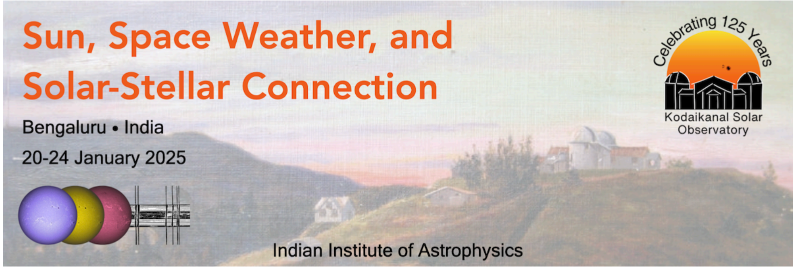

Contribution ID: **30** Type: **Poster**

Solar Wind-Magnetosphere Coupling Efficiency and Its Dependence on Solar Activity During Geomagnetic Storms of 23-24 Solar Cycles

Abstract

Space weather forecasts are of utmost importance in safeguarding navigation, communication, and electric power system operations, satellites from orbital drag, and the astronauts in the International Space Station from hazardous space radiation during extreme space weather conditions. The finest space weather prediction requires a clear understanding of solar wind-magnetosphere coupling. The in-situ measurements of the solar wind properties give unique information about the Sun and its activity on smaller to longer timescales. The present work investigates the influence of solar activity on the coupling of solar wind and Earth's magnetosphere during 23–24 solar cycles. The geomagnetic storms with Symmetric H-component (SYMH) ≤ −85 nT during the 23–24 solar cycles are considered. We present the results of statistical analysis and relationships between the various solar wind parameters such as the total strength of interplanetary magnetic field (B) and its three-axis components (Bx, By, and Bz), solar wind proton density (Nsw), solar wind speed (Vsw), SYMH indices, the amplitude, duration, and profile of the geomagnetic storms. The integrated electric field and integrated SYMH index during storms show the highest correlation of 0.92, implying that integrated SYMH is a better proxy of the injected solar wind energy in the magnetosphere in the form of the ring current. Moreover, we do see the difference in the solar wind-magnetosphere coupling efficiency during the phases of 23–24 solar cycles which is intriguing.

Contribution Type

Poster

Theme

Solar Magnetism over Long-Time Scales

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