

Bipartite and Tripartite Entanglement in a Three-Qubit Heisenberg Model

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Abstract: The bipartite and tripartite entanglement in a three-qubit Heisenberg XY model with a nonuniform magnetic field is studied. There are two or four peaks in the concurrence of the bipartite entanglement when the amplitudes of the magnetic fields are differently distributed between the three qubits. It is very interesting to note that there is no tangle of tripartite entanglement between the three qubits when the amplitudes of the magnetic fields are varied. However, the variation of the magnetic field direction can induce the tangle. The tangle is periodic about the angle between the magnetic field and the z axis of the spin.

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Key words: bipartite entanglement, tripartite entanglement, Heisenberg XY model

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