



## **HDO and D<sub>2</sub>O line parameters by Fourier Transform Infrared Spectroscopy:**

### **The 8800-10800 cm<sup>-1</sup> spectral region**

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In the continuation of our work dedicated to the spectroscopy of the stable isotopologues of water vapor (H<sub>2</sub><sup>16</sup>O, H<sub>2</sub><sup>17</sup>O, H<sub>2</sub><sup>18</sup>O, HDO, D<sub>2</sub>O) [1-7], and considering the current atmospheric and spectroscopic interest for these species (e.g. [8-13], and references therein), this work presents line parameters of HDO and D<sub>2</sub>O in the near infrared.

Long-pathlength Fourier transform absorption spectra of H<sub>2</sub>O:HDO:D<sub>2</sub>O mixtures have been recorded at different partial pressures and at room temperature. Spectra in the presence of dry synthetic air were also recorded. The assignment of the lines to the different isotopologues was based on ratios between spectra of different relative abundances, and correct partial pressures were determined from ratios between line areas. A detailed linelist comprising absolute positions, intensities, self-broadenings and assignments is presented. The results are compared with recent literature data, and improvements as well as future needs are briefly discussed.

[1] A. Jenouvrier et al. (2006) accepted to JQSRT.

[2] O. V. Naumenko et al. (2006) *J. Mol. Spectrosc.*, 238(1), 79-90.

[3] R. N. Tolchenov et al. (2005) *J. Mol. Spectrosc.*, 233(1), 68-76.

- [4] M. Bach et al. (2005) *J. Mol. Spectrosc.*, 232(2), 341-350.
- [5] M.-F. Mérienne et al. (2003) *J. Quant. Spectrosc. Radiat. Transfer*, 82, 99-117.
- [6] S. Fally et al. (2003) *J. Quant. Spectrosc. Radiat. Transfer*, 82, 119-132.
- [7] P.-F. Coheur et al. (2002) *J. Quant. Spectrosc. Radiat. Transfer*, 74, 493-510.
- [8] M. Schneider et al. (2005) *Atmos. Chem. Phys. Discuss.*, 5, 9493-9545.
- [9] D. H. Ehhalt and F. Rohrer (2005) *J. Geophys. Res.*, 110, d13301.
- [10] G. A. Schmidt et al. (2005) *J. Geophys. Res.*, 110, d21314.
- [11] H. Brogniez et al. (2006) *J. Geophys. Res.*, 111, d21109.
- [12] D. C. Tobin et al. (2006) *J. Geophys. Res.*, 111, d09S14.
- [13] L. S. Rothman et al. (2005) *J. Quant. Spectrosc. Radiat. Transfer*, 96(2), 139-204.