Equatorward development of electron precipitation in a longitudinally narrow region beyond the cusp

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Low energy elctron precipitation having relatively large flux produces clear red line auroras. This type aurora often appears in the cusp in a patchy manner. In this study we understand how the appearance of those electron precipitation spots in the cusp leads to the equatorward development of the electron precipitation beyond the cusp. On the basis of observations of the dayside auroras from an all-sky imager at Longyearbyen, Svalbard, in situ observations of precipitating particles and magnetic field from DMSP spacecraft that flew over the aurora, radar observations from EISCAT and SuperDARN, we identified an event in which intense electron precipitation occurred in the cusp, and immediately after that the electron precipitation developed equatorward in a longitudinally narrow region beyond the cusp. The result of the analysis from the event has shown that the intense electron precipitation occurred in the cusp periodically, and that at the same time as the stop of that periodic precipitation the electron precipitation region developed equatorward. We show detailed results from observations that were made with the multi-instruments simultaneously, and discuss the cause of the equatorward development of the electron precipitation region beyond the cusp.

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