

Abstract Submitted
for the NEF16 Meeting of
The American Physical Society

Efficient Quantum Compiling WILLIAM KIRBY, FREDERICK STRAUCH, Williams College — Efficient quantum compiling is a necessary tool for future quantum computers. We have developed an efficient classical algorithm to compile an arbitrary unitary operator into a product of Clifford+T operators, which can be implemented fault-tolerantly on a quantum computer. Runtime and product length for our algorithm are $O(4^N N \log(1/\epsilon))$, where N is the number of qubits and ϵ is the error (normalized trace distance); these values are equivalent to the current state of the art. A theoretical lower bound for both values is $\Omega(4^N \log(1/\epsilon))$.

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Date submitted: 28 Sep 2016

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