

Abstract Submitted
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Time-dependent density functional theory study of correlation in proton-helium collisions¹ MATTHEW BAXTER, TOM KIRCHNER, York University — A recent model to describe electron correlations in time-dependent density functional theory (TDDFT) studies of antiproton-helium collisions [1] is extended to deal with positively charged projectiles. The main complication is that a positively-charged projectile can capture electrons in addition to ionizing them to the continuum. As a consequence, within the TDDFT framework one needs to consider three, instead of just one, correlation integrals (I_c s) when formally expressing the probabilities for the occurring one- and two-electron processes in terms of the density. We discuss possible extensions of an adiabatic model for I_c [2] to deal with this situation and present results for few keV to few MeV proton-helium collisions obtained from basis-generator-method calculations with microscopic response effects included [3].

[1] M. Baxter and T. Kirchner, Phys. Rev. A **87**, 062507 (2013).

[2] F. Wilken and D. Bauer, Phys. Rev. Lett. **97**, 203001 (2006).

[3] M. Keim *et al.*, Nucl. Instr. and Meth. B **233**, 240 (2005).

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