

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Optimization of single shot readout of a transmon qubit using a SLUG microwave amplifier¹ YANBING LIU, SRIKANTH SRINIVASAN, Princeton University, DAVID HOVER, ROBERT MCDERMOTT, University of Wisconsin, Madison, ANDREW HOUCK, Princeton University — We report on measurement of a superconducting transmon qubit using a number of optimization techniques and a low noise amplifier. Optimization is performed over power and frequency, and a genetic algorithm is employed to optimize the readout fidelity as a function of the measurement pulse shape. In addition, a superconducting low-inductance undulatory galvanometer (SLUG), a SQUID-based microwave amplifier, is used to reduce system noise. The SLUG amplifier has very high dynamic range and low noise over a relatively wide frequency range. Both the SLUG amplifier and genetic algorithm lead to improved readout fidelity over analytic pulse shaping and HEMT amplification.

¹Thanks support from IARPA

Yanbing Liu
Princeton University

Date submitted: 09 Nov 2012

Electronic form version 1.4