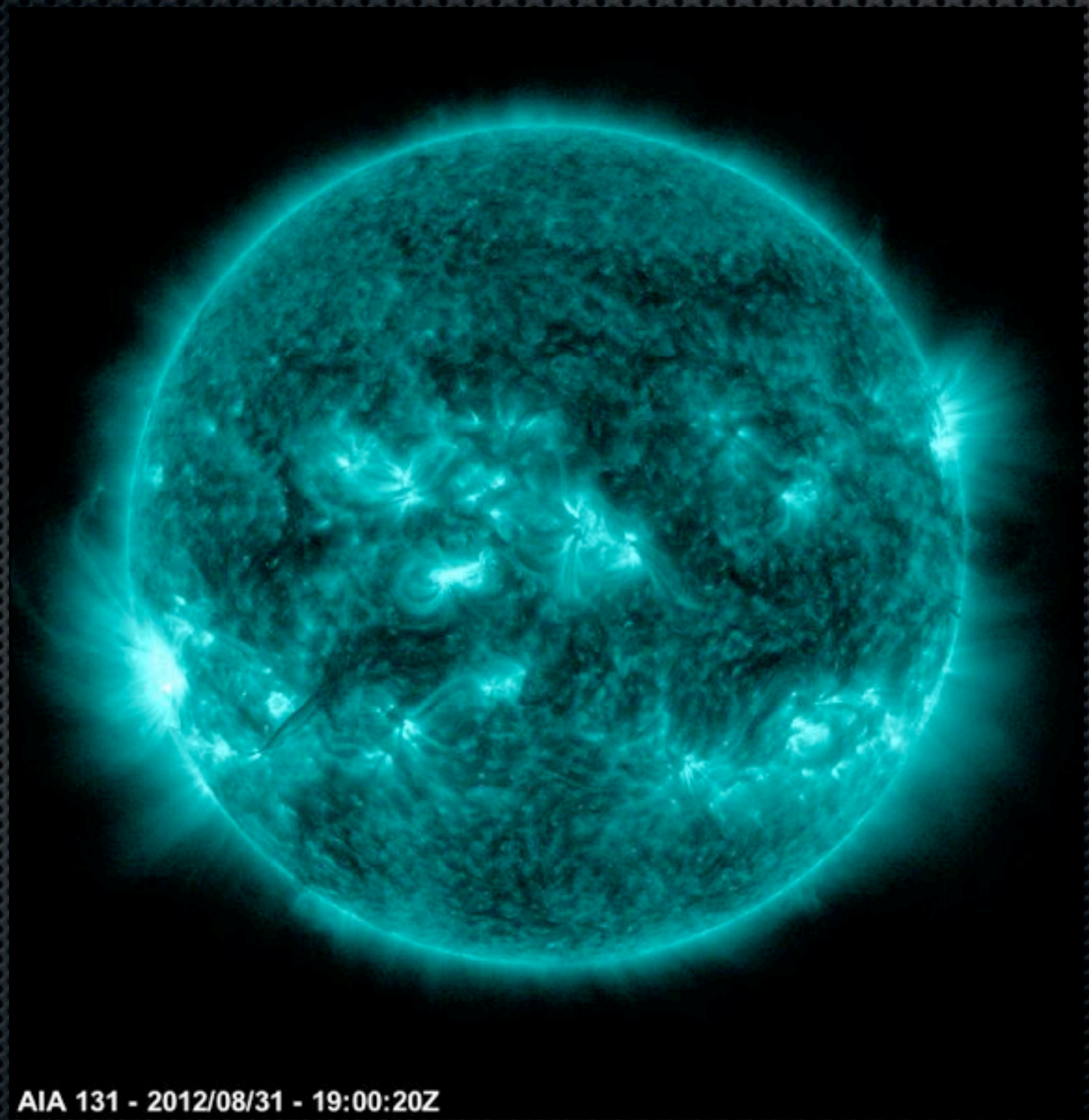
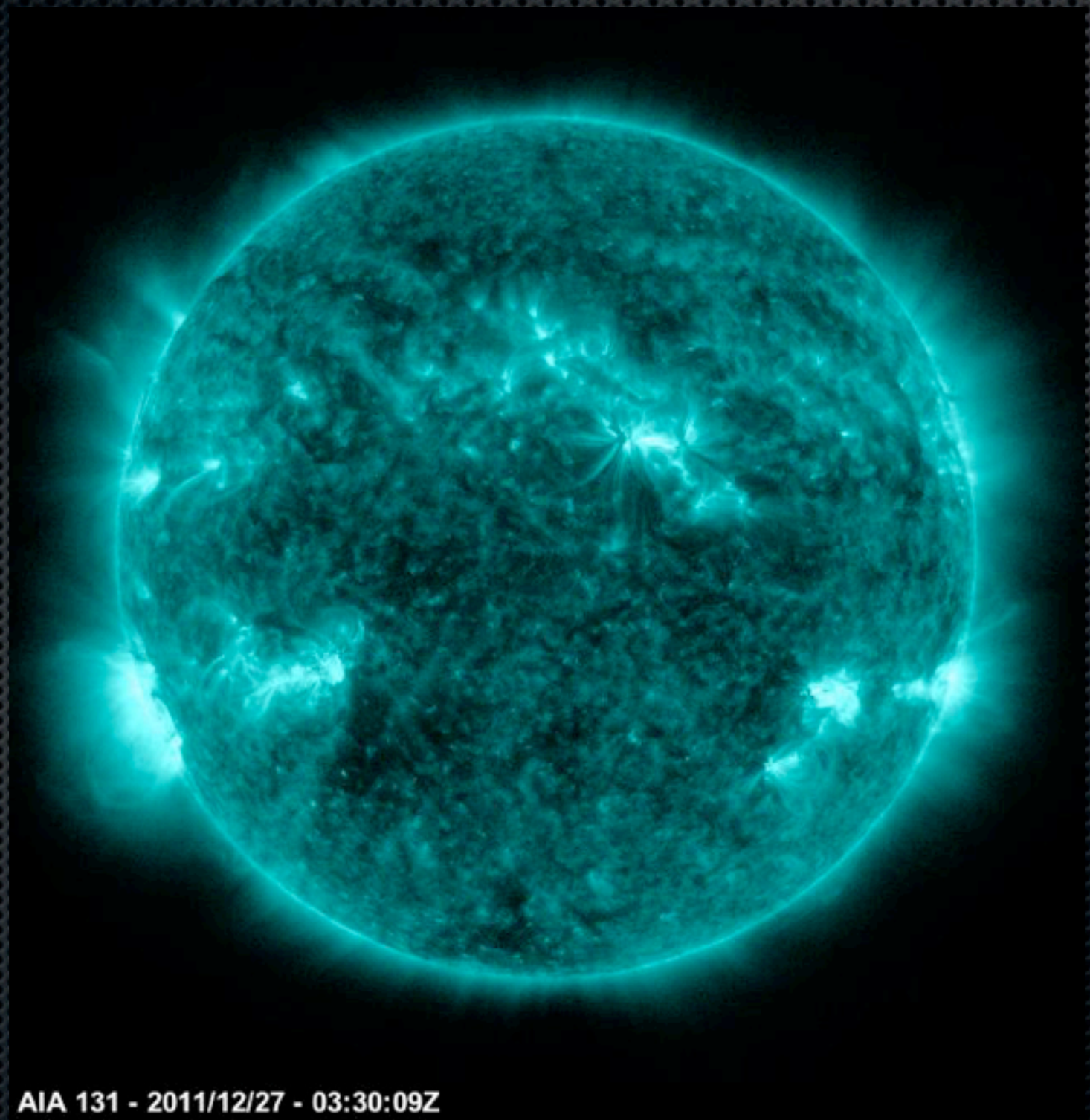
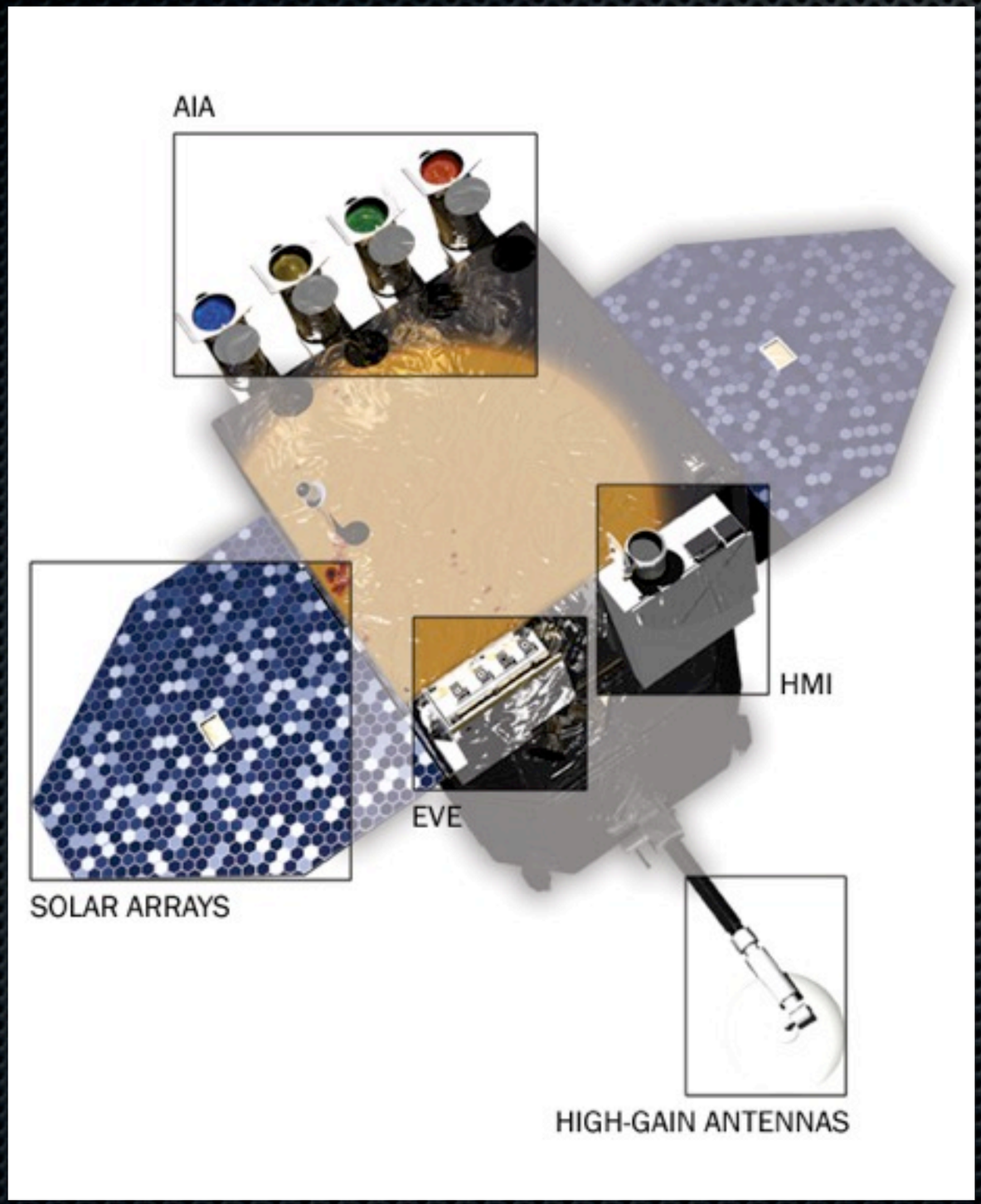
Solar Flares



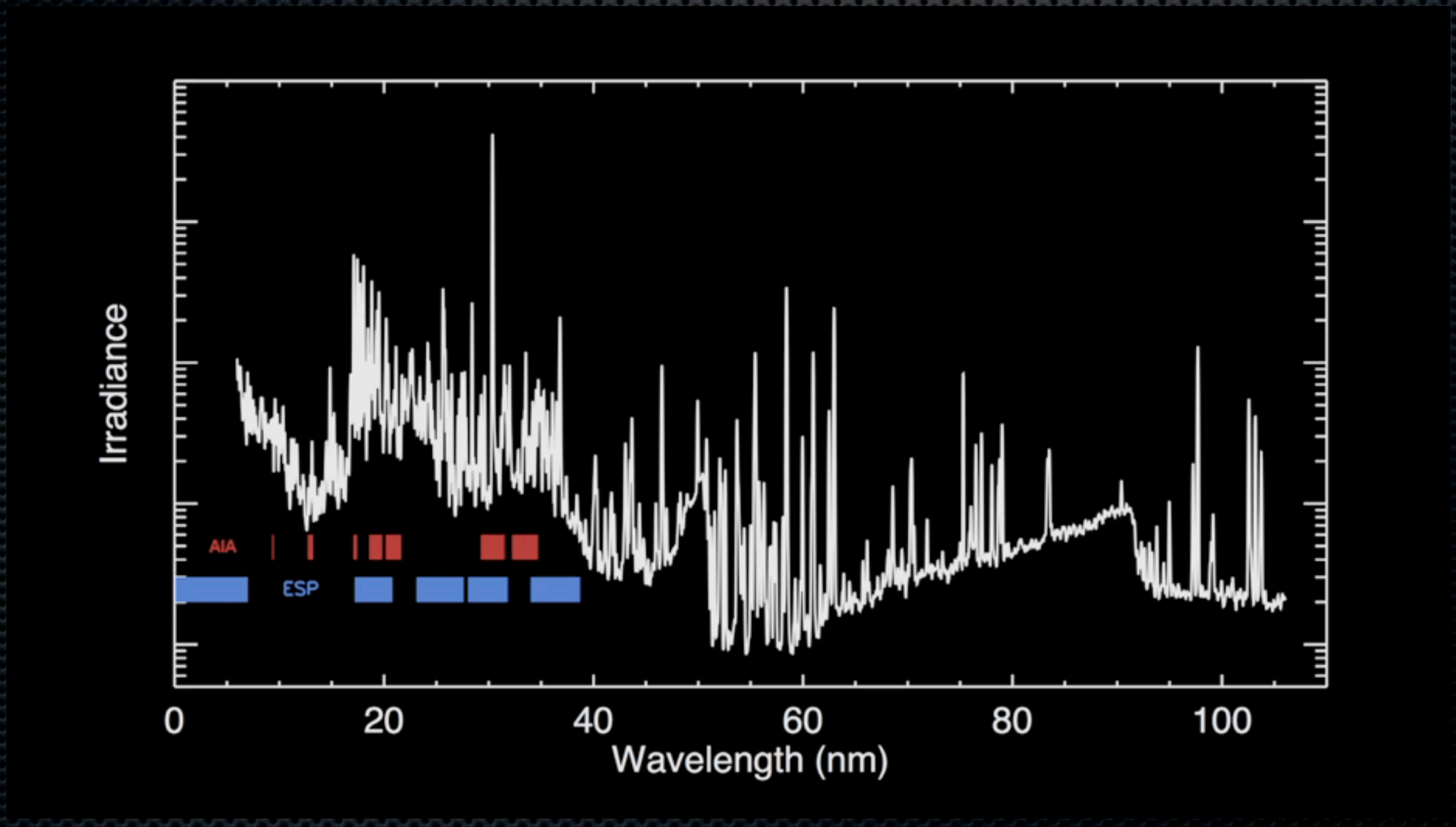
Solar Flares



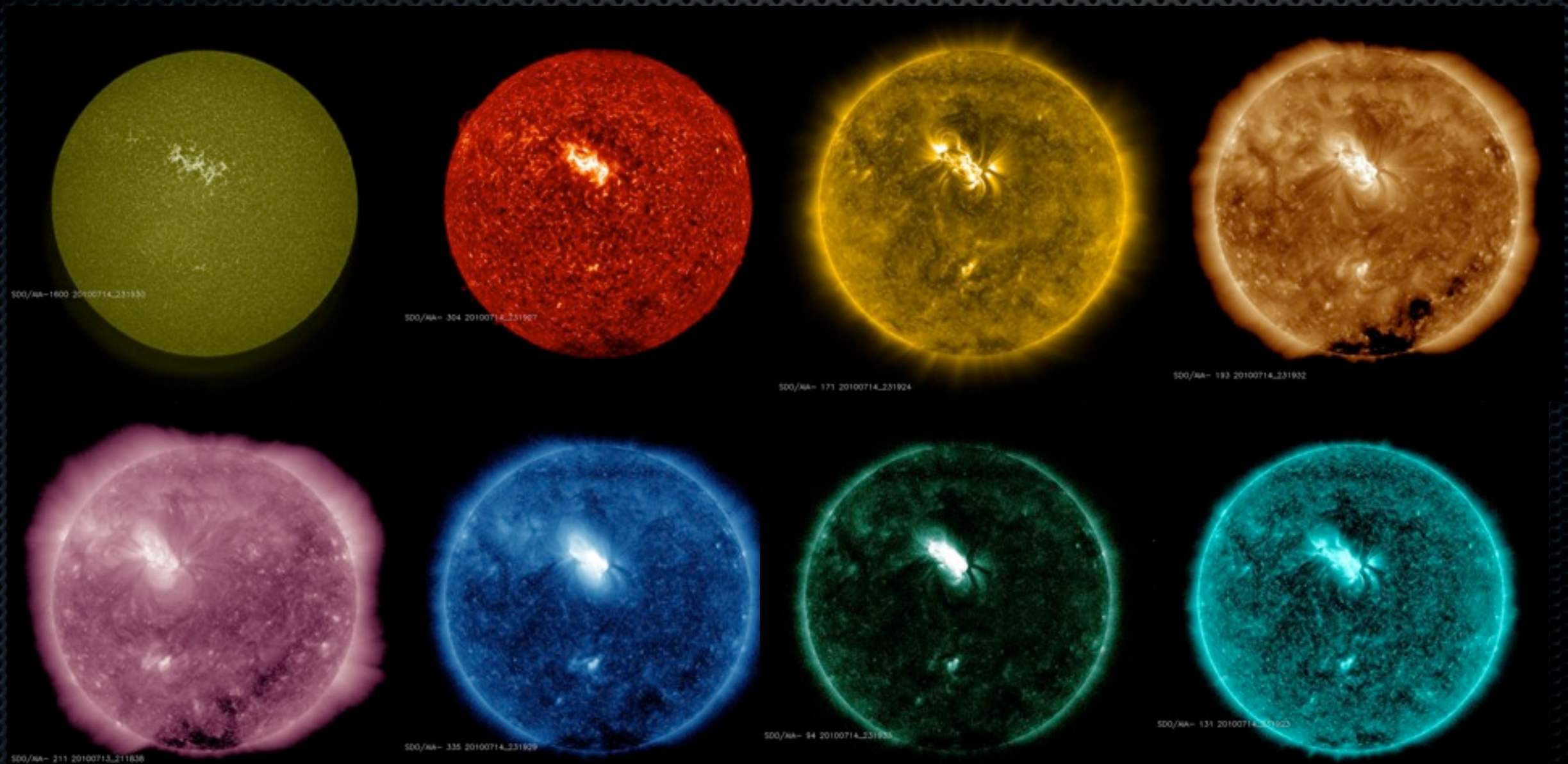
Solar Dynamics Observatory

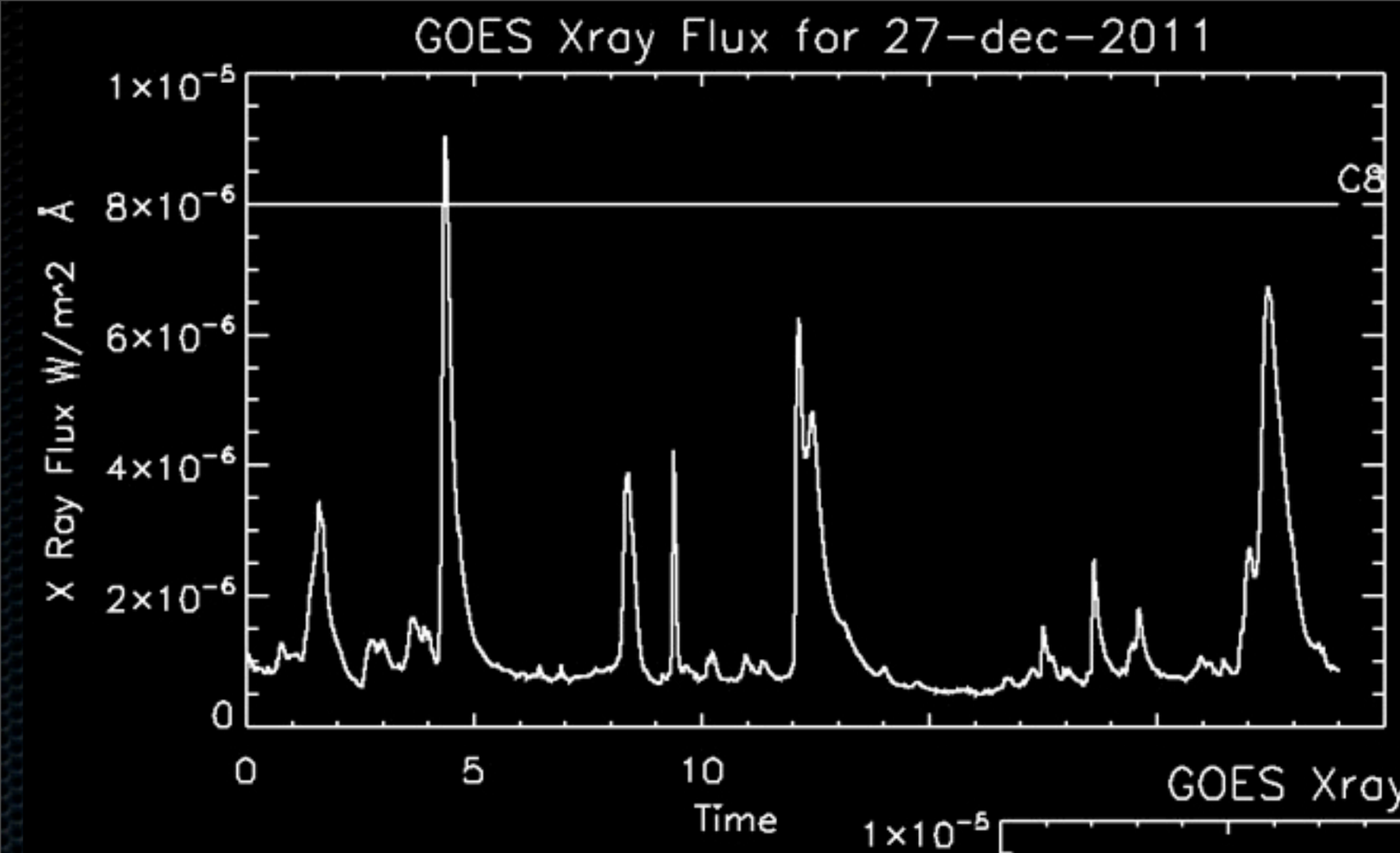


Extreme ultraviolet Variability Experiment (EVE)

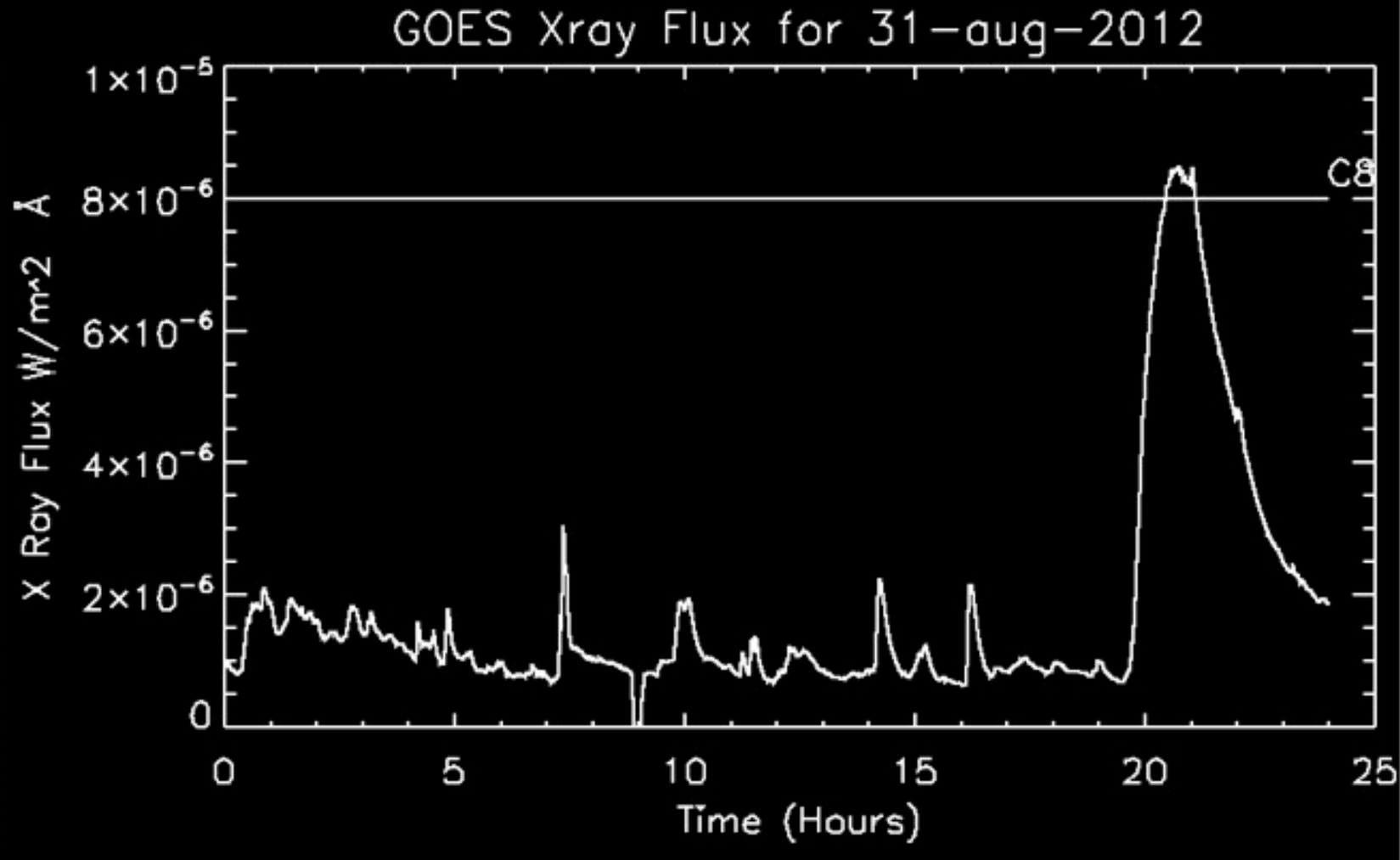


Atmospheric Imaging Assembly (AIA)

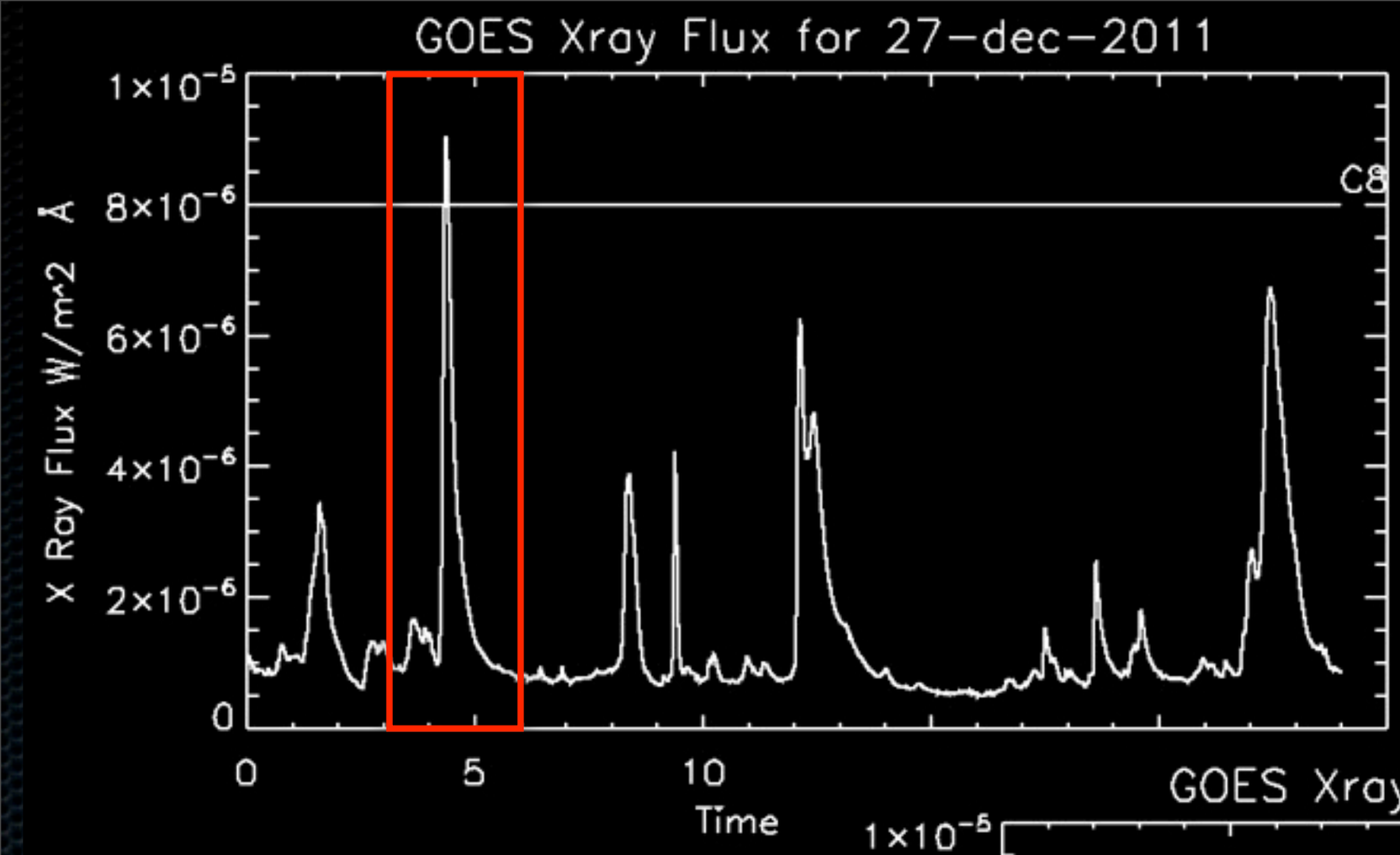




Sample Selection

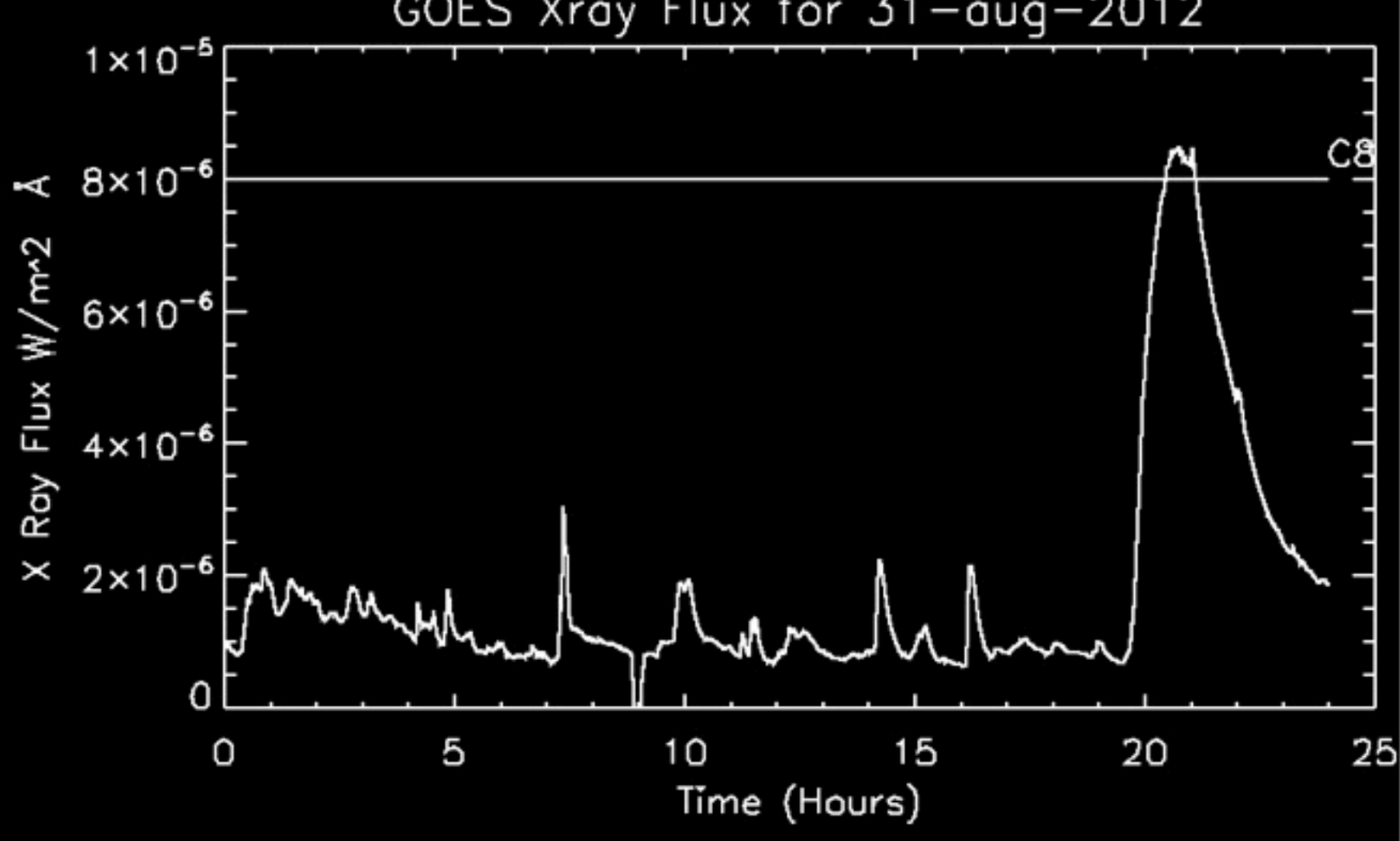


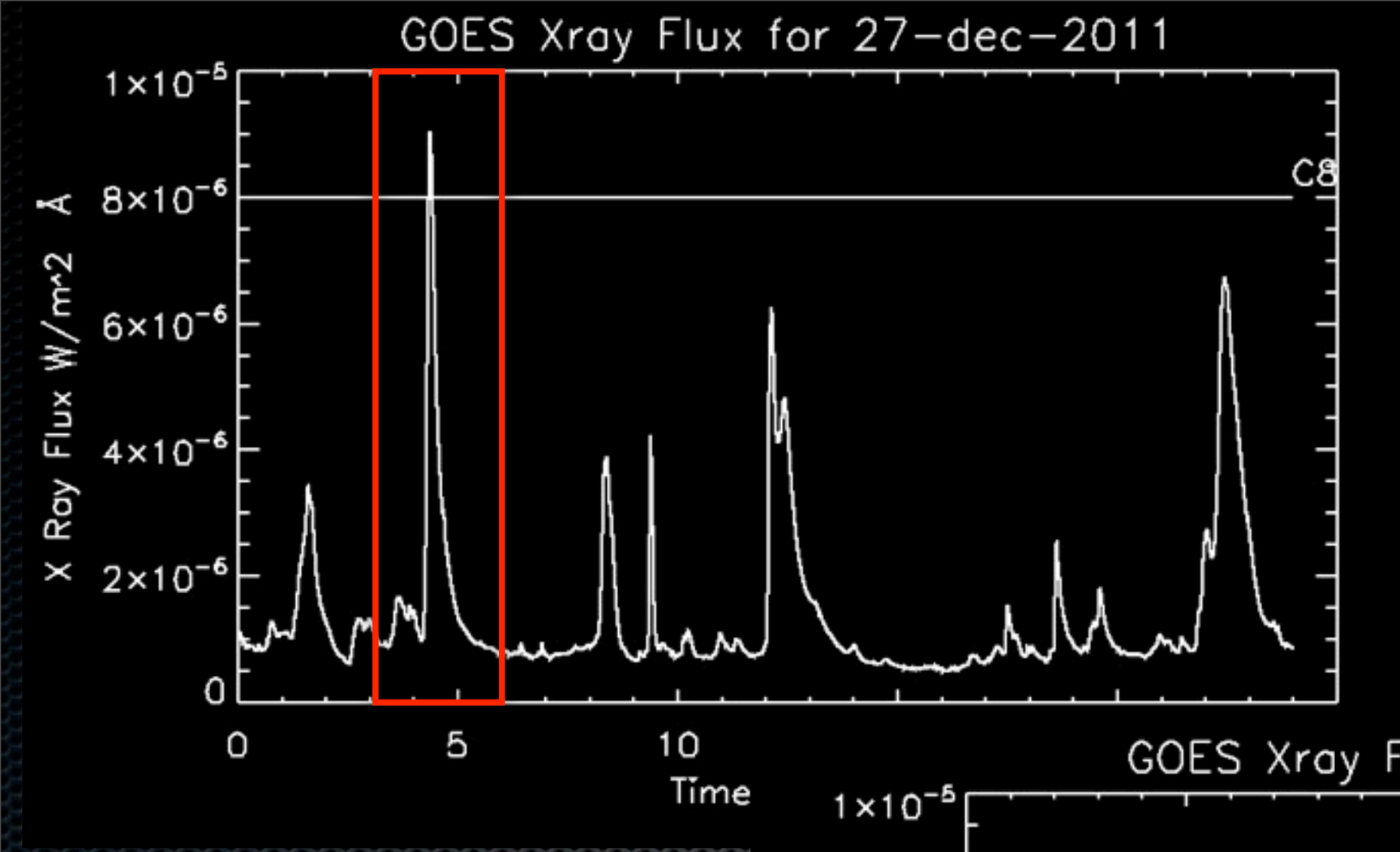
GOES C8 Class



Sample Selection

GOES C8 Class





Sample Selection

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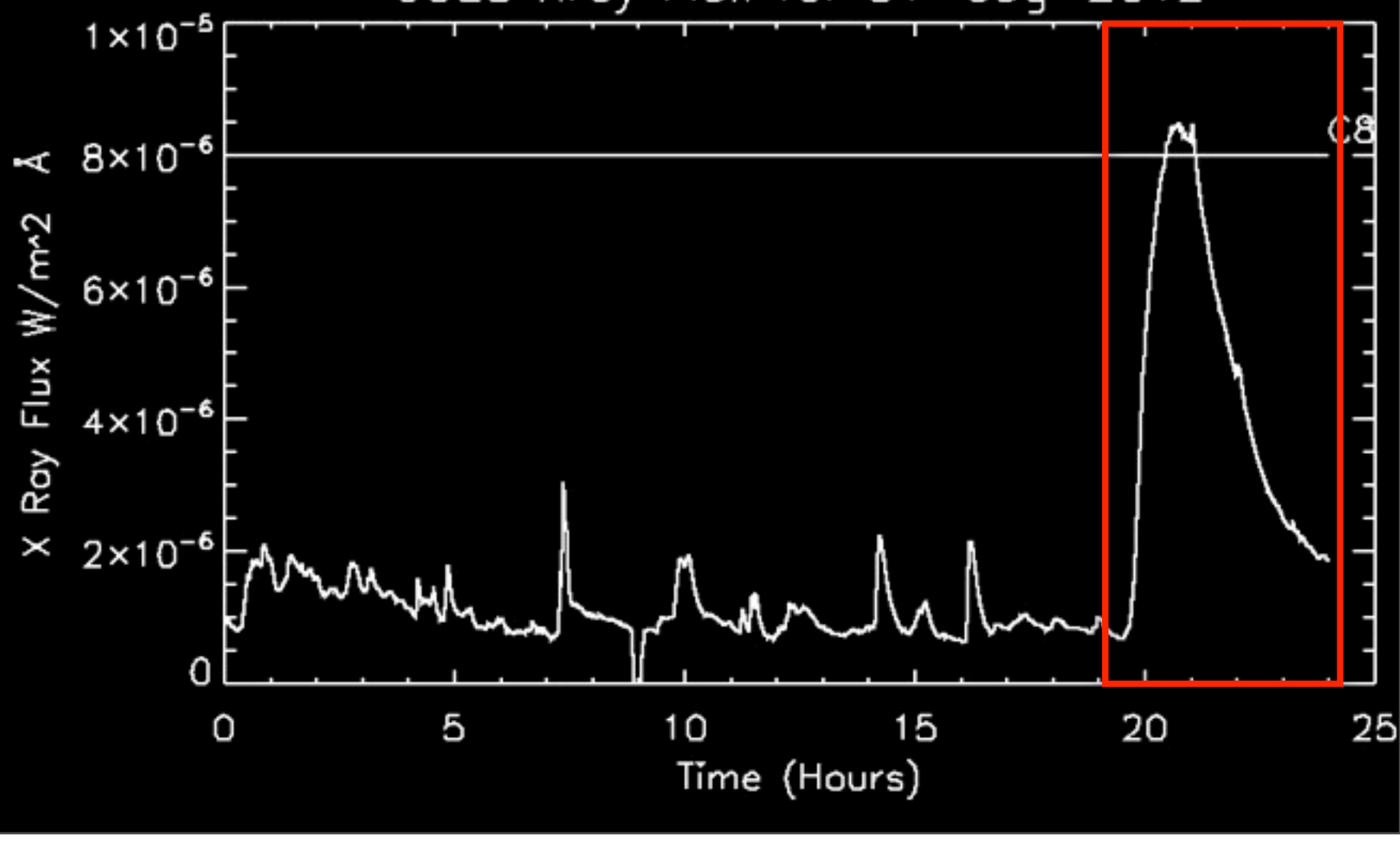
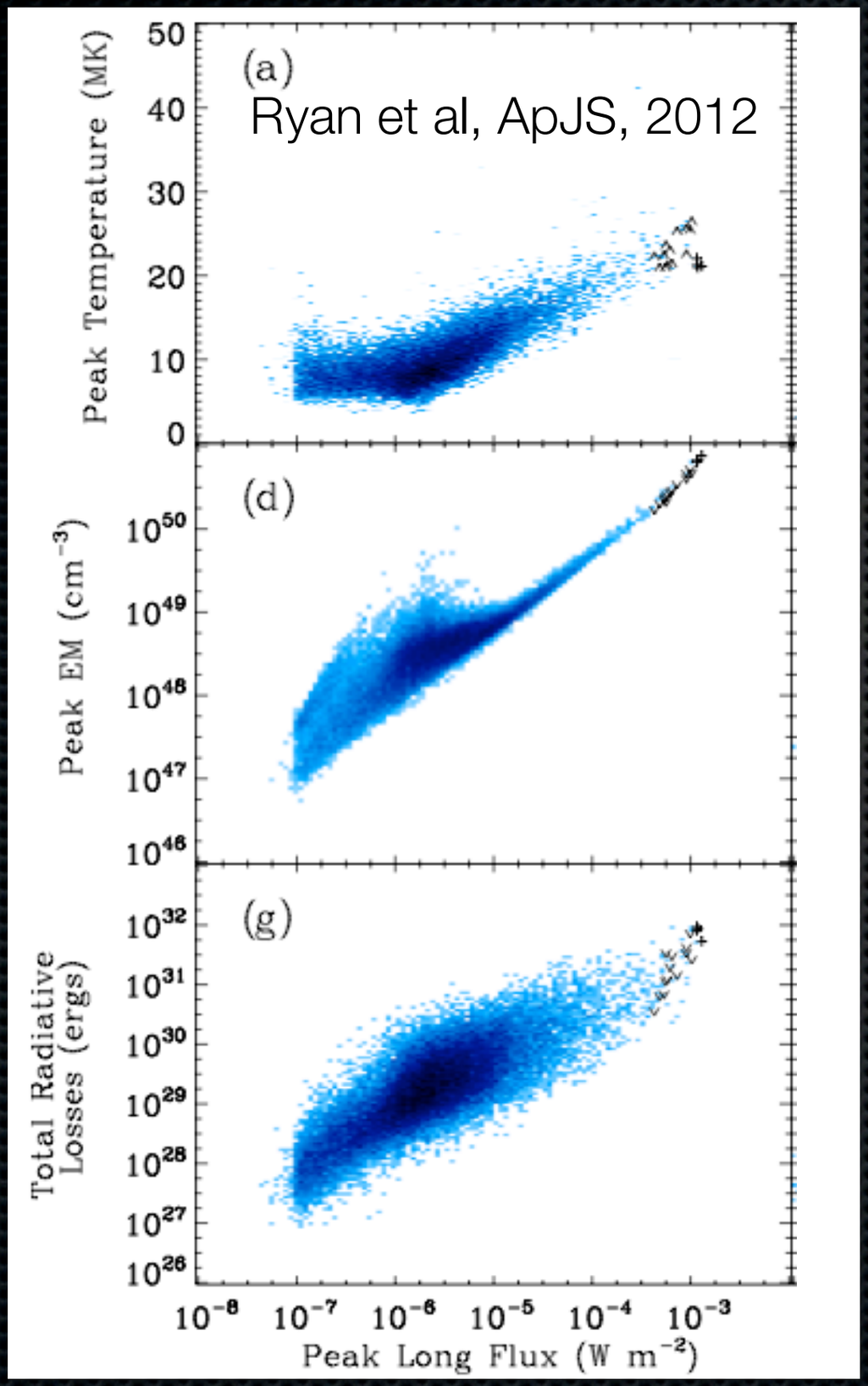
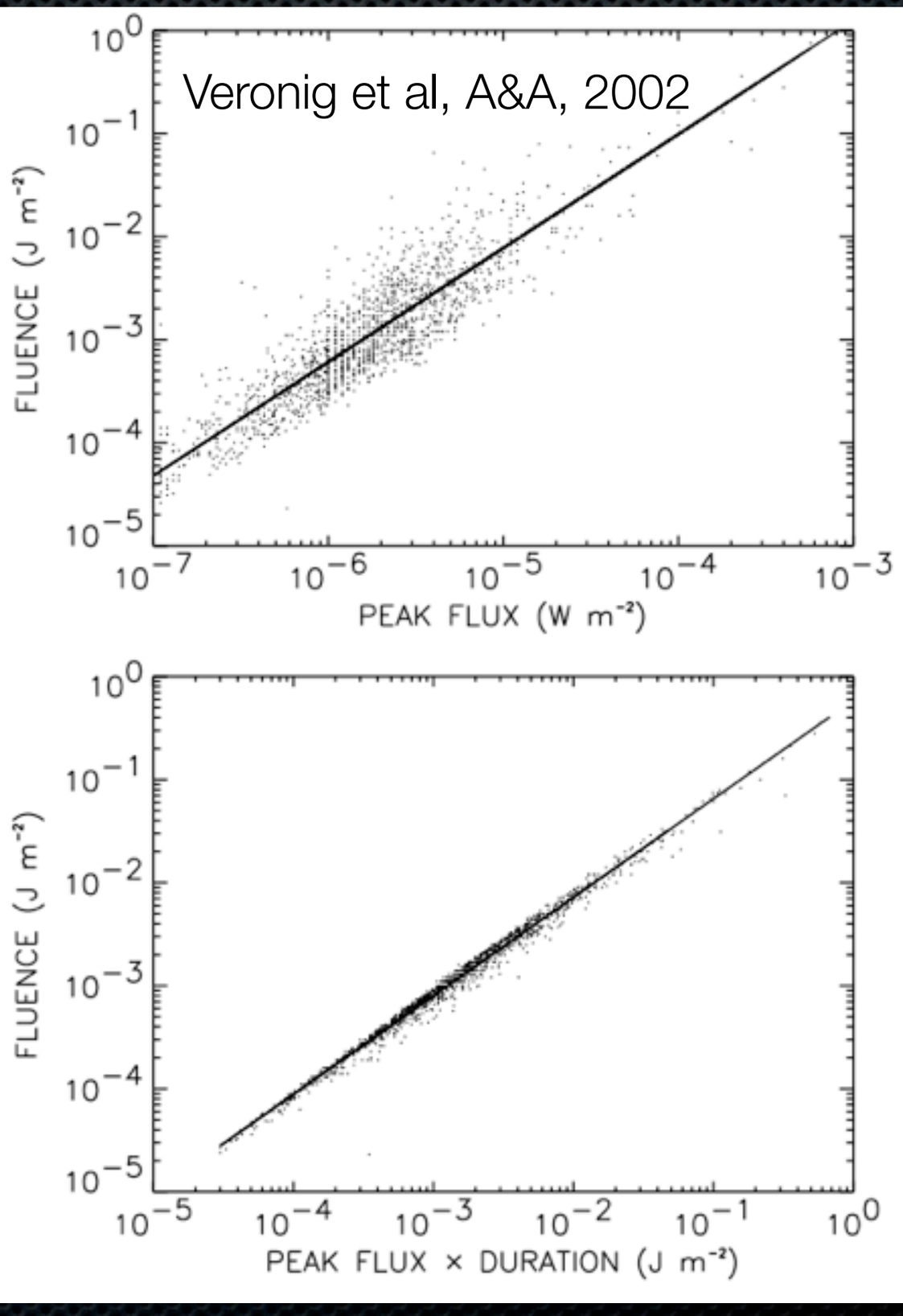


Motivation

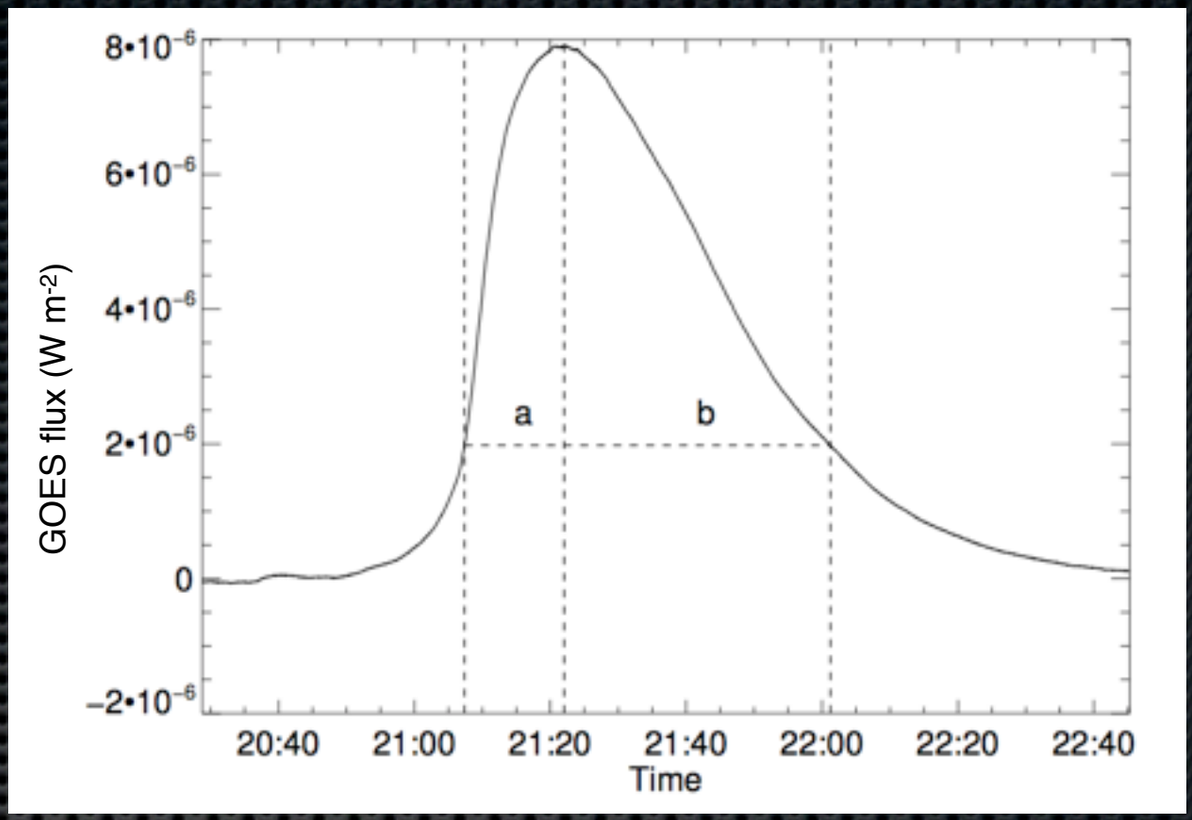


Ryan et al, ApJS, 2012



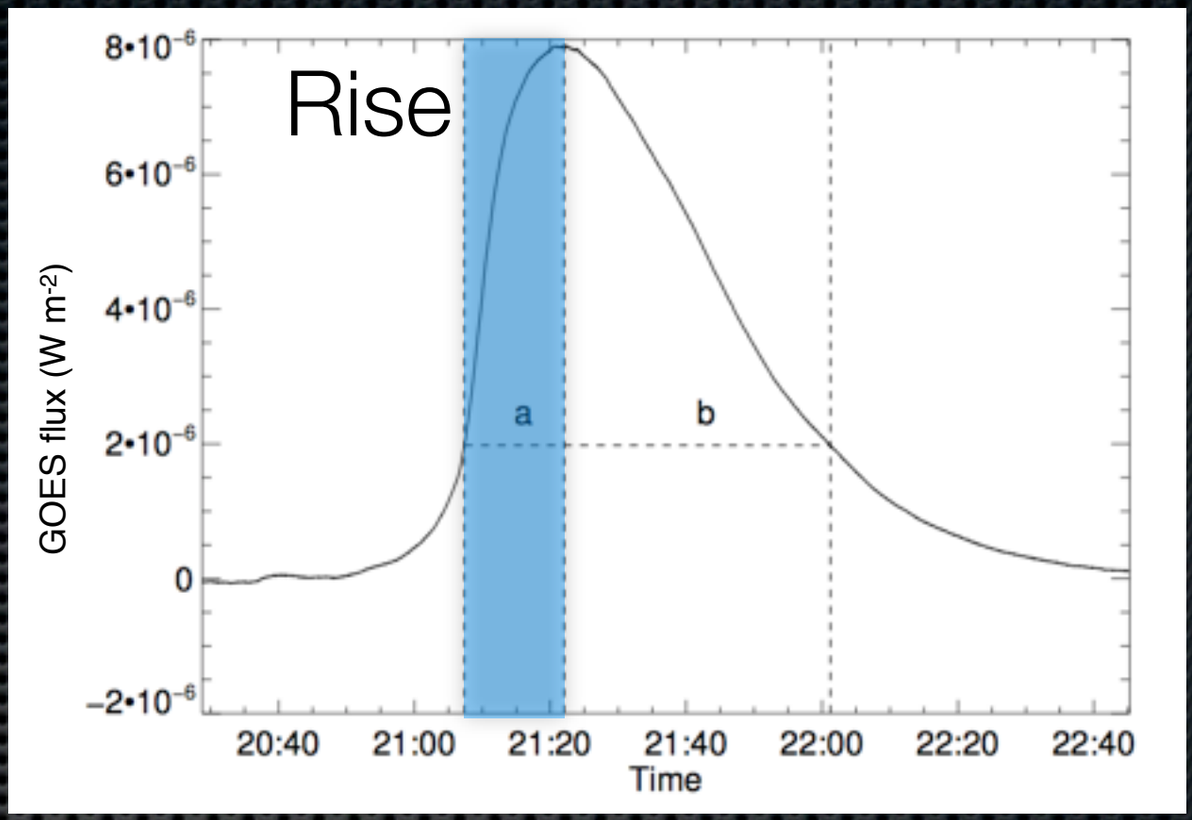
Veronig et al, A&A, 2002

Flare Timing



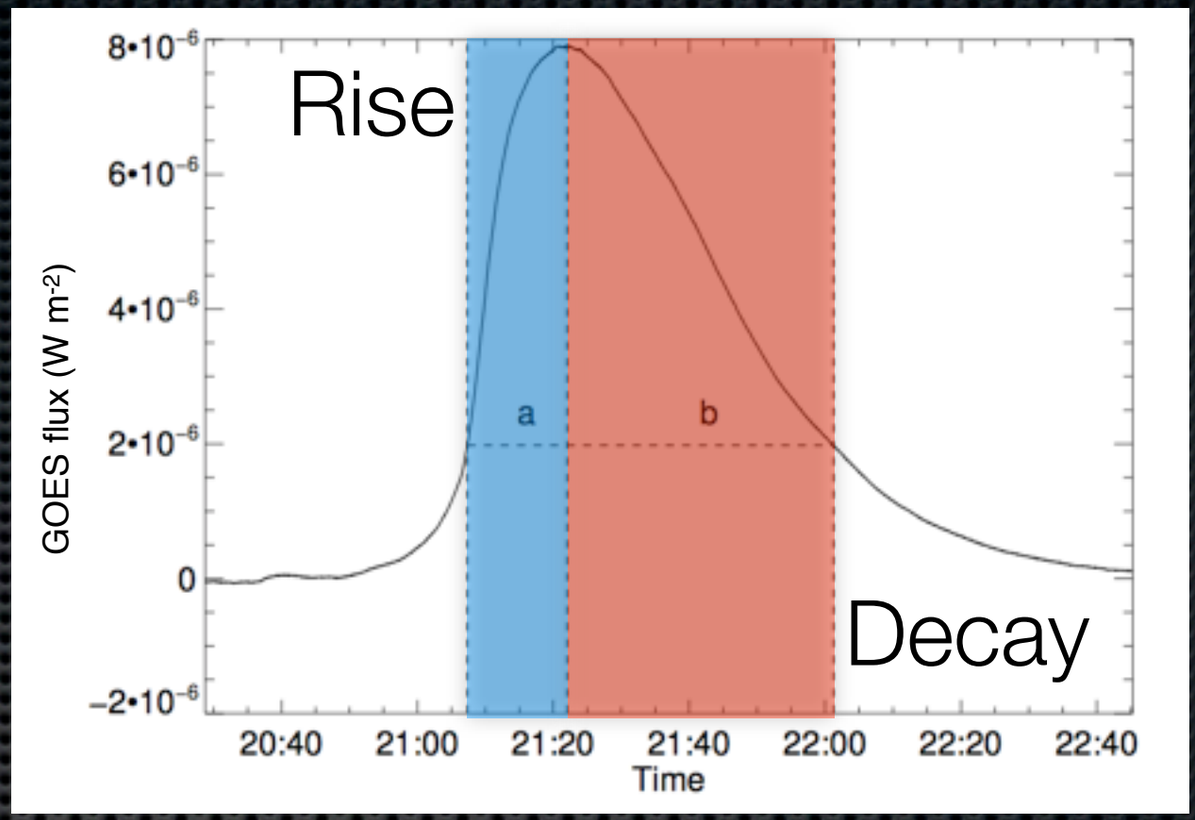
Rise

Flare Timing



Rise

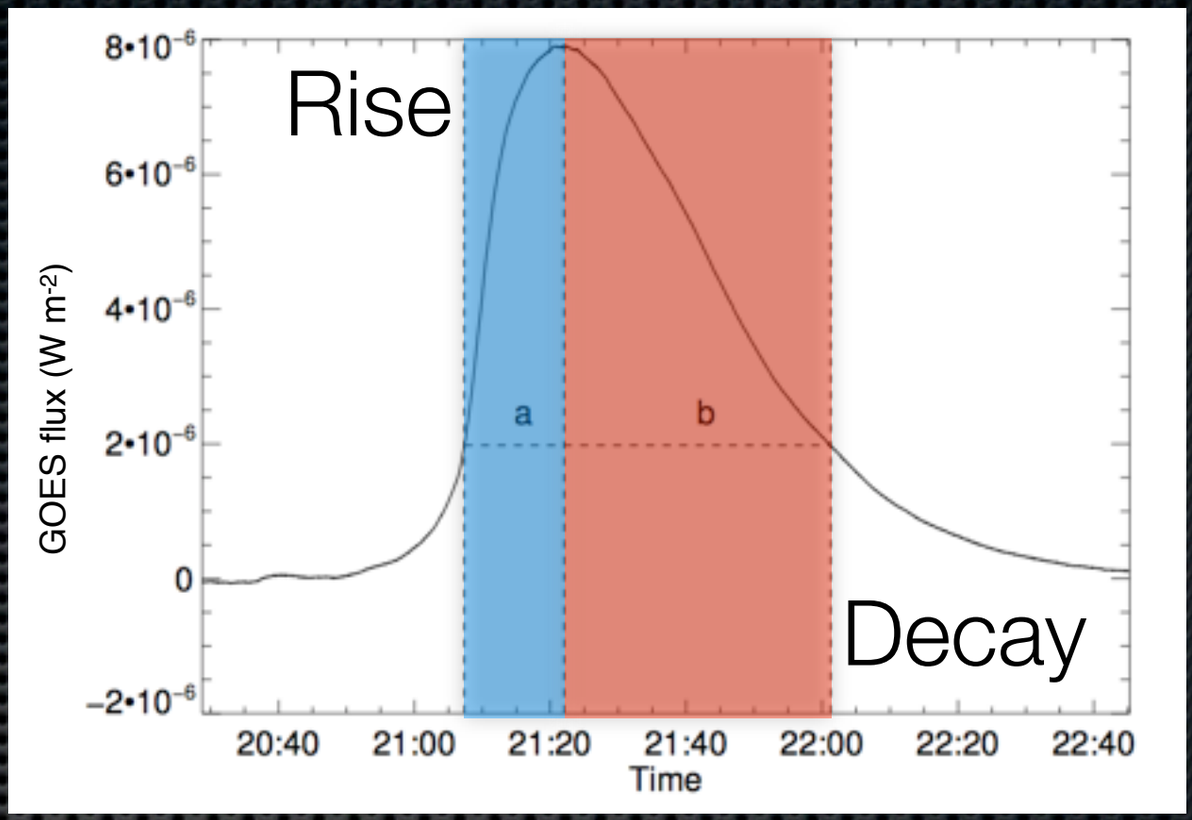
Flare Timing

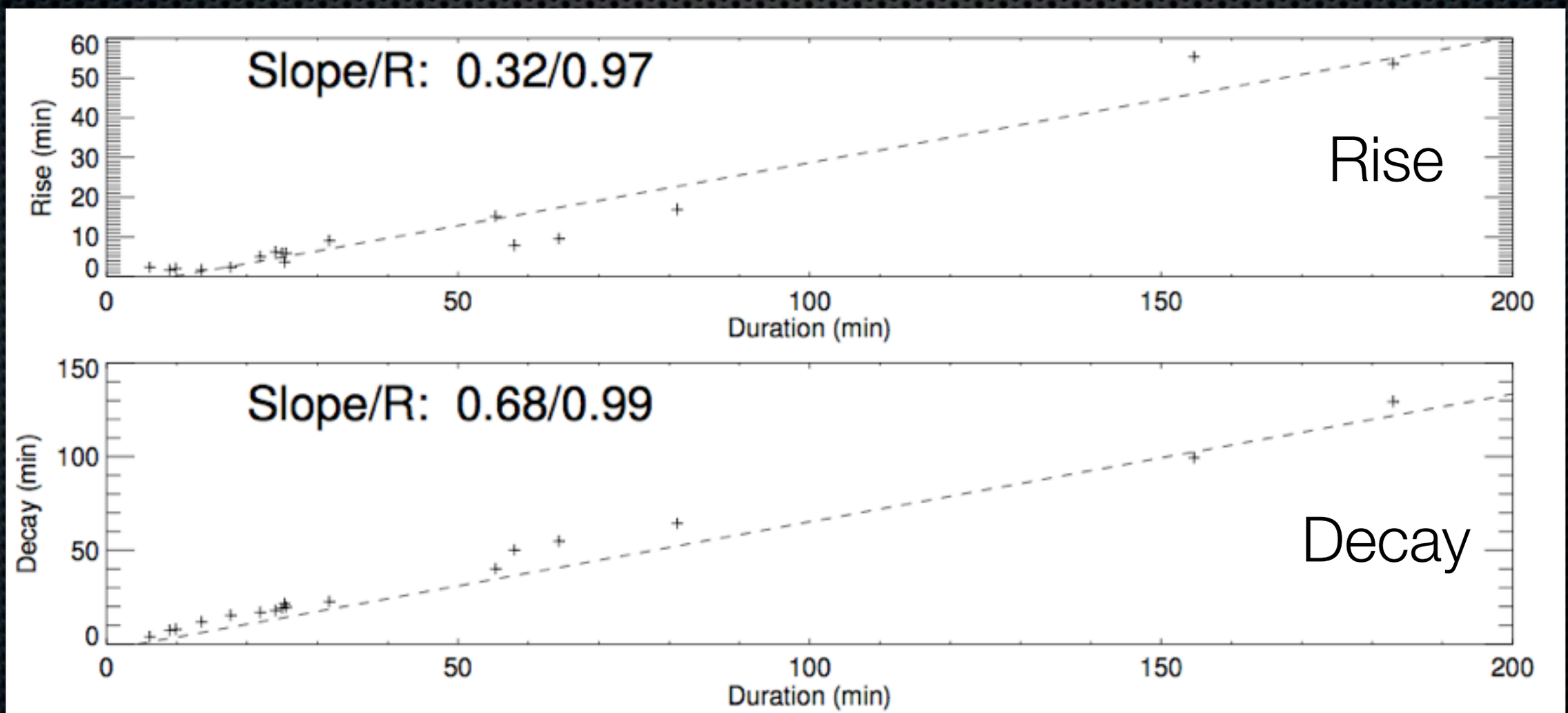


Rise

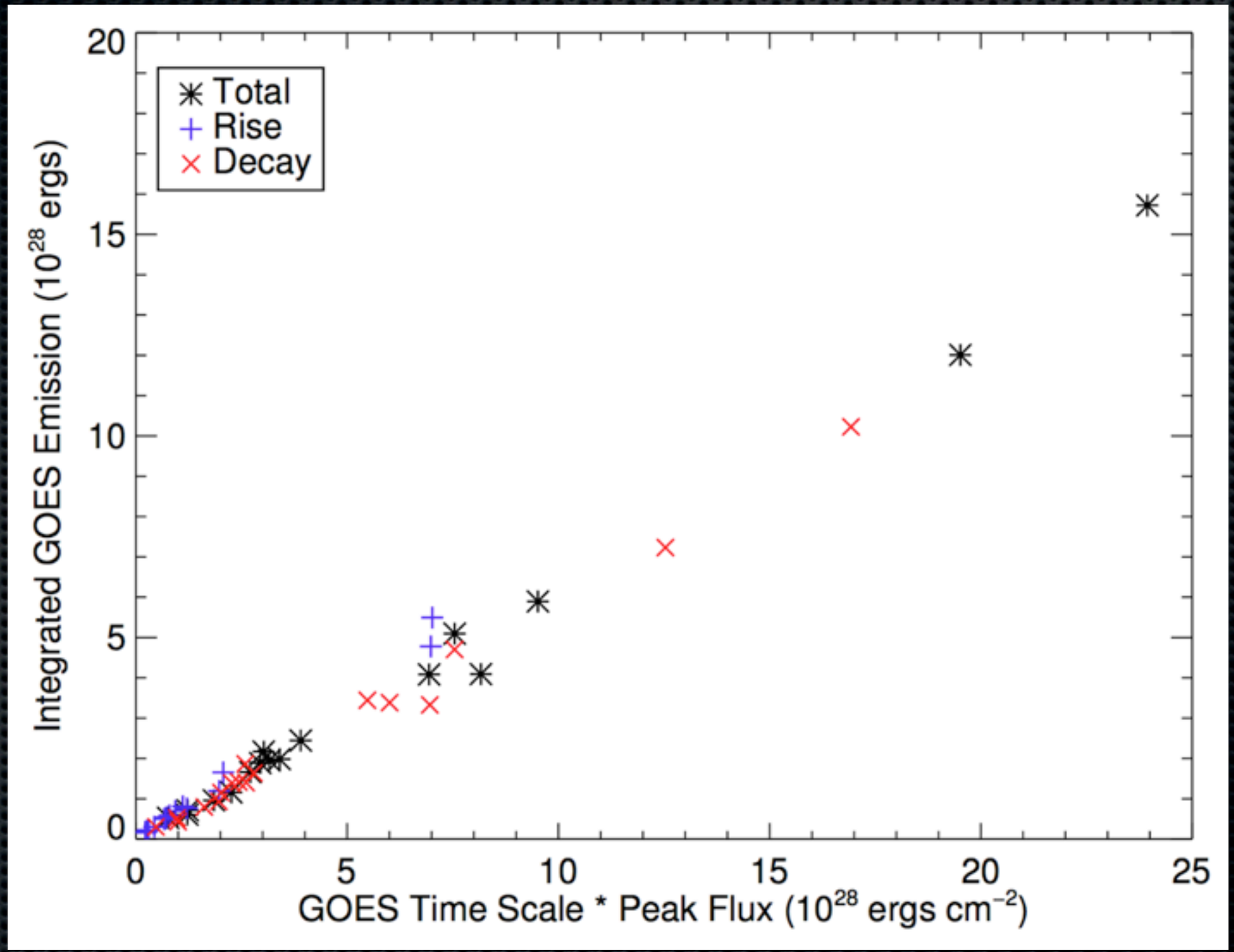
Decay

Flare Timing

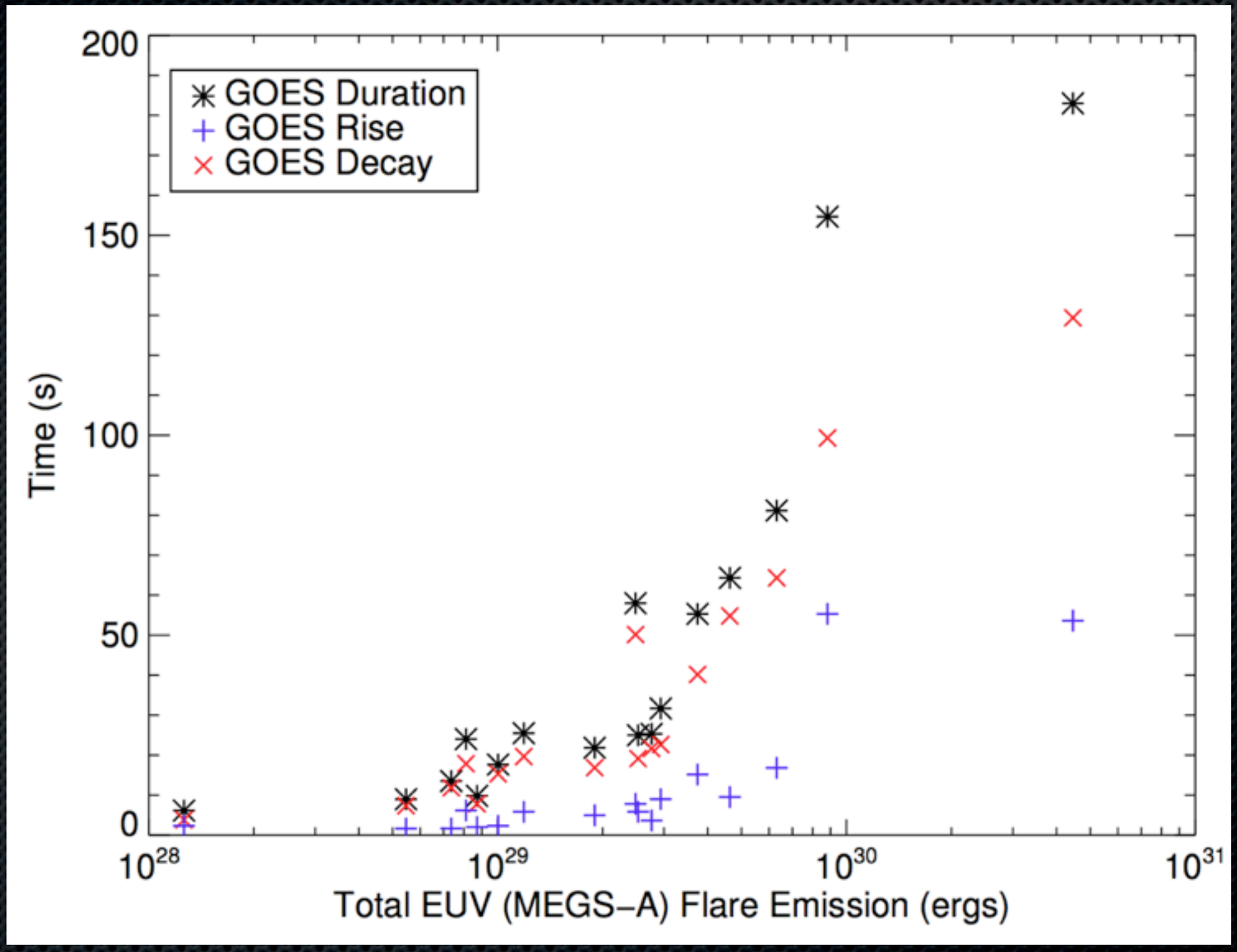




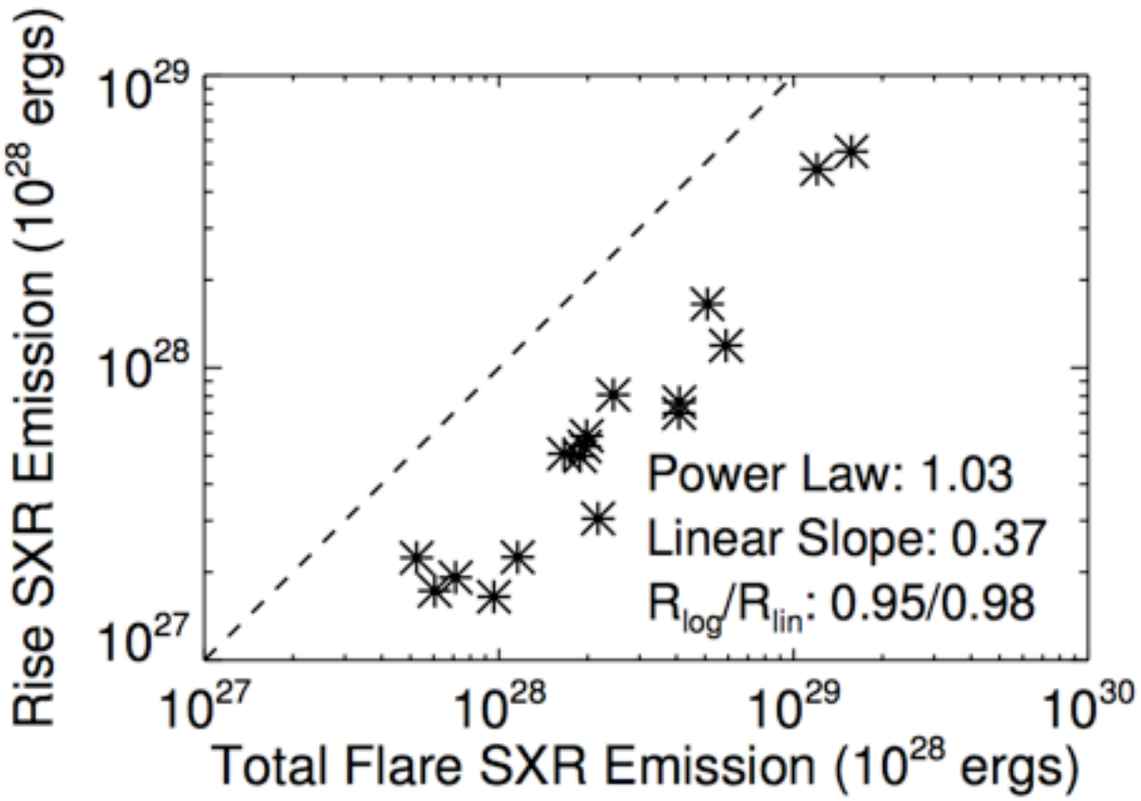
Flare Energetics - X-rays

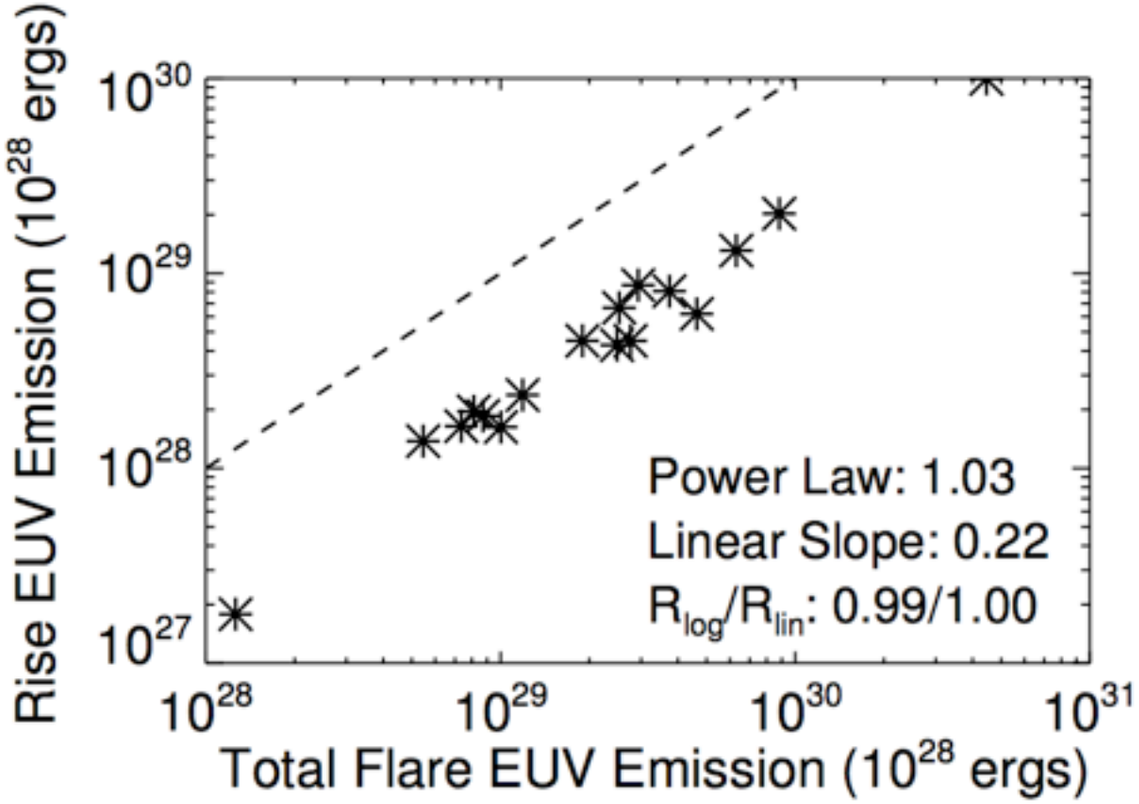


Flare Energetics - EUV



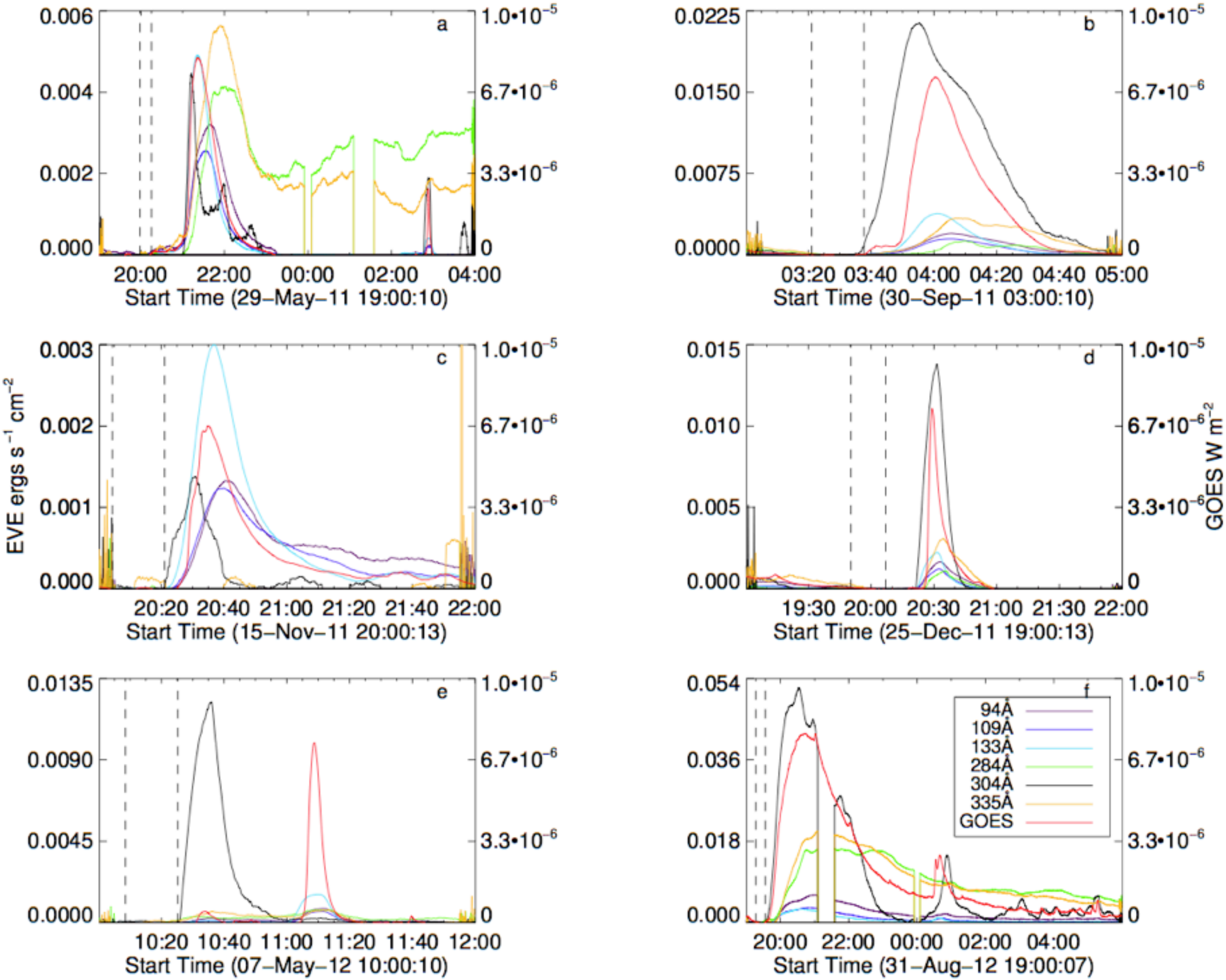
Energy Partition



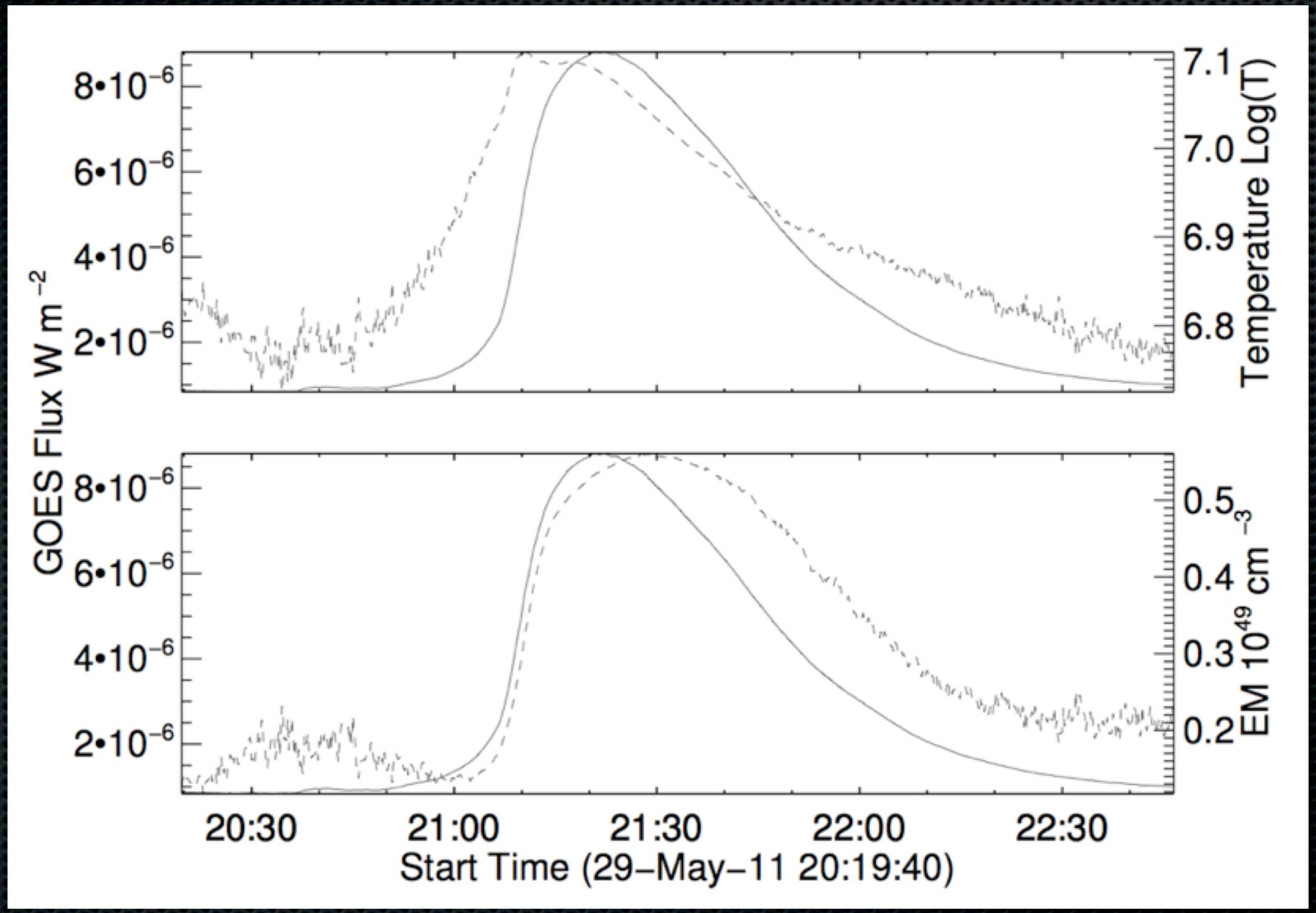


GOES X-rays

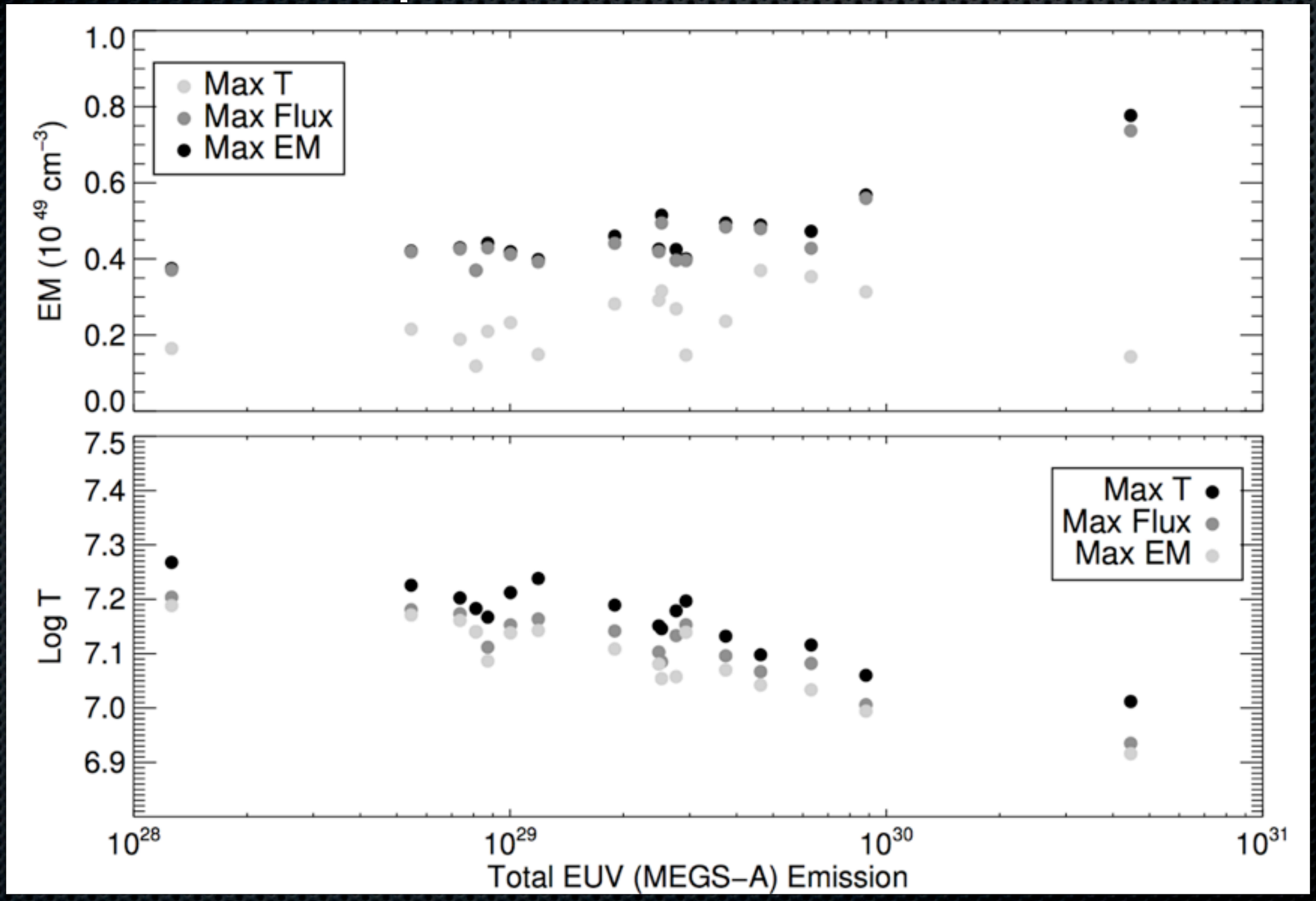
EVE Extreme UV


a
0.006
0.004
0.002
0.000
1.0•10−5
6.7•10−6
3.3•10−6
0
20:00 22:00 00:00 02:00 04:00
Start Time (29–May–11 19:00:10)
b
0.0225
0.0150
0.0075
0.0000
03:20 03:40 04:00 04:20 04:40 05:00
Start Time (30–Sep–11 03:00:10)
c
0.003
0.002
0.001
0.000
EVE ergs s−1 cm−2
20:20 20:40 21:00 21:20 21:40 22:00
Start Time (15–Nov–11 20:00:13)
d
0.015
0.010
0.005
0.000
GOES W m−2
19:30 20:00 20:30 21:00 21:30 22:00
Start Time (25–Dec–11 19:00:13)
e
0.0135
0.0090
0.0045
0.0000
10:20 10:40 11:00 11:20 11:40 12:00
Start Time (07–May–12 10:00:10)
f
0.054
0.036
0.018
0.000
94Å
109Å
133Å
284Å
304Å
335Å
GOES
20:00 22:00 00:00 02:00 04:00
Start Time (31–Aug–12 19:00:07)

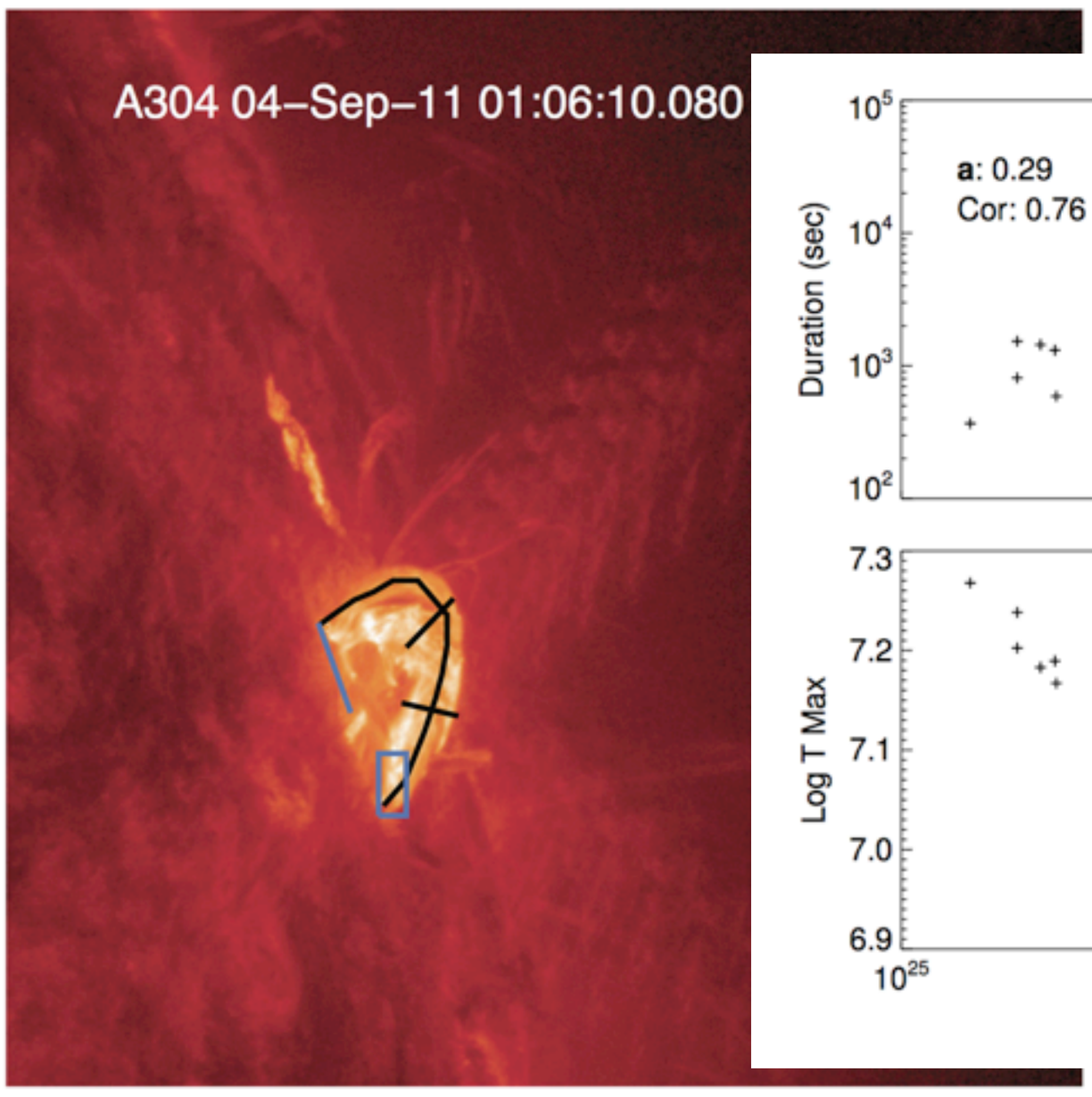
Thermal parameters

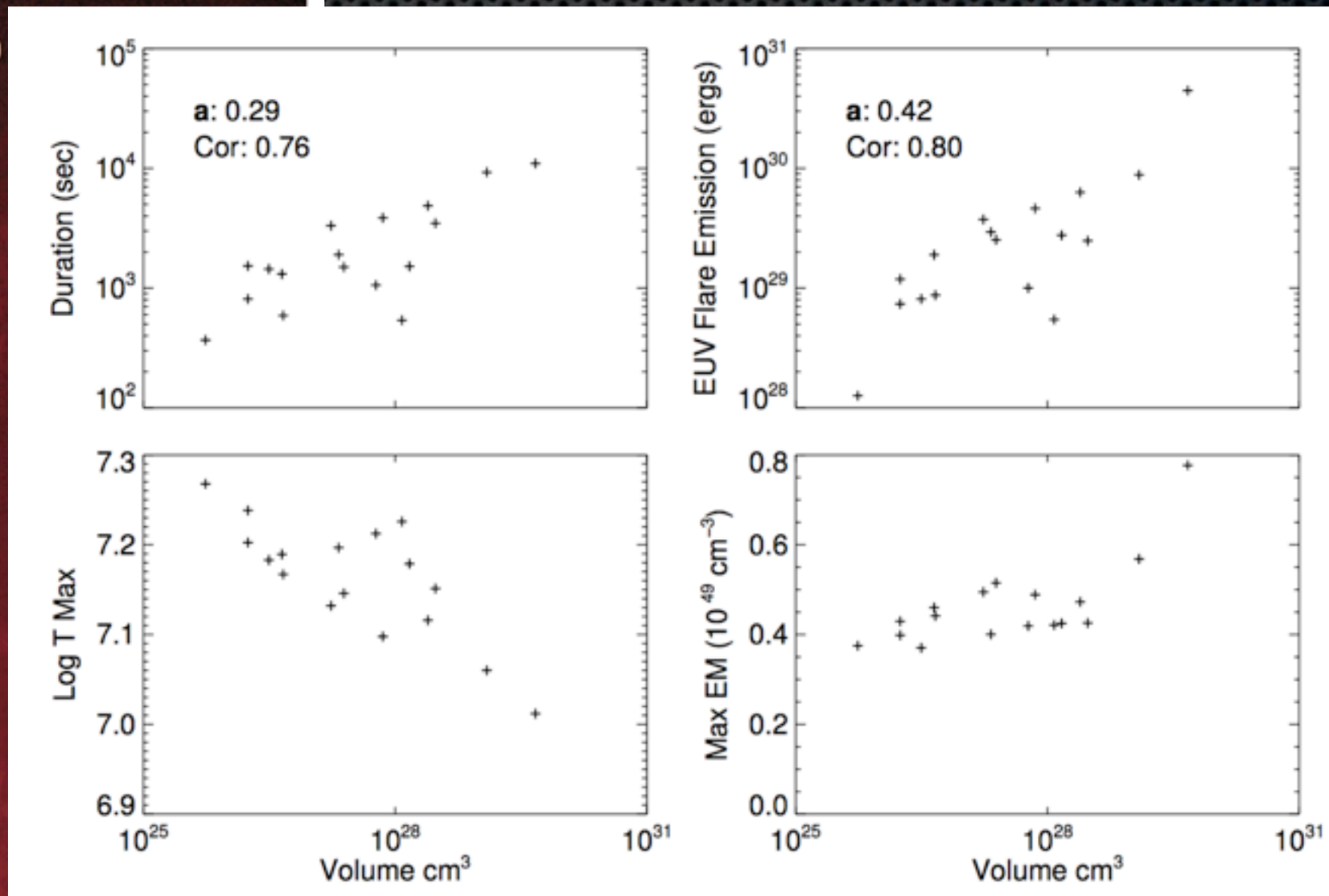


Thermal parameters



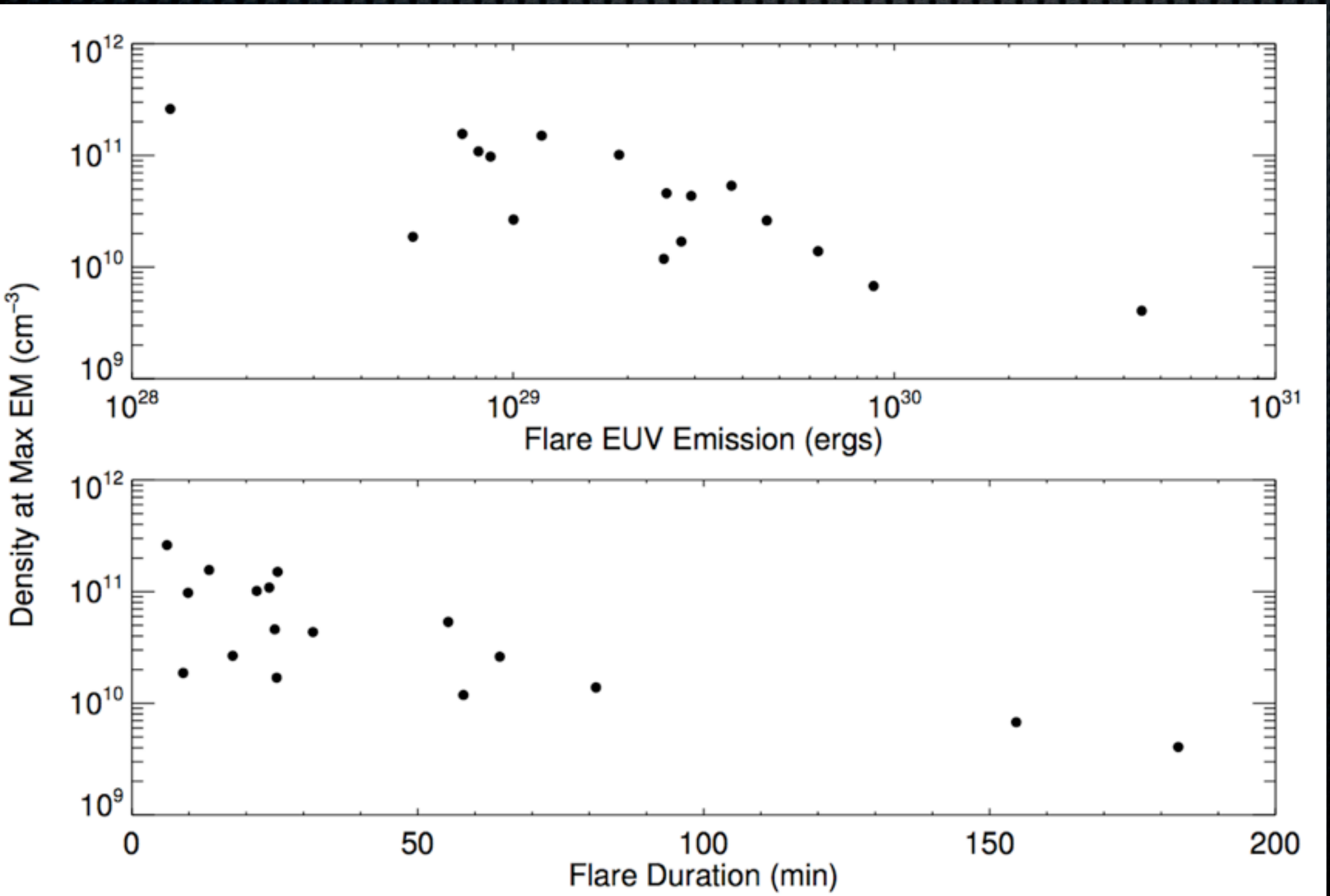
Flare volumes





AIA 304 Å

Flare densities



Conclusions

- The duration of the rise phase is directly proportional to the duration of the decay phase in C8 flares.
- The energy emitted during the rise phase of a flare is proportional to the total energy emitted.
- The above points indicate that the rise phase determines the energetics and timing of the entire flare.
- More energetic flares with longer durations have larger volumes and emit more total radiation, but have lower temperatures and densities. The opposite trends exist for short duration flares.