

Abstract Submitted  
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**Detecting quantum-coherent nanomechanical oscillations using the current-noise spectrum of a double quantum dot**<sup>1</sup> NEILL LAMBERT, FRANCO NORI, RIKEN Advanced Science Institute, DML TEAM — We consider a nanomechanical resonator coupled to a double quantum dot. We demonstrate how the finite-frequency current-noise spectrum through the double quantum dot can be used to distinguish classical and quantum behavior in the nearby nanoelectromechanical resonator. We also show how the full-frequency current-noise spectrum gives important information on the combined double quantum dot-resonator energy spectrum. Finally, we point out regimes where the quantum state of the resonator becomes squeezed and also examine the cross-correlated electron-phonon current noise.

<sup>1</sup>N. W. Lambert and F. Nori, Phys. Rev. B 78, 214302 (2008)

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