Abstract Submitted
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Design and measurement of improved capacitively-shunted flux qubits ADAM SEARS, MIT Lincoln Laboratory, JEFFREY BIRENBAUM, University of California Berkeley, DAVID HOVER, THEODORE GUDMUNDSEN, ANDREW KERMAN, PAUL WELANDER[1], JONILYN L. YODER, MIT Lincoln Laboratory, SIMON GUSTAVSSON, XIAOYUE JIN, ARCHANA KAMAL, Research Laboratory of Electronics, Massachusetts Institute of Technology, JOHN CLARKE, University of California Berkeley, WILLIAM OLIVER, MIT Lincoln Laboratory — The addition of a capacitive or inductive shunt across one of the junctions can alter the coherence properties of a classic flux or RF-SQUID qubit. We have studied the performance of capacitively shunted flux qubits fabricated with MBE aluminum[1], starting from a 2D coplanar waveguide geometry used in similar high-performance transmon qubits, and measured dispersively. We will detail the importance of design parameters that preserve the flux qubit's anharmonicity and discuss conclusions about materials quality based on calculations of the participation of junction, dielectric, and superconductor components. This research was funded in part by the Office of the Director of National Intelligence (ODNI), Intelligence Advanced Research Projects Activity (IARPA); and by the Assistant Secretary of Defense for Research & Engineering under Air Force Contract number FA8721-05-C-0002. All statements of fact, opinion or conclusions contained herein are those of the authors and should not be construed as representing the official views or policies of IARPA, the ODNI, or the U.S. Government

[1] Megrant et al., APL 100, 113510 (2012).

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