Abstract Submitted
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Moving towards strong-field femtosecond control of bond cleavage and charge localization in triatomic molecules[1] BETHANY JOCHIM, U. ABLIKIM, M. ZOHRABI, B. GAIRE, K.D. CARNES, B.D. ESRY, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, Manhattan, KS 66506 — A 3-D momentum imaging technique is employed to study intense ultrafast laser-induced dissociation of triatomic molecular ions from an ion beam. Utilizing our measured kinetic energy release and angular distribution spectra along with the calculated electronic structure of these molecules, we elucidate possible dissociation pathways and anticipate and explore various laser parameters that could be used to drive transitions to specific final products. For example, we have studied N_2O^+, in which we find that for typical intense IR laser pulses ($\sim$30 fs, transform-limited, 800 nm, $\sim 10^{15}$ W/cm^2 pulses), the preferred bond cleavage (*i.e.*, breaking the N-N bond vs. the N-O bond) and charge localization patterns are those that are the most energetically favorable. We investigate laser parameters that could be used to steer this and other systems to less likely outcomes.

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