Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

High Fidelity, Numerical Investigation of Cross Talk in a Multi-Qubit Xmon Processor ALIREZA NAJAFI-YAZDI, Anyon Systems Inc., JULIAN KELLY, JOHN MARTINIS, Google — Unwanted electromagnetic interference between qubits, transmission lines, flux lines and other elements of a superconducting quantum processor poses a challenge in engineering such devices. This problem is exacerbated with scaling up the number of qubits. High fidelity, massively parallel computational toolkits, which can simulate the 3D electromagnetic environment and all features of the device, are instrumental in addressing this challenge. In this work, we numerically investigated the crosstalk between various elements of a multi-qubit quantum processor designed and tested by the Google team. The processor consists of 6 superconducting Xmon qubits with flux lines and gatelines. The device also consists of a Purcell filter for readout. The simulations are carried out with a high fidelity, massively parallel EM solver. We will present our findings regarding the sources of crosstalk in the device, as well as numerical model setup, and a comparison with available experimental data.

Alireza Najafi-Yazdi
Anyon Systems Inc.

Date submitted: 11 Nov 2016 Electronic form version 1.4