NITROUS OXIDE LINE SHAPES IN THE SUB-MILLIMETER REGION: MEASUREMENTS AND THEORY

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The exhaustive study of N_2O/N_2 (O_2, air) rotational transtitions situated in the sub-millimeter wave domain is of a fundamental importance for the reliable interpretation of the experimental data collected by the satellite ODIN (the Swedish-led satellite project supported by Canada, Finland and France). In complement to our recent laboratory measurements near 201, 552 and 577 GHz [1], new results are obtained with a frequency-modulated spectrometer for the N_2O transitions at 502.3 and 602 GHz. The theoretical computations for the collisional line broadening are based on a semiclassical formalism with exact trajectories [2]. The analysis of the line profile is performed with both the classical Voigt model and a speed-dependent Voigt model.

[1] F. Rohart, J.-M. Colmont, G. Wlodarczak, and J.-P. Bouanich, J. Mol. Spectrosc. 222, 159-171 (2003).
[2] J. Buldyreva, J. Bonamy, D. Robert, J. Quant. Spectrosc. Radiat. Transf. 62, 321-343 (1999).