

Simulation of Airglow Observations with IMAP/ VISI on the International Space Station

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The Visible and near-Infrared Spectral Imager (VISI) of the IMAP mission has been developed and ready to be launched onto the International Space Station (ISS) in summer 2012. VISI will be operated in the night-side hemisphere in the range of +/- 51 deg. GLAT, and measure the airglow emissions of OI at 630 nm, the OH Meinel band at 650 nm and the O2 atmospheric band (0-0) at 762 nm at an altitude of ~400 km with typical spatial resolution of 16-50 km. Since the influence of cloud reflections of moon light is overlapped with the airglow pattern in the visible wavelength range, the precise subtraction of the cloud influence is a key issue of this mission. Therefore, a simulation work to study on how much the surface albedo on the cloud top will affect the data is critically important. We carried out the simulation of O2 airglow pattern including cloud albedo under realistic conditions of VISI measurement since the O2 airglow is the primary candidate for measurement of gravity wave modulated airglow emission that is only visible from space. The height profile of volume emission rate of O2 airglow was estimated with the MSIS model, and then the airglow intensity was integrated along the line-of-sight direction. The cloud pattern was based on the realistic data measured with a geostationary climate satellite. We will report the quantitative effect of cloud albedo on the airglow pattern, and discuss the physical parameters those expected to be derived from the VISI data.

Keywords: ISS-IMAP, VISI, airglow simulation, O2 atmospheric band (0-0)