

サブストーム開始前の磁気圏尾部および地上における Pi2 脈動の THEMIS による事例研究

宮下 幸長 [1]; Angelopoulos Vassilis[2]; 平木 康隆 [3]; 家田 章正 [4]; 町田 忍 [5]
[1] 名大 ISEE; [2] UCLA; [3] 電通大; [4] 名大宇宙地球研; [5] 名大・ISEE

A THEMIS case study of Pi2 pulsations in the magnetotail and on the ground before a substorm onset

Yukinaga Miyashita[1]; Vassilis Angelopoulos[2]; Yasutaka Hiraki[3]; Akimasa Ieda[4]; Shinobu Machida[5]
[1] ISEE, Nagoya Univ.; [2] UCLA; [3] UEC; [4] ISEE, Nagoya Univ.; [5] ISEE, Nagoya Univ.

Using THEMIS spacecraft and ground data, we studied low-frequency Pi2 pulsations in the magnetotail and on the ground just before a substorm onset. A case study shows that a new compressional Pi2 pulsation was observed in the plasma sheet just earthward of the near-Earth reconnection site 4 min before initial auroral brightening or 2 min before auroral fading. The ion and magnetic pressure perturbations appeared to be partly in phase at the beginning, indicating that the wave had fast mode. A similar wave was observed also tailward of the near-Earth reconnection site, although it occurred 4 min later. These waves may have been generated at the near-Earth reconnection site. On the ground, Pi2 pulsations were observed widely in the polar cap and at the auroral oval before initial auroral brightening and auroral fading, although the amplitudes were small, compared to those associated with auroral poleward expansion. There was a tendency that the waves were observed first in the polar cap near the initial auroral brightening site and then in the surrounding regions. Ionospheric convection began to be enhanced gradually 1 or 2 min after the Pi2 onsets. We discuss the causal relationship between the Pi2 pulsations in the magnetotail and on the ground as well as their role in substorm triggering.