



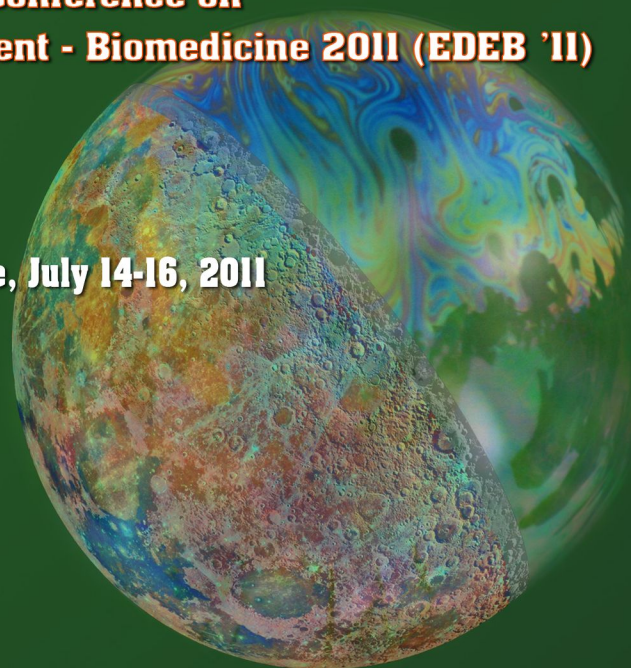
Editors: Nikos Mastorakis, Valeri Mladenov, Zoran Bojkovic, Fragkiskos Topalis, Kleanthis Psarris, Alina Barbulescu, Hamid Reza Karimi, George J. Tsekouras, Abdel-Badeeh M. Salem, Luige Vladareanu, Aleksandar Nikolic, Dana Simian, Berenika Hausnerova, Stevan Berber, Nikolaos Bardis, Azami Zaharim, Chandrasekaran Subramaniam

Recent Researches in Geography, Geology, Energy, Environment and Biomedicine

Recent Researches in Geography Geology, Energy, Environment and Biomedicine

- **Proceedings of the 4th WSEAS International Conference on Engineering Mechanics, Structures, Engineering Geology (EMESEG '11)**
- **Proceedings of the 2nd International Conference on Geography and Geology 2011 (WORLD-GEO '11)**
- **Proceedings of the 5th International Conference on Energy and Development - Environment - Biomedicine 2011 (EDEB '11)**

Corfu Island, Greece, July 14-16, 2011



ISBN: 978-1-61804-022-0



RECENT RESEARCHES in GEOGRAPHY, GEOLOGY, ENERGY, ENVIRONMENT and BIOMEDICINE

**Proceedings of the 4th WSEAS International Conference on
Engineering Mechanics, Structures, Engineering Geology
(EMESEG '11)**

**Proceedings of the 2nd International Conference on Geography and
Geology 2011 (WORLD-GEO '11)**

**Proceedings of the 5th International Conference on Energy and
Development - Environment - Biomedicine 2011 (EDEB '11)**

**Corfu Island, Greece
July 14-16, 2011**

RECENT RESEARCHES in GEOGRAPHY, GEOLOGY, ENERGY, ENVIRONMENT and BIOMEDICINE

**Proceedings of the 4th WSEAS International Conference on
Engineering Mechanics, Structures, Engineering Geology
(EMESEG '11)**

**Proceedings of the 2nd International Conference on Geography and
Geology 2011 (WORLD-GEO '11)**

**Proceedings of the 5th International Conference on Energy and
Development - Environment - Biomedicine 2011 (EDEB '11)**

**Corfu Island, Greece
July 14-16, 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>

ISBN: 978-1-61804-022-0



World Scientific and Engineering Academy and Society



North Atlantic University Union

RECENT RESEARCHES in GEOGRAPHY, GEOLOGY, ENERGY, ENVIRONMENT and BIOMEDICINE

**Proceedings of the 4th WSEAS International Conference on
Engineering Mechanics, Structures, Engineering Geology
(EMESEG '11)**

**Proceedings of the 2nd International Conference on Geography and
Geology 2011 (WORLD-GEO '11)**

**Proceedings of the 5th International Conference on Energy and
Development - Environment - Biomedicine 2011 (EDEB '11)**

**Corfu Island, Greece
July 14-16, 2011**

Editors:

Prof. Nikos Mastorakis, Technical University of Sofia, Bulgaria
Prof. Valeri Mladenov, Technical University of Sofia, Bulgaria
Prof. Zoran Bojkovic, University of Belgrade, Serbia
Prof. Fragkiskos Topalis, National Technical University of Athens, Greece
Prof. Kleanthis Psarris, The University of Texas at San Antonio, USA
Prof. Alina Barbulescu, Ovidius University of Constanta, Romania
Prof. Hamid Reza Karimi, University of Adger, Norway
Prof. George J. Tsekouras, Hellenic Naval Academy, Greece
Prof. Abdel-Badeeh M. Salem, Ain Shams University, Egypt
Prof. Luige Vladareanu, Romanian Academy, Romania
Prof. Aleksandar Nikolic, University of Belgrade, Serbia
Prof. Dana Simian, University Lucian Blaga of Sibiu, Romania
Prof. Berenika Hausnerova, Tomas Bata University in Zlin, Czech Republic
Prof. Stevan Berber, The University of Auckland, New Zealand
Prof. Nikolaos Bardis, Hellenic Army Academy, Greece
Prof. Azami Zaharim, Universiti Kebangsaan, Malaysia
Prof. Chandrasekaran Subramaniam, Anna University of Technology, India

International Program Committee Members:

Evangelos Sapountzakis, GREECE	David Gomez, SPAIN
Manouchehr Amiri, IRAN	Stefano Gresta, ITALY
Viktor Baranov, RUSSIA	Shiyong Zhou, CHINA
L. Borges, PORTUGAL	Shaofeng Liu, CHINA
Fernando Carapau, PORTUGAL	Mandal Prantik, USA
Paulo Correia, PORTUGAL	Tae-Kyung Hong, KOREA
Paul Deuring, FRANCE	Maria Belarmina Diaz Aguado, SPAIN
Alexander Dmitriev, RUSSIA	Vikrant Chitnis, INDIA
Bernard Ducomet, FRANCE	Xiyuan Zhou, CHINA
Paschalis Grammenoudis, GERMANY	Eser Durukal, TURKEY
Alexander Gvozdev, RUSSIA	Alfred Stein, THE NETHERLANDS
Toshiaki Hishida, JAPAN	Zengxi Ge, CHINA
Joao Janela, PORTUGAL	Mustafa Erdik, TURKEY
Roger Khayat, CANADA	Vladimir Sokolov, GERMANY
Stanislav Krasmar, CZECH REPUBLIC	Hing-Ho Tsang, HONG KONG
Petr Kucera, CZECH REPUBLIC	Sergei Stanchits, GERMANY
Aouni Lakis, CANADA	David Schaff, USA
Maria Leftaki, GREECE	Maria Stella Giammarinaro, ITALY
Vladislav Malinin, RUSSIA	Tamaz Chelidze, GEORGIA
George Verros, GREECE	Gulum Birgoren Tanircan, TURKEY
Alexey Markin, RUSSIA	Rui Pedro Juliao, PORTUGAL
Nikolay Matchenko, RUSSIA	Christos Chalkias, GREECE
Bugaru Mihai, ROMANIA	Yanbin Wang, CHINA
Jiri Neustupa, CZECH REPUBLIC	Mustafa Aktar, TURKEY
Juan Ospina, COLOMBIA	Menas Kafatos, USA
Adelia Sequeira, PORTUGAL	Lajosz Barna, HUNGARY
Yoshihiro Shibata, JAPAN	Andrej Krope, SLOVENIA
Nickolay Smirnov, RUSSIA	Tina Krope, SLOVENIA
Maria Specovius-Neugebauer, GERMANY	Danijela Dobersek, SLOVENIA
Aleksander Treschev, RUSSIA	Nicolas Abatzoglou, CANADA
Nikolay Tutyshkin, RUSSIA	Beghidja Abdelhadi, FRANCE
Werner Varnhorn, GERMANY	Wael Al-hasawi, KUWAIT
Kobelev Vladimir, GERMANY	Zakaria Al-Qodah, JORDAN
Chris Cramer, USA	Omar Othman Badran, JORDAN
Tom Rockwell, USA	Pandelis Biskas, GREECE
John Carranza, THE NETHERLANDS	Tomas Bodnar, CZECH REPUBLIC
Levent Yilmaz, TURKEY	Corneliu Botan, ROMANIA
Hong-Kai Chen, CHINA	Arturo Bretas, BRAZIL

Sombat Chuenhooklin, THAILAND
Abdel-Karim Daud, ISRAEL
Yue Dong, CHINA
Jassim Gaeb, JORDAN
Mohamed Hassan, KUWAIT
Iraj Hassanzadeh, IRAN
Seied Hossein, Hosseiny IRAN
Chun Chang Huang, CHINA
Pei-Hwa Huang, TAIWAN
Niranjan Kumar Injeti, INDIA
Lucio Ippolito, ITALY
C. M. Kao, TAIWAN
Sameer Khader, ISRAEL
Rainer Krebs, GERMANY
Sonia Leva, ITALY
Ebrahim Mussavi, IRAN
Panos Papanicolaou, GREECE
Hassan Rahimzadeh, IRAN
Dong-Hee Rhie, KOREA
Nasreddine Saadouli, KUWAIT
Frank Stagnitti, AUSTRALIA
Mladen Stanojevic, SERBIA and
MONTENEGRO
Heiki Tammoja, ESTONIA
Juhan Valtin, ESTONIA
T.Y. Yeh, TAIWAN
Ruey-Fang Yu, TAIWAN
Chen Yuchen, CHINA
Mohamed Zahran, EGYPT
Jiri Zdenek, CZECH REPUBLIC
Gaetano Zizzo, ITALY
Juan Zolezzi Cid, CHILE
Hans Fernlund, UNITED STATES
Paolo Di Giamberardino, ITALY
Vincenzo Di Lecce, ITALY
Anne-Marie Di Sciullo, CANADA
Zeljko Djurovic, SERBIA
Valentin Dogaru Ulieru, ROMANIA
Tomas Dostal, CZECH REPUBLIC
Maitreyee Dutta, INDIA
Karl Edelmöser, AUSTRIA
Erki Eessaar, ESTONIA
Karim El Guemhioui, CANADA
Hamed Elsimary, EGYPT
Ehsan Esfandiary, IRAN
Mehrez Essafi, TUNISIA
Tchier Fairouz, SAUDI ARABIA
Qi Feng, CHINA
Marta Fernandez, SPAIN
Franco Frattolillo, ITALY
Juan Frausto-Solis, MEXICO
Richard Gallery, IRELAND
Gao Gang-yi, CHINA
Gloria Garcia, SPAIN
Ahmad Ghanbari, IRAN
Baluta Gheorghe, ROMANIA
Ryszard Golanski, POLAND

Alexander Grebennikov, MEXICO
Andrea Guerriero, ITALY
Oscar Gustafsson, SWEDEN
Ofar Hadar, ISRAEL
James Haralambides, UNITED STATES
Suhono Harso Supangkat, INDONESIA
Hafiz Md. Hasan Babu, BANGLADESH
Iraj Hassanzadeh, IRAN
Mohsen Hayati, IRAN
Maria Ines Herrero Platero, SPAIN
Tzung-Pei Hong, TAIWAN
Kuo-Hung Hou, TAIWAN
Michel Houtermans, NETHERLANDS,
Chung-Yuan Huang, TAIWAN
Zhou Huiwei, CHINA
Ren-junn Hwang, TAIWAN
Giuseppe Iazeolla, ITALY
Mohamed Ibrahim, EGYPT
Hirotaka Inoue, JAPAN
Naohiro Ishii, JAPAN
Yousuf Mahbulul Islam, BANGLADESH
Juri Jatskevich, CANADA
Cheng-chang Jeng, TAIWAN
Zhang Jilong, CHINA
C. Jittawiriyankoon, THAILAND
HJ Kadim, UNITED KINGDOM
Rihard Karba, SLOVENIA
Stephen Karungaru, JAPAN
Victor Kasyanov, RUSSIA
Osamu Kata, JAPAN
Demetrios Kazakos, UNITED STATES
Vladimir Kazakov, MEXICO
Ahad Kazemi, IRAN
Mohamad Khaldi, LEBANON
Peter Kokol, SLOVENIA
Samad Kolahi, NEW ZEALAND
Chorng-shiuh Koong, TAIWAN
Guennadi Kouzaev, NORWAY
Deniss Kumlander, ESTONIA
Cheng-chien Kuo, TAIWAN
Dan Lascu, ROMANIA
Mihaela Lascu, ROMANIA
Ljubomir Lazic, YUGOSLAVIA
Minh Hung Le, AUSTRALIA
Shih-kai Lee, TAIWAN
Dong-liang Lee, TAIWAN
Seongkee Lee, KOREA
Yong Woo Lee, KOREA
Huey-Ming Lee, TAIWAN
Somchai Lekcharoen, THAILAND
Sheng-Tun Li, TAIWAN
Chunshien Li, TAIWAN
Ying Li, TAIWAN
Yiming Li, TAIWAN,
Wen-Yew Liang, TAIWAN
Ioan Lie, ROMANIA
S. S. Lin, TAIWAN

Wilfred Lin, HONG KONG S.A.R.
Lily Lin, TAIWAN
Hongbo Liu, CHINA
Ismael Lopez-Juarez, MEXICO
Ye Lu, CHINA
Xiaolin Lu, CHINA
Dan Macodiyo, JAPAN
Zaigham Mahmood, UNITED KINGDOM
Bang-on Makdee, THAILAND
Mrinal Manda, CANADA
Umar Manzoor, PAKISTAN
Marius Marcu, ROMANIA
Yulin Mei, CHINA
Elisabeth Metais, FRANCE
Liyang Mi, JAPAN
Hannah Michalska, CANADA
Wasfy Mikhael, UNITED STATES
Manki Min, UNITED STATES
Huang Minhuan, CHINA
Mihai Mitrea, FRANCE
Payman Moallem, IRAN
Nermin Mohamed, EGYPT
Bouhdai Mohamed, MOROCCO
Farah Mohammadi, CANADA
S. Amirhassan Monadjemi, IRAN
Bartolomeo Montrucchio, ITALY
Eduardo Mosqueira-rey, SPAIN
FRANCESCO MUZI, ITALY
Ibtissem Nafkha, TUNISIA
Benedek Nagy, HUNGARY
Sang-Won Nam, KOREA
Hamed Nassar, EGYPT
Pavel Nevriya, CZECH REPUBLIC
Cat Ho Nguyen, VIETNAM
Elena Niculescu, ROMANIA
Vincenzo Niola, ITALY
Javad Nourinia, IRAN
Juan Jesus Ocampo-Hidalgo, MEXICO
Koji Ohashi, JAPAN
Roland Olsson, NORWAY
Igor Ozimek, SLOVENIA
Antonio Pacheco, PORTUGAL
Zeljko Panian, CROATIA (HRVATSKA)
Eunkwang Park, SINGAPORE
Jin Park, UNITED STATES
Federico Perez, SPAIN
Anna Perez, VENEZUELA
Sakthivel Periyasamy, INDIA
Pisit Phokharatkul, THAILAND
Olivier Ponsini, FRANCE
Mircea Popa, ROMANIA
Dan Popescu, ROMANIA
Mihaela Popescu, ROMANIA
Nenad Popovich, NEW ZEALAND
Ali Pouyan, IRAN
Marius Preda, FRANCE
Sorapak Pukdesri, THAILAND

Mohammadreza Rafiei, IRAN
Dejan Rancic, YUGOSLAVIA
Nicolas Ratier, FRANCE
Rabin Raut, CANADA
Fuji Ren, JAPAN
Dimitrios Rigas, UNITED KINGDOM
Addison Rios-Bolivar, VENEZUELA
Francklin Rivas, VENEZUELA
Mercedes Ruiz, SPAIN
Jean Saade, LEBANON
Raafat Saade, CANADA
Mohammad Ali Sadrnia, IRAN
Ma Sadrnia, IRAN
Iwata Sakagami, JAPAN
Bouhouche Salah, ALGERIA
Enrique San Millan, SPAIN
Usiel Sandler, ISRAEL
Oscar SanJuan, SPAIN
Michael Schwarz, GERMANY
Milos Seda, CZECH REPUBLIC
Tsang-Ling Sheu, TAIWAN
Chao-Cheng Shih, TAIWAN
Khalil Shihab, OMAN
YUE Shihong, CHINA
JeongYon Shim, KOREA
Young-chul Shim, KOREA
Jungpil Shin, JAPAN
Vairis Shtrauss, LATVIA
Carmen Simion, ROMANIA
Dharmender Singh Kushwaha, INDIA
Efstratios Skafidas, AUSTRALIA
Suripon Somkuarnpanit, THAILAND
Hua Song, CHINA
Arnd Steinmetz, GERMANY
Rodica Stoian, ROMANIA
Mu-Chun Su, TAIWAN
Pushpa Suri, INDIA
Miroslav Svitek, CZECH REPUBLIC
Feruglio Sylvain, FRANCE
Sabin Tabirca, IRELAND
Razvan Tanasie, ROMANIA
Shaohua Tang, CHINA
Wang Tao, CHINA
Stanislaw Tarasiewicz, CANADA
Domenico Tegolo, ITALY
Kah Leng Ter, SINGAPORE
Spyros Tragoudas, UNITED STATES
Issa Traore, CANADA
Tsung-Han Tsai, TAIWAN
Ruey-Chyn Tsaur, TAIWAN
Shian-Shyong Tseng, TAIWAN
John Tsiligaridis, UNITED STATES
Kazuhiko Tsuda, JAPAN
Hassan Ugail, UNITED KINGDOM
Hans Vandierendonck, BELGIUM
Francisco Vasques, PORTUGAL
Carlos Velez, COLOMBIA

Fernando Vidal, SPAIN
Luige Vladareanu, ROMANIA
Mirela-Catrinel Voicu, ROMANIA
Toshio Wakabayashi, JAPAN
Shuming Wang, TAIWAN
Yi-shun Wang, TAIWAN
Ruye Wang, UNITED STATES
Lin Wilfred, HONG KONG S.A.R.
Lai Wuxing, CHINA
Tianbing Xia, AUSTRALIA
Weiwen Xu, FRANCE
Koichi Yamada, JAPAN
Kiyotaka Yamamura, JAPAN
Thomas Yang, UNITED STATES
Hung-Jen Yang, TAIWAN
Sheng-Yuan Yang, TAIWAN
Kapseung Yang, KOREA
Shun-Ren Yang, TAIWAN
Hung-Jen Yang, TAIWAN
Ping-Jer Yeh, TAIWAN
Jyh-Yeh, UNITED STATES
Hsu-Chun Yen, TAIWAN
Eng-Thiam Yeoh, MALAYSIA
Huifen Ying, CHINA
Tetsuya Yoshida, JAPAN
Enhai Yu, CHINA
Jian Yu ,CHINA
Eugen Zaharescu, ROMANIA
Nadia Zanzouri, TUNISIA
Daniel Zapico, SPAIN
Malika Zazi, MOROCCO
Wenyu Zhang, CHINA
Hong Zheng, CHINA
Hong Zhu, UNITED KINGDOM
Blaz Zmazek, SLOVENIA

Table of Contents

Plenary Lecture 1: Partition and Propagation of Delamination in Fibre Reinforced Composite Laminates <i>Simon S. Wang</i>	16
Abnormal Deflection in the Some Folded Axes within Zagros Fold and Thrust Belt, Northern Iraq, Mirawa-Mawaran Synclinal Axis as a case Study <i>Abdalla Amir Omar</i>	17
Multiplex miniSTR PCR in Miniaturized System based on LTCC Technology – First Report <i>Malgorzata Malodobra, Pawel Bemnowicz, Anna Jonkisz, Anna Karpiewska, Patrycja Sniadek, Anna Gorecka-Drzazga, Leszek Golonka, Tadeusz Dobosz</i>	31
Assessing the Environmental Pollutant Vector of Combustion Gases Emission from Coal-Fired Power Plants <i>Cornelia A. Bulucea, Andreea Jeles, Nikos E. Mastorakis, Carmen A Bulucea, Constantin Brindusa</i>	35
Trace Elements in Sediments of Lakes in Latvia <i>Maris Klavins, Ilga Kokorite, Maruta Jankevica, Jonas Mazeika, Valery Rodinov</i>	43
Approaches for Peat Modification to Improve Oil Sorption Capacity <i>Maris Klavins, Dmitry Porshnov</i>	48
Daylighting Performance of Offices with Controlled Shades <i>Hui Shen, Athanasios Tzempelikos</i>	54
Present Features of the Migration Phenomenon in Romania <i>Tamara Simon, Madalina-Teodora Andrei, Iuliana Pop, Petronela-Sonia Nedea, Florin Vartolomei</i>	60
Aspects of the Tourist Development on the Romanian Black Sea Coastline <i>Tamara Simon, Mirela-Elena Mazilu, Madalina-Teodora Andrei, Roxana-Cristina Severineanu, Costin Dumitrascu</i>	65
The Use of Thermal Energy Storage for Energy System based on Cogeneration Plant <i>Anna Volkova, Andres Siirde</i>	71
Design of Permanent Magnet Hysteresis Motors <i>J. Rizk, A. Hellany, M. Nagrial</i>	76
Monitoring of Energy Flows and Optimization of Energy Efficiency in a Production Facility <i>I. Leobner, K. Ponweiser, C. Dorn, F. Bleicher</i>	81
Self-Potential Methods on Geothermal Exploration (Case Study: Mount Patuha, West Java, Indonesia) <i>Alamta Singarimbun, Mitra Djamal, Fitri Meilawati</i>	86

Cost-Efficient Temperature Regulation of an Office Building Utilizing the Drop in Night Temperature	91
<i>Pal Johan From, Amund J. Foyn</i>	
Acrylic Teeth Ridge Lap Area Chemical Treatment through Tensile Strength Test Investigations	95
<i>Adelina Elena Stoia, Mircea Pielmusi, Sorin Lakatos, Cosmin Sinescu, Mihai Rominu, Adrian Gheorghe Podoleanu</i>	
Greening the e-Medical Equipment: Assessing the Initiatives Undertaken by the Producers	101
<i>Elisabeth Lefebvre, Alejandro Romero, Louis-A. Lefebvre</i>	
European Energy Policy – Directives and Action Plans	107
<i>V. Pozeb, D. Goricanec, J. Krope</i>	
Heavy Metals Behaviour in a Gasification Reactor	111
<i>Martino Paolucci, Carlo Borgianni, Paolo De Filippis</i>	
Field Implementation of Phytoremediation	115
<i>Abdul Rahman Abas, Mushrifah Idris, Siti Rozaimah Sheikh Abdullah, Ahmad Khairi Husin, Raja Farzarul Hanim, Rozita Ayub, Roslina Mat Yazid, Iqmal Husin</i>	
Design and Testing of Solar Dryer for Drying Kinetics of Seaweed in Malaysia	119
<i>A. Fudholi, M. Y. Othman, M. H. Ruslan, M. Yahya, A. Zaharim, K. Sopian</i>	
Life Cycle Cost (LCC) Analysis: Hydrogen as an Alternative Fuel for Internal Combustion Engine (H2ICE)	125
<i>H. Razali, B. Ali, S. Mat, A. Zaharim, K. Sopian</i>	
The Effects of Drying Air Temperature and Humidity on the Drying Kinetics of Seaweed	129
<i>A. Fudholi, M. Y. Othman, M. H. Ruslan, M. Yahya, A. Zaharim, K. Sopian</i>	
The Requirements and Challenges in Energy Policy Formulation for Selected OIC Countries	134
<i>N. Asim, A. Zaharim, K. Sopian</i>	
A Pilot Study of the Building Integrated Photovoltaic Thermal (BIPVT) Collector for Commercial Applications in Malaysia	139
<i>A. Ibrahim, M. Y. Othman, M. H. Ruslan, S. Mat, A. Zaharim, K. Sopian</i>	
Extreme Climatic Phenomena during the Hot Period of the Year in Targoviste Municipality and its Surroundings (1961-2010). Case Studies	143
<i>Ovidiu Murarescu, Gica Pehoiu, Bogdan Puscoi</i>	
Hydrogen Energy Storage Materials Based on Conducting Polymers and their Nanocomposites	149
<i>Kurt E. Geckeler</i>	
TRNSYS Simulation of Solar Water Heating System in Iraq	153
<i>M. N. Mohammed, M. A. Alghoul, Kh. Abulqasem, Alsharif Mustafa, Kh. Glaisa, P. Ooshaksaraei, M. Yahya, A. Zaharim, K. Sopian</i>	

Economic Analysis of Combined Solar-Assisted Ejector Absorption Refrigeration System	157
<i>J. M. Abdulateef, Nurul Muiz Murad, M. A. Alghoul, A. Zaharim, K. Sopian</i>	
Experimental Study on Combined Solar-Assisted Ejector Absorption Refrigeration System	162
<i>J. M. Abdulateef, Nurul Muiz Murad, M. A. Alghoul, A. Zaharim, K. Sopian</i>	
Building Energy Index (BEI) in Large Scale Hospital: Case Study of Malaysia	167
<i>Saeid Moghimi, S. Mat, C. H. Lim, A. Zaharim, K. Sopian</i>	
Thermal Comfort Assessment in Large Scale Hospital: Case Study in Malaysia	171
<i>Fatemeh Azizpour, Saeid Moghimi, Chinhaw Lim, Sohif Mat, Azami Zaharim, Kamaruzzaman Sopian</i>	
Stress-Sensitivity in Tight Gas Reservoirs: A Curse or an Opportunity for Carbon Dioxide Sequestration?	175
<i>Rosalind A. Archer</i>	
Evaluating the Environmental Impact of Coal-Fired Power Plants through Wastewater Pollutant Vector	181
<i>Nikos E. Mastorakis, Andreea Jeles, Cornelia A Bulucea, Carmen A. Bulucea, Constantin Brindusa</i>	
Histopathologic Exam of the Placenta, Membranes and Umbilical Cord – Essential Step in Orienting the Standard Complex Investigation of Recurrent Abortion	188
<i>Carmen A. Bulucea, Nikos E. Mastorakis, Mariana F. Paun, Anca Patrascu, Alina D. Neatu</i>	
Towards a Unified Model of Pavlovian Conditioning: A Solution to the Reconsolidation Problem	193
<i>V. I. Kryukov (Hegumen Theophan)</i>	
Spatial Uncertainty	203
<i>S. Zimeras, Y. Matsinos</i>	
Effect of Cloudless Sky Parameters on Global Spectral Solar Radiation Within 0.3-1.1 μm Region	209
<i>Yousef A. Eltbaakh, M. H. Ruslan, M. A. Alghoul, M. Y. Othman, A. Zaharim, K. Sopian</i>	
Energy Performance Implies Measures from Consumers to the Energy Supply Sources	214
<i>Rodica Frunzulica, Mirela Sanda Toropoc</i>	
Behaviour of Single Storey Frames with Tapered Web Members Accounting for Manufacturing and Assembling Imperfections	219
<i>I. Mircea Cristutiu, Daniel. L. Nunes</i>	
Non-invasive Imagistic Investigations of Repaired IPS Empress e.max All Ceramic Crowns	225
<i>Emanuela Petrescu, Lavinia Meda Negrutiu, Cosmin Sinescu, Roxana Rominu, Florin Topala, Mihai Rominu, Adrian Gh. Podoleanu</i>	
Nanoscience to Nanotechnology for Civil Engineering – Proof of Concepts	230
<i>B. Bhuvaneshwari, Saptarshi Sasmal, Nagesh R. Iyer</i>	

Experimental Studies on Cold-Formed Steel Angle Tension Members	236
<i>P. Prabha, M. Saravanan, V. Marimuthu, S. Arul Jayachandran</i>	
The Behavior of Cable-Stayed Bridges Having Different Cable Arrangements under Static and Dynamic Loads	242
<i>Metin Husem, Selim Pul, Yousef Zandi, M. Emin Arslan</i>	
Analysis of Shear Failure of Flexural Fibre Concrete Beams Reinforced with Rebars of Two Ductility Classes	247
<i>Hana Hanzlova, Jiri Kratky, Robert Heran</i>	
Seismic Performance and Vulnerability Analysis of Code - Conforming RC Buildings	252
<i>A. Cinitha, P. K. Umesha, Nagesh R. Iyer</i>	
Effect of Distribution and Orientation of Steel Fiber Reinforced Concrete	260
<i>Yousef Zandi, Metin Husem, Selim Pul</i>	
Investigation of Relation between Core and Cylindrical Strength of Concrete Specimen Cured in Different Conditions	265
<i>Selim Pul, Metin Husem, M. Emin Arslan, Yousef Zandi</i>	
Effects of Vibration Time on Strength of Ordinary and High Performance Concrete	270
<i>M. Emin Arslan, Ercan Yozgat, Selim Pul, Metin Husem</i>	
Timber-Framed Walls with Openings Coated with Single Fibre-Plaster Boards	275
<i>Erika Kozem Silih, Miroslav Premrov</i>	
Optimized Stochastic Based Design of Structures	280
<i>Abayomi Omishore</i>	
Uncertainty Analysis of the Cross-sectional Area of a Structural Member	284
<i>Abayomi Omishore</i>	
Polymer Coated Carbonyl Iron Particles and their Magnetorheological Suspensions	289
<i>Michal Sedlacik, Vladimir Pavlinek, Petr Saha, Petra Svrcinova, Petr Filip</i>	
Optimization of Biodegradable Polymeric Submicroparticles Preparation	294
<i>Petr Stloukal, Marek Koutny, Vladimir Sedlarik, Pavel Kucharczyk</i>	
Investigation of Experimental and Numerical Analysis on Extrusion Process of Magnesium Alloy Fin Structural Parts	300
<i>Su-Hai Hsiang, Yi-Wei Lin, Wen-Hao Chien</i>	
Experimental Research on Pre-Reduction of Nickel Silicate Ore in New Ferronickel Factory in Drenas	306
<i>Zarife Gashi, Shefik Imeri, Nexhmedin Lohja, Muharrem Zabeli, Naim Tahiraj, Nagip Murati</i>	

Morphology of Polyethylene with Regular Side Chains Distribution <i>Miroslav Janicek, Roman Cermak, Petr Ponizil</i>	312
High-Pressure Crystallization of Poly(1-Butene) <i>Jiri Kalous, Lubomir Benicek, Roman Cermak</i>	318
Effect of Individual Components on Characteristics of Cement Composites with Recyclate <i>Vladimira Vytlacilova</i>	324
Biodegradable Hydrogel Film for Food Packaging <i>Niladri Roy, Nabanita Saha, Petr Saha</i>	329
Measuring and Comparison of Natural Frequencies of Bucket Wheel Excavators SchRs 1320 and K 2000 <i>Jakub Gottvald</i>	335
Characterization of Partially Biodegradable Poly(L-lactic acid)/Poly(methyl methacrylate) Blends as Potential Biomaterials <i>Pavel Kucharczyk, Vladimir Sedlarik, Takeshi Kitano, Michal Machovsky, Marian Barak, Marek Koutny, Petr Stloukal, Petr Saha</i>	341
The Effect of ZnO Modification on Rubber Compound Properties <i>J. Kadlcak, I. Kuritka, P. Konecny, R. Cermak</i>	347
Protein Filled Polymer Composites for Biodegradable Packaging <i>Nabanita Saha, Lenka Jelinkova, Martin Zatloukal, Petr Saha</i>	353
Combined Bending with Induced or Applied Torsion of FRP I-Section Beams <i>Mojtaba B. Sirjani, Stella B. Bondi, Zia Razzaq</i>	358
Analysis of Bonded Anchor in Combined Concrete-Bond Failure Mode <i>Jan Barnat, Miroslav Bajer</i>	364
Numerical Simulation of Dynamic Wind Load of the Foot-bridge <i>Jiri Kala, Miroslav Bajer, Jan Barnat</i>	368
Pore Size Estimation <i>Tomas Matousek, Petr Ponizil, Filip Kremen, Iva Buresova, Petra Dvorakova</i>	372
Polyurethane Improvement by Glasses Fibres, Acoustic, Mechanical and Thermal Application <i>Martin Juricka, Veronika Struharova, Petr Smolka, Ales Mracek, Petr Ponizil</i>	378
A Comparative Study of Crosslinked Sodium Alginate/Gelatin Hydrogels for Wound Dressing <i>A. Saarai, V. Kasparikova, T. Sedlacek, P. Saha</i>	384
On-Line SiO_x Coating of Extruded Polystyrene Sheets Utilizing Atmospheric Pressure Plasma Treatment <i>O. Hudecek, T. Sedlacek, A. Minarik, P. Saha</i>	390

On Pressure and Temperature Affected Shear Viscosity Behaviour of Poly(Lactid) Acid Melt	396
<i>P. Piyamanocha, T. Sedlacek, P. Saha</i>	
On the Influence of Nutrient Agents on Accelerated Physical Aging of LDPE Based Mulch Foil	401
<i>T. Sedlacek, T. Mikulka, R. Cermak, A. Kalendova, P. Saha</i>	
The Effect of Soil-Flexibility on Seismic Response of a Typical Steel Plate Shear Wall Subjected to Duzce Earthquake	407
<i>J. Mirlohi, P. Memarzadeh, F. Behnamfar</i>	
Influence of Geometrical Parameters on the Design of Connections Made with Pins	413
<i>Milan Smak, Josef Puchner</i>	
Sustainable Concrete Using High Volume Supplementary Cementitious Materials	418
<i>Dimitrios Goulias, Upadhyaya Sushant</i>	
Indoor Climate of Classrooms with Alternative Ventilation Systems	423
<i>Alo Mikola, Hendrik Voll, Teet-Andrus Koiv, Merje Rebane</i>	
Numerical Model of Randomly Distributed Particles Generated from the Material Structure as a Quantitative Analysis of Structure/rheology Relationship	429
<i>Berenika Hausnerova, Jan Zidek</i>	
Comparison of Fracture Energy of Various Cement Pastes	433
<i>Pavel Padevet, Ondrej Zobal</i>	
Non-Stationary Identification of Heat Transfer Characteristics Using the Conjugate Gradient Technique	439
<i>Jiri Vala, Stanislav Stastnik</i>	
The Gear Whine Noise	445
<i>V. Niola, V. Avagliano, G. Quaremba</i>	
Exergoeconomic Optimization of the Cryogenic Cycles used in the Pilot Plant for Tritium and Deuterium Separation	451
<i>Sorin Gherghinescu, Alexandru Dobrovicescu, Eugenia Vasilescu</i>	
Adsorption Systems for Cryogenic Plants	456
<i>Sorin Gherghinescu, Gheorghe Popescu</i>	
Creep of Cement Paste Preloaded at High Temperature and Prepared from Portland Cement	461
<i>Pavel Padevet, Petr Bittnar</i>	
Performance Evaluation of Feedforward Neural Networks for Modeling a Vehicle to Pole Central Collision	467
<i>Witold Pawlus, Kjell G. Robbersmyr, Hamid Reza Karimi</i>	

A Recursive Model for Nonlinear Spring-Mass-Damper Estimation of a Vehicle Localized Impact	473
<i>Hamid Reza Karimi, Witold Pawlus, Kjell G. Robbersmyr</i>	
Hysteresis Modeling for the Rotational Magnetorheological Damper	479
<i>Yousef Iskandarani, Hamid Reza Karimi</i>	
Vibration Analysis for the Rotational Magnetorheological Damper	486
<i>Yousef Iskandarani, Hamid Reza Karimi</i>	
Modeling Simulations and Instrumentation of High Pressure Roller Crusher for the Silicon Carbide Production	493
<i>Sylvester Sedem Djokoto, Hamid Reza Karimi</i>	
Noise Fundamental Diagram Deduced by Traffic Dynamics	501
<i>Gerardo Iannone, Claudio Guarnaccia, Joseph Quartieri</i>	
Identification and Robust Active Damping of a Smart Structure	508
<i>Oliver Janda, Ulrich Konigorski</i>	
Authors Index	517

Plenary Lecture 1

Partition and Propagation of Delamination in Fibre Reinforced Composite Laminates



Professor Simon S. Wang

Department of Aeronautical and Automotive Engineering
Loughborough University, Loughborough
Leicestershire, UK
E-mail: s.wang@lboro.ac.uk

Abstract: Fibre reinforced composite laminates are very attractive to manufacturers of light weight structures in several industrial sectors, such as aeronautical, automotive and ship industries. However, delamination has always been a major concern in their applications due to the possibility of caused catastrophic structural failures. Consequently, their competing ability is considerably compromised against advanced metallic alloys. To improve the situation, it is of paramount importance at present time to understand the mechanics of delamination and its propagation. This lecture focuses on this topic. Analytical, numerical and experimental studies are reported.

In our study, delamination is regarded as a mixed mode fracture and strain energy release rate is considered as a quadratic form of positive definite of local crack tip forces and moments. Two sets of orthogonal pure modes are discovered. One set is proved to be a complete basis and is used to partition any mixed delamination mode. Although the individual pure modes in a pure pair are orthogonal, they still interact to each other in a stealthy way which results in a net zero energy change within the pair. However, the stealthy interaction results in energy flow between the orthogonal pure modes which changes mode energy partitions. Numerically, laminar interfaces are modelled by using imaginary springs. Strain energy release rates are calculated by using crack closure technique. An XFSM is developed based on a layer-wise theory to study the propagation of delamination in generally anisotropic laminates under compression. Extensive analytical, numerical and experimental studies are presented. The results show that unstable propagation is often caused by mode I delamination whilst mode II delamination often leads to stable propagation. Multiple delaminations interact with each other and considerably change the propagation behaviour.

Brief Biography of the Speaker:

Simon S. Wang received his BSc and MSc education from Tsinghua University of China between 1978 and 1985. He obtained his PhD from Birmingham University of UK in 1990 and worked as a post doctoral research fellow in the same institution from 1991 to 1996. He joined Loughborough University of UK in 1996 as a lecturer and became a senior lecturer in 2003. He is now a concurrent professor of Hebei University of Engineering of China. He is the author of over 100 academic papers in international journals and conferences. He has been frequently invited to give plenary and keynote presentations in international conferences and research lectures in prestigious research institutions.

Authors Index

Abas, A. R.	115	Dvorakova, P.	372	Jonkisz, A.	31
Abdulateef, J. M.	157, 162	Eltbaakh, Y. A.	209	Juricka, M.	378
Abulqasem, K.	153	Filip, P.	289	Kadlcak, J.	347
Alghoul, M. A.	153, 157	Foyn, A. J.	91	Kala, J.	368
Alghoul, M. A.	162, 209	From, P. J.	91	Kalendova, A.	401
Ali, B.	125	Frunzulica, R.	214	Kalous, J.	318
Andrei, M.-T.	60 65	Fudholi, A.	119, 129	Karimi, H. R.	467, 473, 479
Archer, R. A.	175	Gashi, Z.	306	Karimi, H. R.	486, 493
Arslan, M. E.	242, 265, 270	Geckeler, K. E.	149	Karpiewska, A.	31
Asim, N.	134	Gherghinescu, S.	451, 456	Kasparkova, V.	384
Avagliano, V.	445	Glaisa, K.	153	Kitano, T.	341
Ayub, R.	115	Golonka, L.	31	Klavins, M.	43, 48
Azizpour, F.	171	Gorecka-Drzazga, A.	31	Koiv, T.-A.	423
Bajer, M.	364, 368	Goricanec, D.	107	Kokorite, I.	43
Barak, M.	341	Gottvald, J.	335	Konecny, P.	347
Barnat, J.	364, 368	Goulias, D.	418	Konigorski, U.	508
Behnamfar, F.	407	Guarnaccia, C.	501	Koutny, M.	294, 341
Bembnowicz, P.	31	Hanim, R. F.	115	Kratky, J.	247
Benicek, L.	318	Hanzlova, H.	247	Kremen, F.	372
Bhuvaneshwari, B.	230	Hausnerova, B.	429	Krope, J.	107
Bittnar, P.	461	Hellany, A.	76	Kryukov, V. I.	193
Bleicher, F.	81	Heran, R.	247	Kucharczyk, P.	294, 341
Bondi, S. B.	358	Hsiang, S.-H.	300	Kuritka, I.	347
Borgianni, C.	111	Hudecek, O.	390	Lakatos, S.	95
Brindusa, C.	35, 181	Husem, M.	242, 260	Lefebvre, E.	101
Bulucea, Ca. A.	35, 181, 188	Husem, M.	265, 270	Lefebvre, L.-A.	101
Bulucea, Co. A.	35, 181	Husin, A. K.	115	Leobner, I.	81
Buresova, I.	372	Husin, I.	115	Lim, C.	171
Cermak, R.	347, 401	Iannone, G.	501	Lim, C. H.	167
Cermak, R.	312, 318	Ibrahim, A.	139	Lin, Y.-W.	300
Chien, W.-H.	300	Idris, M.	115	Lohja, N.	306
Cinitha, A.	252	Imeri, S.	306	Machovsky, M.	341
Cristutiu, I. M.	219	Iskandarani, Y.	479, 486	Malodobra, M.	31
De Filippis, P.	111	Iyer, N. R.	230, 252	Marimuthu, V.	236
Djamal, M.	86	Janda, O.	508	Mastorakis, N. E.	35, 181, 188
Djokoto, S. S.	493	Janicek, M.	312	Mat, S.	125, 139
Dobosz, T.	31	Jankevica, M.	43	Mat, S.	167, 171
Dobrovicescu, A.	451	Jayachandran, S. A.	236	Matousek, T.	372
Dorn, C.	81	Jeles, A.	35, 181	Matsinos, Y.	203
Dumitrascu, C.	65	Jelinkova, L.	353	Mazeika, J.	43

Mazilu, M.-E.	65	Porshnov, D.	48	Singarimbun, A.	86
Meilawati, F.	86	Pozeb, V.	107	Sirjani, M. B.	358
Memarzadeh, P.	407	Prabha, P.	236	Smak, M.	413
Mikola, A.	423	Premrov, M.	275	Smolka, P.	294, 341, 378
Mikulka, T.	401	Puchner, J.	413	Sniadek, P.	31
Minarik, A.	390	Pul, S.	242, 260	Sopian, K.	119, 125, 129
Mirlohi, J.	407	Pul, S.	265, 270	Sopian, K.	134, 139, 153
Moghimi, S.	167, 171	Puscoi, B.	143	Sopian, K.	157, 162, 167
Mohammed, M. N.	153	Quaremba, G.	445	Sopian, K.	171, 209
Mracek, A.	378	Quartieri, J.	501	Stastnik, S.	439
Murad, N. M.	157, 162	Razali, H.	125	Stoia, A. E.	95
Murarescu, O.	143	Razzaq, Z.	358	Struharova, V.	378
Murati, N.	306	Rebane, M.	423	Sushant, U.	418
Mustafa, A.	153	Rizk, J.	76	Svrcinova, P.	289
Nagrial, M.	76	Robbersmyr, K. G.	467, 473	Tahiraj, N.	306
Neatu, A. D.	188	Rodinov, V.	43	Topala, F.	225
Nedea, P.-S.	60	Romero, A.	101	Toropoc, M. S.	214
Negrutiu, L. M.	225	Rominu, M.	95, 225	Tzempelikos, A.	54
Niola, V.	445	Rominu, R.	225	Umesha, P. K.	252
Nunes, D. L.	219	Roy, N.	329	Vala, J.	439
Omar, A. A.	17	Ruslan, M. H.	119, 129	Vartolomei, F.	60
Omishore, A.	280, 284	Ruslan, M. H.	139, 209	Vasilescu, E.	451
Ooshaksaraei, P.	153	Saarai, A.	384	Volkova, A.	71
Othman, M. Y.	119, 129	Saha, N.	329, 353	Voll, H.	423
Othman, M. Y.	139, 209	Saha, P.	289, 329, 341	Vytlacilova, V.	324
Padevet, P.	433, 461	Saha, P.	353, 384, 390	Yahya, M.	119, 129, 153
Paolucci, M.	111	Saha, P.	396, 401	Yazid, R. M.	115
Patrascu, A.	188	Saravanan, M.	236	Yozgat, E.	270
Paun, M. F.	188	Sasmal, S.	230	Zabeli, M.	306
Pavlinek, V.	289	Sedlacek, T.	384, 390	Zaharim, A.	119, 125, 129
Pawlus, W.	467, 473	Sedlacek, T.	396, 401	Zaharim, A.	134, 139, 153
Pehoiu, G.	143	Sedlacik, M.	289	Zaharim, A.	157, 162, 167
Petrescu, E.	225	Sedlarik, V.	294, 341	Zaharim, A.	171, 209
Pielmusi, M.	95	Severineanu, R.-C.	65	Zandi, Y.	242, 260, 265
Piyamanocha, P.	396	Sheikh Abdullah, S. R.	115	Zatloukal, M.	353
Podoleanu, A. G.	95, 225	Shen, H.	54	Zidek, J.	429
Ponizil, P.	312, 372, 378	Siirde, A.	71	Zimeras, S.	203
Ponweiser, K.	81	Silih, E. K.	275	Zobal, O.	433
Pop, I.	60	Simon, T.	60, 65		
Popescu, G.	456	Sinescu, C.	95, 225		