Abstract Submitted
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Shearing graphene and its transmission properties[1] ANDRES CONCHA[2], School of Engineering and Applied Sciences, Harvard University, Cambridge, MA 02138, USA, SHENGFENG CHENG, Sandia National Laboratories, Albuquerque, New Mexico 87185, USA, L. MAHADEVAN[3], School of Engineering and Applied Sciences, Harvard University, Cambridge, MA 02138, USA — Graphene being the thinnest possible membrane is prone to deformations under slight external forcing or even under thermal fluctuations. Here, we take advantage of this proneness to deformations to manipulate transport properties of graphene ribbons. We do so by using the spontaneous pattern produced when a wide ribbon is subject to shear. The deformation of the ribbon produces pseudo-magnetic fields as well as scalar potentials, resulting in the modification of transmission properties without the need of an external gate potential. Our proposal is a concrete realization of a quantum device that takes full advantage of an elastic instability that spans from the nano to macro-scales.

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