サブストームと疑似ブレイクアップに伴う低周波磁場振幅：近尾部プラズマシートの Geotail 観測

斉藤 実穂 [1]; 宮下 幸長 [2]; 藤本 正樹 [3]; 篠原 育 [4]; 斎藤 義文 [5]; 向井 利典 [6]
[1] 東大・理・地球惑星; [2] 宇宙研; [3] 宇宙機構・科学本部; [4] 宇宙機構／宇宙研; [5] 宇宙研; [6] JAXA

Magnetic field fluctuations associated with a major substorm and pseudobreakups in the plasma sheet of the near-Earth tail

Miho Saito[1]; Yukinaga Miyashita[2]; Masaki Fujimoto[3]; Iku Shinohara[4]; Yoshifumi Saito[5]; Toshifumi Mukai[6]
[1] Earth and Planetary Sci,Tokyo Univ; [2] ISAS/JAXA; [3] ISAS, JAXA; [4] JAXA/ISAS; [5] ISAS; [6] JAXA

We investigate magnetic field fluctuations in the ultra low frequency range (5-100mHz) detected by Geotail at a down-tail distance of -8 to -12 Re in the midnight sector of the plasma sheet. The magnetic field fluctuations are known to appear in the late substorm growth phase or prior to dipolarizations. We select the observations near magnetic equator throughout the late substorm growth phase to the expansion phase using criteria of ambient magnetic fields and the plasma beta. We examine in detail magnetic field fluctuations near magnetic equator associated with pseudobreakups and the subsequent major substorm that occurred on 3 November 1998. Auroral activities are identified from Polar UVI auroral images. This event provides useful information to understand magnetic field fluctuations of Pi2 frequency range detected in near-Earth tail location, when that is in the same magnetic local time sector of auroral intensification. Kinetic ballooning instability(KBI) is proposed with numerically calculated details by Cheng[2004] to explain AMPTE/CCE observation of high beta threshold and magnetic field fluctuations of Pi2 range(namely periods of 50-75s) associated with substorm-related activity. The major substorm of our event is consistent with previous AMPTE/CCE observation in terms of magnetic fields fluctuation of Pi2 range and high beta threshold profiles. This feature was also observed for pseudobreakups with small magnitude of dipolarizations. We aim to discuss if there is further observational consistency with the KBI theory using further information provided by low energy plasma measurements and statistics obtained by Geotail. Our event of this kind may also be useful to understand what differs between pseudobreakup and major substorm, if near-Earth tail dynamics are responsible.