Geophysical Research Abstracts
Vol. 13, EGU2011-987, 2011
EGU General Assembly 2011

Variability in the atmospheric winds on the cloud top level of Venus according to UV images obtained by VMC

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The wind speed at the cloud top level of Venus derived from manual and automated cloud tracking in the UV channel (365+10 nm) of the Venus Monitoring Camera Experiment (VMC) [1] demonstrates time variability.

More than 110 orbits have been processed and more than 35000 vectors for UV details were obtained using manual tracking. Also we have wind speed vectors derived from 40 orbits using automated method. The period of the observation covers more than 6 venusian year.

Averaged zonal wind speed at selected latitudes demonstrates the secular variations. Similar variations in the wind speeds have been found from UV images obtained by OCPP (Pioneer Venus) [2]. For example, average zonal wind speed at 20 degrees latitude has a variation from season to season of observation in the range 80-100 m/s.

Deeming algorithm [3] was applied to time series of averaged zonal wind speed for variability analysis. Time series contained the average zonal wind speeds at selected latitudes for each season of observation demonstrates variability changes in low and middle latitudes with periods near superrotation period. For example, for orbit 1318-1374 (December, 2009 – January, 2010) the average zonal speed at low latitudes constitutes value 96.9 ± 1.8 km/s on which with the period of 4.2 days the wave by amplitude 12.6 ± 2.6 km/s is imposed.

References

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