

Local Time Variation of Low-Latitude Electric Fields During the November 20-21, 2003 Magnetic Superstorm

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ROCSAT-1 ion drift meter and retarding potential analyzer measurements are used to deduce convective electric fields during the magnetic superstorm of November 20-21, 2003. ROCSAT-1 with an inclination angle of 35° provided global survey of convective electric fields up to 35° magnetic latitudes. Convective electric fields as large 10 mV/m were measured during the main phase magnetic superstorm and decayed with time as storm activity subsided. In general the radial electric field was larger than the zonal electric field. In this paper we focused on local time variation of zonal and radial components of electric fields. Enhancements of electric fields were found in the dusk and dawn sectors. The local time profile of electric fields contains localized features in association with density depletion and enhancement structures. We interpret the enhancement and local time variation of the low-latitude electric field as caused by ring current penetration to lower L-shell on the equatorial plane and coupling to the ionosphere through field-aligned currents.

Reference

 C. S. Lin and H.-C. Yeh, Satellite observations of electric fields in the South Atlantic anomaly region during the July 2000 magnetic storm, to be published in J. Geophys. Res., 2005.