

Remote Preparation of an Entangled State in Nonideal Conditions

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Abstract: In this paper, the theoretical investigation of remote preparation of an entangled state is studied in nonideal conditions. Our studies include two parts. In the first part, we consider the remote state preparation (RSP) of an entangled state through two equally noisy quantum channel states, namely, a mixture of Bell states. Studies show there is a particular mixed-state channel for which all pure entangled states remain entangled after this inexact RSP. In the second part, we suppose that noises which quantum channels suffer from can be expressed as the Lindblad operators. The master equation of the system can be expressed in the Lindblad form. Through solving the master equation, we calculate the fidelity as a function of decoherence rates and parameters of the state to be prepared. For a given entangled state, we investigate the influence of different types of noises on the fidelity.

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Key words: remote state preparation, fidelity, entanglement

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