

Abstract Submitted
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Coherent control of the electron motion and localization in the dissociating H_2^+ by attosecond and femtosecond laser pulses FENG HE, James R. Macdonald Laboratory, Kansas State University, Manhattan, Kansas 66506-2604, USA, ANDREAS BECKER, Department of Physics and JILA, University of Colorado, Boulder 80309-0440, USA, UWE THUMM, James R. Macdonald Laboratory, Kansas State University, Manhattan, Kansas 66506-2604, USA — We show that the electronic dynamics in a molecule driven by a strong field is complex and potentially even counterintuitive. As a prototype example we simulate the interaction of a dissociating H_2^+ molecule with an intense infrared laser pulse. Depending on the laser intensity, the direction of the electron's motion between the two nuclei is found to follow or oppose the classical laser electric force. We explain the sensitive dependence of the correlated electronic-nuclear motion in terms of the diffracting electronic momentum distribution of the dissociating two-center system. The distribution is dynamically modulated by the nuclear motion and periodically shifted in the oscillating infrared electric field.

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