LINE MIXING IN SELF- AND FOREIGN-BROADENED WATER VAPOR

L. R. BROWN, R. A. TOTH, *Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Dr., Pasadena, CA 91109-8099*; V. MALATHY DEVI, D. CHRIS BENNER, *Department of Physics, The College of William and Mary, Williamsburg, VA 23187-8795*; M. A. H. SMITH, *Science Directorate, NASA Langley Research Center, MS 401A, Hampton, VA 23681-2199*.

Line mixing has been measured for two pairs of transitions in the ν_2 band of water. The rotational assignments of the four lines (in terms of the rotational quantum numbers J, K_a and K_c) are a) two P branch lines: (1 0 1)←(2 1 2) mixing with (2 1 2)←(3 0 3) at 1539.061 and 1540.300 cm^{-1}, respectively; and b) two R branch lines: (3 0 3)←(2 1 2) mixing with (2 1 2)←(1 0 1) at 1652.400 and 1653.267 cm^{-1}, respectively. Pressure broadening coefficients of H_2O (halfwidths, pressure shifts and off-diagonal relaxation matrix elements) are reported for seven broadeners (self, H_2, He, CO_2, N_2, O_2 and air) obtained from retrievals performed by multispectrum fitting implemented with line mixing.[a]

[a]The research described in this paper was carried out by the Jet Propulsion Laboratory, California Institute of Technology, Langley Research Center and the College of William and Mary under contract with the National Aeronautics and Space Administration.