Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Quantum optimal control of chiro-optical effects in the ultrafast multiphoton ionization regime ESTEBAN GOETZ, LOREN GREENMAN, Department of Physics, Kansas State University — The forward/backward asymmetry of the photoelectron emission of randomly oriented chiral molecules is a clear indication of chiral activity. Light-induced excitation is the first step towards the manipulation of the chiral activity for application purposes. However, a rigorous treatment of the laser-matter interaction becomes computationally prohibitive. Furthermore, it has been shown that a proper description of the continuum is critical for obtaining a quantitative agreement with experimental data. Here, we describe a simple model designed to manipulate chiro-optical effects with minimum computational effort. It relies on a second-order perturbative treatment of the electron dynamics, which allows us to keep track of the chiral signature imprinted in the photoelectron momentum distribution by interfering photoionization pathways arising from first and second order processes, a sufficient condition for the control of the electron dynamics. The description of the continuum is improved by employing the variational overset grid method, which enables us to efficiently extract the continuum spectrum of interest while simultaneously including the chiral description of the latter and the many-body character of the photoelectron-ion system.

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Date submitted: 23 Jan 2018 Electronic form version 1.4