

Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

Scattering using Electron Vortex Beam Projectiles¹ ALLISON HARRIS, ALEXANDER PLUMADORE, ZORYANA SMOZHANYK, Illinois State University — In the last decade, a new type of electron wave packet has been experimentally realized that carries non-zero orbital angular momentum. Known as electron vortex beams (EVBs), these particles have many proposed applications, such as the control and rotation of nanoparticles and improved resolution in electron microscopy. Unfortunately, very little is known about how EVBs interact with individual atoms, and there are no experimental results yet for collisions between EVBs and atoms. There is also very little theoretical work on this topic, with only a handful of studies to date for EVB collisions with hydrogen atoms. If EVBs are to be used for any of the proposed applications, it is crucial to understand how electrons with non-zero angular momentum interact with atoms on a fundamental level. We present ionization cross sections for EVB projectiles colliding with simple atoms and explore their interactions with targets possessing non-zero angular momentum.

¹Work supported by the National Science Foundation PHY-1912093.

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Date submitted: 01 Jun 2019

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