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JOHANNES GUTENBERG UNIVERSITÄT MAINZ

Theory of Condensed Matter: Hard Condensed Matter

Nov. 11, 2014 at 2:15 p.m.
Galilei room

Prof. Dr. Vitalii Dugaev
Rzeszow University

Edge scattering of electrons in graphene

The contribution of edge scattering to the conductance of graphene nanoribbons and nanoflakes is discussed. We used the Boltzmann equation approach with the specific boundary conditions for the distribution function at the edges, which take into account different character of the electron scattering from edge imperfections, depending on the incoming angle of electron. Using the solution of kinetic equation and various possible types of the boundary conditions for the electron wave function at the edge of graphene, we found the dependence of the momentum relaxation time and conductance on the geometric sizes and on the carrier density. We also consider the case of ballistic nanoribbon and nanodisk, for which the edge scattering is the main mechanism of momentum relaxation.

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