Geophysical Research Abstracts, Vol. 9, 10869, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-10869

Flux variations in the radiation belts and the influence of coupling at the outer boundary

S.R. Elkington(1), A.A. Chan(2), B. Yue(2), and M. Wiltberger(3)
(1) LASP, University of Colorado, (2) Rice University, (3) HAO/NCAR

Energetic particle fluxes in the inner magnetosphere vary as a result of a complex balance between transport, acceleration, and loss. During periods of strong Earthward convection in the tail, inward transport of energetic plasmasheet particles may lead to a boundary population of electrons that can be trapped and subsequently heated to MeV energies through a combination of diffusive radial transport and local heating. Conversely, during periods where plasmasheet particles do not have access to the inner magnetosphere, diffusive transport in the inner magnetosphere will act to deplete the radiation belts as particles move outward through the drift loss cone. In this effort, we use large-scale MHD/particle simulations of the geomagnetic system to calculate the effect of the coupling state between the radiation belts and plasmasheet during geomagnetic storms. By contrasting particle injection and trapping rates at different phases of storms of varying strength, we attempt to describe those conditions in the solar wind and plasmasheet where the outer boundary may significantly influence flux variation in the radiation belts. Calculations of the evolving particle phase space densities in the plasmasheet and inner magnetosphere are used to evaluate the overall influence of convective transport and heating on storm-time radiation belt dynamics.