

Editors: Cornel Panait, Eugen Barsan, Aida Bulucea, Nikos Mastorakis, Charles Long
Associate Editors: Marius Mosoarca, Ancuta Rotaru

ADVANCES in ENVIRONMENTAL and GEOLOGICAL SCIENCE and ENGINEERING



**3rd International Conference on ENVIRONMENTAL
and GEOLOGICAL SCIENCE and ENGINEERING (EG '10)**

Constantza Maritime University, Constantza, Romania, September 3-5, 2010

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Preface

This year the 3rd International Conference on ENVIRONMENTAL and GEOLOGICAL SCIENCE and ENGINEERING (EG '10) was held at the Constantza Maritime University, Constantza, Romania, September 3-5, 2010. The conference remains faithful to its original idea of providing a platform to discuss geosciences and earth engineering, management and technology of energy systems, geology and environmental systems, environmental dynamics, meteorology, hydrology, geophysics, atmospheric physics, physical oceanography, global environmental change and ecosystems management, integrated ecosystems management, satellite applications in the environment, environmental restoration and ecological engineering, biodiversity conservation, pollution and monitoring, water supply and wastewater treatment, air pollution, solid waste management, modeling, simulation and optimization, impact, risk and life cycle assessment, environmental integrated management and policy making, advances in energy systems and sustainability, management and technology of energy systems etc. with participants from all over the world, both from academia and from industry.

Its 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 this conference 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.

A Conference such as this 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

Plenary Lecture 1: Turbidity Determination using Solar Broadband Models <i>Eftimie Elena</i>	12
Plenary Lecture 2: Impact of Wastewater Slops in Mangalia Harbour Area <i>Mariana Panaitescu</i>	13
Plenary Lecture 3: Oil Spill Simulation from an Oilpetroleum Off-Shore Platform in the Black Sea <i>Fanel-Viorel Panaitescu</i>	14
Plenary Lecture 4: Environmental Impact Assessment of Hazardous Industries and Application of Cleaner and Greener Technology <i>Vijayan Gurumurthy Iyer</i>	15
A New Revolution in Energy Saving <i>Ehsan Firouzfard, Mohammad Amin Hosseini Rivandi</i>	17
Heavy Metals Pollution of Vegetation from the Industrial Area of Targoviste City <i>Carmen Cristina Elekes, Nicolae Petrescu, Sorin Constantin Ciulei</i>	22
Estimating Solar Radiation for IRAN by using an Optimum Model <i>Shahram Javadi, Sam Moini, Mohsen Kokabi</i>	27
The Influence of Land Management on Soil Erosion from Buzau Hillock Area <i>Claudia Clara Stirbu, Stefania Iordache, Cezarina Necula, Alexandra Teodora Radu</i>	32
Studies on Heavy Metal Pollution in Dambovita County during the Years 2000 – 2008 <i>Gheorghe Ionita, Loredana Beatrice Neagu Frasin, Aurelia Corina Cosac, Sofia Teodorescu</i>	36
Using Ecological Solutions for Slopes Stability at Cojocna Salty <i>Nicolae Chira, Vasile S. Farcas, Cosmin G. Chiorean</i>	39
Oil Refineries Emissions: A Study using AERMOD <i>S. S. Saqer, A. A. Al-Haddad</i>	45
Environment and its Protection by Legal Means <i>Constantin Anechitoae, Ileana-Irina Albu Panaitescu, Vlad-Adrian Panaitescu</i>	53
Model Simulation of High Power Diesel Engine Exhaust Gas Pollutants <i>Nicolae Buzbuchi, Liviu Constantin Stan</i>	59
Diffusion - driven Instability in Activator - Inhibitor Model - A Mathematical Approach to Biology - <i>Eliodor Constantinescu, Dumitru Deleanu</i>	65
Aspects for Air Pollution in the Area of Danube Delta Reservatoion Caused by Engines for Ship Propulsion <i>Darie Tudor, Feiza Memet, Adrian Sabau</i>	69

The Eutrophication Model and its Application to Rosu Lake – Romania	73
<i>Gabriela Elena Dumitran, Liana Ioana Vuta, Vlad Adrian Panaitescu</i>	
Treatment of Cr(VI) Polluted Wastewater with Scrap Iron. Part 1: Cr(VI) Reduction	81
<i>Marius Gheju, Ionel Balcu</i>	
Treatment of Cr(VI) Polluted Wastewater with Scrap Iron. Part 2: Removal of Species Resulted from Cr(VI) Reduction	87
<i>Marius Gheju, Ionel Balcu</i>	
Dynamics of Marine Bacterioplankton Density in Filtered (0.45 µm) Microcosms Supplemented with Gasoline	93
<i>Simona Ghita, Ioan Ardelean</i>	
Evolution of Greenhouse Gas Emissions in Cluj County Versus County in Constanta	99
<i>Dana Florina Muntean, Mariana Panaitescu, Dumitru Ristoiu</i>	
Cd and Ni in Respirable Dust from Cluj and Constanta	105
<i>Dana Florina Muntean, Viorel Panaitescu, Dumitru Ristoiu</i>	
Experimental Study and Statistical Calculus of Efficiency Techirghiol Lake Mud	110
<i>Mariana Panaitescu, Olga Surdu, Ionica Oncioiu</i>	
Developing of a Database with Representations of Unfolded Surfaces using the Engineering Graphics	116
<i>Carmen Popa, Ivona Petre</i>	
Sound Parameters Identification for the Bottlenose Dolphins from N-W Black Sea, Using Time – Frequency Analysis	120
<i>Chitac Vergil, Pricop Mihail, Atodiresei Dinu, Gheorghe Florin, Ristea Marian, Bautu Andrei, Pricop Codruta</i>	
Soot Modeling in Diesel Engine	126
<i>Adrian Sabau, Oanta Emil</i>	
Pollution Degree of Tabacarie Lake in 2009	132
<i>Sabina Zagan, Irina Enache</i>	
Green House - A Concept Less Known Integrated Design Method	137
<i>Gabriela Draghici, Dan Cotes, Ioan – Mircea Popovici, Mihaela Dragoi</i>	
The Study of Lead and Zinc Concentration and their Changes in Surface Sediments of Zayanderood River	143
<i>Javad Tabatabaei</i>	
Trace-Element Geochemistry of Coal and Suspended Particulate Matter at El Maghara Mine	150
<i>A. A. Melegy, M. M. El-Rahmaney, S. A. Salman</i>	
Lead Ion Adsorption from Wastewater by Recycle Paper Processing Waste Sludge	156
<i>Panida Sampranpi boon, Satapaul Kamhom, Pisit Charnkeitkong</i>	
Materials for Filtering of Electromagnetic Waves	163
<i>Elena Valentina Stoian, Cristiana Zizi Rizescu, Pinteana Jana, Zorica Bacinschi, Cristiana Maria Enescu</i>	

Some Geo-Aspects of the Black Sea Basin	169
<i>Ancuta Rotaru</i>	
Relative Humidity Monitoring	175
<i>Carmen-Otilia Rusanescu, Ileana Nicoleta Popescu, David Ladislau</i>	
Application of Wastewater Treatment from Preserved Egg Production	181
<i>Panida Sampranpiboon, Satapaul Kamhom, Pisit Charnkeitkong</i>	
Seismic Environments and Earthquake Engineering	186
<i>Marius Mosoarca, Victor Gioncu</i>	
Energy Consumption and Indoor Climate Analysis of Office Buildings	192
<i>Martin Thalfeldt</i>	
Hydrogen Risk Analyze in a Cryogenically Distillation Plant	197
<i>Gheorghe Popescu</i>	
Exergoeconomic Analysis to Study Cryogenic Distillation of Hydrogen Isotopes	202
<i>Sorin Gherghinescu</i>	
Modeling of Thermodynamics Properties for Cryogenic Fluids	206
<i>Sorin Gherghinescu</i>	
Efficiency of Multilayer Insulations in Cryogenic Applications	210
<i>Sorin Gherghinescu</i>	
The Investigation of Wind Effects on Porous and Weak Rocks with Using Air Tunnel	214
<i>Adil Binal</i>	
Environmental Impact Assessment of Hazardous Industries and Application of Cleaner and Greener Technology	218
<i>Vijayan Gurumurthy Iyer, Nikos E. Mastorakis</i>	
Modeling of Hysteretic Damper in Three-Story Steel Frame Subjected to Earthquake Load	235
<i>Mohammad Saeed Masoomi, Siti Aminah Osman, Shahed Shojaeipour</i>	
Authors Index	240

Plenary Lecture 1

Turbidity Determination using Solar Broadband Models



Professor Elena Eftimie

Department of Product Design and Robotics
Transilvania University of Brasov
B-dul Eroilor, 29, 500036 Brasov
ROMANIA
E-mail: eftimie@unitbv.ro

Abstract: Attenuation of solar irradiance is strongly dependent on conditions of the sky, cleanliness of the atmosphere, and composition of gaseous constituents. In a clean and dry atmospheric condition, solar irradiance is attenuated by permanent atmospheric constituents of air molecules, gases and ozone, whose contents are nearly invariable. Two additional attenuation processes, which are the absorption by water vapour and scattering by aerosol particles, take place in a real atmosphere. The additional attenuation caused by these two processes is known as being due to the turbidity of the atmosphere.

The complexity of phenomena involved in the attenuation processes causes difficulty in computation of solar irradiance reaching the earth's surface, especially in certain climatic conditions.

The study of atmospheric turbidity is important in meteorology, climatology and for atmospheric pollution monitoring. Information on solar irradiance on the earth's surface is necessary for application of solar energy, for the determination of the amount of spectral global irradiance for the photovoltaic cells designing and for the selective absorbers for spectral thermal collectors.

The proposed study of the turbidity factor is carried out in order to develop a possible method for estimating solar radiation. In this paper, the turbidity factor is calculated for solar radiation data from Brasov with the intention of finding a variation model of this; all the conclusions are very useful in the development of a mathematical model of the solar radiation for the urban area of Brasov.

Atmospheric turbidity is an important parameter for assessing the air pollution in local areas, as well as being the main parameter controlling the attenuation of solar radiation reaching the Earth's surface under cloudless sky conditions. The paper proposes a study of the Linke's and Angstrom turbidity factors, calculated on the basis of the meteorological data recorded during three years, in Brasov urban area. The obtained results will be presented as comparative diagrams (variation of the monthly mean values depending on time).

The turbidity determination will be made using a few broadband models and the present study will present for every model proposed the necessary stages.

It must be mentioned that the technical literature does not offer very accurate values of the turbidity factors; besides, it does not take into consideration the geographical, climatic and urban conditions specific to Brasov area (for instance, according to specialised literature, the monthly mean values of the turbidity factor varies between 1.9 and 3.5).

Brief Biography of the Speaker:

Elena EFTIMIE is professor at the Department of Product Design and Robotics, from Transilvania University of Brasov (Romania). From November 2000 she is Doctor Engineer (MAGNA CUM LAUDE) in the field of Mechanical Engineering; the title of the Ph.D. thesis: Researches concerning the functional performances of the safety intermittent automatic clutches. As academic positions, from October 2006 – present, she is Professor at "Transilvania" University of Brasov, Department of Product Design and Robotics; from October 2003 – September 2006: Senior Lecturer; from February 1999 – September 2003: Lecturer; from September 1995 – February 1999: Professor assistant; September 1992 - September 1995: Laboratory Instructor. Regarding her scientific activities, she authored or co-authored 107 scientific papers published in reviewed journals or presented at international conferences (58 scientific papers as first and single author, 41 scientific papers at international conferences, 31 scientific papers published abroad, 12 monographs, 5 as single author and 1 as first author, 25 research projects of which 2 as project manager). Concerning other activities there are mentioned: she was Teaching Professor, 6-17 July, at RESchool 2009, Technological Educational Institute of Crete, Chania, Greece and she is Vice-President of Brasov subsidiary: Romanian Association of Mechanical Transmission.

Plenary Lecture 2

Impact of Wastewater Slops in Mangalia Harbour Area



Professor Mariana Panaitescu
Constanta Maritime University
Environmental Department
ROMANIA
E-mail: marianapan@yahoo.com

Abstract: The human economical activities which are developed inside outside of Mangalia harbor areas affect physical and biological environmental parameters. There were monitoring small and big impure sources which are present in area Mangalia. The evaluation and establishment of maritime environmental pollution level and the negative impacts of Mangalia economical port activities were accomplished by monitoring systems. The point of monitoring was delimited from 28,560 E to 28,640 E latitude and 43,780 N to 43,840 N longitude.

In this paper we present the evolutions of general indicators, like: the evolution of marine water transparency, the temperature of marine water, salinity, dissolved oxygen, and the evolutions of eutrofization indicators, like: total anorganic nitrogen, silicats, biochemical parameters, heavy metals, total hydrocarbons in period 2003-2008.

In the final paper we present the national measurements which must be applied to reduce the pollution in this harbor Mangalia areas and to resolve the critical problems for to harmonise sustainable strategies.

Brief Biography of the Speaker:

Panaitescu Mariana was born in Romania, Constanta, B.Sc. in Mechanical Engineering, specialization Hydraulic Machines, Bucharest Politehnica University, 1984.

PHD. Eng. In Hydraulics and Fluid Mechanics, Bucharest Politehnica University, 1997

Master Science in Environmental Economy and Management, Ecological University Bucharest, 2007

B.Sc. in Medicine, specialization Balneal Physiotherapy and Medical recover, Constanta Ovidius University, 2009

He is Full Professor at Department of Environmental Sciences, Electromechanical Faculty, Constanta Maritime University.

She graduated different environmental courses: The principles of management, Control and quality management, human resources management, Harbour services management, Environmental port management, Training instructor, Building administrator, Naturist medicine.

She is certified TUV SUD GERMANY Environmental Internal Auditor ISO 14001 and

TUV SUD GERMANY Quality Internal Auditor ISO 9001.

Occupational skills covered: Hydraulic and Hydraulic Machines engineer, Environmental and economical manager, VET Instructor for Emergency management, VET Instructor for Environmental management systems, Maritime Prevention Pollution Instructor course Mo6, Environmental management manager, physiotherapeut.

Research interests include Fluid mechanics, Computational Fluids flows, Waterwaste Treatment, Prevention soils pollution, Prevention Marine environmental pollution, Ecological Engineering, Health and Environmental.

She is Manager of Constanta Maritime University Environmental Integrated Management

She is Editor-in-Chief of the ECOZOOM, environmental Magazine of Constanta Maritime University

She was Reviewer for the 4th International Conference Maritime Transport 2009, Barcelona

She was Chairman of 13th Congress of International Maritime Association of the Mediterranean, 2009 Istanbul, Turkey

Dr. Panaitescu Mariana is member of Romanian Tensometry Association from 1997, member of SPERIN (Society for promotion of renewable, inexhaustible and new energies), from 1999, member IMAM, 2000, member of Scientific European Foundation, 2004, member of Romanian Society for Biochemistry and Molecular Biology, 2006, member of Romanian Environmental Association, 2009.

Plenary Lecture 3

Oil Spill Simulation from an Oilpetroleum Off-Shore Platform in the Black Sea



Assistant Professor Fanel-Viorel Panaitescu

Constanta Maritime University
Environmental Department
ROMANIA

E-mail: viopanaitescu@netscape.net

Abstract: The paper show the experimental data obtained by the Constanta Maritime University during 2 years in the field of sea waves and stream monitoring. The monitoring system was mounted at a sea petroleum platform. Valuable data for surface stream are obtained. In certain period, we find a interesting change of stream direction, with 180 degrees in a 10 hours time period. The real values obtained for stream direction, water temperature and sea waves amplitude and direction, was then imported as input data for a Personal Incident Simulator Control and Evaluation Sistem, for Oil Spill on Sea.

We consider a possible leakage from the submarine pipelines destruction by a tug anchor in maneuver. Then we start the simulation with these real values for the characteristics of the crude oil extracted. Multiple possible scenarios for the spill are presented, including authority responses using sea tugs equipped with booms and skimmers.

Brief Biography of the Speaker:

Panaitescu Fanel Viorel was born in Romania, Babadag, Tulcea, B.Sc. in Mechanical Engineering, specialization Hydraulic Machines, Bucharest Politehnica University, 1984.

PHD. Eng. In Mechanics Engineering, Brasov Transilvania University, Renewable Energies-waves, 2000

Master Science in Environmental Economy and Management, Ecological University Bucharest, 2007

He is Assoc. Professor at Department of Environmental Scieces, Electromechanical Faculty, Constanta MaritimeUniversity.

He is certified TUV SUD GERMANY Environmental Internal Auditor ISO 14001and

TUV SUD GERMANY Quality Internal Auditor ISO 9001

He is Technical and maritime juridical expert, construction and maintenance of ships.

He is certified by Emergency situations simulator instructor TRANSAS, PISCES II and Naval mechanical instructor simulator KONSBERG, NORCONTROL

He is Environmental management instructor and IMO course MO6 Instructor for Prevention maritime pollution

He is Director of Environmental department of Electromechanical Faculty, Constanta Maritime University.

Research interests include Fluid mechanics, Renewable energies, Wastes management, Prevention Marine environmental pollution, Ecological Engineering.

Dr. Assoc. PHD.Eng. Panaitescu Fanel Viorel is member of Romanian Tensometry Association from 1997, member of SPERIN(Society for promotion of renewable, inexhaustible and new energies), from 1999, member IMAM, 2000,member of Scientifical European Foundation,2004, member of Romanian Society for Biochiemy and Molecular Biology, 2006, member of Romanian Environmental Association, 2009.

He is Executive directort of Foundation Ave Maria-NGO, from 1999

He is Executive Director of Ecozoom magazine of Maritime University Constanta in colaboration with Ave Maria Foundation.

Plenary Lecture 4

Environmental Impact Assessment of Hazardous Industries and Application of Cleaner and Greener Technology



Dr. Vijayan Gurumurthy Iyer

Consultant, G.V.I. Technical Inspection Services

13/14 A, Tharachand Nagar Second Street

Virugambakkam, Chennai-600 092

INDIA

E-mail: vijayaniyergurumurthy@hotmail.com

Abstract: Environmental impact assessment (EIA) is a systematic study for identification and evaluation of potential impacts or effects of the proposed projects, programs, processes, plans, legislative actions relative to physical, chemical, biological, radio-active and socio-economic environment with respect to total environment. EIA Studies have been carried out in some hazardous industries and cleaner and greener production have been recommended. Cleaner technologies can be defined as technologies that can produce the same output of unclean technologies by causing less damage to the environment. Cleaner technologies as those that are less polluting, use resources in a sustainable manner, recycle more of their wastes and products and handle all residues in a more environmental acceptable way than the technologies for which they are substitutes. Greener technologies can be defined as technologies that can produce less output of unclean technologies by causing no damage to the environment. The need is to conserve the living planet with any rational approach. It is urgently required to deal with the issues that are closely related to our surroundings, and suggested techniques preferably with local resources and know-how, to make that more sensibly habitable. This article realizes the environmental impact assessment of some hazardous industries and emphasizes the need of cleaner and greener technology applications in order to reduce green house emissions.

Brief Biography of the Speaker:

Dr. Vijayan Gurumurthy Iyer has obtained his Master's and Ph.D. degrees in Environmental Science and Engineering from Indian School of Mines, Dhanbad in the year 1997 and 2003 respectively. He was also a Post-Doctoral Fellow (2006) (2010) in World Scientific and Engineering Academy and Society (WSEAS), Athens, Greece and was honored during 17th July 2006, 30, June, 2010. The Yorker International University, Italy has awarded him with the honorary doctorate in Engineering on June 21 st 2009 and 29 th June, 2008 in two specific areas Eco-Systems and Ecology, Environmental Science and Mechanical Engineering respectively. He has submitted a draft copy of his proposed D.Sc. (Research) thesis to Jadavpur University, Kolkata, India on 09.12.2009. He has got about 26 years organizational experience in research, teaching, extension and industry out of which ten years at the level of Professor. He has demonstrated good academic excellence by way of contributing research articles published in refereed journals, books and proceedings, citation indexes, fellowships and memberships of professional bodies, biographies listed in international biographical references, reviewer journals, books proceedings. He has published more than 123 research publications of high quality. Out of which 42 publications in national and 80 publications in International level (29 papers in journals, 57 papers in the book chapters and 34 papers in the Conference Proceedings, one popular article in national daily, nine biographical inclusions and one patent. This including forty nine book chapters in a series of Reference Books and Textbooks were been published by WSEAS press. His research activities, publications and scholarly works of high standard have evidenced by inclusion in internationally recognized database. His one hundred fifty (150 numbers) documents have been documented in citation databases of peer-reviewed literatures namely MEDLINE, SCOPUS, ISI/SCI Web of Science etc. Out of 150 documents, there are thirty eight documents in national citation database and one hundred twelve documents are available in international citation database. He has more than thirty five awards / recognitions/certificates of appreciation to his credit.

Authors Index

Al-Haddad, A. A.	45	Gheju, M.	81, 87	Panaitescu, V. A.	73, 53
Andrei, B.	120	Gherghinescu, S.	202, 206, 210	Petre, I.	116
Anechitoae, C.	53	Ghita, S.	93	Petrescu, N.	22
Ardelean, I.	93	Gioncu, V.	186	Popa, C.	116
Bacinschi, Z.	163	Hosseini Rivandi, M. A.	17	Popescu, G.	197
Balcu, I.	81, 87	Ionita, G.	36	Popescu, I. N.	175
Binal, A.	214	Iordache, S.	32	Popovici, I.-M.	137
Buzbuchi, N.	59	Iyer, V. G.	218	Radu, A. T.	32
Charnkeitkong, P.	156, 181	Jana, P.	163	Ristoiu, D.	99, 105
Chiorean, C. G.	39	Javadi, S.	27	Rizescu, C. Z.	163
Chira, N.	39	Kamhom, S.	156, 181	Rotaru, A.	169
Ciulei, S. C.	22	Kokabi, M.	27	Rusanescu, C.-O.	175
Codruta, P.	120	Ladislau, D.	175	Sabau, A.	69, 126
Constantinescu, E.	65	Marian, R.	120	Salman, S. A.	150
Cosac, A. C.	36	Masoomi, M. S.	235	Sampranpiboon, P.	156, 181
Cotes, D.	137	Mastorakis, N. E.	218	Saqer, S. S.	45
Deleanu, D.	65	Melegy, A. A.	150	Shojaeipour, S.	235
Dinu, A.	120	Memet, F.	69	Stan, L. C.	59
Draghici, G.	137	Mihail, P.	120	Stirbu, C. C.	32
Dragoi, M.	137	Moini, S.	27	Stoian, E. V.	163
Dumitran, G. E.	73	Mosoarca, M.	186	Surdu, O.	110
Elekes, C. C.	22	Muntean, D. F.	99, 105	Tabatabaei, J.	143
El-Rahmaney, M. M.	150	Neagu Frasin, L. B.	36	Teodorescu, S.	36
Emil, O.	126	Necula, C.	32	Thalfeldt, M.	192
Enache, I.	132	Oncioiu, I.	110	Tudor, D.	69
Enescu, C. M.	163	Osman, S. A.	235	Vergil, C.	120
Farcas, V. S.	39	Panaitescu, I.-I. A.	53	Vuta, L. I.	73
Firouzfard, E.	17	Panaitescu, M.	99, 110	Zagan, S.	132
Florin, G.	120	Panaitescu, V.	105		