Time evolution of aurora structures associated with inverted-V electron distributions

*Morio Tanaka[1], Satoshi Taguchi[1], Keisuke Hosokawa[2]

1. Department of Geophysics, Graduate school of science, Kyoto University, 2. Department of Communication Engineering and Informatics, University of Electro-Communications

The inverted-V is an energetic electron precipitation event, which can be seen as a V-shape structure in electron flux spectrograms, and causes intense auroral arcs. Previous satellite observations have suggested that the inverted-V structure would be stable for 5 min at least, but the detailed characteristics of its time evolution are still unclear. Aurora image data (557.7 nm and 630 nm) from an all-sky imager at Longyearbyen, Svalbard, and precipitating electron and magnetic field data from the DMSP spacecraft (F16, F17, F18, F19) are used to identify the aurora structures associated with inverted-V, and track their time evolution. The result of the analysis indicates that the auroral structures associated with inverted-V electron distributions tend to have longer durations than previously reported from the satellite observations. Some periodic features of the auroral structures are also seen. Key parameters for the stability of the inverted-V, i.e., parallel electric field are discussed in terms of phases of a substorm.

Keywords: field-aligned current, aurora, electron precipitation , inverted-V

