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The Observation and Simulation of the Ionospheric Response to CIR-Induced Geomagnetic Activity on April 4, 2005

Abstract:

The ionospheric response to CIR-induced geomagnetic activity on April 4, 2005 was analyzed both from the global GPS-TEC data and the simulation of TIEGCM. The result showed the ionospheric positive response can be observed from high to low latitude. The duration of the positive at low latitude can continue for several days. The modeling result showed the penetration electric fields was responsible for the positive response at middle and low latitude during the initial and main phase of the geomagnetic storm. The long-duration positive during the recovery time at low latitude was found to be related to the thermospheric composition (O/N₂) changes during the storm.