DEATH OF ENTANGLEMENT AND PURITY IN A TWO QUBITS–FIELD SYSTEM INDUCED BY PHASE DAMPING

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Abstract:

We investigate the death of entanglement and the purity loss of a two qubits–field system in the dispersive regime with a reservoir. For an alternative entanglement measure, we calculate the negativity of the eigenvalues of a partially transposed density matrix and compare it with the mutual entropy. A new measure related to the mutual entropy, namely, the index of entropy, is proposed to measure the degree of entanglement, and this agrees well with the negativity. We found that the entanglement has a strong sensitivity to the phase damping. The asymptotic behavior of the field states, the two qubits, and the total system fall into a mixed state. We treat the phenomena of death of entanglement and purity as they arise from the effect of phase damping.

Keywords:

dehth of entanglement, purity, decoherence, phase damping.

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