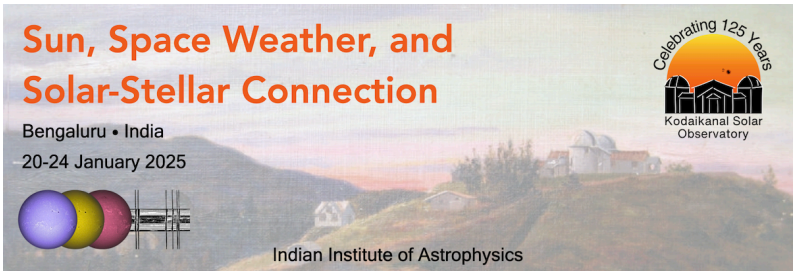

Contribution ID: **168** Type: **Contributed talk**

Transition Region Brightening in a Moss Region and their Relation with Lower Atmospheric Dynamics

Wednesday, January 22, 2025 9:40 AM (15 minutes)

Small-scale Brightenings (SBs) are commonly observed in the transition region that separates the solar chromosphere from the corona. These brightenings, omnipresent in active region patches known as “moss”regions, could potentially contribute to the heating of active region plasma. In this study, we investigate the properties of SB events in a moss region and their associated chromospheric dynamics, which could provide insights into the underlying generation mechanisms of the SBs. We analyzed the data sets obtained by coordinated observations using the Interface Region Imaging Spectrograph and the Goode Solar Telescope at Big Bear Solar Observatory. We studied 131 SB events in our region of interest and found that 100 showed spatial and temporal matches with the dynamics observed in the chromospheric Hα images. Among these SBs, 98 of them were associated with spicules that are observed in Hα images. Furthermore, detailed analysis revealed that one intense SB event corresponded to an Ellerman Bomb (EB), while another SB event consisted of several recurring brightenings caused by a stream of falling plasma. We observed that Hα far wings often showed flashes of strong brightening caused by the falling plasma, creating an Hα spectral profile similar to an EB. However, 31 of the 131 investigated SB events showed no noticeable spatial and temporal matches with any apparent features in Hα images. Our analysis indicated that the predominant TR SB events in moss regions are associated with chromospheric phenomena primarily caused by spicules. Most of these spicules display properties akin to dynamic fibrils.

Contribution Type

Theme

Solar Magnetism in High-Resolution

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