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Onset time estimation of eruptive filaments using Halpha line center and Doppler images.

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A dual-beam H-alpha Doppler system is being developed at the Udaipur Solar Observatory (USO) in order to record images of quiet, activated and erupting filaments on the Sun, with special emphasis on the study of those that are associated with geoeffective coronal mass ejections. These H-alpha line center images will be complemented with near co-temporal Doppler images. These images can also be compared with multi-wavelength images obtained from space missions such as STEREO, SOHO and Hinode.

In order to understand the potential of these observations, we have used the existing data-sets from different ground based observatories and implemented our analysis technique. The technique involves implementation of an automated detection algorithm developed by us for estimation of different attributes of a filament and study its evolution during its eruption using full disk H-alpha and Doppler images. The analysis is important for determining the exact onset time of the filament eruption based on these attributes. We also compare the onset time of eruptive filament with that of the associated CMEs observed by LASCO coronagraphs and EUV images. In this paper, we present our results to highlight the importance of such studies in understanding the mechanism of CME initiation and possible role of eruptive filaments for the same.

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