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Study of zero-photon dissociation of H_2^+ and its isotopes in ultrashort transform limited and chirped laser pulses[1] B. GAIRE, J.V. HERNÁNDEZ, F. ANIS, M. ZOHRABI, J. MCKENNA, K.D. CARNES, B.D. ESRY, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University — We have measured very low kinetic energy release (KER) in the dissociation of H_2^+ and its isotopes in intense ultrashort 800 nm laser pulses. Zero-photon dissociation is the mechanism responsible for this low-KER peak. Our results, obtained by using coincidence three dimensional momentum imaging, suggest some differences in the low kinetic energy release part of the dissociation spectra of HD^+, namely a difference between the two channels H^++D and H+D^+. We also investigate the effect of the positive/negative chirped pulses on the zero-photon dissociation yields. The solutions of the time-dependent Schrödinger equation, which are in good agreement with the experiment for transform limited pulses, show qualitative differences between positively and negatively chirped pulses.

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