



Quantum Efficiency Seminar und Colloquium

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Local Detection of Quantum Correlations in Open Systems

ABSTRACT: Quantum correlations play an essential role for many applications in quantum information technology. The quantum discord is a modern concept which captures mixed-state quantum correlations beyond the concept of entanglement. Recently, non-classical correlations in separable states have been subject to intense research. Furthermore, initially correlated states of an open quantum system do not generally allow for the standard description of the reduced dynamics in terms of completely positive maps. A full state tomography of the total state is usually needed in order to detect the correlations, which requires access to both parts of the bipartite system. In this talk, I present a scheme for the detection of the quantum correlations in an unknown state only by partial access to the system. State tomography and operations on one of the local subsystems are sufficient to detect nonclassical correlations according to the quantum discord. This is applicable to typical open quantum systems since no experimental access to the environment is required.

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