CAVITY-ENHANCED ABSORPTION SPECTROSCOPY WITH A MODE-LOCKED FEMTOSECOND LASER

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The wide spectral coverage and high sensitivity of Mode-Locked Cavity Enhanced Absorption Spectroscopy (ML-CEAS) are illustrated by the observation of a very high overtone transition of $C_2H_2$ in the blue spectral region (420 nm, 8 quanta of CH stretch excitation), which was easily accessed by frequency-doubling a modelocked femtosecond Ti:Sapphire laser. The detection limit is about $10^{-9}$/cm. The rotational analysis of this $\sum^+_u - \sum^+_g$ parallel band, centred at 23813.244 cm$^{-1}$, is presented and the vibrational assignment is discussed.