Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Excitation and Ionization of Argon by Few-Cycle Intense Laser Pulses[1] XIAOXU GUAN, OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University, BARRY SCHNEIDER, National Science Foundation — We have applied our recently developed general *ab-initio*, non-perturbative method to solve the time-dependent Schrödinger equation (TDSE) for the interaction of a strong laser field with a general atom [1] to investigate excitation and ionization of Ar by an intense attosecond laser pulse. The field-free Hamiltonian and the dipole matrices are generated using a flexible B-spline R-matrix (close-coupling) method [2]. This numerical implementation enables us to construct term-dependent, non-orthogonal sets of one-electron orbitals for the bound and continuum electrons. The solution of the TDSE is propagated in time using the Arnoldi-Lanczos method, which does not require the diagonalization of any large matrices. Results are presented for rearrangements in the outer (3p) and inner (3s) subshells and, when possible, compared with predictions from R-matrix Floquet calculations. [1] X. Guan *et al.*, Phys. Rev. A **76**, 053411 (2006). [2] O. Zatsarinny, Comp. Phys. Commun. **174**, 273 (2006).

[1]Supported by the NSF under PHY-0244470 and PHY-0555226 (XG, OZ, and KB).

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Date submitted: 29 Jan 2008 Electronic form version 1.4