

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

3D integration of superconducting qubits with bump bonds: Part 3 ERIK LUCERO, E. JEFFREY, A. VAINSENER, P. KLIMOV, T. HUANG, Google, Santa Barbara, Z. CHEN, B. CHIARO, A. DUNSWORTH, B. FOXEN, C. NEILL, C. QUINTANA, J. WENNER, UC Santa Barbara, JOHN. M. MARTINIS, Google, Santa Barbara UC Santa Barbara, GOOGLE QUANTUM HARDWARE TEAM TEAM — 3D integration doesnt end at the Silicon. Superconducting flip-chip qubit architectures require microwave engineered packaging, high density signal delivery, and cost effective control hardware. We report on our bottom-to-the-top full system architecture from 10 mKelvin to 300 Kelvin. Our report includes solutions to reduce microwave crosstalk, deliver nearly 1000 coaxial lines to base, and arbitrary waveform generators with complete per channel costs under \$2k. These developments form the scalable control solutions for our near term 50 qubit quantum supremacy demonstrations and beyond.

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Date submitted: 16 Nov 2016

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