

Abstract Submitted  
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**The pumpistor: understanding the flux-pumped dc SQUID by its electrical impedance** KYLE SUNDQVIST, Texas A&M University — Parametric amplifiers based on superconducting circuits have experienced recent popularity. It is possible to produce superconducting circuits which may sustain and amplify coherent states of microwaves close to the quantum limit. Such systems currently enable experiments regarding qubit readout, vacuum squeezing, and quantum feedback. To this end, we describe a circuit understanding of the flux-driven dc SQUID. This is useful for developing insight into how these devices perform as active elements, providing parametric gain. We describe three- and four-wave mixing effects, and report on experimental progress. This understanding lends itself to many more testable predictions of otherwise complicated quantum systems.

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