

Program of the Measurement 2023 Conference

29 - 31 May 2023, Smolenice Castle, Slovakia

Monday 29. 5. 2023 9:00 Conference Opening

Monday 29. 5. 2023 9:30 Keynote lecture I

Chairpersons J. Svehlikova (Slovakia)
M. Potse (France)

Time Authors and Title

9:30 **KN lecture: Olaf Dossel**
ECG Imaging - Methods for Solving the Inverse Problem of Electrocardiography

10:15 *Coffee break*

Monday 29. 5. 2023 10:30 Body surface ECG Measurements and Forward and Inverse Problems

Chairpersons J. Svehlikova (Slovakia)
M. Potse (France)

Time Authors and Title

10:30 *Nika Rasoolzadeh, Beata Ondrusova, Yesim Serinagaoglu Dogrusoz, Jana Svehlikova*
Effects of Torso Inhomogeneities on Spontaneous Pvc Localization in Potential and Dipole-Based Methods

10:45 **YIA paper: Beata Ondrusova, Peter Tino, Jana Svehlikova**
The Significance of the Torso Electrodes for Selected Cardiac Regions

11:00 *Katarina Kozlikova*
Electrocardiographic Body Surface Isochrone Maps with Threshold Potential – Variability in Young Healthy Men

11:15 **YIA paper: Lukas Zelieska, Michal Sasov, Peter Hanak, Milan Tysler**
Parameters of Body Surface Potential Maps Reflecting the Dynamics of Ventricular Activation

11:30 *Laura Bear*
The Difference Between Natural PVCs and Ventricular Stimulation for ECGI

Monday 29. 5. 2023 11:45 Theoretical Problems of Measurement – Posters I

Poster Authors and Title

P01 *Gejza Wimmer, Viktor Witkovsky*
Straight-Line Errors-In-Variables Calibration Model Versus Linear Regression Model

P02 *Gejza Wimmer, Gejza Wimmer*
Algorithm for Gum-Compliant Uncertainty Matrix in Straight-Line Calibration

P03 *Jakub Palencar, Anna Kovacikova, Rudolf Palencar*
The Control of a Prepackages by a Truncated Sequential Sampling Plan

P04 *Daniel Petrilak, Maria Markosova*
How Aphasia Influences Written and Spoken Texts

- P05 *Daniel Gogola, Hana Krakovska, Andrej Krafcik, Ivan Frollo, Pavol Szomolanyi*
Low-energy Recognition and Counting Device for Cyclists and Pedestrians Based on Artificial Intelligence
- P06 *Frantisek Rublik*
A Note on Confidence Intervals for Kendall's Tau
- P07 *Orest Kochan, Ze Wang, Yong Ouyang, Valeriy Eromenko, Andrii Aliluiko, Krzysztof Przystupa*
Criteria of Goodness of Fit and Confidence Intervals for Polynomial Regression Models Through the Origin (i.e. Without the Intercept)
- P08 *Martina Chvostekova*
A Difference between an Optimal Parameter Set for a Statistical Inferring of Directionality of Coupling for Stochastic and Chaotic Deterministic Systems Based on Information Theory
- P09 *Laura Hajzokova, Viktor Witkovsky*
Method Comparison for Numerical Inversion of Laplace Transform

Monday 29. 5. 2023 11:45 Measurement in Biomedicine – Posters II

Poster Authors and Title

- P11 *Marek Bajtos, Ladislav Janousek, Roman Radil, Kristina Paulecova*
Determining Initial Conditions for Cellular-Level Experiments With the Exposition of Time-Varying Magnetic Field
- P12 *Martin Bereta, Jozef Babecka, Jan Straka, Peter Valko, Anton Lacko*
The Benefits of Nuclear Cardiology Examinations Using Cardiological SPECT Gamma Camera
- P13 *Daniel Gogola, Nevena Ackovska, Richard Bagin, Bojana Koteska, Ana Madevska Bogdanova, Magdalena Kostoska, Fedor Lehocki, Milan Tysler*
Integrated Smart Patch for Heart Rate and Respiratory Rate Monitoring
- P14 *Jiri Pribil, Anna Pribilova, Ivan Frollo*
Triple PPG Sensor for Measurement of Heart Pulse Transmission Parameters in Weak Magnetic Field Environment
- P15 *Jan Mikulka, David Zimniok, Jan Dusek*
Laboratory System of Electrical Impedance Tomography

12:30 **Lunch**

Monday 29. 5. 2023 13:30 Connectivity and Causality in EEG or other Biological Signals

Chairpersons A. Krakovska (Slovakia)
M. Palus (Czech Republic)

Time Authors and Title

- 13:30 *Milan Palus, Aditi Kathpalia, Martin Brunovsky*
EEG Connectivity in Treatment of Major Depressive Disorder: Tackling the Conductivity Effects
- 13:45 *Katerina Hlavackova-Schindler, Christina Pacher, Claudia Plant, Mykola Lazarenko, Milan Palus, Jaroslav Hlinka, Aditi Kathpalia, Martin Brunovsky*
Pattern Discovery in an EEG Database of Depression Patients: Preliminary Results
- 14:00 **YIA paper: Madhurima Bhattacharjee, Aditi Kathpalia, Martin Brunovsky, Milan Palus**
Phase-based Causality Analysis of EEG in Treatment of Major Depressive Disorder

- 14:15 **YIA paper: Anupam Ghosh, Madhurima Bhattacharjee, Aditi Kathpalia, Martin Brunovsky, Milan Palus**
Phase Dynamics and Directed EEG Connectivity in Treatment of Major Depressive Disorder
- 14:30 *Anna Krakovska, Zuzana Rostakova, Martina Chvostekova, Jana Maslikova*
Do Scalp EEG Measurements Allow Causal Inference?
- 14:45 *Martina Chvostekova*
Inadequacy of the Liang Information Flow for Causal Analysis
- 15:00 *Zuzana Rostakova, Roman Rosipal*
The Effectiveness of Three Neural Spike Validation Methods in Setting Appropriate Spike Boundaries
- 15:15 **Coffee break**

Monday 29. 5. 2023 15:30 Keynote lecture II

Chairpersons M. Tysler (Slovakia)
O. Dossel (Germany)

Time Authors and Title

- 15:30 **KN lecture: Mark Potse**
Simulating Cardiac Electrophysiology: The Quest for Detail and Diversity

Monday 29. 5. 2023 16:15 Measurement in Biomedicine

Chairpersons M. Tysler (Slovakia)
O. Dossel (Germany)

Time Authors and Title

- 16:15 *Elena Cocherova, Milan Tysler*
Simulation of Body Surface Potentials During Ventricular Pacing
- 16:30 *Martin Bereta, Michal Teplan, Djamel Eddine Chafai, Tomas Zakar, Hoang Vuviet, Michal Cifra*
Assessment of Yeast Cells Electroporation by Autoluminescence and Impedance Measurements
- 16:45 **YIA paper: Hoang Vu Viet, Michal Teplan**
Development of an Experimental Platform for the Measurement of Biological Response of Low-Frequency Magnetic Fields
- 17:00 *Martin Skratek, Jan Manka, Alexander Cigan, Iveta Bernatova*
On the Way to Detection and Classification of Biogenic Iron in Tissues of Laboratory Animals with the Help of SQUID Magnetometry
- 17:15 *Jess Tate*
Quantifying Model Generation Error for ECG Modeling
- 17:30 **Coffee break**

Monday 29. 5. 2023 17:45 Theoretical Problems of Measurement

Chairpersons V. Witkovský (Slovakia)
I. Zakharov (Ukraine)

Time Authors and Title

- 17:45 *Igor Zakharov, Olesia Botsiura, Dimitar Diakov, Dariusz Swisulski*
Peculiarities of Measurement Uncertainty Evaluation at Calibrating a Ring Gauge
- 18:00 *Radek Slesinger*
OEFPII: New Method and Software Tool for Fitting Nonlinear Functions to Correlated Data With Errors in Variables
- 18:15 *Viktor Witkovsky*
Characteristic Function of the Tsallis q-Gaussian and Its Applications in Measurement and Metrology
- 19:30 *Welcome Dinner*

Tuesday 30. 5. 2023 9:00 Keynote lecture III

Chairpersons J. Manka (Slovakia)
P. Otomanski (Poland)

Time Authors and Title

- 9:00 **KN lecture: Pavel Ripka**
Precise Measurement of Magnetic Field Variations for Space Research, Geophysics and Security Applications

Tuesday 30. 5. 2023 9:45 Measurement of Physical Quantities I

Chairpersons J. Manka (Slovakia)
P. Otomanski (Poland)

Time Authors and Title

- 9:45 *Zdenek Roubal, Tomas Kriz, Tibor Bachorec*
Measurement of Frequency Dependence of Self-Inductance of Power Capacitors
- 10:00 **YIA paper: Michal Dzuris, Rene Hartansky, Jakub Krchnak**
Measuring the Radiation Pattern of Large FM Antenna System
- 10:15 *Jakub Krchnak, Rene Hartansky, Michal Dzuris, Michal Stibrany*
Calculation of Induced Currents in Antenna System Anchoring Cables by Equivalent Source Substitution
- 10:30 *Noby George, Pavel Ripka*
An Improved Circular Array of Sensors for Wideband Current Measurement in Rectangular Busbar
- 10:45 *Coffee break*

Poster Authors and Title

- P20 *Miroslav Gutten, Daniel Korenciak, Martin Karman, Peter Brncal*
Analysis of the Mechanical Condition of the Dry Transformer by Contact Frequency Measurement Method
- P21 *O. Kochan, X. Ning, J. Su, B. Sus, O. Kozynets, S. Lytvynenko, A. Ivanyshyn*
Development of the Illumination System of Recombination Sensor for Compound Concentration Measurements
- P22 *Stefan Hardon, Jozef Kudelcik, Anton Baran, Peter Hockicko*
Measurement of Effect of Ultrasonic Mixing on the Properties of Polyurethane Potting Compounds Doped with ZnO Nanoparticles
- P23 *Martin Gabrisak, Jozef Hallon, Mikulas Bittera, Karol Kovac*
Variability of Electromagnetic Field Homogeneity During Immunity Test According to EN 61000-4-3
- P24 *Jan Mikulka, Vladislav Smarda*
Analytical Model of Measurement Deviation of Platinum Temperature Sensors
- P25 *Rebeka Tauberova, Peter Lazorik, Julia Nazarejova, Lucia Knapcikova*
Monitoring of Printing Quality In Additive Manufacturing
- P26 *Przemyslaw Otomanski, Zbigniew Krawiecki*
Using LabVIEW to Record and Measure the RMS Voltage of a Distorted Waveform
- P27 *Gabriel Hencze, Jozefa Cervenova, Jozef Jasenek*
Optical Fiber Components Calibration Setup with Thermal Compensation Based on FBG Sensors
- P28 *Michal Stibrany, Rene Hartansky, Jakub Krchnak, Michal Dzuris*
Faulty Antenna Detection in Large Antenna Systems by Measuring the Phase
- P29 *Lukas Zdrazil, Zdenek Roubal*
Power Loss Measurement for Small Closed Material Samples
- P30 *Lubos Skurcak, Lubos Pavlov, Peter Bojda, Jan Gbelec*
Advances in EMP Objectification through Mathematical Modelling Using Innovative Technologies
- P31 *Daniel Korenciak, Miroslav Gutten, Martin Karman, Peter Brncal*
Non-Contact Measurement Dry Transformers using an Acoustic Camera with a Modular System
- P32 *Daniel Korenciak, Miroslav Gutten, Martin Karman, Peter Brncal*
Measurement of Noise Instability of Dry Transformer in a Test Room
- P33 *Miroslav Kamensky, Karol Hilko, Mikulas Bittera, Eva Kralikova*
Employing LabVIEW Web Service in Design of Application Twins with Remote Access
- P34 *Janusz Fidelus, Jacek Puchalski, Anna Trych-Wildner, Paula Weidinger*
The Creep Behaviour of a 2 kN·m Torque Transducer Tested at GUM and PTB
- P35 *Diana Hrakova, Pavel Ripka*
Processing of Nanocrystalline Wire for a Fluxgate Sensor Application
- P36 *Jure Konjevod, Marko Jurcevic*
Modular Instrumentation for Phasor Measurement Unit (PMU) testing
- P37 *Xu Ping, An Li, Hu Jiwei, Orest Kochan, Krzysztof Przystupa, Jacek Majewski*
Simulating Error Due to Inhomogeneity of Type K Thermocouples

P38 *Xu Aibo, Li Haitao, Zhao MingMing, Hu Jiwei, Orest Kochan, Krzysztof Przystupa*
Ad-Hoc Correction of Error Due to Input Resistance of DAQ Units

Tuesday 30. 5. 2023 12:00 Measurement of Physical Quantities II

Chairpersons M. Bittera (Slovakia)
P. Ripka (Czech Republic)

Time Authors and Title

- 12:00 **YIA paper:** *Blazej Nycz, Roman Przylucki, Lukasz Malinski*
Comparison of Characteristics for Two Selected Inductors for Levitation Melting
- 12:15 *Melinda Majerova, Martin Skratek, Anna Prnova, Jozef Kraxner, Andrej Dvurecenskij, Jan Manka, Dusan Galusek*
The Influence of Various Dopants on Magnetic Properties of Gehlenite Glasses
- 12:30 **YIA paper:** *Viesturs Silamikelis, Aigars Apsitis, Janis Snikeris, Austris Pumpurs, Samuel Biggs*
Simultaneous Measurement of the Lifting Force, Joule Heating and Axial/Radial Components of EM Field Inside an Electromagnetic Levitation Coil
- 12:45 **YIA paper:** *Abdullah S. AlOsaimi, Fahd A. AlKharraa and Khaled M. Ahmed*
UV Spectral Characterization and Quantitative Study of Ethanol in Ethanol/Water Solutions Using Spectrophotometry for Standardization Applications
- 13:00 **Lunch**
- 14:15 **Social program**
- 19:00 **Farewell Barbeque**

Wednesday 31. 5. 2023 9:00 Keynote lecture IV

Chairpersons P. Szomolanyi (Slovakia)
M. Krssak (Austria)

Time Authors and Title

- 9:00 **KN lecture:** *Andrea Serra*
Open Sky Low Field MRI: Challenges and Perspectives

Wednesday 31. 5. 2023 9:45 Low Field MRI vs. High Field MRI - Future Perspectives

Chairpersons P. Szomolanyi (Slovakia)
M. Krssak (Austria)

Time Authors and Title

- 9:45 *Martin Krssak*
Multinuclear MR Based Detection of Aging and Adaption to Exercise in Muscle and Brain
- 10:00 *Jiri Kratochvila, Marek Juttner, Radovan Jirik, Zenon Starcuk*
Noninvasive Characterization of Tissue Microvessel Architecture in MRI
- 10:15 *Ladislav Valkovic, Ferenc E. Mozes, Ivan Frollo, William T. Clarke, Damian J. Tyler, Pavol Szomolanyi*
Repeatability of 7T Human Cardiac 3D 31P-MRSI Using Concentric Ring k-space Trajectories

10:30 *Daniel Gogola, Andrej Krafcik, Ivan Frollo, Pavol Szomolanyi*
Eddy Currents Compensation in MRI

10:45 *Coffee break*

Wednesday 31. 5. 2023 11:00 Low Field MRI vs. High Field MRI - Future Perspectives - Posters IV

Poster Authors and Title

- P40 *Tomas Tvrdik, Lubomir Melichercik, Ladislav Baciak, Marianna Makova, Jakub Szabo, Veronika Janacova, Ivica Just, Svatava Kasparova*
In Vivo MRI, DTI and 1H MRS Rat Brain Analysis for Monitoring Early Neurodegeneration and Efficacy of the Used Therapy
- P41 *Marianna Makova, Martin Stosel, Tomas Tvrdik, Lubomir Melichercik, Svatava Kasparova*
Anti-Diabetic Treatment Effect on Early-Stage Neurodegeneration. In Vivo MRI and MRS Study in Rats
- P42 *Andrej Krafcik, Daniel Gogola, Pavol Szomolanyi*
Automated Knee Articular Cartilage Segmentation Using Convolutional Neural Network (CNN): Preliminary Results

Wednesday 31. 5. 2023 11:00 Measurement of Physical Quantities - Posters V

Poster Authors and Title

- P43 *Martin Halaj, Marek Mlkvik, Robert Olsiak, George Sammarah*
Velocity and Flow Rate Measurement in a Natural Circulation Helium Loop
- P44 *Matej Kucera, Miroslav Gutten, Martin Karman, Marek Nad*
The Use of Measurement on the Spark Plugs for the Analysis of the Ignition and Injection System
- P45 *Nasser D. AlDawood, Ebrahim S. AlSbaiy, Nasser M. AlQahtani, Khaled M. Ahmed*
Exploring the Size-Of-Source Effect of Transfer Radiation Thermometers by Various Methods
- P46 *Tatiana Kelemenova, Miroslav Dovica, Ivana Kolarikova, Katarina Palova, Ondrej Benedik*
Experimental Identification of Characteristics of Hall Sensor Arrangement
- P47 *Norbert Palsovics, Martin Pustka, Jan Belik, Pavel Zdarek*
Device for the Sound Quality Measurement of Reeds
- P48 *Pavel Neyezhnikov, Alexander Prokopov, Vladimir Skliarov*
Metrological Aspects of Pollutant Content Monitoring in Water Streams
- P49 *Vladimir Skliarov, Valeriy Aschepkov, Kirill Neyezhnikov*
The Traceability of the Results of Measurement in Additive Manufacturing in Ukraine
- P50 *Xu Aibo, Orest Kochan, Krzysztof Przystupa, Volodymyr Kochan*
Concept of in Situ Metrological Service of Analog-To-Digital Converters for Devices Compatible with the Internet of Things
- P51 *Orest Kochan, Huihui Tian, Jun Su, Krzysztof Przystupa, Roman Kochan, Elvira Dhzumelia, Nataliia Kochan, Ihor Likhnovskiy*
Correcting Measurement Error Due to Heating by Operating Current of Resistance Temperature Detectors
- P52 *Josef Skopalik, Jiri Sekora, Tomas Parak, Vratislav Cmiel, Tomas Horak*
Micro-Chamber Recording System for Stem Cell Adhesion Quantification

Wednesday 31. 5. 2023 11:45 Measurement of Physical Quantities III

Chairpersons M. Skratek (Slovakia)
J. Konjevod (Croatia)

Time Authors and Title

- 11:45 *Abdul Karim A. AlShahrany, Khalid S. AlEnizi, Khaled M. Ahmed*
Accurate Gravimetric Calibration of Micro-Pipettes Using Double Evaporation Trap with Temperature Correction and Uncertainty Budget
- 12:00 *Przemyslaw Otomanski, Eligiusz Pawlowski, Anna Szlachta*
Application of LabVIEW to Determine Characteristics of Two-Terminal Passive Components
- 12:15 *Andrej Krafcik, Peter Babinec, Oliver Strbak, Ivan Frollo*
Finite Elements and Integro-Differential Methods Are Equivalent for Description of Rotational Dynamics of Spherical Particle During Its Magnetic Alignment

Wednesday 31. 5. 2023 12:40 Closing Ceremony

13:00 *Lunch*

14:30 *Conference bus departure from Smolenice to Bratislava*

Young Investigator Award Competition

29-31 May 2023, Smolenice Castle, Slovakia

Monday 29. 5. 2023 10:45 *Body surface ECG Measurements and Forward and Inverse Problems*

- 10:45 **YIA paper:** *Beata Ondrusova, Peter Tino, Jana Svehlikova*
The Significance of the Torso Electrodes for Selected Cardiac Regions
- 11:15 **YIA paper:** *Lukas Zelieska, Michal Sasov, Peter Hanak, Milan Tysler*
Parameters of Body Surface Potential Maps Reflecting the Dynamics of Ventricular Activation

Monday 29. 5. 2023 14:00 *Connectivity and Causality in EEG or other Biological Signals*

- 14:00 **YIA paper:** *Madhurima Bhattacharjee, Aditi Kathpalia, Martin Brunovsky, Milan Palus*
Phase-based Causality Analysis of EEG in Treatment of Major Depressive Disorder
- 14:15 **YIA paper:** *Anupam Ghosh, Madhurima Bhattacharjee, Aditi Kathpalia, Martin Brunovsky, Milan Palus*
Phase Dynamics and Directed EEG Connectivity in Treatment of Major Depressive Disorder

Monday 29. 5. 2023 16:45 *Measurement in Biomedicine*

- 16:45 **YIA paper:** *Hoang Vu Viet, Michal Teplan*
Development of an Experimental Platform for the Measurement of Biological Response of Low-Frequency Magnetic Fields

Tuesday 30. 5. 2023 10:00 *Measurement of Physical Quantities I*

- 10:00 **YIA paper:** *Michal Dzuris, Rene Hartansky, Jakub Krchnak*
Measuring the Radiation Pattern of Large FM Antenna System

Tuesday 30. 5. 2023 12:00 *Measurement of Physical Quantities II*

- 12:00 **YIA paper:** *Blazej Nycz, Roman Przulucki, Lukasz Malinski*
Comparison of Characteristics for Two Selected Inductors for Levitation Melting
- 12:30 **YIA paper:** *Viesturs Silamikelis, Aigars Apsitis, Janis Snikeris, Austris Pumpurs, Samuel Biggs*
Simultaneous Measurement of the Lifting Force, Joule Heating and Axial/Radial Components of EM Field Inside an Electromagnetic Levitation Coil
- 12:45 **YIA paper:** *Abdullah S. AlOsaimi, Fahd A. AlKharraa and Khaled M. Ahmed*
UV Spectral Characterization and Quantitative Study of Ethanol in Ethanol/Water Solutions Using Spectrophotometry for Standardization Applications