

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Robustness and performance scaling of quantum information processors with respect to gate removal and defects YUNSEONG NAM, REINHOLD BLÜMEL, Wesleyan Univ — A single logical gate, when removed from a classical computer, can completely destroy its information processing capability. For a quantum processor, the story is quite different. We find that the processing capability of a quantum information processor is robust with respect to the removal of a large number of quantum logical gates. In fact, even when most of the quantum processor's gates are removed, quantum processors, such as the universally applicable quantum Fourier transform or the quantum adder, work with satisfactory performance. In this talk, we present our numerical and analytical results detailing the performance scaling of quantum processors with respect to gate pruning operations. We also present the performance scaling of pruned quantum processors subjected to gate defects in the remaining gates.

Yunseong Nam
Wesleyan Univ

Date submitted: 25 Nov 2015

Electronic form version 1.4