

量子光学

外磁场下两量子比特海森堡XXZ模型中量子关联和热纠缠的研究

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摘要:

通过在两量子位上分别施加独立可控的外磁场()和(), 以及改变耦合参数、磁场强度、磁场不均匀度和系统的温度, 探讨了两量子比特XXZ模型中量子关联的变化行为, 并在相同参数下与热纠缠做了比较。结果表明: 量子关联存在的参数范围比热纠缠更广; 而且在一定的参数范围内, 量子关联和热纠缠的变化展示出不同的行为。

关键词: 量子光学 量子关联 热纠缠 quantum discord 海森堡XXZ模型

Quantum correlations and thermal entanglement in a two-qubit Heisenberg XXZ model with external magnetic fields

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Abstract:

The quantum correlation of a two-qubit Heisenberg XXZ model has been investigated through applying two independent and controllable magnetic fields () and () on the two qubits respectively and changing the coupling parameter, magnetic field, inhomogeneous magnetic field and temperature. The behavior of quantum correlation and that of thermal entanglement under one and the same parameter is compared. The results show that quantum correlation can exist for a wider parameter range than thermal entanglement. In addition, for a certain region of parameter, quantum correlation and thermal entanglement exhibit completely different behaviors.

Keywords: quantum optics quantum correlation thermal entanglement quantum discord Heisenberg XXZ model

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