

Comparison of EMIC wave distributions between the magnetic equator and higher magnetic latitudes

Chae-Woo Jun[1]; Yoshizumi Miyoshi[2]; Yoshiya Kasahara[3]; Yasumasa Kasaba[4]; Shoya Matsuda[5]; Masafumi Shoji[2]; Fuminori Tsuchiya[6]; Atsushi Kumamoto[7]; Ayako Matsuoka[8]; Iku Shinohara[9]
[1] ISEE, Nagoya Univ.; [2] ISEE, Nagoya Univ.; [3] Kanazawa Univ.; [4] Tohoku Univ.; [5] ISAS/JAXA; [6] Planet. Plasma Atmos. Res. Cent., Tohoku Univ.; [7] Dept. Geophys, Tohoku Univ.; [8] ISAS/JAXA; [9] ISAS/JAXA

To understand the generation and propagation processes of electro-magnetic ion cyclotron (EMIC) waves between the magnetic equator and higher magnetic latitudes, we performed a comparison study of spatial distributions of EMIC waves based on the Van Allen Probes (RBSP) and Exploration of energization and Radiation in Geospace (ERG) observations. From 2017 to 2018, we identified EMIC wave events observed by both satellite missions and categorized them with respect to wave bands (H⁺ and He⁺ EMIC waves) and relative satellite locations from the plasmasphere (inside and outside the plasmasphere). We found two significant observational differences based on RBSP and ERG observations: 1) H⁺ EMIC waves observed by RBSP are dominantly observed outside the plasmasphere at 11-14 MLT at L[~]4-6 near the magnetic equator, while ERG observations at higher magnetic latitudes showed no significant peak wave occurrence regions and relatively lower wave occurrence rates than RBSP observations, indicating that H⁺ band EMIC waves are easily damped due to unguided wave propagation. 2) For He⁺ EMIC waves, RBSP observations showed peak wave occurrence regions at 9-14 MLT at L[~]4-6 inside the plasmasphere. He⁺ EMIC waves observed by ERG have two different peak occurrence regions: 14-17 MLT at L[~]6-8 inside the plasmasphere, 5-7 MLT at L[~]8-11 outside the plasmasphere. In the presentation, we show the details of spatial distributions of EMIC waves between RBSP and ERG observations and the relationship between EMIC waves and geomagnetic conditions.