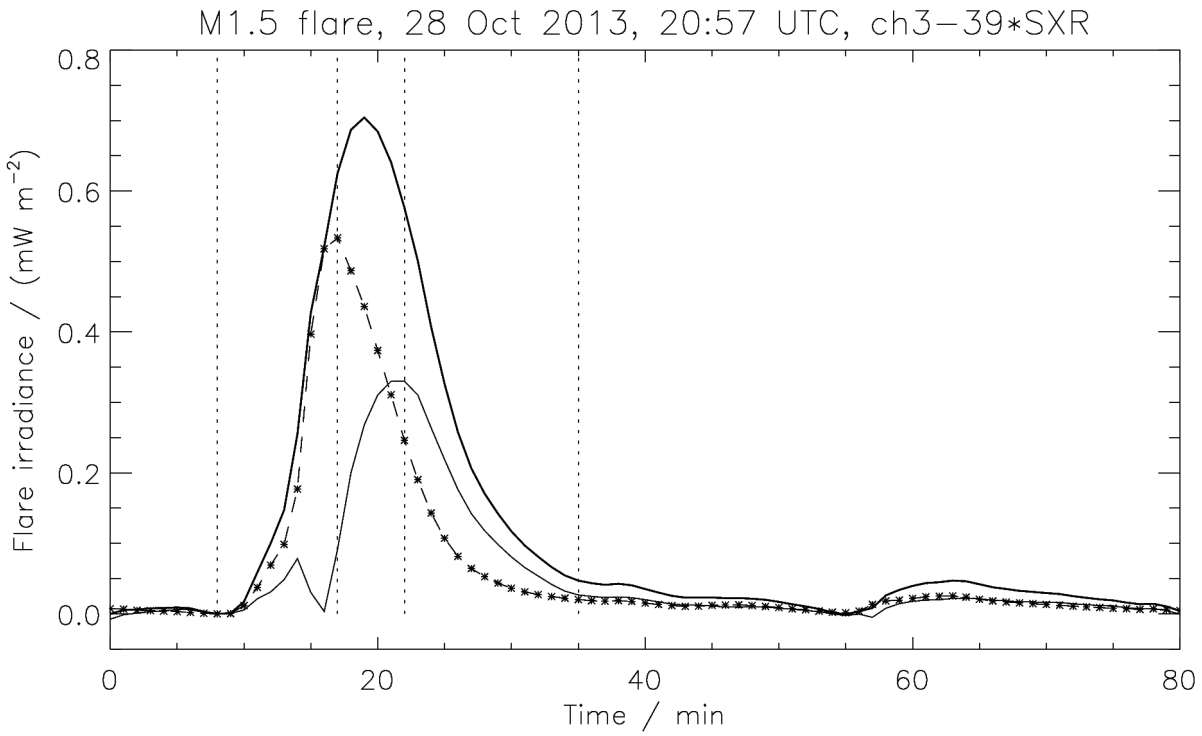
Thermal-component analysis of two flares

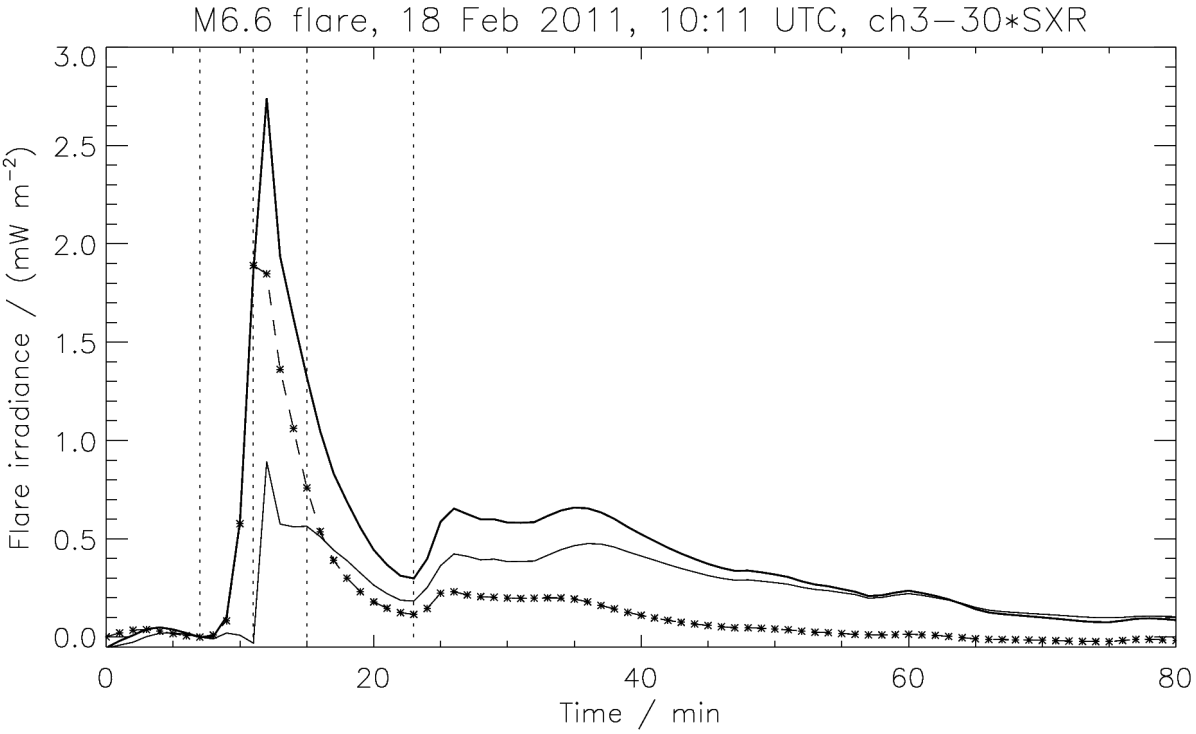
IED 05 Dec 2013



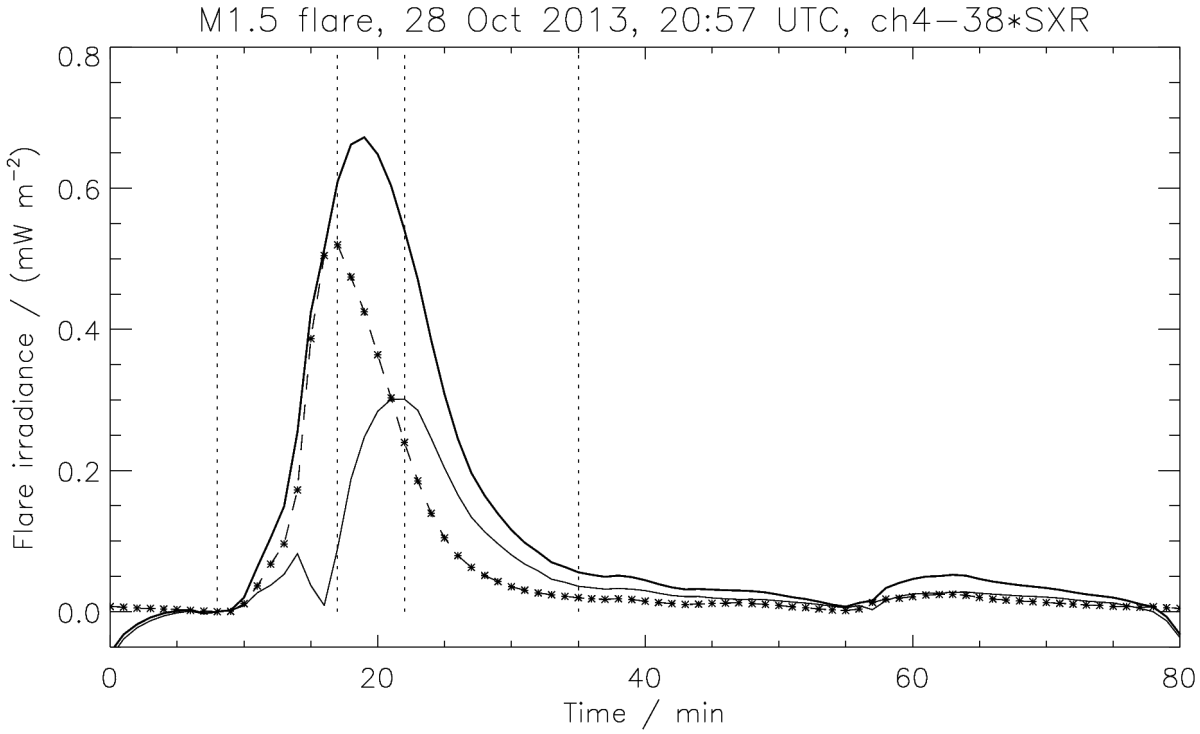
The flares are treated according to a method described here
http://solwww.oma.be/users/dammasch/IED_20110809_SeparateContributions.pdf
and here:
http://solwww.oma.be/users/dammasch/Dammasch_CosparC12000612.ppt

The level of the flare onset is subtracted from both the LYRA and GOES curves. The GOES curve is scaled such that it reaches the LYRA curve without exceeding it. This reflects the assumption that in the rising phase until the peak, hot plasma comparable to GOES 0.1-0.8nm ("SXR") dominates the LYRA response. The residual before and after the GOES peak represents relatively cooler plasma that is also part of the LYRA response ("EUV").

Minute 8 (20:48) was chosen as flare onset.
Minute 17 (20:57) is the SXR peak.
Minute 22 (21:02) is the EUV peak, i.e. 5 minutes later.
Minute 35 (21:15) was chosen as flare end.
Thus, the integral of the whole LYRA flare is 7.92.
The integral of the SXR component is 4.54 (57.3%).
The integral of the EUV component is 3.38 (42.7%).
[Units would be mW/m2 * 1 minute]

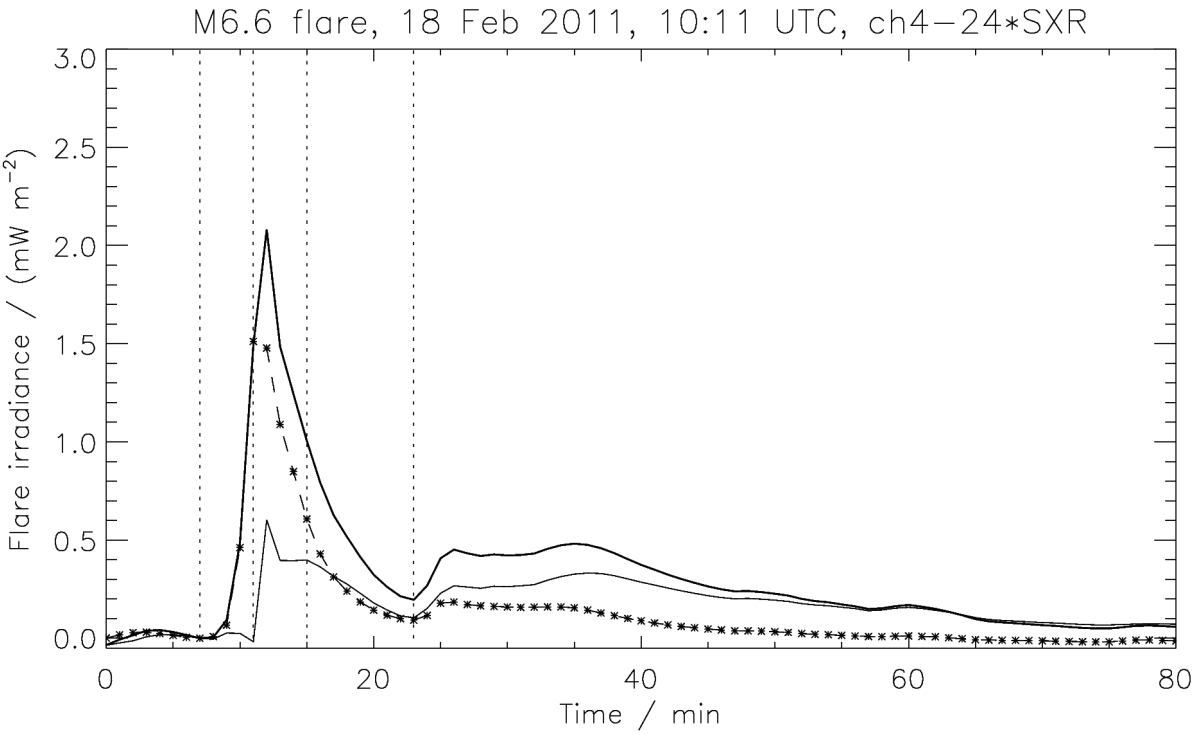


Minute 7 (10:07) was chosen as flare onset; 09:55 would be the onset of a pre-flare.
Minute 11 (10:11) is the SXR peak.
Minute 15 (10:15) is the EUV peak, i.e. 4 minutes later; the kink in the residual is assumed to be an artifact due to temporal resolution.
Minute 23 (10:23) was chosen as flare end, because the next flare starts.
Thus, the integral of the whole LYRA flare is 14.72.
The integral of the SXR component is 9.61 (65.3%).
The integral of the EUV component is 5.11 (34.7%).
[Units would be mW/m2 * 1 minute]



Values for LYRA channel 2-4 (Zirconium):

The integral of the whole LYRA flare is 7.66.
The integral of the SXR component is 4.42 (57.7%).
The integral of the EUV component is 3.24 (42.3%).



The integral of the whole LYRA flare is 11.24.
The integral of the SXR component is 7.69 (68.4%).
The integral of the EUV component is 3.55 (31.6%).

The small differences in behaviour between 2011 and 2013 can probably be explained by degradation. In 2013, channel 2-3 has become even more similar to channel 2-4 by further degradation of the EUV bandpass.