



Seminar/Talk

Repeated Quantum Error Correction in a Surface Code Using Superconducting Circuits

Christopher Eichler

ETH Zürich (Switzerland)

Host: Johannes Fink

The ability to perform logical quantum operations fault-tolerantly by correcting unavoidable errors induced by control inaccuracies and decoherence, will be essential for building and operating large-scale quantum computers. In my talk, I present our recent demonstration of repeated quantum error correction using a surface code, which is known for its exceptionally high error threshold and its compatibility with planar qubit architectures featuring nearest-neighbor coupling. The code implemented in our experiments uses 17 physical qubits, nine of which encode the logical information and eight of which perform repeated measurements of error syndromes. By decoding the syndrome data in post-processing we preserve initialized logical states with a low error probability of 3% per cycle. The demonstration of repeated, fast and high-performance quantum error correction supports our understanding that fault-tolerant quantum computation will eventually be realizable.

Monday, May 9, 2022 10:00am - 11:00am

Heinzel Seminar Room / Office Bldg West (I21.EG.101)



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