

# **Geomagnetic field and aurora reaction to the sharp increase of dynamic solar wind pressure during the magnetic superstorm of November 7, 2004**

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On data of global geomagnetic observations and auroral TV registration at Tixie (MLat  $\sim 66$  deg, MLong  $\sim 190$  deg) the properties of sudden commencement (SC) at 1827 UT on November 7, 2004 and their manifestation in spatial-temporal dynamics of auroral luminosity in the morning ( $\sim 0330$  MLT) sector are studied. SC was registered at both positive IMF By and Bz components by ACE spacecraft data.

It is established that in general SC propagated eastward in azimuth direction and toward the pole in meridional direction. SC propagates poleward at low latitudes and equatorward at higher latitudes. The meridional propagation velocities in the range of 1-7 km/s was registered. The poleward propagation velocity decreased with increasing of geomagnetic latitude to 67-70 deg and equatorward velocity increased beginning from these latitudes. Two typical velocities of azimuth propagation  $V_1 \sim 20-60$  km/s and  $V_2 \sim 5-15$  km/s was obtained. The SC generation was accompanied by simultaneous brightening of auroral arc with a consequent poleward extension of luminosity region in the morning hours and the spatial-temporal modulation of brightness of auroral luminosity with periods  $T \sim 5-6$  min. The enhancement of brightness and poleward extension of luminosity region were simultaneously observed with the enhancement of positive values of the geomagnetic field H-component and the shift of maximum values of  $\Delta H$  poleward with the velocity  $\sim 2,2-2,6$  km/s.

The SC also led to the excitation of geomagnetic pulsations with  $T \sim 2-3$  min in the Pc 4 range at latitudes  $\leq 60$  deg in all temporal sectors which were registered up to 2000 UT and accompanied by wavy distortions of auroral arc at MLat  $\sim 60$  deg at 0330-0500 MLT.

The role of MHD wave, variations of ionospheric conductivity and field-aligned currents in generation of SC and Pc 4 pulsations is discussed.

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