Geophysical Research Abstracts
Vol. 13, EGU2011-9468, 2011
EGU General Assembly 2011

3D VERB Code Simulations of the Dynamic Evolution of the Outer and Inner Radiation Belts

Yuri Shprits (1,2), Binbin Ni (2), Dmitri Subbotin (2), Kyung-Chan Kim (1), and Marianne Daae (2)

(1) Institute of Geophysics and Planetary Physics, UCLA, Los Angeles, United States (yshprits@igpp.ucla.edu), (2) Department of Atmospheric and Oceanic Sciences, UCLA, Los Angeles, United States (yshprits@atmos.ucla.edu)

In this study we present simulations of the inner and outer radiation belts using the Versatile Electron Radiation Belt (VERB) accounting for radial, pitch-angle, energy, and mixed diffusion. Qusi-linear diffusion coefficients are computed using the Full Diffusion Code (FDC) due to day-side and night-side chorus waves, magneto-sonic waves, phasmaspheric hiss waves, EMIC ,and hiss waves in the regions of plumes, lightning generated whistlers and anthropogenic whistlers. Sensitivity simulations show that the knowledge of wave spectral properties and spacial distribution of waves is crucially important for reproducing long term observations. The 3D VERB code simulations are compared to 3D reanalysis of the radiation belt fluxes obtained by blending the predictive model with observations from LANL GEO, CRRES, Akebono, and GPS. We also discuss the initial results of coupled RCM-VERB simulations.