



Characterization of gravity waves in the upper and lower clouds of Venus using VIRTIS-VEX images

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Images obtained by the VIRTIS-M instrument onboard Venus Express present trains of short waves in the opacity of the clouds in two different layers: at the cloud tops altitude (~ 66 km altitude) observed in the day-side hemisphere using reflected ultra-violet light (380nm), and in the lower cloud (altitude ~ 47 km altitude) as observed in the night-side hemisphere using thermal radiation ($1.74 \mu\text{m}$). The waves are nearly zonal, have wavelengths of 60-130 km, propagate westward with respect to the zonal flow with low phase velocities and are confined in wave packets of 400 to 1,600 km. The waves in the lower cloud observed in the infrared are more common and present larger variability on the VIRTIS dataset. In both cases the characteristics of the waves corresponds to gravity waves propagating in the stable layers of the atmosphere. An analytic study and a preliminary numerical modelling of these waves will be presented.