R006-29
A 会場 ：11/7　AM2 （10:45-12:30）
11:15〜11:30

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High temporal variation in electron fluxes during the flux burst event: Test-particle simulation

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Whistler-mode chorus wave is a plausible cause to scatter radiation belt electrons. The cyclotron resonance process has a crucial role to accelerate (decelerate) electrons through not only quasilinear diffusion process but also nonlinear scattering process. Kurita et al. (2018) found the flux enhancement of tens keV electrons accompanied with the enhancement of upper band whistler-mode chorus (UBC) waves within 30 seconds. Furthermore, Saito et al. (2021) demonstrated that the nonlinear scattering process causes the electron flux enhancement observed by Kurita et al. (2018) using a test-particle simulation. It is of interest to further investigate whether other observable signatures for nonlinear scattering processes can be seen during the flux burst event. By analyzing test-particle data obtained from the simulation by Saito et al. (2021), we found that the temporal variation of electron count during the flux enhancement in pitch angle of 60 -80 degree at the equator and energy of 24 keV - 25 keV showed the rapid electron count enhancement within the time scale well shorter than 1 spin period (about 8 seconds) of Medium Energy Particle experiment-electron analyzer (MEP-e) onboard the Arase satellite. The variance in the count distribution increases with increasing the temporal-averaged count during the flux burst event, which becomes significantly larger than the variance in Poisson distribution. The count distribution broader than the Poisson distribution suggests that the temporal variation in the counts includes factors caused by the wave-particle interactions other than statistical noise. The similar trend seen in the count distribution has been found by the MEP-e on board the Arase [Kurita et al., SGEPSS 2022]. We study a cause of the broadening of the count distribution using the test-particle simulation. The simulation results suggest that nonlinear scattering processes by UBC waves contribute to the rapid enhancement of the electron count in the time scale of well less than 1 spin period. In this talk we will report the role of nonlinear scattering of electrons by UBC for the broad count distribution.