

Abstract Submitted
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Fully Differential Study of Projectile Coherence Effects in Ionization of H₂¹ THUSITHA ARTHANAYAKA, SACHIN SHARMA, BASU LAMICHANE, AHAMAD HASAN, JUAN REMOLINA, SUSMITHA AKULA, DON MADISON, MICHAEL SCHULZ, Missouri Univ of Sci & Tech — In recent years, the important role of the projectile coherence properties in ionization of H₂ has been demonstrated in measured double differential cross sections (DDCS). Here, we report the first fully differential study of such effects. The additional kinematic information was used to further “clean” the data from any background which may have survived the coincidence condition and the results show that the observed coherence effects are not just due to an experimental artifact. Furthermore, interference effects could be studied in unprecedented detail by comparing fully differential cross sections (FDCS) for a coherent and an incoherent projectile beam. For relatively small ejected electron energies we observe pronounced single-center interference, for which the molecular structure of the target is not of primary importance. Rather, this type of interference is due to a coherent superposition of different transition amplitudes leading to the same final state. However, for larger electron energies (corresponding to a speed close to the projectile speed) clear signatures of molecular two-center interference are observed in addition to single-center interference.

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