

Abstract Submitted
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Tuning graphene properties by shear¹ ANDRES CONCHA, School of Engineering and Sciences, Adolfo Ibañez University, Diagonal las torres 2640, Peñalolen, Santiago, Chile, SHENGFENG CHENG, Department of Physics, Virginia Tech, Blacksburg, VA 24061, USA, LUCIAN COVACI, Department Fysica, Universiteit Antwerpen, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium, L. MAHADEVAN, School of Engineering and Applied Sciences, Harvard University, Cambridge, MA 02138, USA — Graphene being the thinnest possible membrane made out of carbon atoms is prone to deformations under slight external forcing. Here, we take advantage of this proneness to deformations to manipulate transport properties of graphene ribbons. We analyze the effect on conductance and LDOS of the spontaneous pattern produced when a wide ribbon is subject to shear. The deformation of the ribbon produces pseudo-magnetic fields, scalar potentials, and Fermi velocity renormalization resulting in the modification of transmission properties without the need of an external gate potential. Our proposal paves the way for producing electronic waveguides by using an elastic instability that spans from the nano to macro-scales.

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