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**Phonon Squeezing in a Superconducting Molecular Transistor**

ALEX ZAZUNOV, LPMMC, Grenoble, DENIS FEINBERG, LEPES, Grenoble, THIERRY MARTIN, Centre de Physique Theorique Marseille — Josephson transport through a single molecule or carbon nanotube is considered in the presence of a local vibrational mode coupled to the electronic charge. The ground-state solution is obtained exactly in the limit of a large superconducting gap and is extended by variational analysis. The Josephson current induces squeezing of the phonon mode, which is controlled by the superconducting phase difference and by the junction asymmetry. Optical probes of nonclassical phonon states are briefly discussed. [Phys. Rev. Lett. 97,196801 (2006)]

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