

Abstract Submitted
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Preparation and Detection of an r.f. Mechanical Resonator Near the Motional Ground State TRISTAN ROCHELEAU, TCHEFOR NDUKUM, Cornell University, KEITH SCHWAB, California Institute of Technology — We have cooled the motion of a 6.2 MHz nanomechanical resonator by parametrically coupling it to a 7.5 GHz superconducting resonator. Starting from a thermal occupation of 500 quanta, we have observed occupation factors as low as 3.8 ± 1.2 and expect the mechanical motion to be found with probability 0.21 in the quantum ground state of motion. We will describe the factors which are limiting further cooling and progress towards colder states of motion. By measuring differences in up and down-conversion of microwave photons in a process analogous to Raman scattering, we expect to observe fundamental quantum behavior of the nanomechanics.

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