FEMTOSECOND STIMULATED EMISSION PUMPING OF BARE AND CLUSTERED I_2^-

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Stimulated emission pumping in conjunction with femtosecond photoelectron spectroscopy has been used to create and monitor a coherent superposition of vibrational levels on the ground ($\tilde{X}^2\Sigma_u^+$) state of I_2^-, both bare[a] and clustered with four CO_2 molecules[b]. In the bare ion, the resulting wavepacket oscillations were monitored at several excitation energies up to 0.993 eV; energy-dependent frequencies and anharmonicities were extracted which were used to fit the ground state to a modified Morse potential. In the cluster, which was studied with 0.53 eV excitation energy, the rate of energy loss to the CO_2 molecules was determined both by the increase in the wavepacket oscillation frequency (3.8 cm^{-1}/ps during the initial three picoseconds of coherence) and by the shift of the measured photoelectron spectrum.

[a] M. T. Zanni, A. V. Davis, C. Frischkorn, M. Elhanine and D. M. Neumark *J. Chem. Phys*, submitted

[b] A. V. Davis, M. T. Zanni, C. Frischkorn, M. Elhanine and D. M. Neumark *J. Electron Spectrosc. Relat. Phenom.*, submitted