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**High Resolution Cavity Ringdown Spectroscopy of Jet-Cooled Reactive Intermediates** GABRIEL JUST, PATRICK RUPPER, LINSEN PEI, TERRY MILLER, The Ohio State University — Alkyl peroxy radicals long have been well known to be key intermediates in atmospheric chemistry as well as in low temperature combustion. For the last several years, our group has generated a data set for these radicals using room temperature cavity ringdown spectroscopy. We have recently extended our investigations of the peroxy radicals to obtain a high resolution data set of spectra under jet cooled conditions using a quasi-Fourier-transform-limited laser source and a supersonic slit jet discharge expansion. Over the last few years, we have developed our capability to obtain narrow-bandwidth, near infrared (NIR) radiation for performing high resolution cavity ringdown spectroscopy using the post-amplification of a Ti:Sa ring laser. The NIR light can be generated by either stimulated Raman shifting or by difference frequency mixing by combining the second harmonic of a Nd:YAG laser with our post-amplified light in a BBO crystal. Using this apparatus, we have observed isomer and conformer specific spectra of the following species : methyl peroxy,  $\text{CH}_3\text{O}_2$ , ethyl peroxy,  $\text{C}_2\text{H}_5\text{O}_2$ , propyl peroxy,  $\text{C}_3\text{H}_7\text{O}_2$ , and phenyl peroxy,  $\text{C}_6\text{H}_5\text{O}_2$  . These spectra show rotationally resolved structure with a temperature of  $\sim 15$  K as well as other structure attributable to spin-rotation interactions, tunneling splittings etc.

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