

IR2 (2- μ m) Camera onboard Venus Climate Orbiter

TAKEHIKO SATOH¹, MUNETAKA UENO² and IR2 TEAM

¹*Kumamoto University*

²*Tokyo University*

Among 5 scientific cameras onboard Venus Climate Orbiter (VCO), IR2 plays a key role in sensing deeper atmosphere of Venus. Observations of altitudes below the optically-thick cloud will be done on un-illuminated side of the planet. Wavelengths 1.73, 2.26, and 2.32 μ m, so-called atmospheric windows, regions of free of otherwise very strong CO₂ absorption, are to be utilized. The first two wavelengths are almost absorption free while the last one contains a CO absorption band. By combining the data at these wavelengths, we investigate the spatial/temporal variations in the cloud particle size and the CO abundance.

Additional wavelengths include 2.02 μ m and an astronomical H-band (centered at 1.65 μ m). The former is in a prominent CO₂ absorption band, so we expect to detect variations of cloud-top altitude as variations of brightness of the “illuminated” side of the planet. The H-band observations aim at the zodiacal light of which scientific objectives are discussed in another paper at this meeting.

The camera is designed to achieve a high spatial resolution, 12 km at subspacecraft point when a full-disk of Venus falls just within the 1024x1024-pixels detector (PtSi) which is cooled down to 65 K for highest possible signal-to-noise ratio. The optics consists of 3 elements (triplet) and is operated also at a low temperature (around 170 K). In the 30-hour period orbit around Venus, images will be acquired every 2 hours so that finer structures of atmospheric motion may be continuously tracked and greater deals of the Venusian meteorology will be studied.

Keywords: Venus; atmospheric window; remote sensing; meteorology

References

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- [2] Bell, J., III, et al., *Science* **252**, 1293-1296, 1991.