Abstract Submitted
for the TSF06 Meeting of
The American Physical Society

Simulation of the formation of O+ density troughs in the polar cap magnetosphere using the UT Arlington DyFK model FAJER JAAFARI, JAMES HORWITZ, WEN ZENG, The University of Texas at Arlington — Measurements of the O^+ densities in the polar cap near 5000 km altitude display normal and low density (trough) regions. In this presentation, we use the UTA Dynamic Fluid-Kinetic (DyFK) model to simulate such O^+ density profiles observed by the Thermal Ion Dynamics Experiment (TIDE) on the POLAR spacecraft. Using solar wind parameters and incorporating Cleft Ion Fountain effects for these events to drive a time-varying high-latitude convection model and auroral processes of soft electron precipitation, we simulate the evolving high-latitude ionospheric plasma transport and associated parameter profiles for several convecting flux tubes in the high-latitude ionosphere-magnetosphere system. For the convection patterns thus computed, these flux tubes nominally intersected the POLAR trajectory where the density measurements were made. It is found that, owing chiefly to F-region recombination processes during trajectory segments when the low altitude portions of such flux tubes in darkness, as well as incorporating CIF effects in the dayside auroral region, normal and low trough-like densities at higher altitudes developed along some of these flux tubes. The simulations of the density profiles for these flux tubes will be compared with measured POLAR/TIDE-measured O^+ densities for inside and outside of these regions. This work was completed under financial support by NASA grant NNG05GF67G and NSF grant ATM-0505918 to the University of Texas at Arlington.

James Horwitz
The University of Texas at Arlington

Date submitted: 05 Sep 2006 Electronic form version 1.4