

Peculiarities of meridional propagation of sudden commencement during the magnetic superstorm of November 7-10, 2004: Influence of IMF By

A.V. Moiseyev (1), S.I. Solovyev (1), A. Du (2), K. Yumoto (3), M. Engebretson (4)

(1) Yu.G.Shafer Institute of Cosmophysical Research and Aeronomy, Yakutsk, Russia, (2) Institute of Geology and Geophysics, Beijing, China, (3) Space Environment Research Center, Kyushu University, Fukuoka, Japan, (4) Augsburg College, 2211 Riverside Avenue, MN 55454-1338, Minneapolis, USA (moiseyev@ikfia.ysn.ru / Fax: +7-4112-335551 / Phone +7-4112-335551)

Based on global geomagnetic observations a character of meridional propagation of sudden commencement (SC) events of November 7, 2004 at 1052 UT and November 9, 2004 at 1850 UT depending on the IMF By direction are studied.

By data of the spacecraft ACE, IMF By has the following values: $B_y = -2 -15$ nT and $-2 +7$ nT during the first and the second SC, respectively.

The following regularities of meridional propagation are noted:

1. SCs propagate poleward at low latitudes and equatorward at higher latitudes. The poleward velocity of SC propagation decreases as the geomagnetic latitude increases up to 67-70 degs and equatorward velocity increases beginning from the same latitudes.
2. Meridional propagation in these events is of asymmetric character relative to the mid-noon meridian: at $B_y < 0$ the equatorward propagation is dominant in the pre-noon sector, in the post-noon sector the poleward propagation is prevail. At $B_y > 0$ the reverse picture is observed.

It is supposed, that the observed regularities of SC propagation is associated with the direction of convection electric field determined by the IMF By sign.

This work was supported by the Russian Foundation for Basic Research, project no. 06-05-96118 and partially by the program of presidium of RAS no.16, p.3.