

Proton distribution observed by NOAA/POES multi-satellites during the November, 2004 magnetic storm

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We studied the spatial and energy distribution of protons at low-altitudes using the multiple observations of the NOAA/POES satellites (N15, N16, N17) from July 2002 until now, particularly during the November 2004 geomagnetic storm in detail. These satellites observe eV to MeV ordered particles at altitudes of about 800 km and across the magnetic footprint of the ring current region. The orbit of three satellites can cover all magnetic local times (MLT) during a storm event. We estimated the total energy of particles using observed flux of all energy ranges at ring current region. It is found that the total energy of particles estimated from NOAA observations is well correlated with those estimated from Dst based on the Dessler-Parker-Scopke relation. The flux observed by the 30-80 keV channel contributes largest to the total energy. In addition, the time variation of the total energy of particles during magnetic storms tends to follow the negative peak of Dst. The November 2004 storm, in which the two peaks of development appear under the effect of two solar wind shock events, shows interesting examples of this tendency.