

Abstract Submitted
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Ionization of Two-Electron Targets by Electron Vortex Beam¹

ALLISON HARRIS, Illinois State University — In the last decade, a new type of electron wave packet has been experimentally realized that has transverse linear momentum and 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 they interact with atoms on a fundamental level. We present ionization cross sections for EVB projectiles colliding with two-electron targets and examine whether EVBs can be used to probe electron correlation effects.

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