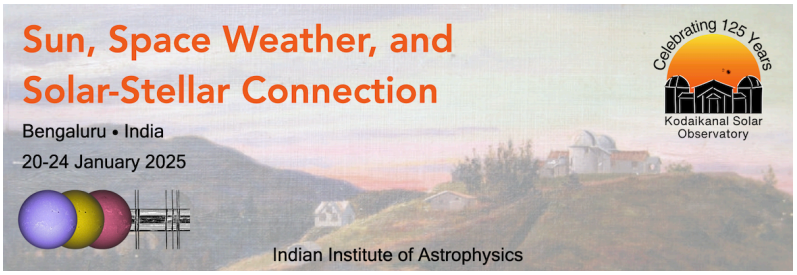

Contribution ID: **147** Type: **Poster**

A statistical study of Ephemeral Regions through HMI Magnetograms

Solar activity is readily observed through the emergence of magnetic structures of varying sizes on the solar surface. While larger magnetic regions have been extensively studied and are well understood, Ephemeral Regions (ERs) represent small-scale, short-lived magnetic features that frequently emerge on the photosphere throughout all phases of the solar cycle. The magnetic flux of ERs ranges from 3×10^{18} Mx to 9×10^{20} Mx (Harvey, 1993), and due to their relatively low contrast, they are not typically visible in white-light images. ERs are thought to play a critical role in terms of the flux budget of Sun and heating the solar corona. Detecting and analyzing ERs is essential for understanding their origin (either through small-scale or large-scale dynamos) and dynamics of solar magnetism at finer scales. In this study, we use line-of-sight magnetogram data from HMI to systematically identify and track ERs with a modified version of the AutoTAB algorithm (Sreedevi et al., 2023, ApJS, 268, 58). Our analysis covers an entire solar cycle, allowing us to explore the emergence, evolution, and decay of ERs across different solar activity phases. We investigate the spatial and temporal characteristics of ERs, their tilt distribution, adherence to Joy's law, and their role in small-scale dynamo processes. In this poster, we present the initial results of this study.

Contribution Type

Poster

Theme

Solar Magnetism over Long-Time Scales

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