2014 Workshop: PINOT Campaign

Long title
PINOT - The PFISR Ion-Neutral Observations in the Thermosphere Campaign
Description

The PINOT research campaign has successfully measured geophysical parameters in the auroral zone for much of November 2012 and March 2013, both of which included interesting storm periods, and periods of very quiet conditions. Another campaign was run for November-December 2013, which was coordinated between PFISR, Sondrestrom, RISR, and Eiscat, to explore the linkages across the polar cap. While the late 2013 even had poor weather for optical measurements, the other time periods were extremely good, and there are many interesting phenomena that were observed and are being studied. We invite researchers who have either explored these data sets or are interested in collaborating on these data sets to attend the session.

Justification

PINOT– The PFISR Ion-Neutral Observations in the Thermosphere is a research campaign currently in its second year. PINOT focuses on the study of ion-neutral interactions using the Poker Flat Incoherent-Scatter Radar and collaborating instruments.

Near-Earth space at auroral latitudes is where the majority of solar wind energy couples to the Earth’s upper atmosphere. The coupling comes through the interaction of ions and electrons with the neutral gas, which occurs at the atomic level when the fast-moving charged particles driven by electric fields of magnetospheric origin collide with the neutral atoms and molecules. This interaction drives neutral winds, heats the gas, and generates waves and turbulence. The interaction and its results are dynamic and complex, and only partially understood. Developing a more complete understanding of the interaction and associated phenomena is the objective of the majority of the aeronomy community. PINOT is attempting to advance that understanding through a coordinated campaign of observations and modeling using the Poker Flat Incoherent-Scatter Radar (PFISR), the Resolute Bay Incoherent-Scatter Radar (RISR), a variety of optical instruments,

the Super Dual Auroral Radar Network (SuperDARN), the Homer VHF radar, and the Global Ionospheric-Thermospheric Model. The investigation is divided into three sub-investigations:

1. Magnetospheric drivers of the I-T state variables
2. Waves and Turbulence
3. Magnetospheric dynamics inferred from the I-T response.

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