Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Laser assisted free-free scattering with variable laser polarization within the scattering plane[1] N.L.S. MARTIN, C.M. WEAVER, University of Kentucky, B.A. DEHARAK, Illinois Wesleyan University — In previous work we reported one-photon emission experiments that examine electron-helium scattering in the presence of an Nd:YAG laser field of 1.17 eV photons, where the laser polarization direction was varied within a plane perpendicular to the scattering plane, and intersecting it along the momentum-transfer direction.[2] The results were perfectly consistent with the Kroll-Watson[3] approximation. In particular there was no evidence of free-free transitions when the polarization was perpendicular to the momentum-transfer direction, in contrast to the experiments of Wallbank and Holmes.[4] We are in the process of reconfiguring our apparatus to more closely mimic their experiments where the laser polarization was varied *within* the scattering plane for one-, two-, and three-photon absorption. Our preliminary results will be presented.

[1]This work was supported by the National Science Foundation under grants Nos. PHY-0855040 (NLSM) and PHY-1402899 (BAdH)
[2]B.A. deHarak, B.Nosarzewski, M. Siavashpouri, N.L.S. Martin, Phys. Rev. A **90**, 032709 (2014)
[3]N. M. Kroll and K. M. Watson, Phys. Rev. A 8, 804 (1973)
[4]M. O. Musa, A. MacDonald, L. Tidswell, J. Holmes, and B. Wallbank, J. Phys. B, 43 (17):175201, 2010

N.L.S. Martin
University of Kentucky

Date submitted: 28 Jan 2015 Electronic form version 1.4