

Abstract Submitted  
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**Analysis of the Frozen Core Approximation in Heavy-Ion Impact Ionization of Helium** ALLISON HARRIS, Illinois State University — The frozen core approximation has been successfully used for decades to model 4-Body collisions as 3-Body processes. Recently, computational advancements have allowed for full 4-Body models to be used to calculate fully differential cross sections (FDCS) for single ionization of helium. These 4-Body models show discrepancies with their 3-Body model counterparts. For heavy-ion impact ionization, we have identified four possible sources of the discrepancies between the models. These four possible sources are: the initial state helium wave function, the final state He+ wave function, the final state potential for the outgoing electrons, and the perturbation. To identify which of these four sources causes the differences in the FDCS, we have performed a comprehensive study of 3-body and 4-body models for several different heavy-ion projectiles, as well as for a wide range of incident projectile energies, ionized electron energies, and momentum transfer values.

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