



**Editors: Vladimir Vasek, Yuriy S. Shmaliy, Denis Trcek,
Nobuhiko P. Kobayashi, Ryszard S. Choras, Zbigniew Klos**

Recent Researches in Applied & Computational Mathematics

Recent Researches in Applied & Computational Mathematics

**International Conference on Applied &
Computational Mathematics (ICACM '11)**

Lanzarote, Canary Islands, Spain, May 27-29, 2011



ISSN: 2223-2877

ISBN: 978-1-61804-002-2



RECENT RESEARCHES in APPLIED and COMPUTATIONAL MATHEMATICS

**International Conference on APPLIED and COMPUTATIONAL
MATHEMATICS (ICACM '11)**

**Lanzarote, Canary Islands, Spain
May 27-29, 2011**

RECENT RESEARCHES in APPLIED and COMPUTATIONAL MATHEMATICS

**International Conference on APPLIED and COMPUTATIONAL
MATHEMATICS (ICACM '11)**

**Lanzarote, Canary Islands, Spain
May 27-29, 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: 978-1-61804-002-2
ISSN: 2223-2877



World Scientific and Engineering Academy and Society



European Society for Environmental Research
and Sustainable Development

RECENT RESEARCHES in APPLIED and COMPUTATIONAL MATHEMATICS

**International Conference on APPLIED and COMPUTATIONAL
MATHEMATICS (ICACM '11)**

**Lanzarote, Canary Islands, Spain
May 27-29, 2011**

Editors:

Prof. Vladimir Vasek, Tomas Bata University in Zlin, Czech Republic
Prof. Yuriy Shmaliy, Guanajuato University, Mexico
Prof. Denis Trcek, University of Ljubljana, Slovenia
Prof. Nobuhiko P. Kobayashi, University of California Santa Cruz, USA
Prof. Ryszard S. Choras, University of Technology & Life Sciences, Poland
Prof. Zbigniew Klos, Poznan University of Technology, Poland

International Program Committee Members:

Joseph Sifakis, FRANCE
Lotfi A. Zadeh, USA
Leon O. Chua, USA
K. R. Rao, USA
Dimitri Bertsekas, USA
Biswa N. Datta, USA
Irwin Sandberg, USA
P. Pardalos, USA
A. Manikas, UK
T. Kaczorek, POLAND
Wlodzislaw Duch, POLAND
Sidney Burrus, USA
Leonid G. Kazovsky, USA
Georgios B. Giannakis, USA
Nikolaos G. Bourbakis, USA
Brian A. Barsky, USA
Ryszard S. Choras, POLAND
Wasfy B. Mikhael, USA
M. Kostic, USA
A. Venetsanopoulos, Canada
K. Benra, GERMANY
S. Sohrab, USA

Table of Contents

<u>Numerical Results for the Blood Micro-Circulation Modelled by a Porous Media</u>	9
<i>Yvon Maday, Noura Morcos, Toni Sayah</i>	
<u>Mixed Number and Clifford Algebra</u>	15
<i>Md. Shah Alam, Sabar Bauk</i>	
<u>Stabilization of Unstable Control System Via Design of Delayed Feedback</u>	18
<i>G. A. Leonov, N. V. Kuznetsov, S. M. Seledzhi, M. M. Shumafov</i>	
<u>Localization of Hidden Attractors in Smooth Chua's Systems</u>	26
<i>N. V. Kuznetsov, V. I. Vagaitsev, G. A. Leonov, S. M. Seledzhi</i>	
<u>On Bayesian Equilibrium Pairs in Free Bayesian Abstract Economies</u>	34
<i>Monica Patriche</i>	
<u>Accelerated Group Krylov Algorithms in 2D Elliptic Partial Differential Equation</u>	42
<i>Norhashidah Hj. Mohd. Ali, Ng Kok Fu</i>	
<u>Asymptotic Solutions of a Fifth Order Model Equation for Steady Capillary-Gravity Waves over a Bump with the Bond Number Near 1/3</u>	49
<i>Chung-Hsien Tsai, Shy-Jen Guo</i>	
<u>Parametric Analysis of Entropy Generation in a Channel Filled with a Porous Medium</u>	54
<i>Dalia Sabina Cimpean, Ioan Pop</i>	
<u>Computational Method for Obtaining Filiform Lie Algebras of Arbitrary Dimension</u>	60
<i>Manuel Ceballos, Juan Nunez, Angel F. Tenorio</i>	
<u>Low-Dimensional Filiform Lie Algebras over Finite Fields</u>	66
<i>Oscar J. Falcon, Juan Nunez, Ana M. Pacheco, M. Trinidad Villar</i>	
<u>A Particular Type of Non-associative Algebras and Graph Theory</u>	72
<i>Juan Nunez, Marithania Silvero, M. Trinidad Villar</i>	
<u>Finite Element and Analytical Fluid-Structure Interaction Analysis of the Pneumatically Actuated Diaphragm Microvalves</u>	78
<i>H. Afrasiab, M. R. Movahhedy, A. Assempour</i>	
<u>Determinants of Commercial Banks' Liquidity in the Czech Republic</u>	92
<i>Pavla Vodova</i>	
<u>On the Critical Group of W_{3n}</u>	98
<i>Zahid Raza</i>	

<u>Flow Control in Twin Air-Intakes Using Vortex Generators</u>	107
<i>Akshoy R. Paul, Pritanshu Ranjan, Ravi R. Upadhyay, Anuj Jain</i>	
<u>A New Correlation for Holdup in Gas-Solids Cyclone</u>	117
<i>Anuj Jain, A. R. Paul, S. K. Aggarwal, B. Mohanty, B. P. Mani</i>	
<u>Hyers-Ulam Stability of a Generalized Trigonometric-Quadratic Functional Equation</u>	127
<i>Charinthip Hengkravit, Vichian Laohakosol, Janyarak Tongsomporn</i>	
<u>Identification Methods Over $(Ea,b)^n$</u>	133
<i>Chillali Abdelhakim</i>	
<u>A New Modification of the HPM for the Duffing Equation with Cubic Nonlinearity</u>	139
<i>Precious Sibanda, Ahmed Khidir</i>	
<u>Admissibility Conditions and Asymptotic Behavior of Strongly Regular Graphs</u>	144
<i>Vasco Moco Mano, Luis Antonio De Almeida Vieira</i>	
<u>The Universe Simulators Based on Measurement Standards Variability</u>	151
<i>Vitaly O. Groppen</i>	
<u>Algebraic Solutions to Multidimensional Minimax Location Problems with Chebyshev Distance</u>	157
<i>Nikolai Krivulin</i>	
<u>The Generalized Bin Packing Problem under Uncertainty</u>	163
<i>Roberto Tadei, Guido Perboli</i>	
<u>Robust Power System Stabilizer Based Advanced Frequency Control Techniques</u>	169
<i>Abdellatif Naceri, Mohamed Abid, Boubakeur Dehiba, Houria Bounoua</i>	
<u>Solving Sudoku Puzzles by Using Hopfield Neural Networks</u>	174
<i>V. Mladenov, P. Karampelas, C. Pavlatos, E. Zirintsis</i>	
<u>The System of Indicators Used in Analysing the Degree of Multi-Serving More than One Workstation</u>	180
<i>Dima Ioan Constantin, Grabara Janusz, Goldbah Felix Constantin, Ciurea Virgil</i>	
<u>Periodic Orbits Around L4 in the Photogravitational Restricted Problem with Oblate Primaries</u>	189
<i>Amit Mittal, Rajiv Aggarwal, K. B. Bhatnagar</i>	
<u>Authors Index</u>	195