

Abstract Submitted
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Dynamical evolution of correlated spontaneous emission of a single photon from a N atoms cloud¹ JUN-TAO CHANG, ANATOLY SVDZINSKY, MARLAN SCULLY, Institute for Quantum Studies and Department of Physics, Texas A&M University, College Station, TX 77843 — We study the correlated spontaneous emission from a dense spherical cloud of N atoms uniformly excited by absorption of a single photon. We find that the decay of such a state depends on the relation between an effective Rabi frequency $\Omega \propto \sqrt{N}$ and the time of photon flight through the cloud R/c . If $\Omega R/c < 1$ the state exponentially decays with rate $\Omega^2 R/c$ and the state life time is greater than R/c . In the opposite limit $\Omega R/c \gg 1$, the coupled atom-radiation system oscillates between the collective Dicke state (with no-photons) and the atomic ground state (with one photon) with frequency Ω while decaying at a rate c/R .

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