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Charge asymmetric breakup of diatomic molecular ions in an intense ultrashort laser field[1] B. GAIRE, J. MCKENNA, A.M. SAYLER, NORA G. JOHNSON, E. PARKE, K.D. CARNES, B.D. ESRY, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Department of Physics, Kansas State University — Charge asymmetric dissociation of small molecules such as $(N_2^{2+})^* \rightarrow N^{2+}+N$ is a topic of considerable interest. There has been some debate on the mechanisms responsible for the sharing of charge in an intense laser field [1]. We present here a study of the ionization of N_2^+ and CO^+ molecular ion beams using ultrashort (10-45 fs) 790 nm laser pulses with intensities up to 5×10^{15} W/cm^2. Employing a coincidence 3D momentum imaging method, we isolate the asymmetric breakup channels (e.g. $N^{2+}+N$) from charge symmetric (e.g. $N^+ + N^+$) channels through detection of neutral fragments in coincidence with the ion fragments. Analysis of the kinetic energy release and angular distributions reveal detailed information on the breakup mechanisms. [1] C. Guo, M. Li, and G.N. Gibson, Phys. Rev. Lett. **82**, 2492, (1999).

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