Nancy Narang

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Research

Presently working as a Ph.D. student at Indian Institute Astrophysics under the supervision of Prof. Dipankar Banerjee, my research focusses on small-scale features and transients observed in different layers of the solar atmosphere. It has become increasingly clear that small scale phenomena have a key role in maintaining the background temperatures of more than a million Kelvin in the corona and accelerating the solar wind. The study of small-scale transients majorly includes the investigation of their morphology, spectral properties, mechanisms of evolution, determination of plasma parameters and clarification of the connection between the observed properties at different heights and photospheric magnetic fields. I mostly perform detailed data-analysis of multi-wavelength observations obtained from different space-based instruments in order to obtain the possible association between different small-scale events observed from the photosphere to the corona.

Contribution to the Meeting: Oral Presentation

TITLE: IRIS VIEW ON MULTI-COMPONENT STRUCTURE OF SOLAR TRANSITION REGION

High-resolution observations from IRIS have provided detailed information of the fine structure of the less studied solar transition region, a layer between chromosphere and corona. In recent past, it has been claimed by many authors that the transition region emission lines often shows a "Two Gaussian Component Profile". Using IRIS observations, we aim towards the investigation of the sources of the two components by examining the corresponding features in slit-jaw images. These two components might be resulting from the network background with network jets and small cool loops. Using joint spectral and imaging observations of IRIS in a coronal hole, the spectral properties of different spatial structures are studied. From our analysis which is based on reduced chi-square test, we can conjecture that the double gaussian profile model is better than single gaussian model near and at the locations of network boundaries. We observe no one to one correlation among the fitted spectral parameters of the second component except for some locations where high doppler speeds (20-50 km/s) are mostly accompanied by presence small doppler widths ($<$40 km/s). On comparison with slit-jaw images, these locations can be clearly regarded as the locations of presence high speed collimated and short-lived transient flows or network jets. We can mainly conclude that the 2nd component of double gaussian fitting indeed reveals the presence the transients in chromosphere and TR. Hence, double gaussian model fitting to the spectral profiles is necessary to study small-scale short-lived transients in details.

Benefits from the Meeting

I am greatly obliged to Solar Physics Division of American Astronomical Society for the award which enabled me to attend the meeting and present my research work as a Metcalf Lecturer. This provided me a unique opportunity to have many fruitful discussions with the other participants of the meeting which improved my present study and future work plan. This meeting has also provided me a wide exposure to different aspects of solar physics which will assist in the growth of my research career.