Mid-Infrared imaging observations of the Venusian atmosphere with Subaru Telescope

Kazuaki Mitsuyama[1]; Takeshi Imamura[2]; Hideo Sagawa[3]; Shoko Ohtsuki[4]; Munetaka Ueno[5]; Masato Nakamura[2]

[1] Earth and Planetary Sci., Univ. of Tokyo; [2] ISAS/JAXA; [3] Univ. of Tokyo; [4] Dept. Earth and Planetary Sci., Univ. Tokyo; [5] Dept. of Earth Sci. and Astron., Univ. of Tokyo

We made the narrowband imaging observations of the Venus atmosphere in the mid-infrared lays area by using COMICS(Cooled Mid-Infrared Camera and Spectrometer) of the SUBARU telescope in December, 2005. The observed wavelengths are three wavelengths (the center wavelengths 11.2micron, 8.6micron, and 17.7micron).

The purpose of this observation is to determine the horizontal and perpendicular structure of the Venus cloud layer,observing the middle infrared rays area that is the heat radiation of Venus cloud layer top(altitude:70km) , and measuring the brightness temperature distribution that originates in the space structure of the cloud. Moreover, in 8.6micron wavelength the absorption belt of SO2 is included, and so the distribution of SO2 ,which is one of the key role in the Venus cloud physics, is obtained by comparing with other wavelength.

In this observation, we got data sets of Venus images for three days, the spatial resolution is 0.13 arcsecond.

In this announcement, we report on the result of an initial analysis. In each wavelength, a wave-like structure of the planet scale with a vertical wave side for the direction of the sun was seen as wel as a zonal structure that extended in the direction of east and west about the brightness temperature distribution. The latter may be related to the super-rotation structure seen in the ultraviolet rays images of Pioneer Venus etc. and this observation is the first one which imaged a synchronous space structure of the sun like the latter This sun-synchronous structure is paid to attention and a detailed analysis will be done in the future. Moreover, the space distribution of cloud grain and an atmospheric temperature will be derived by comparing it with the numerical simulation model of the radiation transportation considering scattering with the cloud particle.