

[구SE-25] Comparison of the PSD radial profiles between before and after geosynchronous flux dropout: case studies using THEMIS observations

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Geosynchronous electron flux dropouts are most likely due to fast drift loss of the particles to the magnetopause (or equivalently, the “magnetopause shadowing effect”). A possible effect related to the drift loss is the radial diffusion of PSD due to gradient of PSD set by the drift loss effect at an outer L region. This possibly implies that the drift loss can affect the flux levels even inside the trapping boundary. We recently investigated the details of such diffusion process by solving the diffusion equation with a set of initial and boundary conditions set by the drift loss. Motivated by the simulation work, we have examined observationally the energy spectrum and pitch angle distribution near trapping boundary during the geosynchronous flux dropouts. For this work, we have first identified a list of geosynchronous flux dropout events for 2007–2010 from GOES satellite electron measurements and solar wind pressures observed by ACE satellite. We have then used the electron data from the Time History of Events and Macroscale Interactions during Substorms (THEMIS) spacecraft measurements to investigate the particle fluxes. The five THEMIS spacecraft sufficiently cover the inner magnetospheric regions near the equatorial plane and thus provide us with data of much higher spatial resolution. In this paper, we report some case studies showing energy dependence during magnetopause shadowing effect.
