Estimation of mesospheric OH temperature by observation data by ISS-IMAP VISI

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In general, the data of satellite observation is inferior in resolution to ground observation data and its wavelength resolution is inferior, so it is difficult to analyze. In this research, from 2012 to 2015, data of atmospheric light emission in the mesosphere by the Visible / Near Infrared Spectroscopic Imager (VISI), which is an observation device mounted on the International Space Station in the ISS-IMAP mission, Temperature estimation of the OH luminescent layer in the mesosphere near 85 km is tried. It is known from the previous study that the relative existence distribution of the rotation level when the OH molecule transitions between certain vibration levels follows the Boltzmann distribution and this distribution is determined by the rotation temperature of the OH molecule. Research using this property to try to estimate temperature from OH multiwavelength data has been used only for ground observation data so far. In this research, we apply this method to observation data from outer space and aim to obtain a spatially large temperature distribution map which has never been obtained. For analysis, data in two modes, Calibration mode and Spectral mode are used. In the calibration mode data, the observation data is recorded using the whole light receiving part of the observation equipment in the wavelength range of 500 to 900 nm, and the data of the spectral mode is narrowed down to the wavelength range of six ROI (Region of interest) And observation data are recorded together with spatial position information. Analysis is based on data in Spectral mode. Removal of salt-and-pepper-noise by cosmic rays and removal of artificial noise-containing data using random sample consensus algorithm for multi-wavelength data of OH around 828 nm, In order to compensate for the low resolution of the wavelength resolution, we tried fitting by Gaussian function and tried to estimate the temperature.

Keywords: ionosphere, airglow, mesosphere, hydroxyl, ISS-IMAP, temperature

