

Comparative study on chorus waves in March 2017 storm between the RAM-SCB/electron hybrid simulations, the Arase observations and the ground-based observations

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We simulate the time evolution of the distribution function of electrons and plasmasphere using the RAM-SCB for the March 2017 storm. During the storm, the Arase satellite observed continuous chorus wave activity in the morning sector of the inner magnetosphere, and also identified the growing peak in electron phase space density, which is evidence of the internal acceleration [Miyoshi et al., 2021]. Using the simulated distribution function data, we calculate several physical parameters related to the wave generation: linear growth rate, non-linear optimum amplitude and threshold, the temperature anisotropy and the relative composition of the hot electrons [Katoh et al., 2018]. We compare the chorus wave activities from Arase and the ground with the simulated parameters to discuss how these parameters are related to the actual chorus dynamics.

Keywords: Arase, Computer simulation, Chorus waves