Geophysical Research Abstracts
Vol. 16, EGU2014-2805, 2014
EGU General Assembly 2014

Synoptic Regional-scale Air Temperature Fields in the Venusian Mesosphere as Observed by Venus Express VIRTIS-M

Davide Grassi (1), Romolo Politi (1), Nikolai Ignatiev (2), Christina Plainaki (1), Sèbastien Lebonnois (3), Paulina Wolkenberg (4), Luca Montabone (3), Alessandra Migliorini (1), Giuseppe Piccioni (1), and Pierre Drossart (5)

(1) IAPS - INAF, Roma, Italy (davide.grassi@iaps.inaf.it), (2) IKI - RAS, Moscow, Russia, (3) LMD - CNRS, Paris, France, (4) CBK - PAS, Warsaw, Poland , (5) LESIA - Obs. de Paris, Meudon, France

The recent reprocessing of the entire night-time VEX VIRTIS-M dataset according a full Bayesian method (Grassi et al., 2013, submitted) has eventually allowed the production of large scale synoptic air temperature fields in the Venusian Mesosphere from the mosaicking of several cubes acquired during a given orbit.
While average fields as a function of latitude and local time suggest a semi-diurnal tide dominating at mid-latitudes and a diurnal tide dominating at high latitudes, synoptic fields reveals a much more complex picture.
At the lowest level probed by VIRTIS-M (98.4 mbar, about 65 km above the surface), the cold collar region appears rich in small scale features. Namely, long (exceeding 90° in longitude) but narrow (less than 5° in latitude) patterns of alternate warm and cold air, apparently originating from the extremes of polar dipole, are over posed to a general trend that shows a minimum in the early hours after midnight.
Similar patterns persist also at higher altitude (34.0 mbar, about 70 km above the surface), but their shapes appear more blurred. Noticeably, relative air temperature maxima and minima are anticorrelated at the two levels of 98.4 and 34.0 for the small scale features, while a similar anticorrelation does not hold true in more smoothed areas.
Moving to even higher altitude than 70 km, the high-frequency patterns become less prominent but are still seen up to 1.4 mbar level (84.5 km) while large scale features seen just above the cloud level (dipole and cold collar) have completely disappeared.
In general, we confirm that the region of the Venus South presents general trends well distinct at different levels between 65 and 85 km, but hosts small scale perturbations extended over at least 20 km in latitude, likely induced by dynamical phenomena.