

# Preface

In the recent decade, there has been growing interest in the numerical treatment of high-dimensional problems. It is well known that classical numerical discretization schemes fail in more than three or four dimensions due to the curse of dimensionality. The technique of sparse grids allows to overcome this problem to some extent under suitable regularity assumptions. This discretization approach is obtained from a multi-scale basis by a tensor product construction and subsequent truncation of the resulting multiresolution series expansion.

Hans-Joachim Bungartz, Jochen Garcke, Michael Griebel, and Markus Hegland organized a workshop specifically to strengthen the research on the mathematical understanding and analysis of sparse grid discretization. Particular focus was given to aspects arising from applications. More than 40 researchers from four different continents attended the workshop in Bonn, Germany, from May 16–20, 2011.

This volume of LNCSE now comprises selected contributions from attendees of the workshop. The contents range from numerical analysis and stochastic partial differential equations to applications in data analysis, finance, and physics.

The workshop was hosted by the Institut für Numerische Simulation and the Hausdorff Research Institute for Mathematics (HIM) of the Rheinische Friedrich-Wilhelms-Universität Bonn as part of the Trimester Program *Analysis and Numerics for High Dimensional Problems*. Financial support of the HIM is kindly acknowledged. We especially thank Christian Rieger for his efforts and enthusiasm in the local organization of the workshop and the staff of the HIM for their assistance.

Bonn, Germany

Jochen Garcke  
Michael Griebel

Sparse Grids and Applications

Garcke, J.; Griebel, M. (Eds.)

2013, X, 286 p., Hardcover

ISBN: 978-3-642-31702-6