Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

PEM031-P08 Room:Convention Hall Time:May 26 14:00-16:30

Intervals of pulsations of diminishing periods (IPDP) and related aurora observed at Athabasca

Kazuo Shiokawa[1*], Kaori Sakaguchi[2], Yuichi Otsuka[1], Connors Martin[3]

[1]STEL, Nagoya University, [2]NICT, [3]Athabasca University

Intervals of pulsations of diminishing periods (IPDP) is the geomagnetic pulsation with varying their frequency from ~100mHz to ~1Hz for about a half an hour. The mechanism of IPDP is that electromagnetic ion cyclotron (EMIC) waves excited at the equatorial region in the magnetosphere by the ion cyclotron instability propagate along the magnetic field to the Earth. Proton particles resonated with these waves also propagate to the Earth and are observed as proton auroras [e.g., Yahnin et al., 2009]. The cause to make the variation of IPDP frequency has been considered that the magnetospheric source region moves earthward by the dawn-to-dusk electric field with the enhancement of the magnetospheric convection [Kangas et al., 1998].

However, Yahnin et al. [2009] pointed out using data from ground magnetometers and the IMAGE satellite that the frequency variation calculated from the latitudinal variation of proton aurora as a projection of magnetospheric source region for IPDP is much smaller than the frequency variation of IPDP observed on the ground.

In order to investigate in more detail of the relation between the frequency variation of IPDP and the motions of proton aurora, we compared IPDP observed by a 64-Hz sampling induction magnetometer and proton auroras observed by an all-sky imager at Athabasca (ATH, 54.7N, 246.7E, magnetic latitude: 61.7N), for 6 events identified from January 2009 to December 2010. We found that proton auroras associated with IPDP appeared within less than 1 degree apart from the equatorward boundary of aurora oval and that southward motion of aurora oval is correlated with southward motion of position of proton aurora. In the presentation, we will discuss the variation of position of proton aurora, and the IPDP frequency in relation with the plasma sheet dynamics.