

## Investigation of Venus cloud particle size distribution using near-infrared spectral images taken by Venus Express/VIRTIS

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Though the size of Venus is almost equal to the earth, the temperature and the pressure of Venus are high temperature and pressures (730K, and 90 atmospheric pressures) at the ground level. The enormous thick cloud that covers the entire planet at the altitudes of 45-70km strongly influences this environment, and is deeply related to the maintenance mechanisms of the super-rotation (reached 60 times the rotation velocity in the cloud top) of the Venus atmosphere through radiative cooling and heating. To understand these processes it is important to observe the meteorological processes in the entire atmosphere from the ground surface to the cloud levels. However, with very thick (physically and optically) cloud layers our knowledge about the physical and chemical conditions below the visible cloud top were quite limited. The situation has been changed by the discovery of 'atmospheric windows' (Allen and Crawford, 1984). These 'windows' are the wavelengths of relatively weaker CO<sub>2</sub> absorption at which infrared radiation originating from deeper levels can escape through the enormous atmosphere and cloud so that these provide the means of remote sensing of otherwise obscured levels. Alternatively one attempt to reproduce numerically ultimate mystery of the Venus atmosphere, super-rotation, with the remarkable improvement of the computer ability. However indispensable information to the numerical simulation is not enough. I will answer the problem of heating distribution in the Venus cloud by constructing an atmospheric structural model including the cloud layer.

In this study, I aim to construct a cloud model by comparing the 1.74 and 2.30 micrometers imaging data taken by VIRTIS on board Venus Express with radiative transfer calculation. The Venusian cloud is known to consist of distinct with 3 modes of particles different with sizes. The calculation considers absorption and scattering in the cloud layer. I developed a new method for deriving the mixing ratio of three modes at the same time.