Abstract Submitted
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Fold assisted transport in graphene systems[1] RAMON CARRILLO-BASTOS, Univ. Autonoma de Baja California, BC, Mexico, DAIARA FARIA, Univ. do Estado de Rio de Janeiro, RJ, Brazil, YUHANG JIANG, JINHAI MAO, GUOHONG LI, EVA Y. ANDREI, Rutgers Univ., NJ, USA, ANDREA LATGE, Univ. Federal Fluminense, RJ, Brazil, NANCY SANDLER, Ohio University, OH, USA — Sasaki pointed out that a constant uniaxial strain applied along the zigzag direction in graphene causes localized states, akin to edge states in nanoribbons[1]. These states are dispersionless and can carry ballistic transport. Recent experiments reported the presence of ballistic channels in graphene grown on SiC characterized with STM spectroscopy[2, 3]. In this work, we show that out-of plane deformations in the form of folds produce states as those predicted by Sasaki. Using tight-binding calculations and recursive Greens function methods, we obtain conductance, density of states (DOS), local density of states, and band structure (BS) for graphene nanoribbons with zigzag termination. Regions with enhanced DOS are identified in the deformed area corresponding to states in new flattened bands in the BS and new ballistic channels in the conductance. Adjusting the fold parameters, desired properties of these states can be tailored. Our results show that folds could serve as pathways for electronic transport and open the possibility of circuitry design within a simple graphene membrane. [1]Sasaki et al., J. Phys. Soc. Jpn. 75 (2006). [2]Baringhaus et al., Nature 506 (2014). [3]Palacio et al., Nano Lett. 15 (2015).

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