



University of Belgrade
Faculty of Mechanical Engineering

TRANSACTIONS

FME TRANSACTIONS	ISSN 1451-2092 UE	OC: 621
Editor:	Volume 48, No 4, 2020, pp. 725 – 978	
Boško Rašuo	CONTENTS	PAGE
University of Belgrade	Goran D. Putnik, Diana Rodrigues, Cátia Alves, Paulo	725
Associate Editor:	Ávila, Hélio Castro, Maria Manuela Cruz-Cunha	
Stevanović Vladimir University of Belgrade	Analysing Meta-Organizations with Embedded Brokering Services Performance Modelled as a Call-Centre for Supporting Dynamic Reconfigurability of Networked and Virtual	
Editorial Board:	Organizations Marta R. Trninić	733
Avellan François Swiss Federal Institute of Technology, Zurich, Switzerland	Mathematical Modelling of Primary and Secondary Pyrolysis –	700
Cizmas Paul Texas A&M University, College Station, USA	State of the Art	715
Dulikravich S. George	Slavenko M. Stojadinovic, Numan M. Durakbasa, Sasa T. Zivanovic	745
Florida International University, Miami, USA Đorđević Vladan	An Optimized and Virtual on-Machine Measurement Planning Model	
University of Belgrade	Andreas Rücker, Jona Rief, Johannes Fottner	753
Ehmann F. Kornel Northwestern University, Evanston IL, USA	Development of a method for the energy efficiency determination of stacker cranes in automated high-bay	
Fragassa Cristiano Alma Mater Studiorum - University of Bologna, Italy	warehouses Dijana Damljanović, Djordje Vuković, Goran Ocokoljić,	761
Gajić Zoran Rutgers University, USA	Boško Rašuo Compagana of Transonia Wind Tunnel Test Pagalta of the	
Jakirlic Suad	Convergence of Transonic Wind Tunnel Test Results of the AGARD-B Standard Model	
Technische Universität Darmstadt, Germany Jovanović Jasmina	Goran Ocokoljić, Boško Rašuo, Dijana Damljanović, Saša Živković	770
University of Belgrade Kartnig Georg Technische Universität Wien, Austria	Experimental and Numerical Research of the Influence of Thrust Vector Control on the Missile Aerodynamics by Cold and Hot Jet Simulations	
Klimenko A. Sergei National Academy of Sciences, Kiev, Ukraine	Payal V. Tembhurnikar, Akash T. Jadhav, Devabrata Sahoo	779
Komatina Mirko University of Belgrade	Effect of Intermediate Aerodisk Mounted Sharp Tip Spike on the Drag Reduction over a Hemispherical Body at Mach 2.0	
Meerkamm Harald Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany	Lucky Anetor, Edward E. Osakue, Kendall Harris	787
Mester Gyula University of Szeged, Szeged, Hungary	Simulation Studies of Combustion in Spark Ignition Engine using Openfoam	
Minak Giangiacomo Alma Mater Studiorum - University of Bologna, Italy	Ekhlas M. Fayyadh, Nibras M. Mahdi, Ali F. Mohammed	800
Moschetta Jean-Marc	The Effect of Air Injection System on Airlift Pump Performance	
ISAE-SUPAERO, University of Toulouse, France	Jong Hyok Ri, Razvan-George Ripeanu, Alin Dinita Erosion Modeling in Parallel Gate Valve	808
Nedić Novak University of Kragujevac	Miroslava Ťavodová, Nataša Náprstková, Michaela	816
Putnik Goran	Hnilicová, Pavel Beňo	
University of Minho, Portugal Radovanović Miroslav	Quality Evaluation of Welding Joints by Different Methods Jamal Baliti, Mohamed Hssikou, Youssef Elguennouni,	825
University of Nis	Ahmed Moussaoui, Mohammed Alaoui	020
Sedmak Aleksandar University of Belgrade Solazzi Luigi	Heat Transfer and Entropy Generation for Natural Convection by Adiabatic Obstacles Inside a Cavity Heated on the Left Side	
University of Brescia, Italy	Ezz Eldin Ibrahim, Tarek Elnady, Mohamed Saffaa	833
Soutis Constantinos The Unversity of Manchester, Manchester, UK	Hassan, Ibrahim Saleh	
Stamenović Dimitrije	Modelling, Transient Response and Hydraulic Behaviour of 2DOF Stabilization Platform	

Sedmak Simon University of Belgrade

Technical Editor:

Boston University, Boston, USA

Published by:

University of Belgrade Faculty of Mechanical Engineering

The journal is covered in the Emerging Sources Citation Index (ESCI) Clarivate Analytics services.

(Contents continued on inside back cover)

841

849

N Ameer Ahamad, Sarfaraz Kamangar, A. F. Aljohani,

Azeem, Maughal Ahmed Ali Baig, Irfan Anjum

Double Diffusion in Square Porous Cavity Subjected to

Ana Zdravkova, Ile Mircheski, Sofija Sidorenko

Bio-Inspired Approach for Innovative Design of Knee

2DOF Stabilization Platform

Conjugate Heat Transfer

Protectors for Recreational Sports

Badruddin

The publication of the Vol. 48, No 4 of this Journal was fully financially supported by the Ministry of Education and Science of the Republic of Serbia. This support is gratefully acknowledged.

Printed by:

"PLANETA print", Ruzveltova 10, 11000 Belgrade

Aims and Scope:

The journal FME Transactions publishes original papers (reviewing and contributed papers, and communications) from all fields of Mechanical Engineering, which is, as a branch of Engineering, considered in the journal in its broadest possible sense. Thus, the articles are welcome from: Applied Mechanics, Fluids Engineering, Thermodynamics, Heat and Mass Transfer, Robotics, Material Science, Tribology, Combustion, Mechanical Design and Machine Dynamics, Production, Industrial, Agricultural, Aerospace, Processing, Railway, Biomedical and Control Engineering, Mechanization, Hydro- and Thermo-power Systems, Internal Combustion Engines and Vehicle Dynamics, Energy Resources Technology, Military Technology, Naval Architecture, and Applied and Industrial Mathematics.

Theoretical, experimental and computational analyses of various problems of Mechanical Engineering are equally welcome and acceptable for publication. In addition, there will be published book reviews, announcements of symposia, and in special issues, proceedings of selected papers from symposia organized by the Faculty of Mechanical Engineering in Belgrade.

Reviewing papers will be published by invitation only. One volume consists of four numbers.

Instructions for Authors:

A FME Transaction manuscript should by written clearly and concisely in correct English, with assumptions clearly identified, with precise logic, with relevance to practice described, and with actual accomplishments of the work plainly stated and honestly appraised.

Normally, the length of a reviewing paper is up to 12 pages, the length of a contributed paper is up to 8 pages, while the length of a short communication should not exceed 4 pages. All papers are subject to a reviewing process. During the process the names of referees will be kept confidential to authors, and also the names of authors will remain anonymous to referees. As a rule the reviewing process should be accomplished in 2-3 months. Final acceptance of a paper for publication in the Journal is based on the decision of the Editorial Board.

Template for Manuscript:

https://www.mas.bg.ac.rs/istrazivanje/fme/start

Submission of Papers:

Papers intended for publication in FME Transactions should be submitted to the Editor, in the electronic form, to the following address:

fme-transactions@mas.bg.ac.rs

or:

Prof. Bosko Rasuo, Editor brasuo@mas.bg.ac.rs Faculty of Mechanical Engineering Kraljice Marije 16, 11120 Belgrade 35 Serbia

On line service:

http:/www.mas.bg.ac.rs/transactions

ISSN 1451-2092 UDC: 621

ISSN 1451-2092	DC: 621
Volume 48, No 4, 2020, pp. 725 – 978	
CONTENTS CONTINUED	PAGE
S. Rehman, M. A. Baseer, L. M. Alhems	855
GIS-Based Multi-Criteria Wind Farm Site Selection Methodology	
Seifeddine Garneoui, István Keppler, Péter Korzenszky	868
Mixing enhancement of wheat granules in a hopper bottom lab- scale mixer using Discrete Element simulations	
Mirko Dinulović, Boško Rašuo, Marta R. Trninić, Vuk M. Adžić	874
Numerical Modeling of Nomex Honeycomb Core Composite Plates at Meso Scale Level	
Fida Zair, Mhamed Mouqallid, El houssine Chatri, Rabii El Maani	882
The Effect of the Presence of Obstacles on the Emission Dispersion Emitted by a Bent Chimney	
A. Gritsenko, V. Shepelev, G. Salimonenko, Yu. Cherkassov, P. Buyvol	889
Environmental Control and Test Dynamic Control of the Engine Output Parameters	
Vimal Kumar Pathak, Ashish Kumar Srivastava, Sumit Gupta	899
Methodology for GD&T Verification in an Innovative Benchmark Part for Contactless Scanning Systems	
Youssef Ouhassan, Seddik Bri, My Chrif El boubakraoui, Mohamed Habibi	908
Dielectric Properties of Ceramic Composite Materials Based on Ilumina Reinforced by Titanium Carbide	i
Vili Milković, Dragutin Lisjak, Davor Kolar	914
New Reliability-Based Model of Stock Optimisation for Railroad Passenger Wagon Maintenance	
Shafiqur Rehman, Salman A. Khan, Luai M. Alhems	922
The Effect of Acceleration Coefficients in Particle Swarm Optimization Algorithm with Application to Wind Farm Layout Design	
Mayank Sharma, Anil Kr. Tiwari, Dhananjay R. Mishra	931
Experimental Evaluation and Theoretical Analysis of the Long Stills Covered with the GI, Cu and Al Sheets	
Oday I. Abdullah, Wisam T. Abbood, Hiba K. Hussein	938
Development of Automated Liquid Filling System Based on he Interactive Design Approach	
Oleg E. Markov, Volodymyr V. Kukhar, Vitalii N. Zlygoriev, Alexander A. Shapoval, Anton S. Khvashchynskyi, Roman U. Zhytnikov	946
mprovement of Upsetting Process of Four-Beam Workpieces Based on Computerized and Physical Modeling	
Dinesh Kumar Suppan, Ravichandran Fhillaigovindan, Yuvaraj Natarajan	954
Experimental Investigation on Cryogenic Assisted Abrasive Aqua Jet Machining of Die Steel	
Dhanesh. C, Anand. T, Venkatesan. J	962
Analysis of Bronze Hybrid Composite for Spark Ignition Engine Piston	
Bharath V, Ashita D H, V Auradi, Madeva Nagaral	968
Influence of variable particle size reinforcement on mechanical	

and wear properties of Alumina reinforced 2014Al alloy

particulate composite