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**C/NOFS and the Air Force Research Laboratory's Thermospheric Research and Reentry EXperiment (T-RREX)**

Abstract:

The Air Force Research Laboratory's Conjugate Point Study leveraged a unique opportunity with the Communication/Navigation Outage Forecasting System (C/NOFS) to make coincident measurements from the satellite and networks of ground stations to specify effects of atmospheric wave activity on the structure of the ionospheric F-layer. The primary objective was to integrate C/NOFS plasma density and drift measurements with ground-based observations of disturbances within magnetic flux tubes to address outstanding scientific questions regarding relationships between plasma fluctuations in the topside ionosphere and wave-like structures generated at bottomside altitudes where satellites have little or no direct access.

This project yielded new insights into the dynamics of ionosphere-neutral atmosphere interactions known to affect operational systems, but there is still much work to be done in understanding the mechanisms that couple the topside and bottomside of the ionosphere. The goal for this next and final phase of the C/NOFS mission is to continue gathering a comprehensive set of low-altitude data that will advance our understanding of bottomside specification, orbital drag, and uncontrolled reentry.