

Energetic electron accelerations of relativistic electrons observed by the Arase satellite

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Geospace Exploration Project; ERG addresses what mechanisms cause acceleration, transportation and loss of MeV electrons of the radiation belts and evolutions of space storms. Cross-energy and cross-regional couplings are key concepts for the project. In order to address questions, the project has been organized by three research teams; satellite observations, ground-based observations, and modeling/data-analysis studies, and interdisciplinary research are realized for comprehensive understanding of geospace. The Arase satellite was successfully launched on December 20, 2016. After the initial operation including maneuvers, Arase has started normal observations since March, 2017. Until now, Arase has observed several geomagnetic storms driven by coronal hole streams and CMEs, and several interesting features are observed associated with geomagnetic disturbances. The six particle instruments; LEPe/ LEP-i/MEP-e/MEP-i/HEP/XEP have shown large enhancement as well as loss of wide energy electrons and ions and variations as well as changes of pitch angle and energy spectrum. The two field/wave instruments: PWE and MGF observed several kinds of plasma waves such as chorus, hiss, EMIC as well as large scale electric and magnetic field variations. And newly developed S-WPIA has been operated to identify microprocess of wave-particle interactions. In this presentation, we will report overview and some results highlights and discuss electron acceleration as well as transportation process by plasma waves in the geospace.