

Abstract Submitted
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Microwave Loss in Josephson Junction Embedded Superconducting Resonators¹ STEVEN WEBER, KATER MURCH, I. SIDDIQI, UC Berkeley, QNL — We report on progress to identify and mitigate sources of microwave frequency loss in Josephson junction resonant circuits at low temperature and power—the operating regime of superconducting qubits. Large critical current junctions ($>500\text{nA}$) were embedded in lumped element 4 – 8 GHz superconducting resonators based on single crystal silicon dielectric overlap capacitors. Small critical current junctions (25-100nA) were characterized by measuring the T_1 relaxation time of transmon qubits. For both sets of measurements, the critical current density was varied from 20-800 A/cm^2 . We present the dependence of junction loss on junction area and environmental factors such as shielding and filtering.

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