Editors: Azami Zaharim, Kamaruzzaman Sopian, Nikos Mastorakis,
Valeri Mladenov

# Recent Researches in Power Systems & Systems Science

Recent Researches in Power Systems & Systems Science

▶ 11th WSEAS/IASME International Conference on
Electric Power Systems, High Voltages, Electric Machines (POWER '11)

▶ 10th WSEAS International Conference on
System Science and Simulation in Engineering (ICOSSSE '11)

Supported by Universiti Kebangsaan Malaysia

Universiti Kebangsaan Malaysia
The National University of Malaysia
SERI Solar Energy Research Institute
Environment Friendly Technologies and Products
www.ukm.my/SERI

Universiti Kebangsaan Malaysia
The National University of Malaysia
CENTRE FOR Engineering Education Research (P3K)
www.ukm.my/p3k

Penang, Malaysia, October 3-5, 2011

ISBN: 978-1-61804-041-1

# RECENT RESEARCHES in POWER SYSTEMS and SYSTEMS SCIENCE

**Proceedings of the 11th WSEAS/IASME International Conference on Electric Power Systems, High Voltages, Electric Machines (POWER '11)**
**Proceedings of the 10th WSEAS International Conference on System Science and Simulation in Engineering (ICOSSSE '11)**

**Penang, Malaysia**
**October 3-5, 2011**

**Supported by Universiti Kebangsaan Malaysia**

Published by WSEAS Press
www.wseas.org
ISBN: 978-1-61804-041-1

# RECENT RESEARCHES in POWER SYSTEMS and SYSTEMS SCIENCE

**Proceedings of the 11th WSEAS/IASME International Conference on Electric Power Systems, High Voltages, Electric Machines (POWER '11)**
**Proceedings of the 10th WSEAS International Conference on System Science and Simulation in Engineering (ICOSSSE '11)**

**Penang, Malaysia**
**October 3-5, 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: 978-1-61804-041-1

World Scientific and Engineering Academy and Society

# RECENT RESEARCHES in POWER SYSTEMS and SYSTEMS SCIENCE

**Proceedings of the 11th WSEAS/IASME International Conference on Electric Power Systems, High Voltages, Electric Machines (POWER '11)**
**Proceedings of the 10th WSEAS International Conference on System Science and Simulation in Engineering (ICOSSSE '11)**

**Penang, Malaysia**
**October 3-5, 2011**

**Editors:**
Prof. Azami Zaharim, Universiti Kebangsaan, Malaysia
Prof. Kamaruzzaman Sopian, Universiti Kebangsaan, Malaysia
Prof. Nikos Mastorakis, Technical University of Sofia, Bulgaria
Prof. Valeri Mladenov, Technical University of Sofia, Bulgaria

**International Program Committee Members:**
R. Hanna, CANADA
Slobodan Babic, CANADA
Patrick Chapman, USA
Steve Pekarek, USA
Mario Fabiano Alves, BRAZIL
Babak Fahimi, USA
Akihiro Ametani, JAPAN
Adrian Badea, ROMANIA
J. Krope, SLOVENIA
Yahia Baghzouz, USA
Constantin Bulac, ROMANIA
Alexander Emanuel, USA
I.Stathopulos, GREECE
Toshihisa Funabashi, JAPAN
Nicolae Golovanov, ROMANIA
Vic Gosbell, AUSTRALIA
Regina Lamedica, ITALY
Roberto Langella, ITALY
Cristian Lazaroiu, ITALY
Sonia Leva, ITALY
Bill Moncrief, USA
I. Tegopoulos, GREECE
Jovica Milanovic, UK
Thomas Ortmeyer, USA
R. Vigotti, ITALY
G. Wolf, GERMANY
G. Wisniewski, POLAND
Sarath Perera, AUSTRALIA
Paulo Ribeiro, USA
Cristina Roscia, ITALY
Fernando Silva, PORTUGAL
Wilsum Xu, CANADA
Alfredo Testa, ITALY
Enrico Tironi, ITALY
Paola Verde, ITALY
Irena Wasiak, POLAND
F. Topalis, GREECE
Kazimierz Wilkosz, POLAND
Ruzena Bajcsy, USA
Stan Jarzabek, SINGAPORE
Ronald Yager, USA
Amauri Caballero, USA
George Vachtsevanos, USA
Robert Finkel, USA
Demetrios Kazakos, USA
Theodore Trafalis, USA
Takis Kasparis, USA
Zhiqiang Gao, USA
Yan Wu, USA
Spyros Tragoudas, USA
Arkady Kholodenko, USA
Gregory Baker, USA
Galigekere Dattatreya, USA
Caroline Sweezy, USA
Asad Salem, USA
Dian Zhou, USA
Metin Demiralp, TURKEY
Olga Martin, ROMANIA
Panos Pardalos, USA
Constantin Udriste, ROMANIA
Kleanthis Psarris, USA
Andrew D. Jones, USA
Valeri Mladenov, BULGARIA
Neri F., ITALY
Chen S. Y., P. R. CHINA
Shyi-Ming Chen, R. O. C.
Yen K., USA
Rong-Jyue Fang, TAIWAN
Argyrios Varonides, USA
Nikolai Kobasko, USA
Xu Anping, P. R. CHINA

**Preface**

This year the 11th WSEAS/IASME International Conference on Electric Power Systems, High Voltages, Electric Machines (POWER '11) and the 10th WSEAS International Conference on System Science and Simulation in Engineering (ICOSSSE '11) were held in Penang, Malaysia, October 3-5, 2011. The conferences provided a platform to discuss power system planning and management, electric machines, electric vehicles, batteries, high voltage engineering, renewable energy sources and technology, transmission and distribution, systems theory, circuits, control systems, robotics, speech and image processing systems, remote sensing, artificial intelligence, wavelets, high performance and large scale computing, grid computing, simulation environments, petri nets, visual reality, markov models, graph theory etc. with participants from all over the world, both from academia and from industry.

Their 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 these conferences 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.

Conferences such as these 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


**Visual Inspection of Blood Containers** 13
*Radka Pustkova, David Vala, Zdenek Slanina, Petr Wagner*

**An Investigation of the Protection Performances for Current-Limiting Fuses Using Stainless Steel Wires** 17
*Narong Mungkung, Somchai Arunrungrusmi, Toshifumi Yuji*

**Optimal Low Thrust Spacecraft Maneuvers for Station Keeping** 25
*Vivivan M. Gomes, Antonio F. B. A. Prado*

**A Close Approach Between a Planet and a Particle: Sun-Jupiter System** 32
*Jorge Kennety, Antonio F. B. A. Prado*

**Rendezvous Maneuvers with Minimal ΔV** 38
*Denilson Paulo Souza dos Santos, Antonio F. B. A. Prado, Guido Colasurdo*

**Study of Trajectories around a Non-Spherical Body** 42
*A. A. Silva, A. F. B. A. Prado, O. C. Winter*

**Comparison Between Two Methods to Calculate the Transition Matrix of Orbital Motion** 48
*Ana Paula Marins Chiaradia, Helio Koiti Kuga, Antonio F. B. A. Prado*

**A Hybrid BCO/HS Algorithm for Optimal Placement and Sizing of Static Var Compensators in Power Systems** 54
*Reza Sirjani, Azah Mohamed, Hussain Shareef*

**Power Supply Voltage with the Transformer Ripple Filter** 60
*Jaroslav Lokvenc, Rene Drtina*

**Parallel RLRC Circuit as the Power Load of Frequency Control** 65
*Jaroslav Lokvenc, Rene Drtina*

**Carotid Artery Reactivity Measurement among Healthy Young People towards Early Detection of Alzheimer Disease** 70
*Mohd Aminudin Jamlos, Eko Supriyant*

**Symbolic Computation Based Control Design Tool for Switched Systems** 77
*At-Tasneem Binti Mohd Amin, Sallehuddin Mohamed Haris, Zulkifli Mohd Nopiah*

**Modeling of Solar Energy for Malaysia Using Artificial Neural Networks** 82
*Tamer Khatib, Azah Mohamed, K. Sopian, M. Mahmoud*

**Simple Forecasts and Impacts of Climate Change on Meteorological Trends in the Chi River Basin, Thailand** 88
*Natthakorn Arunyanart, Cheevin Limsiri*

**Parametric Layout Design and Simulation of Flexible Manufacturing System** 94
*Kwan Hee Han, Sung Moon Bae, Sang Hyun Choi, Geon Lee, Dong Min Jeong*

**The Mathematical Model of a Three-Phase Diode Rectifier with Multi-Converter Power Electronic Loads** 100
*T. Sopapirm, K.-N. Areerak, K.-L. Areerak*

**SPICE Modeling of Hybrid Multi-Frequency Ultrasound Transducer** 106
*Imamul Muttakin, Syed Mohd Nooh, Eko Supriyanto*

**Corona Losses Dependence from the Conductor Diameter** 112
*Isuf Krasniqi, Vjollca Komoni, Avni Alidemaj, Gazmend Kabashi*

**Effects of Unbalanced Faults on Transient Stability of Cogeneration System** 118
*Wei-Neng Chang, Chia-Han Hsu*

**Effect of Adding Flash Tank on the Evaporator's Thermal Load of the Combined Ejector-Absorption Cooling System** 124
*Ranj Sirwan, Yusoff Ali, A. Zaharim, K. Sopian*

**Terrestrial Applications of Bifacial Photovoltaic Solar Panels** 128
*P. Ooshaksaraei, R. Zulkifli, S. H. Zaidi, M. Alghoul, A. Zaharim, K. Sopian*

**Theoretical and Experimental Analysis of Desiccant Wheel Performance for Low Humidity Drying System** 132
*Tri Suyono, Sohif Mat, Muhammad Yahya, Muhd. Hafiz Ruslan, Azami Zaharim, Kamaruzzaman Sopian*

**Investigate The Effect of Thermal Oxidation on Crystalline Silicon Solar Cells** 138
*Cheow Siu Leong, Saleem Zaidi, Nowshad Amin, Azami Zaharim, Kamaruzzaman Sopian*

**The Double-Pass Solar Dryer for Drying Palm Oil Fronds** 143
*Mohd Hafidz Ruslan, Ahmad Fudholi, Mohd. Yusof Othman, Mohd Syahriman Mohd Azmi, Muhammad Yahya, Azami Zaharim, Kamaruzzaman Sopian*

**Improvement of SBC Circuit Using MPPT Controller** 150
*Nor Zaihar Yahaya, Ahmad Afifi Zamir*

**Aspects of Electromagnetic Compatibility Verification by Modern Technology Usage** 156
*Zdenek Machacek, Radovan Hajovsky*

**A Method of Detection and Analysis of Logistics Information Error on B2B Supply Chain** 162
*Soohyung Cho, Sanghak Lee, Jeongmi Yun*

**Aspects of the Development of Mathematical Model of Flexible Energy System** 167
*Martin Pies, Ladislav Vilimec*

**Mathematical Model of Water Injected into Steam/Air Mixture Determined for Temperature Control of Flexible Energy System** 173
*Martin Pies, Zdenek Machacek, Stepan Ozana*

**Parametric Analysis of the Mathematical Model of Steam Superheater** 179
*Martin Pies, Stepan Ozana, Pavel Nevriva*

**Teaching Methodology Evaluation Using Rasch Analysis** 185
*Norazreen Abd Aziz, Norhana Arsad, Badariah Bais, Afida Ayob, Hafizah Husain*

**Application of LDPC Codes for Deep Space Communication under Solar Scintillation Condition** 191
*Qi Li, Liuguo Yin, Jianhua Lu*

**Trap-Decoding Algorithm for Burst-Error-Correcting of Reed-Solomon Codes** 196
*Dunwei Xue, Liuguo Yin*

**Design of Redundant CAN Bus for Telemetry and Telecommand Subsystem of a Micro-Satellite** 202
*Jie Liu, Hao Zhang, Wei Zheng, Liuguo Yin*

**Heterogeneous Driver Behavior State Recognition Using Speech Signal** 207
*Norhaslinda Kamaruddin, Abdul Wahab*

**Environmental Impact on Municipal Solid Waste Management System in Chaiyaphum** 213
*S. Piyaphant, K. Prayong*

**An Evaluation Framework for Software Project Initiation** 219
*Anas Bassam Al-Badareen, Mohd Hasan Selamat, Marzanah A. Jabar, Jamilah Din, Sherzod Turaev*

**Lumped Parameter Model for High Frequency Partial Discharge Estimation in High Voltage Transformer** 223
*Ramizi Mohamed, Paul L. Lewin*

**Selection of Optimal Features for Digital Modulation Recognition** 229
*A. Kubankova, H. Atassi, A. Abilov*

**PWL Function Approximation Circuit with Diodes and Current Input and Output** 235
*David Kubanek, Kamil Vrba*

**Integrated Architecture for Product Information and User Review on the Web** 240
*Sungmoon Bae, Kwan Hee Han, Sang Hyun Choi, Juhyun Park*

**Authors Index** 245