Geophysical Research Abstracts, Vol. 8, 01895, 2006
SRef-ID: 1607-7962/gra/EGU06-A-01895

Coupling between the solar wind and the Earth during the coronal mass ejection with northward IMF rotation

E. Belenkaya
Institute of Nuclear Physics, Moscow State University, Russia (elena@dec1.sinp.msu.ru)

The interaction of coronal mass ejection with the Earth's magnetosphere is considered for the specific case in which there is a sharp increase in the dynamic pressure (interplanetary shock) that is associated with a simultaneous northward turning of the interplanetary magnetic field (IMF). The large-scale topology of magnetic reconnection is described for this case. It was found that under these conditions, the so-called transition current system exists temporary in the high-latitude magnetosphere. In this three-dimensional system, the energy is transferred from the solar wind across the magnetopause to the Earth by the field-aligned currents. The transition current system includes the field-aligned NBZ-currents, the ionospheric Pedersen currents in the region of open field lines in the polar caps, and the field-aligned currents concentrated at the ionospheric open-closed field line boundary. The MHD generator of the solar wind is connected to the ionosphere by the NBZ currents. They are distributed poleward of the Region I field-aligned currents and their intensity increases approaching the cusp. We consider the dependence of the distribution of field-aligned currents in the transition current system to the radial and azimuthal components of the solar wind magnetic field.