

Abstract Submitted
for the DAMOP06 Meeting of
The American Physical Society

Observation of Enhanced Excitation of I_2^{2+} by Strong Laser Fields

GEORGE GIBSON, RYAN COFFEE, LI FANG, University of Connecticut — Using pump-probe spectroscopy with ultrashort laser pulses, we see an enhancement of the charge-asymmetric dissociation (CAD) channel, $(I_2^{2+})^* \rightarrow I^{2+} + I$, over a narrow range of internuclear separation. The enhancement of the CAD channel appears to come from excitation of the symmetric ground state dissociation channel ($I^+ + I^+$) for two reasons. First, there is a depletion in the symmetric channel at approximately the same pump-probe delay as the asymmetric enhancement. Second, for a fixed delay, the asymmetric channel increases as a function of probe intensity while the symmetric channel decreases. In addition, we find that the kinetic energy of the extra $I^{2+} + I$ ions decreases for increasing delay. To explain this dependence of the kinetic energy release on delay, we introduce model potential energy curves. Based on these curves, we conclude that the excitation is produced by a resonant 3-photon transition within I_2^{2+} rather than by ionization of I_2^+ .

George Gibson
University of Connecticut

Date submitted: 25 Jan 2006

Electronic form version 1.4