2013 Workshop: PINOT Campaign Year 1

Long title
PFISR Ion-Neutral Observations in the Thermosphere Campaign Year 1
Conveners
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PINOT Team
Description

PINOT– The PFISR Ion-Neutral Observations in the Thermosphere is a research campaign currently in its first 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 campaign 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.

We propose a workshop to evaluate the first year of the campaign, to present results, and to prepare for the second year.

Justification

The PINOT campaign addresses coupling of the ion fluid and neutral fluid in the thermosphere. Understanding this coupling is of fundamental importance to developing our knowledge of the atmosphere-ionosphere-magnetosphere system as a whole. The campaign is a funded NSF program directed toward furthering our understanding. The questions formulated in the PINOT proposal are being addressed through a series of observational campaigns combined with data analysis and modeling. The observational and modeling resources exist and are being used.

Summary

The PINOT campaign addresses coupling of the ion fluid and neutral fluid in the thermosphere. Understanding this coupling is of fundamental importance to developing our knowledge of the atmosphere-ionosphere-magnetosphere system as a whole. The campaign is a funded NSF program directed toward furthering our understanding. The questions formulated in the PINOT proposal are being addressed through a series of observational campaigns combined with data analysis and modeling. The observational and modeling resources exist and are being used.

The PINOT campaigns were held between

November 5-25, 2012

March 8-19, 2013

Scanning Doppler Imager (Conde) data can be found through the monthly browser. Put in the date, station and wavelength to view summary plots, or download ASCII data. ASCII data readers for IDL are available from the PI.

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