Geophysical Research Abstracts
Vol. 12, EGU2010-4276-1, 2010
EGU General Assembly 2010

Venus winds at cloud level from VIRTIS during the Venus Express mission

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The Venus Express (VEX) mission has been in orbit to Venus for almost four years now. The VIRTIS instrument onboard VEX observes Venus in two channels (visible and infrared) obtaining spectra and multi-wavelength images of the planet. Images in the ultraviolet range are used to study the upper cloud at 66 km while images in the infrared (1.74 μm) map the opacity of the lower cloud deck at 48 km. Here we present our latest results on the analysis of the global atmospheric dynamics at these cloud levels using a large selection over the full VIRTIS dataset. We will show the atmospheric zonal superrotation at these levels and the mean meridional motions. The zonal winds are very stable in the lower cloud at mid-latitudes to the tropics while it shows different signatures of variability in the upper cloud where solar tide effects are manifest in the data. While the upper clouds present a net meridional motion consistent with the upper branch of a Hadley cell the lower cloud present almost null global meridional motions at all latitudes but with particular features traveling both northwards and southwards in a turbulent manner depending on the cloud morphology on the observations. A particular important atmospheric feature is the South Polar vortex which might be influencing the structure of the zonal winds in the lower cloud at latitudes from the vortex location up to 55ºS.

Acknowledgements This work has been funded by the Spanish MICIIN AYA2009-10701 with FEDER support and Grupos Gobierno Vasco IT-464-07.