



Evolution of spectroscopic information over the last years and its effect on line-by-line calculations for validation of radiative transfer models for planetary atmospheres

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Over the last several years, the HITRAN spectral database and commonly used continuum models have been upgraded more than once. Moreover, radically new model was proposed for the calculations of the absorption shape of CO₂ in both central and wing regions of IR bands affected by line-mixing effect. It is especially important for radiative transfer calculation in the Martian and Venus atmospheres, composed chiefly of carbon dioxide. In this report will be discussed uncertainty in the line-by-line (benchmark) calculations for validation of radiative transfer models for planetary atmospheres related to the changes in initial spectroscopic data and assumptions since 2002. For this are considered the line-by-line calculations of longwave radiation fluxes and absorbed solar downward radiation fluxes in the atmospheres of Earth, Mars and Venus with the last HITRAN's editions, new H₂O and other continuum models, as well as with and without taking into account of the line-mixing effect. In addition the report will touch on the acute problem of radiative transfer models themselves for the planet climate simulation and for remote sensing of planetary atmospheres. Financial support is provided by the Russian Foundation for Basic Research (project 08-01-00024)