

Abstract Submitted
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Electron Correlation and Molecular Dynamics in Ethylene after Photo Double Ionization¹ F.P. STURM, S.Y. LEE, TH. WEBER, T.Y. OSIPOV, LBNL, T. JAHNKE, L. PH. SCHMIDT, K. KREIDI, R. DOERNER, Goethe Universitaet Frankfurt, A.L. LANDERS, Auburn University, C.W. MCCURDY, University of California, Davis, M.H. PRIOR, A. BELKACEM, LBNL — As the simplest molecule with a carbon double bond, ethylene is a benchmark system for studying intershell and intrashell photo ionization processes and track down electron correlation. Moreover, non-adiabatic effects such as the transition through two conical intersections present in ethylene play an important role in understanding the molecular dynamics of this system. Therefore, we have investigated the electron correlation and the influence of molecular dynamics upon photo double ionization of ethylene molecules with a single photon (41 eV) in a kinematically complete experiment (COLTRIMS technique). The different pathways leading to dissociation could be identified including the symmetric break-up, deprotonation, and molecular rearrangement. Surprisingly, a stable dication of ethylene was not observed, raising the question what inhibits the release of two electrons from the pi orbital or the stability of the dication.

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