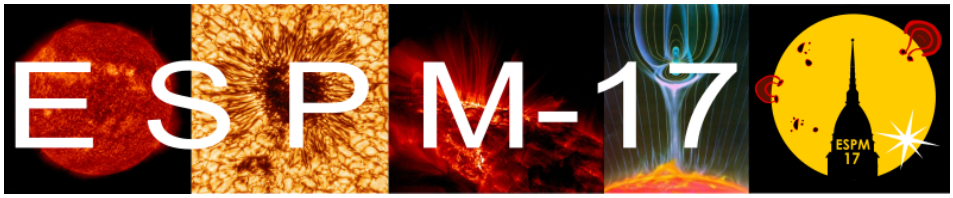

Contribution ID: **48** Type: **Talk**

Analysis of flare ribbon fine structures using high-resolution observations

Wednesday 11 September 2024 12:10 (15 minutes)

The mechanism of energy release from solar flares are still not fully understood and the study of small-scale features is an important aspect toward this understanding. Flare ribbons act as the footpoints of a flare and are crucial to know the process of flare reconnection. We present here a study about the fine structures of flare ribbons using a high resolution observations using the Swedish 1-m Solar Telescope (SST), the Atmospheric Imaging Assembly (AIA), and the Interface Region Imaging Spectrograph (IRIS). The high-resolution SST observations offer spectroscopic data in Hα, Ca II 8542 Å and Hβ lines, which we use to analyze plasma blobs along the flare ribbon. Within the eastern flare ribbon, chromospheric blobs were detected in the red wing of Ca II 8542 Å, Hα, and Hβ. A comparison of plasma blobs in Hβ observations and Si IV 1400 Å has also been performed. These plasma blobs are observed as circular structures having widths from 150 km - 180 km. Intensity profiles at these blob locations show a red wing asymmetry. We conclude that the chromospheric plasma blobs in the flare ribbon are likely formed due to a fractured reconnection process within the flare current sheet, supporting the theory of a direct link between fine-structure flare ribbons and flare current sheet tearing. We believe our observations represent the highest resolution evidence of fine-structure flare ribbons to date.

Primary author: THOEN FABER, Jonas (Rosseland Centre for Solar Physics, University of Oslo)

Co-authors: ROUPPE VAN DER VOORT, Luc (Rosseland Centre for Solar Physics, University of Oslo); JOSHI, Reetika; Dr WEDEMEYER, Sven (Rosseland Centre for Solar Physics, University of Oslo, Norway)

Presenter: THOEN FABER, Jonas (Rosseland Centre for Solar Physics, University of Oslo)

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

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