

Contents

| | | |
|---|---|-----|
| Part I | General Aspects of Quantum Monte Carlo Methods | |
| <hr/> | | |
| General Review of Quantum Statistical Monte Carlo Methods By M. Suzuki (With 3 Figures) | | 2 |
| Interpolation Between Dimensions By M.A. Novotny (With 5 Figures) | | 23 |
| High-Speed Algorithm for Quantum Monte Carlo Simulation By Y. Okabe and M. Kikuchi (With 12 Figures) | | 34 |
| Monte Carlo Renormalization Group for Quantum Systems By M. Kolb (With 6 Figures) | | 41 |
| Quantum Transfer-Matrix Method and Its Application to Quantum Spin Systems. By H. Betsuyaku (With 8 Figures) | | 50 |
| <hr/> | | |
| Part II | Quantum Spin Systems and Quantum Spin Glasses | |
| <hr/> | | |
| Investigation of One- and Two-Dimensional Quantum Spin Systems by Monte Carlo Simulations By M. Marcu (With 3 Figures) | | 64 |
| Critical Properties of the Two-Dimensional Spin-1/2 XY Ferromagnet By T. Onogi, S. Miyashita, and M. Suzuki (With 12 Figures) . . . | | 75 |
| Critical Properties of Spin Chains By S. Takada (With 10 Figures) | | 86 |
| Monte Carlo Simulations of Three-Dimensional Heisenberg and Transverse-Ising Magnets By O. Nagai, Y. Yamada, and Y. Miyatake (With 8 Figures) . . . | | 95 |
| Magnetic Properties of Ising-like Heisenberg $S=1/2$ Antiferromagnets on the Triangular Lattice By S. Miyashita, M. Takasu, and M. Suzuki (With 8 Figures) . . . | | 104 |

| | |
|--|-----|
| Thermodynamic Properties of the Spin-1/2 Heisenberg Antiferromagnet on the Triangular Lattice By M. Takasu, S. Miyashita, and M. Suzuki (With 10 Figures) . . | 114 |
| Randomness and Frustration in Triangular Antiferromagnets By M. Imada (With 12 Figures) | 125 |
| Two New Methods for Computing Finite Quantum Spin Systems By T. Oguchi and H. Kitatani (With 5 Figures) | 136 |
| Monte Carlo Method for Quantum Spin Systems with Use of the Bloch Coherent State Representation By H. Takano (With 3 Figures) | 144 |
| Decoupled Cell Monte Carlo Method for Quantum Spin Systems By S. Homma, K. Sano, H. Matsuda, and N. Ogita (With 11 Figures) | 153 |
| Quantum Monte Carlo for Spin Glasses and Related Systems By I. Morgenstern and D. Würtz (With 8 Figures) | 163 |
| Monte Carlo Study of the Sherrington-Kirkpatrick Spin Glass Model in a Transverse Field By H. Ishii and T. Yamamoto (With 8 Figures) | 176 |

Part III **Fermion Systems and Nuclear Systems**

| | |
|---|-----|
| Computer Simulation of Polaron and Bipolaron Systems By H. De Raedt, A. Lagendijk, and P. de Vries (With 4 Figures) | 188 |
| A Stochastic Algorithm for Many-Fermion Systems By D.J. Scalapino (With 1 Figure) | 197 |
| Simulation of Magnetic Impurities in Metals By J.E. Hirsch (With 9 Figures) | 205 |
| The Spatial Dependence of Spin and Charge Correlations in a One-Dimensional, Single Impurity, Anderson Model By J.E. Gubernatis (With 4 Figures) | 216 |
| Quantum Monte Carlo Studies of Nuclear Systems By J.W. Negele (With 6 Figures) | 226 |
| Index of Contributors | 241 |