



23rd International Scientific Conference

MECHANIKA 2018



**MAY
18**

Druskininkai
Lithuania

Programme



faculty of mechanical
engineering
and design

Kaunas University of Technology
in cooperation with Lithuanian Academy
of Science, IFToMM National
Committee of Lithuania, Baltic
Association of Mechanical Engineering

Scientific Editorial Committee

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SECTIONS

- A** Strength of Materials and Structural Elements
- B** Dynamics of Mechanical Systems
- C** Mechanical Technologies
- D** Technologies of Graphics Media and Advanced Materials

ADDRESS

23rd International Conference "Mechanika-2018"
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MECHANIKA 2018

18 May 2017

Hotel "Grand SPA Lietuva"
V. Kudirkos st. 45, Druskininkai

9.00–10.00 **REGISTRATION**

10.00–12.00 **PLENARY SESSION**

HALL "NERIS". Chairman – **Prof. V. OSTAŠEVIČIUS**

12.00–13.00 Lunch. The hotel's restaurant "Druskininkų restoranas"

13.30–14.30 **SESSIONS**

A. HALL "NERIS". Chairman – **Assoc. Prof. P. GRIŠKEVIČIUS**

B, C & D. HALL "ŪLA". Chairman – **Prof. E. KIBIRKŠTIS**

14.30–15.30 Coffee-break and poster session. HALL "NERIS"

15.30–17.30 **SESSIONS**

A. HALL "NERIS". Chairman – **Assoc. Prof. P. GRIŠKEVIČIUS**

B, C & D. "ŪLA". Chairman – **Prof. A. FEDARAVIČIUS**

18.00 **WELCOME PARTY**

The hotel's restaurant "Restaurant of hotel Grand SPA Lietuva"

Plenary Session

18 May 2018

Hotel "Grand SPA Lietuva"

HALL "Neris"

10.00–12.00 h

CHAIRMAN

Prof. V. OSTAŠEVIČIUS

SCIENTIFIC SECRETARY

Assoc. Prof. S. DILIŪNAS

1 10.00–10.10

Words of Welcome

Dr. A. VILKAUSKAS (Dean of Mechanical Engineering and Design Faculty)

2 10.10–10.40

Managing the Business Transition from Project Oriented Business to Product And Life Cycle Oriented Business

J. VUORELA, M. OLLIKAINEN, V. SALMINEN, J. VARIS

(Lappeenranta University of Technology, Finland)

3 10.40–11.10

Bright Future of Mechanics

P. Štemberk (Czech Technical University in Prague, Czech Republic)

4 10.11–11.40

Experimental Transfer Path Analysis in the Diagnosis of Engine Mount-ing System for Idle Shake Vibrations

E. COURTEILLE, F. MORTIER (Univ Rennes, INSA Rennes, France)

5 Discussions

Section A

18 May 2018

Hotel "Grand SPA Lietuva"

HALL "Neris"

13.00–17.30 h

STRENGTH OF MATERIALS AND STRUCTURAL ELEMENTS

CHAIRMAN

Assoc. Prof. P. GRIŠKEVIČIUS



SECRETARY

Assoc. Prof. V. LEIŠIS

1 13.00–13.15

Characterization of Micromechanical Properties of Different Types of Portland and Blended Cements

J. NĚMEČEK (Jr), V. KOUDELKOVÁ, J. NĚMEČEK (Sr)
(Czech Technical University in Prague, Czech Republic)

2 13.15–13.30

Buckling Analysis of Circular Sandwich Plates with the Nonlinear Elastic Core Material

O. KUDIN, S. CHOPOROV, S. GOMENYUK, V. GRISTCHAK
(Zaporizhzhia National University, Ukraine)

3 13.30–13.45

Determination of Method for Investigation of Irradiation-induced Steel-concrete Interface Degradation

D. KAVANOVÁ, P. ŠTEMBERK, J. FLÁDR (Czech Technical
University in Prague, Czech Republic)



4 13.45–14.00

**Effective Characteristics of the Viscoelastic
Fiber-reinforced Composite with Transversally
Isotropic Components under Transverse Shear**

**S. GREBENYUK, M. KLYMENKO, O. TITOVA,
T. SMOLIANKOVA** (Zaporizhzhya National University, Ukraine)

5 14.00–14.15

**Comparison Micromechanical Properties of Interfacial
Transition Zone in Fiber-Reinforced Cement Paste
Samples Different Age**

V. ZACHARDA, P. ŠTEMBERK, J. NĚMEČEK (Sr) (Czech
Technical University in Prague, Czech Republic)

6 14.15–14.30

**Finite Element Modeling of the Locomotive
Pantograph - Contact Wire Interaction**

A. O. SHIMANOVSKY, I. I. KAPLIUK (Belarusian State
University of Transport, Belarus)

14.30–15.30 Coffee-break and poster session

7 15.30–15.45

**Mechanical Response of Biological Shielding Ring to
Variations in Azimuthal Neutron Flux Distribution**

Y. KHMUROVSKA, P. ŠTEMBERK, T. FEKETE (Czech
Technical University in Prague, Czech Republic)

8 15.45–16.00

**Influence of the Cohesion Between the Matrix
and the Filler Granules on the Cement Composite
Strength**

V. I. YAKUBOVICH, A. O. SHIMANOVSKY (Belarusian State
University of Transport, Belarus)

9 16.00–16.15

**Design and Structural Analysis of CTU in Prague 2018
Concrete Canoe**

Š. ŠONKA, M. FRANTOVÁ, P. ŠTEMBERK, J. BRAUN (Czech
Technical University in Prague, Czech Republic)

10 16.15–16.30

**Numerical Investigation of Hydrogen Influence on Stress
Intensity Factor of Zirconium Alloy**

R. JANULIONIS, G. DUNDULIS, A. GRYBĖNAS (Lithuanian Energy
Institute, Lithuania)

11 16.30–16.45

Ice Loads Impact on Spillway Culverts Piers in Lithuania

R. ŠADZEVIČIUS, T. SANKAUSKIENĖ (Aleksandras Stulginskis
University, Lithuania)

12 16.45–17.00

**Strength and Durability of Carbon Fiber Bars
Adhesive Bonding**

**R. GUDELIAUSKAS, M. LENDRAITIS, N. M. KOMMANABOINA,
K. PETKEVIČIUS** (Kaunas University of Technology, Lithuania)

13 17.00–17.30 Discussions



18 May 2018

Hotel "Grand SPA Lietuva"

HALL "Ūla"

13.00–17.00 h

Section B DYNAMICS OF
MECHANICAL SYSTEMS

Section C MECHANICAL
TECHNOLOGIES

Section D TECHNOLOGIES OF
GRAPHICS MEDIA AND
ADVANCED MATERIALS

CHAIRMAN

Prof. Prof. A. FEDARAVIČIUS

Secretary

Assoc. Prof. R. MIKALAUSKAS

1 13.00–13.15

**Vibration And Temperature Analysis of a Servo Motor
with Programmable Logic Controller**

M. SARI, S. ERSOY (Marmara University, Turkey)

2 13.15–13.30

**Analysis of Pipeline Vibration in Macro, Mini and
Micro Regime**

J. AVSEC, U. NOVOSSEL (University of Maribor, Slovenia)

3 13.30–13.45

**Dynamic Condensation as a Model Order Reduction
Technique for RTFEM Model in Hybrid Simulation**

W. MUCHA (Institute of Computational Mechanics and
Engineering, Poland)

4 13.45–14.00

**The Influence of Polarity and Associating Effects
on Viscosity and Thermal Conductivity**

J. AVSEC (University of Maribor, Slovenia)

5 14.00–14.15

Reverse Ultrasonic Actuator for Efficient Machining

**V. OSTASEVICIUS, V. JURENAS, D. EIDUKYNAS,
P. KARPAVICIUS** (Kaunas University of Technology,
Lithuania)

6 14.15–14.30

**Sonotrode for Formation of Piezocomposite
Functional Elements**

**A. SODAH, A. PALEVICIUS, G. JANUSAS, V. JURENAS,
Y. R. PATEL** (Kaunas University of Technology, Lithuania)

14.30–15.30 Coffee-break and poster session

7 15.30–15.45

**Fast Computations of Granular Flows by the
Discrete Element Method**

R. PACEVIČ, A. KAČENIAUSKAS, R. BARAUSKAS
(Kaunas University of Technology, Lithuania)

8 15.45–16.00

**Investigation of Intervertebral Disc Response to
Dynamic Loading**

S. MIKUCKYTE, V. OSTASEVICIUS, V. JURENAS (Kaunas
University of Technology, Lithuania)

9 16.00–16.15

Rapid Separation of Nanoparticles in Fluids by Sonic and Ultrasonic Acoustophoresis

V. OSTASEVICIUS, V. JURENAS, R. GAIDYS, E. GOLINKA (Kaunas University of Technology, Lithuania)

10 16.15–16.30

Digital and Offset Printing Paper Technology Research

T. SENAVAITYTĖ, N. BUŠKUVIENĖ (Kaunas University of Technology, Lithuania)

11 16.30–16.45

Prepress Quality Control for Offset Printing

J. MAKUSKAITĖ (Kaunas University of Technology, Lithuania)

12 16.45–17.00

Development of Piezoelectrets by Using 3D Printing and Contact Poling of Voided Polymeric Films

J. CEPAITIS (Kaunas University of Technology, Lithuania)

13 17.00–17.15

The Effects of Various Drill Types on Delamination Occurred During Drilling of CFRP

M. OLLIKAINEN, J. VARIS (Lappeenranta University of Technology, Finland)

14 17.15–17.30 Discussions

Poster Section

18 May 2018

Hotel "Grand SPA Lietuva"

HALL "Neris"

14.30–15.30 h

P1

Discrete Mathematical Model of a Flexible Lifting Trawl Flap

NEDOSTUP A. A., RAZHEV A. O. (Kaliningrad State Technical University, Russia)

P2

Optimization and Prediction of Durability and Utility Features of Three-layer Piezoelectric Transducers

GRZEGORZ MIECZKOWSKI (Białystok University of Technology, Poland)

P3

Influence of Technological Factors on Geometrical Parameters of Electrical Conductive Embroidered Element

ŽANETA JUCHNEVIČIENĖ, UGIS BRIEDIS, ALEKSANDRS VALISEVSKIS, MILDA JUCIENĖ, VAIDA DOBILAITĖ, VIRGINIJA SACEVIČIENĖ (Institute of Architecture and Construction, Lithuania)

P4

Review and Perspectives of Additive Layer Manufacturing Technologies for Composites Structures Production

TOMAS KUNCIUS, MARIUS RIMAŠAUSKAS (Kaunas University of Technology, Lithuania)

P5

Dynamics Analysis of the Elevator Chain in an Automated Garage

ANTONI JOHN, CZESŁAW PYPNO, JAROSŁAW BRODNY (Silesian University of Technology, Poland)

P6**The Application of Model-based Testing for Analysing the Impact of Airway Geometry on the Distribution of Methane Concentrations at the Outlet from a Longwall****MAGDALENA TUTAK, JAROSŁAW BRODNY, ANTONI JOHN**
(Silesian University of Technology, Poland)**P7****Investigations of the Flow Characteristics of Low-pressure Gas-phase Injectors under the Conditions of Numerical Simulation****DARIUSZ SZPICA** (Bialystok University of Technology, Poland)**P8****The Calculation Method of Determining of the Engine Full Load Characteristics and Performance****DARIUSZ SZPICA** (Bialystok University of Technology, Poland)**P9****The Inverse Honeycomb Structures in Numerical Modelling and Experiment****MAŁGORZATA JOHN, ANTONI JOHN, WOJCIECH SKARKA**
(Silesian University of Technology, Poland)**P10****Simulation Studies of Passenger Car Brake System Elements Heating Process under Various Braking Parameters****ANDRZEJ BORAWSKI** (Bialystok University of Technology, Poland)**P11****New Concept of Low-pressure Gas-phase Injector****ANDRZEJ BORAWSKI** (Bialystok University of Technology, Poland)

P12

Development of Electroactive PVDF Films by Using 3D Printing and Contact Poling

FARUSIL NAJEEB MULLAVEETIL, ROLANAS DAUKSEVICIUS
(Kaunas University of Technology, Lithuania)

P13

An Experimental Investigation of the Hard Alloy Wear at the Contact with Rock Potash

**VICTOR YA. PRUSHAK, PAVEL N. BOGDANOVICH,
ALEXANDR O. SHIMANOVSKY, VOLHA M. VOLCHEK** (Belarusian
State University of Transport, Belarus)

P14

Physical Properties of Modified and Recycled Polymer Films for Packaging

**E. KIBIRKŠTIS K. VAITASIUŠ, V. MAYIK, T. DUDOK,
R. ZATSERKOVNA, L. MAYIK** (Kaunas University of Technology, Lithuania)

P15

Special Handmade Paper Manufacturing and Decompose in Environment Condition

AUDRĖ JUŠKAITĖ, LAURA GEGECKIENĖ (Kaunas University of
Technology, Lithuania)

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Modeling of Stress-strained State of the Block Spine During the Exploitation of Book and Magazine Editions

**SVITLANA HAVENKO, BOHDAN DURNYAK,
VOLODYMYR BERNATSEK, MYROSLAVA KADYLIAK** (Technical
University of Lodz, Poland)

P17

GFRP Structural Health Monitoring by Using Various Embedded Conductive Elements

**KĘSTUTIS ŠPAKAUSKAS, MANTAS VASILIAUSKAS,
PAULIUS GRIŠKEVIČIUS** (Kaunas University of Technology, Lithuania)

P18

Vibroprotection System with the Elastic Element and the Electrically Controlled Damping Material

KOROBKO EVGUENIA, KUZMIN VLADZIMIR, BUBULIS ALGIMANTAS, BILYK VYACHESLAV, NOVIK EKATHERINA, JUZÉNAS KAZIMIERAS (Kaunas University of Technology, Lithuania)

P19

Analysis of the Influence of the Width of the Sample of a Paper with the Slit on the Strength Parameter

YURIY PYR'YEV, EDMUNDAS KIBIRKŠTIS (Warsaw University of Technology, Poland)

P20

Modeling of Constructions' Structurally Nonlinear Oscillations Using Chebyshev's Polynomials

SERGEI YU. GRIDNEV, YURI I. SKALKO, ALEXANDR O. SHIMANOVSKY (Voronezh State Technical University, Russia)

P21

Investigation of Relief Elements Formed by 3D Printing Technology

GEDIMINAS URBONAS, INGRIDA VENYTĖ (Kaunas University of Technology, Lithuania)

P22

The Analysis of Label Quality for Pasteurization

ILONA KAPOČIŪTĖ, ASTA KABELKAITĖ-LUKOŠEVIČĖ (Kaunas University of Technology, Lithuania)

P23

Innovative Research Method of the Fuel Injector that Allows to Evaluate the Efficiency of Wood Chip Drive Control Systems

KONRAD J. WALUŚ, PIOTR KRAWIEC, BARTOSZ WIECZOREK (Poznan University of Technology, Poland)

P24

**Effect of Geometrical Parameters Road Railway Crossing
on Accelerating the Body of the Vehicle – Pilot Studies**

JAKUB POLASIK, JANUSZ MIELNICZUK, ŁUKASZ WARGUŁA
(Poznan University of Technology, Poland)

poster section



