

Abstract Submitted
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Electron-electron interactions in strained graphene ANAND SHARMA, VALERI KOTOV, University of Vermont — We present a theoretical study on the effects of electron-electron interactions under an applied weak uni-axial strain in graphene, described as anisotropic Dirac liquid. We calculate the electron self-energy using perturbation theory in both the Coulomb interactions and strain, and find that near the Dirac point the self-energy exhibits logarithmic singularity structure, similarly to an un-deformed graphene. We present results for the renormalization of the electronic anisotropy by using first the bare Coulomb interaction, as well as the random-phase approximation, which takes into account the anisotropic nature of the vacuum polarization. The mutual interplay of interactions and strain can provide a route towards understanding the role of correlations in graphene, which so far have been quite elusive in the un-deformed case.

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