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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Theoretical framework of quantum transport in semiconductors and devices -- Particle-based Wigner Monte Carlo approach to device simulation -- Application of the Wigner Monte Carlo technique to RTD, MOSFET, and CNTFET -- Transition from quantum to semi-classical

transport through decoherence theory.

Sommario/riassunto

This book gives an overview of the quantum transport approaches for nanodevices and focuses on the Wigner formalism. It details the implementation of a particle-based Monte Carlo solution of the Wigner transport equation and how the technique is applied to typical devices exhibiting quantum phenomena, such as the resonant tunnelling diode, the ultra-short silicon MOSFET and the carbon nanotube transistor. In the final part, decoherence theory is used to explain the emergence of the semi-classical transport in nanodevices.