



Investigating gravity waves evidences in the Venus upper atmosphere

Alessandra Migliorini (1), Francesca Altieri (1), Alexey Shakun (2,3), Ludmila Zasova (2,3), Giuseppe Piccioni (1), Giancarlo Bellucci (1), and Davide Grassi (1)

(1) IAPS-INAF, via del Fosso del Cavaliere, 100, 00133, Rome, Italy, (2) IKI, Space Research Institute, Russian Academy of Science, Moscow, Russia, (3) Moscow Institute of Physics and Technology, Dolgoprudnyy, Russia

We present a method to investigate gravity waves properties in the upper mesosphere of Venus, through the O₂ nightglow observations acquired with the imaging spectrometer VIRTIS on board Venus Express.

Gravity waves are important dynamical features that transport energy and momentum. They are related to the buoyancy force, which lifts air particles. Then, the vertical displacement of air particles produces density changes that cause gravity to act as restoring force.

Gravity waves can manifest through fluctuations on temperature and density fields, and hence on airglow intensities. We use the O₂ nightglow profiles showing double peaked structures to study the influence of gravity waves in shaping the O₂ vertical profiles and infer the waves properties. In analogy to the Earth's and Mars cases, we use a well-known theory to model the O₂ nightglow emissions affected by gravity waves propagation.

Here we propose a statistical discussion of the gravity waves characteristics, namely vertical wavelength and wave amplitude, with respect to local time and latitude. The method is applied to about 30 profiles showing double peaked structures, and acquired with the VIRTIS/Venus Express spectrometer, during the mission period from 2006-07-05 to 2008-08-15.