

Title: Coupled Magnetosphere-Ionosphere-Thermosphere Simulation of the System Response to a Sudden Reversal in the Interplanetary Magnetic Field B_y Component

Student: Pauline M. Dredger, Kansas State University

Mentors: Rick Wilder, Stefan Eriksson (LASP)

Abstract: Observations from the Cluster mission and the Super Dual Auroral Radar Network (SuperDARN) showed a delayed response of the lower latitude ionospheric ExB drift to a rapid rotation of the interplanetary magnetic field (IMF) B_y component on March 6, 2006. One hypothesis is that this delay is caused by the finite rate of magnetic reconnection in the magnetopause, that is, over-draped IMF lines need to be cleared before the new orientation of IMF can begin a new pattern of reconnection. We use the Coupled Magnetosphere-Ionosphere-Thermosphere (CMIT) simulation to investigate both the ionospheric convection pattern and magnetospheric topology during this event to find evidence for an extended transition period in the reconfiguration of the cusp and dayside reconnection x-line. Although the simulation exhibited a different local time response from the observations, it was able to qualitatively recreate the ionospheric convection pattern and the lower latitude time delay in its reconfiguration. We also show a remnant dayside x-line coexists with the reconfigured x-line for a time comparable to the initial ExB drift delay.