



University of Belgrade Faculty of Mechanical Engineering

TRANSACTIONS

1

29

37

45

57

68

E	di	to	O	r	•

Boško Rašuo

University of Belgrade

Associate Editor:

Stevanović Vladimir

University of Belgrade

Editorial Board:

Avellan François

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Cizmas Paul

Texas A&M University, College Station, USA

Dulikravich S. George

Florida International University, Miami, USA

Ehmann F. Kornel

Northwestern University, Evanston IL, USA

Fragassa Cristiano

Alma Mater Studiorum - University of Bologna, Italy

Gajić Zoran

Rutgers University, USA

Jakirlic Suad

Technische Universität Darmstadt, Germany

Jemcov Aleksandar

University of Notre Dame, South Bend IN, USA

Jovanović Jasmina

University of Belgrade

Kartnig Georg

Technische Universität Wien, Austria

Komatina Mirko

University of Belgrade

Meerkamm Harald

Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Mester Gyula

University of Szeged, Szeged, Hungary

Minak Giangiacomo

Alma Mater Studiorum - University of Bologna, Italy

Moschetta Jean-Marc

ISAE-SUPAERO, University of Toulouse, France

Parezanović Vladimir

Khalifa University of Science and Technology, Abu Dhabi, UAE

Putnik Goran

University of Minho, Portugal

Radovanović Miroslav

University of Nis

Sedmak Aleksandar

University of Belgrade

Solazzi Luigi

University of Brescia, Italy

Soutis Constantinos

The Unversity of Manchester, Manchester, UK

Stamenović Dimitrije

Boston University, Boston, USA

Vukelic Sinisa

Columbia University, New York, USA

Technical Editor:

Sedmak Simon

University of Belgrade

Published by:

University of Belgrade Faculty of Mechanical Engineering

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

Volume 52, No 1, 2024, pp. 1 – 172

CONTENTS

M. Elgezzar, A. Rashad, M. S. Hassan, T. Elnady

CFD Analysis and Geometrical Parameter Investigation For The Design of A High-Efficiency Supersonic Ejector

Thanh Truong Nguyen, Thanh Hai Nguyen, 12 Ha Quang Thinh Ngo

Investigation on the Mechanical Design of Robot Gripper for Intelligent Control Using the Lowcost Sensor

Sergii G. Karnaukh, Oleg E. Markov, Anton A. Lysenko

Research on the New Process of Separating Hollow Work-Piece by Eccentric Torsion Cutting for Stamping

Le Hoai Phuong, Vo Duy Cong

Control the Robot Arm through Vision-Based Human Hand Tracking

Imran M. Jamadar, Ajit Kumar Patil, Prasanta Kumar Samal, B. Suresha

An Empirical Model Integrating Dimensional Analysis and Box-Behnken Design for Crack Detection in Rotor Fan Blades

Ghufran Hamza Omran, Nabaa Sattar Radhi, Basim Ajeel Abass

Synthetic and Characterization of Al-PTFE Functionally Graded Material Using Powder Metallurgy Technique

Youssef Ouhassan, Seddik Bri, Mohamed Habibi

The Effect of Reinforcement of Alumina Matrix Composites by ZrB2 and FeSiAl Inclusions on the Dielectric Property at Microwave Frequencies

Hilal H. Nuha, Adil Balghonaim, Rizka Reza 78 Pahlevi, S. Rehman, M. Mohandes

Vertical Wind Speed Extrapolation Using Statistical Approaches

(Contents continued on inside back cover)



The Ministry of Education and Science of the Republic of Serbia financially supported the publication of Volume 52, No 1 of this Journal. This support is gratefully acknowledged.

Printed by:

"PLANETA print", Ruzveltova 10, 11000 Belgrade

Aims and Scope:

The journal FME Transactions publishes original scientific, double-blind peer-review papers (reviewing and contributed papers) 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, Machine Dynamics, Agricultural, Production, Industrial, Aerospace, Railway, Processing, Biomedical and Control Engineering, Mechanization, Hydro- and Thermopower Systems, Internal Combustion Engines and Vehicle Dynamics, Energy Resources Technology, Military Technology, Naval Architecture, Applied and Industrial Mathematics, etc.

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 and, in special issues, 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:

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

Usually, the length of a reviewing paper is up to 25 pages, and the length of a contributed article is up to 15 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. The 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 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

Volume 52, No 1, 2024, pp. 1 – 172

CONTENTS CONTINUED	PAGE
Varun Kumar A, Pradeep Krishna R, Masood Fakouri Hasanabadi, Sathickbasha K	90
Evaluation of Machine Learning Techniques for the Nd: YAG Laser & TIG Welded Stainless Steel 304	
Salah Mahmood Shakir, Alaa Abdulhady Jaber	103
Innovative Application of Artificial Neural Networks for Effective Rotational Shaft Crack Localization	
Ronit Shah, Naveen Venkatesh S, P Arun Balaji, V Sugumaran	115
Weightless Neural Network-Based Fault Diagnosis in Suspension System	
Vesna Milošević-Mitić, Ana Petrović, Nina Anđelić, Miloš Jovanović	128
The Influence of Temperature Gradient on Thin Plates Bending	
M. G. McKie, A. N. Evans, R. Jones	136
Improving Lean Engagement Through Utilising Improved Communication, Recognition and Digitalisation During the COVID-19 Pandemic in JLR's Powertrain Machining Facility	
A. Gritsenko, V. Shepelev, A. Burzev, B.K. Kaliyev	147
The Development of a Method for Diagnosing Internal Combustion Engines Based on Acceleration and Rundown Characteristics	
Younes Oulahou, Youssef Elguennouni, Mohamed Hssikou, Jamal Baliti, Mohammed Alaoui	157
Numerical Investigation of Natural Convection	



Heat Transfer Using TiO2/Al2O3-Water

Nanofluids