[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-P08]Statistical analysis of equatorward drift speed and intensity of SAR arcs detached from auroral oval based on all-sky imaging observations at Athabasca, Canada

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Stable Auroral Red (SAR) arcs observed at subauroral latitudes are the 630-nm optical emissions caused by low-energy electron precipitation into the ionospheric F layer from the interaction region between the ring current and the plasmasphere. In the recovery phase of geomagnetic storms, low-energy electrons in the plasmasphere are heated by high-energy plasma in the ring current, and precipitate into the F layer at subauroral latitudes where oxygen atoms are excited to emit 630-nm emissions at altitudes of ~400 km. Thus, SAR arcs are mainly observed at subauroral latitudes during geomagnetic storms. Recently, Shiokawa et al. (2009) reported an event of SAR arc detached from the main oval after substorms, based on observation at Athabasca, Canada (54.7N, 246.7E, magnetic latitude = 61.7N). However, statistical analysis of such SAR arcs detached from the main oval has not been done yet. In this study, we perform a statistical analysis of SAR arc detachment observed at Athabasca.

We analyzed 11 years of all-sky images at wavelengths of 630.0 nm obtained at Athabasca from 2006 to 2016. The SAR arcs move equatorward after the detachment from the oval. We estimate the equatorward velocity of the SAR arc motion. We also estimated the latitudinal distribution of the 630-nm intensity between SAR arcs and the main oval, which may correspond to the densities of high- and low-energy plasma in the interaction region between the plasmasphere and the ring current. We investigate dependences of these SAR arc velocities and intensities on AU/AL indices, SYM-H, solar wind pressure, IMF-Bz, and X component of magnetic field variation at Yellowknife (YKC), which is located in the north of Athabasca in the auroral zone. The 630-nm intensity between SAR arcs and the main oval is high in the dusk sector. The equatorward

velocities of SAR arcs are higher in the dusk and dawn local times compared with those around midnight.