Abstract Submitted
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Student Excellence Award Finalist: Fully Differential Study of Capture with Vibrational Dissociation in p + H_2 Collisions
BASU LAMICHHANE, Missouri University of Science Technology, THUSITHA ARTHANAYAKA, Columbia Astrophysics Laboratory, JUAN REMOLINA, University Of Michigan, AHMAD HASAN, Dept. of Physics, UAE University, Al Ain, Abu Dhabi, UAE, MARCELO CIAPPINA, Institute of Physics, Academy of Sciences of the Czech Republic, Doln Beany, Czech Republic, FRANCISCO NAVARRETE, RAUL BARRACHINA, Centro Atmico Bariloche and Instituto Balseiro, Bariloche, Ro Negro, Argentina, RAMAZI LOMSADZE, Tbilisi State University, Tbilisi 0179, Georgia, MICHAEL SCHULZ, Missouri University of Science Technology — In recent years, the important role of the projectile coherence properties has been confirmed in several studies on ion-atom scattering processes. In the present study, we used such coherence effects as a tool to sensitively study the few- body dynamics of the scattering process. To this end, a kinematically complete experiment on dissociative capture in 75 Kev p + H_2 collisions was performed. Fully differential cross-sections (FDCS) were extracted for a kinetic energy release of 1 eV and for two different molecular orientations as a function of scattering angle. The experiment was performed with a coherent and incoherent projectile beam. The coherent to incoherent FDCS ratios, which represents the interference term, revealed two different types of interference, single- and two-center interference. In the latter an unexpected phase shift of π was found in the pronounced oscillations observed in the interference term. This phase shift will be discussed in context of data reported by other groups for other processes in similar collision systems.

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