

# Preliminary results of rocket attitude and auroral green line emission rate in the Delta Campaign

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Preliminary results of the rocket attitude and the auroral green line emission rate during the Delta Campaign carried out at Andoya, Norway in December 2004 are presented. The aim of the campaign was to understand the energy flow from the aurora to the atmosphere by combining information from microscopic processes such as optical emissions and rotational temperature change, and also from macroscopic processes such as wind field change. Collaborations with the EISCAT radar and a ground-based FP spectrometer were essential for the present campaign.

The attitude information was needed by NTV(number density and rotational temperature) measurement which may be affected by the shock wave, and by AGL(auroral green line) measurement which needs zenith angle correction. Because of the aurora, star tracker cannot be used to find out the attitude. HOS(horizon sensor) and SFF(surface finder) utilizing the thermal emission from the atmosphere and the surface were used to determine the attitude. HOS is sensitive to 14-16 $\mu$ m in the CO<sub>2</sub> 15 $\mu$ m band, and SFF to 7-14 $\mu$ m in the atmospheric window region. SFF may be made 10 times more sensitive than HOS, but cannot be used in daytime. Good data sets were obtained for both.

AGL consists of an interference filter, a lens, a PMT and electronics as usual. The data quality was good enough for analysis, but its analysis may become complicated because the rocket penetrated a discrete aurora instead of a diffuse aurora as planned. It was set in the sub-payload with its line of sight 60 deg (usually 30 deg) away from the spin axis to prevent NTV-glow from disturbing AGL. In the measured data, the height of energy deposition and its spatial inhomogeneity is seen