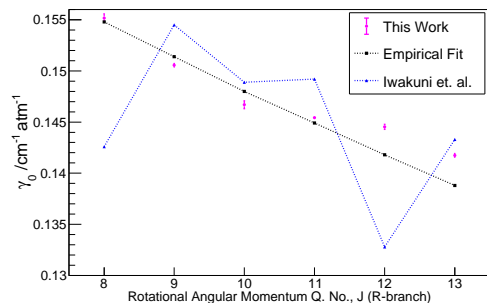


CONTINUING INVESTIGATIONS OF ORTHO-PARA-DEPENDENT PRESSURE BROADENING IN THE $\nu_1 + \nu_3$ BAND OF ACETYLENE

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abundance isotopomer lines. Detailed modeling of Iwakuni et al. results suggest the alternation is an artifact of the fits neglecting collisional narrowing in a strongly absorbing regime. Further low temperature measurements have been planned to try to limit influence of the hot-band lines.

In 2016, Iwakuni et al.¹ measured the $\nu_1 + \nu_3$ vibrational combination band of acetylene using a dual-frequency comb based spectrometer. They reported an alternation in the self-pressure broadening coefficients of even and odd rotational levels, which correspond to the para- and ortho-nuclear spin states. This can occur if relaxation involving resonant energy transfer between molecules with common nuclear spin symmetry is important, because ortho-ortho collisions are statistically more probable than para-para ones. Subsequently several authors^{2,3} have disputed these findings. Our recently published results, using a frequency-comb stabilized laser spectrometer found no experimental evidence of the reported effect in the R(8)–R(13) lines of the band.⁴ Analysis of the data needed careful accounting of weak underlying absorptions due to hot-bands and lower

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