

Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Pulse-parameter dependence of nuclear “attosecond time delays”¹ GREG ARMSTRONG, D. URSREY, J. V. HERNANDEZ, F. ANIS, T. SEVERT, M. ZOHRABI, BEN BERRY, PEYMAN FEIZOLLAH, BETHANY JOCHIM, KANAKA RAJU P., J. MCKENNA, B. GAIRE, K. D. CARNES, I. BEN-ITZHAK, B. D. ESRY, J. R. Macdonald Laboratory, Kansas State University — One of the main goals of strong-field photodissociation is the control of chemical reactions. Recent experiments [1] have successfully controlled the spatial asymmetry in D_2^+ using two-color interferometry. These experiments achieved vibrational resolution, and so were able to determine the spatial asymmetry of a number of vibrational states as a function of two-color delay. The relative phase in the delay-dependent spatial asymmetry obtained in these experiments may be used to define a time delay in dissociation from adjacent vibrational states — a technique used previously to produce relative time delays in atomic ionization from the photoelectron spectrum [2]. Further two-color measurements in this direction are being planned. As a guide to these experiments, we aim to determine theoretically the dependence of such delays on laser intensity, pulse length, and pulse shape. We also identify the parameters that maximize the contrast in the delay-dependent spatial asymmetry. [1] M. Zohrabi, Ph.D thesis, Kansas State University (2014). [2] K. Klünder et al., Phys. Rev. Lett. **106** 143002 (2011)

¹This work is supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U. S. Department of Energy under Contract No. DE-FG02-86ER13191

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Date submitted: 29 Jan 2017

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