

Actual Conference Program

TUESDAY, SEPTEMBER, 27

9.30-10.10. Opening ceremony. (**Rector Building, Room 12**)

General Session. Chairs: L. Kurpa, Yu. Mikhlin, F. Pellicano

10.10-10.40. Eduardo Saetta, Giuseppe Rega (Roma, Italy). Modelling and Nonlinear Dynamics of Third-Order Thermomechanically Coupled Laminated Plates. (**Key Lecture; WEB presentation**)

10.40-11.10. Yuri Kivshar (Kanberra, Australia). Nonlinear Systems With Parity-Time Symmetry (**Key Lecture; WEB presentation**)

11.10-11.40. Lidiya Kurpa (Kharkov, Ukraine). Application of R-functions theory to problems of nonlinear dynamics of multilayer shallow shells and plates.

Coffee Break

12.00-12.25. Francesco Pellicano, Antonio Zippo, Marco Barbieri, Matteo Strozzi (Modena, Italy). Nonlinear dynamics of pre-compressed circular cylindrical shell under axial harmonic load: experiments.

12.25- 12.50. Zvonko Rakaric, Ivana Kovacic (Novi Sad, Serbia). Bursting oscillations in nonlinear oscillators with slowly varying excitation (**WEB Presentation**)

13.00-14.00 Lunch

MS “The R-functions theory, it's development and recent applications” (Library Building).

Chairs: V. Kolodyazhny, L. Kurpa,

14.00-14.20. Tetyana Shmatko, Atul Bhaskar (Kharkov, Ukraine; Southampton, UK). Geometrically Nonlinear Vibrations of Functionally Graded Shallow Shells.

14.20-14.40. Lidiya Kurpa, Olga Mazur, Viktoriya Tkachenko (Kharkov, Ukraine). Investigation of the Parametric Vibrations of Laminated Plates by RFM.

14.40-15.00. Katherine Lyubitska, Lydiya Kurpa (Kharkov, Ukraine). Application of the R-Functions Method for Nonlinear Bending of Orthotropic Shallow Shells on an Elastic Foundation.

Coffee Break

15.20-15. 40. Tatiana Sheiko, Yulia Litvinova, Kyrylo Maksymenko-Sheiko (Kharkov, Ukraine). R-functions in Development of Analytical Identification of Geometrical Objects.

15.40-16.00. Volodymyr M. Kolodyazhny (Kharkov, Ukraine). Atomic Functions: the History of the Formation, Development and Practical Application.

16.00-16.20. Sergiy Sklepus (Kharkov, Ukraine). The R-Functions Method in the Creep and Creep Damage Problems of Piecewise-Homogeneous Bodies of Revolution with Meridional Section of Any Shape.

16.20-16.40. Roman Uvarov (Kharkov, Ukraine). Analyzing Parallel Computation of the Functions Created with R-Operations in CUDA.

Section 1. Applications of Nonlinear Dynamics (Library Building). Chairs: D. Breslavsky, O. Larin

14.00-14.20. Valery Gulyayev, Olena Vashchilina, Sergey Glazunov (Kyiv, Ukraine). Incipient Regimes of Drill Bit Whirlings on Uneven Bottoms of Deep Bore-Holes.

14.20-14.40. Dmitry Breslavsky, Holm Altenbach, Konstantin Naumenko, Oksana Tatarinova (Kharkov, Ukraine; Magdeburg, Germany). Modelling of Creep and Oscillations in Material Described by Armstrong-Frederick Equations.

14.40-15.00. Oleg Morachkovsky, Denis Lavinsky (Kharkov, Ukraine). The Nonlinear Deformation of the Body System Under Electromagnetic Field Action.

Coffee Break

15.20-15.40. Yurii Vorobiov, Leopold Kruszka, Nataliia Ovcharova (Kharkov, Ukraine; Warsaw, Poland). Nonlinear Deformation of Structure Elements from Different Materials under Impulse and Shock Loads.

15.40-16.00. Pavel Krot, Vladimir Korennoy (Dniepr, Ukraine). Nonlinear Effects in Rolling Mills Dynamics.

16.00-16.20. Rasim Labibov, Yuri Chernyakov (Dniepr, Ukraine). Modeling of Slow Plasticity Waves.

WEDNESDAY, SEPTEMBER, 28

General Session. (Rector Building, Room 12). Chairs: O.Gendelman. L.Manevitch

10.00-10.30. Leonid Manevitch, Valeri Smirnov (Moscow, Russia). Semi-inverse Method in the Nonlinear Dynamics.

10.30-11.00. Oleg Gendelman, T. Sapsis (Haifa, Israel; Massachusetts, USA). Energy Exchange and Localization in Essentially Nonlinear Oscillatory Systems: Canonic Formalism.

11.00-11.30. Matteo Strozzi, Leonid Manevitch, Valeri Smirnov, Francesco Pellicano (Ferrara, Modena, Italy; Moscow, Russia). Nonlinear Dynamics of SWNTs. Energy Beating and Localization.

Coffee Break

11.50-12.15. Fotios Georgiades (Lincoln, UK). Nonlinear Dynamics of a Spinning Shaft with Non-Constant Rotating Speed.

12.15- 12.40. Roman Kushnir, Mykhailo Marchuk (L'viv, Ukraine). The Nonlinear Dynamics of Composite Plates and Shells.

12.50-13.50 Lunch

Section 3. Theoretical Problems of Nonlinear Dynamics (Library Building). Chairs: Yu.Mikhlin, F.Georgiades

14.00-14.25. 14.25-14.50. Kateryna Plaksiy, Yuri Mikhlin (Kharkov, Ukraine). Resonance Behavior of the Forced Dissipative Spring-Pendulum System.

14.50-15.15. Nikolay Perepelkin (Kharkov, Ukraine). Non-Iterative Rauscher Method for 1-DOF System: A New Approach to Studying Non-Autonomous System via Equivalent Autonomous One.

Coffee Break

15.30-15.50. Igor Andrianov, Viktor Olevskiy, Yulia Olevska (Aachen, Germany; Dniepr, Ukraine). Analytical Approximation of Periodic Ateb Functions Via Elementary Functions.

15.50-16.10. Victor Bazhenov, Olga Pogorelova, Tatiana Postnikova (Kyiv, Ukraine). Discontinuous Bifurcations under 2-DOF Vibroimpact System Moving.

16.10-16.30. Anton Tkachuk, Manfred Bischoff (Stuttgart, Germany).Simulation of Vibro-Impact Systems Using Reciprocal Mass Matrices.

Section 4. Nonlinear Dynamics of Shells and Plates (Library Building). Chair: M.Marchuk

14.00-14.25. Yuliia Fatieieva, Viktor Gristchak (Zaporizhzhye, Ukraine). An Approximate Analytical Solution of Vibration Problem for Imperfect FGM Shallow Shells with Time Dependent Thickness under Static Loading.

14.25-14.50. Mykhailo Marchuk, Taras Goriachko, Vira Pakosh, Oksana Lesyk (L'viv, Ukraine). Method of Determination of Natural Frequencies and Forms of Nonlinear Vibrations for Layered Cylindrical Panels.

14.50-15.15. Ivan Breslavsky, Marco Amabili, Mathias Legrand (Montreal, Canada). Circular Cylindrical Shell Made of Neo-Hookean -Fung Hyperelastic Material Under Static and Dynamic Pressure.

Coffee Break

15.30-15.50. Elena Strelnikova, Vitaly Naumemko, Vasyl Gnitko (Kharkov, Ukraine). Multi-domain boundary element method in nonlinear liquid sloshing analysis for fuel tanks.

15.50-16.10. Natalia Obodan, Victor Adlutskii, Vasilii Gromov (Dniepr, Ukraine). Inverse bifurcation problem as a tool for rapid assessment progressive collapse for thin-walled systems.

Special WEB Session. Key lectures from Western hemisphere and other WEB-presentations (Rector Building). Chair: Yu.Mikhlin

17.45-20.30.

Marco Amabili (Montreal, Canada). Identification of Nonlinear Damping for Large-Amplitude Vibrations of Plates and Curved Panels. **Key lecture.**

José Manoel Balthazar (São José dos Campos, Brasil). Nonlinear Dynamic Interactions and Phenomena: Vibrating Systems with Limited Power Supply: An Emergent Topic after Prof. Kononenko. **Key lecture.**

Alexander Vakakis (Urbana, USA). Nonlinear Sonic Vacua. **Key lecture.**

Si Mohamed Sah, Richard Rand (Stockholm, Sweden; Ithaca, USA). Three ways of treating a linear delay differential equation.

Shiyang Chen, Bogdan Epureanu (Ann Arbor, USA). Forecasting bifurcation of parametrically excited systems: Theory & Experiments.

THURSDAY, SEPTEMBER, 29

Plenary lectures (Library Building). Chairs: K. Hedrih, A. Manevich

10.00-10.25. Katica R. Hedrih (Stevanović) (Belgrade, Niš, Serbia). From Geometry, Kinematics and Dynamics of Billiards to the Extended Theory of Skew Collision between Two Rolling Bodies and Methodology of Vibro-Impact Dynamics.

10.25-10.50. Arkadiy Manevich (Dniepr, Ukraine). Nonlinear Interaction of Oscillation and Rotation in Oscillator-Vibrator Systems.

Coffee Break

11.10-11.35. Julian Stephen Gosliga, Olga Ganilova (Sheffield, UK). Improvement of Piezoelectric Energy Harvester Efficiency Through Optimal Patch Configuration.

11.35- 12.00. Victor Belan, Alexander Kovalev, Anastasiya Peretyatko (Kharkov, Ukraine). Breather Modes Induced by Localized RF Radiation: Analytical and Numerical Approaches.

12.00-13.15 – **Poster Session, including promote presentations (Library Building)**

1. Leonid D. Akulenko, Tatyana A. Kozachenko, Dmytro D. Leshchenko, Yanina S. Zinkevich (Moscow, Russia; Odessa, Ukraine). Perturbed Rotations of a Rigid Body Close to the Lagrange Case Under the Action of Unsteady Perturbation Torques.

2. Igor Baranov, Oleg Kravchenko, Iryna Suvorova (Kharkov, Ukraine; Moscow, Russia). Developing Structural Methods for Solving Boundary-Value Problems in Non-Smooth Boundary Domains.

3. Dmitry Breslavsky, Volodymyr Mietielov, Oleg Morachkovsky, Oksana Tatarinova, Sergey Pashchenko (Kharkov, Ukraine). Asymptotic Solution of Anisotropic Cyclic Creep Problem.

4. George M. Chechin, Denis S. Ryabov, Stepan A. Shcherbinin (Rostov on Don, Russia). Bushes of Nonlinear Normal Modes in Single-Layer Graphene.

5. Alexander Ya. Grigorenko, Serhii A. Pankratiev, Serhii N. Yaremchenko (Kyiv, Ukraine). Numerical Analysis of Stress-Strain State of Orthotropic Plates in the Form of Arbitrary Convex Quadrangle.

6. Yaroslav Grigorenko, Elena Bespalova, Natalia Yaremchenko (Kyiv, Ukraine). Some Stationary Deformation Problems of Compound Shells of Revolution.

7. Dariusz Grzelczyk, Jan Awrejcewicz (Lodz, Poland). Resonances and Synchronization in Two Coupled Oscillators with Stick-slip Vibrations and Spring Pendulums.

8. Anna Karpik, Yuri Vorobjov (Kharkov, Ukraine). Nonlinear analysis of gas flow in compressors stage based on CFD-method.
9. Victor F. Kravchenko, Oleg V. Kravchenko, Yaroslav Yu. Konovalov, Vladislav I. Pustovoi, Dmitry V. Churikov (Moscow, Russia). R-functions and WA-systems of Functions in Modern Information Technologies.
10. Vladimir Kulyabko, Vyacheslav Chaban, Andrey Makarov, Denis Yaroshenko (Dniepr, Ukraine). Taking Account of Nonlinear Properties of Subsystems in Problems of Dynamic Interaction of Structures with Loads, Bases and Flows.
11. Lidiya Kurpa, Galina Timchenko, Andrey Osetrov (Kharkov, Ukraine). Application of R-functions Theory to Nonlinear Vibration Problems of Laminated Shallow Shells with Cutouts.
12. Oleksiy Larin, Oleksii Vodka, Ruslan Kaidalov, Volodymyr Bashtovoi (Kharkov, Ukraine). Stochastic Dynamics of the Specialized Vehicle with Nonlinear Suspension.
13. Olga Yu. Lisina (Kharkov, Ukraine). Modeling of Nonlinear Environment with the Help of Families of the Atomic Functions.
14. Gennadii Martynenko (Kharkov, Ukraine). Nonlinear Vibrations of Rotors in Systems with Magnetic Bearings.
16. Yuri Mikhlin, Natalia Goloskubova (Kharkov, Ukraine). Analysis of Traveling and Standing Waves in the DNA Model by Peyrard-Bishop-Dauxois.
17. Igor Moiseyenko, Valeriy Storozhev, Oksana Sidash (Donetsk, Ukraine). Kinematic Characteristics of Nonlinear Second Harmonic for Guided Torsion Elastic Waves in Transversely Isotropic Cylinder.
18. Irina Morachkovska, Galina Timchenko, Kateryna Lyubitskaya (Kharkov, Ukraine). Application of the Variational–Structural Method to Investigate the Elasto-Plastic Bending of Thin Shells and Plates.
19. Nikolay Perepelkin (Kharkov, Ukraine). Construction of Nonlinear Normal Modes by Shaw-Pierre via Schur Decomposition.
20. Iuliia Petrova, Oleksiy Larin (Kharkov, Ukraine). A Simulation of the Transient Self-heating Process in Dynamically Loaded Rubber-based Multilayers Reinforced Composites.
21. Ivan Sergienko, Oleg M. Lytvyn, Oleg O. Lytvyn, Oleksandr Tkachenko, Olga Grytsai (Kharkov, Zaporizhzhia, Ukraine). Isogeometric Approximation Methods Using the Interlineation Operators.
22. Nataliya Sizova (Kharkov, Ukraine). Structural Modeling of Elastoplastic Deformation Processes of the Bodies of Non-classical Shape.
23. Sergey Storozhev (Donetsk, Ukraine). Fuzzy Evaluations for Kinematic Characteristics of Nonlinear Second Harmonics of Shear Waves in Transversely Isotropic Elastic Medium.
24. Igor Tsukanov. Application of Solution Structure Method to Modeling Dynamic Response of Mechanical Structures.
25. Roman Uvarov (Kharkov, Ukraine). Algorithms and JavaScript Programs in Calculation of R-Functions and Producing Their Two- and Three-Dimensional Charts.

13.20-14.20 – Lunch

14.30 – **Excursion**

FRIDAY, SEPTEMBER, 30

Section 5. Nonlinear Physics, Biomechanics (Rector Building). Chairs: Y. Syrkin, Yu. Romashov

10.00-10.20. Victor Lykah, Yevgen Syrkin (Kharkov, Ukraine). Stability, Bifurcation and Transitions of the Nonlinear Molecular Chain In Electric Field.

10.20-10.40. Alexander Kazachkov, Victor Lykah, Ksenia Minakova, Evgeniy Syrkin, Olena Tkachenko (Kharkov, Ukraine). Liquid Nonlinear Oscillations in the U-tube System.

Coffee Break

11.20-11.40. Yurii Romashov, Natalya Kizilova, Gediminas Gaidulis (Kahrkov, Ukraine; Vilnius, Letuva). Mathematical Modeling of Mitral Valve Dynamics: Nonlinear vs Linear Models.

11.40-12.00. Helen Solovyova, Natalya Kizilova, J. Mizerski (Kharkov, Ukraine; Warsaw, Poland). Nonlinear model of blood flow through stenosed coronary arteries.

12.00-12.20. Valeriy Grytsay (Kyiv, Ukraine). Nonlinear Dynamics of a Metabolic Process of the Atherosclerosis.

Section 6. Engineering Problems (Rector Building). Chairs: O. Larin, M. Tkachuk

10.00-10.20. Eduards Skukis, Kaspars Kalnins, Olgerts Ozolins (Riga, Latvia). Application of Vibration Correlation Technique for Open Hole Cylinders. (**WEB-presentation**)

10.20-10.40. Mykola M. Tkachuk, Yuriy Kostenko, Andriy Grabovsky, Mykola A. Tkachuk (Kharkov, Ukraine). Parameter Analysis of Vibro-impact Machines Dynamics with Variable Mass and Stiffness.

10.40-11.00. Yuri Andreev, Roman Antoshchenkov (Kharkov, Ukraine). Dynamics of Multielement Agricultural Aggregates, Taking Into Account Nonholonomic Constraints and Spatial Motion.

Coffee Break

12.20-12.40. Alexei Zotov, Anvar Valeev, Sergey Glebov (Ufa, Russia). Oscillating Systems with Elastic Element Moving between Guides with given Shape. (**WEB-presentation**)

12.45-13.30 - **Closing ceremony.**