NEW INFRARED AMMONIA SPECTRA IN THE 5650-6350 CM-1 RANGE

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Accurate reference laboratory data plays a crucial role in understanding remote observations, especially in astrophysical surveys. In this contribution, we focus on improving and verifying the accuracy of our previously published peak list in the 6000 cm^{-1} region [1] which belongs to the important 1.6 μm atmospheric transparency window. The core of this study is the analysis of a recently recorded high-resolution Fourier transform spectra. This source offers an improved frequency sampling and better traceability of the measurement conditions compared to previously studied Kitt Peak spectra. 4864 lines are observed in the 5650 - 6350 cm^{-1} region with 2091 new transitions compared with our previous study, part of the HITRAN2020 database. Upper energies for 1021 levels are derived from 3363 assigned transitions. Independently, ammonia spectra recorded in a supersonic jet using a tunable extended cavity diode laser allows to check the absolute transition energies in the limited 5980 - 6080 cm^{-1} range. Methane transitions R0, R1 of $2\nu_3$ band measured with kHz accuracy [2], were used as reference lines. The comparison of the positions of 20 well isolated lines shows an agreement within the 4x10^{-4} cm^{-1} uncertainty of the ammonia positions measured in the jet expansion.

[1] doi:10.1006/10.1016/j.jqsrt.2020.107334, P. Cacciani, P. Čermák, S. Béguier, A. Campargue, *J. Quant. Spectrosc. Radiat. Transf.*, **258**, :107334, (2021).

[2] doi:10.1039/d1cp04989e O. Votava, S. Kassi, A. Campargue and D. Romanini, *Phys. Chem. Chem. Phys.*, 2022,24, 4157-4173

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