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1 micro-m camera onboard Akatsuki / Venus Climate Orbiter

Naomoto Iwagami[1*], Shoko Ohtsuki[2], Seiko Takagi[3]

[1]University of Tokyo, [2]ISAS, [3]University of Tokyo

The 1 micro-m camera named IR1 is one of 5 cameras, and works both on the dayside and the nightside. On the dayside, it measures the solar radiation at 0.90 mm scattered by the clouds, and quantifies the horizontal wind vectors by using the cloud-tacking technique. By combining the information obtained from various heights by the other cameras and by the radio occultation, meteorological information such as the wind field and the distribution of eddy diffusion may be deduced. This will make it possible to investigate the generation mechanism of the super-rotation. On the nightside, it has 3 channels of 0.90, 0.97 and 1.01 mm to detect thermal emission mostly from the surface and a little from the lower atmosphere. The latter two channels are a differential absorption pair for measuring the surface H2O abundance with the 1.01 mm channel as a reference. Although the center of the H2O band is located at 0.94 mm, the 0.97 mm channel is suitable to obtain information about H2O abundance because of moderate absorption (not too strong and not too weak). H2O is one of the most important minor constituents near the surface because of various reactions with surface minerals. Also it is related to the chemistry of the clouds, which are mostly made of H2SO4 and H2O.

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