
Contents

Future Architectures in Supercomputing

| | |
|--|----|
| The NEC SX-8 Vector Supercomputer System <i>S. Tagaya, M. Nishida, T. Hagiwara, T. Yanagawa, Y. Yokoya, H. Takahara, J. Stadler, M. Galle, and W. Bez</i> | 3 |
| Have the Vectors the Continuing Ability to Parry the Attack of the Killer Micros? <i>P. Lammers, G. Wellein, T. Zeiser, G. Hager, and M. Breuer</i> | 25 |

Performance and Applications on Vector Systems

| | |
|---|----|
| Performance Evaluation of Lattice-Boltzmann Magnetohydrodynamics Simulations on Modern Parallel Vector Systems <i>J. Carter and L. Oliker</i> | 41 |
| Over 10 TFLOPS Computation for a Huge Sparse Eigensolver on the Earth Simulator <i>T. Imamura, S. Yamada, and M. Machida</i> | 51 |
| First-Principles Simulation on Femtosecond Dynamics in Condensed Matters Within TDDFT-MD Approach <i>Y. Miyamoto</i> | 63 |
| Numerical Simulation of Transition and Turbulence in Wall-Bounded Shear Flow <i>P. Schlatter, S. Stolz, and L. Kleiser</i> | 77 |

Applications I: Finite Element Method

| | |
|--|-----|
| Computational Efficiency of Parallel Unstructured Finite Element Simulations <i>M. Neumann, U. Küttler, S.R. Tiyyagura, W.A. Wall, and E. Ramm</i> | 89 |
| The Role of Supercomputing in Industrial Combustion Modeling <i>N. Currle-Linde, B. Risio, U. Küster, and M. Resch</i> | 109 |

Applications II: Fluid Dynamics

| | |
|--|-----|
| Simulation of the Unsteady Flow Field Around a Complete Helicopter with a Structured RANS Solver <i>T. Schwarz, W. Khier, and J. Raddatz</i> | 125 |
| A Hybrid LES/CAA Method for Aeroacoustic Applications <i>Q. Zhang, P. Bui, W.A. El-Askary, M. Meinke, and W. Schröder</i> | 139 |
| Simulation of Vortex Instabilities in Turbomachinery <i>A. Ruprecht</i> | 155 |

Applications III: Particle Methods

| | |
|---|-----|
| Atomistic Simulations on Scalar and Vector Computers <i>F. Gähler and K. Benkert</i> | 173 |
| Molecular Simulation of Fluids with Short Range Potentials <i>M. Bernreuther and J. Vrabec</i> | 187 |
| Toward TFlop Simulations of Supernovae <i>K. Kifonidis, R. Buras, A. Marek, and T. Janka</i> | 197 |

Applications IV: Turbulence Simulation

| | |
|---|-----|
| Statistics and Intermittency of Developed Channel Flows: a Grand Challenge in Turbulence Modeling and Simulation <i>K.N. Beronov, F. Durst, N. Özyilmaz, and P. Lammers</i> | 215 |
| Direct Numerical Simulation of Shear Flow Phenomena on Parallel Vector Computers <i>A. Babucke, J. Linn, M. Kloker, and U. Rist</i> | 229 |

High Performance Computing on Vector Systems 2005

Proceedings of the High Performance Computing

Center Stuttgart, March 2005

Bönisch, Th.; Benkert, K.; Furui, T.; Seo, Y.; Bez, W.

(Eds.)

2006, XIV, 248 p. 63 illus. in color., Hardcover

ISBN: 978-3-540-29124-4