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ENVIRONMENTAL SCIENCE, ECOSYSTEMS & DEVELOPMENT

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Preface

The book you are currently holding contains the Proceedings of the 5th WSEAS Int. Conf. on ENVIRONMENT, ECOSYSTEMS and DEVELOPMENT (EED'07) which was held in Puerto De La Cruz, Tenerife, Canary Islands, Spain, December 14-16, 2007

Environmental Science and Engineering as well as Environmental Policy is now of fundamental importance to our civilization. Several problems have now become major political issues and the subject of international debate and regulation. It is for this reason that there is a need for conferences dedicated to energy and environment issues. Environment, Ecosystems and Development is an interdisciplinary conference aimed at natural scientists, technologists and the international social science and policy communities covering the direct and indirect environmental impacts of environment, ecology and ecosystems, sustainable development, cultural heritage, energy acquisition, transport, production and use, natural hazards, water resources management and so on.

The Plenary Speech of EED'07 was:

Natural Rain – Analysis, Modeling, Simulation

Professor Marius Oteteanu

Politehnica University of Timisoara, Romania

Dean of the Faculty of Electronics and Telecommunications

Abstract:

NATURAL RAIN. Sprinkle equipment is used to generate water drops for fire protection, for irrigation or for functional and reliability tests of different systems designed for outdoor use. Neither of this known equipment generates patterns of drops according to natural (real) rain.

But other applications need detailed tests in atmospheric conditions, with controlled parameters, among which natural rain is one of the most important.

For such applications, a rain simulator (generator) with natural parameters, in a controlled environment, has to be developed. To achieve such equipment, next steps must be fulfilled.

RAIN ANALYSIS. In order to classify different types of rain, rain parameters have to be understood, defined and measured. Meteorological definition, limited to rain intensity (water quantity / m² / time), is not enough to correctly classify rain types. Technical definition uses a set of measurable parameters (number of drops / m² / time, drops size, drops velocity, etc), which allows precise classification of rain types. The rain analysis is based on measuring methods and equipment. The paper presents rain classification criteria and, based on large amount of collected data, answers the questions:

- Is rain intensity uniformly distributed in space ? and time?
- Is the rain drops diameter constant for each type of rain ?
- What relationships are between rain intensity, drops diameter and drops velocity ?

RAIN MODELING. Several sets of parameter recording were used to select appropriate rain models. The model must match the natural rain behavior, so real rain parameters distribution were compared with computed values.

The paper presents additional requirements, imposed to a rain simulator (as desired velocity of the rain drops).

RAIN SIMULATION. Different devices (nozzles, sprinklers) were tested and selected, to simulate (generate) each type of natural rain, according to the real set of parameters.

Based on defined parameters for each type of rain and on selected rain generation devices, the design and development of a rain simulator can be started.

RAIN SIMULATOR. The paper compares different rain simulators, according to their target application and presents solutions for generating fog, drizzle, light rain, heavy rain, etc.

A complex system, based on mechanical, hydrodynamic and intelligent electronic blocks, controlled by software, is proposed to create a controlled rainy environment, able to simulate natural rain, with all its measurable parameters.

Brief Biography of the Presenter:

Prof. Marius Ottesteanu obtained the Diploma of engineer – with honors, in 1978, and the Ph.D., in 1983, both in electronics, at the Politehnica University in Timisoara, Romania. From 1978 to 1982 he was with AEM Timisoara company (Electronic Measuring Equipment) as R&D engineer. Starting with 1982 he is with Politehnica University in Timisoara.

Specialized at Texas Instruments in Freising, Germany (1993, 1994) as third party consultant in digital signal processors for T.I. Visiting professor at University of South-Carolina in Columbia, U,S,A (1995-1996), at University of Central Lancashire in Preston, England (1997), at Polytechnic Institute in Oulu, Finland (1998), at Institute of Technology in Nice, France (2001), at Technical University in Ostrava, Czech Republic (2007) and at Czech Technical University in Prague (2007). Invited professor at University of Technology in Bocholt, Germany (1999, 2000) and at University of Technology in Gelsenkirchen, Germany (2006).

His scientific interest is in real time systems and in image compression. He wrote 12 books, he published 73 articles, he has 9 patents and he was involved in 18 R&D contracts.

He was organizer and chairman of the Special Session Intelligent Systems and Adaptive Control, at the WSEAS International Conference on Dynamical Systems and Control (CONTROL '05), Venice, Italy, 2005. He was chairman of the 7th International Symposium on Electronics and Telecommunications (ETc'06), Timisoara, Romania, 2006, co-chair of the 2nd WSEAS International Conference on Dynamical Systems and Control (CONTROL '06), Bucharest, Romania, 2006, and co-chair of the 8th WSEAS International Conference on Mathematical Methods and Computational Techniques in Electrical Engineering (MMACTEE '06), Bucharest, Romania, 2006. He has co-editor of Proceedings of WSEAS International Conferences CONTROL '05, CONTROL '06, MMACTEE '06.

We would like to thank all members of the organizing laboratories for their contribution to the organization of the conference.

The contents of this Book are also published in the CD-ROM Proceedings of the Conference. Both will be sent to the WSEAS collaborating indices after the conference: www.worldses.org/indexes.

In addition, papers of this book are permanently available to all the scientific community via the WSEAS E-Library.

Expanded and enhanced versions of papers published in these conference proceedings are also going to be considered for possible publication in one of the WSEAS journals that participate in the major International Scientific Indices (Elsevier, Scopus, EI, Compendex, INSPEC, CSA see: www.worldses.org/indexes) these papers must be of high-quality (break-through work) and a new round of a very strict review will follow. (No additional fee will be required for the publication of the extended version in a journal).

We cordially thank all the people of WSEAS for their efforts to maintain the high scientific level of conferences, proceedings and journals.

The Editors

**Proceedings of the 5th WSEAS International Conference on
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TABLE OF CONTENTS**

Evaluation Method of Ecological Environment Vulnerability and its Application <i>Dongjie Guan, Baoshan Hu, Weijun Gao</i>	1
Mathematical Model for Diffusion- Sorption Processes in Layered Strata with Interlayers <i>Solvita Kostjukova, Andris Buikis</i>	7
Limit Analysis of Stability of Circular Foundation Pit <i>Cui Xinzhuang, Yao Zhanyong, Jin Qing, Wu Shimei</i>	13
Cross Section Strength Calculation of Partial Bonded Prestress Concrete Beam on Dynamic Loading <i>Fengze Hou, Yanzhao Li</i>	19
Direct Mesh Method of Sewer Networks Optimal Design Based on Topography-Geomorphic <i>Yu-Zhou Sima, Yuan-Ming Yang, Bing Zhao, Jian-Sheng Guo</i>	24
Formal Description and Modeling Topological Relations in 3D Based on Dimension-Extended and Euler-Poincare Characteristics <i>Nian Dong Deng, En Ke Hou, Zhi Hua Zhang, Jun Hua Guo</i>	29
Study on 3D Mine Tunnel Modeling <i>Zhi Hua Zhang, En Ke Hou, Nian Dong Deng, Jun Hua Guo</i>	34
Linear Instability of Wake-Shear Layers in Shallow Water <i>I. Volodko, V. Koliskina</i>	40
On Active Filtering of Harmonics Pollution -Theoretical Aspects <i>Vladimir Rasvan, Dan Popescu</i>	45
Structural Identifiability of some Biotechnological Systems <i>Dorin Sendrescu, Emil Petre, Eugen Bobasu</i>	49
Heat Transfer Enhancement in Swirl Annulus Flows <i>Ali M. Jawarneh</i>	55
Mathematical Modeling and Simulation of Automotive Internal Combustion Engine <i>I. H. Kazmi, Q. R Butt, S. I. A. Tirmizi, A. I. Bhatti</i>	61
Study on the Maximum Thickness of Superposition Throttle Slices of Shock Absorber <i>Changcheng Zhou, Zhiyun Zheng</i>	68
Experimental Research on Hysteretic Behavior of Top-Seat and Web Angles Connections <i>Xinwu Wang</i>	74
Experimental Research and Finite Element Analysis on Behavior of Steel Frame with Semi-Rigid Connections <i>Xinwu Wang</i>	79
Influence on the Dynamic Characteristic of Non-Bonded Prestressed Concrete Beam by Initial Effective Prestress <i>Fengze Hou, Yanzhao Li</i>	84
Diesel Engine Emission Improvements by the Use of EGM-DMC-Diesel Blends Fuel <i>Yanxia Wang, Yongqi Liu</i>	89

Methane Mitigation by Thermal Oxidation in a Reverse Flow Reactor <i>Ruixiang Liu, Yongqi Liu, Zhenqiang Gao</i>	94
Optimization of the Operating Parameters of a Reverse Flow Reactor for Methane Thermal Oxidation <i>Ruixiang Liu, Yongqi Liu, Zhenqiang Gao</i>	99
Modeling Study on a Forward Recursive Construction Approach of Dynamical Equations of Mechanism Systems with Flexible Articulated Joints <i>Yuan-Ming Yang, Bing Zhao, Jiansheng Guo, Chuan-Yao Chen, Tian-Xia Song</i>	103
Base Resistance of Individual Piles in Pile Group <i>Mohamed M. Shahin</i>	111
Design and Performance of a Multiple Compressor Solar Ice-maker <i>Petros Axaopoulos, Michael P. Theodoridis</i>	116
Lean Burn Engine Control for Fuel Economy and Exhaust Aftertreatment <i>Zhengmao Ye, Zhijun Li, Habib Mohamadian</i>	121
Considerations on Environmental Engineering Education for Sustainable Development in Oltenia Region <i>Adrian Rosca, Daniela Rosca</i>	127
Ant Colony System vs ArcGIS Network Analyst: The Case of Municipal Solid Waste Collection <i>Nikolaos V. Karadimas, Maria Kolokathi, Gerasimoula Defteraïou, Vassili Loumos</i>	133
The Evaluation of the Oxycombustion for Power Cycles <i>Gheorghe Dumitrascu</i>	140
The Study on the Water Budget of Hashtgerd Plain in North West of Tehran, Iran (Kordan Basin) <i>Homayoun Moghimi</i>	146
Comparison of Actuated and Fixed Traffic Signals in Controlling Air Pollution and Delay at Intersections <i>Mansour Hadji Hosseinlou, Somaye Sadat Azimi</i>	153
Predicting and Identifying Hot Spots by Applying Neuro- Fuzzy Systems <i>Mansour Hadji Hosseinlou, Mahdi Sohrabi Moshtaghin</i>	159
Biogeochemistry of Macrophytes in Reservoirs of St.-Petersburg <i>Margarita Ufimtseva, Natalia Terekhina</i>	165
Models and Indicators for Energy and CO₂ Emission Assessment of Electric Chillers and Direct-Fired Absorption Chillers <i>Gianfranco Chicco, Pierluigi Mancarella</i>	168
Application of Modern Electrochemical Techniques and Electrode Materials in Determination of Trace Elements in Environment <i>Tomas Navratil, Ivana Sestakova</i>	174
Measuring the Sustainability of Biomass Resources – The Sustainable Biomass Index SBI <i>Stefan König, Juergen Sachau</i>	180
Non-Traditional Metal Electrode Materials in Electrochemical Environmental Analysis of Biologically Active Compounds <i>Bogdan Yosypchuk, Ivana Sestakova</i>	186
Portugal Wind Energy Situation <i>F. A. Barata, J. C. Quadrado</i>	191

Energy Saving in a High Insulated House in Iran <i>Reza Srkan Dizaji, Ahadollah A'Zami, Mohammad Hariri</i>	196
Sustainable Development and Processes Innovation <i>Davorin Kralj, Mirko Markic</i>	200
Product Responsibility as a Part of Sustainable Development Strategy <i>Davorin Kralj, Maja Skafar, Mirko Markic</i>	206
Desertification in Crete and the Effect of Global Warming <i>Maria Tsakona, Vassilis Gekas</i>	211
Design of a New Micro Direct Methanol Fuel Cell Using MEMS Technology <i>Xiuling Ji, Wenzhong Lou</i>	217
Air Quality Modelling by Kohonen's Neural Networks <i>Vladimir Olej, Petr Hajek, Jiri Krupka, Ilona Obrsalova</i>	221
Multi Temporal Disaggregation of MODIS Images Using Non-Linear Analysis <i>Hasan Roosta, Rahmatolah Farhoudi, Majid Roosta</i>	227
A Simple Approach to Estimate the Steady-State Performance of Self-Excited Induction Generator <i>K. S. Sandhu, Dheeraj Joshi</i>	233
Evaluation of Ecological Preservative Management Using Multi-Stage Decision and FAHP Process in a Mountainous Maoli site, Taiwan <i>Kuei-Yang Wu, Wann-Ming Wey, Wen-Zer Lin</i>	238
A Framework on Urban Design Strategies for Sustainability of Cultural and Historical Heritage in Urban Landscape <i>Selma Celikyay, Sirin Donmez, Emine Ikiz, Pinar Aydin, Sevgi Gormus Cetinkale, Nurhan Kocan</i>	245
Major Components of Environmental Protection Process <i>Selma Celikyay, Nazmiye Uzun</i>	250
Preliminary Thermal and Mineral Water Survey of Nisyros Volcano, Aegean Sea: A Study Targeted Towards Sustainable Development <i>Dimitrios Zouzias, Karen St. Seymour, George Papaioannou</i>	256
Influence of Atmospheric Pollution on Materials of Culture Heritage. A Physicochemical Study <i>I. Bassiotis, T. Agelakopoulou, S. Margariti, V. Siokos, E. Metaxa, Ch. Karagianni, F. Roubani-Kalantzopoulou</i>	262
Aerosol Hygroscopic Models Based on in Situ Measurements and Lidar Retrievals <i>Daniela Viviana Vladutescu, Yonghua Wu, Barry Gross, Leona Charles, Fred Moshary, Samir Ahmed</i>	268
A Study of Forest Structure, Diversity Index and Above-ground Biomass at Tok Bali Mangrove Forest, Kelantan, Malaysia <i>I. Kasawani, J. Kamaruzaman, M. I. Nurun-Nadhirah</i>	274
The Efficiency of Water Reservoirs at the Region of the Former Lake Karla in Thessaly to Meet Irrigation Requirements <i>P. Lokkas, S. Kotsopoulos, J. Alexiou, G. Gravanis, V. Vassiloglou, S. Magalios, V. Kassos</i>	282
Methodological Approach for Ground Contamination Assessment and Remediation of Brownfields <i>M. G. Brito, C. N. Costa, D. Vendas</i>	288
Economic and Environmental Advantages of Using Fly Ash as a Soil Amendment in Agronomy <i>Isa Yunusa, V. Manoharan, Derek Eamus, Greg Skilbeck</i>	294

Distribution Pattern of Rare Tree Species in Two Virgin Jungle Reserves in Pahang and Johor, Malaysia <i>I. Faridah-Hanum, J. Kamaruzaman, A. Hikmat, A. Latiff</i>	303
M5 Model Tree for Regional Mean Annual Flood Estimation <i>K. K. Singh</i>	311
Removal of Ni(II) from Aqueous Solution by Biosorption using two Green Algal Species <i>Oscillatoria</i> sp. & <i>Spirogyra</i> sp. <i>Diwan Singh</i>	315
Reducing Risks of Power Plants Development <i>Anna Lampridou, Konstantinos Kirytopoulos</i>	320
Some Problems in Water Vapor Tomography <i>Peep Miidla, Kalev Rannat, Peep Uba</i>	326
A Hydrologic-Hydraulic Method to Define of Ecological Flows Downstream Dams Located in South European Semi-Arid Regions <i>Maria Manuela Portela</i>	334
Variation in Air Pollution Tolerance Index of Plants near a Steel Factory: Implications for Landscape-Plant Species Selection for Industrial Areas <i>Yanju Liu, Hui Ding</i>	340
Telerobotics – Control over the Internet <i>Ionut Resceanu, Marius Niculescu</i>	346
Multivariate Statistical Interpretation of Physical, Chemical and Microbiological Data of Potable Water in the Context of Public Health <i>A. Papaioannou, K. Kakavas, P. Plageras, A. Minas, Z. Roupa, A. G. Paliatsos, P. T. Nastos, A. Minas</i>	352
Zinc Removal From Aqueous Solutions By Turkish Clinoptilolite <i>H. Inan, E. Yazici, Z. Yigit</i>	358
Risk Assessment for Redevelopment of Contaminated Land at an Old Industrial Site <i>D. F. Vendas, C. N. Costa, M. G. Brito</i>	363
Evaluation of Daylighting in Office Buildings <i>L. Doulos, A. Tsangrassoulis, F. V. Topalis</i>	368
Introduction of Wind Power into a Weak Power System Considering System Fluctuation and Limitation <i>Jeff Huang, Zulati Litifu, Ken Nagasaka</i>	377
EUCLIMA: The Personal Micro-Clima Concept, as Environmental Policy Redefinition for Modern Cities: Sensor Interfacing, Anti-Pollution Technology and Economic Development Aspects <i>George Topalidis, Emmanouil Katsanos, Pocha Zoi, Margarita Ganatsios, Dimitrios Zissopoulos</i>	386
Propulsion and Trigeneration by Fuel Cell: an Eco-friendly Camper Van <i>L. Fabiano, G. Florio, P. Fragiacom</i>	394
Adaptation of Socio-Ecological Systems in sub-Saharan Africa to Global Environmental Change: ICSU ROA's Strategy <i>Achuo Enow, Sospeter Muhongo</i>	400
Dense Ocean Floor Network for Mega Thrust Earthquakes and Tsunamis around the Nankai Trough in Southwestern Japan <i>Yoshiyuki Kaneda, Katsuyoshi Kawaguchi, Eiichiro Araki, Hiroyuki Matsumoto, Takeshi Nakamura, Keisuke Ariyoshi, Hinichiro Kamiya, Takane Hori, Toshitaka Baba</i>	406

Conservation of a Wetland Near a City: A Case Study	410
<i>Maisarah Ali, Amnah Shurfa Binti Mohammed Shukry, Noor Shakilah Bt Mohd Radzi, Kamaruzaman Jusoff</i>	
Fibre Shedding from Cotton Spun Yarn -A Serious Indoor Air Pollution in Knitting Industry	419
<i>N. Bhowmick, S. Ghosh</i>	
Steady State Modeling of Isolated Induction Generators	425
<i>K. S. Sandhu</i>	
Geographical Relations Dynamics (3) - on a Material Basis Vs. on a Monetary Basis -	432
<i>Minoru Ueda</i>	
Mangrove Conservation through Community Participation in Pakistan: The Case of Sonmiani Bay	438
<i>Amjad A. Shah, Kamaruzaman Jusoff</i>	
Spectral Signatures of Some Mangrove Species in Malaysia	445
<i>J. Kamaruzaman, I. Kasawani</i>	
Water as a Design Material in Nine Plans of Le Notre; A Topological Study of Relations Between Ensemble, River and Settlement	455
<i>Martin van den Toorn</i>	
Environmental Education and Design; The Role of Landscape Architecture	465
<i>Martin van den Toorn</i>	
Air Pollution and Urban Form: Evidence from Satellite Data	477
<i>Julian D. Marshall, Heather Sander, Steven M. Manson</i>	

Authors Index

Agelakopoulou, T.	262		Huang, J.	377		Muhongo, S.	400
Ahmed, S.	268		Ikiz, E.	245		Nagasaka, K.	377
Alexiou, J.	282		Inan, H.	358		Nakamura, T.	406
Ali, M.	410		Jawarneh, A. M.	55		Nastos, P. T.	352
Araki, E.	406		Ji, X.	217		Navratil, T.	174
Ariyoshi, K.	406		Joshi, D.	233		Niculescu, M.	346
Axaopoulos, P.	116		Jusoff, K.	410	438	Nurun-Nadhirah, M. I.	274
Aydin, P.	245		Kakavas, K.	352		Obrsalova, I.	221
A'Zami, A.	196		Kamaruzaman, J.	274	303 445	Olej, V.	221
Azimi, S. S.	153		Kamiya, H.	406		Paliatsos, A. G.	352
Baba, T.	406		Kaneda, Y.	406		Papaioannou, A.	352
Barata, F. A.	191		Karadimas, N. V.	133		Papaioannou, G.	256
Bassiotis, I.	262		Karagianni, Ch.	262		Petre, E.	49
Bhatti, A. I.	61		Kasawani, I.	274	445	Plageras, P.	352
Bhowmick, N.	419		Kassos, V.	282		Popescu, D.	45
Bobasu, E.	49		Katsanos, E.	386		Portela, M. M.	334
Brito, M. G.	288	363	Kawaguchi, K.	406		Qing, J.	13
Buikis, A.	7		Kazmi, I. H.	61		Quadrado, J. C.	191
Butt, Q. R.	61		Kirytopoulos, K.	320		Radzi, N. S. B. M.	410
Celikyay, S.	245	250	Kocan, N.	245		Rannat, K.	326
Cetinkale, S. G.	245		Koliskina, V.	40		Rasvan, V.	45
Charles, L.	268		Kolokathi, M.	133		Resceanu, I.	346
Chen, C. Y.	103		Konig, S.	180		Roosta, H.	227
Chicco, G.	168		Kostjukova, S.	7		Roosta, M.	227
Costa, C. N.	288	363	Kotsopoulos, S.	282		Rosca, A.	127
Defteraiou, G.	133		Kralj, D.	200	206	Rosca, D.	127
Deng, N. D.	29	34	Krupka, J.	221		Roubani-Kalantzopoulou, F.	262
Ding, H.	340		Lampridou, A.	320		Roupa, Z.	352
Dizaji, R. S.	196		Latiff, A.	303		Sachau, J.	180
Donmez, S.	245		Li, Y.	19	84	Sander, H.	477
Doulos, L.	368		Li, Z.	121		Sandhu, K. S.	233 425
Dumitrascu, G.	140		Lin, W. Z.	238		Sendrescu, D.	49
Eamus, D.	294		Litifu, Z.	377		Sestakova, I.	174 186
Enow, A.	400		Liu, R.	94	99	Shah, A. A.	438
Farhoudi, R.	227		Liu, Y.	340		Shahin, M. M.	111
Faridah-Hanum, I.	303		Liu, Y.	89	94 99	Shimei, W.	13
Ganatsios, M.	386		Lokkas, P.	282		Shukry, A. S. B. M.	410
Gao, W.	1		Lou, W.	217		Sima, Y. Z.	24
Gao, Z.	94	99	Loumos, V.	133		Singh, D.	315
Gekas, V.	211		Magalios, S.	282		Singh, J. H.	311
Ghosh, R.	419		Mancarella, P.	168		Siokos, V.	262
Gravanis, G.	282		Manoharan, V.	294		Skafar, M.	206
Gross, B.	268		Manson, S. M.	477		Skilbeck, G.	294
Guan, D.	1		Margariti, S.	262		Song, T. X.	103
Guo, J. H.	29	34	Markic, M.	200	206	St. Seymour, K.	256
Guo, J. S.	24	103	Marshall, J. D.	477		Terekhina, N.	165
Hajek, P.	221		Matsumoto, H.	406		Theodoridis, M. P.	116
Hariri, M.	196		Metaxa, E.	262		Tirmizi, S. I. A.	61
Hikmat, A.	303		Miidla, P.	326		Toorn, M. v. d.	465
Hori, T.	406		Minas, A.	352		Topalidis, G.	386
Hosseiniou, M. H.	153	159	Moghimi, H.	146		Topalis, F. V.	368
Hou, E. K.	29	34	Mohamadian, H.	121		Tsakona, M.	211
Hou, F.	19	84	Moshary, F.	268		Tsangrassoulis, A.	368
Hu, B.	1		Moshtaghin, M. S.	159		Uba, P.	326

Authors Index

Ufimtseva, M.	165	Wu, K. Y.	238	Zhang, Z. H.	29	34
Uzun, N.	250	Wu, Y.	268	Zhanyong, Y.	13	
Vassiloglou, V.	282	Xinzhuang, C.	13	Zhao, B.	24	103
Vendas, D. F.	363	Yang, Y. M.	24	Zheng, Z.	68	
Vladutescu, D. V.	268	Yazici, E.	358	Zhou, C.	68	
Volodko, I.	40	Ye, Z.	121	Zissopoulos, D.	386	
Wang, X.	74	Yigit, Z.	358	Zoi, P.	386	
Wang, Y.	89	Yosypchuk, B.	186	Zouzias, D.	256	
Wey, W. M.	238	Yunusa, I.	294			