Abstract Submitted
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3D imaging of molecular-ion dissociation following slow impact with atomic targets[1] BEN BERRY, NORA G. JOHNSON, WANIA WOLFF[2], A. MAX SAYLER, DAG HATHIRAMANI, JACK W. MASEBERG, SAM FAHRENHOLTZ, K.D. CARNES, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Physics Department, Kansas State University — Collisions between few keV molecular ions and atoms result primarily in collision-induced dissociation (CID) and dissociative capture (DC). The CID process can be a result of vibrational excitation; however, previous experimental efforts were unable to resolve the vibrational process from the competing electronic excitation, complicating comparison with theory. Employing coincidence 3D momentum imaging of the ion beam fragments and recoil ions, we are able to experimentally separate the vibrational (vCID) and electronic (eCID) processes, giving new insight into the vibrational mechanism. We investigate the influence of alignment and orientation of the molecule on eCID and vCID as well as other collision channels. In addition, we address the fate of the target atom following these collisions. A sample of results exploring CID and other processes occurring in such collisions will be presented.

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