

#岩瀬 智哉¹⁾, 寺本 万里子¹⁾, 片岡 龍峰²⁾, 三好 由純³⁾, 笠原 禎也⁴⁾, 松岡 彩子⁵⁾, 鳥居 祥二⁶⁾, 尾崎 光紀⁴⁾, 松田 昇也⁴⁾, 中村 紗都子³⁾, 北原 理弘⁸⁾, 小路 真史³⁾, 今城 峻⁵⁾, 篠原 育⁷⁾, 三宅 晶子⁹⁾, 中平 聡志⁷⁾
(¹⁾ 九工大, (²⁾ 極地研, (³⁾ 名大 ISEE, (⁴⁾ 金沢大, (⁵⁾ 京都大学, (⁶⁾ 早稲田大学理工総研, (⁷⁾ 宇宙研, (⁸⁾ 東北大・理・惑星プラズマ大気, (⁹⁾ 茨城高専

Relativistic electron precipitation and plasma waves observed by the International Space Station and the Arase satellite

#Tomoya Iwase¹⁾, Mariko Teramoto¹⁾, Ryuho Kataoka²⁾, Yoshizumi Miyoshi³⁾, Yoshiya Kasahara⁴⁾, Ayako Matsuoka⁵⁾, Shoji Torii⁶⁾, Mitsunori Ozaki⁴⁾, Shoya Matsuda⁴⁾, Satoko Nakamura³⁾, Masahiro Kitahara⁸⁾, Masafumi Shoji³⁾, Shun Imajo⁵⁾, Iku Shinohara⁷⁾, Shoko Miyake⁹⁾, Satoshi Nakahira⁷⁾

(¹⁾Kyutech, (²)NIPR, (³)ISEE, Nagoya Univ., (⁴)Kanazawa Univ., (⁵)Kyoto University, (⁶)WISE, Waseda U., (⁷)ISAS/JAXA, (⁸)Planet. Plasma Atmos. Res. Cent., Tohoku Univ., (⁹)NIT(KOSEN), Ibaraki College

Relativistic Electron Precipitation (REP) is a phenomenon of MeV electron precipitation into the atmosphere from the outer radiation belt. Previous studies (e.g., Kataoka et al., 2016) suggest that electromagnetic ion cyclotron (EMIC) waves cause REP during magnetic storms when they resonate with and scatter energetic electrons in the radiation belt. Meanwhile, Kataoka et al. (2020) have reported three different types of REP events associated with different types of plasma waves (chorus, electrostatic whistler, and EMIC waves). While different types of plasma waves can play important roles as drivers of REP, the relative importance between the different types of plasma waves and REP events have not been statistically clarified. In this study, we identified plasma waves which were associated with many REP events from conjugate observations between the International Space Station (ISS) and the Arase satellite. First, we identified REP events from data observed by CALorimetric Electron Telescope (CALET) /Charge Detector (CHD) onboard ISS in the period from March 2017 to December 2021. Then, we detected 31 REP-related conjunction events, in which the ionospheric footprints of Arase were close to the ISS locations when the CALET/ISS observed REP events. Finally, we identified the plasma waves by visual inspection from the REP-related conjunction events, using the electric and magnetic field spectra data observed by Plasma Wave Experiment (PWE)/Onboard Frequency Analyzer (OFA) and Magnetic Field Experiment (MGF) onboard the Arase satellite. We identified chorus waves in 9 events out of the 31 conjunction REP events dominantly in the post-midnight sector (23-03MLT) near the magnetic equator. The second largest population is the 7 REP events associated with electrostatic whistler waves, which were mostly observed in the pre-midnight sector (20-24MLT). The last 3 events were associated with EMIC waves. Besides these waves, hiss waves were also seen in 7 events. These results suggest that various types of plasma waves other than EMIC waves can drive REP events.