Abstract Submitted
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Precision treatment of single and double multiphoton ionization of He atoms by strong laser fields: Time-dependent generalized pseudospectral method in internal coordinates[1] DMITRY A. TELNOV, St. Petersburg State University, Russia, JOHN HESLAR, National Taiwan University, Taiwan, SHIH-I CHU, University of Kansas — We have developed a new computational method for accurate and efficient numerical solution of the time-dependent Schrödinger equation for two-electron atoms. Our approach is full-dimensional and makes use of the internal coordinates of the electrons in the plane defined by the electrons and the nucleus (r_1, r_2, and θ_{12}) as well as Euler angles which determine the orientation of the plane in space. The internal coordinates can be optimally discretized by means of the generalized pseudospectral method while the Euler angles appear through the basis set functions with the definite total angular momentum and its projections. The results of the single and double ionization of the helium atom by strong 800 nm laser fields will be presented. The accurate time-dependent electron density obtained can be used for testing and improvement of various approximate exchange-correlation functionals of the time-dependent density functional theory.

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