

[EE] Evening Poster | P (Space and Planetary Sciences) | P-EM Solar-Terrestrial Sciences, Space Electromagnetism & Space Environment

[P-EM16] Dynamics of Earth's Inner Magnetosphere and Initial Results from Arase

convener: Danny Summers (Memorial University of Newfoundland), Yoshizumi Miyoshi (Institute for Space-Earth Environmental Research, Nagoya University), Keisuke Hosokawa (電気通信大学大学院情報理工学研究科, 共同), Yusuke Ebihara (Research Institute for Sustainable Humanosphere, Kyoto University)

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Earth's inner magnetosphere is a fascinating source of space research problems. There remain many fundamental questions concerning the physics of the radiation belts, the ring current, the plasmasphere and the ionosphere. The JAXA spacecraft Arase (ERG) was successfully launched in December 2016, and has since been providing excellent data on waves, particles and fields over a range of L-shells in the inner magnetosphere. This session particularly welcome submissions related to the Arase mission. As well, data from other recent missions to the magnetosphere are also welcome, including the Van Allen Probes, MMS, and THEMIS. Topics of interest include charged particle interactions with the predominant electromagnetic wave modes such as whistler-mode chorus and hiss, ion cyclotron waves, magnetosonic waves, and ULF waves. Projects involving the prevailing issues of particle acceleration and loss, and particle transport are also of interest. In addition, projects involving the coupling of plasma populations in the inner magnetosphere are also timely. Studies involving observations, simulations, theory and modeling are all invited.

[PEM16-P19] Relativistic effect on dispersionless injection associated with substorms

*Tzu-Fang Chang^{1,2}, Chio-Zong Cheng², Chih-Yu Chiang², Sunny Wing-Yee Tam², Yoshizumi Miyoshi¹, Tomoaki Hori¹, Takefumi Mitani³, Takeshi Takashima³, Ayako Matsuoka³, Mariko Teramoto¹ (1. Institute for Space-Earth Environmental Research, Nagoya University, Japan, 2. Institute of Space and Plasma Sciences, National Cheng Kung University, Tainan, Taiwan, 3. Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan)

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Substorm dispersionless energetic particle injection to inner magnetosphere has been investigated on the basis of a classical electromagnetic pulse model [Zaharia et al., 2000]. In order to consider the effect of disturbed event on particle transport, relativistic effect is considered in our study to improve non-relativistic calculation results to get better agreement with satellite observation. We combine the ground-based observations and in situ magnetic field and particle data observed from satellites in the inner magnetosphere to investigate the transport of energetic particles associated with the substorms. In this study, the particle drift motion, the adiabatic invariant and particle magnetic moment differ from the previous non-relativistic particle motion model. We simulate the evolution of energetic particle injections during substorms and discuss the difference among non-relativistic, relativistic, and observational results.