3D Simualtions of the Dynamics of the Radiation Belts

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The evolution of the relativistic electron fluxes in the radiation belts may be described by the 3D modified Fokker-Plank equation in terms of radial distance, pitch-angle, and energy. We present the results of numerical simulations using a newly developed at UCLA 3D radiation belt diffusion code. Quasi-liner diffusion coefficients are computed for resonance scattering by chorus and EMIC waves outside plasmasphere, and hiss waves inside plasmasphere. In this study using controlled numerical experiments we show how ring current ions and electrons, dynamics of the plasmasphere and plumes, and solar wind conditions can influence the dynamical evolution of the radiation belt electrons.