

Abstract Submitted  
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**Electrical measurements of parametric resonance in silicon cantilevers** MICHAEL REQUA, KIMBERLY TURNER, University of California, Santa Barbara — Micro- and nano- scale mechanical oscillators, in particular cantilevers, show great promise as highly sensitive mass sensors for their small inertial mass and high Q-factors. Sensitivity to environmental factors (force and mass) are limited by the resolution of the resonant frequency measurement in such systems. Experimental investigations to the frequency resolution of bistable nonlinear dynamics for resonators exhibiting parametric resonance have been performed. Using Lorentz interactions for excitation and detection, the all electrical measurements of such oscillations in nonlinear dynamics require nontrivial instrumentation demonstrated in this work. Frequency resolution of 100 parts in 1 billion in vacuum are demonstrated at room temperature suggesting potential enhancements over more conventional harmonic resonant techniques.

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