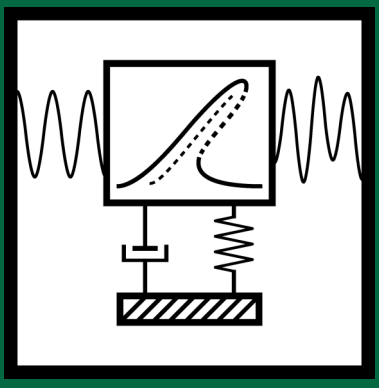
November 2020, Volume 35
ISSN Print 2345-0533
ISSN Online 2538-8479

Vibroengineering PROCEDIA



Editor in Chief

Minvydas Ragulskis	Kaunas University of Technology, (Lithuania)	minvydas.ragulskis@ktu.lt

Editorial Board

Mahmoud Bayat	Roudehen Branch, Islamic Azad University, (Iran)	mbayat14@yahoo.com
Rafał Burdzik	Silesian University of Technology, (Poland)	rafal.burdzik@polsl.pl
Jinde Cao	Southeast University, (China)	jdcao@seu.edu.cn
Maosen Cao	Hohai University, (China)	cmszhy@hhu.edu.cn
Sezgin Ersoy	Marmara University, (Turkey)	sersoy@marmara.edu.tr
W. H. Hsieh	National Formosa University, (Taiwan)	allen@nfu.edu.tw
Vassilis Kappatos	Center for Research and Technology Hellas, (Greece)	vkappatos@certh.gr
Chen Lu	Beihang University, (China)	luchen@buaa.edu.cn
L. E. Muñoz	Universidad de los Andes, (Colombia)	lui-muno@uniandes.edu.co
Nicola Nisticò	Sapienza University of Rome, (Italy)	nicola.nistico@uniroma1.it
Vytautas Ostaševičius	Kaunas University of Technology, (Lithuania)	vytautas.ostasevicius@ktu.lt
Grigory Panovko	Mechanical Engineering Research Institute of the Russian Academy of Sciences, (Russia)	gpanovko@yandex.ru
Subhash Rakheja	Concordia University, (Canada)	subhash.rakheja@concordia.ca
Vinayak Ranjan	Bennett University, (India)	vinayak.ranjan@bennett.edu.in
G. Eduardo Sandoval-Romero	The National Autonomous University of Mexico, (Mexico)	eduardo.sandoval@ccadet.unam.mx
Miguel Angel Fernandez Sanjuan	University Rey Juan Carlos, (Spain)	miguel.sanjuan@urjc.es
G. Song	University of Houston, (USA)	gsong@uh.edu
Shigeki Toyama	Tokyo A&T University, (Japan)	toyama@cc.tuat.ac.jp
Piotr Vasiljev	Lithuanian University of Educational Sciences, (Lithuania)	piotr.vasiljev@leu.lt
Vincentas Veikutis	Lithuanian University of Health Sciences, (Lithuania)	vincentas.veikutis@lsmuni.lt
Jānis Vība	Riga Technical University, (Latvia)	janis.viba@rtu.lv
Xiao-Jun Yang	China University of Mining and Technology, (China)	dyangxiaojun@163.com
Krzysztof Kamil Żur	Bialystok University of Technology, (Poland)	k.zur@pb.edu.pl

VP Vibroengineering PROCEDIA

Vibroengineering PROCEDIA Volume 35 contains papers presented at the 49th International Conference on VIBROENGINEERING held in Almaty, Kazakhstan, November 26-28, 2020. The main theme of the Conference is “Electrical Engineering and Communication Electronics”.

Aims and Scope

Journal publishes original papers presenting the state of the art in vibroengineering of dynamical systems. The list of principal topics:

- Measurements in engineering
- Mathematical models in engineering
- Acoustics, noise control and engineering applications
- 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, non-linear dynamics and applications
- Oscillations in electrical engineering
- Fractional dynamics and applications
- System dynamics in manufacturing system modeling
- Dynamics of smart and functionally graded materials

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

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

Vibroengineering PROCEDIA is referred in:

SCOPUS: ELSEVIER Bibliographic Database.
COMPENDEX: ELSEVIER Bibliographic Database.
EBSCO: Academic Search Complete;
Computers & Applied Sciences Complete;
Central & Eastern European Academic Source;
Current Abstracts;
TOC Premier.
GALE Cengage Learning:
Academic OneFile Custom Periodical;
Science in Context.
INSPEC: OCLC. The Database for Physics, Electronics and Computing.
SEMANTIC SCHOLAR: https://www.semanticscholar.org
GOOGLE SCHOLAR: https://scholar.google.com
CNKI SCHOLAR: http://eng.scholar.cnki.net
ULRICH’S PERIODICALS DIRECTORY: https://ulrichsweb.serialssolutions.com
CORE: https://core.ac.uk
cnpLINKer (CNPIEC): http://cnplinker.cnpeak.com
CROSSREF: https://www.crossref.org

Internet: https://www.jveconferences.com; https://www.jvejournals.com
E-mail: info@jveconferences.com; publish@jvejournals.com
Address: Geliu ratas 15A, LT-50282, Kaunas, Lithuania
Publisher: JVE International Ltd.

VP Vibroengineering PROCEDIA

NOVEMBER 2020. VOLUME 35, PAGES (1-104), ISSN PRINT 2345-0533, ISSN ONLINE 2538-8479

Contents

FAULT DIAGNOSIS BASED ON VIBRATION SIGNAL ANALYSIS

VIBRATION DIAGNOSIS OF TURBOMACHINERY COUPLED WITH INDUCTION MOTOR **1**
KRISHNAREDDY G, VENKATESHAM B, RAMIREDDY G

MODAL ANALYSIS AND APPLICATIONS

TRIPLE RESONANCES INVOLVING TWO FREQUENCIES IN THE MOTOR FREQUENCY CONVERSION START PHASE **7**
BAI-ZHOU LI, HUI-MIN WU, LAN-RONG CAI

VIBRATION IN TRANSPORTATION ENGINEERING

CONTROL OF THE AIR SUSPENSION SYSTEM OF SEMI-TRAILER TRUCKS TO ENHANCE THE ROAD FRIENDLINESS **13**
HUAXIANG ZHOU, XIAOYAN WU, PEILING WANG

EFFECT OF THE MASS-STIFFNESS DISTRIBUTION OF THE VIBRATORY ROLLER CAB ON THE RIDE QUALITY IN LOW-FREQUENCY REGION **20**
HUAN YUAN, ZHIQIANG ZHANG, AORAN YANG, HAO DONG

BIOMECHANICS AND BIOMEDICAL ENGINEERING

BIPED DYNAMIC WALKER WITH ALTERNATE UNPOWERED AND PARTIALLY POWERED STEPS IN A GAIT CYCLE **27**
KRISHNA PRAKASH YADAV, PRASANTH KUMAR R

DYNAMICS AND OSCILLATIONS IN ELECTRICAL AND ELECTRONICS ENGINEERING

SIMULATION OF THREE-PHASE SHORT CIRCUIT ELECTROMAGNETIC TRANSIENT PROCESS OF SYNCHRONOUS GENERATOR **33**
HONGTAO WANG

MATERIALS AND MEASUREMENTS IN ENGINEERING

FRACTURE AND DAMAGE MODEL OF COMPOSITE CERAMICS **39**
JINFENG YU, ZHAOGANG CHENG, XINHUA NI, XIEQUAN LIU, DA XU

A SYSTEM DESIGN METHOD BASED ON DIGITAL AGC PHOTOELECTRIC PREAMPLIFIER GAIN ADAPTIVE CONTROL **46**
XUEFENG GU, GAOQUAN GU, JING ZHANG

MATHEMATICAL MODELS IN ENGINEERING

MATHEMATICAL MODELING OF THE SOLUTION TO THE PROBLEM OF PLATE BENDING GIVEN VARIOUS FASTENINGS ALONG THE CONTOUR AND VARIOUS LOADS **52**
SERIKBAY TOIBAYEV, ASSEMGUL UDERBAYEVA, ZHANAR BIDAKHMET, AYAULYM RAKHMATULINA, ALGAZY ZHAUYT

NUMERICAL SIMULATION OF POLYGONAL SPIRAL CURVED PIPE WITH ABRASIVE FLOW MACHINING BASED ON LARGE EDDY SIMULATION **58**
WEIHONG ZHAO, XIWEI DONG, XIMING HUI, QIFEI PENG, JUNYE LI, CHENRI ZHANG

BENDING OF A CIRCULAR FLEXIBLE PLATE TAKING INTO ACCOUNT THE INITIAL CURVATURE **64**
G. U. MAMATOVA, A. K. SUGIRBEKOVA, N. M. BEKAULOV

PROCESSING METHOD OF EMD ENDPOINT EFFECT BASED ON SVRM EXTENSION **70**
KAI CHAI, SHAO-WEI FENG

AN IMPROVED METHOD FOR EMD MODAL ALIASING EFFECT **76**
SHAO-WEI FENG, KAI CHAI

MODELING AND SIMULATION ON ENGRAVING PROCESS OF PROJECTILE ROTATING BAND BASED ON TWO-PHASE FLOW INTERIOR BALLISTIC **82**
ZHEN WANG, LIQUN WANG, GUOLAI YANG

RELIABILITY ANALYSIS OF RAILWAY FREIGHT CAR WHEELSET BASED ON BIRNBAUNM-SAUNDERS FATIGUE LIFE DISTRIBUTION **88**
YAXUAN ZHANG, ZILIANG AN, MINGXU LU, QINGBIAO MENG

OPTIMAL 5R PARALLEL LEG DESIGN FOR QUADRUPED ROBOT GAIT CYCLE **94**
MANGESH D. RATOLIKAR, PRASANTH KUMAR R

SYSTEM DYNAMICS IN MANUFACTURING SYSTEM MODELING

COMPARISON OF FRICTION POWER LOSS BETWEEN CRANKPIN AND CRANKSHAFT BEARINGS ON IMPROVING THE ENGINE POWER **99**
NGUYEN VAN LIEM, XIAOYAN GUO, RENQIANG JIAO