

IMAP/VISI で観測されたオーロラと極域大気重力波の関係

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Relationship between aurora and airglow at high-latitudes measured with IMAP/VISI

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IMAP/VISI is a visible imaging spectrometer which measures three nightglow emissions from ISS (~400 km altitude); O (630 nm, 250 km alt.), OH Meinel band (730 nm, 87km alt.), and O₂ (0-0) atmospheric band (762 nm, 95 km alt.) with the two field-of-views (+/-45 deg. to nadir) to make a stereoscopic measurement of the airglow and aurora emission to subtract background contaminations from clouds and ground structures. Since the N₂ 1st positive band exists in the same wavelength range as the OH Meinel band, VISI measures the N₂ aurora at high-latitudes, in addition to O₂ and O630 auroras. Each field-of-view has 90 deg width faced perpendicular to the orbital plane, which is mapped to ~600 km width at 100 km altitude and ~300 km width at 250 km altitude. A continuous line-scanning for all emissions lines in the latitudinal range from + 51 deg to - 51 deg is carried out by VISI with the successive exposure cycle with a time interval of 1 - several sec, which corresponds to a spatial resolution of 10 km – a few tens km.

Although the maximum latitude of ISS orbit is +/- 51 deg, during geomagnetically disturbed period we sometimes measured auroral emissions at O₂ 762 (~120 km alt.) N₂ 1st positive band (~110 km alt.) and O 630 nm (~250 km alt.) at high-latitudes. One of major purposes of auroral measurement with VISI is to clarify the atmospheric gravity wave caused by auroral activity. VISI has a capability to measure faint airglow emission and strong aurora emission simultaneously since the dynamic range of VISI is sufficiently large. However, so far we could not obtain the event in which we can clearly see the gravity wave caused by aurora in the E-region (O₂ and N₂) and F-region (O630) data.

In this presentation, we give the summary of one-year observation of aurora and airglow with IMAP/VISI. We also report the current status of the operation and state of the VISI instrument.

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