Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Fabrication of capacitively-shunted superconducting qubits JONILYN L. YODER, THEODORE J. GUDMUNDSEN, VLADIMIR BOLKHOVSKY, MIT Lincoln Laboratory, PAUL B. WELANDER, MIT Lincoln Laboratory; present address: SLAC National Accelerator Laboratory, SIMON GUSTAVSSON, Massachusetts Institute of Technology, DAVID HOVER, ANDREW J. KERMAN, ADAM P. SEARS, WILLIAM D. OLIVER, MIT Lincoln Laboratory — Improvements in superconducting qubit coherence times and reproducibility have been demonstrated using capacitive shunting. In this study, we present methods for the preparation of both capacitively-shunted charge qubits (transmons) and capacitively-shunted flux qubits. Hybrid fabrication techniques were employed to combine high-quality-factor aluminum capacitive shunts with shadow-evaporated Josephson junctions, and the Josephson junctions were prepared using suspended-bridge germanium masks. We also will describe process testing results that were acquired to assess wafer-to-wafer reproducibility of our fabrication protocols. 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 and 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.

Jonilyn Yoder
MIT Lincoln Laboratory

Date submitted: 15 Nov 2013 Electronic form version 1.4