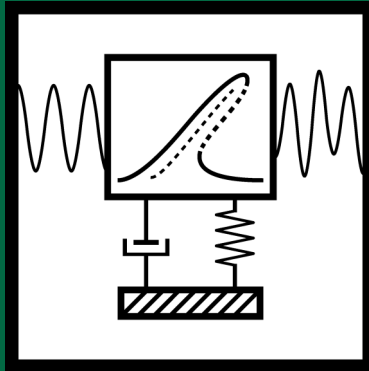


December 2019, Volume 21, Issue 8  
Pages (2025-2295)  
ISSN Print 1392-8716  
ISSN Online 2538-8460

# JVE Journal of Vibroengineering



**Editor in Chief**

M. Ragulskis

Kaunas University of Technology, (Lithuania)

minvydas.ragulskis@ktu.lt

**Editorial Board**

H. Adeli	The Ohio State University, (USA)	adeli.1@osu.edu
V. Babitsky	Loughborough University, (UK)	v.i.babitsky@lboro.ac.uk
M. Bayat	Roudehen Branch, Islamic Azad University, (Iran)	mbayat14@yahoo.com
I. Blekhman	Mekhanobr – Tekhnika Corporation, (Russia)	iliya.i.blekhman@gmail.com
K. Bousson	University of Beira Interior, (Portugal)	bousson@ubi.pt
A. Bubulis	Kaunas University of Technology, (Lithuania)	algimantas.bubulis@ktu.lt
R. Burdzik	Silesian University of Technology, (Poland)	rafal.burdzik@polsl.pl
M. S. Cao	Hohai University, (China)	cmszhy@hhu.edu.cn
Lu Chen	Beihang University, (China)	luchen@buaa.edu.cn
F. Chernousko	Institute for Problems in Mechanics, (Russia)	chern@ipmnet.ru
Z. Dabrowski	Warsaw University of Technology, (Poland)	zdabrow@simr.pw.edu.pl
Y. Davydov	Institute of Machine Building Mechanics, (Russia)	1institut@bk.ru
J. Duhovnik	University of Ljubljana, (Slovenia)	joze.duhovnik@lecad.uni-lj.si
S. Ersoy	Marmara University, (Turkey)	ersoy@marmara.edu.tr
A. Fedaravičius	Kaunas University of Technology, (Lithuania)	algimantas.fedaravicius@ktu.lt
R. Ganiev	Blagonravov Mechanical Engineering Research Institute, (Russia)	rganiev@nwmtc.ac.ru
W. H. Hsieh	National Formosa University, (Taiwan)	allen@nfu.edu.tw
David Hui	University of New Orleans, (USA)	dhui@uno.edu
V. Kaminskas	Vytautas Magnus University, (Lithuania)	v.kaminskas@if.vdu.lt
V. Kappatos	Center for Research and Technology Hellas, (Greece)	vkappatos@certh.gr
V. Klyuev	Association Spektr – Group, (Russia)	v.klyuev@spektr.ru
G. Kulvietis	Vilnius Gediminas Technical University, (Lithuania)	genadijus.kulvietis@vgtu.lt
V. Lyalin	Izhevsk State Technical University, (Russia)	velyalin@mail.ru
R. Martonka	Technical University of Liberec, (Czech Republic)	rudolf.martonka@tul.cz
R. Maskeliūnas	Vilnius Gediminas Technical University, (Lithuania)	rimas.maskeliunas@vgtu.lt
L. E. Muñoz	Universidad de los Andes, (Colombia)	lui-muno@uniandes.edu.co
N. Nistico	University of Roma La Sapienza, (Italy)	nicola.nistico@uniroma1.it
V. Ostaševičius	Kaunas University of Technology, (Lithuania)	vytautas.ostasevicius@ktu.lt
A. Palevičius	Kaunas University of Technology, (Lithuania)	aryvdas.palevicius@ktu.lt
G. Panovko	Blagonravov Mechanical Engineering Research Institute, (Russia)	gpanovko@yandex.ru
L. Qiu	Nanjing University of Aeronautics and Astronautics, (China)	lei.qiu@nuaa.edu.cn
S. Rakheja	Concordia University, (Canada)	subhash.rakheja@concordia.ca
V. Ranjan	Bennett University, (India)	vinayak.ranjan@bennett.edu.in
G. E. Sandoval-Romero	The National Autonomous University of Mexico, (Mexico)	eduardo.sandoval@ccadet.unam.mx
M. A. F. Sanjuan	University Rey Juan Carlos, (Spain)	miguel.sanjuan@urjc.es
E. Shahmatov	Samara State Aerospace University, (Russia)	shakhm@ssau.ru
A. El Sinawi	The Petroleum Institute, (United Arab Emirates)	aelsinawi@pi.ac.ae
G. Song	University of Houston, (USA)	gsong@uh.edu
S. Toyama	Tokyo A&T University, (Japan)	toyama@cc.tuat.ac.jp
K. Uchino	The Pennsylvania State University, (USA)	kenjiuchino@psu.edu
A. Vakhguelt	Nazarbayev University, (Kazakhstan)	anatoli.vakhguelt@nu.edu.kz
A. Valiulis	Vilnius Gediminas Technical University, (Lithuania)	algirdas.valiulis@vgtu.lt
P. Vasiljev	Lithuanian University of Educational Sciences, (Lithuania)	piotr.vasiljev@leu.lt
V. Veikutis	Lithuanian University of Health Sciences, (Lithuania)	vincentas.veikutis@ismuni.lt
J. Viba	Riga Technical University, (Latvia)	janis.viba@rtu.lv
J. Wallaschek	Leibniz University Hannover, (Germany)	wallaschek@ids.uni-hannover.de
Xiao-Jun Yang	China University of Mining and Technology, (China)	dyangxiaojun@163.com
K. K. Żur	Bialystok University of Technology, (Poland)	k.zur@pb.edu.pl

# **JVE Journal of Vibroengineering**

## **Aims and Scope**

Journal publishes original papers presenting the state of the art in vibroengineering of dynamical systems.

The list of principal topics:

- Mechanical vibrations and applications;
- Fault diagnosis based on vibration signal analysis;
- Vibration generation and control;
- Seismic engineering and applications;
- Modal analysis and applications;
- Vibration in transportation engineering;
- Flow induced structural vibrations;
- Oscillations in biomedical engineering;
- Chaos, nonlinear dynamics and applications;
- Oscillations in electrical engineering;
- Acoustics, noise control and engineering applications;
- Fractional dynamics and applications.

**All published papers are peer reviewed and crosschecked by plagiarism detection tools.**

More information is available online <https://www.jvejournals.com>

## **The journal material is referred:**

### **CLARIVATE ANALYTICS (former THOMSON REUTERS):**

Emerging Sources Citation Index (ESCI);  
Journal Citation Reports / Science Edition.

**SCOPUS:** ELSEVIER Bibliographic Database.

**COMPENDEX:** ELSEVIER Bibliographic Database.

**EBSCO:** Academic Search Complete;

Computers & Applied Sciences Complete;  
Central & Eastern European Academic Source;  
Current Abstracts;  
Shock & Vibration Digest;  
TOC Premier.

### **GALE Cengage Learning:**

Academic OneFile Custom Periodical;  
Science in Context.

**INSPEC:** OCLC. The Database for Physics, Electronics and Computing.

**VINITI:** All-Russian Institute of Scientific and Technical Information.

**DIRECTORY OF OPEN ACCESS JOURNALS (DOAJ):** <https://doaj.org>

**SEMANTIC SCHOLAR:** <https://www.semanticscholar.org>

**GOOGLE SCHOLAR:** <https://scholar.google.com>

**CNKI SCHOLAR:** <http://eng.scholar.cnki.net>

**ERIH PLUS:** <https://dbh.nsd.uib.no/publiseringskanaler/erihplus>

**ULRICH'S PERIODICALS DIRECTORY:** <https://ulrichsweb.serialssolutions.com>

**BASE (Bielefeld Academic Search Engine):** <https://www.base-search.net>

**cnpLINKer (CNPIEC):** <http://cnplinker.cnpeak.com>

**CROSSREF:** <https://www.crossref.org>

**Internet:** <https://www.jvejournals.com>

**E-mail:** [publish@jvejournals.com](mailto:publish@jvejournals.com)

**Publisher:** JVE International Ltd., Geliu ratas 15A, LT-50282, Kaunas, Lithuania

# JVE Journal of Vibroengineering

DECEMBER 2019. VOLUME 21, ISSUE 8, PAGES (2025-2295), ISSN PRINT 1392-8716, ISSN ONLINE 2538-8460

## Contents

### MECHANICAL VIBRATIONS AND APPLICATIONS

- DEM SIMULATION AND EXPERIMENTAL STUDY ON THE SCREENING PROCESS OF ELLIPTICAL VIBRATION MECHANICAL SYSTEMS** 2025  
BING CHEN, JIWEI YAN, WEI MO, CHUANLEI XU, LIJIE ZHANG,  
KUMAR K TAMMA
- INFLUENCE OF ULTRASONIC VIBRATION ON DISCRETE MEDIA FILLED TUBES DURING FORWARD EXTRUSION** 2039  
XIA CHEN, TONG WEN, HAOXING TANG
- RESEARCH ON VERTICAL VIBRATION OF HOT ROLLING MILL UNDER SCREW-DOWN-STRIP COMBINED EXCITATION** 2050  
BIAO XIAO, XIAOQIANG YAN
- DYNAMICAL PROCESSES IN A MULTI-MOTOR GEAR DRIVE OF HEAVY SLABBING MILL** 2064  
PAVLO V. KROT

### FAULT DIAGNOSIS BASED ON VIBRATION SIGNAL ANALYSIS

- AUTOMATIC CONDITION MONITORING OF ELECTROMECHANICAL SYSTEM BASED ON MCSA, SPECTRAL KURTOSIS AND SOM NEURAL NETWORK** 2082  
ZAIR MOHAMED, RAHMOUNE CHEMSEDDINE, BENAZZOUZ DJAMEL,  
RATNI AZEDDINE
- DAMAGE IDENTIFICATION OF BRIDGE STRUCTURE BASED ON FREQUENCY DOMAIN DECOMPOSITION AND STRAIN MODE** 2096  
JIAQUAN WU, HONGYAN LI, FEI YE, KUN MA
- FINE-GRAINED FAULT RECOGNITION METHOD FOR SHAFT ORBIT OF ROTARY MACHINE BASED ON CONVOLUTIONAL NEURAL NETWORK** 2106  
BO WU, SONGLIN FENG, GUODONG SUN, LIANG XU, CHENGHAN AI

<b>RANDOMNESS COMPLEXITY AS A FAMILY FEATURE OF ROLLING BEARINGS' DEGRADATION</b>	<b>2121</b>
YAOLONG LI, HONGRU LI, BING WANG, HE YU	
<b>A MODIFIED DAMAGE INDEX PROBABILITY IMAGING ALGORITHM BASED ON DELAY-AND-SUM IMAGING FOR SYNTHESIZING TIME-REVERSED LAMB WAVES</b>	<b>2140</b>
QINGWEI XIA, YANYAN LIU, YU LU, SHUHAO CAO, HANFEI ZHANG, SHIWEI MA	
<b>A NOVEL FAULTS DETECTION METHOD FOR ROLLING BEARING BASED ON RCMDE AND ISVM</b>	<b>2148</b>
XIN ZHANG, JIANMIN ZHAO, HONGZHI TENG, GUOZENG LIU	
<b>VIBRATION GENERATION AND CONTROL</b>	
<b>DESIGN AND REAL TIME IMPLEMENTATION OF NONLINEAR SLIDING SURFACE WITH THE APPLICATION OF SUPER-TWISTING ALGORITHM IN NONLINEAR SLIDING MODE CONTROL FOR TWIN ROTOR MIMO SYSTEM</b>	<b>2159</b>
LISY E. R., M. NANDAKUMAR, ANASRAJ R.	
<b>SEISMIC ENGINEERING AND APPLICATIONS</b>	
<b>A STUDY ON THE BEHAVIOR OF STRUCTURES BASED ON THE ROCKING MOTION OF RIGID CORES INVOLVING PRE-COMPRESSED SPRINGS AND VISCOUS DAMPERS</b>	<b>2180</b>
GHOLAMREZA LEGZIAN, BEHROKH HOSSEINI HASHEMI, MAHMOOD HOSSEINI	
<b>DAMAGE DETECTION IN CONCRETE GRAVITY DAMS USING SIGNAL PROCESSING ALGORITHMS BASED ON EARTHQUAKE VIBRATIONS</b>	<b>2196</b>
SAJAD ESMAIELZADEH, HASSAN AHMADI, SEYED ABBAS HOSSEINI	
<b>SELECTION OF GROUND MOTION PREDICTION EQUATIONS FOR PROBABILISTIC SEISMIC HAZARD ANALYSIS BASED ON AN IMPROVED FUZZY LOGIC</b>	<b>2216</b>
MOHSEN ALI SHAYANFAR, MOHAMMAD ALI BARKHORDARI, MOSTAFA MAHMOUDI, EHSAN JAHANI	
<b>NONLINEARITY AND NUMERICAL SIMULATION APPLICATIONS IN GEOTECHNICAL ENGINEERING</b>	
<b>EXPERIMENTAL STUDY ON SECONDARY BEARING MECHANISM OF WEAKLY CEMENTED BROKEN ROCK MASS</b>	<b>2228</b>
PING WANG, TAO FENG, YONGJIAN ZHU, WEIJIAN YU	
<b>BIOMECHANICS AND BIOMEDICAL ENGINEERING</b>	
<b>VIBROTACTILE FREQUENCY DISCRIMINATION ON THE WRIST OF VISUALLY IMPAIRED PEOPLE</b>	<b>2242</b>
DOROTA CZOPEK, JERZY WICIAK	
<b>ACOUSTICS, NOISE CONTROL AND ENGINEERING APPLICATIONS</b>	
<b>OPTIMIZATION OF THE LONGITUDINAL-TORSIONAL ULTRASONIC STEP-LIKE HORN DESIGN FOR MILLING TOOL APPLICATIONS VIA THE TOOL LOAD ACCOUNT</b>	<b>2250</b>
XIAO-BO WANG, FENG JIAO, CHONG-YANG ZHAO	

<b>SOURCE LOCALIZATION IN REVERBERATION ENVIRONMENT BASED ON IMPROVED EQUIVALENT SOUND SOURCE NEAR-FIELD ACOUSTIC HOLOGRAPHY ALGORITHM</b> HONGYU ZHANG, WENYONG GUO, JIANGGUI HAN, HANTAO CHEN	<b>2260</b>
--	-------------

FRACTIONAL DYNAMICS AND APPLICATIONS

<b>GRAPHICAL PID TUNING METHOD FOR UNCERTAIN FRACTIONAL-ORDER MULTIVARIABLE SYSTEMS</b> MINGHUI CHU, CHI XU, JIZHENG CHU	<b>2273</b>
---	-------------

DYNAMICS OF SMART AND FUNCTIONALLY GRADED MATERIALS

<b>BOUNDARY CONDITION IDENTIFICATION OF A CLAMPED HONEYCOMB SANDWICH PANEL BASED ON THIN-LAYER ELEMENT</b> YU XU, ZHIFU CAO, DONG JIANG	<b>2286</b>
--	-------------



