[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-P15]Oxygen torus near the plasmapause observed by Arase

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Using the magnetic field and plasma wave data obtained by the fluxgate magnetometer (MGF) and plasma wave experiment/high-frequency wave receiver and onboard frequency analyzer (PWE/HFA and OFA) instruments on board the Arase satellite, we search for enhancements of O^+ ion density in the deep inner magnetosphere known as “the oxygen torus”. We estimate the local plasma mass density (rho_L) and the local electron number density (n_{eL}) from the resonant frequencies of standing Alfvén waves and the upper hybrid resonance band, respectively. The average ion mass (M) can be calculated by $M \sim rho_L / n_{eL}$ under the assumption of quasi-neutrality of plasma. Preliminary analysis of some events at dawn, in which toroidal standing Alfvén waves appear clearly during the storm recovery phase, reveals that M is enhanced in the vicinity of the plasmapause, implying formation of the oxygen torus. In presentation, we will show more detailed analysis results and discuss the formation mechanism of the oxygen torus.