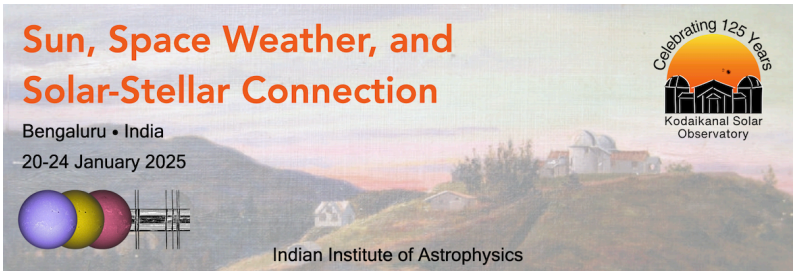

Contribution ID: **82** Type: **Poster**

Solar Chromospheric Differential Rotation Using Ca-K Features Derived from Kodaikanal Data

Solar differential rotation plays an important role in the generation of Sun's magnetic fields and its activities. For the present work, the digitized data of four chromospheric features viz plage area, enhanced network (EN), active network (AN), and quiet network (QN) obtained from Kodaikanal Observatory for the period 1907-1996 are used to investigate the differential rotation at different latitude belt from 0 to 80 degrees with a step size of 10° in both hemispheres. We find that plages and all types of networks exhibit the differential rotation of the chromosphere. Furthermore, the rotation rate shows a decreasing pattern as one move from the equator to the higher polar latitudes for all the features used in the study. At the equator, the rotation rate (rotation period) is obtained to be ~13.98° day^{-1} (25.74 days), ~13.91° day^{-1} (25.88 days), ~13.99° day^{-1} (25.74 days), and ~14.11° day^{-1} (25.51 days) for plage, EN, AN, and QN areas, respectively. By analyzing how the area of chromospheric features varies over time, we can effectively map the Sun's rotation rate at all latitudes, including the polar regions. Interestingly, both plages and small-scale networks exhibit a similar differential rotation rate. This suggests these features likely rooted at the same layer below the visible surface of the Sun. Therefore, the long-term Ca-K data is very useful for studying the solar rotation rate at all latitudes including the polar regions.

Contribution Type

Theme

Solar Magnetism over Long-Time Scales

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