

Peculiarities of matrix-element calculations with few Coulomb functions for particles' scattering processes

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We present ultra high resolution data on single ionization of helium under impact of 1-MeV protons in comparison with theoretical calculations. Good agreement between theory and experiment [1] is obtained. Three initial trial helium wave functions are employed: a weakly correlated Roothaan-Hartree-Fock function, a simple Silverman-Platas-Matsen function of the configuration interaction family, and a strongly correlated function [2,3]. Multidimensional singular integrals which defining differential cross sections are calculated using special transform for each above trial function. Results of some calculations are presented in Figure 1.

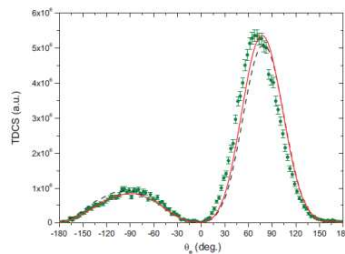


Fig.1. Triple Differential Cross Section in coplanar geometry versus the angle of escaped electron: Plane Wave First Born Approximation (black dashed line) and 3C final correlated wave function + highly correlated helium ground state [2] (red solid line). Experimental values [1] are represented by green points.

References

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