リコネクションした磁力線に沿うカスプ電子降下の成長と減衰

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Growth and decay of cusp electron precipitation along the reconnected field lines

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Immediately after the open magnetic field line is created by reconnection, magnetosheath electrons and ions stream into the reconnected open flux tube. At low altitudes the injected ion energy flux tends to decrease with increasing distance from the origin of the open flux, and this feature is well understood. For the injected electrons, however, it is still not understood how the electron precipitation along the reconnected field lines changes with increasing distance from the origin of the open flux tube. In this study we examined the growth and decay of the electron precipitation along the reconnected open field lines by using observations of moving cusp auroras, which are thought to be caused by bursty and/or patchy reconnection, from an all-sky imager at Longyearbyen, Svalbard. We analyzed 630 nm aurora image data obtained at a time resolution of approximately 10 s. The results of the analysis show that the distance from the origin of the open flux is not an important parameter for the cusp electron precipitation along the reconnected field lines, and that to what extent the motion of the reconnected field lines is east-west aligned is important. We discuss this feature in terms of the intensification of associated field-aligned currents.