# Effect of a double constriction on the magnetotransport properties of semicondutor nanowires

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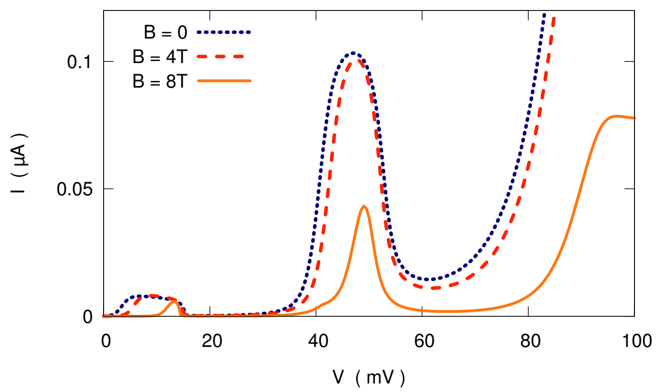
Nanowires belong to the class of nanostructures characterized by a very small aspect ratio which makes them very attractive for theoretical nanoscience as well as for nanotechnology applications. The electronic properties of these nanostructures depend on material composition and geometrical parameters [1, 2]. It is especially visible in the case of the electronic transport, because all basic transport characteristics of the nanowires are diameter-dependent. For very narrow nanowires it is possible to observe the conductance quantization, and the same phenomenon can be also observed in wider nanowires with a geometrical constriction which forms the quantum point contact.




*Current-voltage characteristics calculated for magnetic field B=0, 4, and 8 T.*

An equally attractive issue is to examine the influence of the double constriction on the transport properties of the nanowire in the presence of an external magnetic field, which is the aim of this report. For this purpose the electronic transport in InAs semiconductor nanowires with two embedded geometrical constrictions is considered in the ballistic regime. The influence of the geometrical parameters of the constrictions and the magnetic field on the dynamical magnetoconductance is investigated by solving the three-dimensional Schrödinger equation within the adiabatic approximation and using the Landauer-Büttiker formalism [3].

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