Stellingen

behorend bij het proefschrift

On dephasing and spin decay in open quantum dots

1. If you measure the energies in the excitations of two locally separate systems, let them collide, wait till they are separate again and measure then again these excitations, the sum of the energies does not have to be the same as before the collisions even if their relative velocity didn’t change.

cond-mat/0606608.

2. The average electron-hole entanglement production rate on a set of quantum dots decreases monotonously with the increasing decoherence strength of the voltage probe model and the latter increases with temperature.


3. The coherence time of a charge qubit can be measured in a transport experiment by an electronic analogue of the optical method of coherent population trapping.

This thesis, Chapter 4.

4. There is no physical reality to the charge excitations with energies close to the middle of the gap in the insulating half-filled phase of the one-band Hubbard model, predicted by the self-energy functional approximation.


5. Electron-hole pairs produced at a tunnel barrier are entangled if and only if the correlator of parallel spin currents is at least twice larger than the correlator of antiparallel spin currents.

This thesis, Chapter 3.

6. A measurement of the squared magnetisation on a many-particle spin system can be performed by guiding it through an antiferromagnetic tube.

cond-mat/0606608.

7. Models in theoretical physics originate from intuition based on daily-life phenomena — thus a successful search for qualitatively new models should be preceded by extensions of that intuition.

8. Charge transfer in the regime of coherent population trapping occurs in bunches of three electrons on average.

This thesis, Chapter 5.

9. In semiconductor electronics it is possible to measure the time dependence of a $10^{-19}$ A current very accurately with a $10^{-9}$ A current passing close by.

Björn Dieter Michaelis
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