

Abstract Submitted  
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**Comprehensive out-of-plane ( $e, 2e$ ) measurements on He autoionizing levels.**<sup>1</sup> N.L.S. MARTIN, B.N. KIM, C.M. WEAVER, University of Kentucky, B.A. DEHARAK, Illinois Wesleyan University, O. ZATSARINNY, K. BARTSCHAT, Drake University — We report out-of-scattering-plane ( $e, 2e$ ) measurements on helium  $2\ell 2\ell'$  autoionizing levels for 80, 100, 120, 150, and 488 eV incident electron energies, and scattering angles  $60^\circ$ ,  $50.8^\circ$ ,  $45^\circ$ ,  $39.2^\circ$ , and  $20.5^\circ$ , respectively. The kinematics are similar in all cases: ejected electrons are detected in a plane that contains the momentum transfer direction and is perpendicular to the scattering plane, and the momentum transfer is 2.1 a.u..<sup>2</sup> The results are presented as ( $e, 2e$ ) angular distributions energy-integrated over each level, and are compared with our second-order theory calculated for 488 eV incident electron energy, as well as predictions based on a fully non-perturbative close-coupling model. At all energies except 80 eV, the shapes of the angular distributions, and the recoil peak intensities, are in excellent agreement with the 488 eV results for all three autoionizing levels. The reasons why this is so, for incident energies that vary by almost a factor of five, is at present unclear.

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<sup>2</sup>B.A. deHarak, K. Bartschat, and N.L.S. Martin, Phys. Rev. Lett. **100**, 063201 (2008)

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