Abstract Submitted
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Asymmetric Molecular-Frame Photoelectron Angular Distribution for K-shell Photoemission from CO_2: a Theoretical Study[1] SHUNGO MIYABE, U. C. Davis, C. WILLIAM MCCURDY, U. C. Davis and LBNL, THOMAS N. RESCIGNO, Lawrence Berkeley National Lab. — Coincidence measurements can now be made of the momenta of the electrons and fragment ions that emerge from a molecule following absorption of an energetic photon to obtain the angular distribution of the ejected electrons in the molecular-frame. Recent measurements [1] of molecular frame photoelectron angular distributions (MFPADs) for C 1s photoemission from CO_2 show a rapid change over a narrow range of photon energies as well as weak, but definite definite asymmetry with respect to the O^+ and CO^+ fragment ions for certain energies. Here we report results of complex Kohn calculations of MFPADs for this process and show how asymmetries can arise from the sensitivity of the photoejection process to the instantaneous position of the nuclei and the rapidity of subsequent Auger decay. We show that these effects are most prominent over the narrow range of photon energies where photoelectron confinement effects are present. [1] X.- J. Liu et al. Phys. Rev. Lett. B 101, 083001 (2008).

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