DEVELOPMENT OF BROAD RANGE SCAN CAPABILITIES WITH JET COOLED CAVITY RINGDOWN SPECTROSCOPY

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We have developed a technique for obtaining broad scans, $>$100 cm^{-1}, for jet cooled cavity ringdown spectroscopy (CRDS) spectra. Previously the scans of the jet cooled, CRDS apparatus were limited to $<$10 cm^{-1} due to the use of a narrow linewidth radiation source. However, by coupling our jet cooled, CRDS apparatus with a moderate resolution ($\simeq$ 0.05 cm^{-1}) dye laser we are able to greatly increase our rate of data acquisition thereby gaining the capability to perform broad spectral surveys of jet cooled molecules. As a test of the capabilities of the technique we have scanned the $\tilde{A}$–$\tilde{X}$ transition of NO_3 previously reported by Deev *et al.*[a] at room temperature. We believe that this will be a very useful technique to search for transitions of cold molecules whose frequencies are not well known and which later can be studied using high resolution methods.

[a] A. Deev, J. Sommar, and M. Okumura, J. Chem. Phys. 122, 224305 (2005).