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Zoom meeting B ：11/4 AM2 (10:45-12:30)
10:45-11:00

Statistical investigation of cross energy coupling during magnetic storms

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The Arase satellite has observed a number of magnetic storms since March 2017, which corresponds to the declining phase of the solar cycle 24. We performed the superposed epoch analysis of energetic electrons and related parameters in the inner magnetosphere using data obtained by Arase satellite. The electron measurements in the wide energy range are utilized to clarify the cross energy coupling process during storms. The energetic electron flux variations strongly depend on the storm phase and L-shell as well as the electron energy. Electrons with energies ranging from tens of keV to ~200 keV largely increase their fluxes in the outer radiation belt during the main phase, and the electron fluxes gradually decrease during the recovery phase. The sub-relativistic/relativistic electrons show different flux variations. The electron fluxes decrease at the outer part of the outer belt during the main phase, and the fluxes gradually increase from the inner part of the outer belt during the recovery phase. The variations in the energy spectrum and phase space density indicate that the local accelerations mainly contribute to enhancements of MeV electrons in the outer belt. The thermal plasma density derived from the Arase observations shows the significant shrinkage of the plasmapause during the main phase and subsequent, gradual refilling of the plasmasphere during the recovery phase. The whistler mode chorus wave intensity estimated from the POES satellite observations shows continuous enhancement of chorus waves during the main phase and early recovery phase. In this study, we discuss variations in the energy spectrum by considering different roles of each energy range in the cross energy coupling process, i.e., source population for generating waves, seed population for subsequent acceleration, and relativistic electrons.