

<<Quasi-hydrodynamic s>>

图书基本信息

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内容概要

In this book a hierarchy of macroscopic models for semiconductor devices is presented. Three classes of models are studied in detail: isentropic drift-diffusion equations, energy-transport models, and quantum hydrodynamic equations. The derivation of each of the models is shown, including physical discussions. Furthermore, the corresponding mathematical problems are analyzed, using modern techniques for nonlinear partial differential equations. The equations are discretized employing mixed finite-element methods. Also, numerical simulations for modern semiconductor devices are performed, showing the particular features of the models. Modern analytical techniques have been used and further developed, such as positive solution methods, local energy methods for free-boundary problems and entropy methods. The book is aimed at applied mathematicians and physicists interested in mathematics, as well as graduate and postdoc students and researchers in these fields.

书籍目录

Preface ix 1 Introduction 1.1 A hierarchy of semiconductor models 1.2 Quasi-hydrodynamic semiconductor models 2 Basic Semiconductor Physics 2.1 Homogeneous semiconductors 2.2 Inhomogeneous semiconductors 3 The Isentropic Drift-diffusion Model 3.1 Derivation of the model 3.1.1 Semiconductor equations based on Fermi-Dirac statistics 3.1.2 The isentropic model-scaling 3.1.3 The convergence result 3.2 Existence of transient solutions 3.2.1 Assumptions and existence result 3.2.2 Proof of the existence result 3.3 Uniqueness of transient solutions 3.4 Localization of vacuum solutions 3.4.1 Main results 3.4.2 Proofs of the main results 3.4.3 Numerical examples 3.5 Numerical approximation 3.5.1 The mixed finite element discretization in one space dimension 3.5.2 Numerical examples in one space dimension 3.5.3 The mixed finite element discretization in two space dimensions 3.5.4 Numerical examples in two space dimensions 3.6 Current-voltage characteristics 3.6.1 Numerical current-voltage characteristics 3.6.2 High-injection current-voltage characteristics 4 The Energy-transport Model 4.1 Derivation of the model 4.1.1 General non-parabolic band diagrams 4.1.2 A drift-diffusion formulation for the current densities 4.1.3 A non-parabolic band approximation 4.1.4 Parabolic band approximation 4.2 Symmetrization and entropy function 4.3 Existence of transient solutions 4.3.1 Assumptions and main results 4.3.2 Semidiscretization 4.3.3 Proof of the existence result 4.4 Long-time behavior of the transient solution 4.5 Regularity and uniqueness 4.5.1 Regularity of transient solutions 4.5.2 Uniqueness of transient solutions 4.6 Existence of steady-state solutions 4.7 Uniqueness of steady-state solutions 4.8 Numerical approximation 4.8.1 The mixed finite element discretization in one space dimension 4.8.2 Numerical results 5 The Quantum Hydrodynamic Model 5.1 Derivation of the model 5.2 Existence and positivity 5.2.1 Existence of steady-state solutions 5.2.2 Positivity and non-positivity properties 5.3 Uniqueness of steady-state solutions 5.4 A non-existence resultReferences Index

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