

## FORMOSAT-2/ISUAL で観測された 630 nm 大気光の鉛直・水平空間構造

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## Vertical and horizontal structures of 630-nm airglow observed with FORMOSAT-2/ISUAL

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In order to clarify the physical and chemical processes occurring in the F-region ionosphere, optical observation of 630-nm airglow is a useful method. Since past observations have primarily been carried out on the ground, three-dimensional structures of airglow are not yet fully understood. Here, we report new observational results of 630-nm airglow obtained with the ISUAL instrument on board the FORMOSAT-2 satellite. The FORMOSAT-2 flies on a sun-synchronous (09:30 to 21:30 LT) polar-orbit at an altitude of ~891 km. The ISUAL looks at the Earth's limb in the midnight direction while the satellite proceeds northward. It consists of an imager with a selectable six-color filter wheel, a six-color spectrophotometer, and a dual-color array photometer. In this study, we mainly analyze the imager data.

In December 2006 and from May to June in 2007, airglow observations were carried out on Australia-to-Japan orbit ( $125^{\circ}$ - $155^{\circ}$  in geographical longitude) during a total of 8 nights. The airglow images were obtained through 630-nm filter with an exposure time of 999 ms and a repetition rate of ~20 s. Owing to the satellite motion, the geomagnetic latitude range between  $-30^{\circ}$  and  $50^{\circ}$  was scanned over ~30 minutes in December 2006 while the range between  $-50^{\circ}$  and  $20^{\circ}$  was scanned over ~25 minutes in May and June 2007. On each night, 2-5 bright airglow regions were found in the obtained images, which sometimes drastically change their latitudinal locations day by day. The maximum brightness was located at an altitude of around 200 km. In addition, some wave-like structures were found that would probably be extended in a horizontal plane with spatial scales of a few hundred kilometers. In this study, by analyzing the successive images, the vertical and horizontal structures of airglow are discussed.