

## れいめい衛星によるスプライト発光の単色イメージング観測

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### Monochromatic imaging observation of sprites with Reimei

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The sprite emission is characterized by vertically extending fine structures (called as streamer, halo, etc.) in the approximate altitude range from 40 to 90 km. Satellite observation is useful to investigate the global distributions of sprite since an optical instrument on a satellite can measure the sprite in the wide range without atmospheric absorption. However, the sprite has been measured mainly by ground-based instruments, and there is no monochromatic imaging data from space.

The multi-spectral camera (MAC) on Reimei has taken the monochromatic images at wavelengths of 428 nm, 558 nm, and 670 nm with an exposure time of 957 ms in the limb direction at middle and low-latitudes during the period from March 2008 to February 2012. The spatial resolution at a tangential point is about 4 km. According to the noon-midnight sun-synchronous orbit of Reimei at an altitude of 640 km, the observation is made around the midnight sector.

We finally found seven sprites events in N2 1P (670 nm) images. On six events, the simultaneous observations between N2+ 1N (428nm) and N2 1P were performed. The electron temperature and electric field associated with a sprite can be estimated from the intensity ratio between emission of N2+ 1N and that of N2 1P. However, we did not obtain the N2+ 1N emission intensity due to the low sensitivity of 428 nm channel of MAC. Therefore, the N2+ 1N intensities of sprites are estimated to be less than the noise level (26 - 54 R), while the measured N2 1P intensities of sprites are 2.9 - 3.6 kR. Using these data, we estimate the upper limit of electron temperature and electric field associated with sprites. The altitude of sprite emission is accurately determined with the satellite attitude data and the field-of-view direction of MAC. On the 2008 Sep.2 case, we obtained sprite events at 26.6 GLAT and 107.6 GELON, and determined its height range from 47 to 81 km. In this presentation, we will report the estimation of temperatures and electric fields associated with sprites.