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**Superconducting Low-inductance Undulatory Galvanometer Microwave Amplifier** SHAOJIANG ZHU, DAVID HOVER, GUILHEM RIBEILL, YUNG-FU CHEN, ROBERT MCDERMOTT, University of Wisconsin — We describe a novel microwave linear amplifier based on the Superconducting Low-inductance Undulatory Galvanometer (SLUG). The compact SLUG element is straightforward to model at microwave frequencies, allowing separate optimization of the SLUG element and the resonant input matching network; we expect optimized devices based on high-Jc junctions to achieve gains around 15 dB in the range from 5-10 GHz, with instantaneous bandwidth of order hundreds of MHz and noise performance approaching the standard quantum limit. Using amplifiers based on low-Jc Al/AlO<sub>x</sub>/Al junctions, we have achieved gain in excess of 20 dB at 3 GHz and greater than 15 dB at 9 GHz with bandwidth of several MHz. We discuss progress toward the incorporation of high-Jc Nb/AlO<sub>x</sub>/Nb junctions in the SLUG amplifier, and describe strategies to promote the thermalization of the SLUG shunt resistors at dilution refrigerator temperatures by integrating large-volume normal metal cooling fins with the shunts.

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