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MITRA RT tool results from MEx/OMEGA data analysis

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The OMEGA spectrometer [1] on board the Mars Express spacecraft has been studying Mars since late December 2003. The instrument has acquired a huge amount of data targeting both the surface and the atmosphere of the red planet. Atmospheric studies by means of radiative transfer (RT) modeling can be performed with both nadir and limb observing geometries. However, multiple scattering is required in order to correctly reproduce and interpret the data registered by the spectrometer. We adopt the full multiple scattering MITRA RT tool [2,3,4,5] to invert the signal observed by OMEGA and obtain the microphysical and geometrical properties of dust and H_2O ice clouds from both nadir and limb data.
In this study we present the ongoing analysis of two separate sets of OMEGA data: 1) nadir observations of gravity waves within H_2O ice clouds; 2) limb observations of a dust detached layer at high altitude. We show how the MITRA RT tool can correctly reproduce both nadir and limb observations. The nadir case is treated with a plane parallel atmosphere, taking advantage of the DISORT solver [6]. On the other hand, to deal with the limb case we exploit the 1D spherical Monte-Carlo MYSTIC solver [7]. We present the preliminary results from the analysis of both datasets and discuss the planned future work.

References:

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