Data assimilation of radiation belt electrons

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We present results from a data-assimilation of radiation belt electrons, and investigate the effect of the radial diffusion and the amplitude of the plasmashpheric hiss. In the data-assimilation, we use our 1-D radial diffusion model [Miyoshi et al., 2003, JGR] that includes various physical processes of the radiation belts such as radial diffusion, Coulomb collisions, and wave-particle interactions. We assimilate in-situ 400 keV electrons measured by the Tsubasa satellite into a 1-D radial diffusion model. The particle filter is used for the assimilation to handle the nonlinear property of the model. We compare the assimilation result with the empirical radial diffusion coefficients as function of the Kp index [Brautingam and Albert, 2000]. While the latter simulation overestimates the flux of the outer belt, the assimilation reproduces the appropriate flux variation. Since the Tsubasa satellite has two energy channels for electron measurements, we compare the observations at higher energy channel with the simulation using the radial diffusion coefficient and hiss amplitude estimated from the data-assimilation for lower energy. Such comparison would be useful for discussion whether the radial diffusion is essential for the flux enhancement at higher energy.