

Abstract Submitted  
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**Decoherence in Improved Transmon Qubits** ADAM SEARS, HAN-HEE PAIK, DAVID SCHUSTER, LEV BISHOP, GERHARD KIRCHMAIR, LUIGI FRUNZIO, MICHEL DEVORET, ROB SCHOELKOPF, Yale University — The transmon is a simple superconducting qubit which has less dependence on the usual sources of  $1/f$  noise, and has coherence which is mostly limited by a source of anomalous dissipation. The quality factors of transmon qubits on sapphire are observed to be  $\sim 50,000$ , similar to that of transmission line resonators made with the same geometry. It is likely that both these devices may be limited by surface dielectric losses. We will report on the design and characterization of transmon qubits which are fabricated with reduced dielectric losses to possibly increase coherence times.

Adam Sears  
Yale University

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