

LODZ UNIVERSITY OF TECHNOLOGY

Volume 22

Number 1, 2018

Mechanics and Mechanical Engineering

Editor in Chief: Tomasz Kapitaniak

Łódź, Poland

**MECHANICS AND
MECHANICAL ENGINEERING
International Journal**

Editor in chief – Tomasz Kapitaniak

Mechanics and Mechanical Engineering
Editorial Office

Division of Dynamics, Lodz University of Technology
90-924 Łódź, Poland, Tel. (48 42) 636 68 22

Editorial board

J. Brindley – Leeds	M. S. El Naschie – Cambridge
J. Giergiel – Rzeszów	W. Ostachowicz – Gdańsk
M. Giergiel – Kraków	Z. Peradzyński – Warsaw
W. Kaniewski – Łódź	W.-H. Steeb – Johannesburg
M. Królak – Łódź	A. Tylikowski – Warsaw
K. Li – Michigan	K. E. Thylwe – Stockholm
J. Manevich – Dniepropetrovsk	M. Wiercigroch – Aberdeen
A. Nayfeh – Blacksburg	

Editorial staff:

Anna Jach, anna.jach@p.lodz.pl,
Agnieszka Chudzik, agnieszka.chudzik@p.lodz.pl,
Jerzy Wojewoda

Scope of the journal

Mechanics and Mechanical Engineering publishes original papers, notes, and invited review articles from all fields of theoretical and applied mechanics as well as mechanical engineering. In addition to the classical fields, such as Rigid Body Dynamics, Elasticity, Plasticity, Hydrodynamics and Gas Dynamics, it gives special attention to recently developed and boundary areas of mechanics. As a rule, only contributions written in English will be accepted.

ISSN 1428–1511

e-ISSN 2354–0192

on-line: www.kdm.p.lodz.pl

Copyright Tomasz Kapitaniak, 2002-2018

Submission of manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if, and when the manuscript is accepted for publication, by authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without consent of the copyright holders.

CONTENTS

Hugo Miguel Silva, José Filipe Meireles and Jerzy Wojewoda	
Experimental Validation of a Novel thin-Walled Beam Prototype	7
Marek Balcerzak	
Optimal Control of an Inverted Pendulum Based on the New Method of Lyapunov Exponents Estimation	25
Marek Balcerzak	
Swing-Up Problem of an Inverted Pendulum – Energy Space Approach	33
Mohamed I. A. Othman and A. M. S. Mahdy	
Numerical Studies for Solving a Free Convection Boundary-Layer Flow Over a Vertical Plate	41
Amit Sharma	
Vibration of Skew Plate with Circular Variation in Thickness and Poisson’s Ratio	49
S. Rajendran, S. M. Abish, M. Sakthivel, P. Sandeep and S. Rahul Krishna	
Design and Analysis of Ejection in Sub Wheel Assembly	59
M. Meignanamoorthy and M. Ravichandran	
Synthesis of Metal Matrix Composites via Powder Metallurgy Route: A Review	65
Mohamed A. Medebber and Nouredine Retiel	
Numerical Study of Natural Convection in a Vertical Cylindrical Partially Annular	77
V. Chitti Babu, P. Govinda Rao, K. Santa Rao and K. Murali Krishna	
Design of Accurate Steering Gear Mechanism	93
S. Nandhakumar, S. Sathish Kumar and K. Sakthivelu	
Optimization of Machining Variables in Electric Discharge Machining Using Stainless Steel 317 in Full Factorial Method	105

S. Ramdoun, F. Bouafia, B. Serier and H. Fekirini	
Effect of Residual Stresses on the Stress Intensity Factor of Cracks in a Metal Matrix Composite: Numerical Analysis	119
A. Chandrashekhar and G. Satish Babu	
Performance Analysis of Gough Stewart Platform with 6 Limbs	133
Kirill N. Voinov and Altyn Z. Esbulatova	
Unique Information about Lubricants	143
Sanjay Sharma and Rajeev Kumar Awasthi	
Performance of Hydrodynamic Journal Bearing Operating under Transient Wear	153
Meryem El Moufari and Larbi El Bakkali	
Fracture Toughness Analysis of Delaminated Composites under Variable Temperatures	171
Lebbal Habib, Reffas S. Ahmed, Berrekia Habib and Mario Guagliano	
Experimental Study of Spot Weld Parameters in Resistance Spot Welding Process	179
Aħa V. Ilyashenko and Sergey V. Kuznetsov	
Elastic Waves in Spatially Periodic Anisotropic Media: Diffraction by Periodic Arrays of Voids or Anisotropic Inclusions	187
B. Venkata Suresh, Y. Shireesha and B. Sateesh	
Vibration Analysis and Control of Locomotive System	195
M. Akhilesh, K. Santarao and M. V. S. Babu	
Thermal Conductivity of CNT - Wated Nanofluids: a Review	207
B. Kebli, S. Berkane and F. Guerrache	
An Axisymmetric Contact Problem of an Elastic Layer on a Rigid Circular Base	221
S. Shadmani, S. M. Mousavi Nainiyan, R. Ghasemiasl, M. Mirzaei and S. G. Pouryoussefi	
Experimental Study of Flow Control Over an Ahmed Body Using Plasma Actuator	239

S. Khaldi, A. N. Korti and S. Abboudi	
Applying CFD for Studying the Dynamic and Thermal Behavior of an Indirect Solar Dryer: Parametric Analysis	253
Abdelaziz Abboudi, Brahim Chermime and Salim Boulahrouz	
Simulation of the Flattening of High Frequency Induction Welded Tubes	273
S. Rajaram, G. RajKumar, R. Balasundaram and D. Srinivasan	
Experimental Investigation of Drilling Small Hole on Duplex Stainless Steel (SS2205) Using EDM	285
A. Francis, S. Rajaram, A. Mohanakrishnan and B. Ashok	
Mechanical Properties of Sisal Fibre Reinforced Polymer Matrix Composite	295
Otbi Bouguenina, Allel Mokaddem, Bendouma Doumi and Ahmed Boutaous	
The Effect of the Kenaf Natural Fiber on Enhancing the Mechanical Properties of Bio-Composites Materials Used in Civil Engineering	301
S. M. Abo-Dahab, S. Z. Rida, R. A. Mohamed and A. A. Kilany	
Rotation, Initial Stress, Gravity and Electromagnetic Field Effect on P Wave Reflection from Stress-Free Surface Elastic Half-Space with Voids under Three Thermoelastic Models	313
Abdessamad Brahami, Benattou Bouchouicha, Mokhtar Zemri and Jamal Fajoui	
Fatigue Crack Growth Rate, Microstructure and Mechanical Properties of Diverse Range of Aluminum Alloy: A Comparison	329
M. Kathirvel, K. Palani Kumar and P. M. Diaz	
Experimental Analysis on Surface Roughness in Turning Hybrid Metal Matrix (6061Al+SiC+Gr) Composites	341
S. Sakthivelu, P. P. Sethusundaram, M. Meignanamoorthy and M. Ravichandran	
Synthesis of Metal Matrix Composites through Stir Casting Process – a Review	357

