RSPP seminars

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"Statistical patterns of ionospheric convection derived from mid-latitude, high-latitude, and polar SuperDARN HF radar observations"

The Super Dual Auroral Radar Network (SuperDARN) is an international collaboration of ground-based HF backscatter radars that are located in both the Northern and Southern Hemispheres. These radars are designed to measure the ExB plasma drift over large regions of the high-latitude ionosphere on timescales of 1 to 2 minutes. The versatile nature of these radars has enabled a variety of studies of the thermosphere, ionosphere, and magnetosphere as well as the coupling between these regions and the solar wind.

Global patterns of ionospheric convection have been widely studied in terms of the interplanetary magnetic field (IMF) magnitude and orientation using SuperDARN observations. The dynamic range of driving conditions under which existing SuperDARN statistical models are valid is currently limited to periods when the high-latitude convection pattern remains above about 60 degrees geomagnetic latitude. Conversely, under northward IMF conditions the high-latitude radars often experience difficulties in measuring convection above about 85 degrees geomagnetic latitude. In this presentation, we introduce a new statistical model of ionospheric convection which is valid for much more strongly dominant IMF Bz conditions than was previously possible by including velocity measurements from the newly constructed tiers of radars in the Northern Hemisphere at mid-latitudes and in the polar cap. We also consider the statistical convection morphology as a function of geomagnetic activity and the time history of the solar wind. These results are compared to previous models derived from high-latitude SuperDARN observations and their utility for ionospheric forecasting is examined.

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Thursday, February 8th at 1 pm in Physics LTB