

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Using the SLUG as a First Stage, Low Noise Microwave Amplifier for Superconducting Qubit Readout** EDWARD LEONARD JR., TED THORBECK, SHAOJIANG ZHU, ROBERT MCDERMOTT, Univ of Wisconsin, Madison — The SLUG (Superconducting Low-inductance Undulatory Galvanometer) microwave amplifier is a large bandwidth, high saturation power, high gain, and low noise microwave element designed as a first stage cryogenic amplifier for dispersive readout of superconducting qubits. High forward gain is paired with simultaneous high reverse isolation such that bulky, expensive cryogenic circulators and isolators might be eliminated from the microwave readout chain. Here we present recent experimental data on SLUG gain, noise, and reverse isolation. We achieve gain over 10 dB at 7 GHz across a band of several hundred MHz, with system added noise of order one photon. For appropriate flux bias of the device, reverse isolation is better than -20 dB. These qualities make the SLUG a very desirable first stage amplifier for a scalable superconducting qubit readout.

Edward Leonard Jr.  
Univ of Wisconsin, Madison

Date submitted: 14 Nov 2014

Electronic form version 1.4