



Morphology and wind measurements at the lower cloud of Venus using VIRTIS-VEX images

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Images obtained from April to July 2006 by the VIRTIS-M channel instrument on-board Venus Express have been used to retrieve the zonal wind velocity profile and morphology at the lower cloud. Sensitivity to this cloud with a good signal-to-noise ratio was obtained from thermal night-time emission at wavelengths of 1.74 and 2.3 microns. Cloud tracking was performed on 425 individual features, allowing to measure cloud motions between latitudes 5 deg S to 90 deg S. Additionally a digital correlator which compares two or more consecutive images and identifies patterns by maximizing correlations between image blocks has been used to retrieve the winds. Our main results are: (1) From latitudes 0 deg to 64 deg S the velocity is constant with a value $\langle u \rangle = -53.4 \pm 9$ ms⁻¹; (2) Wind velocities decrease from this value at 65 deg S to near 0 ms⁻¹ at the South Pole; (3) There is a strong wind variability in the latitude band from 65 deg S to 75 deg S where u varies from -80 to -10 ms⁻¹; (4) Poleward meridional winds on the order of -10 m/s could be present at high southern latitudes according to the correlation data but are not detected in the tracking data. We compare our results with previous ones at a much lower resolution and with the vertical zonal winds profiles retrieved by Venera and Pioneer-Venus probes to infer the altitude location of this cloud.