

Abstract Submitted  
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**Effective model of nonlinear circuit quantum electrodynamics**<sup>1</sup> SIMON NIGG, Physics Department, Yale University, MICHEL DEVORET, Department of Applied Physics, Yale University, STEVEN GIRVIN, Physics Department, Yale University — Superconducting electronic circuits containing nonlinear elements such as Josephson junctions are of interest for quantum information processing. The low-energy spectrum of such circuits can now be measured to a precision of better than one part per million. A precise knowledge of their Hamiltonian that goes beyond current models is thus desirable. In this talk I will show how to quantize a superconducting, weakly nonlinear circuit from the knowledge of its classical linear admittance matrix. This approach represents a change of paradigm in circuit quantum electrodynamics and may potentially become a useful alternative to the standard models based on the language of atomic physics and quantum optics.

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