

Abstract Submitted
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High dynamic range Josephson parametric amplifiers NICOLAS ROCH, CNRS and Universite Grenoble Alpes, Institut Neel, 38042 Grenoble, France, KATER W. MURCH, Department of Physics, Washington University, St. Louis, Missouri 63130, USA, RAJAMANI VIJAY, Tata Institute of Fundamental Research, Mumbai 400005, India — Josephson parametric amplifiers (JPAs) have become the technology of choice to amplify small amplitude microwave signals since they show noise performances close to the quantum limit of amplification. An important challenge that faces this technology is the low dynamic range of current devices, which limits the number of measurements that can be performed concurrently and the rate of information acquisition for single measurements. We have fabricated and tested novel parametric amplifiers based on arrays of up to 100 SQUIDS. The amplifiers produce gain in excess of 20 dB over a large bandwidth and match the dynamic range achieved with traveling wave devices. Compared to the latter devices they are fabricated in a single lithography step and we will show that their bandwidth performance can be further extended using a recently developed impedance matching technique.

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