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Coherence Loss of Two-Photon Jaynes--Cummings Model in Dispersive Approximation

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Abstract: Completely solving the dissipative dynamics of nonlinear Jaynes-Cumming model is a very difficult task. In our recent work (Phys. Lett. A284 (2001) 156), we just obtained analytical results of the field dissipative dynamics of the nonlinear JCM. In the present paper, employing the perturbative expansion of master equation, we obtain the density operator of the system (field +atom). The coherence losses of the system and of the atom are investigated when two-photon process is involved. We also study the effect of different atomic initial states and the influence of the field amplitude on the atomic coherence loss.

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Key words: dissipative dynamics, two-photon Jaynes-Cummings model, master equation, coherence loss, linear entropy

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