



Contribution ID: 31

Type: Poster

Observation of EUV dynamic fibrils with Solar Orbiter and IRIS

Detection of dynamic fibrils (DFs) in coronal images had been a difficult task so far, primarily due to their small size and the lower spatial resolution of the current EUV imagers. In this talk, I will present the first unambiguous detection of DFs in coronal EUV data using high-resolution images from the Extreme Ultraviolet Imager (EUI) on board Solar Orbiter. Using the EUI 174 Å data, we find many bright dot-like features (of size 0.3-0.5 Mm) that move up and down (often repeatedly) in the core of an active region and produce parabolic tracks in a space-time map, akin to the chromospheric observations of DFs. Properties such as their speeds, lifetime, deceleration and lengths are also reminiscent of the chromospheric DFs. All this evidence strongly suggests that these bright EUV dots are basically hot tips of the cooler chromospheric DFs. Additionally, we observe that DFs located close to a sunspot exhibit higher speeds and stronger deceleration as compared to DFs that emerge from moss-type regions. Interestingly, not all of these differences are similar in nature to that of their chromospheric counterparts and therefore, our results pose new questions regarding the complex interplay between the driving mechanism of DFs, their magnetic field topology and their coronal counterparts. I will further discuss their evolutionary scenarios in corona (1 MK plasma) and transition region (0.1 MK plasma) using co-observations with IRIS and put those results in the context of the recent MHD modeling of DFs.

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Session Classification: Posters

Track Classification: Corona