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Quantum error correction in classical analog devices[1] BRIAN LA COUR, COREY OSTROVE, SEAN LANHAM, GRANVILLE OTT, Applied Research Laboratories, The University of Texas at Austin — Quantum computers are believed to be fundamentally different from classical analog devices due to the possibility that the former may be operated in a fault-tolerant manner. According to the threshold theorem, quantum error correction may be used to improve the fidelity of a logical gate operation over those of the constituent physical gate operations, provided that the latter are of sufficient fidelity. In this talk we will describe an experimental demonstration of a classical analog device capable of emulating a universal gate-based quantum computer using a wavetrain of analog signals to represent a multi-qubit state. By programming the device to execute a simple quantum error correction protocol, we are able to demonstrate an improvement in the overall gate fidelity.

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Brian La Cour
The University of Texas at Austin

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