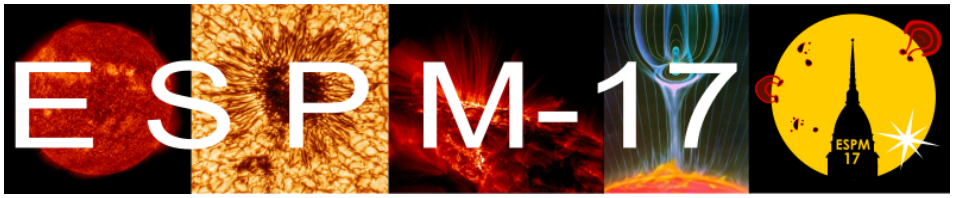

Contribution ID: **316** Type: **Talk**

First comparison of MSDP spectroscopic observation of the C1.6 solar flare with FLARIX NLTE simulations

Thursday 12 September 2024 10:10 (15 minutes)

For the first time we present comparison of advanced FLARIX NLTE time-dependent numerical simulations of flaring emission with spectral observations of a compact C1.6 GOES-class flare recorded with MSDP (Multi-channel Subtractive Double Pass) imaging spectrograph installed at the Białków Observatory. The high time resolution (50 ms) MSDP spectral data, enabled comprehensive analysis of H-alpha line profiles and light curves measured within the chromospheric flaring sources. For FLARIX simulation an initial atmospheric model similar to VAL-C, but with a modified temperature in the upper chromosphere, was applied. We also used, as an input parameters, increased to sub-second time resolution non-thermal electron (NTE) beam's parameters obtained from RHESSI satellite. To achieve it the basic 4-sec resolution data were modulated using the de-modulated (to 250 ms) hard X-ray (HXR) RHESSI flux. Synthetic H-alpha line profiles obtained from FLARIX were compared with the observed spectra. During the impulsive phase of the flare, the general evolution of the observed and synthetic H-alpha line intensity were in good agreement, but some differences were observed in intensities in various parts of the H-alpha line profile. Variations of the energy flux of NTEs was in strong correlation with H-alpha emission during the analysed HXR pulse. Considering various effects, such as the filling factor FF = 0.20 influenced on observed emissions, relatively good agreement between theoretical and observed lines was achieved.

Primary authors: Dr RADZISZEWSKI, Krzysztof (Astronomical Institute, University of Wrocław, Poland); Prof. HEINZEL, Petr (Center of Scientific Excellence - Solar and Stellar Activity, University of Wroclaw, Poland)

Co-authors: BERLICKI, Arkadiusz (Centre of Scientific Excellence - Solar and Stellar Activity, University of Wroclaw, Poland); KASPAROVA, Jana (Astronomical Institute of the Czech Academy of Sciences); Dr LITWICKA, Michalina (Center of Scientific Excellence - Solar and Stellar Activity, University of Wroclaw, Poland); RUDAWY, Pawel (Astronomical Institute, University of Wroclaw, Poland); FALEWICZ, Robert (Astronomical Institute, University of Wroclaw, Poland)

Presenter: BERLICKI, Arkadiusz (Centre of Scientific Excellence - Solar and Stellar Activity, University of Wroclaw, Poland)

Session Classification: Multi-scale energy release, flares and coronal mass ejections

Track Classification: Multi-scale energy release, flares and coronal mass ejections