

MULTIPHYSICS 2018

13-14 DEC 2018

KRAKOW, POLAND

WWW.MULTIPHYSICS.ORG

FINAL PROGRAM

Thursday 13 December 2018

09:00 – 09:30 Registration

09:30 – 09:45 Conference Opening

Opening of The 13th International Conference of Multiphysics 2018

Jerzy Wiciak, Deputy Dean for Science, Faculty of Mechanical Engineering and Robotics, AGH University of Science and Technology, Poland

Maciej Petko, Head of Department of Robotics and Mechatronics, AGH University of Science and Technology, Poland

09:45 – 11:00 Session 1.1

Keynote Address & Synopsis

Chair: *Moji Moatamedi, The International Society of Multiphysics*

Health Monitoring implementation to aerial platforms for structural integrity monitoring - need or necessity?

Krzysztof Dragan, Air Force Institute of Technology, Warsaw, Poland

Synopsis Part 1: The International Journal of Multiphysics

Synopsis Part 2: The International Conference of Multiphysics 2019

Hassan Khawaja, The International Society of Multiphysics

11:00-11:30 Tea/Coffee Break & Group Photograph

11:30-13:00 Session 1.2

Impact and Explosions

Chair: *A Martowicz, AGH University, Poland*

FEM and SPH methods for Industrial Applications

M.Souli^a, E. Albahkali^b, M. Moatamedi^c

a. Lille University of Science and Technology, France

b. King Saud University, KSA

c. UiT-The Arctic University of Norway

Non-contact evaluation of boundary conditions influence on guided waves propagation in thin soft layers

Patrycja Pyzik, Lukasz Ambrozinski,

AGH University of Science and Technology, Krakow, Poland

Experiment and numerical analysis of softening of meat using underwater shock wave

Ken Shimojima, Yoshikazu Higa, Osamu Higa, Hideaoki Kawai, Kazuyuki Hokamoto,

Department of Mechanical Systems Engineering, National Institute of Technology, Okinawa College, Japan

On the prediction of rupture impulse of the square plates subjected to localised blast load

Navid Mehreganian^a, Arash Fallah^b; a. Imperial College London, London, UK; b. Brunel University London, UK

13:00-14:00 Lunch

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14:00-15:30

Session 1.3

Simulation Techniques

Chair: E Albahkali, King Saud University, KSA

Enhancing the understanding of complex phenomena in powder coating, by applying Eulerian-Lagrangian simulation methodology

G.Boiger, M.Boldrini, B.Siyghan,

ZHAW Zurich University of Applied Sciences, ICP Institute of Computational Physics, Switzerland

Comparison of Explicit Method of Solution for CFD Euler Problems using MATLAB® and FORTRAN 77

Anders Nordli, Hassan Khawaja,

UiT-The Arctic University of Norway, Tromsø, Norway

EOF-Library: highly efficient open-source coupler for FEM and FVM frameworks

Juris Vencels,

University of Latvia, Riga, Latvia

Multiphysics approach for a pantograph-catenary system simulation

Paweł Zdziebko, Tadeusz Uhl, Adam Martowicz,

AGH University of Science and Technology, Poland

15:30-16:00

Tea / Coffee Break

16:00-17:30

Session 1.4

Aerospace

Chair: A Fallah, Brunel University, UK

Aerodynamic Improvement of Test Rig for Investigation of Blade Cascade at Large Incidence Angles of Subsonic Flow

Vadym Kruts, Anatoliy Zinkovskii; Serhii Kabannik,

IPS NAS of Ukraine

The Express Method for Determination of Stability Limit of Axial Compressor Blading against Subsonic Flutter

Kyrylo Savchenko, Serhiy Kabannyk, Yevheniia Onyshchenko,

IPS, NAS of Ukraine

Prediction of mechanical and electrical properties of composites based on weft-knitted fabrics

V. Stavychenko^a, M. Shevtsova^a, P. Shestakov^a, A. Litvinova^a, O. Mazna^b, V. Kokhany^b, I. Obodeeva^b; a. KhAI; b. IMPS NASU

Lightweight MAX phases - based materials heat-resistant in oxidizing and hydrogen atmosphere

PRIKHNA Tetiana¹, OSTASH Orest², SVERDUN Vladimir¹, CABIOC'H Thierry³, KARPETS Myroslav¹, SERBENYUK Tetiana¹, STAROSTINA Alxanda¹, JAVORSKA Lucyna⁴, DUB Sergey¹, KUPRIN Alexander⁵; ¹ Institute for Superhard Materials of the National Academy of Sciences of Ukraine; ² Karpenko Physical-Mechanical Institute of the National Academy of Sciences of Ukraine; ³ Universite de Poitiers, Chasseneuil Futuroscope Cedex, France; ⁴ The Institute of Advanced Manufacturing Technology, Krakow, Poland; ⁵ National Science Center Kharkov Institute of Physics and Technology, Kharkov, Ukraine

19:30

Conference Banquet

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Session 2.1

Thermal Modelling

Chair: B Alzahabi, Al Ghurair University, UAE

IR Thermography in Multiphysics Applications

Hassan Khawaja

UiT-The Arctic University of Norway, Tromsø, Norway

Multi-scale Electrochemical-Thermal models for Automotive Battery Pack Thermal Management

K. Darcovich⁽¹⁾, D.D. MacNeil⁽¹⁾, S. Recoskie⁽¹⁾, Q. Cadic⁽²⁾, F. Ilincal⁽³⁾; (1) National Research Council of Canada, Energy, Mining and Environment Research Centre, Ottawa, Ontario, Canada; (2) ICAM-Toulouse, 75 avenue de Grande Bretagne, 31300 Toulouse, France; (3) National Research Council of Canada, Automotive and Surface Transportation Research Centre, Boucherville, Québec, Canada

Laser Spot Thermography - scanning mod

Jakub Roemer, Łukasz Pieczonka,

AGH University of Science and Technology, Krakow, Poland

Nonlocal approaches for modeling components of gas foil bearing

Adam Martowicz, Jakub Bryla, Jakub Roemer, Wiesław J. Staszewski,

AGH University of Science and Technology, Krakow, Poland

11:00-11:30

Tea / Coffee Break

11:30 – 13:00

Session 2.2

Advanced Materials

Chair: G Boiger, Zurich University of Applied Sciences, Switzerland

Investigation on Multi-Material Flows by Coupling MMALE and FDM

Tao Li, Hao Li, Cheng Wang,

State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology, Beijing, China

A novel ex-situ aluminum foam filled fourfold-tube nested tube system as the energy absorber

Bin Xu, Cheng Wang, Wenlong Xu,

State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology, Beijing, China

Multi-Material Interface Method Based on Hyperelastic Model

Wanli Wang, Cheng Wang,

State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology, Beijing, China

Flame propagation characteristic of explosion in the tube with a tilted obstacle

Yangyang Cui, Cheng Wang,

State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology, Beijing, China

13:00-14:00

Lunch

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Session 2.3

Multiphysics Applications

Chair: H Khawaja, UiT-The Arctic University of Norway

Frequency band structure of phononic dispersion in fractal lattices

Navid Navadeh^a, Vladimir V Tereshchuk^b, Vyacheslav Gorshkov^b, Arash S Fallah^c; a. Imperial College London, UK; b. Kiev Polytechnic Institute, Ukraine; c. Brunel University London, UK

Impact of fouling on mechanical resonator-based viscosity sensors: Comparison of experiments and numerical model

Daniel Brunner^{a,c}, Kaus Häusler^a, Sunil Kumar^b, Hassan Khawaja^c, Moji Moatamedi^c, Gernot Boiger^a; a. ZHAW Zurich University of Applied Sciences, ICP Institute of Computational Physics, Switzerland; b. Rheonics GmbH, Winterthur, Switzerland; c. UiT-The Arctic University of Norway, Tromsø, Norway

A Comparison Between Two Different Elbow Design for a Fiberglass Pipe Using Fluid Structure Interaction

Essam AlBahkali¹, Hisaham Elkanani¹, Zeyad Almutairi¹, Thamer AlBahkali¹, Mhamed Souli²; 1 Department of Mechanical Engineering, King Saud University, Riyadh, Saudi Arabia; 2 Laboratoire de Mécanique, de Lille, UMR CNRS 8107, Villeneuve d'Ascq, France

Numerical simulations of ultrasonic waves self-focusing in composite laminates

Lukasz Pieczonka, Daniel Błaszkiwicz, Radosław Mormul
AGH University, Poland

15:30-16:00

Tea / Coffee Break

16:00-17:30

Session 2.4

Posters

IR Thermography of Steel Specimens undergoing Tensile Tests

Even Stange, Hassan Khawaja
UiT-The Arctic University of Norway, Tromsø, Norway

Finite Structure Interaction of Aquaculture Net Cages

Odd Einar Myrli, Hassan Khawaja
UiT-The Arctic University of Norway, Tromsø, Norway

An Efficient Grayscale Representation for Retinal Vessel Extraction

Mohammad Asmat Ullah Khan, Mojtaba Moatamedi, Basem Alzahabi
Al Ghurair University, UAE

Numerical procedure for identifying the ammonia concentration of the sewage influent based on SCADA measurements of the effluent properties

P. Król*, A. Gallina*, T. Uhl*, T. Żaba**; *Department of Robotics and Mechatronics, AGH University of Science and Technology, Kraków, Poland; **MPWIK S.A. w Krakowie, Kraków, Poland

CFD modelling of pollutant transport

Synne Karoline Madsen, Hassan Khawaja; UiT-The Arctic University of Norway, Tromsø, Norway

17:30

Close of Conference