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# Lattice Wigner-Weyl formalism in graphene

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We discuss the tight-binding models of solid state physics with the $Z_2$ sublattice symmetry in the presence of elastic deformations, and their important particular case - the tight binding model of graphene. In order to describe the dynamics of electronic quasiparticles we explore Wigner-Weyl formalism. It allows to calculate the two-point Green function in the presence of both slowly varying external electromagnetic fields and the inhomogeneous modification of the hopping parameters resulted from the elastic deformations. The developed formalism allows us to consider the influence of elastic deformations and the variations of magnetic field on the quantum Hall effect.

**Primary authors:** FIALKOVSKIY, Ignat (Ariel University, Israel, UFABC, Brazil); ZUBKOV, Mikhail (Ariel University, Israel and ITEP, Russia)

**Presenter:** FIALKOVSKIY, Ignat (Ariel University, Israel, UFABC, Brazil)

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