

A large-amplitude Pc5 event in the recovery phase of the October 2003 geomagnetic storm

Tetsuo Motoba[1]; Yasunobu Ogawa[2]; Ryouichi Fujii[3]; Satonori Nozawa[3]

[1] Nagoya Univ.; [2] STE Lab., Nagoya Univ.; [3] STEL, Nagoya Univ

During the recovery phase of the October 2003 geomagnetic storm, the solar wind speed detected by ACE exceeded 1000 km/s and the solar wind dynamic pressure (P_{sw}) showed three enhancements under the condition of northward interplanetary magnetic field. Following the second P_{sw} enhancement with about 10 nPa at 0500 UT on October 31, 2003, strong magnetic field oscillations in the Pc5 period range (5-6 min) were observed by the IMAGE magnetometer chain which was located in the morning sector (08 MLT) for the time interval 0530-0630 UT. The Pc5 amplitude in the magnetic X component at Tromsø (CGMlat.=66.64 deg) was 300 nT or more, in particular, the maximum amplitude of the initial three periodic cycles exceed 500 nT. For the same interval, the EISCAT Tromsø UHF radar detected periodic enhancements in the electron density and the ion temperature in a wide altitude range. The enhanced electron density oscillations could be associated with pulsed electron precipitation and accompanied by the modulation of localized ionospheric conductivity and electric field responsible for the extremely amplified magnetic field variations in the morning auroral zone. The Pc5 range oscillations in the ground magnetic field were not localized in the auroral zone, but seen also at low and equatorial latitudes. The amplitudes at Kakioka (15 MLT) varied in the range of 20-50 nT. In this paper, we will discuss high-latitude ionospheric behaviors during the large-amplitude Pc5 in the morning auroral zone and the relationship between high-latitude and low-latitude/equatorial Pc5s.