

Strain Engineering in Graphene

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Abstract: Graphene is a unique example of a one atom thick metallic membrane. Hence, graphene brings together properties of soft and hard condensed matter systems. The elementary electronic excitations in graphene, the Dirac quasiparticles, couple in a singular way to structural distortions in the form of scalar and vector potentials. Therefore, graphene has an effective electrodynamics where structural deformations couple to the Dirac particles at equal footing to electric and magnetic fields. This so-called strain engineering of the electronic properties of graphene opens doors for a new paradigm in terms of electronic devices, where electronic properties can be manipulated at will using its membrane-like properties.