

Quasi-classical description of transport in graphene

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A Boltzmann equation describes the evolution of a density distribution in phase space. It can be used to describe classical systems but also quantum systems, in the latter case, however, only approximately since the Heisenberg uncertainty does not allow particles to be described both by space and momentum coordinates simultaneously. The Boltzmann equation is usually a good tool to get some intuitive grip of transport properties of a quantum system and gives in many cases also decent quantitative results. We will review how a quantum Boltzmann equation is derived from the impurity averaged Dyson equation and then discuss what the Boltzmann equation looks like for graphene with impurities, where the electrons are described by a massless Dirac Hamiltonian.