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Sommario/riassunto

This book reviews a range of quantum phenomena in novel nanoscale transistors called FinFETs, including quantized conductance of 1D transport, single electron effect, tunneling transport, etc. The goal is to create a fundamental bridge between quantum FinFET and nanotechnology to stimulate readers' interest in developing new types of semiconductor technology. Although the rapid development of micro-nano fabrication is driving the MOSFET downscaling trend that is evolving from planar channel to nonplanar FinFET, silicon-based CMOS technology is expected to face fundamental limits in the near future. Therefore, new types of nanoscale devices are being investigated aggressively to take advantage of the quantum effect in carrier transport. The quantum confinement effect of FinFET at room temperatures was reported following the breakthrough to sub-10nm scale technology in silicon nanowires. With chapters written by leading scientists throughout the world, *Toward Quantum FinFET* provides a comprehensive introduction to the field as well as a platform for knowledge sharing and dissemination of the latest advances. As a roadmap to guide further research in an area of increasing importance for the future development of materials science, nanofabrication technology, and nano-electronic devices, the book can be recommended for Physics, Electrical Engineering, and Materials Science departments, and as a reference on micro-nano electronic science and device design. Offers comprehensive coverage of novel nanoscale transistors with quantum confinement effect Provides the keys to understanding the emerging area of the quantum FinFET

Written by leading experts in each research area Describes a key enabling technology for research and development of nanofabrication and nanoelectronic devices.
