

Abstract Submitted
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Study of thin film and substrate losses affecting qubit coherence times¹ WEI CHEN, DOUGLAS BENNETT, VIJAY PATEL, JAMES LUKENS, Stony Brook University, Department of Physics and Astronomy — For superconducting qubits, losses in superconducting films as well as substrates and dielectrics can play important roles in determining the coherence time. We used co-planar waveguide resonators to study the losses in Nb films and substrates. Resonators with quality factors as high as 6×10^5 were fabricated and measured. We found that both the fabrication process and resistivity of the substrates contribute to the quality of the resonators and hence to the losses. With a proper fabrication process, very high quality Nb films can be made. The etching process, which is necessary for the fabrication of qubits, lowers the quality of the resonators. We are optimizing the fabrication process to reduce the losses and to increase coherence time for our qubits.

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