

Abstract Submitted
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Alignment-free Molecular Frame Tunneling Probabilities¹ A. STAUDTE, NRC, H. AKAGI, JAEA, D. PAVICIC, A. SHINER, F. TURNER, NRC, R. DOERNER, Frankfurt University, D.M. VILLENEUVE, M.YU. IVANOV, P.B. CORKUM, NRC — Tunneling ionization from a molecule in a strong laser field depends on the angle between the molecule and the electric field. This fact reflects the structure of the molecular orbital the electron tunnels from. We introduce a new method to measure the angular ionization probability of a small molecule in a strong field without actively aligning the molecule. Using COLTRIMS we have measured the angular ionization probability in the molecular frame of H₂ molecules. We find a considerable deviation from predictions made in established theories. We have also applied this technique to a small heteronuclear molecule. There we find evidence for tunneling from a lower lying molecular orbital.

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