

Abstract Submitted
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Nanomechanical parametric amplification and oscillation via electrostatic coupling to Cooper-pair box JUNHO SUH, MATT LAHAYE, Caltech, PIERRE ECHTERNACH, Jet Propulsion Laboratory, KEITH SCHWAB, Cornell University, MICHAEL ROUKES, Caltech — Nanomechanical resonator coupled to a Cooper-pair box exhibits frequency modulation as a function of the gate voltage when the qubit is adiabatically tuned. We utilize this effect to demonstrate mechanical degenerate parametric amplification and oscillation. Gain above 30dB and self-oscillation is observed. This technique would provide an efficient way to enhance the force sensitivity in the measurement of coupled dynamics of nanomechanical resonator modes and a solid state qubit.

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