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Quantum Transport, Entanglement and Discord

Quantum effects, during the excitation transport of photosynthesis, have become an active field of research not only in Physical Chemistry and Biophysics but also in Quantum Optics and Quantum Information.

Following the latter approach, we will investigate a model of coupled qubits in an Markovian environment for different kinds of initial conditions. In the first part we will see how the initial conditions and the trapping affects the efficiency of the transport process. The second part will be dedicated to entanglement and quantum correlations, quantified by quantum discord. Here we will see, that in the single excitation subspace, quantum discord and relative entropy of entanglement coincide, while this is not true for the full Hilbertspace.