Abstract Submitted
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High quality factor titanium nitride and aluminum resonators for increased superconducting qubit coherence[1] N.E. FRATTINI, A. DOVE, D.M. TOYLI, S. HACOHEN-GOURGY, A. EDDINS, I. SIDDIQI, QNL, University of California, Berkeley — Superconducting qubits have successfully realized effective two–level quantum systems whose state can be read out by dispersive coupling to a linear resonator. Superconducting films which exhibit low loss in the microwave frequency regime at millikelvin temperatures and single photon excitation powers are an essential ingredient in realizing high-coherence qubits and high-fidelity readout. To explore the magnitude of these losses and their correlation with fabrication recipes, we prepare and characterize both lumped element and distributed element resonators derived from titanium nitride on silicon and aluminum on sapphire. We study the role of substrate annealing, film growth conditions, and lithographic technique on resonator quality factor.

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