Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Model for atomic dielectric response in strong, time-dependent laser fields T.C. RENSINK, T.M. ANTONSEN, University of Maryland, College Park, J.P. PALASTRO, D.F. GORDON, Naval Research Laboratory — A nonlocal quantum mechanical model is explored for calculating the atomic response to a strong laser electric field. By replacing the Coulomb potential with a nonlocal potential in the Schrodinger equation, a 3+1D calculation of the time-dependent electric dipole moment is reformulated as a 0+1D integral equation that retains the 3D dynamics. The model is benchmarked against an established ionization theory and \textit{ab initio} simulation of the time-dependent Schrodinger equation. An extension to include multiple bound states, as well as 2 color THz generation predictions are also presented.

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Date submitted: 13 Jul 2014  
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