

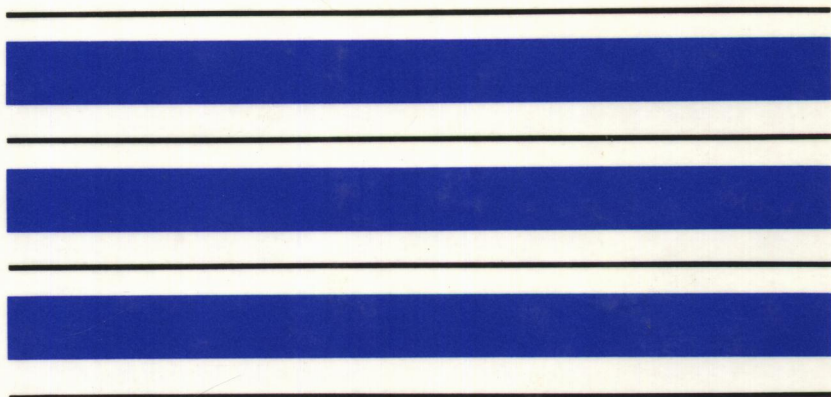
---

# Monte Carlo Device Simulation: Full Band and Beyond

---

edited by

**Karl Hess**



---

**Kluwer Academic Publishers**

## TABLE OF CONTENTS

|  |     |
|--|-----|
| Contributors .....   | vii |
| Preface .....  | ix  |
| <b>Chapter 1.</b> Numerical Aspects and Implementation of<br>the <i>DAMOCLES</i> Monte Carlo Device<br>Simulation Program .....          | 1   |
| S. E. Laux and M. V. Fischetti   |     |
| <b>Chapter 2.</b> Scattering Mechanisms for Semiconductor<br>Transport Calculations .....  | 27  |
| J. Bude  |     |
| <b>Chapter 3.</b> Evaluating Photoexcitation Experiments<br>Using Monte Carlo Simulations .....  | 67  |
| C. J. Stanton and D. W. Bailey   |     |
| <b>Chapter 4.</b> Extensions of the Monte Carlo Simulation in<br>Semiconductors to Fast Processes.....                                   | 99  |
| D. K. Ferry, A. M. Krizan, M. -J. Kann<br>and R. P. Joshi  |     |
| <b>Chapter 5.</b> Theory and Calculation of the Deformation<br>Potential Electron-Phonon Scattering<br>Rates in Semiconductors .....     | 123 |
| M. V. Fischetti and J. M. Hightower  |     |
| <b>Chapter 6.</b> Ensemble Monte Carlo Investigation<br>of Nonlinear Transport Effects in<br>Semiconductor Heterostructure Devices ..... | 161 |
| K. F. Brennan  |     |
| <b>Chapter 7.</b> Monte Carlo Simulation of Quasi-One-<br>Dimensional Systems .....  | 191 |
| D. Jovanovic and J. P. Leburton  |     |
| <b>Chapter 8.</b> The Application of Monte Carlo Techniques<br>in Advanced Hydrodynamic Transport Models.....                            | 219 |
| D. L. Woolard, H. Tian, M. A. Littlejohn,<br>R. J. Trew, and K. W. Kim   |     |

|   |     |
|---|-----|
| <b>Chapter 9.</b> Vectorization of Monte Carlo Algorithms<br>for Semiconductor Simulation ..... | 267 |
| U. Ravaioli   |     |
| <b>Chapter 10.</b> Full Band Monte Carlo Program for<br>Electrons in Silicon .....              | 285 |
| H. Shichijo, J. Y. Tang, J. Bude,<br>and D. Yoder   |     |
| Index .....   | 309 |