LINKING PLASMA CONDITIONS IN THE MAGNETOSPHERE WITH IONOSPHERIC SIGNATURES

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Modeling of the full magnetosphere, ring current and ionosphere system has become an indispensible tool in analyzing the series of events that occur during geomagnetic storms. The CCMC has a full model suite available for the magnetosphere, together with visualization tools that allow a user to perform a large variety of analyses.

The January, 21, 2005 storm was a moderate-size storm that has been found to feature a large penetration electric field and unusually large polar caps (low-latitude precipitaion patterns) that are otherwise found in super storms. Based on simulations runs at CCMC we can outline the likely causes of this behavior. Using visualization tools available to the online user we compare results from different magnetosphere models and present connections found between features in the magnetosphere and the ionosphere that are connected magnetically. The range of magnetic mappings found with different models can be compared with statistical models (Tsyganenko) and the model's fidelity can be verified with observations from low earth orbiting satellites such as DMSP and TIMED.