



Small-scale wave activity in the Martian atmosphere

K. Matcheva

Department of Physics, University of Florida, USA

The longterm observations of the Martian atmosphere by the Mars Global Surveyor resulted in a large number of radio occultations that provide information about the vertical structure of the Martian atmosphere over a large range of latitudes and longitudes with a vertical resolution less than a kilometer. Small amplitude temperature fluctuations are readily observed in a large percentage of the retrieved vertical temperature profiles. Similar temperature variations are very typical for the Earth's atmosphere and have been also observed on other solar system planets. These quasi-periodic temperature variations are often attributed to atmospheric wave activity. In the Earth's atmosphere the slope of the power spectrum of the observed vertical temperature fluctuations is remarkably constant in time and space and is often referred to as a "universal" slope. We use the observations from the Radio Science Experiment of the Mars Global Surveyor to perform a wavelet analysis on a large set of vertical temperature profiles and identify the vertical characteristics of the dominant wave modes in the Martian atmosphere. The power spectrum of the present temperature fluctuations is then compared to the observed "universal" gravity wave power spectrum in the Earth's atmosphere.