Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Electron-impact ionization-excitation of helium in the quasi-photon regime[1] JEAN MARCEL NGOKO DJIOKAP, University of Nebraska at Lincoln, EMMANUEL FOUMOUO, Universite catholique de Louvain, MOISE GODFROY KWATO NJOCK, University of Douala, XAVIER URBAIN, BERNARD PIRAUX, Universite catholique de Louvain — The triply differential cross section (TDCS) for ionization and excitation of helium (leaving the residual ion in the n=2 excited states) is evaluated for the kinematics considered experimentally by Dupré *et al.* [J. Phys. B **25**, 259 (1992)]. The interaction of the incident electron with the target is described in first order, while that of the ejected electron with the residual ion is treated accurately within the Jacobi matrix method formalism. In the quasi-photon limit and for small ejected electron energies, the presence of series of doubly excited states below the n=3 single ionization threshold in helium makes the TDCS extremely sensitive to both the energy and angle of the ejected electron. Comparison of our theoretical results (convoluted both in energy and angle) with the experimental data demonstrates the importance of an accurate description of the He spectrum. A possible two-step mechanism involving single ionization of the target followed by excitation of the core electron is proposed in order to explain the remaining discrepancies.

[1]IISN4.4.503.02.F,FRFC2.4556.99,FRFC2.4.592.07,OEA-AC-71,UNL

Jean Marcel Ngoko Djiokap
University of Nebraska at Lincoln

Date submitted: 14 Jan 2010 Electronic form version 1.4