

Nanooptics and nanophotonics

Establishing the terms “conservativeness” and “damping” for a many atomic system coupled with quantized em field

A. S. Sizhuk¹, S. M. Yezhov²

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E-mail: cannabiss@mail.univ.kiev.ua

1, 2 Faculty of Physics, Kiyv National University, Kiyv 2, Academician Glushkov Avenue, Building 1, Ukraine 03022

We discuss the system of N identical atoms coupled with a quantized electromagnetic field, prepared via a single photon Fock state with near resonant frequency. Not restricting ourselves to any boundary conditions and not applying the "Weisskopf-Wigner" (and "Markovian") approximations, we developed technique to estimate the probability amplitudes for an atomic excitation. The theory allows to introduce the conservativeness and (or) damping of the system states through the “specific order of limits”. The conservativeness of the collective modes of the system can be interesting in describing the long-living excited system state of big organic molecules (pigments), recently built and investigated for “light trapping”.