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Ionization of N_2^+ and O_2^+ beams in femtosecond intense laser fields.¹ A.M. SAYLER, B. GAIRE, NORA G. JOHNSON, M. LEONARD, E. PARKE, K.D. CARNES, I. BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, P.Q. WANG, Department of Physics, Western Illinois University — The dissociative ionization of N_2^+ and O_2^+ molecular ion beams has been studied using laser pulses of 790 nm, 10-45 fs and up to 2×10^{15} W/cm². The momentum distributions of the dissociation channels $N^+ + N^+$ and $O^+ + O^+$ are measured by a three-dimensional momentum imaging method. The angular distributions of the ionization of these two molecules exhibit significant differences, which will be compared to theoretical predictions. The angular distribution of the ionization of O_2^+ is found to strongly depend on the kinetic energy release. The branching ratios and the intensity dependence of the ionization channels will also be discussed.

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