TOWARDS A GLOBAL EIGHT-STATE FIT OF THE ROTATIONAL AND VIBRATIONAL SPECTRA OF HN_3

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Our longstanding goal has been achieving a global fit of the ground state and seven lowest excited states of HN_3 (ν_5, ν_6, ν_4, ν_3, $2\nu_5$, $2\nu_6$, and ν_5+ν_6), all of which are strongly connected by Coriolis, anharmonic, and Darling-Dennison resonance perturbations. From the combined effort of the Wisconsin and Prague groups, we observed and assigned most of the millimeter-wave spectrum from low-frequency microwave lines up to 720 GHz. Recently, we have acquired an extensive set of infrared (IR) spectral data at the Canadian Light Source (CLS), 30-5000 cm^{-1} at 0.0009 cm^{-1} resolution and pressures between 1 and 100 mTorr. This data supersedes all previous IR data, in that it provides higher sensitivity (providing transitions with higher *J*'s and *K*'s) and higher frequency accuracy for all the ground and fundamental states. More importantly, it has permitted assignment of thousands of lines in about 30 subbands involving the combination and overtone states. Using linear least-squares treatments of individual subbands (Fortrat or Q-branch plots), we have so far determined absolute energies of K_a = 0-7 of $2\nu_5$, K_a = 2-6 of ν_5+ν_6, and K_a = 0-6 of $2\nu_6$, using redundant measurements from multiple subbands confirmed by combination differences with known *a*-type lines in the mm-wave spectrum. Several additional mm-wave series were assigned using improved predictions from the IR spectra, and several others have been reassigned. We present our current spectral analysis and progress on the implementation of an eight-state global fit.