[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-P27]Calibration of Waveform Data Measured by the Plasma Wave Experiment (PWE) on board the ARASE (ERG) Satellite

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Keywords:Plasma Wave Experiment, Waveform capture, Calibration

The Plasma Wave Experiment (PWE) on board the Arase satellite measures electric field from DC to 10 MHz, and magnetic field from a few Hz to 100 kHz. The waveform capture (WFC) is one of subsystems of the PWE and is dedicated to measuring waveform for the two electric components and three magnetic field components. The WFC nominally covers the frequency range below 20 kHz, which is crucial for the measurements of chorus, hiss and magnetosonic waves. It is necessary to calibrate the WFC data in order to correctly reproduce the waveform actually measured by the sensors. In the present paper, we introduce the calibration method of the WFC data using inverse filter.

We applied the calibration tables, in which the frequency responses of sensors and receivers of the WFC are defined, provided by the Arase/PWE team. We first designed inverse filters by taking the inverse of the transfer functions of the WFC and performing the inverse FFT. In the process, we determined cutoff frequencies comparing the reproduced waveform with standard signals generated by the known signal source inside the PWE. This method is effective because waveforms can be calibrated continuously without periodical joint, although the computational complexity is large. As a future work, it is necessary to examine a method of correcting waveform distortion due to receiver nonlinearity. We also note that the electric field intensity is provisionally calibrated under the assumption of combining the theoretical antenna capacitance in a vacuum, and the typical plasma resistance. We also correct this

point by comparing the refractive index obtained from both the electric field and the magnetic field waveforms with the theoretical value.