

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

A >10 GHz JPC with Trans-Gain for Qubit Readout¹ K. SLIWA, A. NARLA, M. HATRIDGE, F. SCHACKERT, B. ABDO, S. SHANKAR, L. FRUNZIO, M.H. DEVORET, Applied Physics Department, Yale University — For multi-qubit circuit QED experiments, it is desirable to work with cavities at frequencies >10 GHz to allow for design flexibility. However, performance of following electronics can be best optimized at low frequencies (3-5 GHz). These seemingly contradictory requirements can be naturally reconciled using the Josephson Parametric Converter (JPC). The JPC is a quantum limited amplifier comprised of two non-degenerate resonators coupled via a ring of Josephson junctions. It can bridge frequency ranges separated by more than an octave via its trans-gain, a process in which a signal incident on one port is frequency converted and transmitted with gain on the other port. Here we present data on the trans-gain of a JPC with one resonator at 11.5 GHz and the other at 4.5 GHz which could be used in such a readout scheme without any significant compromise on gain, dynamic range, or bandwidth.

¹Work supported by: IARPA, ARO, NSF, and IBM.

K. Sliwa
Applied Physics Department, Yale University

Date submitted: 07 Nov 2012

Electronic form version 1.4