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Energy and angular structure in momentum space images of electrons ionized from aligned O₂ and CO₂ molecules by short, intense laser pulses¹ CHAKRA MAHARJAN, PREDRAG RANITOVIC, IRINA BOCHAROVA, DIPANWITA RAY, BEN GRAMKOW, IGOR LITVINYUK, CHARLES COCKE, Kansas State University — We have used COLTRIMS to measure momentum spectra of electrons generated by ionizing dynamically aligned molecules of O₂ and CO₂ by short laser pulses. An ultra-short, weak, vertically polarized laser pulse produced an aligned ensemble of molecules through rotational revivals. These molecules were then ionized with a subsequent strong horizontally polarized pulse. The rotational revival structure was controlled by measuring the angular distribution of dissociation fragment ions from each target molecule as a function of the time delay between the pump and probe pulses. Full momentum-space images of the electrons were then measured as a function of this time delay. We observed pronounced energy and angular structures of the momentum images which show a dependence on the alignment of the molecule.

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