

POLAR CAP ELECTRIC FIELD SATURATION DURING IMF BZ NORTH AND SOUTH CONDITIONS

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We report the results of an investigation of the saturation of the polar cap potential and electric field during periods of large northward and southward IMF. While it has been demonstrated that saturation can occur for both Northward and Southward IMF, a direct comparison between the two during saturated driving has not been performed. We use the high resolution OMNI database obtained from the NASA National Space Science Data Center to search for events between 1998 to 2007 when the interplanetary magnetic field (IMF) is stable for more than 40 minutes. The selected intervals are bin-averaged according interplanetary electric field ($-V_{sw} \times B_z$) and the superposed SuperDARN Doppler radar velocity data are used to determine the average electric potential pattern for the various ranges of interplanetary electric field driving. Results show that the reverse convection potential under northward IMF saturates at approximately one fourth the saturation potential under southward IMF, but that the reverse convection electric field under northward IMF and the electric field across the anti-sunward flow under southward IMF saturate at the same value. Comparison between northward IMF and southward IMF are done during the summer solstice high conductivity conditions.

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