

Abstract Submitted  
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**He Single Ionization in Collisions with “Fixed-in-Space” MeV  $\text{H}_2^+$  Ions** SHAOFENG ZHANG, JAN SUSKE, DANIEL FISCHER, KAI-  
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physik — Two center effects in collisions of fast ions with  $\text{H}_2$  molecules have been  
studied intensively. We investigated in a kinematical complete experiment the ion-  
ization of He in collisions with  $\text{H}_2^+$ -molecular ions at 0.5 and 1.0 MeV at the Max  
Planck Institute for Nuclear Physics at Heidelberg. The momenta of the recoiling He  
ions and the electrons produced in the collisions were measured using a “Reaction  
Microscope.” The fragments of the  $\text{H}_2^+$  were separated by a dipole magnet after the  
interaction region and detected by two position sensitive MCP detectors. From this  
information the orientation and the internuclear distance of the molecular ion at the  
instance of the collision could be determined. Pronounced structures are found both  
in the experimental data and theoretical calculations, indicating that the emitted  
He electron shows a slight preferential emission parallel to the molecular axis. Ac-  
cording to our theoretical calculations the effects are due to two-center interference,  
which turned out to be strongly dependent on the type of approximated molecular  
wave function used in the calculations.

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