Abstract Submitted
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Experimental bring-up procedures with metrology to improve superconducting qubit performance ERIK LUCERO, UCSB, JULIAN KELLY, RADOSLAW BIALCZAK, MIKE LENANDER, MATTEO MARIANTONI, MATTHEW NEELEY, AARON O'CONNELL, DANIEL SANK, HAOHUA WANG, MARTIN WEIDES, JAMES WENNER, TSUYOSHI YAMAMOTO[1], YI YIN, ANDREW CLELAND, JOHN MARTINIS — Demonstrating complex algorithms on a quantum computer will require high fidelity single qubit and coupled qubit gates. Current superconducting architectures have demonstrated high fidelity single qubit gates, entangling gates through novel coupling schemes, and small scale algorithms. Building on these achievements, we present progress towards scalable implementations of high fidelity gates that will enable more complex quantum algorithms. In particular, we present a detailed experimental bring-up procedure complete with improved single qubit gates that use Derivative Reduction by Adiabatic Gates (DRAG), calibrated Z-gates to cancel the AC Stark effect, and metrological techniques to quantify errors.

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