Abstract Submitted
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Graphene as an electronic membrane EUN-AH KIM, Stanford University, ANTONIO CASTRO NETO, Boston University — Experiments are finally revealing intricate facts about graphene which go beyond the ideal picture of relativistic Dirac fermions in pristine two dimensional (2D) space, two years after its first isolation. While observations of rippling [1, 2, 3] added another dimension to the richness of the physics of graphene, scanning single electron transistor images displayed prevalent charge inhomogeneity [4]. The importance of understanding these non-ideal aspects cannot be overstated both from the fundamental research interest since graphene is a unique arena for their interplay, and from the device applications interest since the quality control is a key to applications. We investigate the membrane aspect of graphene and its impact on the electronic properties. We show that curvature generates spatially varying electrochemical potential. Further we show that the charge inhomogeneity in turn stabilizes ripple formation.[5]
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