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Strain induced magnetism in graphene LUCIAN COVACI, FRANCOIS PEETERS, University of Antwerp — Electron-electron interactions are believed not to be very important in graphene since the strength of the on-site Hubbard repulsion is moderate and the electron density of states is small near the Dirac points. Even so, graphene is believed to be in the proximity of a phase transition between a conducting state and an insulating one (antiferromagnetic or spin liquid). Finding a way to bring graphene across the transition is thus an important issue. We consider the effect of inhomogeneous strain from deformations induced by imperfections or steps in the substrate or from specific strain configurations that give almost constant pseudo-magnetic fields. We perform self-consistent mean field calculations for a tight-binding Hamiltonian where we consider only a repulsive on-site Hubbard term. We show that due to strain induced modifications of the kinetic energy, the staggered magnetization will become finite near regions where the strain is large. We also uncover that near deformations, spin-polarized states will appear, in a similar way the spin-polarized states appear at zig-zag edges of graphene nanoribbons.

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