Abstract Submitted
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Circularly polarized attosecond pulses for molecular attomagnetism ANDRE D. BANDRAUK[1], University of Sherbrooke — Circularly polarized molecular high order harmonic generation, MHOHG, is modelled from numerical solutions of the time-dependent Schroedinger equation, TDSE, for the one-electron H2+ in the nonlinear nonperturbative regime of laser-molecule interaction. It is shown that molecules due to their nonspherical symmetry are the preferred medium for producing circularly polarized harmonics by few cycle intense IR (800,400nm) circularly polarized laser pulses. An intense TeraHz(4um) pulse is combined to force recollision of the ionized electron with the parent ion thus enhancing the efficiency of the circularly polarized MHOHG process through single recollision [1]. Superposition of these harmonics allows for the synthesis of single circularly polarized attosecond (10^{-18}s) pulses.Such new ultrashort pulses allow for controlling electrons on their natural time scale [2]. In particular the TDSE simulations illustrate the generation with such new pulses coherent quantum electronic currents inside molecules for the creation of attosecond magnetic field pulses of intensity >10 Teslas [3].

[1] KJ Yuan, AD Bandrauk, Phys Rev Lett 110,023003(2013)
[2] KJ Yuan, AD Bandrauk, Chem Phys Lett 592,334(2014)
[3] KJ Yuan, AD Bandrauk, Phys Rev A 88,013417(2013)

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