

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Demonstrated control of a Transmon using a Reciprocal Quantum Logic digital circuit - Part 1 MICAH STOUTIMORE, JAMES MEDFORD, QUENTIN HERR, OFER NAAMAN, HAROLD HEARNE, JOEL STRAND, ANTHONY PRZYBYSZ, AARON PESETSKI, JOHN PRZYBYSZ, Northrop Grumman Corporation — We report on experiments in which we used a Reciprocal Quantum Logic circuit to perform Z rotations on a Transmon qubit. Reciprocal Quantum Logic (RQL) [1] is a low-power superconducting digital technology based on pairs of single-flux quantum voltage pulses. Here we discuss the RQL hardware used in these experiments - an RQL output amplifier [2] whose output is non-return-to-zero (NRZ) encoded 3 mV differential signal, and is primarily intended for transmitting RQL data signals to standard room temperature CMOS hardware. We demonstrate the circuit operation at both 4 K and 20 mK with wide circuit operating margins. [1] J. Appl. Phys **109**, 103903 (2011) [2] Supercond. Sci. Technol. **23**, 022044 (2010)

Micah Stoutimore
Northrop Grumman Corporation

Date submitted: 15 Nov 2014

Electronic form version 1.4