Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Two-photon Ionization of Helium using the Complex Kohn Variational Method[1] NICOLAS DOUGUET, University of Central Florida, BARRY SCHNEIDER, National Institute of Standards and Technology, LUCA ARGENTI, University of Central Florida — The complex Kohn variational method [1,2] is extended to compute light-driven electronic transitions between continuum wavefunctions of an atomic or molecular system. This development enables the treatment of multiphoton processes in the perturbative regime. We present a proof of principles on two-photon ionization of ground and excited states of Helium induced by combining extreme ultra-violet (XUV) and near infrared (NIR) fields. The XUV pulse is tuned near the $\mathrm{He}(2s2p)^1P_1^o$ Feshbach resonance and the photoionization spectrum is compared with time-dependent calculations. The method is general and could for instance be used to study photoionization time-delay RABBITT experiments. [1] B. I. Schneider and T. N. Rescigno, Phys. Rev. A **37** 3749 (1988), [2] T. N. Rescigno, B. H. Lengsfield III, and C. W. McCurdy, *Modern Electronic Structure Theory 1* (World Scientific, Singapore, 1995).

[1]Work supported by the NSF under PHY-1607588

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Date submitted: 25 Jan 2018 Electronic form version 1.4