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**Determining the quantum phase coherence time of a NEMS resonator** EMILY PRITCHETT, University of Georgia, MICHAEL GELLER COLLABORATION — Recently steps have been made toward characterizing macroscopic quantum behavior in nanoelectromechanical devices (NEMS), particularly resonators with large frequencies and high Q factors. While the quantum phase coherence time as well as energy relaxation time of NEMS resonators are believed to be long, this cannot be tested directly using standard techniques. Using formalism typically found in quantum computation, we propose a procedure for directly measuring both phase coherence and energy relaxation times of NEMs resonators by coupling them to anharmonic Josephson junction devices. We hope that using this proposed method experiments will verify current models of decoherence in harmonic oscillator systems.

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