Advances in Environmental Sciences, Development and Chemistry

- Proceedings of the 2014 International Conference on Energy, Environment, Development and Economics (EEDS 2014)
- Proceedings of the 2014 International Conference on Geology and Seismology (GESE 2014)
- Proceedings of the 2014 International Conference on Maritime and Naval Science and Engineering (MANASE 2014)
- Proceedings of the 2014 International Conference on Water Resources, Hydraulics & Hydrology (WHH 2014)
- Proceedings of the 2014 International Conference on Chemistry and Chemical Engineering (CCE 2014)

Santorini Island, Greece, July 17-21, 2014

Edited by

Nikos Mastorakis
Vladimir Sokolov
Reinhard Neck
Rui Pedro Juliao
Jian Wang
Efthimios Karymbalis
Levent Yilmaz
Ernst D. Schmitter
Marc A. Rosen
Roy Perryman
Ottavia Corbi
Manijeh Razeghi
Jun Zhang
Samuel Lofland

Associate Editors

Luís Loures
Liandong Zhu

ISBN: 978-1-61804-239-2

Advances in Environmental Sciences, Development and Chemistry

ADVANCES in ENVIRONMENTAL SCIENCES, DEVELOPMENT and CHEMISTRY

Proceedings of the 2014 International Conference on Energy, Environment, Development and Economics (EEDS 2014)
Proceedings of the 2014 International Conference on Geology and Seismology (GESE 2014)
Proceedings of the 2014 International Conference on Maritime and Naval Science and Engineering (MANASE 2014)
Proceedings of the 2014 International Conference on Water Resources, Hydraulics & Hydrology (WHH 2014)
Proceedings of the 2014 International Conference on Chemistry and Chemical Engineering (CCE 2014)

Santorini Island, Greece
July 17-21, 2014

ADVANCES in ENVIRONMENTAL SCIENCES, DEVELOPMENT and CHEMISTRY

Proceedings of the 2014 International Conference on Energy, Environment, Development and Economics (EEDS 2014)
Proceedings of the 2014 International Conference on Geology and Seismology (GESE 2014)
Proceedings of the 2014 International Conference on Maritime and Naval Science and Engineering (MANASE 2014)
Proceedings of the 2014 International Conference on Water Resources, Hydraulics & Hydrology (WHH 2014)
Proceedings of the 2014 International Conference on Chemistry and Chemical Engineering (CCE 2014)

Santorini Island, Greece
July 17-21, 2014

All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.

ISBN: 978-1-61804-239-2

ADVANCES in ENVIRONMENTAL SCIENCES, DEVELOPMENT and CHEMISTRY

Proceedings of the 2014 International Conference on Energy, Environment, Development and Economics (EEDS 2014)
Proceedings of the 2014 International Conference on Geology and Seismology (GESE 2014)
Proceedings of the 2014 International Conference on Maritime and Naval Science and Engineering (MANASE 2014)
Proceedings of the 2014 International Conference on Water Resources, Hydraulics & Hydrology (WHH 2014)
Proceedings of the 2014 International Conference on Chemistry and Chemical Engineering (CCE 2014)

Santorini Island, Greece
July 17-21, 2014

Organizing Committee

General Chairs (EDITORS)

- Prof. Nikos Mastorakis, Technical University of Sofia, Bulgaria
- Prof. Vladimir Sokolov, University of Karlsruhe, Germany
- Prof. Reinhard Neck, Klagenfurt University, Austria
- Prof. Rui Pedro Juliao, Universidade Nova De Lisboa, Portugal
- Prof. Jian Wang, Los Alamos National Laboratory, USA
- Prof. Efthimios Karymbalis, Harokopio University, Athens, Greece
- Prof. Levent Yilmaz, Istanbul Technical University, Turkey
- Prof. Ernst D. Schmitter, University of Applied Sciences, Germany
- Prof. Marc A. Rosen, University of Ontario, Canada
- Prof. Roy Perryman, University of East London, UK
- Prof. Ottavia Corbi, University of Naples Federico II, Italy
- Prof. Manijeh Razeghi, Northwestern University, USA
- Prof. Jun Zhang, Inner Mongolia University, P. R. China
- Prof. Samuel Lofland, Rowan University, USA

Associate Editors:

- Luís Loures
- Liandong Zhu

Senior Program Chair

- Prof. Shoji Arai, Kanazawa University,
  Kanazawa, Ishikawa Prefecture,
  Japan

Program Chairs

- Prof. Panos Pardalos,
  Department of University of Florida,
  USA
- Prof. Filippo Neri
  Dipartimento di Informatica e Sistemistica
  University of Naples "Federico II"
  Naples, Italy
- Prof. Bharat Doshi,
  John Hopkins University,
  Mayrland, USA

Tutorials Chair

- Prof. Pradip Majumdar
  Department of Mechanical Engineering
  Northern Illinois University
  Dekalb, Illinois, USA

Special Session Chair

- Prof. Essam Eldin Khalil,
  ASME Fellow,
  Cairo University, Cairo,
  Egypt

Workshops Chair

- Prof. Hyung Hee Cho, ASME Fellow,
  Yonsei University (and National
  Academy of Engineering of Korea),
  Korea

Local Organizing Chair

- Dr. Claudio Guarnaccia, University of Salerno, Italy

Publication Chair

- Prof. Marcin Kaminski,
  Department of Structural Mechanics,
  Al. Politechniki 6, 90-924 Lodz, Poland

Publicity Committee

- Prof. Kumar Tamma,
  University of Minnesota,
  Minneapolis, MN, USA
- Prof. Gang Yao,
  University of Illinois at Urbana -
  Champaign, USA

International Liaisons

- Prof. Quan Wen,
  Department of Economics University of Washington,
  Seattle, WA, USA
- Prof. Fotios Rigas,
  School of Chemical Engineering,
  National Technical University of Athens,
  Greece.
- Prof. Vincenzo Niola
  Departement of Mechanical Engineering for Energetics
  University of Naples "Federico II"
  Naples, Italy
- Prof. Christopher G. Provatidis,
  National Technical University of Athens,
  Zografou, Athens, Greece

Steering Committee

- Prof. Aida Bulucea, University of Craiova, Romania
- Prof. Zoran Bojkovic, Univ. of Belgrade, Serbia
- Prof. Ottavia Corbi, University of Naples Federico II, Italy
- Prof. Imre Rudas, Obuda University, Budapest, Hungary
- Prof. Metin Demiralp, Istanbul Technical University, Turkey
- Prof. Reinhard Neck, Klagenfurt University, Klagenfurt, Austria
- Prof. Ottavia Corbi, University of Naples Federico II, Italy

Program Committee

Prof. Bharat Doshi, John Hopkins University, Mayrland, USA
Prof. Gang Yao, University of Illinois at Urbana - Champaign, USA
Prof. Lu Peng, Luisian State University, Baton Rouge, LA, USA
Prof. Y. Baudoin, Royal Military Academy, Brussels, Belgium
Prof. F.Rigas, School of Chemical Engineering, National Technical University of Athens, Greece.
Prof. S. Sohrab, Northwestern University, IL, USA
Prof. A. Stamou, National Technical University of Athens, Greece
Prof. A. I. Zouboulis, Dept. of Chemistry, Aristotle University of Thessaloniki, Greece
Prof. Z. A. Vale, ISEP - Instituto Superior de Engenharia do Porto Rua Antonio Bernardino de Almeida, Portugal
Prof. M. Heiermann, Dr., Department of Technology Assessment and Substance Flow, Potsdam, Germany
Prof. I. Kazachkov, National Technical University of Ukraine (NTUU KPI), Kyiv, Ukraine
Prof. A. M.A. Kazim, UAE University, United Arab Emirates
Prof. A. Kurbatskiy, Novosibirsk State University, Department of Physics, Russia
Prof. S. Linderoth, Head of Research on Fuel Cells and Materials Chemistry at Riso National Laboratory. Denmark
Prof. P. Lunghi, Dipartimento di Ingegneria Industriale, University degli Studi di Perugia, Italy
Prof. J. Van Mierlo, Department of Electrotechnical Engineering and Energy Technology (ETEC) Vrije Universiteit Brussel, Belgium
Prof. Pavel Loskot, Swansea University, UK
Prof. N. Afgan, UNESCO Chair Holder, Instituto Superior Tecnico, Lisbon, Portugal
Prof. F. Akgun, Gebze Kocaeli, Turkey
Prof. Fernando Alvarez, Prof. of Economics, University of Chicago, USA
Prof. Mark J. Perry, Prof. of Finance and Business Economics, University of Michigan-Flit, USA
Prof. Biswa Nath Datta, IEEE Fellow, Distinguished Research Prof., Northern Illinois University, USA
Prof. Panos Pardalos, Distinguished Prof. Director, Center for Applied Optimization, University of Florida, USA
Prof. Gamal Elnagar, University of South Carolina Upstate,Spartanburg, SC, USA
Prof. Luis Tavares Rua, Cmte Guyubricht, 119. Conj. Jardim Costa do Sol. Atalaia, Brazil
Prof. Igor Kuzle, Faculty of electrical engineering and computing, Zagreb, Croatia
Prof. Maria do Rosario Alves Calado, University of Beira Interior, Portugal
Prof. Gheorghe-Daniel Andreescu, "Politehnica" University of Timisoara, Romania
Prof. Jiri Strouhal, University of Economics Prague, Czech Republic
Prof. Morris Adelman, Prof. of Economics, Emeritus, MIT, USA
Prof. Germano Lambert-Torres, Itajuba,MG, Brazil
Prof. Jiri Klima, Technical faculty of CZU in Prague, Czech Republic
Prof. Goricanec Darko, University of Maribor, Maribor, Slovenia
Prof. Ze Santos, Rua A, 119. Conj. Jardim Costa do Sol, Brazil
Prof. Ehab Bayoumi, Chalmers University of Technology,Goteborg, Sweden
Prof. Robert L. Bishop, Prof. of Economics, Emeritus, MIT, USA
Prof. Glenn Loury, Prof. of Economics, Brown University, USA
Prof. Patricia Jota, Av. Amazonas 7675, BH, MG, Brazil
Prof. S. Ozdogan, Marmara University, Goztepe Campus, Kuyubasi, Kadikoy, Istanbul, Turkey
Prof. Morris Adelman, Professor of Economics, Emeritus, MIT, USA
Prof. Robert L. Bishop, Professor of Economics, Emeritus, MIT, USA
Prof. Glenn Loury, Professor of Economics, Brown University, USA
Prof. Fernando Alvarez, Professor of Economics, University of Chicago, USA
Prof. Mark J. Perry, Professor of Finance and Business Economics, University of Michigan-Flit, USA
Prof. Quan Wen, Department of Economics University of Washington, Seattle, WA, USA
Prof. David E. Giles, Department of Economics, University of Victoria, Canada
Prof. Joao Ricardo Faria, University of Texas at El Paso, El Paso, Texas, USA
Prof. Jacob Engwerda, Tilburg University, The Netherlands
Prof. Thomas D. Crocker, University of Wyoming, 1000 E. University Ave. Laramie, USA

Additional Reviewers

Santoso Wibowo	CQ University, Australia
Lesley Farmer	California State University Long Beach, CA, USA
Xiang Bai	Huazhong University of Science and Technology, China
Jon Burley	Michigan State University, MI, USA
Genqi Xu	Tianjin University, China
Zhong-Jie Han	Tianjin University, China
Kazuhiko Natori	Toho University, Japan
João Bastos	Instituto Superior de Engenharia do Porto, Portugal
José Carlos Metrôlho	Instituto Politecnico de Castelo Branco, Portugal
Hessam Ghasemnejad	Kingston University London, UK
Matthias Buyle	Artesis Hogeschool Antwerpen, Belgium
Minhui Yan	Shanghai Maritime University, China
Takuya Yamano	Kanagawa University, Japan
Yamagishi Hiromitsu	Ehime University, Japan
Francesco Zirilli	Sapienza Universita di Roma, Italy
Sorinel Oprisan	College of Charleston, CA, USA
Ole Christian Boe	Norwegian Military Academy, Norway
Deolinda Rasteiro	Coimbra Institute of Engineering, Portugal
James Vance	The University of Virginia's College at Wise, VA, USA
Valeri Mladenov	Technical University of Sofia, Bulgaria
Angel F. Tenorio	Universidad Pablo de Olavide, Spain
Bazil Taha Ahmed	Universidad Autonoma de Madrid, Spain
Francesco Rotondo	Polytechnic of Bari University, Italy
Jose Flores	The University of South Dakota, SD, USA
Masaji Tanaka	Okayama University of Science, Japan
M. Javed Khan	Tuskegee University, AL, USA
Frederic Kuznik	National Institute of Applied Sciences, Lyon, France
Shinji Osada	Gifu University School of Medicine, Japan
Dmitrijs Serdjuks	Riga Technical University, Latvia
Philippe Dondon	Institut polytechnique de Bordeaux, France
Abelha Antonio	Universidade do Minho, Portugal
Konstantin Volkov	Kingston University London, UK
Manoj K. Jha	Morgan State University in Baltimore, USA
Eleazar Jimenez Serrano	Kyushu University, Japan
Imre Rudas	Obuda University, Budapest, Hungary
Andrey Dmitriev	Russian Academy of Sciences, Russia
Tetsuya Yoshida	Hokkaido University, Japan
Alejandro Fuentes-Penna	Universidad Autónoma del Estado de Hidalgo, Mexico
Stavros Ponis	National Technical University of Athens, Greece
Moran Wang	Tsinghua University, China
Kei Eguchi	Fukuoka Institute of Technology, Japan
Miguel Carriegos	Universidad de Leon, Spain
George Barreto	Pontificia Universidad Javeriana, Colombia
Tetsuya Shimamura	Saitama University, Japan

Table of Contents

Plenary Lecture 1

Floating Offshore Wind Turbines: The Technologies and the Economics

Prof. Paul D. Sclavounos
Professor of Mehanical Engineering and Naval Architecture
Massachusetts Institute of Technology (MIT)
77 Massachusetts Avenue
Cambridge MA 02139-4307
USA
E-mail: pauls@mit.edu

Abstract: Wind is a vast, renewable and clean energy source that stands to be a key contributor to the world energy mix in the coming decades. The horizontal axis three-bladed wind turbine is a mature technology and onshore wind farms are cost competitive with coal fired power plants equipped with carbon sequestration technologies and in many parts of the world with natural gas fired power plants.

Offshore wind energy is the next frontier. Vast sea areas with higher and steadier wind speeds are available for the development of offshore wind farms that offer several advantages. Visual, noise and flicker impacts are mitigated when the wind turbines are sited at a distance from the coastline. A new generation of 6-10MW wind turbines with diameters exceeding 160m have been developed for the offshore environment. They can be fully assembled at a coastal facility and installed by a low cost float-out operation. Floater technologies are being developed for the support of multi-megawatt turbines in waters of moderate to large depth, drawing upon developments by the offshore oil & gas industry.

The state of development of the offshore wind energy sector will be discussed. The floating offshore wind turbine technology will be reviewed drawing upon research carried out at MIT since the turn of the 21st century. Floating wind turbine installations worldwide and planned future developments will be presented. The economics of floating offshore wind farms will be addressed along with the investment metrics that must be met for the development of large scale floating offshore wind power plants.

Brief Biography of the Speaker: Paul D. Sclavounos is Professor of Mechanical Engineering and Naval Architecture at the Massachusetts Institute of Technology. His research interests focus upon the marine hydrodynamics of ships, offshore platforms and floating wind turbines. The state-of-the-art computer programs SWAN and SML developed from his research have been widely adopted by the maritime, offshore oil & gas, and wind energy industries. His research

activities also include studies of the economics, valuation and risk management of assets in the crude oil, natural gas, shipping and wind energy sectors. He was the Georg Weinblum Memorial Lecturer in 2010-2011 and the Keynote Lecturer at the Offshore Mechanics and Arctic Engineering Conference in 2013. He is a member of the Board of the North American Committee of Det Norske Veritas since 1997, a member of the Advisory Committee of the US Navy Tempest program since 2006 and a member of the Advisory Board of the Norwegian Center for Offshore Wind Energy Technology since 2009. He has consulted widely for the US Government, shipping, offshore, yachting and energy industries.
http://meche.mit.edu/people/?id=76

Plenary Lecture 2

The Influence of a Magnetic Field in the Fuel of a Gasoline Engine

Professor Charalampos Arapatsakos
Department of Production and Management Engineering
Democritus University of Thrace
GREECE
E-mail: xarapat@pme.duth.gr

Abstract: This work examines the effect of magnetic field in a four stroke gasoline engine. The magnetic field that was created affected the fuel just before it enters to the engine. As a result there was a change in the combustion of the engine as well as variations in the exhaust gases. The engine was functioned without and under full load.

Brief Biography of the Speaker: Dr Charalampos Arapatsakos is a Greek citizen, who has been born in Athens. He has studied Mechanical Engineering. He is Professor on Democritus University of Thrace in Greece. Prof C. Arapatsakos has participated in many research programs about biofuels, gas emissions and antipollution technology. His research domains are mainly on biofuels and their use in internal combustion engines, the power variation from the use of biofuels, the gas emissions, mechanical damages, internal combustion engines, antipollution technology, renewable sources of energy, gas emissions, vehicle design, elements of machines, resistance of materials, technical mechanics, heat transmission.