R006-47
Zoom meeting B ：11/3 AM1 (9:00-10:30)
09:45-10:00

Relative contribution of ULF waves and whistler-mode chorus to the radiation belt variation during May 2017 storm

#Naoko Takahashi[1)], Kanako Seki[1)], Mei-Ching Fok[2)], Yihua Zheng[2)], Yoshizumi Miyoshi[3)], Satoshi Kasahara[1)], Kunihiro Keika[1)], David Hartley[4)], Yoshiya Kasahara[5)], Yasumasa Kasaba[6)], Nana Higashio[7)], Ayako Matsuoka[8)], Shoichiro Yokota[9)], Tomoaki Hori[3)], Masafumi Shoji[3)], Satoko Nakamura[3)], Shun Imajo[3)], Iku Shinohara[10)]
[1)]The University of Tokyo,[2)]NASA/GSFC,[3)]ISEE, Nagoya Univ.,[4)]Univ. of Iowa,[5)]Kanazawa Univ.,[6)]Tohoku Univ.,[7)]JAXA,[8)]Kyoto University,[9)]Osaka Univ.,[10)]ISAS/JAXA

The purpose of the present study is to understand when, where, and how ultra-low frequency (ULF) waves and whistler-mode chorus contribute to the Earth's radiation belt dynamics. We first investigate the temporal contribution of ULF waves and whistler-mode chorus to the relativistic electron flux enhancement during 27 May 2017 storm. Both Arase (post-midnight) and Van Allen Probe (RBSP)-B (dusk) show the global enhancement of ULF waves during the early recovery phase, which corresponds to the global increase of relativistic electron fluxes. On the other hand, whistler-mode chorus is mainly enhanced during the late recovery phase even RBSP-B locates at the dusk sector where is far from the ordinary location of wave generation. Relativistic electron fluxes significantly increase around L~4 during the late recovery phase. We also investigate the spatial contribution of waves using Comprehensive Ring Current Model (CRCM) coupled with Block-Adaptive-Tree Solar-Wind Roe-Type Upwind Scheme (BATS-R-US) simulation. The simulation qualitatively reproduces the global evolution of externally-driven ULF waves. The estimated region where the thermal energy anisotropy of electrons (~20-60 keV) is large shifts toward dusk during the recovery phase. We also find the large magnetic field curvature at noon and dusk sectors during the recovery phase. Estimated spatial distributions of thermal energy anisotropy and magnetic field curvature give explanation of the observational result that enhanced whistler-mode chorus exists at the dusk sector.