



Contribution ID: 303

Type: Poster

## Interaction of particles beams with chromosphere during impulsive phase of solar flares

*Tuesday, 7 September 2021 11:26 (13 minutes)*

Energy transport by fast, non-thermal particles from primary energy release place - located in the top of flaring loop - to the loop foot-points, plays very important role in solar flares. A fully understanding of the processes of transportation, energy deposition in the chromosphere and radiative response of chromospheric plasma requires both: high (sub-second) cadence observations and numerical models consistent with them.

The analysis of two compact solar flares with similar GOES-class (C1.1 and C1.6), but with significance differences during impulsive phase is presented. Variations of the position and the vertical extent of the energy deposition layer (EDL) as well as variations of the flaring spectra and emission intensities recorded in the  $H\alpha$  hydrogen line are studied.

The variations of the HXR fluxes and  $H\alpha$  intensities were well-correlated in time during the impulsive phases of the flares, and they agreed with the variations of the calculated position and vertical extent of the EDL. Impulsive variations of the  $H\alpha$  emission were caused by individual, short-time episodes of energy deposition by the electron beams on various depths in the chromospheric plasma.

The compared flares were observed in  $H\alpha$  line with very high time resolution (20 spectra-images per second) using the MSDP spectrograph at Bialkow Observatory (University of Wrocław, Poland), as well as by GOES and RHESSI satellites in X-ray domain. The numerical model was calculated assuming that the external energy is delivered to the flaring loop by non-thermal electrons.

**Primary author:** Dr RADZISZEWSKI, Krzysztof (Astronomical Institute, University of Wrocław, Poland)

**Co-authors:** Prof. RUDWAY, Pawel (Astronomical Institute, University of Wrocław); Dr FALEWICZ, Robert (Astronomical Institute, University of Wrocław)

**Presenter:** Dr RADZISZEWSKI, Krzysztof (Astronomical Institute, University of Wrocław, Poland)

**Session Classification:** Poster Session 4.4

**Track Classification:** Session 3 - Fundamental Plasma Processes in the Solar Atmosphere: Magnetic Reconnection, Waves, Emission, Particle Acceleration