[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

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Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
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-P23]Statistical analysis of spacecraft charging environment in the medium earth orbit

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Keywords:Spacecraft surface charging, Medium earth orbit (MEO), ARASE satellite

Analysis of spacecraft surface charging in the medium earth orbit (MEO) is important for spacecraft designs and operations, because the surface charging sometimes cause spacecraft anomalies due to discharging arcs. We study the surface charging environment using the Electric Field and Wave instruments (EFW) and the Helium Oxygen Proton Electron (HOPE) data of the Van Allen Probes and the Low energy Experiments (LEP) data of the ARASE satellite. We analyze the relationship between the observed spacecraft potential and the average electron temperature which show an approximate power law relationship in the geostationary earth orbit (GEO). However, we cannot find such a power law relationship in MEO. Therefore we calculate other plasma environmental parameters, for instance, from multi-temperature treatments using a discriminant analysis for the energy flux distributions. We will discuss the relationships between the spacecraft potential and these plasma environment parameters in MEO.