

Abstract Submitted
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Micromechanical Membranes Coupled to Superconducting Microwave Resonators JOHN TEUFEL, DALE LI, KATARINA CIOK, SHANE ALLMAN, FABIO ALTOMARE, JED WHITTAKER, ADAM SIROIS, RAYMOND SIMMONDS, NIST — We will present preliminary results on fabrication and characterization of the mechanical properties of freely suspended aluminum membranes at ultralow temperatures. The radio-frequency vibrational modes are detected by dispersively coupling membranes to superconducting microwave circuits. The resulting microwave optomechanical system provides excellent displacement and force sensitivity, as well as the ability to use resolved sideband cooling to prepare the mechanical degree of freedom near its quantum ground state. We will discuss initial results and future experiments which will couple these mechanical oscillators to superconducting qubits.

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