

On equatorward expansion of the auroral belt during intense geomagnetic storms

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It has been known for some time that the auroral belt shifts toward lower latitudes during intense geomagnetic storms (e.g., Akasofu and Chapman, 1963; Kedall et al., 1969; Meng, 1984). Various theories were proposed to account for this equatorward expansion of the auroral belt or the polar cap boundary, i.e., the open-closed field lines, in terms of the effects of the storm-time ring current which increases magnetic flux in the tail, enlarging the polar cap area (e.g., Siscoe, 1979; Stern, 1985; Schulz, 1997). In the present paper, however, observations indicate that Dst, a measure of the ring current intensity, is less important than changes in the southward component of IMF.