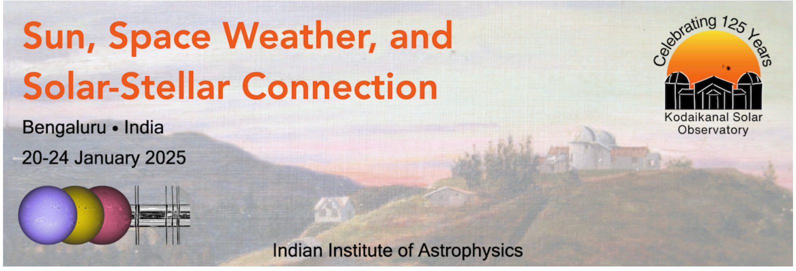

Contribution ID: **190** Type: **Poster**

Energetic and Kinematic Properties of Recurrent Solar Active Region Jets: Multi-Wavelength Analysis with AIA and IRIS Observations

Solar jets are described as collimated, beam-like structures that eject plasma along straight or slightly oblique magnetic field lines. They can be observed from the lower solar atmosphere up to the corona, spanning a wide range of temperatures. In this study, we present an analysis of recurrent solar jets observed on 6 March 2022 near the active region NOAA 12960, using data from the Atmospheric Imaging Assembly (AIA) onboard the Solar Dynamics Observatory (SDO) and the Interface Region Imaging Spectrograph (IRIS). The jets were observed in various passbands of AIA and multiple spectral channels of IRIS, enabling a comprehensive examination of their dynamics and energetics.

We calculated the kinematic properties of four distinct jets, including length, width, duration, and velocity, and estimated mean temperature, as well as electron density, using the differential emission measure (DEM) technique. Using the intensity ratio of the O IV 1399.77/1401.16 Å lines, we further estimated electron densities and energy fluxes within the jets. To investigate the magnetic origins of these jets, we incorporated magnetogram data from the Helioseismic and Magnetic Imager (HMI) onboard SDO. This magnetic field analysis revealed that flux emergence and cancellation events near NOAA 12960 likely contributed to magnetic reconnection, driving the observed jet eruptions. A crude estimate of the energy flux components —kinetic flux, potential flux, enthalpy flux, radiative flux and magnetic flux are calculated —indicating that kinetic and enthalpy fluxes were the largest contributors to the total energy budget of these jets, highlighting their dominant role in jet dynamics.

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Theme

Energetic Phenomena

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