

## Relationship between structures of sprite streamers and inhomogeneity of preceding halos

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Transient Luminous Events (TLEs) in the stratosphere, mesosphere and lower thermosphere is phenomena of high time resolution associated with lightning. The diffuse glows such as elves and sprite halos progresses first and discrete structure of sprite streamers progresses next. Elves and sprite halos are considered to have a relationship with structure of sprite streamers. Therefore, spatial distribution and time evolution of these phenomena is key parameters of the condition of generation and mechanism of TLEs.

In the period of June 27 - July 10, 2011, aircraft and ground-based campaign in support of NHK Cosmic Shore project was carried out under collaboration between NHK, Japan Broadcasting Corporation, and universities. Two aircrafts carried the high-speed camera, and observed the TLEs.

The observation from an aircraft makes it possible to capture TLEs without influence of atmospheric absorption, and detailed structures of TLEs over 40 events was able to observe with the high-speed camera with frame rate of 8300 /sec.

In the TLEs observed by the campaign, sprite streamers and sprite halos are always showing some inhomogeneity, and it seemed that sprite streamers is clearly related to inhomogeneity of sprite halos. At this presentation, we will show the relationship between inhomogeneity of halo and sprite streamers with these velocities of progress estimated from the high-speed images.

Keywords: sprite, halo, streamer, high-speed camera