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O_2^+ dissociation caused by an ultrashort intense laser pulse[1] A.M. SAYLER, P.Q. WANG, J.F. XIA, M.A. SMITH, R. CABRERA-TRUJILLO, K.D. CARNES, B.D. ESRY, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Department of Physics, Kansas State University — Laser-induced dissociation of O_2^+ has been experimentally studied with ultrashort ($\sim$50 fs) intense (10^{14} to 10^{15} W/cm^2) laser pulses at 790 nm using kinematically complete coincidence 3D momentum imaging. The resulting kinetic energy release (KER) distribution has several distinct peaks, each of which has a unique angular distribution. The lower KER features are peaked around the laser polarization, while at higher KER, dissociation perpendicular to the laser polarization is significant. For comparison, a theoretical study of O_2^+ dissociation using the Electron-Nuclear Dynamics (END) approach with a laser pulse included in the time-dependent dynamics is underway. Preliminary results also indicate that ionization, which occurs predominantly at the high end of the intensity range, is strongly peaked along the laser polarization.

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