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Angular distribution of photoelectron from single-photon ionization of aligned N_2 and CO_2molecules[1] CHENG JIN, ANH-THU LE, C.D. LIN, Physics Department, Kansas State University — We calculate the angular distribution of photoelectron from aligned N_2 and CO_2 molecules in the photoionization process. The molecules are first exposed to a pump IR laser which creates molecules that are transiently aligned or anti-aligned. These molecules are then probed by absorbing a single XUV photon (through high-order harmonic generation) with the emission of photoelectron. We present the angular distribution of photoelectron in the laboratory frame so they can be compared to upcoming experiments. By integrating over the calculated angular distribution of photoelectron, we obtain the alignment dependence of the total ionization yield vs time delay to compare with the measurement reported by Thomann et al. [J. Phys. Chem. A **112**, 9382 (2008)]. We also study the alignment dependence of HHG for N_2 generated by the IR laser with the alignment dependence of single-photon ionization since the same dipole matrix elements are involved in the two processes. We further study the alignment dependence of single-photon ionization by the XUV photons vs the alignment dependence of multiphoton ionization by intense IR lasers.

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