

Reverse Convection Potential Saturation During Northward IMF

F.D. Wilder, C.R. Clauer, and J.B.H. Baker

**Bradley Department of Electrical and Computer Engineering Virginia Tech,
e-mail: bakerjb@vt.edu**

We report the results of an investigation of the reverse convection potentials in the day side high latitude ionosphere during periods of steady northward interplanetary magnetic field (IMF). While it has been shown that the polar cap potential in the ionosphere exhibits non-linear saturation behavior when the IMF becomes increasingly southward, it has yet to be shown whether the high latitude reverse convection cells in response to increasingly northward IMF exhibit similar behavior. We use solar wind data from the ACE satellite from 1998 to 2005 to search for events in the solar wind when the IMF is northward and the interplanetary electric field is stable for more than 40 minutes. We then use bin-averaged SuperDARN convection data and apply a spherical harmonic fit to calculate the average potential pattern for each northward IMF bin. Results show that the reverse convection cells do, in fact, exhibit non-linear saturation behavior. The saturation potential is approximately 20 kV and is achieved when the electric coupling function reaches between 18 and 30 kV/RE.