

Project Details

ROSES ID: NNH05ZDA001N

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Program Element: Focused Science Topic

Topic: Storm effects on the global electrodynamics and the middle and low latitude ionosphere

Project Title:

Sub-Auroral Polarization Streams Effects on the Ionosphere and Thermosphere

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Summary:

The coupling processes within the magnetosphere/ionosphere/thermosphere system are a key area of research in the Sun Earth Connections theme. One dramatic manifestation of this coupling is enhanced sub-auroral electric fields, labeled sub-auroral polarization streams (SAPS) or sub-auroral ion drifts (SAID) (Galperin et al., 1973; Spiro et al., 1978, respectively). These events are of great importance in determining the temporal evolution of the ring current and thermal plasma distribution in the magnetosphere, ionosphere and plasmasphere.

In this proposal we will create a climatological picture of SAPS/SAID, including their conjugacy, frequency, and intensity. We will also investigate the mechanisms behind their formation and duration and the effect that SAPS/SAID have on ionospheric density and thermospheric composition through analysis of multi-satellite observations and simulations using the NCAR Thermosphere Ionosphere Electrodynamics General Circulation Model (TIE-GCM).

Publication References:

Summary: no summary

Reference: Ontiveros, Veronica; Vourlidas, Angelos; (2009), Quantitative Measurements of Coronal Mass Ejection-Driven Shocks from LASCO Observations, The Astrophysical Journal, Volume 693, Issue 1, pp. 267-275, doi: 10.1088/0004-637X/693/1/267

Summary: no summary

Reference: Vourlidas, Angelos; Ontiveros, Veronica; (2009), A Review of Coronagraphic Observations of Shocks Driven by Coronal Mass Ejections, SHOCK WAVES IN SPACE AND ASTROPHYSICAL ENVIRONMENTS: 18th Annual International Astrophysics Conference. AIP Conference Proceedings, Volume 1183, pp. 139-146, doi: 10.1063/1.3266770