LINE STRENGTH MEASUREMENTS IN THE ν_2 BAND OF $H_2{}^{18}O$

Yu. I. BARANOV, *Institute of Experimental Meteorology, Lenina 82, Obninsk, Kaluga region 249020, Russia*; P. CHELIN, J. ORPHAL, and L. H. COUDERT, *LISA, CNRS/Universités Paris 12 et 7, 61 Avenue du Général de Gaulle, 94010 Créteil, France*.

Spectra of an $H_2{}^{18}O$ enriched sample of water vapor were recorded from 1780 to 4500 cm^{-1}, at room temperature, with a Bruker IFS-125 instrument and a liquid nitrogen cooled InSb detector. A single path, 24 cm long, glass cell with ZnSe windows was filled with $H_2{}^{18}O$ water vapor at 97.1% purity from CDN Isotopes. For the various spectra, pressures ranging from 4.3 to 18.4 Torr were measured with two different MKS Baratron gauges having 10 and 100 Torr pressure limits. The unapodized spectral resolution was 0.002 cm^{-1}. Line strengths were retrieved from these spectra for transitions belonging to the ν_2 band with the help of a computer program determining simultaneously line positions, strengths, and linewidths by nonlinear least-squares fitting. The new line strength values were analyzed with those already available for rotational transitions within the ground vibrational state[a] and for ν_2 band[b] transitions. In order to account for the anomalous centrifugal distortion displayed by water, this line intensity analysis was performed using the Bending-Rotation Hamiltonian approach.[c]

[a]Toth, *J. Molec. Spectrosc.* **190** (1998) 379.
[b]Toth, *J. Opt. Soc. Am. B* **9** (1992) 462.
[c]Coudert, Wagner, Birk, Baranov, Lafferty, and Flaud, *J. Molec. Spectrosc.* **251** (2008) 339.