

Ground-based observations of temporal variations in Venus cloud-top thermal structures

Kazuaki Mitsuyama[1]; Takeshi Imamura[2]; Hideo Sagawa[3]; Shoko Ohtsuki[4]; Yasumasa Kasaba[5]; Munetaka Ueno[6]; Masato Nakamura[2]; Takehiko Satoh[2]

[1] Earth and Planetary Sci., Univ. of Tokyo; [2] ISAS/JAXA; [3] MPS; [4] Dept. Earth and Planetary Sci., Univ. Tokyo; [5] Tohoku Univ.; [6] Dept. of Earth Sci. and Astron., Univ. of Tokyo

Mid-infrared at about 10 micron band coming from Venus represents thermal structures around Venus cloud-top. The results of past mid-infrared observations show the constancy of cloud-top thermal structures except near-polar regions (Taylor et al., 1980; Orton et al., 1991) but our previous ground-based observations at mid-infrared with a higher spatial resolution and a higher signal-to-noise ratio conducted in 2005 discovered that small structures does exist in lower/middle latitude regions, which scales are several hundreds km.

This study is continuative one of our previous observations, aiming to derive temporal variations of small cloud-top structures. Observations were carried out in July and October, 2007 using large telescopes on the Mauna Kea in Hawaii. IRTF, which was utilized in July, 2007, is possible to conduct daytime observations and images with longer time interval, more than 2 hours, were obtained by starting observations before the sunset. Variations of cloud-top caused by atmospheric dynamics are derived from these images, and these have some similarities with that seen in ultraviolet images of cloud-top patterns. In the observations with Subaru Telescope in October, 2007, spectral data with a spectral range of about 8-13 micron were also obtained in addition to time interval imaging. The slit was set at two positions, one is from North Pole to South one and the other is equatorial. These data are available to know vertical structure near the cloud-top at the region small structures exist.

This paper mentions to mainly short time and daily variations of small structures.