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Accuracy of the Gamow Factor for Approximating the Post Collision Interaction (PCI) in Electron-Impact Ionization of Atoms[1] ADAM UPSHAW, Missouri S&T, HARI SAHA, University of Central Florida, DON MADISON, Missouri S&T — Recently Kheifets et al. [1] reported a distorted wave Born (DWBA) calculation for ionization of helium, neon and argon where the post collision interaction (PCI) between the two final state electrons was approximated using the Gamow-factor (called the G-factor). For cases where there was a large difference between experiment and theory at the recoil peak, the G-factor significantly improved agreement between experiment and theory. The G-factor is an approximation for including the final state Coulomb interaction between the two continuum electrons in the final state wavefunction. The 3DW (three-body-distorted-wave) method properly includes the Coulomb interaction in the final state wavefunction without approximation. The G-factor approximation is attractive due to its computational simplicity (i.e. the effects of PCI can be determined by multiplying DWBA results by the Gamow factor). 3DW calculations, on the other hand, require a full numerical 6-dimensional integration. We will examine the accuracy of the G-factor approximation by comparing 3DW results with G-factor results for ionization of neon, argon and xenon for low, intermediate and high energy. [1] Kheifets et al., J. Phys. B, 41, 145201 (2008).

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Don Madison
Missouri S&T

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