Soumya
Yadav
University of Lucknow
Poster
Auroral latitude expansion during geomagnetic disturbances is commonly interpreted as a response to global storm strength inferred from point measurements of the upstream solar wind at L1. However, many events exhibit unusually large auroral expansions under only moderate geomagnetic and IMF conditions, indicating that spatial and temporal structure in the solar wind is not fully captured by conventional indices. The Polarimeter to Unify the Corona and Heliosphere (PUNCH) mission provides continuous wide field white light imaging of heliospheric density, enabling direct observation of propagating solar wind density enhancements such as compressive fronts and sheaths. In this study, PUNCH observations are used to identify and track these density enhancements as they propagate through the inner heliosphere, estimate their kinematics from their evolving elongation and brightness, and relate their arrival at Earth to in situ solar wind compression and associated magnetospheric and ionospheric responses, including magnetopause motion, ionospheric convection, and particle precipitation. This approach establishes an observation driven framework for linking structured solar wind forcing to global auroral response and represents a practical step toward imaging-based characterization of geospace dynamics.
Meeting homepage
PUNCH 7 Science Meeting
Download Abstract