Abstract Submitted for the DAMOP06 Meeting of The American Physical Society

Imaging Molecular Wavefunctions during Dissociation<sup>1</sup> MARK BAERTSCHY, University of Colorado at Denver, BRETT PEARSON, DAVID CARDOZA, THOMAS WEINACHT, Stony Brook University — Recent fragmentation control experiments with  $CHBr_2COCF_3$  suggest an approach for measuring the dissociating wavepacket. The approach is based on detecting changes in fragmentation yields as the wave packet passes through a spatially dependent resonance. It is possible to measure the quantum mechanical probability density of the dissociating wavepacket directly. Furthermore, phase information about the nuclear wave function can be obtained using molecular wave packet interferometry. It is also possible to directly observe the consequences of entanglement between nuclear and electronic wave functions. This approach is general, and well suited for even large polyatomic molecules as long as they can be driven to dissociate and traverse a dynamic charge transfer resonance during dissociation.

<sup>1</sup>Supported through the National Science Foundation, the Department of Energy, and the American Chemical Society Petroleum Research Fund.

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Date submitted: 27 Jan 2006

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