



NORTH ATLANTIC UNIVERSITY UNION

Editors: N. Mastorakis, V. Mladenov, Z. Bojkovic

Latest Trends on Theoretical & Applied Mechanics, Fluid Mechanics and Heat & Mass Transfer

- ◆ **International Conference on
Theoretical and Applied Mechanics 2010**
- ◆ **International Conference on
Fluid Mechanics and Heat & Mass Transfer 2010**

Corfu Island, Greece, July 22-24, 2010

**ISSN: 1792-4359
ISBN: 978-960-474-211-0**



LATEST TRENDS on THEORETICAL and APPLIED MECHANICS, FLUID MECHANICS and HEAT & MASS TRANSFER

**International Conference on Theoretical and Applied Mechanics 2010
International Conference on Fluid Mechanics and Heat & Mass
Transfer 2010**

**Corfu Island, Greece
July 22-24, 2010**

Mechanical Engineering Series
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

ISSN: 1792-4359
ISBN: 978-960-474-211-0

LATEST TRENDS on THEORETICAL and APPLIED MECHANICS, FLUID MECHANICS and HEAT & MASS TRANSFER

**International Conference on Theoretical and Applied Mechanics 2010
International Conference on Fluid Mechanics and Heat & Mass
Transfer 2010**

Corfu Island, Greece, July 22-24, 2010

Mechanical Engineering Series
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

Copyright © 2010, 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: 1792-4359
ISBN: 978-960-474-211-0



North Atlantic University Union

**LATEST TRENDS on
THEORETICAL and APPLIED
MECHANICS, FLUID MECHANICS
and HEAT & MASS TRANSFER**

**International Conference on Theoretical and Applied Mechanics 2010
International Conference on Fluid Mechanics and Heat & Mass
Transfer 2010**

**Corfu Island, Greece
July 22-24, 2010**

Editors:

Prof. Nikos E. Mastorakis, BULGARIA

Prof. Valeri Mladenov, BULGARIA

Prof. Zoran Bojkovic, SERBIA

International Program Committee Members:

Rozhan M. Idrus, MALAYSIA

Andrei G. Fedorov, USA

Fotis Sotiropoulos, USA

Shabaan Abdallah, USA

Oleg V. Vasilyev, USA

Shoaib Usman, USA

Bozidar, Liscic, CROATIA

Tatsuo Inoue, JAPAN

Michiharu Narazaki, JAPAN

George Totten, USA

Lynn Ferguson, USA

Boris Ushakov, RUSSIA

Pavel Krukovsky, UKRAINE

Gareth Thomas, USA

Tamas Reti, HUNGARY

Valery Rudnev, USA

Claudia del Carmen Gutierrez-Torres, MEXICO

Hyung Hee Cho, KOREA

K. P. Sandeep, USA

Jing Liu, CHINA

Aly Elshamy, EGYPT

Rafael Royo, SPAIN

Slawomir Smolen, GERMANY

Junjie Gu, CANADA

C. J. Ho, TAIWAN

Pradip Majumdar, USA

Ivan Kazachkov, SWEDEN

Jeong-se Suh Gyeongsang, KOREA

Abul-Fazal Arif, S. ARABIA

Yizhen Huang, CHINA

Asad Salem, USA

Suman Chakraborty, INDIA

Ahmed Mohammadein, EGYPT

Joakim Wren, SWEDEN

Agis Papadopoulos, GREECE

Hany Mohamed, EGYPT

A. K. Haghi, IRAN

Chin-Hsiang Cheng, TAIWAN

Aydin Misirlioglu, TURKEY

Valeri Bubnovich, CHILE

Dragoljub Mirjanic, BOSNIA AND

HERZEGOVINA

Hossein Shokouhmand, IRAN

Ramil Sharafutdinov, RUSSIA

Gónter K. F., GERMANY

Kadir Bilen, TURKEY

Federico Mendez, MEXICO

Yinping Zhang, P.R. CHINA

C. W. Leung, HONG KONG

M. Abu-Zaid, JORDAN

Somchai Wongwises, THAILAND

Chun-I Chen, TAIWAN

Mohd Al-Nimr, JORDAN

Mehmet C. Ece, TURKEY

Md Anwar, BANGLADESH

Ali J. Chamkha, KUWAIT

C. Trevipo, MEXICO

Aroudam El hassan, MAROCCO

P. V. S. N. Murthy, INDIA

H. S. Takhar, UK

Federico Mendez, MEXICO

Nickolay Smirnov, RUSSIA

Olga Martin, ROMANIA

Xiaojing Zheng, CHINA

Table of Contents

Iterative Imposing Near Wall Logarithmic Velocity Profile in Turbulent Flow Pressure Modeling over Cylindrical for Unstructured Triangular Meshes	9
<i>Saeed-Reza Sabbagh-Yazdi, Fatemeh Namazi-Saleh</i>	
Thermal Control of Flow Characteristics inside Vertically-Oriented Plane Sudden Expansions	15
<i>Essam Wahba</i>	
Performance Analysis of Solar Air Heater By Extended Heat Transfer Surfaces	21
<i>P. C. Tiwade, N. R. Pathare</i>	
Heat Transfer over an Unsteady Stretching Sheet in a Micropolar Fluid with Prescribed Surface Heat Flux	26
<i>N. Bachok, A. Ishak, R. Nazar</i>	
Marangoni-Driven Boundary Layer Flow in Nanofluids	32
<i>N. M. Arifin, R. Nazar, I. Pop</i>	
Initial Design of Very Light Jet with Unconventional Arrangement	36
<i>Purwo Kadarno, Siti Zawiah Md. Dawal, T. M. Yusoff Shah Tuan Ya, Khairi Yusuf, Nukman Yusoff, Prasetyo Edi</i>	
Changes of Spatial Patterns of Surface-Air-Temperature on the Tibetan Plateau	42
<i>Mingyuan Du, Jingshi Liu, Xianzhou Zhang, Yingnian Li, Yanhong Tang</i>	
Observations and Numerical Simulations of Windbreak Effects on Surface Temperature	48
<i>Mingyuan Du, Tomoki Ushiyama, Taichi Maki</i>	
Optimizing Surface Tension in Two Phase Flow with using Levenberg-Marquardt'S Method	53
<i>Mohammad Reza Mahpeykar, Edris Yousefirad, Ali Reza Mohammadi</i>	
Numerical Simulation of Unsteady Flow with Vortex Shedding Around Circular Cylinder	62
<i>Ali Kianifar, Edris Yousefi Rad</i>	
Ideal Detonation Characteristics of Biogashydrogen and -Hydrogen Peroxide Mixtures	69
<i>Khalid M. Saqr, Hassan I. Kassem, Mohsin M. Sies, Mazlan A. Wahid</i>	
Performance of RANS Turbulence Models in Predicting Strained Flows in a Curved Duct	73
<i>Hassan I. Kassem, Hossam S. Aly, Khalid M. Saqr, Mohsin M. Sies, Mazlan A. Wahid</i>	
Single Pulse Detonation Study of Natural Gas	78
<i>Ahmad Faiz M. Z., Mazlan A. Wahid, Khalid M. Saqr, Haffis U.</i>	
Large Eddy Simulation of Shear-Driven Vortex Flow in a Cylindrical Cavity	84
<i>Khalid M. Saqr, Hossam S. Aly, Hassan I. Kassem, Mohsin M. Sies, Mazlan A. Wahid</i>	
Several Intensive Steel Quenching Models for Rectangular Samples	88
<i>M. Buike, A. Buikis</i>	

Complete Blow-Up for a Degenerate Semilinear Parabolic Problem with a Localized Nonlinear Term	94
<i>P. Sawangtong, B. Novaprateep, W. Jumpen</i>	
Conceptual Design of Fuselage Structure of Very Light Jet Aircraft	100
<i>Khairi Yusuf, Nukman Y., S. Z. Dawal, Devi Chandra, N. Sofia</i>	
Control Strategy for Car Active Suspension	107
<i>Ales Kruczek, Antonin Stribrsky, Jaroslav Honcu, Martin Hlinovsky</i>	
Flow of a Micropolar Fluid in Channel with Heat and Mass Transfer	112
<i>Precious Sibanda, Faiz Ga Awad</i>	
Sea Surface Roughness and Drag Coefficient under free Convection Conditions	121
<i>C. H. Huang</i>	
Merging of Sheet Plumes in Turbulent Convection	128
<i>G. S. Gunasegarane, Baburaj A. Puthenveetil</i>	
Forced Convection Heat Transfer in the Transition Region between Laminar and Turbulent Flow for a Vertical Circular Tube	132
<i>D. Huber, H. Walter</i>	
Integral Rational Spline with Jump for Discontinuous Mathematical Problems in Layered Media	137
<i>S. Kostjukova, A. Buikis</i>	
Hyperbolic Heat Equation in Bar and Finite Difference Schemes of Exact Spectrum	142
<i>A. Buikis, H. Kalis</i>	
Experimental Evaluation of Heat Transfer on Falling Film Tube Bundles in Atmospheric Pressure	148
<i>Jiri Pospisil, Libor Chroboczek, Zdenek Fortelny</i>	
Authors Index	153

Authors Index

Aly, H. S.	73, 84	Mahpeykar, M. R.	53
Arifin, N. M.	32	Maki, T.	48
Awad, F. G.	112	Mohammadi, A. R.	53
Bachok, N.	26	Namazi-Saleh, F.	9
Buike, M.	88	Nazar, R.	26, 32
Buikis, A.	88, 137, 142	Novaprteep, B.	94
Chroboczek, L.	148	Nukman, Y.	36, 100
Dawal, S. Z.	100	Pathare, N. R.	21
Dawal, S. Z. Md.	36	Pop, I.	32
Devi, C.	100	Pospisil, J.	148
Du, M.	42, 48	Prasetyo, E.	36
Faiz, A. M. Z.	78	Puthenveetil, B. A.	128
Fortelny, Z.	148	Sabbagh-Yazdi, S.-R.	9
Gunasegarane, G. S.	128	Saqr, K. M.	69, 73, 78
Haffis, U.	78	Saqr, K. M.	84
Hlinovsky, M.	107	Sawangtong, P.	94
Honcu, J.	107	Sibanda, P.	112
Huang, C. H.	121	Sies, M. M.	69, 73, 84
Huber, D.	132	Sofia, N.	100
Ishak, A.	26	Stribrsky, A.	107
Jumpen, W.	94	Tang, Y.	42
Kadarno, P.	36	Tiwade, P. C.	21
Kalis, H.	142	Ushiyama, T.	48
Kassem, H.	69, 73, 84	Wahba, E.	15
Khairi, Y.	36, 100	Wahid, M. A.	69, 73, 78
Kianifar, A.	62	Wahid, M. A.	84
Kostjukova, S.	137	Walter, H.	132
Kruczek, A.	107	Ya, T. M. Y. S. T.	36
Li, Y.	42	Yousefirad, E.	53, 62
Liu, J.	42	Zhang, X.	42