

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Characterization of a Multi-Layer Parametric Amplifier with On-Chip Bias Line T. WHITE, R. BARENDS, J. BOCHMANN, B. CAMPBELL, Y. CHEN, B. CHIARO, E. JEFFREY, J. KELLY, M. MARIANTONI, A. MEGRANT, J. MUTUS, C. NEILL, P. O'MALLEY, S. OHYA, P. ROUSHAN, D. SANK, A. VAINSENER, J. WENNER, A.N. CLELAND, J.M. MARTINIS, UC Santa Barbara — Single shot dispersive readout of superconducting qubits requires a near quantum limited microwave amplifier. Based on the parametric amplifier design from UC Berkeley, we have developed a parametric amplifier using the UCSB multilayer fabrication with a single ended input and an on-chip flux bias line. These changes enable us to use a smaller and simpler chip mount with separate signal and flux ports. The high bandwidth of the flux port allows us to flux pump the amplifier and should allow dynamic frequency tuning on ns timescales. Flux pumping also requires fewer components in the measurement line, reducing signal loss. With this design we have achieved parametric amplification using two kinds of input pumping and three kinds of flux pumping; for each mode we have characterized gain bandwidth product, saturation power, and noise temperature.

Ted White
UC Santa Barbara

Date submitted: 07 Nov 2012

Electronic form version 1.4