

Abstract Submitted
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Experimental and theoretical fully differential study of coherence effects in ionization of He by proton impact¹ MICHAEL SCHULZ, THUSITHA ARTHANAYAKA, BASU LAMICHHANE, Missouri Univ of Sci Tech, AHMAD HASAN, UAE University, SUDIP GURUNG, JUAN REMOLINA, Missouri Univ of Sci Tech, SANDOR BORBELY, FERENC JARAI-SZABO, LADISLAU NAGY, Babes-Bolyai University — We have measured and calculated fully differential cross sections (FDCS) for ionization of He by 75 keV proton impact. Results were obtained for transverse projectile coherence lengths of 3.3 and 1.0 a.u. The coherence length is related to the maximum dimension of a diffracting object that can be coherently illuminated by the projectiles. In the calculation impact parameter dependent amplitudes $a(b)$ are computed and multiplied by a wave packet of varying width, reflecting the coherence length, which describes the projectile. The scattering angle dependent transition amplitude is then obtained from a Fourier transform. Pronounced coherence effects observed in the data are qualitatively well reproduced by the calculation. Along with extensive data published already the present work therefore confirms the presence of such effects beyond reasonable doubt.

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