

# サブストーム開始時における P i 型磁気波動の地上高緯度と磁気圏近尾部観測との比較

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## Comparisons of Pi pulsations observed at a high-latitude ground station and in the near-Earth magnetotail at substorm onsets

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This study presents the results concerning Pi 1 and Pi 2 period range oscillations at a substorm onset observed at a high latitude ground station and the THEMIS satellites located in the near-Earth magnetotail. The examination has been done on a substorm event observed on 28 February, 2009 at a THEMIS GBO station, Kuujuaq (KUJ) (Mag. Lat.=66.89 N, Mag. Lon.=13.23 E, Mag. Midnight =4.15 UT, L-value = 6.4 ) located at the high latitude of the Northern America Continent. The data examined are the magnetic field, all-sky images (ASI) and keograms (ASK) obtained at KUJ and the satellite observations of the magnetic field, electric field, electron and ion energy spectra of the ESA pair, and peer data observed by the three THEMIS satellites, THEMIS-A, -E, and -D, respectively located at ~8 Re, ~8 Re and ~11 Re in the near-Earth magnetotail near the mid-night region . The results reveal a close relationship in the oscillation signatures and the spectral power in both the Pi 1 and Pi 2 period range oscillations between the magnetic field oscillations observed on the ground and the magnetic and electric fields, and the plasmas observed at the THEMIS satellites. These observations suggest that Pi 1 and Pi 2 period range oscillations of the magnetic and electric fields, and the plasmas play an important role for the plasma processes at a substorm onset in the near-Earth magnetotail.

P i 2 型地磁気脈動は地上におけるサブストーム開始時刻を同定する極めて良い指標の一つである事は広く知られており、多くの研究者によって利用されている。本研究ではこの P i 2 型磁気脈動開始時刻がオーロラの開始(initial brightening), サブストーム開始(expansion onset)とどのような関係にあるかを先ず明らかにし、更に、地上の共役点に近い磁気圏近尾部に位置する衛星による磁場、電場、プラズマ等の観測と比較し、磁気圏—電離圏を通してのサブストーム開始機構を検討する。