

DUAL REVERSED CONVECTION UNDER NORTHWARD IMF: A COMPREHENSIVE OBSERVATIONAL AND NUMERICAL INVESTIGATION

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We present a case study of dual reversed convection configuration in both the northern and southern hemispheres on November 9, 2004 when the IMF was strongly northward. At the same time, the solar wind dynamic pressure was highly elevated and the IMF B_x component was negative. Comprehensive space and ground based observations are examined to unveil global magnetospheric and ionospheric electrodynamic properties under northward IMF conditions, including the Cluster satellites located near the high-altitude southern cup region, the low-altitude DMSP spacecraft, and ground radar network and magnetometer chains. Global patterns of high-latitude ionospheric convection and field-aligned currents are obtained from the assimilative mapping of ionospheric electrodynamics (AMIE) procedure to investigate the possible external drivers for the reversed convection flows. In addition, global MHD simulations are carried to investigate the physical processes involved in the solar wind-magnetosphere-ionosphere interaction, particularly, the reconnection configuration at the magnetopause under northward IMF, the transport of mass and energy, and the coupling between the magnetosphere and the ionosphere.

Solar wind-magnetosphere-ionosphere coupling; northward IMF; ionospheric convection

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