

LATITUDINAL SHIFT AND TILT OF THE RING CURRENT DURING MAGNETIC STORMS

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The equatorial ring current (ERC) theory suggested that the global distribution of horizontal geomagnetic field only dependent on the cosine of station's latitude. However, we always observe a larger disturbed H at higher latitude stations than lower ones, implying that the ERC could tilt or/and shift with respect to the equatorial plane during several intense storms. In this paper, we analyze 11 intense magnetic storms from 2000 -2004, and introduce two configurational factors to characterize the topology of storm time ring current. The results show that ERC has occasionally deviated off equatorial plane with both tilt angle $\delta_t \approx 13 \sim 25^\circ$ and latitudinal shift $\delta_s \approx 0 \sim 21.8^\circ$. The ground disturbed field distribution should be improved as $\Delta H_k = Dst \cos(\varphi_k - \delta)$, which agree well with the most geomagnetic observations.

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