

Storm-time variation of the horizontal and vertical components of the geomagnetic fields and rate of induction at different latitudes

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Abstract

The paper presents the hourly mean variation of horizontal (H) and vertical (Z) components of the geomagnetic field and the rate of induction DH/DZ at different latitudes during magnetic storm of 20 March 2001 and 1 October 2001. The results of the analysis revealed that at high latitude stations greater than 60° , the reduction in DH component was noticed after the noon time while other stations less than 60° experienced reduction of H in the morning time during the geomagnetic storm. Large amplitude of DH and DZ were exhibited during the daytime over the equatorial zone, the amplitude decreases from mid latitudes to the dip equator during the nighttime. The daytime enhancement of DH at AAE, BAN and MBO suggest the presence of a strong eastward directed current which comes under the influence of electrojet. There were strong positive and negative correlations between ring current (DR) and horizontal component of the magnetic field DH. The effect of rate of induction is more significant at high latitudes than lower latitudes, during the geomagnetic storm. More enhancement in rate of induction occurred at nighttime than daytime. This result may be from other sources other than the ionosphere that is magnetospheric process significantly contributes toward the variation of induction.

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