

Abstract Submitted
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Analysis of the Contribution of the Tunneling and Multiphoton regime in High-order Harmonic Generation of H_2^{+1} K. NASIRI AVANAKI, University of Kansas, PENG-CHENG LI, National Taiwan University, SHIH-I. CHU, University of Kansas — We present an *ab initio* three-dimensional precision calculation and analysis of high-order-harmonic generation (HHG) of the hydrogen molecular ion subject to intense laser pulses employing the time-dependent generalized pseudo spectral method in two-center prolate spheroidal coordinates. The calculations are performed for the ground states of H_2^+ at the equilibrium internuclear separation $R = 2$ a.u. and different orientation angle. We utilized the spectral and temporal structures of the HHG and semi-classical calculations to explore the contribution of the tunneling and multi-photon (MP) process in the above threshold ionization regime in different part of the HHG plateau. We show that the HHG yields can be tuned by the alignment of the molecular ions to the laser polarization in which confirming the dependence of MP ionization and HHG on the orientation angle. The results uncovered several aspects of dynamical behavior of the electron on sub femto-second time scale that is independent of the details of the molecular structures.

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