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Investigating energy loss in substrates of gigahertz LC resonators

J.D. WHITTAKER, NIST, Boulder, K.D. OSBORN, A.J. SIROIS, R.W. SIMMONDS — Dissipation in superconducting qubits is a significant obstacle to the realization of a superconducting quantum computer. One source of dissipation is through coupling to two-level system defects in the substrate on which qubits are fabricated. To study this effect, loss measurements on LC resonators fabricated on bulk silicon were compared to those fabricated on thin silicon nitride membranes, where much of the substrate material has been removed.

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