FREQUENCY-COMB REFERENCED, SUB-DOPPLER SPECTROSCOPY OF HOT BANDS OF ACETYLENE IN THE REGION OF THE $\nu_1 + \nu_3$ COMBINATION BAND

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To take full advantage of recent improvements in the accuracy obtained in collision-induced absorption line shape measurements of the acetylene $\nu_1 + \nu_3$ combination band, independent and accurate knowledge of the positions of weaker, overlapping hot band transitions is required. We have used cavity-enhanced saturation-absorption spectroscopy together with a frequency-comb referenced, extended cavity diode laser to determine Doppler-free transition frequencies for the ν_4 and ν_5 hot band transitions in this region . A laser intensity dependent asymmetry in the sub-Doppler saturation line shape is observed, and will be discussed in terms of the intra-cavity beam geometry.

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