2015 Workshop: Topside/bottomside dynamics

Long title
C/NOFS: Topside/bottomside dynamics
Conveners
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Description

The C/NOFS (Communication/Navigation Outage Forecast System) satellite was launched in 2008 into a 13° elliptical orbit. Currently it is the only satellite monitoring the equatorial space environment. It is predicted to re-enter the atmosphere sometime in October or November 2015, providing a unique opportunity to collect a comprehensive set of low-altitude measurements as the orbit decays. This final phase of C/NOFS is being called T-RREX, the Thermosphere Research and Reentry Experiment. Its primary goals are to advance our understanding of topside/bottomside dynamics and to improve models for trajectory propagation, orbital drag, and uncontrolled reentry predictions.

As the orbit rapidly degrades, C/NOFS is gathering unprecedented observations of neutral winds, neutral densities and pressure, electric fields, plasma densities, and plasma drifts at low altitudes in the low latitude ionosphere. This comprehensive set of fundamental measurements has never been obtained before and is not obtainable again in the forseeable future. Of particular interest are observations of (1) bottomside irregularities; (2) large scale waves in the lower ionosphere; and (3) neutral winds, a key driver of ionospheric irregularities and an important aspect of understanding atmospheric drag.

Short presentations (5 slides max) that address any of these areas are welcome, as well as any ideas on how best to leverage this unique opportunity.

Justification

The C/NOFS satellite database currently being obtained will contribute to Strategic Thrust 2 of the CEDAR Strategic Plan: Explore exchange processes at interfaces and

boundaries, as well as to one of the overarching goals of the Decadal Survey for Solar and Space Physics: determine the dynamics and coupling of Earth’s magnetosphere, ionosphere, and atmosphere and their responses to solar and terrestrial inputs.

C/NOFS is now regularly observing the bottomside ionosphere with an instrument suite that measures ion densities, velocities, and temperatures, line of sight TEC, electric and magnetic fields, and neutral densities and winds.

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