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Enhancing steady-state entanglement generated by a nondegenerate three-level laser with thermal reservoir. (English) Zbl 1480.81014

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Summary: We analyze a nondegenerate three-level cascade laser with an open cavity and coupled to a two-mode thermal reservoir employing the stochastic differential equations for atomic operators associated with the normal ordering. Applying the large-time approximation scheme, we obtain the solutions for the corresponding equations of evolution of the expectation values of atomic operators. Furthermore, employing the resulting solutions, we studied the photon as well as cavity atomic-state entanglement amplification of the cavity radiation.

MSC:

81P40 Quantum coherence, entanglement, quantum correlations
78A60 Lasers, masers, optical bistability, nonlinear optics
81S22 Open systems, reduced dynamics, master equations, decoherence
81V45 Atomic physics
35P15 Estimates of eigenvalues in context of PDEs
81V80 Quantum optics

Full Text: DOI

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