

[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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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-P02] Simulation study of the dependence of the whistler-mode chorus generation on properties of energetic electrons in the Earth's inner magnetosphere

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By a series of self-consistent electron hybrid code simulations, we study the dependence of the generation process of whistler-mode chorus emissions on the properties of the velocity distribution function of energetic electrons. In particular, in the present study, we focus on the temperature anisotropy and density of energetic electrons in the Earth's inner magnetosphere. We use the same magnetic field gradient in the simulation system and different temperature anisotropy  $A_T$  for the initial distribution of energetic electrons at the magnetic equator. We conduct 6 sets of simulations for different  $A_T$  from 4 to 9, changing the initial number density  $N_h$  of energetic electrons at the equator in each set of simulations. By analyzing the spectra obtained in the simulation results, we identify chorus elements with rising tones in the results for higher  $N_h$  but no distinct chorus in smaller  $N_h$ . We compare the simulation results with estimations of the threshold and optimum amplitude proposed by the nonlinear wave growth theory. We find that the chorus generation processes reproduced in the simulation results are consistently explained by the theoretical estimates. We also compare the simulation results with linear growth rates for all simulation runs. We find clear disagreement between the spectral characteristics of reproduced chorus and the predictions by the linear theory. The present study clarifies that the spectra of chorus are essentially different from those predicted by the linear

theory and are determined fully by nonlinear processes of wave-particle interactions in the chorus generation region.