Abstract Submitted
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Investigating asymmetries in the $HD^+(1s\sigma)$ branching ratio following electron impact at energies from threshold to 100[1] J.B. WILLIAMS, A.L. LANDERS, Auburn University, I. BEN-ITZHAK, JRML, Kansas State University, E. WELLS, Augustana College — We present preliminary results where momentum-imaging is used to investigate e^- + HD collisions at energies from near threshold to 100 eV. Single ionization proceeding to the ground ($1s\sigma$) electronic state usually results in the production of HD^+, but a small fraction of the ionization events reach the vibrational continuum, leading to H^++D($1s$) or, via charge transfer to the $2p\sigma$ state, H($1s$) + D^+. The H($1s$) + D^+ final state is 3.7 meV higher than the H^+ + D(1s) state at the separate atom limit. When initiated by fast ion impact, this energy difference leads to a measurable asymmetry in the ground state dissociation process [1]. Fast electron impact is expected to produce a similar result, but as the electron energy is reduced toward threshold, this asymmetry may increase and have significant astrophysical implications. [1] E. Wells, B.D. Esry, K.D. Carnes, and I. Ben-Itzhak, Phys. Rev. A **62**, 062707 (1999).

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