Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Control of Ion Polarization in the Pump-Probe Ionization of Helium[1] SAAD MEHMOOD, Phys. Dept., University of Central Florida, EVA LINDROTH, Phys. Dept., Stockhol University, Sweden (EU), LUCA ARGENTI, CREOL and Phys. Dept., University of Central Florida — Attosecond pump-probe ionization processes can be used to prepare atomic ions in a coherent superposition of states with opposite parity. The multiphoton shake-up ionization of Helium, in particular, generates ions with a same principal quantum number and a net dipole moment that evolves on a time scale of several picoseconds, due to spin-orbit coupling. In this work we use an ab initio time-dependent close-coupling code [1,2] to study how the coherence between the 3s, 3p, and 3d levels of the Helium ion can be controlled from the parameters of the ionizing-pulse sequence. The observed periodic revival, on a picosecond time scale, of the ion dipole moment gives access to the study of the ionization of oriented targets. [1] L Argenti and E Lindroth, Phys. Rev. Lett. 105, 053002 (2010). [2] T Carette et al., Phys. Rev. A 87, 023420 (2013).

[1]NSF Grant No. 1607588

Saad Mehmood
Phys. Dept., University of Central Florida

Date submitted: 31 Jan 2019 Electronic form version 1.4