Formation of maximum electric potential at geomagnetic equator by the disturbance dynamo

C. M. Huang(1), A. D. Richmond(2), and M. Q. Chen(1)

(1)Institute of Space Science, National Central University, Chung-Li, Taiwan, China (2) High Altitude Observatory, National Center for Atmospheric Research, Boulder, Colorado, USA

Equatorward electric currents produced by the dynamo action of thermospheric winds associated with geomagnetic activity tend to enhance the ionospheric electric potential at geomagnetic equator, maximizing around midnight. Model runs with the NCAR TIEGCM(Thermosphere-Ionosphere-Electrodynamics General Circulation Model) are used in order to investigate how and where the electric-potential maximum forms. Preliminary results show that the maximum perturbed potential is located at an altitude of 250 km and occurs in the period after the usual pre-reversal enhancement of the eastward electric field. The results indicate that the combination of disturbed winds with the low night-time conductivity at the geomagnetic equator is the most important factor that determines the formation of the maximum disturbance-dynamo electric potential.