Abstract Submitted
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Gate Set Tomography on two qubits ERIK NIELSEN, ROBIN BLUME-KOHOUT, JOHN GAMBLE, KENNETH RUDINGER, Sandia National Laboratories — Gate set tomography (GST) is a method for characterizing quantum gates that does not require pre-calibrated operations, and has been used to both certify and improve the operation of single qubits. We analyze the performance of GST applied to a simulated two-qubit system, and show that Heisenberg scaling is achieved in this case. We present a GST analysis of preliminary two-qubit experimental data, and draw comparisons with the simulated data case. Finally, we will discuss recent theoretical developments that have improved the efficiency of GST estimation procedures, and which are particularly beneficial when characterizing two qubit systems. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

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