

Abstract Submitted
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Fully differential study on projectile coherence effects in ionization of helium by protons¹ SACHIN SHARMA, T ARTHANAYAKA, B.R LAMICHHANE, Missouri Univ of Sci & Tech, A HASAN, Dept of Physics, UAE Univ, Al Ain, Abu Dhabi, UAE, S BORBLY, F JRAI-SZAB, L NAGY, Faculty of Physics, Babes-Bolyai Univ, Romania, MICHAEL SCHULZ, Missouri Univ of Sci & Tech — Atomic-fragmentation experiments have played a crucial role in our understanding of the dynamic few-body processes. Despite incredible progress in the field, puzzling discrepancies between theory and experimental still exist for some very fundamental collision systems e.g. single ionization of He by 100 MeV/a.m.u C6+ ions. In recent years, a possible explanation for these discrepancies has been explored through various experimental studies on “Projectile Coherence Effects” (PCE). Here, we present a fully differential study on single ionization of helium by 75 keV protons. FDCS were measured for two different transverse projectile coherence lengths i.e. 1 a.u. and 3.5 a.u.. Substantial differences between the FDCS were observed, once again signifying pronounced PCE. The FDCS for the large PCL contain an interference term due to a coherent superposition of different impact parameters that are leading to the same scattering angles, which is suppressed for the small PCL. The experimental data have been qualitatively well reproduced by a non-perturbative ab initio time-dependent model, which treats the projectile coherence properties in terms of a wave-packet.

¹NSF

Sachin Sharma
Missouri Univ of Sci & Tech

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