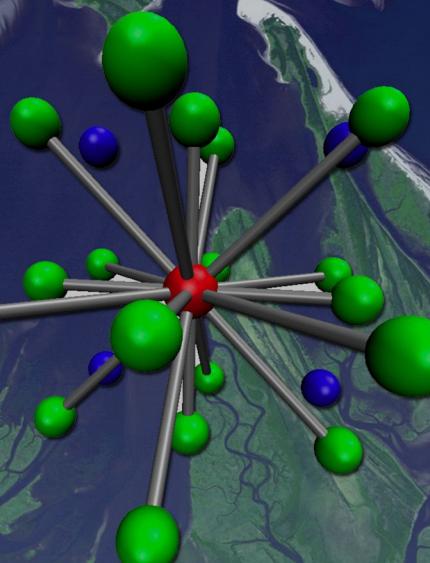




Editors: Zoran Bojkovic, Janusz Kacprzyk, Nikos Mastorakis,
Valeri Mladenov, Roberto Revetria, Lotfi A. Zadeh, Alexander Zemliak

Recent Researches in Hydrology, Geology & Continuum Mechanics



6th IASME / WSEAS International Conference
on Continuum Mechanics (CM 'II)

6th IASME / WSEAS International Conference
on Water Resources, Hydraulics & Hydrology (WRRH 'II)

5th IASME / WSEAS International Conference
on Geology and Seismology (GES 'II)



ISSN: 1792-8370

ISSN: 1792-8397

ISSN: 1792-8419

ISBN: 978-960-474-275-2



Cambridge, UK, February 23-25, 2011



RECENT RESEARCHES in HYDROLOGY, GEOLOGY and CONTINUUM MECHANICS

**6th IASME / WSEAS International Conference on CONTINUUM
MECHANICS (CM '11)**

**6th IASME / WSEAS International Conference on WATER
RESOURCES, HYDRAULICS & HYDROLOGY (WHH '11)
5th IASME / WSEAS International Conference on GEOLOGY and
SEISMOLOGY (GES '11)**

**Cambridge, UK
February 23-25, 2011**

RECENT RESEARCHES in HYDROLOGY, GEOLOGY and CONTINUUM MECHANICS

**6th IASME / WSEAS International Conference on CONTINUUM
MECHANICS (CM '11)**

**6th IASME / WSEAS International Conference on WATER
RESOURCES, HYDRAULICS & HYDROLOGY (WHH '11)**

**5th IASME / WSEAS International Conference on GEOLOGY and
SEISMOLOGY (GES '11)**

**Cambridge, UK
February 23-25, 2011**

Published by WSEAS Press

www.wseas.org

Copyright © 2011, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.

See also: <http://www.worldses.org/review/index.html>

ISSN: 1792-8370
ISSN: 1792-8397
ISSN: 1792-8419
ISBN: 978-960-474-275-2



World Scientific and Engineering Academy and Society

RECENT RESEARCHES in HYDROLOGY, GEOLOGY and CONTINUUM MECHANICS

**6th IASME / WSEAS International Conference on CONTINUUM
MECHANICS (CM '11)**

**6th IASME / WSEAS International Conference on WATER
RESOURCES, HYDRAULICS & HYDROLOGY (WHH '11)**

**5th IASME / WSEAS International Conference on GEOLOGY and
SEISMOLOGY (GES '11)**

**Cambridge, UK
February 23-25, 2011**

Editors:

Prof. Zoran Bojkovic, University of Belgrade, SERBIA
Prof. Janusz Kacprzyk, International Fuzzy Systems Association, POLAND
Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA
Prof. Valeri Mladenov, Technical University of Sofia, BULGARIA
Prof. Roberto Revetria, University of Genoa, ITALY
Prof. Lotfi A. Zadeh, University of California, USA
Prof. Alexander Zemliak, Autonomous University of Puebla, MEXICO

International Program Committee Members:

Laszlo Garbai, HUNGARY	Hyung Hee Cho, KOREA
Dorde Kozic, SERBIA and MONTENEGRO	Ivan Kazachkov, SWEDEN
Darko Goricanec, SLOVENIA	Jean-Christophe Robinet, FRANCE
A. C. Benim, GERMANY	Jeong-se Suh Gyeongsang, KOREA
Abul-Fazal M. Arif, SAUDI ARABIA	Jing Liu, P. R. CHINA
Agis Papadopoulos, GREECE	Joakim Wren, SWEDEN
Ahmed Hassan, AEGYPT	Joseph T. C. Liu, USA
Ahmed Mohammadein, EGYPT	Junjie Gu, CANADA
Alexander Kuzmin, RUSSIA	K. P. Sandeep, USA
Ali J. Chamkha, KUWAIT	Kadir Bilen, TURKEY
Aly Elshamy, EGYPT	Kai H. Luo, UK
Ana Sirviente, USA	Khaled Alhussan, SAUDI ARABIA
Andrei G. Fedorov, USA	Krish Thiagarajan, AUSTRALIA
Aroudam El hassan, MAROCCO	Luis Cortez, BRAZIL
Asad Salem, USA	M. Abu-Zaid, JORDAN
Aura L. Lopez de Ramos, VENEZUELA	Mahmoud Jamiolahmady, UK
Aydin Misirlioglu, TURKEY	Mario Misale, ITALY
Beghidja Abdelhadi, FRANCE	Md Anwar, BANGLADESH
Bodo Ruck, GERMANY	Mehdi Azhdary Moghaddam, IRAN
Boris Ushakov, RUSSIA	Mehmet C. Ece, TURKEY
Bouhadef Khedidja, ALGERIA	Michiharu Narazaki, JAPAN
Bouhadef Malek, ALGERIA	Mohd Al-Nimr, JORDAN
Bozidar, Liscic, CROATIA,	Mostafa Mahmoud, EGYPT
C. J. Ho, TAIWAN	Muthukumaran Packirisamy, CANADA
C. Trevino, MEXICO	Nabil Moussa, EGYPT
C. W. Leung, HONG KONG	Nicolas Galanis, CANADA
Chang Kyun Choi, KOREA	Nikolaos Markatos, GREECE
Chin-Hsiang Cheng, TAIWAN	Oh-hyun Rho, KOREA
Chun-I Chen, TAIWAN	Oleg V. Vasilyev, USA
Claudia del Carmen Gutierrez-Torres, MEXICO	Olga Mazhorova, RUSSIA
David Katoshevski, ISRAEL	Omar Abdel-hafez, EGYPT
Domenico Guida, ITALY	P V S N Murthy, INDIA
Dragoljub Mirjanic, BOSNIA and HERZEGOVINA	Pablo S. Casas, SPAIN
Falin Chen, TAIWAN	Pascal Roubides, USA
Federico Mendez, MEXICO	Pavel Kruckovsky, UKRAINE
Fereydoun Sabetghadam, IRAN	Pradip Majumdar, USA
Florin Popescu, ROMANIA	Pradipta Panigrahi, GERMANY
Fotis Sotiropoulos, USA	Rafael Royo, SPAIN
Francoise Daumas-Bataille, FRANCE	Ramil Sharafutdinov, RUSSIA
Gareth Thomas, USA	Roger Grimshaw, UK
Gennaro Cardone, ITALY	Ryszard Tadeusiewicz, POLAND
Gunter K. F., GERMANY	Serkan Ozgen, TURKEY
H. S. Takhar, UK	Shabaan Abdallah, USA
Hany Mohamed, EGYPT	Shoaib Usman, USA
Haris Catrakis, USA	Siavash Sohrab, USA
Henar Herrero, SPAIN	Slawomir Smolen, GERMANY
Hossein Shokouhmand, IRAN	Somchai Wongwises, THAILAND
	Sujoy Kumar, INDIA

Suman Chakraborty, INDIA
Tahira Haroon, PAKISTAN
Tamas Reti, HUNGARY
Tatsuo Inoue, JAPAN
Valeri Bubnovich, CHILE
Viorel Stoian, ROMANIA
Vitoriano Ruas, FRANCE
Yinping Zhang, P. R. CHINA
Yizhen Huang, CHINA
Marco Mucciarelli, ITALY
Chris Cramer, USA
Tom Rockwell, USA
John Carranza, THE NETHERLANDS
Levent Yilmaz, USA
Hong-Kai Chen, CHINA
David Gomez, SPAIN
Stefano Gresta, ITALY
Shiyong Zhou, CHINA
Shaofeng Liu, CHINA
Mandal Prantik, A. P.
Tae-Kyung Hong, SOUTH KOREA
Maria Belarmino Diaz Aguado, SPAIN
Vikrant Chitnis, INDIA
Xiyuan Zhou, CHINA
Eser Durukal, TURKEY
Alfred Stein, THE NETHERLANDS
Zengxi Ge, CHINA
Mustafa Erdik, TURKEY
Vladimir Sokolov, GERMANY
Hing-Ho Tsang, HONG KONG
Sergei Stanchits, GERMANY
David Schaff, USA
Maria Stella Giammarinaro, ITALY
Efthimios Karymbalis, GREECE
Tamaz Chelidze, GEORGIA
Gulum Birgoren Tanircan, TURKEY
Rui Pedro Juliao, PORTUGAL
Christos Chalkias, GREECE
Yanbin Wang, CHINA
Filippos Vallianatos, GREECE
Mustafa Aktar, TURKEY
Menas Kafatos, USA
Stelios Zimeras, GREECE
Renato Lancellotta, ITALY
Nam H. Tran, AUSTRALIA
Daniel E. McNamara, USA
Stefan Florin Balan, ROMANIA
Mircea Radulian, ROMANIA
Vladimir Graizer, USA
Ernst D. Schmitter, GERMANY
Constantin Ionescu, ROMANIA
Andrei Bala, ROMANIA
J. R. Kayal, INDIA
Mihaela Popa, ROMANIA

Preface

This year the 6th IASME / WSEAS International Conference on CONTINUUM MECHANICS (CM '11), the 6th IASME / WSEAS International Conference on WATER RESOURCES, HYDRAULICS & HYDROLOGY (WHH '11) and the 5th IASME / WSEAS International Conference on GEOLOGY and SEISMOLOGY (GES '11) were held in Cambridge, UK, February 23-25, 2011. The conferences remain faithful to their original idea of providing a platform to discuss solid mechanics, fluid mechanics, gas mechanics, strength of materials, energy applications, transportation theory, water resources management, measurement tools, wetland creation and restoration, mitigation of water resources, wetland and stream functional assessment, water and sediment budgeting, non-point source pollution quantification, water pollution control and water systems, computational hydraulics, hydrologic and coastal processes, coastal erosion, historical geology, palaeontology, physical geography, geochemistry, rock mechanics applied to geology etc. with participants from all over the world, both from academia and from industry.

Their success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of these conferences are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

Conferences such as these can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

Table of Contents

Elastic Buckling of Stepped Beams with Cracks	11
<i>Jaan Lellep, Tiina Kraav</i>	
Over the Modelling of Cracks on Anisotropic Meshes	17
<i>Razvan Raducanu</i>	
Mass Conservation of Level Set Approach for Nonlinear Droplet Dynamics	20
<i>Tadashi Watanabe</i>	
An Artificial Neural Network Model for Downscaling of Passive Microwave Soil Moisture	26
<i>Soo See Chai, Jeffrey P. Walker, Bert Veenendaal, Geoff West</i>	
Experimental Study on Fracture Behavior of Pre-Notched Mortar Beams Using ESPI Technique	32
<i>H. H. Chen, R. K. L. Su</i>	
Linear Instability of Curved Shallow Mixing Layers	38
<i>I. Eglite, A. A. Kolyshkin</i>	
Haptic Manipulation of Virtual Materials for Medical Application	42
<i>Hidetoshi Wakamatsu, Satoru Honma</i>	
Dynamic Response of a Spherical Shell Impacted by a Sphere	51
<i>Yury Rossikhin, Marina Shitikova, Vyacheslav Shamarin</i>	
Soil Moisture Estimation Using Classification and Regression Trees and Neural Networks	57
<i>Gwangseob Kim, Jung-a Park</i>	
Water Resources Assessment for Mbombela Local Municipality in South Africa	61
<i>Jeremiah Mutamba, Ola Busari</i>	
About the Source of Earthquake's Sound	75
<i>Ahmad Barzkar</i>	
Artificial Recharge & Storm Water Management in Hero Honda Motors Ltd for Haridwar & Dharuhera Plants, Haryana State, India	79
<i>S. K. Jain, Dilip Singh Chundawat</i>	
Prediction of the Flood Disasters in Yangtze River: Examples for Three Gorges Dam Project and Estuarine City Shanghai	89
<i>Defu Liu, Guilin Liu, Huajun Li, Fengqing Wang</i>	
Harmonizing Member State Water Policies to the EU Water Directive 2000/60/EU: The Case of Greece	95
<i>Kalliopi Kalampouka, George N. Zaimis, Dimitrios Emmanouloudis</i>	
Possibility of Energy Saving in On-Demand Irrigation Systems	101
<i>Nicola Lamaddalena, Sami Khila, Fethi Lebdi</i>	

Arc-Continent Collisions: General Regularities <i>Victor N. Puchkov</i>	107
Water Circulates Model of River in Natural Environment <i>Yoshiro Takanashi, Haruna Sakagami, Yuta Taki, Minetada Osano</i>	113
Open-Channel Discharge Characteristics and Secondary Flow Development over a Biotope-Scale Heterogeneous Channel Bed <i>Michael Jesson, John Bridgeman, Mark Sterling</i>	120
Multitime Optimal Control and Equilibrium Deformations <i>Andreea Bejenaru, Constantin Udriste</i>	126
Modeling of Conjugated Heat and Mass Transfer in Solid Sorbents <i>C. E. L. Nobrega, N. C. L. Brum</i>	137
Fluid Filament Stretching and Thinning Using One-dimensional Non-linear Models <i>M. Tembely, D. Vadillo, M. R. Mackley, A. Soucemarianadin</i>	143
Martensitic Phase Transformation Accompanied by Transformation Induced Plasticity at Large Strains <i>Rolf Mahnken</i>	149
Two-Dimensional FMCW Radar Imaging of Entire Avalanche Events <i>M. Ash, P. V. Brennan, N. M. Vriend, J. N. McElwaine, C. J. Keylock</i>	153
New Non-Local Models of Transfer and Aggregation Processes <i>Arnold M. Brener, Nurlybek Zhumataev</i>	158
Authors Index	164

Authors Index

Ash, M.	153	Mahnken, R.	149
Barzkar, A.	75	McElwaine, J. N.	153
Bejenaru, A.	126	Mutamba, J.	61
Brener, A. M.	158	Nobrega, C. E. L.	137
Brennan, P. V.	153	Osano, M.	113
Bridgeman, J.	120	Park, J.-A.	57
Brum, N. C. L.	137	Puchkov, V. N.	107
Busari, O.	61	Raducanu, R.	17
Chai, S. S.	26	Rossikhin, Y.	51
Chen, H. H.	32	Sakagami, H.	113
Chundawat, D. S.	79	Shamarin, V.	51
Eglite, I.	38	Shitikova, M.	51
Emmanouloudis, D.	95	Soucemarianadin, A.	143
Honma, S.	42	Sterling, M.	120
Jain, S. K.	79	Su, R. K. L.	32
Jesson, M.	120	Takanashi, Y.	113
Kalampouka, K.	95	Taki, Y.	113
Keylock, C. J.	153	Tembely, M.	143
Khila, S.	101	Udriste, C.	126
Kim, G.	57	Vadillo, D.	143
Kolyshkin, A. A.	38	Veenendaal, B.	26
Kraav, T.	11	Vriend, N. M.	153
Lamaddalena, N.	101	Wakamatsu, H.	42
Lebdi, F.	101	Walker, J. P.	26
Lellep, J.	11	Wang, F.	89
Li, H.	89	Watanabe, T.	20
Liu, D.	89	West, G.	26
Liu, G.	89	Zaimes, G. N.	95
Mackley, M. R.	143	Zhumataev, N.	158