



Global simulations of ring current and radiation belt electrons in the inner magnetosphere

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Understanding the ring current and radiation belts has been a major challenge since the discovery of the space radiation. We first present long-term simulations with a VERB-3D of relativistic and ultra-relativistic electrons with boundary conditions from GEO observations. We then present VERB-4D modelling that include convection, radial diffusion, pitch angle scattering and local acceleration. VERB simulations show that the lower energy inward transport is dominated by the convection and higher energy electron transport is dominated by the diffusive transport. We also show that at energies of 100s of keV, a number of processes work simultaneously, including convective transport, radial diffusion, local acceleration, loss to the loss cone and loss to the magnetopause. The results of the simulation of the Marc, 17 2013 storm are compared with Van Allen Probes observations for a wide range of energies.