Abstract Submitted
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Coupled channel theory of photoionization microscopy[1] LIBO ZHAO, ILYA FABRIKANT, University of Nebraska, JOHN DELOS, College of William & Mary, FRANCK LEPINE, CHRISTIAN BORDAS, Laboratoire UMR CNRS, SAMUEL COHEN, University of Ioannina — A quantum-mechanical coupled-channel theory is presented to simulate spatial distributions of electron probability density and current density, produced in photoionization of nonhydrogenic atoms in a uniform external electric field and recorded on a position-sensitive detector. Coupled equations for the multicomponent wavefunction are solved in mixed semiparabolic and parabolic coordinates. Using the theory, we predict distributions of electron probability density and current density produced in photoionization of the ground-state Li atom. The computed results are compared with experiment and very good agreement is found. The atomic core produces a significant effect in the electron probability density distribution in the vicinity of Stark resonances. The quantum tunneling effects in the presence of the atomic core are also analyzed.

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Ilya Fabrikant
University of Nebraska

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