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ELECTRICAL PROPERTIES OF QUANTUM NANOWIRES

Zhanabaev Z.Zh.¹, Grevtseva T.Yu.¹, Ikramova S.B.¹, Filippov N.V.²

¹National Nanotechnology Open Laboratory, Almaty, Kazakhstan,

²al-Farabi Kazakh National University, Almaty, Kazakhstan

In the present work we suggest equations for the description of electrical conductivity of semiconductor quantum nanowires. By use of these equations we explain such features of their current-voltage characteristics as existence of areas with negative differential resistance as well as oscillating behavior of the curves. We take into account scale-invariant, hierarchically self-similar, fractal structure of nanostructures. We consider that quantum nanowires form fractal clusters at their interaction. Electrical potential of these structures can be described as a fractal measure. Theoretical results are confirmed by specific experimental results on study of electrical properties of nanocluster semiconductors.

Keywords: nanostructure, morphology, fractal dimension, current-voltage characteristics, semiconductor.