SFB/TRR 21 - Seminar
29. Oktober 2007, Ulm

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Optimal Quantum Protocols

The development of quantum information protocols relies on the characterization and control of quantum systems.
The understanding of the physical processes driving the evolution of a quantum system is fundamental to reach a desired goal while numerical optimizations can enhance a protocol performance taking also into account the effects of noise and decoherence. Indeed noise and decoherence contrast the successful performance of quantum protocols and ought to be corrected.
A powerful numerical technique, Quantum optimal control theory, allows us to design accurate quantum processes: We employ it to design high-fidelity quantum tasks in different experimental setups. We show that optimal protocols are quite robust in the disruptive presence of noise, decoherence and signals bandwidth limitations.

29. Oktober 2007, 11 Uhr

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