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Error budgeting single and two qubit gates in a superconducting qubit[1] 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 — Superconducting qubits have shown promise as a platform for both error corrected quantum information processing and demonstrations of quantum supremacy. High fidelity quantum gates are crucial to achieving both of these goals, and superconducting qubits have demonstrated two qubit gates exceeding 99% fidelity. In order to improve gate fidelity further, we must understand the remaining sources of error. In this talk, I will demonstrate techniques for quantifying the contributions of control, decoherence, and leakage to gate error, for both single and two qubit gates. I will also discuss the near term outlook for achieving quantum supremacy using a gate-based approach in superconducting qubits.

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