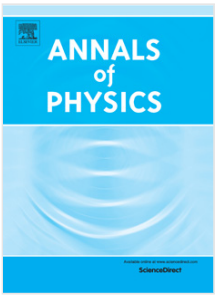

Anti-symmetry consideration on the preservation of entanglement of spin system

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Anti-symmetry consideration on the preservation of Entanglement of spin system

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Abstract

In this work we offer an approach to protect the entanglement based on the anti-symmetric property of the hamiltonian. Our main objective is to protect the entanglement of a given initial three-qubit state which is governed by hamiltonian of a three-spin Ising chain in site-dependent transverse fields. We show that according to anti-symmetric property of the hamiltonian with respect to some operators mimicking the time reversal operator, the dynamics of the system can be effectively reversed. It equips us to control the dynamics of the system. The control procedure is implemented as a sequence of cyclic evolution; accordingly the entanglement of the system is protected for any given initial state with any desired accuracy and long-time. Using this approach we could control not only the multiparty entanglement but also the pairwise entanglement. It is also notable that in this paper although we restrict ourselves mostly within a three-spin Ising chain in site-dependent transverse fields, our approach could be applicable to any n-qubit spin system models.

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