

Abstract Submitted
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Theoretical analysis of the nonlinear susceptibility of hydrogen atom¹ ANDREW SPOTT, AGNIESZKA JARON-BECKER, ANDREAS BECKER, JILA and Department of Physics, University of Colorado - Boulder — The nonlinear refractive index of air and other gases plays an important role in the understanding of the propagation of intense laser pulses in the atmosphere. Using a numerical basis state method [1] we have performed accurate calculations of the nonlinear susceptibility in hydrogen atom. Currently, models of filamentation mainly use perturbative approaches to determine the nonlinear susceptibility. We compare our results from ab-initio calculations of the nonlinear susceptibility with those from a perturbative calculation. The comparison allows us to determine an intensity at which perturbation theory breaks down for these kinds of calculations.

[1] S.H. Chen et al., Phys. Rev. A **86**, 013410 (2012)

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