Graduate Seminar

Speaker

Mr. Subhendu Paul
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Thursday, September 28, 2017
1:00-2:00pm, HH-3017

Three-spin Heisenberg-XX chain in open quantum system

Abstract:

We consider an open quantum system consisting of a linear spin chain of three spins (qubits) with nearest-neighbor Heisenberg-XX interactions, and two bosonic reservoirs are connected at the two ends of the spin chain. We calculate the time-dependent reduced density matrices for three qubits, two qubits and single qubit. To obtain the reduced density matrices for bipartite and single qubit system, we construct four matrices, useful for computational purpose. The diagonal elements of the density matrix represent the population of the states, according to the order of the basis. The simulation results revel some interesting feature of the population dynamics which can be explained analytically as well. In addition, we investigate three kind of entanglement for the system, bipartite entanglement, the concurrence (the measure of the entanglement) for tripartite system, and intrinsic three qubits entanglement.