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Segmentation of Full-Disk H-alpha Images to Understand the Lower Solar Chromospheric Variability

Segmentation of Full-Disk H-alpha Images to Understand the Lower Solar Chromospheric Variability

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The CaII H and K resonance lines are widely used to study the solar chromospheric structures and their variability. These lines are very sensitive to the variations in temperature and the magnetic field strength, therefore they are excellent indicators of the chromospheric structural changes related to solar magnetic activity. The studies on the lower chromospheric variability using H-alpha images have not been done. It is important to study the lower chromospheric variability by segmenting the different chromospheric features from the spatially resolved full-disk H-alpha images.

We have developed an algorithm in python to analyze the full disk H-alpha images observed from Kodaikanal Solar Observatory (KSO) and National Astronomical Observatory of Japan (NAOJ) for the period: 2014 to 2024. We have segmented the spatially resolved H-alpha images and extracted the different features such as bright faculae, dark filaments and background regions to understand the lower chromospheric variability. The intensity and area of the segmented features are determined. The contributions of the segmented H-alpha features to total lower chromospheric variations are estimated. The preliminary results of the intensity and area variations of all features and their contributions to total lower chromospheric variability will be discussed in this paper. The results obtained from both KSO & NAOJ images will be inter-compared.

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