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Gauge fields for rippled graphene membranes under central load SALVADOR BARRAZA-LOPEZ, JAMES V. SLOAN, University of Arkansas, ALE-JANDRO A. PACHECO, Universidad del Norte, CEDRIC M. HORVATH, University of Arkansas, ZHENG FEI WANG, University of Utah — Gauge fields on graphene are invariably expressed in the language of continuum elasticity. Following an approach where the atomic positions play the preponderant role, a model of strain on graphene was developed where all relevant quantities -including gauge fields- are directly expressed in terms of atomic displacements only. Suspended, rippled graphene membranes under cetral load by a sharp object were studied using this approach. The effects from both the pseudo-magnetic field and the deformation potential were included in calculations of the electron density at different spatial locations (the deformation potential acts as an on-site potential energy). The deformation potential -neglected without proper justification in many published worksappears to modify the electronic spectrum dramatically in a qualitative way. Discussion of experiments relevant to the model will also be given.

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