

CMND2007

**Proceedings of the International Workshop on
Coupled Methods in Numerical Dynamics**

Inter-University Center Dubrovnik, Croatia,
September 19th–21st, 2007

**Edited by
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University of Zagreb
Faculty of Mechanical Engineering and Naval Architecture

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Preface

In the wake of fast development of new technologies, many areas of contemporary engineering, that were conventionally divided or loosely coupled in the previous times, merge together to meet new challenges. This is very evident specially in the area of contemporary dynamics, since engineering dynamics is fundamental technical discipline that serves as a starting point of many rising technologies in aerospace engineering, mechanical engineering and naval architecture as well as many other related disciplines. By having its origin in continuum mechanics, engineering dynamics is very often “theoretical common ground” to various technologies in different areas of technical application. In the framework of this environment, by using numerical simulation technologies, it is possible today to model, analyze and design complex engineering systems by utilizing mathematical models and methodologies that classically belonged to different fields of applied sciences. Of course, these possibilities bring up new application opportunities but also give possibility of gaining new understandings of fundamental physical phenomena.

However, successful implementation of advanced numerical methodologies in domain of coupled problems of contemporary engineering dynamics rise many questions in terms of proper use of specific methodologies. Since studying of these phenomena requires modeling of different types of systems and continuum that come into dynamic interaction like deformable structures and fluid flow in aeroelastic and hydroelastic applications or multibody systems with unilateral constraints and aerodynamic loadings, many approaches attempt to synthesize optimal methodologies combining different modeling techniques of computational mechanics. With development and coupling of existing methods and modeling procedures, the use of numerical simulation tools is changing from the traditional “physics-based” approach towards the “application-based” view, where several physical models co-exist and interact within the same simulation procedure.

The objective of the workshop is to get together distinguished academics and industrial experts to deliver invited lectures on different aspects of modeling of coupled problems in numerical dynamics. The aim is to discuss relevant issues in the field and disseminate expertise to international graduate students of engineering and researchers. Aeroelastic applications in aeronautical engineering and aerospace, fluid-structure interaction in mechanical engineering and naval architecture, hydrodynamic applications and topics of multibody dynamics are covered by invited lectures and submitted presentations. The targeted audience are graduate students of aerospace engineering, mechanical engineering and naval architecture as well as researchers and engineers from industrial companies active in the field.

In promoting best practice in domain of advanced numerical simulations, the objective of the workshop is complementary to the EU Tempus project “Numerical Simulation Curricula” (NUSIC) that has been conducted at the Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb with

University of Brussels (VUB) being Grant Holder of the project. The program of the workshop is based and can be observed as a follow-up of the academic program that has been successfully prepared and delivered in the framework of the NUSIC project at University of Zagreb.

We are grateful to all the lecturers and participants in the CMND2007 for their excellent papers and contributions. We are also very much indebted to the members of the International Program Committee for their valuable suggestions and advise in the organization of the workshop.

We would like to take this opportunity to thank all those involved in organizing CMND2007. It has been a great effort and there have been many individuals whose contributions have been well beyond the call of duty. In particular, the Local Organizing Committee has worked tirelessly and we are grateful for all their efforts.

September, 2007

Zdravko Terze
Chris Lacor

Organization

International Workshop on COUPLED METHODS IN NUMERICAL DYNAMICS is organized under the auspices of



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University of Zagreb

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University of Brussels (VUB), the NUSIC Grant Holder



Faculty of Mechanical Engineering and Naval Architecture
Zagreb

Workshop Venue:



Inter-University Center Dubrovnik, Dubrovnik, Croatia
September 19th–21st, 2007

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Workshop Web Page

<http://cmd2007.fsb.hr>

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