Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Quantum simulation with arrays of transmon qubits: Ising dynamics[1] VINAY RAMASESH, SHAY HACOHEN-GOURGY, QNL, University of California, Berkeley, THOMAS KIENDL, FLORIAN MARQUARDT, Institut for Theoretical Physics, Universität Erlangen-Nürnberg, Staudtstraße 7, D-91058 Erlangen, Germany, NATHAN SIWAK, CHRISTOPHER RICHARDSON, Laboratory for the Physical Sciences - University of Maryland, College Park, IRFAN SIDDIQI, QNL, University of California, Berkeley — Chains of coupled qubits are known to realize the transverse-field Ising Hamiltonian in the two-level approximation. In this model, the qubit transition frequencies map onto the external magnetic field, so the ground and excited states play the role of spin-up and spin-down atoms. We implement this structure in a planar, on-chip architecture, with a one dimensional linear array of capacitively-coupled transmon qubits, where the two terminal qubits are dispersively coupled to microwave independent resonators for state readout. We present spectroscopic data and describe coherent manipulations in the array.

[1]This work is supported by the AFOSR.

Vinay Ramasesh
UNL, University of California, Berkeley

Date submitted: 13 Nov 2014 Electronic form version 1.4