A NEW "DIET" FOR AIR-BROADENED HALF-WIDTHS OF WATER VAPOR IN THE HITRAN2004 COMPILATION

I. E. GORDON, L. S. ROTHMAN, *Harvard-Smithsonian Center for Astrophysics, Atomic and Molecular Physics Division, Cambridge MA 02138-1516, USA*; D. JACQUEMART, *Laboratoire de Dynamiques, Interactions et Réactivités, Université Pierre at Marie Curie, 4 place Jussieu, Paris 75252, France*; R. R. GAMACHE, *University of Mass. Lowell, Department of Environmental, Earth & Atmospheric Sciences, Lowell MA 01854, USA*.

The half-widths of molecular lines are very important parameters for atmospheric remote sensing. Out of all the molecules represented in HITRAN, the air-broadened half-widths for H_2O have the greatest dynamic range. The HITRAN2004 compilation employs an efficient algorithm for choosing the most accurate values available for these half-widths[a]. Nevertheless some of the values in the HITRAN2004 database were found to be far from ideal.

It was found that the major source of problems was associated with arithmetic averaging of all experimental data available for every transition[b], which is a first step in the algorithm. The available experimental data have been reassessed, and inaccurate measurements were removed from the averaging or replaced by a calculated value. This procedure yields a significant improvement of the air-broadened half-width parameters in the database. Other collision-induced parameters for water vapor will be discussed as well.

[a] L. S. Rothman et al., JQSRT 96, 139 (2005).

[b] R. R. Gamache and J.-M. Hartmann, Can. J. Chem. 82, 1013 (2004).