

Abstract Submitted
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Controlling Molecular Fragmentation: Charge Transfer in a Dissociating Molecule¹ BRETT PEARSON, Stony Brook University, MARK BAERTSCHY, University of Colorado at Denver, DAVID CARDOZA, Stony Brook University, THOMAS WEINACHT, Stony Brook University — We investigate control of molecular fragmentation in the halogen-substituted acetone $\text{CHBr}_2\text{COCF}_3$. Feedback experiments can successfully control the $\text{CF}_3^+/\text{CHBr}_2^+$ branching ratio during dissociative ionization. Optimal pulse shapes, combined with pump-probe spectroscopy, suggest a control mechanism that transfers electronic charge from the CF_3 to the CHBr_2 fragment during dissociation. Further tests show that the charge transfer process may be interpreted in terms of adiabatic rapid passage mediated by a dynamic resonance between different electronic states in the dissociating molecule. This control mechanism provides a possibility for measuring the nuclear wave function of the dissociating molecule.

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