Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Quantum Model for Atomic Response in Strong, Time Dependent Electric Fields T.C. RENSINK, T.M. ANTONSEN, JR., JOHN PALASTRO, University of Maryland, College Park — Laser pulse propagation simulations typically involve simplified ionization models where plasma generation is treated via rate laws. These models neglect the fact that the bound electronic response of the atom, ionization, and ionization damping are a continuous process, and do not capture dynamics during the electronic transition from bound to free. We present a reduced 3D quantum model that treats the full time dynamics of the electronic response and compare it to current models. By replacing the Coulomb potential with a non-local binding potential, computation is reduced from 3+1D equation set to a 0+1D integral equation, offering a fast, continuous treatment of the electronic response for use in laser propagation simulations.

T. C. Rensink
University of Maryland, College Park

Date submitted: 12 Jul 2013 Electronic form version 1.4