

Ultra Violet Imager on Venus Climate Orbiter

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We are developing a Ultra Violet Imager (UVI) which is one of the 5 cameras on-board the Venus Climate Orbiter (VCO). The VCO is the first planetary meteorological spacecraft and the cameras measuring different wavelength reveal atmospheric dynamics by cooperating with each other.

The Venus atmosphere has broad absorption of solar radiation between 200nm and 500nm. The UVI is designed to measure the ultraviolet scattering lights at 283nm and 365nm wavelengths from cloud tops of ~ 70 km altitude. The field of view is 0.015° with 1024×1024 SiCCD. The spatial resolution is ~ 15 km at apoapsis of 13 Rv. SO_2 at the cloud top absorbs the radiation in the region between 200nm and 320nm but the absorption above 320nm is due to “unknown” absorber. Identification of the absorber is important for the energy balance and dynamics of the Venus atmosphere. Tracking the cloud motion is used to investigate the dynamics of cloud, winds and wave phenomena. The typical size of the features is ~ 100 km and contrast is typically 5–10%. The superrotation of the Venus cloud at ~ 70 km altitude has the zonal velocity of ~ 100 m/s. Therefore, the imaging of clouds by the UVI will make clear the spatial and vertical distribution of the ultraviolet absorbers at the cloud tops, identification of unknown absorber, dynamics of cloud, and vertical distribution of haze above the cloud. Now we are testing the method to raise signal to noise ratio by use of an electrical breadboard model. We will report the results of those tests.