

ディフューズオーロラ降下電子に見られる微細構造: れいめい観測

三好 由純 [1]; 加藤 雄人 [2]; 坂野井 健 [3]; 西山 尚典 [4]; 浅村 和史 [5]; 平原 聖文 [6]

[1] 名大 STE 研; [2] 東北大・理・地球物理; [3] 東北大・理; [4] 東北大・理・惑星プラズマ大気; [5] 宇宙研; [6] 東大・理・地惑

Fine structures of precipitating electrons associated with diffuse aurora: Reimei observations

Yoshizumi Miyoshi[1]; Yuto Katoh[2]; Takeshi Sakanoi[3]; Takanori Nishiyama[4]; Kazushi Asamura[5]; Masafumi Hirahara[6]

[1] STEL, Nagoya Univ.; [2] Dept. Geophys., Grad. Sch. Sci., Tohoku Univ.; [3] Grad. School of Science, Tohoku Univ.; [4] Planet. Plasma Atmos. Res. Cent., Tohoku Univ.; [5] ISAS/JAXA; [6] Dept. Earth & Planet. Sci., Univ. Tokyo

We report fine structures of precipitating electrons as seen in energy-time diagrams associated with diffuse aurora from the Reimei observations. In the diffuse aurora region, Reimei often observes electron precipitations at two different energy ranges. Higher energy electron precipitations more than a few keV are often associated with the pulsating aurora, while lower energy precipitations around 1 keV are relatively stable. The precipitation energy increases gradually when the satellite moves from the higher to the lower latitude, suggesting that the cyclotron resonance works for the precipitation of electrons. There is a clear gap between higher and lower energy precipitations, in which electron precipitations are very weak. In order to investigate possible wave modes that cause the observed fine structures of the precipitations, we calculate the quasi-linear scattering rate of precipitating electrons with whistler mode chorus. In general, whistler mode chorus has two different upper and lower frequency-bands. From the calculations, it is found that the upper (lower)-band chorus causes the observed lower (higher)-energy precipitations. The precipitation gap between lower and higher energy precipitations corresponds to the frequency gap at half gyro-frequency that is a natural characteristic of whistler mode chorus. Therefore, it is suggested that the fine structures of precipitating electrons associated with the diffuse aurora can be caused by whistler mode chorus wave-particle interactions.