

Calibration and analysis of IMAP/VISI observational data

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Visible and near-infrared spectrographic imager (VISI) for the ISS-IMAP (Ionosphere, Mesosphere, upper Atmosphere and Plasmasphere mapping) mission installed on the Exposure Facility on the Japanese Experiment Module on the International Space Station in August 2012. Initial observations were held in August and September and nominal observations started in October. The objective of this study is the quantitative evaluation of some noises which are recorded in the observational data. VISI observes airglow emissions in the night by two field-of-views in nadir direction toward the Earth. VISI observes airglow with three different observational modes which are named "Calibration", "Spectral" and "Peak." Airglow observed by this imager is diffracted and imaged on the single CCD. Noise caused by an electrical interference were found in the Calibration mode images. Stripes in the same position which caused by this interference were able to reduce by the evaluation of the noise pattern from 56 calibration data in initial and nominal observations. It is also found that count value of the Peak mode are not uniform in the image. These are thought to be caused by the non-uniformity of the shape of the optical part since these noise were not observed on data in case of the no incoming light to the imager. These noise are also reduced from the analysis of 320 data in Peak mode observations. Sensitivity to the light intensity are different between the two field-of-views. These non-uniformity and difference of sensitivity could be able to be corrected by using patterns earned by the statistical study of the observational data.

Keywords: spectrography, imager, airglow, the International Space Station, nadir, mesosphere