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WCCM VI
in conjunction with
APCOM'04
September 5-10, 2004 Beijing, China
iacm

SIXTH WORLD CONGRESS ON COMPUTATIONAL MECHANICS IN CONJUNCTION WITH SECOND ASIAN-PACIFIC CONGRESS ON COMPUTATIONAL MECHANICS

September 5-10, 2004, Beijing Hotel, Beijing, China

CONGRESS HONORARY CHAIRMEN
L. X. Qian (China)
O. C. Zienkiewicz (UK)

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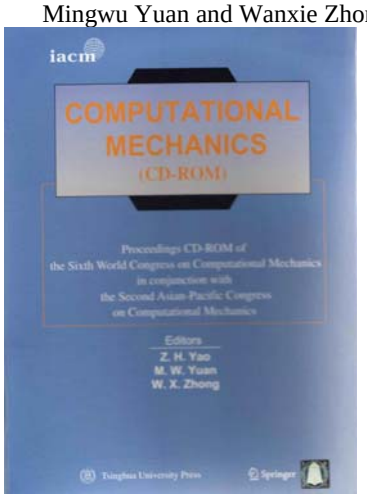
CONGRESS CHAIRMEN
M. W. Yuan (China)
W. X. Zhong (China)

From the PREFACE
written by Zhenhan Yao (Secretary General of WCCM VI)
Mingwu Yuan and Wanxie Zhong (Chairmen of WCCM VI) in June 12, 2004



The impact of Computational Mechanics on engineering and technological progress started in early 60's of the last century and continued to flourish during the entire 20th Century. From the latter part of the 20th Century and the beginning of the 21st Century till now, it also had an impressive influence on the mathematical, physical and biological sciences. The extensive research being carried out around the world in applying the concepts of computational mechanics to multi-physical, multi-scale problems, nano and micro mechanical simulations and biomechanics, is a testament to this.

The International Association for Computational Mechanics founded to promote the activities related to computational mechanics in the early 80's of the last century has also made an impressive progress. The most important scientific event of the Association is the World Congress. The first Congress was held in Austin (USA) in 1986 and then Stuttgart (Germany) in 1990, Chiba (Japan) in 1994, Buenos Aires (Argentina) in 1998 and Vienna (Austria) in 2002. The 6th World Congress on Computational Mechanics, WCCMVI is held in Beijing (China) in conjunction with 2nd Asian Pacific Congress on Computational Mechanics, APCOM'04. The first Asian Pacific Congress was held in Sydney (Australia) in 2001.The Beijing venue is the first time that both congresses are held together

and it is a unique occasion for the world community of researchers in computational mechanics to get together.

The Chinese scientists in computational mechanics consider it a great honor to host the combined WCCM/APCOM in Beijing. The selection of Beijing (China) indicates the recognition of the world community, about the progress made by Chinese scientists in theory and practice of computational mechanics.

China has made a fast economic growth during the past 25 years and it is the belief of the Chinese computational mechanics community that a significant growth of computational mechanics will be made with the international collaboration through this combined congresses.

The Congress Publications consist of the printed Proceedings, two volumes of abstracts and the Proceedings CDROM. The printed Proceedings contain the papers of 3 Plenary Lectures, 11 of 21 Semi-plenary Lectures and 108 of 155 Keynote lectures. The abstracts of other papers are included in two volumes of abstracts: 650 abstracts of the papers to be presented at 83 Minisymposia in volume 1, and 545 abstracts of the papers to be presented at Regular Sessions in volume 2. The Proceedings CDROM contains all the full length papers received in time, more than 900 papers, and the abstracts for other presentations. The editors acknowledge the help of the Paper Review Committee members in maintaining the high standard of the assessment of papers and the co-operation of the authors in complying with the requirement of the editors and the reviewers.

PLENARY LECTURES

1. *Multiscale analysis with atomistic/continuum models for fracture* by Ted Belytschko*, S. P. Xiao

2. *Intelligent adaptive fluid structure interaction systems* by Roger Ohayon

3. *Duality system in optimal control and applied mechanics* by Wanxie Zhong*, Zhigang Wu, Qiang Gao Masaki Shiratori*, Qiang Yu

SEMI-PLENARY LECTURES

1. *The high performance element library for solid mechanics by C. K. Choi*, In-Seon Han*

2. *Nano-to-macro biomechanics of bones: recent developments and current research endeavors by Christian Hellmich*, Franz-Josef Ulm, Luc Dormieux, Jean-François Barthélémy, Sherin Torabia, Cornelia Kober*

3. *Mesh or meshless methods? Is this the right question? By Sergio R. Idelsohn*, Eugenio Oñate*

4. *Large scale finite element simulation and modeling for environmental flows using GIS/CAD by Kazuo Kashiyama*, Hidetaka Hamada, Takeshi Okada, Takeo Taniguchi*

5. Kirchhoff's analogy between rods and gyrostats for chaos determination by Y. T. Leung*, J. L. Kuang

6. Inverse analysis problems in structural engineering of concrete dams by Giulio Maier*, Raffaele Ardito, Roberto Fedele

7. New developments in computational material failure mechanics by X. Oliver*, A. E. Huespe, M. D. G. Pulido, S. Blanco, D. Linero

8. Development of statistical design support system and its applications to some industrial problems by Masaki Shiratori*, Qiang Yu

9. Advanced computational techniques for moving boundaries and interfaces by Tayfun E. Tezduyar

10. Grand challenge of CIP towards universal solver from nano-scale to astrophysical scale by Takashi Yabe

11. Challenges of high dam construction to computational mechanics by Chuhan Zhang

12. Computational durability mechanics by Graham Baker

13. The role of verification and validation in using computationally-based models for making high-consequence, risk-informed decisions by Thomas Bickel

14. Multiscale multiphysics modeling and simulation of materials and structures by Jacob Fish

15. Variational and multiscale methods in turbulence with particular emphasis on large eddy simulation by Thomas. J. R. Hughes

16. A temporal perspective on computational mechanics by Gregory Hulbert

17. Simulation of turbulent flows in natural environment by Jiachun Li

18. Multiscale nano-electromechanics of cell biological systems by Wing Kam Liu

19. Computational strategies for Lagrangian flows by Djordje Peric

20. Lattice Boltzmann vs. Navier-Stokes approach to CFD by Nobuyuki Satofuka

21. Computational contact mechanics at different length scalesby Peter Wriggers

Minisymposia

One of the Minisymposia was ***Fracture Mechanics Problems*** **2004**
Session 1 S4 MS-018-3 Fracture Mechanics Problems
http://www.wccm6-apcom04.org.cn/minisymposia.htm

Proceedings contain the following papers in this chapter:

**** Fracture Analysis of Piezoelectric Materials by Boundary And Trefftz Finite Element Methods*** **(Keynote)**
Quing-Hua Qin

* ***A Generalized 3D Virtual Crack Closure-Integral Method(VCCM) For Hexahedron and Tetrahedron Finite Elements***
H.Okada, M.Higashi, T.Kamibeppu, Y.Fukui, N.Kumazawa

* ***Megnetoelastic Stress Singularities near Corner Point of Compound Ferromagnetic Wedge***
G. Y. Bagdasaryan and D. J. Hasayan

* ***Electromechanical Interaction of Piezoelectric Materials***
F.Yang

* ***Dugdale Model Solution for Mechanically Ductile and Electrical Brittle Piezoelectric Plate***
R.R.Bhargava, Namita Saxena

* ***Edge and Corner Singularities in Isotropic Materials and Layered Composites (Keynote)***
E. Schnack

* ***Rapture in Supper Alloy Composite***
Tau C. Fan

* ***Description o f Non-Linear Wave Process in Viscoelastic Composite Layer o f Cubic System***
K. I. Kurennaya and V. I. Storozhev

* ***Fracture Mechanics Approach for Shear Failure along Bi-material Interface in Dams***
J.M. Chandra Kishen, Sudheer Kamble and Sk. Main Bhasha

* ***Interaction of Internal Crack with Interfacial Rigid Inclusion***
Norio Hasebe, P.B .N. Prasad, X. F. Wang , A. K. Ray*