

Abstract Submitted
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Improved coherence times for transmon qubits in two-dimensional resonators SIMON GUSTAVSSON, ARCHANA KAMAL, MIT, THEODORE GUDMUNDSEN, JONILYN YODER, PAUL WELANDER, MIT Lincoln Laboratory, XIAOYUE JIN, FEI YAN, MIT, DAVID HOVER, ANDREW KERMAN, ADAM SEARS, MIT Lincoln Laboratory, TERRY ORLANDO, MIT, WILLIAM OLIVER, MIT Lincoln Laboratory — We have designed, fabricated and characterized the coherence of transmon qubits coupled to planar microwave resonators. By using high-quality, epitaxially grown aluminum, we see a significant increase in coherence times compared to samples fabricated with evaporated metal. We also study how the coherence time scales with qubit dimensions, and for the device with largest spacing between the fingers of the interdigitated capacitance we report an energy-relaxation time (T_1) of 34 μ s. The Lincoln Laboratory portion of this work was sponsored by the Assistant Secretary of Defense for Research & Engineering under Air Force Contract number FA8721-05-C-0002. Opinions, interpretations, conclusions and recommendations are those of the author and are not necessarily endorsed by the United States Government.

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