

Abstract Submitted
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COLTRIMS Study of Transfer-Excitation in Proton-Helium Collisions¹ A. HASAN, Department of Physics, United Arab Emirates University, P.O. Box 17551, Al-Ain, Abu Dhabi, United Arab Emirates, B. TOOKE, M. SCHULZ, Physics Department and Laboratory for Atomic, Molecular, and Optical Research, University of Missouri-Rolla, Rolla, MO, 65409, USA — We have carried out a cold-target recoil-ion momentum spectroscopy (COLTRIMS) measurement for $p + \text{He}$ collisions to study the capture of one and simultaneous excitation of the second target electron (transfer excitation, TE) as a function of the projectile scattering angle and velocity. The measurement was carried out at projectile energies of 25, 50, and 75 keV. The neutralized projectiles were measured in coincidence with the recoil ions. We obtained the energy loss of the projectile from the longitudinal component of the recoil-ion momentum and the scattering angle from its transverse component. The energy loss, in turn, was used to identify and distinguish TE from single capture. Absolute differential cross sections for TE as well as for state-selective single capture were obtained. Furthermore, cross section ratios of transfer excitation to single electron capture were analyzed. The role of correlated versus uncorrelated TE mechanisms will be discussed.

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