

Abstract Submitted
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Suppression of O_2^+ dissociation using intense few-cycle pulses¹ M. ZOHRABI, B. GAIRE, J. MCKENNA, A.M. SAYLER, NORA G. JOHNSON, E. PARKE, K.D. CARNES, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Department of Physics, Kansas State University — The dissociation spectra of an O_2^+ beam in an intense 795 nm laser are rich in structure. This is due to the complex laser-driven dynamics involving coupling between the many different electronic states of O_2^+ . We employ a coincidence 3D momentum imaging method to unravel these dynamics and reveal the important dissociation pathways. Intriguingly we find that unlike most small diatomic molecules, the dissociation spectra are particularly sensitive to pulse duration with dramatic differences observed between 8 and 40 fs pulses. We trace the enhancements of some channels and suppression of others for various pulses back to the femtosecond dynamics which dictate the dissociation pathways involved.

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