THE ROTATIONAL TORSIONAL SPECTRUM OF THE $\nu_5/2\nu_9$ DYAD OF NITRIC ACID

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The measurements and analysis of the millimeter/submillimeter transitions of the $\nu_5/2\nu_9$ dyad of nitric acid have been extended from the symmetric top[a] into the asymmetric top limit. The analysis involves an IAM approach and includes the first term of a Fourier series expansion, $\cos(\rho K_a)$, for several elements of the Watson-type Hamiltonian. The analysis includes over 2300 transitions between 90-700 GHz that have been fit to a rms deviation of 97 kHz. The analysis also reproduces the published infrared line positions. Because of the strong Fermi resonance between the two vibrational states, the labeling of the torsional rotational energy levels can become ambiguous when the torsional and asymmetric splittings are similar. The analysis and schemes to deal with the labeling problem will be discussed.

[a]Thomas M. Goyette, Lee C. Oesterling, Douglas T. Petkie, Randy A. Booker, Paul Helminger, and Frank C. De Lucia, *J. Mol. Spectrosc.* **175**, 395-410 (1996).