**Second-order distorted wave calculation for electron impact ionization of helium to He$^+$(n=1 and 2)** ZHANGJIN CHEN, DON H. MADISON, Laboratory for Atomic and Molecular Research, University of Missouri-Rolla — Second-order distorted wave calculations are presented for electron impact ionization of helium with the residual ion left in n=1 and 2 states at intermediate energies in coplanar asymmetric geometry. Whereas previous second-order calculations have used the plane wave Born approximation and have used approximations to simplify the evaluation of the second-order term, we perform a full distorted wave calculation and make no approximations in the evaluation of the second-order amplitude (i.e. we sum over all contributing intermediate states). The triple differential cross sections are compared with experimental measurements and other theoretical results.

Zhangjin Chen
Laboratory for Atomic and Molecular Research, University of Missouri-Rolla

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