



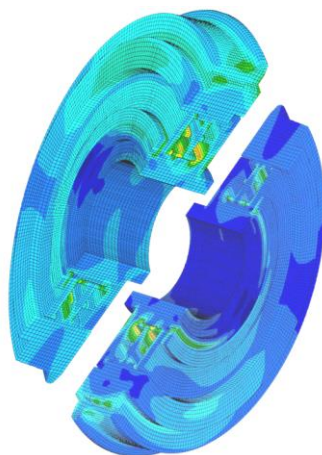
**Alexander Dubček University of Trenčín
Faculty of Industrial Technologies in Púchov**

**The 30th International
Slovak-Polish Scientific Conference**

on

Machine Modelling and Simulations

MMS 2025



CONFERENCE PROGRAMME

September 2 – 5, 2025

Tále, Slovakia

Tuesday – September 2, 2025

11:00 – 15:00 Registration of participants
12:30 – 14:30 Lunch
15:00 – 16:00 Opening ceremony
16:00 – 16:15 Coffee break
16:15 – 17:45 Invited lectures
19:00 – 21:00 Dinner

Wednesday – September 3, 2025

07:30 – 09:00 Breakfast
09:00 – 09:15 Sponsor lecture
09:30 – 10:45 Lectures – Sessions A1, B1, C1
10:45 – 11:15 Coffee break
11:15 – 12:30 Lectures – Sessions A2, B2, C2
12:30 – 14:00 Lunch
14:00 – 15:15 Lectures – Sessions A3, B3, C3
15:15 – 15:45 Coffee break
15:45 – 16:45 Lectures – Sessions B4, C4
18:45 – 19:00 Official photo
19:00 – 02:00 Gala evening

Thursday – September 4, 2025

07:30 – 09:00 Breakfast
09:00 – 13:00 Time for free social program
13:00 – 14:30 Lunch
14:30 – 15:45 Lectures – Sessions B5, C5
15:45 – 16:00 Coffee break
16:00 – 17:15 Lectures – Sessions B6, C6
17:30 – 18:30 Meeting of Scientific Committee
19:00 – 22:00 Grill party
22:00 – 01:00 Disco

Friday – September 5, 2025

07:30 – 09:00 Breakfast
9:00 – 10:00 Lectures – Session A4
Contest evaluation
Closing of the conference

Tuesday – September 2, 2025

Invited Lectures, 16:15 – 17:45

Chairman: Prof. Darina Ondrušová, Prof. Marek Macko

Polyoxymethylene hybrid composites containing alumina oxide: effect of amino polysilsesquioxane on the ageing resistance

Dorota Czarnecka-Komorowska, Dominika Przelazła, Karolina Wiszumirska, Wiktoria Kanciak, Katarzyna Gawdzińska

Predicting the creep compliance of short fiber reinforced polymer composites from the matrix creep using an elementary approach

Bernhard Möginger, Julian Rech, Berenika Hausnerova

Modelling and Simulation of a Mechatronic System Actuated by Pneumatic Artificial Muscles in Matlab/Simulink

Vladimír Bulej, Juraj Uriček, František Jozef Legerský, Andrzej Piotrowski, Piotr Boral

Wednesday – September 3, 2025

Sponsor Lecture, 09:00 – 09:15

Chairman: Assoc. Prof. Róbert Janík

Advanced atmospheric plasma technologies for surface modification of materials and coatings

RNDr. Richard Krumpolec, PhD.

CEPLANT - R&D centre for Plasma and Nanotechnology Surface Modifications, Masaryk University, Brno

Session A1, 09:30 – 10:45 (Presentation contest)

Chairman: Prof. Alžbeta Sapietová, Assoc. Prof. Tomasz Domański,
Prof. Jan Krmela, Assoc. Prof. Krzysztof Talaśka

Extended numerical analysis of the effect of metering unit inclination on fertilizer dose – simulation results and validation

Wiktor Jan Łykowski, Łukasz Gierz

Conceptual design of a simulation model for bulk material transport by pipe conveyor

Bohdana Bobinics, Daniela Marasová

Hybrid executive system for welding processes integrating cam mechanisms and electronic motion profiles

Karol Wójkowski, Dominik Wilczyński, Dominik Wojtkowiak

Redesign of the tactical water filter FPW-50 through additive manufacturing

Adam Zabrowarny, Marek Macko

Physical and chemical alterations of NR composite induced by atmospheric-pressure plasma

Mariana Pajtášová, Silvia Ďurišová, Darina Ondrušová, Róbert Janík, Zuzana Mičicová, Oľga Novosadová, Simona Lokšíková

Session B1, 09:30 – 10:45

Chairman: Assoc. Prof. Ján Vavro, Prof. Grzegorz Jan Domek

Numerical analysis of deformation of a wind turbine blade with variable geometry controlled by means of centrifugal force

Jarosław Markowski, Grzegorz Wieczorkiewicz, Paweł Imilkowski, Piotr Długiewicz

Stamping of thick sheets after welding process

Waldemar Matysiak

Influence of the geometry and support conditions of the steel facing band on the local instability of the sandwich panel

Jolanta Pozorska, Zbigniew Pozorski

The concept of designing 3D printed parts with improved mechanical properties by splitting part into segments and assembling after printing

Dominik Wojtkowiak

Assessment of thermal stability and surface morphology of flat belts made of leather

Piotr Krawiec, Grzegorz Domek, Adam Piasecki, Radomir Majchrowski

Session C1, 09:30 – 10:45

Chairman: Assoc. Prof. Vladimíra Krmelová, Assoc. Prof. Branislav Ftorek

Low-Range Rotary Torque Meter with Hall Sensors

Jakub Bartoszek, Maciej Bodnicki

Basic experimental research supporting the modeling of Vacuum Packed Particles using the Discrete Element Method

Paweł Chodkiewicz, Arthur Bourdin, Robert Zalewski

Comparative analysis of the transmissibility functions of passive, Acceleration-Driven Damping (ADD) semiactive, and inerter-based suspension systems and their influence on ISO road random excitation responses

Grzegorz Waldemar Ślaski, Zbyszko Klockiewicz

Strain measurement using a 3D image correlation system during three-point bending

Marcin Kubiak, Tomasz Domański, Zbigniew Saternus, Wiesława Piekarska, Krzysztof Talaśka

Experimental and simulation investigation of a Tuned Mass Damper (TMD) with adjustable inertia for engineering applications

Igor Kotłowski, Cezary Korab, Krzysztof Twardoch, Bogumił Chiliński

Session A2, 11:15 – 12:30 (Presentation contest)

Chairman: Prof. Alžbeta Sapietová, Assoc. Prof. Tomasz Domański,
Prof. Jan Krmela, Assoc. Prof. Krzysztof Talaśka

Ultrasonic-based active thermography for determining depth detection limits in Onyx composites

Lucia Deganová, Vladimír Dekýš, Milan Sapieta, Alžbeta Sapietová

Weld pool detection and analysis from images using deep learning methods

Przemysław Frankiewicz, Jan Pawlik, Michał Bemberek

Changes in properties over time in paper heritage objects – ARTEMISA web application

Martina Fusková, Jan Krmela, Vladimíra Krmelová

Study of mixing and curing process of elastomeric blends with alternative filler content

Ivan Labaj, Juliána Vršková, Petra Skalková, Ivan Kopal, Darina Ondrušová, Zuzana Mičicová,
Slavomíra Božeková

Mechanical properties of polymer composites with walnut shell powder and cellulose

Juliána Vršková, Ivan Labaj, Petra Skalková, Ivan Kopal, Zuzana Mičicová, Slavomíra Božeková,
Darina Ondrušová

Session B2, 11:15 – 12:30

Chairman: Assoc. Prof. Andrea Feriancová, Assoc. Prof. Marcin Kubiak

Study of physical aspects of changes in the morphology parameters of the surface layer after machining using LFV technology

Piotr Boral, Rafał Gołębski, Adam Gnatowski

Alternative methods for simulating dynamic phenomena in containers for transporting sensitive cargo

David Cekus

The impact of the functional on the quality of the heat transfer coefficient mapping under fourth kind boundary conditions using swarm algorithms

Robert Dyja, Maria Zych, Elżbieta Gawrońska

Estimation of the heat transfer coefficient for three ranges of reference values under fourth-kind boundary conditions using swarm algorithms

Maria Zych, Robert Dyja, Elzbieta Gawronska, Grzegorz Domek

Conceptual design with strength analysis based on the FOPS test for a tubular cover dedicated to the Kubota M135GX-IV tractor

Łukasz Gierz, Mikołaj Spadło, Antoni Kuchta

Session C2, 11:15 – 12:30

Chairman: Assoc. Prof. Dana Bakošová, Assoc. Prof. Sebastian Uzny

Comparative wear analysis of Q&P treated AHSS steel

Michal Krbaťa, Marcel Kohutiar, Milan Jus, Alena Breznická, Pavol Mikuš, Jozef Fekiač, Lucia Kakošová

The effect of fuel content on engine oil life

Pavol Mikuš, Alena Breznická, Marcel Kohutiar, Michal Krbaťa, Milan Jus, Lucia Kakošová, Jozef Fekiač

The trade-off between strength parameters and residual stresses in modern engineering materials

Łukasz Urbaniak

Analysis of the preparation and magnetic properties of Fe/SiO₂ soft magnetic composites

Denisa Olekšáková, Livia Provázková, Lucia Knapčíková, Stephan Schlögl

Enhancing of the progressive materials production process using Tecnomatix Plant Simulation software

Lucia Knapčíková, Denisa Olekšáková, Maksym Karakai, Christian Ploder

Session A3, 14:00 – 15:15 (Presentation contest /part)

Chairman: Prof. Alžbeta Sapietová, Assoc. Prof. Tomasz Domański,
Prof. Jan Krmela, Assoc. Prof. Krzysztof Talaśka

Fourier transform based identification of spectral properties of nonlinear mechanical systems

Ján Minárik, Milan Sága, Milan Vaško, Branislav Ftorek, Tomasz Domański

Research stand for determining the tension force in transport straps

Maciej Szulc, Dominik Wilczyński, Dominik Wojtkowiak, Krzysztof Talaśka

Experimental investigations of the load state in a threaded connection

Kuba Kryszczyński, Dominik Wilczyński, Krzysztof Wałęsa, Krzysztof Talaśka

Concept of numerical modelling and simulation in machine crushing processes

Jarosław Seńko

FE analysis of multiaxial fatigue damage prediction of transport machinery frames

Lenka Jakubovičová, Milan Sága, Milan Vaško

Session B3, 14:00 – 15:15

Chairman: Assoc. Prof. Milan Vaško, Prof. Michal Bembenek

Simulation model of CNC cell

Milan Jus, Alena Breznická, Pavol Mikuš, Marcel Kohutiar, Michal Krbaťa, Maroš Eckert

Modeling the influence of carbon black type and loading on the mixing dynamics of rubber blends using a Generalized Regression Neural Network

Ivan Kopal, Juliána Vršková, Ivan Labaj, Marta Harničárová, Jan Valíček

New method of adjusting flow parameters of axial fans

Piotr Odyjas, Ivan Kuric, Marek Macko, Damian Pietrusiak, Milan Sága, Andrzej Szczepańczyk, Zbigniew Szczepańczyk, Mariusz Śliwiński, Kamil Urbański, Milan Vaško, Jędrzej Więckowski, Przemysław Moczko

Modular online system for beam bending monitoring

Tibor Krenický, Vitalii Romaniuk

Discrete Element Method in modelling of the lunar regolith

Damian Pietrusiak, Jakub Wróbel, Przemysław Moczko, Piotr Czyżewski, Dawid Marciniak

Session C3, 14:00 – 15:15

Chairman: Assoc. Prof. Piotr Boral, Prof. Marek Kočiško

Analysis of the anti-slip properties of sidewalks and road surfaces in the area of pedestrian crossings and parking lots

Konrad Jan Waluś

Determining the Air-Fuel Ratio (AFR) for gasoline and gasoline-ethanol blends (E5 and E10): Differences in calculation methods and technical and commercial simplifications

Łukasz Warguła, Daniel Małozieć, Piotr Kaczmarzyk, Bartosz Wieczorek

Influence of the geometric parameters of connection for utility properties of timing belt

Dominik Wilczyński, Dominik Wojtkowiak, Krzysztof Wałęsa, Grzegorz Domek, Michał Wilczyński

Experimental and numerical investigation of a electromagnetic impact damper with variable mass

Mateusz Żurawski

Research and properties of porous structures

Maciej Berdychowski

Session B4, 15:45 – 17:00

Chairman: Assoc. Prof. Dawid Cekus, Assoc. Prof. Vladimír Bulej

Dynamics simulations of Vacuum Packed Particles Torsional Damper using a modified Bouc-Wen model identified from quasi-static experiments

Dominik Rodak, Mateusz Żurawski, Robert Zalewski

Modelling of mechanical properties of thermoplastic elastomer for simulation of belt welding process

Krzysztof Wałęsa, Krzysztof Talaśka, Dominik Wilczyński

Study of the dynamic-mechanical properties of polymeric blends for a novel material component in sustainable bulk material transport

Róbert Janík, Ivan Labaj, Darina Ondrušová, Mariana Pajtášová, Jan Krmela, Daniela Marasová, Olga Novosadová

Effect of cold plasma on surface and tribological properties of 34CrNiMo6 steel

Marcel Kohutiar, Michal Krbaťa, Alena Breznická, Pavol Mikuš, Milan Jus, Maroš Eckert, Ingrid Kovaříková

The effect of processing temperature on the properties of thin TiO₂ films on a steel substrate

Iveta Papučová, Jana Pagáčová, Jana Šulcová, Andrea Feriancová, Igor Barényi, Marcel Kohutiar, Aleksandra Ewa Nowicka

Session C4, 15:45 – 17:00

Chairman: Assoc. Prof. Denisa Olekšáková, Assoc. Prof. Michal Krbaťa

Alternative fillers in polymers: an expert view on innovation and environmental solutions

Slavomíra Božeková, Zuzana Mičicová, Darina Ondrušová, Iveta Papučová, Petra Skalková, Ivan Labaj, Juliána Vršková

Silane modification of bentonite using a microwave system for application in polymer composites

Zuzana Mičicová, Slavomíra Božeková, Mariana Pajtášová, Petra Skalková, Juliána Vršková, Ivan Labaj

Effect of cellulose microfibrils physical treatment on mechanical adhesion in elastomer blend

Andrej Dubec, Ivan Labaj, Petra Dubcová, Juliána Vršková, Dana Bakošová, Alžbeta Bakošová

Effect of recycled PP/EPDM on the performance of NR-based elastomeric systems

Petra Skalková, Ivan Labaj, Zuzana Mičicová, Slavomíra Božeková, Juliána Vršková

The effect of NaOH concentration as stabiliser on the properties of aqueous SiO₂ sols and their xerogels

Iveta Papučová, Jana Pagáčová, Petr Exnar, Andrea Feriancová

Thursday – September 4, 2025

Session B5, 14:30 – 15:45

Chairman: Prof. Piotr Krawiec, Assoc. Prof. Damian Pietrusiak

Effect of manufacturing inaccuracies on the Peaucelier linear mechanism

Alžbeta Sapietová

New device for manufacturing highly-filled composites from polymer waste

Tomasz Klepka

Strain field determination for additively manufactured thermoplastics using computer vision

Jaroslav Majko, Ondrej Piroh, Ján Minárik, Milan Vaško, Marián Handrik, Milan Sága, Zbigniew Saternus

Influence of the thermal load on piezoelectric solids at micro/nano scale

Miroslav Repka

Bending of functionally graded micro/nano plates with flexoelectric effect by Moving Finite Element Method

Ladislav Sátor, Miroslav Repka

Session C5, 14:30 – 15:45

Chairman: Prof. Dorota Czarnecka-Komorowska, Prof. Bernhard Möglinger

A note on the Thomas-Fermi equation

Božena Dorociaková, Rudolf Olach, Zuzana Malacká

Comparative analysis of extreme value distributions for modeling particulate matter air pollution in Trenčín, Slovakia

Ivana Pobočíková, Mária Michalková, Daniela Jurášová, Zuzana Sedliačková, Branislav Ftorek

Analysis of the influence of laser welding parameters on the quality of the lap joint

Zbigniew Saternus, Wiesława Piekarska, Tomasz Domański, Ján Vavro Jr., Marcin Kubiak, Pavol Čerňava

Stability of a column loaded with a follower force directed towards the negative pole, taking into account two stiffness discontinuities

Sebastian Uzny

Comparison and verification of stress measurement results using the Barkhausen effect during three-point bending

Tomasz Domański, Wiesława Piekarska, Milan Sága, Zbigniew Saternus, Marcin Kubiak, Milan Vaško

Session B6, 16:00 – 17:15

Chairman: Assoc. Prof. Tibor Krenický, Assoc. Prof. Przemysław Moczko

Parameters of the compaction process of aluminium alloy chips after machining

Krzysztof Talaśka, Łukasz Urbaniak, Dominik Wilczyński, Dominik Wojtkowiak, Marcin Kubiak, Krzysztof Wałęsa

Experimental measurement of defects propagation for a passenger car tire casing under dynamic loading

Ján Vavro jr., Ján Vavro, Pavol Čerňava, Lukáš Klimek, Miloš Taraba, Tomasz Domański, Zbigniew Saternus, Petra Dubcová

FDM produced PLA prototype car parts – design and tensile properties

Jan Krmela, Vladimíra Krmelová, Terézia Matejíková, Martina Fusková

Optimized welding of austenitic chromium-nickel steel rollers of food machinery and lines

Marek Makúch, Jan Krmela, Vladimíra Krmelová

Microscopic and macroscopic examination of structural elements of a knee endoprosthesis made using DMLS technology

Jakub Lewandowski, Jacek Jackiewicz

Session C6, 16:00 – 17:15

Chairman: Assoc. Prof. Petra Skalková, Prof. Ján Vavro

Microwave treatment of kaolinite with organic reagents as a filler for rubber compounds

Andrea Feriancová, Jana Šulcová, Jana Pagáčová, Iveta Papučová, Beáta Pecušová, Mariana Pajtášová, Andrej Dubec

Characterisation of TiO₂ thin films on various metallic substrates

Jana Šulcová, Andrea Feriancová, Iveta Papučová, Jana Pagáčová, Jan Krmela, Alexandra Ewa Nowicka

Effect of heat treatment on material properties

Mariana Janeková, Daniela Košťaliková, Dana Bakošová, Andrej Dubec, Petra Dubcová, Alžbeta Bakošová, Milan Hlavčo

Stress analysis of the bicycle frame

Daniela Košťaliková, Mariana Janeková, Dana Bakošová, Petra Dubcová, Alžbeta Bakošová, Marek Kuvik

Study of physical and mechanical properties of elastomer systems for a new material element of a pipe conveyor

Darina Ondrušová, Ivan Labaj, Mariana Pajtášová, Jan Krmela, Róbert Janík, Daniela Marasová

Friday – September 5, 2025

Session A4, 09:00 – 10:00

Chairman: Assoc. Prof. Jana Šulcová, Assoc. Prof. Vladimír Dekýš

ESPI interferometry and computational modeling in the analysis of vibration modes and material parameters of polyamide-based composites reinforced with carbon fibers

Dana Bakošová, Alžbeta Bakošová, Petra Dubcová, Daniela Košťaliková, Andrej Dubec, Mariana Janeková

The influence of micropurity on the failure of the steel reinforcement in the production process

Petra Dubcová, Ján Vavro, Jr., Ján Vavro, Andrej Dubec, Alžbeta Bakošová, Dana Bakošová,
Daniela Košťaliková, Mariana Janeková

The effect of accelerated weathering tests on the properties of materials in the exterior

Katarína Moricová, Jana Šulcová, Andrea Feriancová