A study of the magnetosphere-ionosphere-thermosphere coupling and its impact on lower latitude ionosphere

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The Coupled Magnetosphere-Ionosphere-Thermosphere (CMIT) model is the geospace component of the Center for Integrated Space weather Modeling (CISM) suite of Sun-to Earth models. The CMIT model includes the Lyon-Fedder-Mobarry (LFM) global MHD code and the National Center for Atmospheric Research (NCAR)-Thermosphere- Ionosphere-Electrodynamic Global Circulation Model (TIEGCM). These two models are coupled by exchanging information about electric fields, particle precipitation, ionospheric conductance, and neutral-wind -generated, field-aligned currents at high latitudes. The CMIT model has been run to simulate the geospace response to the April 2004 geomagnetic storm. We investigate global neutral wind variations during the storm, changes in the dynamo field induced by these variations, and their effects on ionospheric F region electron densities. Large changes are seen in these fields during this storm.