

Abstract Submitted
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Superconducting Qubit with Integrated Single Flux Quantum Controller Part II: Experimental Characterization EDWARD LEONARD JR., MATTHEW BECK, TED THORBECK¹, SHAOJIANG ZHU, University of Wisconsin - Madison, CALEB HOWINGTON, JJ NELSON, BRITTON PLOURDE, Syracuse University, ROBERT MCDERMOTT, University of Wisconsin - Madison — We describe the characterization of a single flux quantum (SFQ) pulse generator cofabricated with a superconducting quantum circuit on a single chip. Resonant trains of SFQ pulses are used to induce coherent qubit rotations on the Bloch sphere. We describe the SFQ drive characteristics of the qubit at the fundamental transition frequency and at subharmonics ($\omega_{01}/n, n = 2, 3, 4, \dots$). We address the issue of quasiparticle poisoning due to the proximal SFQ pulse generator, and we characterize the fidelity of SFQ-based rotations using randomized benchmarking.

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