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Zoom meeting B ：11/2 AM2 (10:45-12:30)
11:45-12:00

Observations of drifting hole structures in radiation belt electrons induced by EMIC waves

#Satoko Nakamura[1)], Yoshizumi Miyoshi[1)], Kazuo Shiokawa[1)], Yoshiharu Omura[3)], Takefumi Mitani[2)], Takeshi Takashima[2)], Tomoaki Hori[1)], Ayako Matsuoka[4)], Shun Imajo[1)], Iku Shinohara[2)]
[1)]ISEE, Nagoya Univ.,[2)]ISAS/JAXA,[3)]RISH, Kyoto Univ.,[4)]Kyoto University

We present observations of drifting hole structures in radiation belt electrons. The Arase satellite and Van Allen Probes often detect fine structures in energy spectra of particle fluxes. We examined time variations of energetic electron fluxes normalized by their averaged fluxes over the previous 10 minutes. The flux variation shows 1-min scale depressions with clear energy dispersion, which appear only in the relativistic energy ranges (500 keV - a few MeV) and small pitch angles. We find that these “drifting hole structures" are frequently observed with EMIC waves in space or around the ionospheric footprint of a satellite. The energy range and the pitch-angle dependency of drifting hole is consistent with nonlinear cyclotron resonances with EMIC waves. These observational characteristics suggest that EMIC waves cause a strong pitch-angle scattering, leading to a sharp loss of small pitch-angle electrons. We show some examples of simultaneous observations of drifting hole structures and EMIC waves observed by the Arase satellite and Van Allen Probes, and compare the results with nonlinear resonance theory and drift periods of relativistic electrons.