



APPLIED AND COMPUTATIONAL MATHEMATICS

**Proceedings of the 13th WSEAS International Conference on
APPLIED MATHEMATICS (MATH'08)**

**Puerto De La Cruz, Tenerife, Canary Islands, Spain,
December 15-17, 2008**

Mathematics and Computers in Science and Engineering
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

ISSN: 1790-2769
ISBN: 978-960-474-034-5

APPLIED AND COMPUTATIONAL MATHEMATICS

**Proceedings of the 13th WSEAS International Conference on
APPLIED MATHEMATICS (MATH'08)**

**Puerto De La Cruz, Tenerife, Canary Islands, Spain,
December 15-17, 2008**

Mathematics and Computers in Science and Engineering
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

Copyright © 2008, 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: 1790-2769
ISBN: 978-960-474-034-5



World Scientific and Engineering Academy and Society

APPLIED AND COMPUTATIONAL MATHEMATICS

**Proceedings of the 13th WSEAS International Conference on
APPLIED MATHEMATICS (MATH'08)**

**Puerto De La Cruz, Tenerife, Canary Islands, Spain,
December 15-17, 2008**

Editors:

Prof. Stamatios Kartalopoulos, University of Oklahoma, USA

Prof. Andris Buikis, University of Latvia, Latvia

Prof. Nikos Mastorakis, Technical University of Sofia, Bulgaria

Prof. Luigi Vladareanu, Romanian Academy, Bucharest, Romania

International Program Committee Members:

Munir Al-Absi, SAUDI ARABIA
Hazem Dwairi, JORDAN
Abdelatif Bencherif-Madani, ALGERIA
Abdelaziz Hamad Elawad, SUDAN
Abdelmadjid Khelassi, ALGERIA
Abdelwadood Mesleh, JORDAN
Abdullah Altin, TURKEY
Adem Kilicman, MALAYSIA
Ahmad Mahir Razali, MALAYSIA
Ahmet Nuri Ceranoglu, TURKEY
AISSAT abdelkader, ALGERIA
Akihiro Matsuura, JAPAN
Akio Tada, JAPAN
Alexander Zemliak, MEXICO
Alexander Milnikov, GEORGIA
Ali Tangel, TURKEY
Ali Maamar, LIBYA
Ali Alaei, IRAN
Aloka Sinha, INDIA
Amritasu Sinha, RWANDA
Andrei Shindiapin, MOZAMBIQUE
Andris Buikis, LATVIA
Anton Abdulbasah Kamil, MALAYSIA
Aris Skander, ALGERIA
Azami Zaharim, MALAYSIA
bangchun wen, CHINA
Bee Theng Lau, MALAYSIA
Bizdoaca Nicu George, ROMANIA
Branislav Radjenovic, SERBIA
Chebbi Souad, TUNISIA
Chi-Cheng Cheng, TAIWAN
Christopher Bingham, UNITED KINGDOM
Constantin Udriste, ROMANIA
Dino Isa, MALAYSIA
Eisaku Miyoshi, JAPAN
Faiz Ahmed Mohamed Elfaki, MALAYSIA
Fani Roubani-Kalantzopoulou, GREECE
Fatiha Merazka, ALGERIA
Fauziah Sulaiman, MALAYSIA
Fituri Belgasse, LIBYA
Fotis Koumboulis, GREECE
Francesco Marra, ITALY
Francesco Muzi, ITALY
Fusun Ulengin, TURKEY
Gabda Darmesah, MALAYSIA
Gabriella Bogner, HUNGARY
Ghezal Elhadj Ahmed, ALGERIA
Gilberto Perez-Lechuga, MEXICO
Gley Kheder, TUNISIA
Hafizah Husain, MALAYSIA
Hamed Al-Sharari, SAUDI ARABIA
Hamzeh Duwairi, JORDAN
Hani Elsayed-Ali, UNITED STATES
Harrar Khaled, ALGERIA
Hassan Al-mahdi, EGYPT
Helen Boussalis, UNITED STATES

Ian McCulloh, UNITED STATES
Itoh Toshiaki, JAPAN
Jaejoon Kim, KOREA
Jesus Pacheco, VENEZUELA
Jiann-Horng Lin, TAIWAN
Jin He, CHINA
Joseph El Hayek, SWITZERLAND
Jung-Hui Tsai, TAIWAN
Kamal Khandakji, JORDAN
Kamel Bensebaa, BRAZIL
Kamsia Budin, MALAYSIA
Katsuhiko Ichiyanagi, JAPAN
Khaled Issa, JAPAN
Lakhdar Ragoub, SAUDI ARABIA
Lakhdar Chiter, ALGERIA
Lakshmanan Muthukaruppan, INDIA
Lazim Abdullah, MALAYSIA
Leila weitzel, BRAZIL
Levent Yilmaz, TURKEY
Lijiao Zhao, CHINA
Liliana Braescu, ROMANIA
Lokesh Bhajantri, INDIA
M. Kudret Yurtseven, TURKEY
Madhu S. Nair, INDIA
Mahmoud Awad, JORDAN
Maitree Podisuk, THAILAND
Malika Zazi MOROCCO
Manouchehr Amiri, UNITED ARAB
EMIRATES
Marco Gherlone, ITALY
Maria Tzamtzi, GREECE
Maria Osorio, MEXICO
Mayumi Ohmiya, JAPAN
Mehmet Alper Tunga, TURKEY
Mohamed Ahmed, CANADA
Mohamed Abdel Fattah, JAPAN
Mohammad Khalaj-amirhosseini, IRAN
Mohammad Al rababah, JORDAN
Mohammad Ali Sadrnia, IRAN
Mohammad ali Fariborzi araghi, IRAN
Mohammed Al-gawagzeh, JORDAN
Mohd Syakirin Ramli, MALAYSIA
Mojtaba Lotfizad, IRAN
Muhammad Abuzar Fahiem, PAKISTAN
Muhammad mehdi pourpasha, IRAN
Muhammad Shuaib Khan, PAKISTAN
NADIR Mostefa, ALGERIA
Nakhoon Baek, KOREA
Nejib Smaoui, KUWAIT
Nestor Thome, SPAIN
Nicholas Nechval, LATVIA
Nobutoshi Ikeda, JAPAN
Noorizam Daud, MALAYSIA
Noraini Abdullah, MALAYSIA
Norhashidah Ali, MALDIVES
Norihan Md. Arifin, MALAYSIA

Pankaj Kumar Sa, INDIA
Permyos Ruengsakulrach, THAILAND
Prachi Mukherji, INDIA
Priti Rege, INDIA
Qiang Hua, CHINA
Rachid Beguenane, CANADA
Radhika Joshi, INDIA
Ranjan Bose, INDIA
Ritu Soni, INDIA
Rouba Borghol, FRANCE
Rozeha A. Rashid, MALAYSIA
Ruey-shun Chen, TAIWAN
Rugang Zhong, CHINA
Saeed Seyedtabaai, IRAN
Salina Abdul samad, MALAYSIA
Sang-Young Cho, KOREA
Sanjay Ganorkar, INDIA
Sattar Arshadi, IRAN

Sayeh Elhabashi, LIBYA
Shahab Aldin Shamshirband, IRAN
Sherif Michael, UNITED STATES
Sonja Currie, SOUTH AFRICA
Stefan Emet, FINLAND
Suriani Hassan, MALAYSIA
Toraj Mohammadi, IRAN
Tzung-Pei Hong, TAIWAN
Vasos Pavlika, UNITED KINGDOM
Veselin Ivanovic, MONTENEGRO
Vudhichai Parasuk, THAILAND
Waraporn Parasuk, THAILAND
Wei Wu, CHINA
Yangweon Lee, KOREA
Yasir Ibrahim, JORDAN
Zhongdi Chen, BOTSWANA
Zubairi Yong, MALAYSIA

Preface

This book contains the proceedings of the 13th WSEAS International Conference on APPLIED MATHEMATICS (MATH'08) which was held in Puerto De La Cruz, Tenerife, Canary Islands, Spain, December 15-17, 2008. This conference aims to disseminate the latest research and applications in Linear Algebra and Applications, Numerical Analysis and Applications, Differential Equations, Multilinear Algebra, Numerical Methods for Solving Equations, Ordinary Differential Equations, Partial Differential Equations, Theoretical Probability Theory and other relevant topics and applications.

The friendliness and openness of the WSEAS conferences, adds to their ability to grow by constantly attracting young researchers. The WSEAS Conferences attract a large number of well-established and leading researchers in various areas of Science and Engineering as you can see from <http://www.wseas.org/reports>. Your feedback encourages the society to go ahead as you can see in <http://www.worldses.org/feedback.htm>

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 this 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, ACM, 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). WSEAS has also collaboration with several other international publishers and all these excellent papers of this volume could be further improved, could be extended and could be enhanced for possible additional evaluation in one of the editions of these international publishers.

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

Table of Contents

Plenary Lecture I: Direct and Time Reverse Problems for Hyperbolic Heat Equation - New Models for Intensive Steel Quenching Processes	15
<i>Andris Buikis</i>	
Plenary Lecture II: Investigating The Relationships Between Airborne Particulate Matter And Meteorological Variables Using Non-Decimated Wavelet Transform	17
<i>Azami Zaharim</i>	
Plenary Lecture II: Geometric Function Theory and Applications (New Development)	18
<i>Maslina Darus</i>	
Linearizing Control of the Asynchronous Motor with an Interconnected Observers for a Special Class of Nonlinear Systems	19
<i>Chouya Ahmed</i>	
Anisotropy Properties of Turbulence	26
<i>Sankha Banerjee, Oezguer Ertunc, Franz Durst</i>	
A Semi-analytical-numerical Technique to Nonlinear Stochastic Differential Equations	58
<i>Parviz Darania, Jafar Ahmadi Shali, Karim Ivaz</i>	
Evaluating Responses Containing Both Correct and Incorrect Information	65
<i>Sylvia Encheva, Sharil Tumin</i>	
Versal Deformations for Generalized Second Order Linear Systems. Application to Control Theory	69
<i>M.Isabel Garcia-Planas</i>	
Three-phase ZCZ Sequence Sets with Good Cross-correlation Properties for CDMA Cellular Systems	75
<i>Hideyuki Torii, Makoto Nakamura</i>	
Parallel Algorithm for Finding an Eulerian Path in an Undirected Graph	82
<i>Akio Tada, Daisaburo Yoshioka, Eiichi Mukai, Yoshimi Matsumoto</i>	
Hexagonal Stratification of Numbers	87
<i>Manuel Meireles</i>	
On Goldbach Conjecture	93
<i>Manuel Meireles</i>	
A Note on Convergence Rates in the Strong Law of Large Numbers for Associated Sequences	98
<i>Cecilia Azevedo</i>	

Layered Upward Embedding of Acyclic Digraphs	101
<i>Nassim Sohaee</i>	
Calculation of Diffusion Process Nonlinearity According to Mass Measurements	105
<i>Marija Iltina, Ilmars Iltins</i>	
Interval Neutrosophic Sets and Topology	110
<i>Francisco Gallego Lupianez</i>	
Functional Image Quality and Performance Evaluation for JPEG Compression and De-Noising Filters	113
<i>Yun Fah Chang, Omar Mohd Rijal, Syed Abdul Rahman Abu Bakar</i>	
Transform Representation of the Level-crossing Probability in a Single-server Queue	119
<i>Andrzej Chydzinski</i>	
Inference in Multi-state Survival Data	123
<i>Luis Meira-Machado, Carmen Cadarso-Suarez, Jacobo Una-Alvarez</i>	
Generating Random Deviates for a Nonstationary Fixed-Planned Rate Process	129
<i>Marcos Antonio Masnik Ferreira, Celso Carnieri, Rui Carlos Botter</i>	
Encoding Properties of Lukasiewice Path	135
<i>Anna Varvak</i>	
Semidiscretization Methods in Certain Controllability Measures of a Parabolic PDE System	144
<i>Jerzy Stefan Respondek</i>	
Improving the Performances of the Collocation Method for Numerically Solving Linear Differential Equations of the Wavefunctions in Large atomic Systems	148
<i>Sever Spanulescu, Mircea Moldovan</i>	
The Fekete-Szego Problem for Certain Classes of Parabolic Starlike and Uniformly Convex Functions	153
<i>Oqlah Al-Refai, Maslina Darus</i>	
Profit Analysis and Simulation in Motor Insurance	161
<i>Noriszura Ismail, Abdul Aziz Jemain</i>	
Surface Fitting with NURBS - a Gauss Newton with Trust Region Approach	169
<i>Nils Carlson, Marten Gulliksson</i>	
Stabilization of a String with Two Rigid Loads: Application of Optimal Feedback Gain Based on a Finite Difference Approximation	175
<i>Hideki Sano</i>	
A Model of Quadratic Approximation Adapted to Structural Optimization	183
<i>Yaghob Gholipour</i>	

Thermohaline Fields Monitoring Model	188
<i>Peep Miidla, Kalev Rannat</i>	
Frequency of Admittance and Probability of Inpatient Treatment: Experience of Emergency Department, Hospital Universiti Kebangsaan Malaysia	193
<i>Noriszura Ismail, Zatul Iradah Abdul Karim, Saiful Hafizah Jaaman, Noriza Majid</i>	
Hyperbolic Heat Equation as Mathematical Model for Steel Quenching of L-Shape Samples, Part 1 (Direct Problem)	198
<i>Margarita Buike, Andris Buikis</i>	
Total Electron Content (TEC) and Model Validation at an Equatorial Region	204
<i>Norsuzila Ya'acob, Mardina Abdullah, Mahamod Ismail, Azami Zaharim</i>	
Improved Ambiguity Resolution by an Equatorial Ionospheric Differential Correction for Precise Positioning	209
<i>Norsuzila Ya'acob, Mardina Abdullah, Mahamod Ismail, Azami Zaharim</i>	
Parameters Optimization of Rotary Ultrasonic Machining of Glass Lens for Surface Roughness Using Statistical Taguchi's Experimental Design	214
<i>Muhammad Hisyam Lee, Izman Sudin, Goh Eng Ken, Azami Zaharim</i>	
Performance Evaluation of Routing Protocols for Mobile Ad Hoc Networks Using Statistical Taguchi's Experimental Design	220
<i>Muhammad Hisyam Lee, Mazalan Sarahintu, Hazura Mohamed, Bahrom Sanugi, Stephan Olariu, Azami Zaharim</i>	
Approximation of Error Concentration Parameter for Simultaneous Circular Functional Model	227
<i>A. G. Hussin, S. F. Hassan, Y. Z. Zubairi, A. Zaharim, K. Sopian</i>	
The Versatility of Logit Over Probit Regression Analyses in Estimating the Strength of Gear Teeth	232
<i>A. A. Shariff, A. Zaharim</i>	
Numerical Simulation of Lid-Driven Cavity Flow Using the Lattice Boltzmann Method	236
<i>M.A. Mussa, S. Abdullah, C.S. Nor azwadi, N. Muhamad, K. Sopian</i>	
Genetic Algorithm in Time Series Fatigue Analysis	241
<i>Azami Zaharim, Shahrum, Abdullah, Mohammad Darahim Ibrahim, Zulkifli Mohd Nopiah</i>	
Subclass of Harmonic Univalent Functions with Respect to 2k-Symmetric Conjugate Points	246
<i>Maslina Darus, Khalifa Al-Shaqsi</i>	
Uniqueness of Positive Solutions for Semilinear Neumann Problems in a Half Space	252
<i>Chenghua Dang, Wei Dong</i>	
Existence of Periodic Solutions for a Class of Differential Equations of Second Order	255
<i>Tieguo Ji, Wei Dong</i>	

Improving security and flexibility of user authentication	258
<i>Jan Hajny, Tomas Pelka, Vaclav Zeman</i>	
Series Solution of Nonlinear Dynamic System Containing Fractional Derivative	262
<i>A.K. Alomari, M.S.M. Noorani, R. Nazar, M. Darus</i>	
The Impact of Network Performance and Perceived Value on Hsdpa Broadband Customer Satisfaction and Loyalty	267
<i>N.R.M. Suradi, A.S. Yee, F.A. Shahabuddin, Z.M. ALI, Z. Mustafa, W.R.Ismail, M. Darus</i>	
Unsteady Boundary Layer Flow and Heat Transfer over a Stretching Surface in a Micropolar Fluid	273
<i>Roslinda Nazar, Anuar Ishak, Ioan Pop</i>	
XOR Based LSB Watermarking for Information Protection in Land Consolidation Project	279
<i>Li Li, Chao Zhang, Xinyu Li, Daoliang Li</i>	
Hierarchical Object Oriented Land Cover Classification Method Using SPOT 5 Imagery in Waste Dump Opencast Coalmine Area	285
<i>Wei Su, Chao Zhang, Xiang Zhu, Daoliang Li</i>	
A Method for Land Consolidation Progress Assessment Based on GPS and PDA	291
<i>Guangming Zhu, Daoliang Li</i>	
ComGIS-based Decision Support System for Land-use Structure Optimization	297
<i>Li Xiaoli, Yingyi Chen, Li Daoliang</i>	
An Integrated Indicator-based System for Soil Environmental Quality Assessment in Sustainable Rehabilitation of Mine Waste Area	303
<i>Xiang Zhu, Yingyi Chen, Daoliang Li</i>	
Road Detection Method for Land Consolidation Using Mathematical Morphology from High Resolution Image	309
<i>Rui Guo, Daoliang Li</i>	
Using Image Texture Analysis to Improve Land Cover Classification	315
<i>Xiaochen Zou, Daoliang Li</i>	
A Comparison of Pixel-based and Object-oriented Classification Using SPOT5 Imagery	321
<i>Minjie Chen, Wei Su, Li Li, Chao Zhang, Anzhi Yue, Haixia Li</i>	
Beef Quality Risk Identification and Optimization in Beef Cattle Breeding	327
<i>Hui Li, Jian Zhang, Lingxian Zhang, Daoliang Li, Zetian Fu</i>	
Fifth-Order Mean Runge-Kutta Methods Applied to the Lorenz System	333
<i>Noorhelyna Razali, Rokiah Rozita Ahmad, Maslina Darus, Azmin Sham Rambely</i>	

A Novel Algorithm for Generating Muhammad Pattern Based on Cellular Automata	339
<i>Seyed Amir Hadi Minoofam, Azam Bastanfard</i>	
Reducing Exergy Losses of Liquid Fluid Using Embedded Open Parallel Microchannels within the Surface	345
<i>M.H. Yazdi, S. Abdullah, I. Hashim, K. Sopian</i>	
On The Design and Alphabet Size of Roth-Skachek Nearly MDS Expander Codes	351
<i>Marc A. Armand</i>	
Cylindrical Model of Transient Heat Conduction in Automotive Fuse Using Conservative Averaging Method	355
<i>Raimonds Vilums, Hans-Dieter Liess, Andris Buikis, Andis Rudevics</i>	
An Mixed Integer Approach for Optimizing Production Planning	361
<i>Stefan Emet</i>	
The Mathematical Model of the Plywood Production	365
<i>Andris Buikis, Janis Cepitis, Solvita Kostjukova</i>	
On Sophie Germain primes	370
<i>Manuel Meireles</i>	
Analytical Treatment of High Transcendental Functions Involved in Perturbation Theory for Inner Shell Electrons Interaction with Gamma-ray	374
<i>Adrian Costescu, Sever Spanulescu and Cristian Stoica</i>	
On The Optimality of A Variable Parameters Inventory Model for Deteriorating Items Under Trade Credit Policy	381
<i>Zaid Tamim Balkhi</i>	
Author Index	393

Plenary Lecture I

Direct and Time Reverse Problems for Hyperbolic Heat Equation - New Models for Intensive Steel Quenching Processes



Professor Andris Buikis

Institute of Mathematics and Computer Science
University of Latvia
Raina bulv. 29, Riga, LV1459
LATVIA

Email: buikis@latnet.lv

Abstract: Intensive quenching processes are important branches of modern metallurgical technologies. In new ecologically clean steel quenching processes important aspect is the heat exchange with the surrounding cold water. But the type of heat exchange is mostly defined by initial heat flux densities: if initial heat flux density is higher as first critical heat flux density, then the full film boiling is observed. If the initial heat flux density is lower, then the nucleate boiling establishes on the sample's surface. This is the preferable type of heat exchange process, because it provides the intensity of the process and defines the quality of the obtained material. In 2005 we proposed the hyperbolic heat equation as mathematical model for intensive steel quenching process. In several papers during 2005-2008 we have developed some approaches (Green function method, original conservative averaging method) for the solving of ill-posed time reverse problems for the parabolic part of the hyperbolic heat equation. These ideas gave quite good compatibility of theoretical and experimental initial heat flux densities. In this lecture we develop some new ideas for the solving of time reverse problems for the hyperbolic heat equation. They lead us to well-posed statements for determination of initial heat fluxes instead of ill-posed statements as it was in our previous papers.

Brief Biography of the Speaker:

Professor Andris BUIKIS

- Professor, University of Latvia, Faculty of Physics and Mathematics, Department of Mathematics
- Head of Laboratory of Mathematical Technologies, Institute of Mathematics and Computer Science, University of Latvia

Born: March 15, 1939, Valka, Latvia

Interests:

- Mathematical Modelling
- Mathematical Problems of Heat and Mass Transfer, Especially for Layered Media
- Analytical and Numerical Methods for Partial Differential Equations
- Innovative Energetic
- Philosophy of Science

Languages: German, English, Latvian, Russian

Education:

- University of Latvia (Faculty of Physics and Mathematics), 1963
- Dr.math. (Candidate of Science in former USSR), University of Latvia, 1970
- Dr.habil.math. (Doctor of Science in former USSR), University of Kasan, Russia, 1988
- Professor, University of Latvia, 1991

Experience:

- Junior Researcher, Senior Researcher, Computing Centre, University of Latvia, 1962 - 1972
- Assistant Professor and Head of Chair of Applied Mathematics, Faculty of Physics and Mathematics, University of Latvia, 1972 - 1976
- Assistant Professor and Head of Chair of Differential Equations and Numerical Methods, Faculty of Physics and Mathematics, University of Latvia, 1976 - 1984
- Senior Researcher, Faculty of Physics and Mathematics, University of Latvia, 1984 - 1986
- Assistant Professor, Chair of Differential Equations and Numerical Methods, Faculty of Physics and Mathematics, University of Latvia, 1986 - 1988
- Senior Researcher, Head of Laboratory of Mathematical Physics, Institute of Physics, Latvian Academy of Sciences, 1988 - 1991
- Director, Institute of Mathematics, Latvian Academy of Sciences and Latvian University, 1991 - 1996; 2003 - 2006
- Head of Laboratory of Mathematical Physics (1996 -2006) and Head of Scientific Council (1996 – 2003), Institute of Mathematics, Latvian Academy of Sciences and Latvian University
- Director, Science and Dialogue Centre of Latvia, 1993 -2007
- Head of Laboratory of Mathematical Technologies (2006-), Institute of Mathematics and Computer Science, University of Latvia

Honours and Awards:

- Corresponding Member, Latvian Academy of Sciences, 1992 - 1997
- Full Member, Latvian Academy of Sciences, 1997
- The Latvian Academy of Sciences Piers Bohl Prize for a cycle of papers "Method of Conservative Averaging, Theory and Applications", 2005
- Member of Board, Soros Foundation - Latvia, 1997
- Head of "Spidola" Council, Culture Foundation of Latvia, 1987 - 1992
- Member of Board, Vidzemes University College, 1996 - 1998

Professional Activities and Memberships:

- Member, Senate of the Latvian Academy of Sciences, 1994 -
- Member, Vidzeme University College Advisory Board, 1997-2002
- Vice-Chairman (in Mathematics), Latvian Council of Science Expert Committee on "Physics, Mathematics & Astronomy", 1991 - 1993
- Chairman, Promotion Council for Mathematics, 1992 -
- Member, Editorial Advisory Board for Proceedings of the Latvian Academy of Sciences, 1988-1995
- Member, Editorial Advisory Board for Computational Methods in Applied Mathematics, 2000-
- Member of Editorial Advisory Board, Journal Mathematical Modelling and Analysis (The Baltic Journal on Mathematical Applications, Numerical Analysis and Differential Equations), Lithuania, 1999-
- Editor, Progress in Industrial Mathematics at ECMI 2002 , Springer
- Member, Editorial Board for International Journal of Applied Mathematical Sciences (IJAMS), 2004 -
- Member, Gesellschaft Angewandte Matematik und Mechanik, Germany 1991 -
- Member, International Sociological Association, 1998-2002
- Holder of state capital share at The Latvian Institute, 1998 -2004
- Member, American Mathematical Society, 1999 –
- Member, World Scientific and Engineering Academy and Society, 2006-

Plenary Lecture II

Investigating The Relationships Between Airborne Particulate Matter And Meteorological Variables Using Non-Decimated Wavelet Transform



Assoc. Professor Azami Zaharim
Coordinator Fundamental Engineering Studies
Faculty of Engineering and Built Environment,
Universiti Kebangsaan Malaysia,
43600 UKM, Bangi, Selangor
MALAYSIA

Email: azami@vlsi.eng.ukm.my, azaminelli@gmail.com

Abstract: Malaysia has experienced several haze periods since early 1980s in which suspended particulate matter was the major components. The temporal variations observed in suspended particulate matter concentrations are the result of interactions of various meteorological variables and pollutants emissions in different time scales. In order to study the relationships between particulate matter, temperature and wind speed, non-decimated wavelet transform was applied to the time series. The time series registered significant relationships between meteorological variables and PM10 for low frequency components. While for the high frequency components, the relationships were not significant. The correlations between PM10 and temperature were found positive. The correlations between PM10 and wind speed registered both positive and negative correlations. The findings also support the suggestion that during the dry season, one of the major sources of particulates was from outside the country.

Brief Biography of the Speaker: Azami Zaharim worked first 13 years as a lecturer in the Universiti Teknologi MARA (University of MARA Technology - UiTM) before joining the Universiti Kebangsaan Malaysia (National University of Malaysia - UKM) in the year 2003. He is Associate Professor at the Faculty of Engineering and Built Environment UKM, and is currently Coordinator for the Unit Fundamental Engineering Studies. He obtained his BSc (Statistics and Computing) with Honours from North London University, UK in 1988 and PhD (Statistics) in 1996 from University of Newcastle Upon Tyne, UK. He specialize in statistics, public opinion, engineering education and renewable energy resources. He has until now published over 80 research papers in Journals and conferences, conducted more than 15 public opinion consultancies and delivered 3 keynotes/invited speeches at national and international meetings. He is currently the head of Renewable Energy Resources and Social Impact Research Group under the Solar Energy Research Institute (SERI). In the year 2007, he headed the Engineering Mathematics Research Group. At the same time, he is currently active involve in outcome based education (OBE) approach at the national level and the chairman of the Engineering Education Research Group since 2005. He is also involved actively in the research for the future of engineering education in Malaysia 2006 under the Ministry of Higher Education of Malaysia.

Plenary Lecture II

Geometric Function Theory and Applications (New Development)



Professor Dr Maslina Darus
Head of Fundamental Studies Unit
Centre of Research Modeling Analysis
&
Head of Mathematics Programme

School of Mathematical Sciences,
Universiti Kebangsaan Malaysia,
43600 UKM, Bangi, Selangor
MALAYSIA

Email: maslina@ukm.my

Abstract: The theory of analytic univalent function is a classical problem of complex analysis which belongs to a beautiful part of geometric function theory (GFT). To our interest, GFT denotes the part of functions analysis devoted to estimations of different magnitudes related to conformal mapping of one region onto another. Conformal mapping is a classical part of complex analysis having intimately connected with the theory of boundary value problems for harmonic functions, thus has numerous applications in mathematical physics and other branches of mathematics. A large number of generalizations of the class of univalent function have been explored and properties such as distortion theorems, radii and Fekete-Szego theorems are the main interests of solving problems. To date, various methods have been used such as method of differential subordinations, method of differential inequalities and methods of arising from the convolution theory. These are rather some curiosity provoking and recently attracted many other mathematicians to the derivation of new subclasses and new properties. Results from the theory of the geometric function are remarkable by their particular elegance and simplicity of formulations. However, in searching for a new breakthrough in the field, new approach and new development are indeed needed.

Brief Biography of the Speaker: Maslina Darus started her career in Universiti Kebangsaan Malaysia(UKM) in 1992 as a Tutor at the Department of Mathematics. She pursued her PhD (Mathematics) in University of Wales, Swansea, United Kingdom late September 1992. She specialized in Complex Analysis (Geometric Function Theory) and obtained her PhD in July 1996. She has been appointed as a lecturer at UKM in the duration of 1996-2000 and appointed as Associate Professor in the duration of 2001-2005. In 2002, she has been awarded the “National Young Scientist Award” by the Ministry of Science and Technology, Malaysia. She has been promoted to full Professor in 2006 till present. She has until now published over 170 research papers in Journals internationally and nationally. She is currently the Head of Fundamental Studies Unit, Centre for Research Modeling Analysis and also acting as Head of Mathematics Programme, School of Mathematical Sciences. She has been actively involved collaborating with many other researchers in the specialized area, namely from Macedonia, Romania, India, China, Turkey and Japan. Concurrent with the mutual interests among the researchers, a specialized conference with the theme “New Development of Geometric Function Theory and its Applications” is organized jointly between UKM and Kinki University, Japan. The conference is scheduled in November 10-13, 2008.