Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Energization and Injection of Ring Current Ions during Magnetic Storms MICHELE CASH, ROBERT WINGLEE, ERIKA HARNETT, University of Washington — During storms, induced electric and magnetic fields within the magnetosphere lead to the build up of energetic particles within the ring current and radiation belts. Using single-particle tracking with time-dependent global magnetic and electric fields, we explore the mechanisms responsible for the acceleration and injection of plasma sheet ions into the inner magnetosphere. We examine the contribution from various ionospheric source regions to the storm-time ring current. Solar wind boundary conditions are used as inputs for a self-consistent 3D multi-fluid model, which produces time-dependent global electric and magnetic fields that are read into our single-particle code. Ionospheric H^+ and O^+ are injected into the simulation from various ionospheric regions. Results show that the energization and trapping of ionospheric H^+ and O^+ are highly dependent on the location where the outflowing ions are initialized, and small scale structures in the current sheet are correlated with particle convection and energization. The same magnetic features that produce intensification of auroral current lead to the injection of energetic particles into the inner magnetosphere.

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Date submitted: 14 Jul 2010 Electronic form version 1.4