R006-23
Zoom meeting B ：11/1 PM2 (15:45-18:15)
17:30〜17:45

A statistical study on electron injection events whose peak-energy exceed 100 keV observed in the inner magnetosphere

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The substorm injection plays a crucial role in supplying the free energy to generate relativistic electrons in the radiation belts. However, how injected electrons penetrate the inner magnetosphere and get their energy remains unclear though numbers of studies on substorm injections have been reported. Arase (ERG) often observes electron injections whose maximum energies reach hundreds of keV, while the typical maximum energy of injected electrons is about 100 keV or less.

In this study, we do a statistical survey using high-energy electron experiment (HEP) and extreme high-energy electron experiment (XEP) data. We found 96 electron injection events above 95keV during the period from March 2017 to December 2019. Collecting injection events during the period when the apogee of Arase is located in the nightside, we are examining the statistical properties of the high-energy injection events, e.g., maximum energy at the observation point, the distribution of their estimated source regions, pitch angle anisotropy, and the first adiabatic invariant with relativistic approximation in detail to find whether dependence on the maximum energy is a key to limit the acceleration mechanisms of electron injection or not. We are also checking the electron energy spectra of the dispersionless injection events to find any signatures that indicate the acceleration mechanisms. Further, we also calculate phase space density for comparing with those obtained by other satellites observing magnetotail and previous studies on the profiles of the phase space density depending on L. (e.g., Boyd et al., 2019)