Abstract Submitted
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Hartree simulations of multi-electron atoms ionization in strong laser fields MATT KALINSKI, Utah State University — The recent success of classical simulations of the ionization process of few electron atom is an argument that normal electron exchange and correlations effects are negligible for certain conditions of strong field ionization and only the Coulomb effects are essential [1]. The numerical convenience of solving the Schrödinger equation with nonlinearity instead of classical equations of the motion has been recently proved by us in case of so-called Trojan electrons in strong CP fields with Shay logarithmic quantum mechanics [2]. We present Hartree simulations of the ultra-strong field time-dependent ionization of model one dimensional atoms with up to 10 active electrons involved (10 dimensional configuration space). N coupled Schrödinger equations is solved simultaneously on the Cartesian grid with our new nonlinear split-operator method. The continuum states are taken into account with delta grid representation of the multi electron wavefunction and the Coulomb interaction integral is calculated as the direct solution of the Poisson equation with the ultra-fast Fast Fourier convolution method developed by us to treat the supersolid formation in Bose-Einstein condensate. We calculate n-electron ionization rates for ultra-strong ultra-short few cycle pulses. [1] P. J. Ho and J. H. Eberly, Phys. Rev. Lett. **95**, 193002 (2005). [2] M. Kalinski, contributed paper, APS DAMOP meeting, Lincoln, Nebraska, May, 2005

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