R006-P28 **会場: Poster** **時間: 11 月 25 日**

脈動オーロラロケット Rocsat-XN と LAMP の開発ならびに将来超高大気観測衛星計画 FACTORS

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Rocket experiments Rocksat-XN and LAMP, and a a future satellite mission FACTORS for understanding aurora and upper atmosphere

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We report two rocket experiments Rocksat-XN and LAMP for understanding high-energy electron precipitation associated with pulsating aurora, and also present a future satellite mission FACTRS which aim to understand the coupling processes in the terrestrial magnetosphere/ionosphere/thermosphere. In-situ and remote-sensing observations are essential to understand complicated auroral phenomena. Recent advances of measurement techniques enable us to obtain precise auroral and plasma parameters with high-time and spatial resolutions even using a commercial-based instrument, and it is worth to propose rocket/space experiments based on unique idea.

We are now carrying out two sounding rocket projects, Rocksat-XN/PARM and LAMP/PARM2. The Rocksat-XN rocket is scheduled to be launched from Andoya, Norway in January 2019. In this rocket we carry out simultaneous auroral imaging and medium- and high-energy electrons to understand the generation and loss process of high-energy electrons associated with pulsating aurora. The auroral imaging camera (AIC) will measure the optical thickness and imaging of pulsating aurora at magnetic footprint of rocket. AIC observes mainly N2 1PG aurora with the RG-665 filter, Watec 910HX CCD and wide FOV lens (FOV of 96 deg x 75 deg). So far, we completed all of the tests in Japan, such as intensity calibration, electrical interface tests, environmental (vacuum, vibration and thermal) tests and confirmed their sufficient performances. We have shipped the instruments to NASA Wallops, and are now carrying out interface tests there. In addition, we started another rocket experiments LAMP under collaboration with University of New Hampshire, and two auroral imagers will be installed to measure different auroral emissions. LAMP will be launched in winter of 2019 from the Poker Flat research range.

Further, we started discussion on a future mission called FACTORS (Frontiers of Formation, Acceleration, Coupling, and Transport Mechanisms Observed by Outer Space Research System) as a community exploration mission in Japanese apace research after the success of the ERG mission. This will measure the precise structure of auroral acceleration region, particle transportation between ionosphere and magnetosphere, and thermosphere-ionosphere coupling using two formation flight satellites. Possibility of third satellite by Sweden is now in under discussion. We mainly concern on optical and ultra-violet remote sensing of aurora and airglow for this mission. A visible imager will measure small-scale auroral structures at a wavelength of auroral prompt emission line with high-time (˜0.1s) and high-spatial (˜1km) resolutions using EMCCD. The FOV of 8 x 8 deg covers an area of 400 x 400 km viewed from altitudes of 3000 km. The far-ultraviolet (FUV) imager adopts a wide (˜50 x 50 deg.) FOV objective mirror system which covers ˜3000 x 3000 km area viewed from 3000 km altitude. FUV imager adopts a filter wheal to change the wavelength between O 135.6 nm and the N2 LBH band at 140-160 nm to estimate O/N2 ratio. Wide-field N2 image enable us to examine large-scale auroral dynamics like westward-travelling surge during substorm, and O/N2 images provide us to understand the global thermospheric activity.