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Squeezing with a flux-driven Josephson parametric amplifier E.P. MENZEL, L. ZHONG, P. EDER, A. BAUST, M. HAEBERLEIN, E. HOFFMANN, F. DEPPE, A. MARX, R. GROSS, Walther-Meissner-Institut and TU Muenchen, Garching, Germany, R. DI CANDIA, E. SOLANO, University of the Basque Country UPV/EHU and IKERBASQUE Foundation, Bilbao, Spain, M. IHMIG, TU Muenchen, Germany, K. INOMATA, RIKEN Center for Emergent Matter Science, Japan, T. YAMAMOTO, NEC Smart Energy Research Laboratories and RIKEN, Japan, Y. NAKAMURA, The University of Tokyo and RIKEN, Japan — Josephson parametric amplifiers (JPA) are promising devices for the implementation of continuous-variable quantum communication protocols. Operated in the phase-sensitive mode, they allow for amplifying a single quadrature of the electromagnetic field without adding any noise. While in practice internal losses introduce a finite amount of noise, our device still adds less noise than an ideal phase-insensitive amplifier. This property is a prerequisite for the generation of squeezed states. In this work, we reconstruct the Wigner function of squeezed vacuum, squeezed thermal and squeezed coherent states with our dual-path method [L. Zhong et al. arXiv:1307.7285 (2013); E. P. Menzel et al. Phys. Rev. Lett. 105 100401 (2010)]. In addition, we illuminate the physics of squeezed coherent microwave fields. This work is supported by SFB 631, German Excellence Initiative via NIM, EU projects SOLID, CCQED, PROMISCE and SCALEQIT, MEXT Kakenhi "Quantum Cybernetics," JSPS FIRST Program, the NICT Commissioned Research, Basque Government IT472-10, Spanish MINECO FIS2012-36673-C03-02, and UPV/EHU UFI 11/55.

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