



## **Understanding the electrons radiation belts using modeling and observations**

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We present radiation belt relativistic electron Phase Space Density (PSD) obtained using the data assimilative VERB code combined with observations from LANL GEO, CRRES, and Akebono and GPS observations. Reanalysis of data shows pronounced peaks in the phase space density and pronounced drop outs of fluxes during the main phase of a storm. Reanalysis results clearly show that persistent peaks in PSD independent of the assumed magnetic field model. Simulations with the 3D VERB code accounting for the violations of all three adiabatic invariants is presented. The results of the reanalysis are discussed and compared to the simulations with the recently developed VERB 3D code. Reanalysis of 441 days during the CRRES period shows that dramatic depletions of the radiation belts occur during specific conditions in the solar wind. We present statistical analysis of the drop outs of the radiation belt fluxes and discuss physical mechanisms which can be responsible for the loss of the radiation belt electrons.