Preface

This special issue is a collection of the papers contributed by authors who were invited to speak at the minisymposium on **Stabilized, Multiscale and Multiphysics Methods**, World Congress on Computational Mechanics, Los Angeles, CA, 16–22 July 2006. The minisymposium was organized by Arif Masud (University of Illinois at Urbana-Champaign), Tayfun E. Tezduyar (Rice University) and Thomas J.R. Hughes (University of Texas, Austin).

The topics covered in this collection of papers can be categorized into two main areas: (i) Fundamental and Enabling Technologies, and (ii) Moving Boundaries and Interfaces. The topics covered in **Fundamental and Enabling Technologies** include: methods for advection-dominated processes, discontinuity-capturing and shock-capturing techniques, arterial drug delivery, methods for compressible flows, turbulent flow computations with finite calculus–finite element formulations, mixed finite element methods for Darcy–Stokes flow, objectivity in Laplace formulations of the Navier–Stokes equations, Galilean invariance of the stabilized methods for compressible flows, vorticity–strain residual-based turbulence modelling of the Taylor–Green vortex, spatial and temporal multiscale methods for transient convection–diffusion–reaction equations, semidiscrete formulations for transient transport at small time steps, adjoint weighted equations for steady advection in compressible flows, and dynamic subscales in the finite element approximation of thermally coupled incompressible flows.

The second main area, **Moving Boundaries and Interfaces**, includes **fluid–structure interactions (FSI)**, **free-surface flows** and **fluid–fluid interfaces**. The topics covered in this area include: the Stabilized Space–Time Fluid–Structure Interaction technique, FSI modelling in arterial fluid mechanics including aneurysms, effect of hypertensive blood pressure on cerebral aneurysm, meso-scale analysis of lipid bilayers with the dissipative particle dynamics method, 3D adaptive mesh moving schemes, CIP method based on adaptive Soroban grids, ship hydrodynamics, adaptive control systems using the fuzzy theory for multi-physics simulations, FSI modelling of membrane–wind interactions, modelling of fluid–solid and fluid–fluid interfaces with the Mixed Interface–Tracking/ Interface–Capturing Technique, and modelling of free-surface flows with edge-based finite element methods.

We would like to thank the authors for the effort in preparing their contributions and for meeting the deadlines. We also would like to thank those whom we asked for their help in reviewing these papers.

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