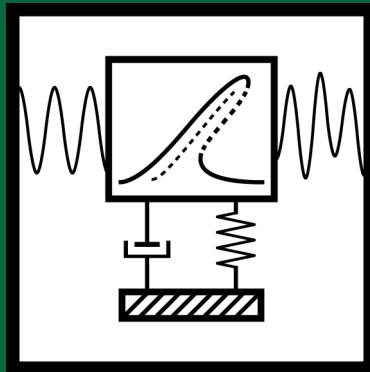


October 2015, Volume 6
ISSN 2345-0533

Vibroengineering PROCEDIA



Editor in chief

K. Ragulskis

Lithuanian Academy of Sciences, (Lithuania)

k.ragulskis@jve.lt,

ragulskis.jve@gmail.com

Editorial Board

V. Babitsky

Loughborough University, (UK)

v.i.babitsky@lboro.ac.uk

N. Bachschmid

Politecnico di Milano, (Italy)

nicolo.bachschmid@polimi.it

R. Bansevičius

Kaunas University of Technology, (Lithuania)

ramutis.bansevicius@ktu.lt

M. Bayat

Tarbiat Modares University, (Iran)

mbayat14@yahoo.com

I. Blekhman

Mekhanobr – Tekhnika Corporation, (Russia)

iliya.i.blekhman@gmail.com

M. Bogdevičius

Vilnius Gediminas Technical University, (Lithuania)

marijonas.bogdevicius@vgtu.lt

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

R. Daukševičius

Kaunas University of Technology, (Lithuania)

rolanasd@centras.lt

Y. Davydov

Institute of Machine Building Mechanics, (Russia)

1institut@bk.ru

M. Dimentberg

Worcester Polytechnic Institute, (USA)

diment@wpi.edu

J. Dušovnik

University of Ljubljana, (Slovenia)

joze.duhovnik@lecad.uni-lj.si

S. Ersoy

Marmara University, (Turkey)

sersoy@marmara.edu.tr

A. Fedaravičius

Kaunas University of Technology, (Lithuania)

algimantas.fedaravicius@ktu.lt

R. Ganiev

Blagonravov Mechanical Engineering Research

rganiev@nwmte.ac.ru

Institute, (Russia)

W. H. Hsieh

National Formosa University, (Taiwan)

allen@nfu.edu.tw

V. Kaminskas

Vytautas Magnus University, (Lithuania)

v.kaminskas@if.vdu.lt

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. Maskeliūnas

Vilnius Gediminas Technical University, (Lithuania)

rimas.maskeliunas@vgtu.lt

L. E. Muñoz

Universidad de los Andes, (Colombia)

lui-muno@uniandes.edu.co

V. Ostaševičius

Kaunas University of Technology, (Lithuania)

vytautas.ostasevicius@ktu.lt

A. Palevičius

Kaunas University of Technology, (Lithuania)

arvydas.palevicius@ktu.lt

G. Panovko

Blagonravov Mechanical Engineering Research

gpanovko@yandex.ru

Institute, (Russia)

M. Ragulskis

Kaunas University of Technology, (Lithuania)

minvydas.ragulskis@ktu.lt

V. Royzman

Khmelnytskyi National University, (Ukraine)

iftomm@ukr.net

M. A. F. Sanjuan

University Rey Juan Carlos, (Spain)

miguel.sanjuan@urjc.es

E. Shahmatov

Samara State Aerospace University, (Russia)

shakhm@ssau.ru

J. Škliba

Technical University of Liberec, (Czech Republic)

jan.skliba@tul.cz

S. Toyama

Tokyo A&T University, (Japan)

toyama@cc.tuat.ac.jp

K. Uchino

The Pennsylvania State University, (USA)

kenjiuchino@psu.edu

A. Vakhgult

Nazarbayev University, (Kazakhstan)

anatoli.vakhgult@nu.edu.kz

P. Vasiljev

Vilnius Pedagogical University, (Lithuania)

vasiljev@vpu.lt

V. Veikutis

Lithuanian University of Health Sciences, (Lithuania)

vincetas.veikutis@lsmuni.lt

J. Viba

Riga Technical University, (Latvia)

janis.viba@rtu.lv

V. Volkovas

Kaunas University of Technology, (Lithuania)

vitalijus.volkovas@ktu.lt

J. Wallaschek

Leibniz University Hannover, (Germany)

wallsachek@ids.uni-hannover.de

Mao Yuxin

Zhejiang Gongshang University, (China)

maoyuxin@zjgsu.edu.cn

M. Zakrzhevsky

Riga Technical University, (Latvia)

mzakr@latnet.lv

VP Vibroengineering PROCEDIA

Vibroengineering PROCEDIA Volume 6 contains papers presented at the International Conference “Vibroengineering – 2015” held in Katowice, Poland, 14-15 October, 2015.

Aims and Scope

Original papers containing developments in vibroengineering of dynamical systems (macro-, micro-, nano- mechanical, mechatronic, biomechanics and etc. systems).

The following subjects are principal topics: vibration and wave processes; vibration and wave technologies; nonlinear vibrations; vibroshock systems; generation of vibrations and waves; vibrostabilization; transformation of motion by vibrations and waves; dynamics of intelligent mechanical systems; vibration control, identification, diagnostics and monitoring.

All published papers are peer reviewed.

General Requirements

The authors must ensure that the paper presents an original unpublished work which is not under consideration for publication elsewhere.

The following structure of the manuscript is recommended: abstract, keywords, nomenclature, introduction, main text, results, conclusions and references. Manuscript should be single-spaced, one column 162×240 mm format, using Microsoft Word 2007 or higher. Margins: top 10 mm, bottom 10 mm, left 15 mm, right 10 mm, header 4 mm, footer 7 mm.

Font: Times New Roman. Title of the article 16 pt Bold, authors name 10 pt Bold, title of the institution 9 pt Regular, equations and text 10 pt Regular, indexes 5 pt Regular, all symbols Italic, vectors Bold, numbers Regular. Paragraph first line indentation 5 mm. Equations are to be written with Microsoft Office 2007 or higher Equation Tool.

Heading of the table starts with table number 9 pt Bold as “**Table 1.**”, then further text 9 pt Regular. Table itself 9 pt Regular.

Figure caption starts with figure number 9 pt Bold as “**Fig. 1.**”, then further text 9 pt Regular. Figure itself must be a single or grouped graphical item.

Tables and figures are placed after the paragraph in which they are first referenced.

List of references: reference number and authors 9 pt Bold, further information 9 pt Regular:

- [1] **Pain H. J.** The Physics of Vibrations and Waves. Chichester: John Wiley and Sons, 2005.
- [2] **Juška V., Svilainis L., Dumbrava V.** Analysis of piezomotor driver for laser beam deflection. Journal of Vibroengineering, Vol. 11, Issue 1, 2009, p. 17-26.

The authors are responsible for the correctness of the English language.

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.

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

GOOGLE SCHOLAR: <http://scholar.google.com>

Internet: <http://www.jveconferences.com>; <http://www.jve.lt>

E-mail: m.ragulskis@jve.lt; conferences@jve.lt

Address: Gėlių ratas 15A, LT-50282, Kaunas, Lithuania

Publisher: JVE International Ltd.

VP Vibroengineering PROCEDIA

OCTOBER 2015. VOLUME 6, PAGES (1-366). ISSN 2345-0533

Contents

MECHANICAL VIBRATIONS AND APPLICATIONS

DEVELOPMENT OF SPHERICAL ULTRASONIC MOTOR FOR SPACE. EVALUATIONS OF DURABILITY UNDER HIGH TEMPERATURE ENVIRONMENT	1
UICHI NISHIZAWA, TARO OOHASHI, SHIGEKI TOYAMA	
SEGMENTATION ALGORITHM OF ROADHEADER VIBRATION SIGNAL BASED ON THE STABLE DISTRIBUTION PARAMETERS	7
JACEK WODECKI, PAWEŁ STEFANIAK, AGNIESZKA WYLOMANSKA, RADOSŁAW ZIMROZ, GRZEGORZ ZAK	
NONLINEAR MODEL OF RUBBER TORSIONAL VIBRATION DAMPER	13
PIOTR DEUSZKIEWICZ, JAROSŁAW PANKIEWICZ	
VIBRATION MEASUREMENTS FOR COPPER ORE MILLING AND CLASSIFICATION PROCESS OPTIMIZATION	18
MARCIN KURZYDŁO, MAREK PAWELCZYK	
NUMERICAL CHECK OF A 2DOF TRANSMISSION FOR WIND TURBINES	24
BEIBIT SHINGISSOV, GANI BALBAYEV, SHYNAR KURMANALIEVA, ALGAZY ZHAUTY, ZHANAR KOISHYBAYEVA	
RESEARCH METHODOLOGY FOR VIBRATION ISOLATION MATERIALS	30
MAREK STANKIEWICZ, JAN TARGOSZ	
THE INVESTIGATION OF THE IMPACT OF CHANGES IN THE CHARACTERISTICS OF THE RUBBER ELEMENT ON THE EFFECTIVENESS OF TORSIONAL VIBRATION DAMPER	36
JACEK DZIURDŹ, MACIEJ ZAWISZA	
MECHANISM OF GENERATION OF THE FLEXURAL VIBRATIONS IN AN ULTRASONIC WAVEGUIDE	40
A. MIKHAIL BRITCH, ALGIMANTAS BUBULIS, VLADIMIR MINCHENYA, VINCENTAS VEIKUTIS, JONAS NAVICKAS	
EXAMPLE OF THE APPLICATION OF OPERATIONAL MODAL ANALYSIS METHOD FOR DAMAGE DETECTION OF THE ROTATING BLADES	45
JAROSŁAW BEDNARZ	
IDENTIFICATION OF A MODEL OF CRANK SHAFT WITH A DAMPER OF TORSIONAL VIBRATIONS	50
ZBIGNIEW DĄBROWSKI, BOGUMIŁ CHILIŃSKI	

FINITE ELEMENT ANALYSIS OF COUPLED VIBRATION FOR HOISTING CABLE WITH TIME-VARYING LENGTH	55
JINJIE WANG, GUOHUA CAO, MINGXING LIN, SHANZENG LIU	
MODELLING OF LATERAL-TORSIONAL VIBRATIONS OF THE CRANK SYSTEM WITH A DAMPER OF VIBRATIONS	61
BOGUMIL CHILIŃSKI, MACIEJ ZAWISZA	
THE EFFECT OF THE TYPE OF LUBRICATION OIL ON THE VIBRATION OF INDUSTRIAL PLANETARY GEARBOXES	66
WIECZOREK ANDRZEJ	
INVESTIGATION OF THREE-LAYERED RECTANGULAR CORRUGATED CARDBOARD PACKAGE RESISTANCE TO DYNAMIC LOADS	70
LAURA GEGEKIENĖ, EDMUNDAS KIBIRKŠTIS, VITALIJUS VOLKOVAS, ROBERTAS MIKALAUSKAS	
STRENGTH ANALYSIS OF SMALL-DIMENSION HUB RUBBER TORSIONAL VIBRATION DAMPER	74
WOJCIECH HOMIK, ANDRZEJ SKRZAT	
THE SIMULATION MODEL OF SMALL-DIMENSION RUBBERY TORSIONAL VIBRATION DAMPER	78
WOJCIECH HOMIK, PIOTR GRZYBOWSKI	
REDUCTION OF THE AMPLITUDES OF SELECTED COMPONENTS OF THE FREQUENCY SPECTRUM OF MOMENTARY VELOCITY OF THE CRANKSHAFT OF THE INTERNAL COMBUSTION ENGINE PISTON THROUGH THE USE OF TORSIONAL VIBRATION DAMPERS	83
GRZEGORZ WOJNAR, WOJCIECH HOMIK	
 FAULT DIAGNOSIS BASED ON VIBRATION SIGNAL ANALYSIS	
DAMAGE DETECTION OF WIND TURBINE SUPPORTING STRUCTURES USING AN IMPROVED HARMONY SEARCH ALGORITHM	87
MAHMOUD M. JAHJOUH, UDO NACKENHORST	
CONSTRUCTING A DYNAMIC MODEL FOR DAMAGE DETECTION OF PIPELINES USING A HYBRID MODELING APPROACH	93
YONGXIANG WANG, AMEEN HUSSEIN EL-SINAWI	
STATIONARY DEVICE FOR VIBRODIAGNOSTICS OF PASSING VEHICLE	98
JAKUB VÁGNER, JAROMÍR ZELENKA, ALEŠ HÁBA, MARTIN KOHOUT, PETR HAVLÍČEK	
REAL-TIME LABVIEW APPLICATION FOR DIAGNOSTICS AND EVALUATION OF MACHINE VIBRATION	104
KAROL LISTEWNIK, GRZEGORZ GRZECZKA, MACIEJ KŁACZYŃSKI, WITOLD CIOCH	
VIBRATION ASSESSMENT OF THE CONSUMPTION OF A TECHNICAL OBJECT	109
BOGDAN ŻÓŁTOWSKI, MARCIN ŁUKASIEWICZ	
RELIABILITY DETERMINATION OF IGNITION SYSTEM OF ROCKET PLATFORM USING RELIABILITY BLOCK DIAGRAM AND FMEA ANALYSIS	115
NARONGKORN DERNLUGKAM, PARKPOOM CHOKCHAIRUNGROJ	
FILTERING PROCEDURE FOR LOCAL DAMAGE DETECTION IN GEARBOX USING ALPHA STABLE MODELING	121
GRZEGORZ ŻAK, AGNIESZKA WYLOMAŃSKA, RADOSŁAW ZIMROZ	
INTEGRATION OF MULTIDIMENSIONAL FAULT DIAGNOSTIC INDICATORS ON THE EXAMPLE OF ROLLING ELEMENT BEARINGS	127
MARCIN STRĄCZKIEWICZ, TOMASZ BARSZCZ	

COMBINATION OF ICA AND TIME-FREQUENCY REPRESENTATIONS OF MULTICHANNEL VIBRATION DATA FOR GEARBOX FAULT DETECTION	133
JACEK WODECKI, PAWEŁ STEFANIAK, JAKUB OBUCHOWSKI, AGNIESZKA WYŁOMAŃSKA, RADOSŁAW ZIMROZ	
ROLLING BEARING DEFECT DETECTION AND DIAGNOSTICS	139
ROBERT KOSTEK, BOGDAN ŻÓŁTOWSKI	
VIBROTHERMOGRAPHY IN DIAGNOSTIC BEARINGS DURING OPERATION	145
DARIUSZ LEPIARCZYK	
ON-LINE DIAGNOSIS OF MECHANICAL DEFECTS OF THE COMBUSTION ENGINE WITH PRINCIPAL COMPONENTS ANALYSIS	150
IWONA KOMORSKA, ANDRZEJ PUCHALSKI	
MEASUREMENT RELIABILITY OF THE CONTINUOUS VIBRATION MONITORING PROCESS OF WIND TURBINES IN CONDITIONS OF AN ACCREDITED LABORATORY	155
MAREK SZCZUTKOWSKI, JANUSZ MUSIAŁ, ZBIGNIEW LIS	
DEFECT DETECTION IN COMPOSITE CONSTRUCTIONS – THE PROPOSITION OF A DIAGNOSTIC TEST	160
DAMIAN MARKUSZEWSKI, MACIEJ ZAWISZA	
VIBRATION EFFECT ON THE ANTHROPO-TECHNICAL SYSTEMS RELIABILITY	166
LASKOWSKI DARIUSZ, RAFAŁ BURDZIK, PIOTR ŁUBKOWSKI, ŁUKASZ KONIECZNY	
SELECTED ISSUES OF VIBRATION EFFECTS ON IT NETWORK DEVICES RELIABILITY	171
PIOTR ŁUBKOWSKI, RAFAŁ BURDZIK, DARIUSZ LASKOWSKI, ŁUKASZ KONIECZNY, POLAK RAFAŁ	
USE OF VIBROACOUSTIC DIAGNOSTICS IN THE EXPLOITATION OF A VESSEL IN REAL CONDITIONS	176
ZBIGNIEW ŁOSIEWICZ	
THE EFFECT OF DAMAGE TO THE FUEL INJECTOR ON CHANGES OF THE VIBROACTIVITY OF THE DIESEL ENGINE DURING ITS STARTING	180
TOMASZ FIGLUS, ŁUKASZ KONIECZNY, RAFAŁ BURDZIK, PIOTR CZECH	
ASSESSMENT OF DIAGNOSTIC USEFULNESS OF VIBRATION OF THE COMMON RAIL SYSTEM IN THE DIESEL ENGINE	185
TOMASZ FIGLUS, ŁUKASZ KONIECZNY, RAFAŁ BURDZIK, PIOTR CZECH	
VIBRATION ANALYSIS IN DIAGNOSING TURBINE ENGINES WORKING IN NON-STATIONARY STATES	190
WITOLD CIOCH	
VIBRATION GENERATION AND CONTROL	
AN OPTIMAL PLACEMENT OF PCLD TREATMENT FOR VIBRATION REDUCTION OF PLATES	194
ALI EL HAFIDI, CINTYA DE LA PEGNA, BRUNO MARTIN	
SEISMIC ENGINEERING	
SEISMIC SIGNALS DISCRIMINATION BASED ON INSTANTANEOUS FREQUENCY	200
JAKUB SOKOŁOWSKI, JAKUB OBUCHOWSKI, MACIEJ MADZIARZ, AGNIESZKA WYŁOMAŃSKA, RADOSŁAW ZIMROZ	
DIFFERENCES IN TIME-VARYING GROUP DELAY OF SEISMIC SIGNALS	206
MARTA POLAK, JAKUB OBUCHOWSKI, MACIEJ MADZIARZ, AGNIESZKA WYŁOMAŃSKA, RADOSŁAW ZIMROZ	
SEISMIC MULTIPLE EVENTS – A STUDY ON SIGNALS' SEPARATION	212
JAKUB OBUCHOWSKI, MACIEJ MADZIARZ, RADOSŁAW ZIMROZ	

VIBRATION IN TRANSPORTATION ENGINEERING

DETERMINATION OF EQUIVALENT LOADING OF TURNOUT FROG	217
ALEŠ HÁBA, JAROMÍR ZELENKA, MARTIN KOHOUT	
THE CONCEPT OF FUNCTIONAL EVALUATION OF INNOVATIVE DRIVER INTERFACE (HMI) ON THE EXAMPLE OF MULTIFUNCTIONAL STEERING WHEEL IN AN ELECTRIC CAR	223
WŁODZIMIERZ CHOROMANSKI, MACIEJ KOZŁOWSKI, IWONA GRABAREK	
INSTRUMENTED STUDY OF THE WHEEL-RAIL INTERACTION	228
BOGDAN ŻÓŁTOWSKI, LEONEL CASTANEDA, MARIUSZ ŻÓŁTOWSKI	
PASSENGER SAFETY AND INFORMATION MODULE IN INTELLIGENT INTEGRATED TRAFFIC MANAGEMENT SYSTEM	234
JAKUB MŁYŃCZAK, TOMASZ HEJCZYK, BARTŁOMIEJ WSZOŁEK, ADAM GAŁUSZKA, DAMIAN SURMA, ROMAN OGAZA, Rafał BURDZIK	
MOBILE ANALYSIS OF RAILWAY TRAFFIC SAFETY	238
SZYMON SURMA, JAKUB MŁYŃCZAK, IRENEUSZ CELIŃSKI, JAN WARCZEK	
EFFECT OF VIBRATIONS ON THE BEHAVIOUR OF A VEHICLE DRIVER	243
JAKUB MŁYŃCZAK, IRENEUSZ CELIŃSKI, Rafał BURDZIK	
SIMULATION STUDIES OF A SHOCK ABSORBER MODEL PROPOSED UNDER CONDITIONS OF DIFFERENT KINEMATIC INPUT FUNCTIONS	248
JAN WARCZEK, JAKUB MŁYŃCZAK, IRENEUSZ CELIŃSKI	
NON-CONVENTIONAL SUSPENSION SYSTEMS IN HEAVY SPECIAL-PURPOSE TRUCKS	254
PAULINA NOGOWCZYK, GRZEGORZ SZCZĘŚNIAK, ŁUKASZ KONIECZNY, Rafał BURDZIK	
TECHNICAL ELEMENTS FOR MINIMISING OF VIBRATION EFFECTS IN SPECIAL VEHICLES	259
TOMASZ OSTROWSKI, PAULINA NOGOWCZYK, Rafał BURDZIK, ŁUKASZ KONIECZNY	
RESEARCH ON VIBRATION OF STEERING GEAR OF AUTOMOTIVE VEHICLE	264
MARIUSZ WANDOR, Rafał BURDZIK	
FLOW INDUCED STRUCTURAL VIBRATIONS	
AIR FLOW PRESSURE DROP RESEARCH OF VEHICLE AIR FILTER WITH DIFFERENT INNER LINER DESIGN	268
DARIUS MAŽEIKA, MARTYNAS LENDRAITIS, ALGIMANTAS BUBULIS, AUDRIUS BARTKUS	
MODELLING SHORELINE MOVEMENT USING TWO EXTREME BEACHFACE SLOPES	272
H. KIM, K. P. LEE, LEE S. H., J.-Y. JIN, C. JANG	
MODELING OF FLOW TWO-PHASE MIXTURE IN CURVED CHANNEL PIPELINE	278
V. E. LYALIN, A. N. KRASNOK	
NUMERICAL SIMULATION OF FLOW OF WET GAS IN THE RESERVOIRS OF AIR COOLERS	283
V. E. LYALIN, A. N. KRASNOK	
OSCILLATIONS IN BIOMEDICAL ENGINEERING	
INFLUENCE OF A TOOL'S WORKING DIAMETER ON THE LEVEL OF HANDLE VIBRATIONS OF AN IMPACT DRILL	288
BARTOSZ JAKUBEK, WOJCIECH RUKAT	

MEASUREMENT OF MECHANICAL VIBRATION ON HEXAPOD ON CAR SEAT – VERIFICATION OF MEASUREMENTS WHOLE-BODY HUMAN AND 3DH DUMMY AND 2H DUMMY, VIBRATION ASSESSMENT	292
RUDOLF MARTONKA, VITEZSLAV FLIEGEL, ALES LUFINKA	
MEASUREMENT SYSTEM FOR TESTING THE ALAR CAST PARTIALS	297
MAREK KUCHTA, MIROSŁAW SIERGIEJCZYK, JACEK PAŚ	
VISION-BASED MOTION ANALYSIS OF A KITESURFER	302
ANNA GRZECZKA, PIOTR KOHUT, MACIEJ KŁACZYŃSKI, EDMUND WITTBRODT, TADEUSZ UHL	
VIBRATIONS AS THE MAIN ELEMENT OF TRANSPORT EXTERNAL COSTS IN TERMS OF ECONOMIC AND HUMAN IMPACT	306
MARIA CIEŚLA	
CHAOS, NONLINEAR DYNAMICS AND APPLICATIONS	
EVOLUTION OF ACOUSTIC WAVES IN HEAPED GRANULAR MATERIAL	312
ANATOLI VAKHGUET, MAREK BERGANDER	
ANALYSIS OF DYNAMIC PROPERTIES OF TWO-MASS SYSTEM WITH INERTIAL EXCITER OF LIMITED POWER	316
ALEXANDER SHOKHIN, ANDREY NIKIFOROV, GEORGY KORENDYASEV, SERGEY EREMEYKIN	
ADAPTIVE PROPERTIES OF A SELF-SYNCHRONIZATION EFFECT OF UNBALANCED VIBROEXCITERS	321
GRIGORY PANOVKO, ALEXANDER SHOKHIN, SERGEY EREMEYKIN	
THE PECULIARITIES OF ULTRASOUND WAVE PROPAGATION IN MAGNETORHEOLOGICAL FLUID WITH COMPLEX DISPERSIVE PHASE	326
E. KOROBKO, A. BAEV, A. BUBULIS, V. KUZMIN, Z. NOVIKOVA, E. NOVIK	
ANALYSIS OF THE COMBUSTION ENGINE DYNAMICS BY UNIFIED MEASURE IN THE PHASE SPACE OF THE VIBRATION SIGNAL	330
ANDRZEJ PUCHALSKI, IWONA KOMORSKA	
SIMULATION OF ROLLING BEARING VIBRATION IN DIAGNOSTICS	335
ROBERT KOSTEK, BOGDAN LANDOWSKI, ŁUKASZ MUŚLEWSKI	
A MICROSPLIT MODEL FOR LAYERED STRUCTURES SUBJECTED TO BENDING	341
CHARLES LORD, JEM RONGONG	
OSCILLATIONS IN ELECTRICAL ENGINEERING	
MODELING OF STATOR SYSTEM OF ASYNCHRONOUS MACHINE FOR MAGNETISM AND SOLID COUPLING VIBRATION	346
BAIZHOU LI, YU WANG	
ACOUSTICS, NOISE CONTROL AND ENGINEERING APPLICATIONS	
AUTOMATIC DETECTION SYSTEM OF AIRCRAFT NOISE EVENTS DURING ACOUSTIC CLIMATE LONG-TERM MONITORING NEAR AIRPORT	352
MACIEJ KŁACZYŃSKI, PAWEŁ PAWLIK	
THE EFFECT OF THE GEAR PARAMETERS TO THE NOISE OF TRANSMISSION	357
MARTIN ZUBIK, ALES PROKOP, KAMIL REHAK, PAVEL NOVOTNY	
THE STUDY OF THE VOCAL CORDS IN THE PROCESS OF STUTTERING	363
GRAŻYNA MALCZYK, WIESŁAW WSZOŁEK	

