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Directional Amplification using Josephson Ring Modulators[1] M. HATRIDGE, K.M. SLIWA, A. NARLA, S. SHANKAR, M.H. DEVORET, Department of Applied Physics, Yale University — Quantum limited parametric amplifiers usually amplify in reflection, so that the input and output signals travel on the same physical port. Circulators and isolators are thus required both to separate input and output signals with minimal loss of signal-to-noise ratio and to avoid backward irradiation of the signal source. These devices are bulky, dissipative, and operate in large magnetic fields which make them incompatible with integration on chip. By interfering the non-reciprocal mixing processes present in Josephson Ring Modulators, directional amplification can be realized. The theory and performance of a novel directional amplifier will be presented.

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