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Two-mode squeezing in a broadband parametric amplifier J. A. GROVER, A. KAMAL, S. GUSTAVSSON, F. YAN, T. P. ORLANDO, W. D. OLIVER, Research Laboratory of Electronics, MIT, D. HOVER, V. BOLKHOVSKY, J. L. YODER, MIT Lincoln Laboratory, C. MACKLIN, K. O'BRIEN, I. SIDDIQI, University of California Berkeley — The Josephson traveling wave parametric amplifier (JTWPA) exhibits gains of greater than 20 dB over a frequency range of a few gigahertz. In addition to being a quantum-limited amplifier over a wide frequency range, the JTWPA is a source of broadband squeezed radiation. We report the observation of broadband squeezing of microwave light generated by a JTWPA by measuring cross correlations between modes separated by up to one gigahertz in frequency. Employing a chain of two JTWPAs, the first as a squeezer and the second as a quantum-limited preamplifier, ensures a high-efficiency measurement of squeezing. We also discuss progress towards employing such two-mode squeezed radiation to realize high-fidelity dispersive readout of superconducting qubits.

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