

Investigation of Venus cloud structure using near infrared spectral images taken by Venus Express/VIRTIS

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It is necessary to unveil the cloud structure to understand the Venusian climate system. The cloud structure has not been understood well, because the technique for observing the inside of the cloud layer had not been established. Recently, Carlson et al. (1991) was developed a new technique, in which the spatial distribution of the cloud particle size of Venus can be deduced from the correlation between the 1.74 and 2.30 micrometer radiations which are in the atmospheric windows and are transmitted through the clouds.

VIRTIS (Visible and Infrared Thermal Imaging Spectrometer) on board Venus Express is observing the Venusian atmosphere at near-infrared wavelengths with higher spatial resolutions than that of NIMS on board Galileo. Using this data the spatial inhomogeneity and the temporal variability of the cloud particle size can be evaluated more accurately than previous studies using Galileo/NIMS.

In the present study, in addition to the wavelengths of 1.74 and 2.30 micrometers used in the analysis of Galileo/NIMS images, we focus on the wavelength of 1.14 micrometers which is also located in one of the atmospheric windows. The correlation between the intensities of 1.74 or 2.30 micrometers and 1.14 micrometers is different from that between 1.74 and 2.30 micrometers. The behavior of 1.14 micrometer radiation is studied with radiative transfer calculation and the result will be reported.