

Abstract Submitted
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Phase Dependence of Molecular High Order Harmonic Generation at Long-Range¹ ANDRE D. BANDRAUK, SAMIRA BARMAKI, GERARD LAGMAGO-KAMTA, Universite de Sherbrooke — The physics of high-order harmonic generation in single-electron molecular ions at long-range (large molecular internuclear distances) is compared for the two proton system H₂⁺ [1] vs the three proton system H(+)-H₂(+) via exact numerical solutions of the 3-D time-dependent Schroedinger equation in intense laser fields ($I = 10^{14}$ W/cm²). These numerical solutions show that photon energies can be produced exceeding the atomic cut-off law $I_p + 3.17 U_p$, where I_p is the ionization potential and U_p the ponderomotive energy [2]. It is shown that electron recollision with the parent ion and collision with neighboring ions can be controlled by the absolute phase (carrier envelope phase) of a few cycle ultrashort laser pulse. Furthermore the new cut-off law is a sensitive function of internuclear distance thus allowing in principle for imaging of electron states in molecules separated by large internuclear distances $R = 30-50$ a.u. [1] A D Bandrauk, H Yu, J Phys B 31,4243(1998) [2] A D Bandrauk, H Yu, E Constant, Phys Rev A 56,2537(1997)

¹NSERC

Andre D. Bandrauk
Universite de Sherbrooke

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