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Quantum gates that correct their own (quantum) errors[1]
LORENZA VIOLA, KAVEH KHODJASTEH, Dartmouth College — Scalable quantum computation in realistic devices requires that precise control can be implemented efficiently in the presence of decoherence and operational errors. I will describe a general constructive procedure for designing robust unitary gates on an open quantum system without encoding or measurement overhead. These results allow for a low-level error correction strategy solely based on Hamiltonian engineering using realistic bounded-strength controls, and may prove instrumental to substantially reduce implementation requirements for fault-tolerant quantum computing architectures.

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