

DAMOP14-2014-000436

Abstract for an Invited Paper
for the DAMOP14 Meeting of
the American Physical Society

Imaging of the dissociation dynamics of polyatomic molecules following low-energy electron resonant attachment¹
ALI BELKACEM, Lawrence Berkeley National Laboratory

There is a very large body of experimental work on dissociative electron attachment to molecules but the majority of that work is focused on the measurement of absolute total cross sections or energetic positions of the resonances. There is scarce information on the dynamics of electron attachment and the subsequent dissociation that often involves highly non-Born-Oppenheimer dynamics, funneling through conical intersections or intricate nuclear motion during the dissociation process. Through COLTRIMS detection techniques we investigate the electron attachment in a fixed-in-frame manner that yields direct information on the symmetries of the neutral and negatively charged resonant states. We will present a study that combines experimental data along with theoretical analysis of dissociative electron attachment to carbon dioxide, methanol and uracil. In these studies we demonstrated that an understanding of anion dissociation dynamics beyond simple one-dimensional models is crucial in interpreting the measured angular distributions.

¹This work is supported by the Chemical Sciences Biosciences and Geosciences Division, Basic Energy Sciences, DOE.