Abstract Submitted
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**Out-of-equilibrium current-induced forces on a suspended graphene sheet** SILVIA VIOLA KUSMINSKIY, Dahlem Center for Complex Quantum Systems - Freie Universität Berlin — We have recently developed a formalism that allows to obtain the current-induced forces that act on the vibrational degrees of freedom of a nanoelectromechanical system, purely from scattering matrix theory [*cf* N. Bode, S. Viola Kusminskiy, R. Egger, F. von Oppen, *Phys. Rev. Lett.* **107**, 036804 (2011) and *Beilstein J. Nanotechnol.* **3**, 144 (2012), and M. Thomas, T. Karzig, S. Viola Kusminskiy, G. Zaránd, F. von Oppen, arXiv:1209.0620 (2012)].The forces are expressed in terms of the frozen electronic scattering matrix and its first non-adiabatic correction, the A-matrix, and the expressions are valid both in and out of thermal equilibrium. We apply our results to study the effects of transport currents on the dynamics of the flexural modes of a suspended graphene sheet. We pay particular attention to the non-equilibrium contributions to the force which occur in the presence of a finite applied bias voltage.

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