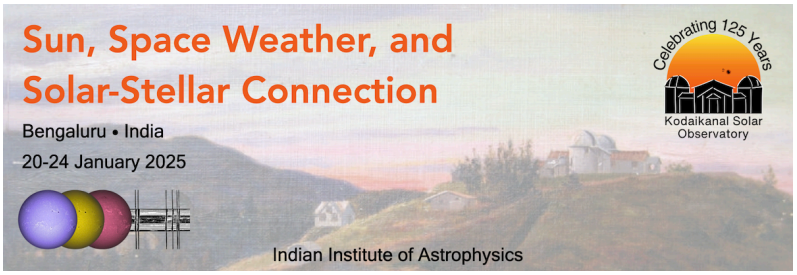

Contribution ID: **179** Type: **Poster**

Extracting the h| E & h| F of the ionospheric layers using the digitized Kodaikanal ionograms

Earth's ionosphere owes its existence to the ionization of the neutral constituents by the Solar Extreme Ultraviolet (EUV) and Soft X-ray (SXR). This results in the creation of ionospheric layers like D, E, and F. These layers are distinct only during the daytime ionosphere, and features can be well noticed at the equatorial latitudes. Each layer has its maximum density at a certain altitude, and the density decreases with an increase in height. The peak density and peak height of the E and F layers of the ionosphere can be well understood by probing them at their critical frequencies. These ionospheric features can be well studied using the HF (High Frequency) radar, which is also known as Ionosonde. Ionograms record these high-frequency radio waves reflected back by the ionosphere at different altitudes.
The c3 ionosonde at Kodaikanal solar observatory started collecting data of the ionosphere above India (latitude 10° 13' 50" N, longitude 77° 28' 07" E, geomagnetic latitude 0.8° N) from 1950 to 1990, and this location suitable for studying the equatorial-latitude ionospheric phenomenon. The ionosonde operates between the frequency of 1 to 20 MHz, and the ionosphere can be probed up to an altitude of 1000km. The ionograms were captured using 35mm film on a C-3 analog ionospheric recorder. Now, these ionograms are digitalized (still undergoing) using the CCD camera (4K X 4k) with 32-bit resolution. We have used the image processing technique to identify the critical frequency and the corresponding height of both the h| E and h| F layers. Understanding the peak density and peak height of these layers will provide critical information on how the earth's ionosphere responds to the change in the solar irradiance variation and also to the high energy particle precipitation events.

Contribution Type

Theme

Connecting Solar Corona to Heliosphere

Primary author: GRAMAPUROHIT, Pavan

Co-authors: Dr K B, Ramesh (Indian Institute of Astrophysics); K, Nagaraju (Indian Institute of Astrophysics); B, Ravindra (IIA, Bangalore); Mr R, Ashrith (National Atmospheric Research Laboratory); Dr HEGDE, Manjunath (Indian Institute of Astrophysics)

Presenter: GRAMAPUROHIT, Pavan