MAR15-2014-003095

Abstract for an Invited Paper
for the MAR15 Meeting of
the American Physical Society

Implementing fault tolerance in a superconducting quantum circuit

RAMI BARENDS, Google, Santa Barbara

The surface code error correction scheme is appealing for superconducting circuits as the fundamental operations have been demonstrated at the fault-tolerant threshold. Here, we present experimental results on the repetition code, a one-dimensional primitive of the surface code which can detect bit-flip errors, implemented on a device consisting of nine Xmon transmon qubits. We discuss the basic mechanics of error detection, show preservation of a Greenberger-Horne-Zeilinger state, and show suppression of environmentally-induced error.