

Duskside proton auroral dynamics related to magnetospheric boundary processes induced by solar wind fast shocks

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We carried out proton aurora observation with an all-sky proton aurora imager at Longyearbyen (75.3 N invariant latitude) in Svalbard. Intense proton aurora with a peak intensity of 300 R occurred associated with the arrival of solar wind fast shocks for the interval 14-16 UT on November 26, 2000. By comparing the aurora data with DMSP, GEOTAIL, Polar and IMAGE spacecraft data, we have concluded that this proton aurora event is a result of precipitation of protons with an energy of 10 keV in the boundary plasma sheet (BPS) adjacent to the duskside magnetopause. Two possible mechanisms are discussed to produce such high energy protons in the duskside BPS. One is the compression of the magnetosphere induced by enhanced solar wind pressure and the other is the effect of SSC-induced substorms.