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Multipartite entanglement

Many of the fascinating applications of quantum information are due to the existence of multipartite entanglement. Thus, the investigation of it is at the heart of quantum information. However, due to the exponential scale of the dimension of the Hilbert space the qualification and quantification of multipartite entanglement is far from being completely understood.

In this talk I will present two different approaches to tackle this problem. First, I will discuss the necessary and sufficient conditions for local unitary equivalence of arbitrary pure n-partite states. Then, I will focus on the entanglement properties of three-qubit states and will present a complete set of operational measures, which uniquely characterizes the non-local properties of these states.

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