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Theoretical Fully Differential Cross Sections for Heavy Particle Transfer-Excitation Collisions A.L. HARRIS, D.H. MADISON, J.L. PEACHER, M. SCHULZ, Missouri University of Science and Technology — Recent experimental measurements of four body collision processes present a stringent test of theory. To date, experimental results have been presented for ionization plus excitation, charge transfer plus excitation, and charge transfer plus ionization. Most of the experimental and theoretical effort so far has concentrated on ionization plus excitation. However, the transfer-excitation process provides a unique opportunity to study initial state electron correlation effects. 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. We will present theoretical results using a full four-body approach, taking each particle into account. This allows for complete flexibility for treating each particle, which provides the opportunity to examine the effects of different types of interactions. Theoretical fully differential cross sections (FDCS) compared with experimental results will be presented.

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