



XXI International Technical Systems Degradation Conference

Liptovský Mikuláš, 23 - 25 April 2025

Conference framework program



**Faculty of Automotive
and Construction
Machinery Engineering**

WARSAW UNIVERSITY OF TECHNOLOGY



**LUBLIN UNIVERSITY
OF TECHNOLOGY
MECHANICAL
ENGINEERING FACULTY**



Liptovský Mikuláš
23.04÷25.04.2025



XXI INTERNATIONAL TECHNICAL SYSTEMS DEGRADATION CONFERENCE

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CONFERENCE PROGRAMME of 21th ITSDC

23.04.2025 (Wednesday)

14⁰⁰-14⁵⁰ – Registration (Armed Forces Academy of General M. R. Štefánik)

14⁵⁰-15⁰⁰ – Opening ceremony of XXI ITSDC

15⁰⁰-16⁴⁰ – Plenary session – VEHICLES & SHIPS – S1

16⁴⁰-17⁰⁰ – Coffee Break

17⁰⁰-18⁴⁰ – Plenary session – DIAGNOSTICS I – S2

24.04.2025 (Thursday)

15⁰⁰-15²⁰ – Plenary session – DIAGNOSTICS II– S3

15²⁰-15⁴⁰ – Coffee Break

15⁴⁰-18⁰⁰ – Poster Session

25.04.2025 (Friday)

15⁰⁰-16⁴⁰ – Plenary session – SECURITY & DEFENSE – S4



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SESSION 1 - VEHICLES & SHIPS (S1)

(Chairmen: Prof. M. Makowski / prof. J. Dižo)

15:00 Adam FULEK, Vladimír KADLUB, Miroslav MARKO

TRIBOTECHNICAL DIAGNOSTICS –ANALYSIS OF ENGINE OIL DEGRADATION VIA OIL PROPERTIES OF SAE 10W-30 IN TATRA PHOENIX DURING 9 MONTHS OF USE

15:20 Jan MONIETA

DEVICE AND METHOD FOR DIAGNOSING THE DEVELOPMENT OF DEFECTS IN THE INJECTION APPARATUS OF RECIPROCATING INTERNAL COMBUSTION ENGINES USING SYMPTOMS OF THE VIBRATION ACCELERATION SIGNAL

15:40 Peter DROPPA, Vladimír KADLUB, Martin BARTOŠ, Samuel DUBJAK, Filip FERENCZI, Ján LYSÝ

PASSIVE ANTI-DRONE PROTECTION OF COMBAT VEHICLES

16:00 Damian MARKUSZEWSKI, Aleksandra GRZYBEK

UNIVERSAL APPLICATION OF THE ALGORITHM CONTROLLING SERVOS VIA THE COMMUNICATION BUS

16:20 EC Test Systems

EC TEST SYSTEMS COMPANY PRESENTATION



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SESSION 2 - DIAGNOSTICS I (S2)

(Chairmen: prof. A. Borucka / Prof. P. Droppa)

- 17:00 **Radosław NOWAK, Przemysław RUMIANEK, Jacek CABAN, Jarosław SEŃKO**
ON PIEZOELECTRIC ENERGY HARVESTING IN A CITY BUS COMPOSITE BODY
- 17:20 **Damian MARKUSZEWSKI, Paweł CIĘŻKOWSKI**
EVALUATION OF CONCRETE STRENGTH BASED ON STRUCTURE VIBRATION ANALYSIS
- 17:40 **Arkadiusz KWAŚNIEWSKI, Sebastian BĄK, Paweł CIĘŻKOWSKI, Karol BRZEZIŃSKI**
ANALYSIS OF SOIL COMPACTION USING THE INTELLIGENT GRAIN "GRAINCEPTOR"
- 18:00 **Paweł CIĘŻKOWSKI, Paweł WOLIŃSKI, Sebastian BĄK**
UTILIZATION OF A VARIETY OF BANDED IRON FORMATIONS (TACONITE) FOR THE PRODUCTION OF CONCRETE COMPOSITES
- 18:20 **Damian MARKUSZEWSKI, Arkadiusz KWAŚNIEWSKI**
TESTING OF STRENGTH PROPERTIES FOR ONYX WITH FIBERGLASS, CARBON FIBRE AND KEVLAR COMPOSITE SUPERSTRUCTURES



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SESSION 3 - DIAGNOSTICS II (S3)

(Chairmen: prof. M. Makowski / prof. P. Droppa)

15:00 **Krzysztof WIĘCŁAWSKI, Jędrzej MĄCZAK**

FMEA METHOD FOR ASSESSING THE RELIABILITY OF A GASOLINE DIRECT INJECTION SYSTEM



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POSTER SESSION

(Chairmen: prof. J. Mączak / prof. J. Stodola)

1. **Sebastian SOBCZUK, Anna BORUCKA**
PASSENGER AIR TRANSPORT IN POLAND COMPARED TO SELECTED EUROPEAN COUNTRIES DURING DISRUPTIONS CAUSED BY THE COVID-19 PANDEMIC: COMPARISON AND PROSPECTS FOR THE FUTURE
2. **Edward KOZŁOWSKI, Magdalena ZIMAKOWSKA-LASKOWSKA, Piotr WIŚNIEWSKI, Andrzej ŚWIDERSKI, Jan LASKOWSKI**
ENERGY CONSUMPTION MODELLING IN ELECTRIC BUS DRIVE SYSTEMS
3. **Paweł CIĘŻKOWSKI, Paweł WOLIŃSKI, Krzysztof WIĘCŁAWSKI, Sławomira DUMAŁA**
ATTEMPT TO USE CERTIDUM FOR PLASTERING MORTAR BASED ON ALUMINOUS CEMENT
4. **Krzysztof WIĘCŁAWSKI, Jędrzej MĄCZAK, Paweł CIĘŻKOWSKI**
MOBILE SENSOR SYSTEM FOR DETERMINING THE TOXICITY OF CAR EXHAUST EMISSIONS
5. **Piotr MIŚ, Przemysław SZULIM, Jędrzej MĄCZAK**
OPTIMIZATION OF THE SPATIAL-TIME-FREQUENCY ALGORITHM USING ESTIMATION OF VISUAL MARKER MOVEMENT DIRECTION IN IMAGES
6. **Katarzyna MIŚ, Piotr PIÓRKOWSKI, Jędrzej MĄCZAK**
IMPROVING OF SELECTED OPERATIONAL PARAMETERS OF TRACTION BATTERIES USING A SUPERCAPACITOR
7. **Przemysław RUMIANEK, Radosław NOWAK, Jarosław SEŃKO, Jacek CABAN**
IMPACT OF EXTREME CONDITIONS ON THE STRUCTURAL DEGRADATION OF EXPANDED POLYPROPYLENE (EPP) FOAMS
8. **Piotr WINIARSKI, Przemysław SZULIM, Michał MAKOWSKI**
MEASUREMENT SYSTEM FOR THE STUDY OF AIR PARAMETERS IN A NIV HELMET
9. **Maciej SŁOMCZYŃSKI, Michał MAKOWSKI, Katarzyna RUTCZYŃSKA-WDOWIAK**
MODELLING THE DISSIPATION CHARACTERISTICS OF A MAGNETO-RHEOLOGICAL DAMPER
10. **Przemysław SZULIM**
UTILIZING MAGNETIC FIELD MAPPING FOR INDOOR MOBILE ROBOT LOCALIZATION
11. **Vratislav KREHEĽ, Tomáš RÁZGA**
DETECTION SIGNATURES OF MODERN TECHNOLOGIES IN NIGHT COMBAT OPERATION
12. **Martin ILAVSKÝ, Tomáš RÁZGA**
CONCEPTUAL DESIGN OF A TRIP FLARE
13. **Patrik ĎURICA, Michal MOZOLA**
CONCEPTUAL DESIGN OF AN IMPROVISED FIREARMS FROM AVAILABLE MATERIALS
14. **Anezka KRALOVA, Martin BARTOS**
THE DESIGN OF THE SPECIALIZED SHOTGUN SHELL AND ITS USE AGAINST UAS
15. **Pavol LUKÁŠIK, Vladimír KADLUB**
THE IMPACT OF BROKEN AXLE SPRINGS ON THE DYNAMIC CHARACTERISTICS OF SUSPENSION DAMPERS



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16. Radovan STEPHANY, Vladimir KADLUB

DEGRADATION OF ENGINE OIL PROPERTIES SAE 5W-30 IN AUTOMOTIVE BMW XDRIVE DURING SHORT INTERVALS OF OPERATION

17. Robert ROZGONYI

OPERATIONAL USE OF MULTISPECTRAL METHODS AGAINST UAS EFFECTS

18. Oleksandr KRAVCHENKO, Juraj GERLICI, Jan DIZO

ANALYSIS OF DEGRADATION OF AUTOMOTIVE INTERNAL COMBUSTION ENGINES

19. Ján DIŽO, Alyona LOVSKA, Miroslav BLATNICKÝ, Martin BUČKO

EVALUATION OF RAIL VEHICLE MECHANICAL VIBRATIONS' EFFECTS ON A HUMAN BODY BY MEANS OF SIMULATIONS



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SESSION 4 - SECURITY & DEFENSE (S4)

(Chairmen: prof. J. Mączak / prof. P. Droppa)

- 15:00 **Piotr TADZIK, Krzysztof SZCZUROWSKI, Marcin JASIŃSKI, Przemysław SIDELNIK**
ANALYSIS OF THE BEHAVIOR OF A RIFLE BARREL DURING A SHOT
- 15:20 **Jiri STODOLA**
WEAR OF SPECIAL EQUIPMENT
- 15:40 **Krzysztof WIĘCŁAWSKI, Krzysztof SZCZUROWSKI**
THE ACCURACY OF RECORDING ACCIDENT – RELATED INFORMATION IN THE ELECTRONIC MEMORY OF VEHICLES
- 16:00 **Jędrzej MĄCZAK, Michał MAKOWSKI, Dmytro SAMOILENKO**
LOW-TEMPERATURE CENTRIFUGAL EXTRACTOR FOR DRIED PLANT MATERIAL EXTRACTION
- 16:20 **Marcin BAJKOWSKI, Roman GRYGORUK, Marcin JASIŃSKI, Krzysztof SZCZUROWSKI**
BALLISTIC INSERTS FOR BULLETPROOF VESTS ON A CONTROLLED MATRIX – SIMULATION MODEL

PLACE OF THE CONFERENCE

Akadémia Ozbroyených Síľ generála M. R. Štefánika.

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