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Quantum correlations and quantum Fisher information of two qubits in the presence of the time-dependent coupling effect (Article)

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Abstract   ⌃ View references (48)

In this paper, we consider two separate Jaynes–Cummings (JC) nodes with a nonidentical qubit-field system in the presence of dissipation terms. We reveal the influence of the time variation of the coupling terms on some important measures when the qubits are immersed in a vacuum. The density matrix for the two qubits initially in Bell states are obtained. The dynamical behavior of the quantum discord (QD), classical correlation (CC), qubit-qubit entanglement, and quantum Fisher information (QFI) is investigated. We explore the relationship among QD, CC, qubit-qubit entanglement, and QFI in the absence and presence of the dissipation effect during the time evolution. Furthermore, we show the main optimal conditions for obtaining a high level of correlation and coherence between the two qubits.
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