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Comparing the Bruntz et al. (2012) viscous potential formula to the ionospheric cross-polar cap potential from two empirical formulas ROBERT BRUNTZ, CEZANNE NARCISSE, JOSEPH SCHINCO, KYLE VAN ZUIDEN, RAMON LOPEZ, Univ. of Texas at Arlington — As the solar wind flows past the Earth, it interacts by two main methods: magnetic reconnection between the interplanetary magnetic field (IMF) and the Earth's magnetic field; and a viscous interaction between the solar wind plasma and plasma trapped in Earth's magnetic field. Both interactions produce electrical fields, and thus electrical potentials, in Earth's ionosphere. The Bruntz et al. (2012) viscous potential formula was derived from studies of the viscous interaction in the Lyon-Fedder-Mobarry (LFM) magnetohydrodynamic (MHD) simulation, to predict the ionospheric electrical potential resulting from the viscous interaction. Recent results have shown that the viscous interaction is constant for southward IMF values, but is reduced for northward IMF. We will compare the Bruntz et al. (2012) formula (which is insensitive to IMF values) to the output of the Weimer (2005) empirical model and the Assimilative Mapping of Ionospheric Electrodynamics (AMIE) model, to see whether those results also reduce the viscous interaction when the IMF is northward.

Robert Bruntz
Univ. of Texas at Arlington

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