Abstract Submitted
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Clear evidence of zero-photon dissociation of H_2^+ in intense few cycle laser pulses[1] B. GAIRE, J. MCKENNA, A.M. SAYLER, F. ANIS, M. ZOHRABI, NORA G. JOHNSON, J.J. HUA, K.D. CARNES, B.D. ESRY, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University — Evidence of net zero-photon dissociation is elusive, since the low kinetic energy release, which is the signature of this process, can also be due to resonance enhanced multi-photon ionization (REMPI) of H_2 [Posthumus *et al.*, Phys. Rev. Lett. **101**, 233004 (2008)]. To eliminate the competing REMPI process we have studied an H_2^+ beam target. Explicitly, we measured very low kinetic energy release (down to 0 eV) upon dissociation of H_2^+ using a coincidence three dimensional momentum imaging technique. Our experimental findings are supported by the solutions of the time-dependent Schrödinger equation for the conditions used in the experiment. Our results suggest that the zero-photon dissociation mechanism, most visible at $\sim 10^{13}$ W/cm^2, is enhanced for short laser pulses ($\leq$10 fs).

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