

Multiple electron precipitation spots in the cusp and subsequent equatorward expansion of aurora beyond the cusp

Satoshi Taguchi[1]; Kohei Takasu[1]; Keisuke Hosokawa[2]; Yasunobu Ogawa[3]
[1] Grad school of Science, Kyoto Univ.; [2] UEC; [3] NIPR

Aurora image data obtained from ground based all-sky imagers have shown that multiple brightening spots often appear in the cusp. This indicates that the electron precipitation having a relatively large energy flux can occur in a patchy manner. In this study we understand how the appearance of those electron precipitation spots in the cusp is related to a midday lower-latitude auroral expansion feature, which is sometimes seen in the near-noon meridian equatorward of the cusp. This feature represents the electron precipitation having a large energy flux expands equatorward beyond the cusp. On the basis of observations of dayside auroras from an all-sky imager at Longyearbyen, Svalbard, and in situ observations of precipitating particles and magnetic field from DMSP spacecraft that flew over the aurora, we identified an event in which the intense cusp electron precipitations became localized in a narrow range of MLT near noon, and eventually the aurora started to expand equatorward of the cusp. This observation suggests a close relationship between the occurrence of the electron precipitation spots in a narrow range of MLT and the subsequent equatorward expansion of the electron precipitation region beyond the cusp. We will show detailed results about the motion of the auroral spots by analyzing the aurora images obtained at two wavelengths, 557.7nm and 630.0 nm, and discuss the cause of the equatorward expansion of the electron precipitation region beyond the cusp.