Contribution ID: **33** Type: **Poster**

Empirical atmosphere model in a mini flare during magnetic reconnection

Monday, 24 May 2021 13:05 (40 minutes)

A spatio-temporal analysis of IRIS spectra of Mg II, C II, and Si IV ions allows us to study the dynamics and the stratification of the flare atmosphere along the line of sight during magnetic reconnection at the jet base. Strong asymmetric Mg II and C II line profiles with extended blue wings observed at the reconnection site are interpreted by the presence of two chromospheric temperature clouds: one explosive cloud with blueshifts at 290 km/s and one cloud with smaller Doppler shift (around 36 km/s).
Simultaneously at the same location a mini flare was observed with strong emission in multi temperatures (AIA), in several spectral IRIS lines (e.g. O IV and Si IV, Mg II), with absorption of identified chromospheric lines in Si IV broad, with enhancement of the Balmer continuum and X-ray emission (FERMI/GBM). With the standard thick-target flare model we calculate the energy of non thermal electrons observed by FERMI/GBM and compare it to the energy radiated by the Balmer continuum emission. We show that the low energy input by non thermal electrons above 20 keV was still efficient to produce the excess of Balmer continuum.

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Session Classification: Poster session: SQ1 and SQ2

Track Classification: Onset of flare energy release