

## Preface

### *Special Issue for “the 2nd Sino-German Workshop on Computational and Applied Mathematics”*

The 2nd Sino-German Workshop on Computational and Applied Mathematics took place in Hangzhou, China, from October 9-13, 2007. The long list of senior Chinese numerical analysts who had spent a year or more somewhere in Germany as Humboldt fellows had led to the first Sino-German Workshop in Berlin held at the Humboldt-Universität zu Berlin in 2005. The particular purpose of the second German-Chinese Workshop on Computational and Applied Mathematics was to attract more junior Chinese scientists to the actual research activities in Germany. A summer school in Beijing on adaptive finite element methods with Carsten Carstensen and Rolf Rannacher prior to the Hangzhou workshop underlined this activity to foster the collaboration of the new generations in the fields of computational and applied mathematics. This special issue reflects the present topics therein in both countries and can be summarised under five headings (i)-(v).

(i) The finite element a posteriori error control and adaptive finite element methods focus on convergence and computational details like hanging nodes for conforming and nonconforming adaptive finite element methods.

(ii) Optimal control under PDE constraints focus on convection dominated problems and on error control via recovery techniques.

(iii) Problems in unbounded domains involve some truncation in a finite domain computation and the proper boundary condition is analysed as well as boundary element methods for a bounded interface.

(iv) Computational fluid mechanics is exemplified for convection diffusion and Navier-Stokes fluid flow in several contributions.

(v) The remaining computational nonlinear partial differential equations considered cover equations named after Boltzmann, Schrödinger, and Sobolev.

The sequence of high-quality papers on (i)-(v) exploit mathematical and computational aspects and are listed in no particular order (i.e., the time of acceptance after a severe refereeing procedure based solely on the quality of the contribution).

The participants and all of the authors thankfully acknowledge the support by the Sino-German Center for Research Promotion jointly founded by the National Natural Science Foundation of China (NSFC) and the German Research Foundation (DFG). Without their ongoing support, this fruitful collaboration with the first joint publications of leading German and Chinese scientists would not have happened with this impact for the ongoing collaboration in the younger generations.

Carsten Carstensen, Humboldt University  
Rolf Rannacher, University of Heidelberg  
Zhongci Shi, Chinese Academy of Sciences  
Tao Tang, Hong Kong Baptist University