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Arbitrary n-Qubit State Transfer Using Coherent Control and Simplest Switchable Local Noise FRANK WILHELM, Saarland University, VILLE BERGHOLM, THOMAS SCHULTE-HERBRGGEN, Dept. Chemistry, Technical University of Munich (TUM), D-85747 Garching, Germany — We study the reachable sets of open n-qubit quantum systems, the coherent parts of which are under full unitary control, with time-modulable Markovian noise acting on a single qubit as an additional degree of incoherent control. In particular, adding bang-bang control of amplitude damping noise (non-unital) allows the dynamic system to act transitively on the entire set of density operators. This means one can transform any initial quantum state into any desired target state. Adding switchable bit-flip noise (unital), on the other hand, suffices to explore all states majorised by the initial state. We have extended our open-loop optimal control package DYNAMO to also handle incoherent control so that these unprecedented reachable sets can systematically be exploited in experiments. We propose implementation by a GMon, a superconducting device with fast tunable coupling to an open transmission line, and illustrate how open-loop control with noise switching can accomplish all state transfers without the need for measurement-based closed-loop feedback schemes with a resettable ancilla. Based on arXiv:1605.06473

Frank Wilhelm
Saarland University

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