R006-49
Zoom meeting B ：11/4 AM1 (9:00-10:30)
09:00-09:15

Spatial evolution of injected energetic electrons as observed by Arase and Van Allen Probes

#Tomoaki Hori[1)], Yoshizumi Miyoshi[1)], Takefumi Mitani[2)], Satoshi Kurita[3)], Mariko Teramoto[4)], Takeshi Takashima[5)], Iku Shinohara[6)], Ayako Matsuoka[7)], S. G. Claudepierre[8)], J. F. Fennell[8)], J. B. Blake[8)], Craig A. Kletzing[9)]
[1)]ISEE, Nagoya Univ.,[2)]ISAS/JAXA,[3)]RISH, Kyoto Univ.,[4)]Kyutech,[5)]ISAS, JAXA,[6)]ISAS/JAXA,[7)]Kyoto University,[8)]Space Sciences Department, The Aerospace Corporation,[9)]Department of Physics and Astronomy, Univ. of Iowa

In this study, we investigate how drifting energetic electron populations evolve in the inner magnetosphere, using the Arase and Van Allen Probes (RBSP) satellites. Electrons and ions of the plasma sheet origin are energized up to tens to hundreds of keV and abruptly transported on the night side into geosynchronous distance and even further inward during substorms, which is referred to as substorm injection. Then injected electrons drift eastward and disperse along their drift path with azimuthal drift velocities depending on their energies. Extensive observations with geosynchronous satellites have shown that energy dispersion signatures can be quantitatively explained by magnetic drift velocities, while its two-dimensional evolution, particularly the radial structure of a drifting electron population has not been well examined except for a few case studies where many satellites were available simultaneously at different radial distances and local times. In this regard, we make a statistical study on simultaneous observations of Arase and RBSPs to examine how injected energetic electrons spread radially in the course of their eastward drift. Our preliminary analysis on one of the events where the three satellites were located on the dusk side shows that Arase (L ~ 7.7, MLT ~ 10h) and RBSP-B (L ~ 5.8, MLT ~ 4h) observed an energy-dispersed electron population nearly at the same time (within a few minutes), despite the large difference in MLT sector. This result strongly suggests that the “drift front" of energetic electrons goes significantly ahead at farther radial distances even if they have started drifting at the same MLT. On the basis of statistics with many simultaneous observations, we address how the spatial shape of drifting populations looks like and how it evolves as drifts eastward from night to the dayside.