
Analysis and Simulation of Semiconductor Devices

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Contents: Introduction. — Some Fundamental Properties. — Process Modeling. — The Physical Parameters. — Analytical Investigations About the Basic Semiconductor Equations. — The Discretization of the Basic Semiconductor Equations. — The Solution of Systems of Nonlinear Algebraic Equations. — The Solution of Sparse Systems of Linear Equations. — A Glimpse on Results. — References. — Author Index. — Subject Index.

Numerical analysis and simulation has become a basic methodology in device research and development. This book satisfies the demand for a thorough review and judgement of the various physical and mathematical models which are in use all over the world today. A compact and critical reference with many citations is provided, which is particularly relevant to authors of device simulation programs. The physical properties of carrier transport in semiconductors are explained, great emphasis being laid on the direct applicability of all considerations. An introduction to the mathematical background of semiconductor device simulation clarifies the basis of all device simulation programs. Semiconductor device engineers will gain a more fundamental understanding of the applicability of device simulation programs. A very detailed treatment of the state-of-the-art and highly specialized numerical methods for device simulation serves in an hierarchical manner both as an introduction for newcomers and a worthwhile reference for the experienced reader.

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