Abstract Submitted
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Student Award Finalist - Interference in Recoil-Ion Momentum Spectra for ionization in p + H_2 Collisions SACHIN SHARMA, THUSITHA ARTHANAYAKA, AHMAD HASAN, BASU LAMICHHANE, JUAN REMOLINA, ALYSON SMITH, MICHAEL SCHULZ, Missouri S & T - Rolla — We have performed a kinematically complete experiment on ionization in 75 keV p + H_2 collisions. The double differential cross sections (DDCS) for fixed projectile energy loss as a function of the recoil momentum reveal interference due to indistinguishable diffraction of the projectile from the two atomic centers in the molecule. Earlier, we observed such structures in the projectile scattering angle dependent DDCS. In the present data the oscillations are more pronounced because the phase factor depends only on the recoil momentum, but not on the electron or projectile momentum. Recently, we found that interference structures are not present for an incoherent beam. However, it is not easy to unambiguously distinguish the coherence properties from projectile resolution effects, which both depend on the beam profile. Since the recoil momentum resolution is independent of the beam profile, the present measurement is not affected by this problem. While the experiment has not been completed yet for an incoherent beam, we anticipate that we will be able to present such data by the time of the meeting.

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