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ETS-VIII と MAGDAS で観測される Pc 4 帯地磁気脈動の特性 Characteristics of Pc 4 Range Magnetic Pulsations Observed by ETS-VIII Satellite and MAGDAS/Yap Station

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Pc 4 is a continuous pulsation with a period from 45 to 150 seconds, and Pi 2 is an impulsive pulsation with a period from 40 to 150 seconds (cf. Saito, 1969). In the present paper, we compared magnetic north-south Y-component data obtained from ETS-VIII (Engineering Test Satellite-VIII; Koga and Obara, 2008) satellite (GG Lon.=146, L=6.6) and H-component data at the MAGDAS/Yap station (GG Lat.=9.50, GG Lon.=138.08, GM Lat.=1.49, GM Lon.=209.06, L= 1.00; K. Yumoto et al., 2006 and 2007) during one month of April, 2009, in order to clarify wave characteristics of Pc 4 range pulsations observed at the geosynchronous orbit and near its projection point on the surface of the earth. Moreover, we investigated the local time dependence of occurrence of Pc 4 range pulsations with 20 min. shorter and longer durations at the ETS-VIII orbit. The longer duration Pc 4 pulsations were furthermore analyzed to examine the correlation of Pc 4 waveforms between the ETS-VIII satellite and the Yap station on the ground.

The following results were found;

(1) Pc 4 range pulsations with 20 min. longer duration at the ETS-VIII satellite occur frequently around 09 h and 13-16 h local time(LT). The occurrence frequency shows a dawn-dusk asymmetry with a dusk-side peak.

(2) The occurrence distribution of Pc 4 range pulsations with duration less than 20 min. at ETS-VIII shows a similar local time dependence of Pi 2 pulsations observed at the CPMN/GUA station in the nighttime (see Yumoto et al., 2001), where the GUA station is located near the geomagnetic longitude of ETS-VIII.

(3) Pc 4 range pulsations with duration more than 20 min. show an in-phase relation between ETS-VIII and YAP during 09h -15 h LT, while out-of-phase relationship during 16h - 24 h LT.

These observational results suggest that the longer- and shorter-duration Pc 4 range pulsations can be explained by using Pc 4 excited by K-H instability in daytime and Pi 2 during substorm onset in nighttime, respectively.

キーワード: 地磁気脈動, きく 8 号, マグダス, 地方時依存性, 静止軌道

Keywords: Pc 4, ETS-VIII, MAGDAS, local time dependence, geosynchronous orbit