Preliminary Reports of Summer Sprite Observation at The Top of Mt. Fuji, Japan

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Many investigations of transient luminous events (TLEs) such as sprites and elves have been carried out since the 1990s. However, there are still unsolved issues like the morphologies of sprites. In this study, we report a preliminary result of a mountain observation which enables us to observe the TLEs for a long term at the fixed point.

1. Introduction

Many investigations of transient luminous events (TLEs) such as sprites have been carried out since the 1990s. Recently, a low-cost highly sensitive CCD camera movie system with a motion capture software have been popular. High school students and amateur scientists in Japan have observed the transient luminous phenomena by the system. However, there are still unsolved issues like the morphologies of TLEs. One of approach to investigate this issue is statistical study with collecting many events from various locations and altitudes. In this study, we report a preliminary result of a mountain observation which enables us to observe the TLEs for a long term at the fixed point.

2. Mountain Observation

In this study, we report a preliminary result of a mountain observation which enables us to observe the TLEs for a long term at the fixed point. The mountain observation was conducted at the top of Mt. Fuji (3776 meter altitude) in Japan, which enables us to widely detect the TLEs above the central region of Japan, the west side of Pacific Ocean and the east side of the Sea of Japan. In particular, the altitude of the top of Mt. Fuji is located over the summer cloud covering the wide regions, so that the distant TLEs can be observed and low pressure and clean air yield better color images of TLEs. Moreover, the lower cost operation is possible, comparing with the aerial and balloon observation. However, there are few examples of mountains observations, because sever experimental conditions are required [1]. The period of the observation is from July, 2013 to August, 2013. Fig. 1 shows our observation Image. We observed from the top of Mt. Fuji with sensitive black-and-white CCD cameras at the fixed point for one month and with the color single-lens reflex camera.

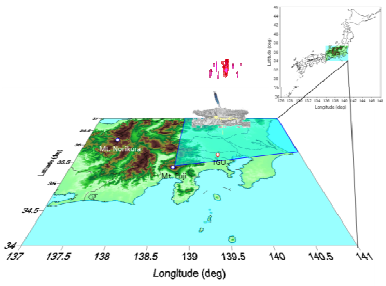

Fig. 1 Observation Image

3. Result

In the summer time of 2013, we detected several events of TLEs. Fig. 2 shows example of events of TLEs. These image shows possibility that we observe TLEs without cloud. It leads to solve of the structure of the TLEs in future by continuing observation in Mt. Fuji.

Fig. 2 Example of events of sprite (a)Image took by black-and-white CCD camera (b)Image took by color single-lens reflex camera

References

[1] van der Velde, O. A., Á. Mika, S. Soula, C. Haldoupis, T. Neubert, and U. S. Inan, Observations of the relationship between sprite morphology and in-cloud lightning processes, *J. Geophys. Res.*, **111**, D15203 (2006)