

Abstract Submitted
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Significance of Different Interactions in Transfer-Excitation¹ A.L. HARRIS, M. SCHULZ, J.L. PEACHER, D.H. MADISON, Missouri University of Science and Technology — In the transfer-excitation process for proton-helium scattering, an incident proton captures one electron from a helium atom, and the remaining electron is left in an excited bound state of the helium ion. Theoretical fully differential cross sections (FDCS) will be compared with experimental results for this process. The theoretical approach used is a full four-body approach, taking each particle into account. This results in a T-matrix requiring a nine dimensional integral, which is numerically intensive. On the other hand, one of the great strengths of this approach lies in the fact that we have complete flexibility in the choice of wavefunctions, which provides the opportunity to examine the effects of different types of interactions. A fully correlated Hylleraas wavefunction is used for the initial state helium atom, and hydrogenic wavefunctions are used for the hydrogen atom and the residual ion in the final state. The focus will be on the role of projectile interactions for transfer-excitation.

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