

Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Local-field corrections in a Doppler-broadened gas YI LI, JUHA JAVANAINEN, University of Connecticut — We introduce the thermal motion of atoms into our classical-electrodynamics simulations to study the cooperative response of a near-resonant gas to light. The simulation results for the shift of the resonance line are closer to the standard prediction from local-field corrections plus “cooperative Lamb shift” than we have seen either in dilute homogeneously broadened atomic samples or in cases when inhomogeneous broadening is modeled with a random distribution of resonance frequencies of stationary atoms. Inhomogeneous broadening due to the motion of the atoms may be a key factor in establishing the traditional phenomenology of local-field corrections.

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Date submitted: 29 Jan 2015

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