

Ground-based observations of the cloud patterns on Venus dayside with the Iitate 60-cm telescope

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We have carried out imaging observations of dayside cloud patterns of the Venus at wavelengths of 410 nm and 1000 nm using the 60-cm telescope at Iitate observatory, Fukushima. The patterns in the 410-nm images represent the features of upper clouds at about 70 km altitude, while the 1000-nm images represent the features of the lower clouds at about 50 km altitude. Our goal is to monitor these patterns continuously and deduce the wind field from cloud motions.

To reduce the effect of atmospheric scintillation on the seeing, we adopted fast imaging technique. A high-speed CCD camera with an exposure time of 15 ms and an interval of about 200 ms was used for this purpose. First we selected only the frames with shape images of Venus. Then, the stacking of frames was performed for about 100 frames to improve the spatial resolution and contrast.

The contrast of the cloud patterns on the Venus dayside is estimated about 25% at 407 nm and 3% at 986 nm from the Galileo spacecraft observation (Benton et al., 1991). We used a cubic spline interpolation to make a smooth curved surface representing the Venus dayside background emission. We also applied an empirical function used for Galileo data analysis which reproduces brightness gradients by considering phase angles. We will show the result of these data analyses.