

Abstract Submitted
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Taming of decoherence-optimal control approach ILYA GRIGORENKO, Postdoc Associate, DMITRI KHVESHCHENKO, Associate Professor, University of North Carolina — We carry out an analysis of the system of two coupled qubits, each of which is subject to its own dissipative environment. We find a combination of the inter-qubit couplings that provides for the lowest possible decoherence rates of the two-qubit register. Using this result, we construct optimized implementations of the CNOT and other universal two-qubit gates that, unlike in the most of previously proposed protocols, are carried out in a single step. The new protocols require tunable inter-qubit couplings but, in return, show a significant improvements in the quality of gate operations.

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