

Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Non-perturbative B-spline R-matrix with pseudo-states calculations for electron-impact excitation-ionization of helium to the $n = 3$ states of He^{+1} KLAUS BARTSCHAT, OLEG ZATSARINNY, Drake University — We present fully-differential cross sections for electron-impact ionization plus simultaneous excitation of helium obtained from a non-perturbative close-coupling formalism with our B-spline R-matrix approach [1,2]. Using a large number of pseudo-states we obtain excellent agreement with directly measured cross-section ratios [3,4] for ionization leaving the residual He^{+} ion in either the $1s$ ground state, the $n = 2$ ($2s + 2p$) excited states, or the $n = 3$ ($3s + 3p + 3d$) excited states.

[1] O. Zatsarinny and K. Bartschat, Phys. Rev. Lett. **107** (2011) 023203.

[2] O. Zatsarinny and K. Bartschat, J. Phys. B **47** (2014) 061001.

[3] S. Bellm *et al.*, Phys. Rev. A **75** (2007) 042704.

[4] S. Bellm *et al.*, Phys. Rev. A **78** (2008) 032710.

¹This work was supported by the United States National Science Foundation under grants PHY-1212450 and PHY-1430245, and the XSEDE allocation PHY-090031.

Klaus Bartschat
Drake University

Date submitted: 09 Jun 2015

Electronic form version 1.4