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Improving the Coherence Time of Microwave Cavities
MATTHEW REAGOR, HANHEE PAIK, LUYAN SUN, ERIC HOLLAND, LUIGI FRUNZIO, ROBERT SCHOELKOPF, Department of Physics and Applied Physics, Yale University — A superconducting cavity resonator is able to store quantum states of light, protect qubits from decoherence and place bounds on material losses. The resonator's utility in all three goals is inherently tied to its quality factor. We report recent progress in improving the quality factors of aluminum waveguide cavities in the quantum regime. We will also report on the use of these cavities to measure the dielectric properties of low-loss substrates and the surface impedance of bulk superconductors and thin films.

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