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Manipulation of non-classical microwave states using parametric interactions MANUEL CASTELLANOS-BELTRAN, NIST - Boulder, MICHAEL DEFEO, ADAM SIROIS, LEONARDO RANZANI, NIST - Boulder, University of Colorado - Boulder, RAYMOND SIMMONDS, JOHN TEUFEL, JOSE AUMENTADO, NIST - Boulder — A primary goal for researchers in *quantum optics* has been the generation of exotic quantum states – such as Fock states or superpositions of two coherent states. These states have served well in many basic tests of the foundations of quantum theory and the latter may eventually prove useful for quantum computing, communication, and metrology. One important requirement for the generation and use of these states is their precise control and manipulation. In this respect, c-QED is a very versatile tool. In the past decade there have been extensive improvements in the storage and retrieval of quantum states of light in this experimental platform and more recently in the manipulation of those states using parametric interactions. In this talk, I will discuss our progress toward the goal of efficiently generating a superposition of small-amplitude coherent states, as well as their detection. This follows from our attempt/goal to implement an "on-chip" optical table which utilizes parametric interactions for state preparation and measurement. I will also discuss how we use homodyne tomography to fully characterize the states prepared in our setup.

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