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New Results for Quantum Control Problems

# Advances in the numerical solution of quantum control problems

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**Abstract:** Recent developments in nanotechnology are boosting intensive investigation in quantum systems with a focus on control problems and numerical simulation. In particular, nuclear magnetic resonance spectroscopy, magnetic resonance imaging, quantum optics, and in the control of photochemical processes.
In this talk, efficient and robust computational schemes are discussed, that solve large classes of quantum optimal control and exact-controllability problems. The focus is on adjoint methods and appropriate discretisation techniques. Theoretical estimates and results of numerical experiments illustrate the computational ability of the proposed schemes to solve challenging quantum control problems.