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Angle-dependent strong-field ionization and fragmentation of CO2 using rotational wave packets[1] HUYNH LAM, SURESH YARLAGADDA, ANBU VENKATACHALAM, RAJESH KUSHAWAHA, TOMTHIN WANGJAM, J. R. Macdonald Laboratory, Kansas State University, Manhattan, KS 66506, USA, CHUAN CHENG, Department of Physics and Astronomy, Stony Brook University, Stony Brook, New York 11794, USA, PETER SVIHRA, ANDREI NOMEROTSKI, Brookhaven National Laboratory, Upton, New York 11793, USA, TOM WEINACHT, Department of Physics and Astronomy, Stony Brook University, Stony Brook, New York 11794, USA, DANIEL ROLLES, VINOD KUMARAPPAN, J. R. Macdonald Laboratory, Kansas State University, Manhattan, KS 66506, USA — The angle-dependent single ionization of carbon dioxide by linearly polarized probe pulse has been actively discussed over the past decade. In this work, the angle dependence of ionization was extracted with high resolution from time-domain measurements on an impulsively-excited rotational wave-packet. The results are in good agreement with direct angle scan measurements, and are consistent with measurement using circularly polarized probe pulse. We further expand the method to photo-ion momentum measurements, and quantify the breakdown of the axial recoil approximation for the $CO^+ + O^+$ channel. These molecular frame measurements can be extended to asymmetric top molecules, and well as to photoelectron angular distributions.

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