

グローバルPC5に伴う電離圏電場電流特性とSSCとの類似性

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Characteristics of ionospheric electric field and currents of the global PC5 and their similarity to the SSC

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The PC5 geomagnetic pulsations often appear at high-equatorial latitudes with amplification at the dayside geomagnetic equator. The analyses of the ground magnetometer data have shown that the low latitude PC5 is caused by the MHD waves propagated directly from the magnetosphere, while the equatorial PC5 is enhanced by the ionospheric currents (EEJ) flowing from the polar ionosphere [Motoba et al., 2002]. The PC5 electric field detected by the HF Doppler (HFD) measurements at low latitude has been shown to be correlated with EEJ [Motoba et al., 2004]. These observations suggested that the PC5 electric field at low latitude should be transmitted from the high latitude by the TM0 mode wave in the Earth-ionosphere waveguide. In this paper, we made correlation analyses between the low latitude HFD and EEJ observed on both the day and nightsides during the series of PC5 events on October 29-31 2003. We show that the electric field is in excellent correlation (correlation coefficient = 0.9) with the EEJ in both the day and night hemispheres, although the nightside EEJ is one order of magnitude weaker than dayside. Furthermore, the electric fields on both local time hemispheres are in opposite direction to each other, showing a potential field carried by the field-aligned currents to the polar ionosphere and then to the low latitude ionosphere by the TM0 mode waves. We discuss similarity between the PC5 and SSC in terms of the electric field and currents developed in the polar-equatorial ionosphere.