



Contribution ID: 304

Type: Poster

Infrared spectropolarimetry of C class solar flare

The influence of solar flares on the dynamics of lower atmospheric plasma is not yet fully understood. We performed full-Stokes spectropolarimetric observations of active region NOAA 3363 on GREGOR Infrared Spectrograph (GRIS) during consecutive C class flares on July 16, 2023. The near-infrared spectral interval covered photospheric Si I 10827 Å and Ca I 10839 Å lines and chromospheric He I 10830 Å triplet line. Besides the enhanced emission of He I 10830 Å triplet, the upper photospheric line Si I 10827 Å also showed a significant intensity increase. The intensity of the Si I line was increased after several minutes of He I enhancement, which indicates slow energy transfer from the chromosphere to the upper photosphere. We speculate that the heat transfer by thermal conduction from the formation height of He I to the formation height of the Si I line is responsible for the observed time delay.

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Session Classification: Coffee break and poster session 2

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