Meshfree Methods for Partial Differential Equations II

With 157 Figures and 11 Tables
Preface

Over the past years meshfree methods for the solution of partial differential equations have significantly matured and are used in various fields of applications. One of the reasons for this development is the fact that meshfree discretizations and particle models are often better suited to cope with geometric changes of the domain of interest than mesh-based discretization techniques such as finite differences, finite elements or finite volumes. Furthermore, the computational costs associated with mesh generation are eliminated in meshfree approaches, since they are based only on a set of independent points. From the modelling point of view, meshfree methods gained much interest in recent years since they may provide an efficient and reliable approach to the coupling of continuum models to particle models.

In light of these developments the Sonderforschungsbereich 611 and the Gesellschaft für Mathematik und Mechanik sponsored the second international workshop on Meshfree Methods for Partial Differential Equations. It was hosted by the Institut für Numerische Simulation at the Rheinische Friedrich–Wilhelms Universität Bonn from September 15 to September 17, 2003. The organizers Ivo Babuška, Ted Belytschko, Michael Griebel, Wing Kam Liu, Helmut Neunzert, and Harry Yserentant invited scientist from twelve countries to Bonn with the aim to bring together European, American and Asian researchers working in this exciting area of interdisciplinary research. The objective of the workshop was not only to strengthen the mathematical understanding and analysis of meshfree discretizations but also to promote the exchange of ideas on their implementation and application.

This volume of LNCSE now comprises selected contributions of attendees of the workshop. Their content ranges from applied mathematics to physics and engineering.

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Contents

A Particle Strategy for Solving the Fokker-Planck Equation
Modelling the Fiber Orientation Distribution in Steady Recirculating Flows Involving Short Fiber Suspensions
Amine Ammar, Francisco Chinesta ........................................... 1

Extended Meshfree Method for Elastic and Inelastic Media
Jiun-Shyan Chen, Dongdong Wang ............................................. 17

Meshfree Petrov-Galerkin Methods for the Incompressible Navier-Stokes Equations
Thomas-Peter Fries, Hermann Georg Matthies .......................... 39

The $\alpha$-shape Based Natural Element Method in Solid and Fluid Mechanics
D. González, I. Alfaro, E. Cueto, M. Doblaré, F. Chinesta ............ 55

A Particle-Partition of Unity Method Part VI: A $p$-robust Multilevel Solver
Michael Griebel, Peter Oswald, Marc Alexander Schweitzer ............ 71

Enriched Reproducing Kernel Approximation: Reproducing Functions with Discontinuous Derivatives
Pierre Joyot, Jean Trunzler, Francisco Chinesta .......................... 93

Reproducing Kernel Element Interpolation: Globally Conforming $T^m/C^n/P^k$ Hierarchies
Shaofan Li, Daniel C. Simkins, Hongsheng Lu, Wing Kam Liu ....... 109

Multi-scale Analysis Using Two Influence Radii in EFGM
Sachiko Masuda, Hirohisa Noguchi ......................................... 133
Solution of a Dynamic Main Crack Interaction with a System of Micro-Cracks by the Element Free Galerkin Method
Boris Muravin, Eli Turkel, Gregory Muravin ........................................ 149

Finite Cover Method for Physically and Geometrically Nonlinear Problems
Kenjiro Terada, Mitsuteru Asai ...................................................... 169

A Numerical Scheme for Solving Incompressible and Low Mach Number Flows by the Finite Pointset Method
Sudarshan Tiwari, Jörg Kuhnert .................................................. 191

SPH Renormalized Hybrid Methods for Conservation Laws: Applications to Free Surface Flows
Jean Paul Vila ................................................................. 207

Discontinuous Radial Basis Function Approximations for Meshfree Methods
Jingziao Xu, Ted Belytschko ................................................ 231

Treating Moving Interfaces in Thermal Models with the C-NEM
Julien Yvonnet, David Ryckelynck, Philippe Lorong, Francisco Chinesta ........................................ 255

Bridging Scale Particle and Finite Element Methods
Wing Kam Liu, Lucy T. Zhang, Eduard G. Karpov, Hiroshi Kadowaki, Harold Park ........................................ 271

Appendix. Color Plates .......................................................... 291