

Abstract Submitted  
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**Microwave design optimization for broadband Josephson parametric amplifiers** MATTHEW REAGOR, EYOB SETE, DANE THOMPSON, Rigetti Quantum Computing, ARPIT RANADIVE, R. VIJAY, Tata Institute of Fundamental Research, Mumbai, CHAD RIGETTI, Rigetti Quantum Computing — Broadband Josephson parametric amplifiers are crucial components of a scalable superconducting quantum computing architecture. Recently, the bandwidth of a resonator-based Josephson parametric amplifier was significantly enhanced by introducing a controlled reactance in the signal chain. The design was based on a  $\lambda/2$  section fabricated on an RF circuit board. We present the design of an on-chip version that will improve robustness and minimize performance variability from one device to another. Further, we will discuss microwave design optimization for flux pumping mechanism to minimize cross-talk between different input-output ports of the device. Finally, we will discuss design goals for further improvement of amplifier performance.

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