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Strong-field control over the product branching ratios in molecular dissociation[1] BRANDON RIGSBEE, MOHAMMAD ZOHRABI, UTUQ ABLIKIM, NICOLAIS GUEVARA, KEVIN CARNES, ITZIK BEN-ITZHAK, BRETT ESRY, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, Kansas 66506, USA — We present a theoretical and experimental study of strong-field control over the fragmentation channel in molecular dissociation by intense, single-color laser fields with emphasis on the effect of chirped pulses. In particular, the branching ratio between $H+D^+$ and H^++D from an HD^+ target is examined as a function of kinetic energy release for 790 nm pulses with intensities on the order of 10^{14} W/cm^2 and pulse lengths ranging from 25 to 65 fs. Theoretical calculations based on numerical solutions of the time-dependent Schrödinger equation in the Born-Oppenheimer approximation are compared to measurements using a coincidence 3-D momentum imaging technique. Both demonstrate that control is indeed possible and depends, as expected, on details of the laser pulse such as its chirp.

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