Low-latitude ionospheric variations observed by FM-CW radar at Sasaguri during magnetospheric substorms

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High-latitude (polar) ionospheric electric fields during substorms have been studied in detail, for example [Kamide et al., 1996]. But less has been said about low latitude penetration of the ionospheric electric field. In this study we examined the possibility and properties of the polar electric field penetrating in to the lower latitude.

We deduced the electric field in the low-latitude ionosphere by FM-CW radar at Sasaguri station (geomagnetic latitude 23.2[deg], geomagnetic longitude 199.6[deg]). Then we examined correlation between the electric field and magnetic bay at Kuju station (geomagnetic latitude 26.03[deg], geomagnetic longitude 202.90[deg]) and compared to the electric field caused by substorm in high-latitude. The observation period spans from November 2003 to February 2004.

From the observations, it maybe concluded that electric field is penetrating from high-latitude to low latitude ionosphere during magnetospheric substorms.

In the future, we are planning to analysis data from another FM-CW radar at Kamchatka, Russia.