



METADATA

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Abstract

This book can be used as the main textbook for postgraduate courses in Nanoelectronics. It covers comprehensively the subject of Nanoelectronics through the detailed presentation of the most important process in nanoelectronic devices, i.e., the carrier transport in them. It also presents all the modern theoretical and computational methods for the design, analysis, and simulation of nanoelectronic devices. This book is self-contained and contains all the necessary material for Quantum Mechanics. Among others, the most modern and efficient method for the study and analysis of nanoelectronic devices is described, i.e., the combination of tight-binding Hamiltonians with non-equilibrium Green's functions. The book contains detailed computation examples

of the nanoelectronic devices operating parameters. The Graphene nanoelectronic devices and the Graphene logic gates are presented as application examples of the methods described in the book. Software developed for the design, parametric analysis, and simulation of nanoelectronic devices is given in the form of Matlab source code, and is available through the website of "KALLIPOS" Repository along with detailed instructions for the user. The software is open and free to use. This software was used for research work published in international scientific journals. With this software, the user will be able to reproduce the published results and will also be able to modify and develop the software and use it for his training and research.

