

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Experimental demonstration of cheap and accurate phase estimation KENNETH RUDINGER, Center for Computing Research, Sandia National Laboratories, SHELBY KIMMEL, QuICS, University of Maryland, DANIEL LOB-SER, PETER MAUNZ, Sandia National Laboratories — We demonstrate experimental implementation of robust phase estimation (RPE) to learn the phases of X and Y rotations on a trapped Yb^+ ion qubit.. Unlike many other phase estimation protocols, RPE does not require ancillae nor near-perfect state preparation and measurement operations. Additionally, its computational requirements are minimal. Via RPE, using only 352 experimental samples per phase, we estimate phases of implemented gates with errors as small as $\sim 10^{-4}$ radians, as validated using gate set tomography. We also demonstrate that these estimates exhibit Heisenberg scaling in accuracy.

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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Date submitted: 08 Nov 2016

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