

24 -- 2017-02-28 16:49:54

Session 7B Paper 1

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### **The influence of the ionospheric dynamo on the shape of the plasmasphere**

The Naval Research Laboratory SAMI3 (Sami3 is Also a Model of the Ionosphere) code is used to model observed plasmasphere dynamics for 1–5 February 2001, a geomagnetically quiet period.

The SAMI3 model is driven at high latitudes by the magnetospheric potential calculated by the Weimer05 empirical model, using the observed solar wind. At middle-to-low latitudes, the self-consistent ionospheric dynamo is computed, driven by thermospheric winds. We find that the shape of the plasmasphere, at any given time, varies significantly with the wind model even as a similar degree of

model-data agreement is recovered for each of the three wind models used. Diurnal oscillations in the

model electron density, which are strong when plotted at fixed magnetic local time, are consistent with the degree of variation seen in the measured densities. In all three cases, SAMI3 compares favorably to the electron density measured in situ by the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) spacecraft. Results with no winds or with specific wind effects excluded show that wind-driven  $E \times B$  drifts shape the plasmasphere, relative to a round plasmasphere with no winds.