ROTATIONALLY RESOLVED SPECTRA OF THE $B^2\Pi$ - $X^2\Pi$ $0_0{}^0$ AND $\mu^2\Sigma$ - $\mu^2\Sigma$ $11_1{}^1$ TRANSITIONS OF C_6H AND C_6D

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The linear carbon chain radicals have been topic of a series of spectroscopic studies. The hexatriynyl radical C_6H (and deuterated equivalent C_6D), a member of the linear C_nH series, has attracted renewed interest in recent years after the astronomical identification of its chemically related anion C_6H^- and its low-lying 11_1 $\mu^2\Sigma$ vobronic state.
In this talk, rotationally resolved spectra of the $B^2\Pi$ - $X^2\Pi$ $0_0{}^0$ and $11_1{}^1$ transitions of both C_6H and C_6D are presented. Cavity ringdown spectroscopy is used to record the spectra in direct absorption through a supersonically expanding planar plasma. The $\mu^2\Sigma$ - $\mu^2\Sigma$ $11_1{}^1$ vobronic hot bands are observed for the first time. Heavy rotational perturbations are found in the upper levels of C_6D. Precise spectroscopic parameters for the 11^1 $\mu^2\Sigma$ levels of both C_6H and C_6D are determined for the first time, and the spectroscopic parameters for the $B^2\Pi$ 0^0 states are also improved. The Renner-Teller interaction is also discussed to estimate the excitation energies of the low-lying 11_1 $\mu^2\Sigma$ vibronic states.