

Abstract Submitted
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Application of Coulomb Wave Function DVR to Atomic Systems in Strong Laser Fields¹ LIANG-YOU PENG, ANTHONY F. STARACE, University of Nebraska-Lincoln — We present an efficient and accurate grid method for solving the time-dependent Schrödinger equation (TDSE) for atomic systems interacting with short laser pulses. The radial part of the wave function is expanded in a DVR (Discrete Variable Representation) basis constructed from the positive energy Coulomb wave function. The time propagation of the wave function is implemented using the well-known Arnoldi method. Compared with the usual finite difference (FD) discretization scheme for the radial coordinate, this method requires fewer grid points and handles naturally the Coulomb singularity at the origin. As examples, the method is shown to give accurate ionization rates for both H and H⁻ over a wide range of laser parameters.

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