

Effects of the outer boundary flux for the Earth's radiation belt

Kengo Komatsu[1]; Shigeto Watanabe[2]

[1] Earth and Planetary Sci., Hokkaido Univ; [2] Earth and Planetary Sci., Hokkaido Univ.

Radiation belts are discovered by Van Allen's team in 1958. It is well known that particle fluxes in the radiation belt vary with magnetic activity. Many researchers have studied about the flux variation of the radiation belt and offered some particle acceleration/loss processes, but the mechanism of the variation has not been understood in quantitative aspects.

A radial diffusion model can reproduce a basic structure of the radiation belts. The flux of the radiation belt is well governed by outer boundary fluxes. Thus, it is important to examine how the outer boundary condition affects to the flux of the radiation belt before investigating acceleration/loss processes in the radiation belt.

In this study, we use the radial diffusion model with a outer boundary condition. We assume that the outer boundary flux has a kappa distribution and is described as an empirical model between their particle density and characteristic energy and solar wind parameters. In this simulations, we examine the dependence of outer boundary flux on the particle density distribution of radiation belt.