

Topic: Overview of the Solar wind-Magnetosphere-Ionosphere-Atmosphere Coupling effects at low latitudes – particularly near the Dawn Terminator

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Abstract

The Solar wind-Magnetosphere-Ionosphere-Atmosphere coupling during geomagnetic storms is complex. The coupling effects vary with time as well as with latitude and local time. In-situ plasma density measurements onboard polar Low-Earth-Orbiting satellites are utilized to investigate the low-latitude electrodynamics near the dawn terminator during geomagnetic storms. Approximately 5-6 hours after the main phase onset, pronounced equatorial ionization anomaly (EIA) was observed, regardless of the polarity of the southward component of interplanetary magnetic field. This may indicate that the disturbance dynamo electric field is strongest and eastward near the dawn terminator after 5-6 hours from the storm onset, which continues for about 5-10 hours. This may be a peculiar feature of the disturbed time electrodynamics near dawn, giving a pre-sunrise enhancement or morning pre-reversal enhancement. Further, it is found that the occurrence of EIA is highest in the 180°-240°E longitude zone, and the strength of ExB drift also peaked in the same longitude sector.