

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Non-dissociative and dissociative ionization of a CO^+ beam in intense ultrashort laser pulses¹ B. GAIRE, U. ABLIKIM, M. ZOHRABI, S. ROLAND, K.D. CARNES, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University — We have investigated the ionization of CO^+ beams in intense ultrashort laser pulses. With the recent upgrades to our coincidence three-dimensional momentum imaging method we are able to measure both non-dissociative and dissociative ionization of the molecular-ion beam targets. Using CO^+ as an example, we have found that non-dissociative ionization (leading to the metastable dication CO^{2+}) involves a direct transition, i.e. the molecule is ionized with little or no internuclear distance stretch. Dissociative ionization ($\text{C}^+ + \text{O}^+$) occurs both directly and indirectly, stretching first and then ionizing. Our results show that the yield of dissociative ionization is higher than that of non-dissociative ionization and can be manipulated with the laser pulse duration by suppressing the indirect ionization path using ultrashort pulses (≤ 10 fs).

¹Supported by the Chemical Sciences, Geosciences and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U.S. Department of Energy

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Date submitted: 06 Feb 2011

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