IRKUTSK STATE UNIVERSITY

INTERNATIONAL CONFERENCE

DYNAMIC SYSTEMS AND COMPUTER SCIENCE:
THEORY AND APPLICATIONS
(DYSC 2020)

19-22 October 2020,
IRKUTSK, RUSSIA

October 19, 2020 (Monday)

OPENING

Section "Dynamic Systems and Applications – I"

Irkutsk Time	Speakers	Titles of Presentations
12:00–12:30	**Falaleev M. V.** (Irkutsk State University), RUSSIA	OPENING REMARKS. To the Theory of Solvability of Degenerate Integro-Differential Equations in Banach Spaces
12:30–13:00	**Sidorov N. A.** (Irkutsk State University), RUSSIA	On the Role of Prior Evaluations in the Method of Non-Local Continuation of Solutions with Respect to a Parameter
13:00–13:15	**Kazakov A. L., Lempert A. A.** (Matrosov Institute for System Dynamics and Control Theory, Siberian Branch of the RAS)**, Spevak L. F. (**Institute of Engineering Science, Ural Branch of the RAS)**, RUSSIA	One Exact Solution of the Non-Linear Heat Equation with the Source
13:15–13:30	**Kazakov A. L., Kuznetsov P. A.** (Matrosov Institute for System Dynamics and Control Theory, Siberian Branch of the RAS), RUSSIA	A Problem with a Given Diffusion Front for a System of Reaction-Diffusion Equations
13:30–14:00	**Mizhidon A. D.** (East Siberian State University of Technology and Management), RUSSIA	An Equilibrium Position in the Generalized Mathematical Model of a System of Rigid Bodies Elastically Mounted on an Euler-Bernoulli Beam
14:00–14:20	**Byckov E. V., Zamyshlyaeva A. A.** (South Ural State University), RUSSIA	Numerical Solution of Showalter–Sidorov and Cauchy Problems of Ion–Acoustic Waves Propagation Mathematical Model
14:20–14:40	**Goncharov N. S.** (South Ural State	Barenblatt – Zheltov – Kochina Equation on the Interval with an Initial Showalter – Sidorov Condition

	University), RUSSIA	and a Generalized Wentzell Boundary Conditions
14:40–15:00	**Gavrilova O. V., Manakova N. A.** (South Ural State University), RUSSIA	Non-uniqueness of the Solution of One Mathematical Model of an Autocatalytic Reaction with Diffusion and the Showalter – Sidorov condition
15:00–15:20	**Yuldashev T. K.** (National University of Uzbekistan), UZBEKISTAN	Integro-Differential Equation with Fractional Order Caputo Operators and Spectral Parameters
15:20–15:40	**Nadolin K. A.** (Southern Federal University), RUSSIA	Reduced Mathematical Model of the Flow in a Deep Extended Natural Channel
15:40–16:00	**Noeiaghdam L.** (University of Mohaghegh Ardabili), IRAN **Sidorov D. N. (**Irkutsk National Research Technical University**,** Melentiev Energy Systems Institute, Siberian Branch of the RAS), RUSSIA **Noeiaghdam S. (**Irkutsk National Research Technical University**,** South Ural State University), RUSSIA	Dynamical Control on the Homotopy Analysis Method for Solving Nonlinear Shallow Water Wave Equation
16:00–16:20	**Sidorov D. N.** (Melentiev Energy Systems Institute, Siberian Branch of the RAS; Irkutsk State University), **Muftahov I. R. (**Melentiev Energy Systems Institute, Siberian Branch of the RAS; Main Computing Center, Russian Railways), **Tynda A. N. (**Penza State University), RUSSIA	Numerical Solution of Fractional Volterra Integral Equation with Piecewise Continuous Kernel
16:20–16:40	**Karamov D. N., Sidorov D. N.** (Melentiev Energy Systems Institute, Siberian Branch of the RAS;	Optimization of Isolated Power Systems with Renewables and Storage Batteries Based on Nonlinear Volterra Models for the Specially Protected Natural Area of Lake Baikal

	Irkutsk National Research Technical University), RUSSIA **Muftahov I. R.** (Melentiev Energy Systems Institute, Siberian Branch of the RAS; Main Computing Center, Russian Railways), RUSSIA **Liu F.** (Central South University), CHINA	
16:40–17:10	**Fedorov V. E., Gordievskikh D. M, Filin N. V.** (Chelyabinsk State University; South Ural State University; Shadrinsk State Pedagogical University; Krasovskii Institute of Mathematics and Mechanics, Ural Branch of the RAS), RUSSIA	On Approximate Controllability of a Class of Degenerate Fractional Order Distributed Systems
17:10–17:30	**Grazhdantseva E. Yu.,** (Irkutsk State University), **Solodusha S. V.** (Melentiev Energy Systems Institute, Siberian Branch of the RAS), RUSSIA	On a Hyperbolic System of Equations in the Problem of Unsteady Fluid Motion
17:30–17:50	**Leontiev R. Yu.,** (Irkutsk State University), RUSSIA	On Small Solutions of Nonlinear Equations with a Vector Parameter in Sectorial Areas
17:50–18:10	**Zakharova I. V.,** (Irkutsk State University), RUSSIA	Applying the regularization method to hyperbolic equations with singular perturbances
18:10–18:30	**Golovko E. A.,** (Irkutsk State University), RUSSIA	The effect of minor derivatives on the resolution of the Dirichlet problem for one class of elliptical systems

October 20, 2020 (Tuesday)

Section "Dynamic Systems and Applications – II"

Irkutsk Time	Speakers	Titles of Presentations
13:00–13:15	**Arguchintsev A. V., Kedrina M. S.** (Irkutsk State University), RUSSIA	Determination of Functional Parameters in Boundary Conditions of Linear Hyperbolic Systems by Optimal Control Methods
13:15–13:30	**Arguchintsev A. V., Poplevko V. P.** (Irkutsk State University), RUSSIA	An Optimal Control Problem by a First-Order Hyperbolic System with Delay and Integral Control Constraints
13:30–13:50	**Baturin V. A.** (Matrosov Institute for System Dynamics and Control Theory, Siberian Branch of the RAS) **Sizykh V. N., Daneev A. V.** (Irkutsk State Transport University), RUSSIA	Second-Order Iterative Method for Optimal Control Problems for Multistage Processes
13:50–14:10	**Ankilov A. V., Velmisov P. A.** (Ulyanovsk State Technical University), RUSSIA	Program Complex for Solving of Some Classes of Aerohydroelasticity Problems
14:10–14:35	**Kerimbekov A.** (Kyrgyz-Russian Slavic University), **Baetov A.** (Kyrgyz State University) **Krasnichenko L.** (Kyrgyz-Russian Slavic University) KYRGYZSTAN	On the Solvability of a Semilinear Hyperbolic Equation with a Parameter

14:35–15:00	**Mansimov K. B.,** (Institute of Control Systems, Azerbaijan National Academy of Sciences; Baku State University), **Mastaliyev R. O.** (Baku State University), AZERBAIJAN	First and Second Order Necessary Optimality Conditions for Stochastic Distributed Systems
15:00–15:30	**Mardanov M. J.,** (Institute of Mathematics and Mechanics, Azerbaijan National Academy of Sciences; Baku State University), **Malik S. T.** (Institute of Mathematics and Mechanics, Azerbaijan National Academy of Sciences; Baku Higher Oil School), AZERBAIJAN	Discrete Maximum Principle in Systems with a Delay in Control
15:30–15:50	**Vasiuchkova K. V.** (South Ural State University), RUSSIA	Numerical Investigation of the Optimal Control Problem for one Model of Potential Distribution in a Crystalline Semiconductor with the Showalter–Sidorov Condition
15:50–16:10	**Kudimova A. B., Nasedkin A. V.,** (Southern Federal University), RUSSIA	Limit Transitions in Plane Homogenization Problems for Two-phase Dielectric Composites with Extreme Material Properties of One Phase
16:10–16:30	**Karyakin M. I.** (Southern Federal University, Southern Mathematical Institute – the Affiliate of VSC RAS), **Ustinov Yu. A.** (Southern Federal University RUSSIA	Mathematical Modelling and Design of Isolation Diaphragms for Pressure Gauges

16:30–17:00	**Barseghyan V.** (Institute of Mechanics, National Academy of Sciences of the Republic of Armenia, Yerevan State University), ARMENIA **Solodusha S. V.** (Melentiev Energy Systems Institute, Siberian Branch of the RAS), RUSSIA	On One Boundary Control Problem of String Vibrations with Given Velocity of Points at an Intermediate Moment of Irkutsk Time
17:00–17:20	**Uuriintsetseg Ariunaa** (Mongolian University of Science and Technology), MONGOLIA	Complete Riemann Solvers for the Hyperbolic GPR Model of Continuum Mechanics
17:20–17:40	**Arguchintsev A. V., Kedrin V. S.** (Irkutsk State University), RUSSIA **Sinitsyn A. V.** (Universidad Nacional de Colombia), COLOMBIA	The Effective Potential Approach in the Limit Model of an Uninsulated Vacuum Plane Diode
17:40–18:00	**Aksenyushkina E. V.** (Baikal State University), **Antonik V. G. Srochko V. A.** (Irkutsk State University), RUSSIA	The Method of Parameterization in a Quadratic Optimal Control Problem

October 21, 2020 (Wednesday)

Section "Information Technologies, Discrete Mathematics and Applications - I"

Irkutsk Time	Speakers	Titles of Presentations
11:00–11:20	**Naumov D. A.,** (Irkutsk National Technical Research University) **Zakharov D. V.** (Irkutsk State University), RUSSIA	The Formalization of Building Software System User Segments Using Relational Interactive Logic
11:20–11:40	**Timofeev S. V., Baenkhaeva A. V.** (Baikal State University), RUSSIA	A Model of New Information Dissemination in the Society: Important Area in the Parameter Space
11:40–12:00	**Enkhbat Rentsen** (Institute of Mathematics and Digital Technology, Mongolian Academy of Sciences) **Tungalag Natsagdorj** (National University of Mongolia)**,** MONGOLIA	Application of the Sphere Packing Theory to a Flotation Process
12:00–12:20	**Kocov A. A., Semenov E. I.** (Matrosov Institute for System Dynamics and Control Theory, Siberian Branch of the RAS)**,** RUSSIA	Distributed Model of Space Exploration by Two Types of Interacting Robots and its Exact Solutions

Section "Information Technologies, Discrete Mathematics and Applications - II"

Irkutsk Time	Speakers	Titles of Presentations
15:00–15:30	**Artamonov Y. N.,** (Federal State Budgetary Scientific Institution "Gosmetodcenter") **Alyaeva Y. V.** (National Research University "Moscow Power Engineering Institute"), RUSSIA	New Selection Algorithm Based on Generating Sequences
15:30–16:00	**Balagura A. A., Kuzmin O. V.** (Irkutsk State University), RUSSIA	Encoding and Decoding Algorithms for Unlabeled Trees
16:00–16:20	**Kuzmin O. V., Starkov B. A.** (Irkutsk State University), RUSSIA	Application of Hierarchical Structures Based on Binary Matrices with the Generalized Arithmetic of Pascal's Triangle in Route Building Problems
16:20–16:50	**Polatov A. M., Khaldjigitov A. A., Ikramov A. M., Pulatov S. I.** (National University of Uzbekistan), UZBEKISTAN	Finite Element Simulation of Fibrous Composites Strain with Stress Concentrators
16:50–17:20	**Arguchintsev A. V., Kedrin V. S., Dobrinets I. M.** (Irkutsk State University), RUSSIA	Mechanisms of Polymorphic Bioecological Data Systematization within the BaikalIntelli Platform for Computational Models of Population Dynamics
17:20–17:50	**Khrustalev M. M.,** (V. A. Trapeznikov Institute for Control Problems of RAS) **Sizykh V. N., Daneev A. V.** (Irkutsk State Transport University),	Approximate Optimal Synthesis of Operational Control Systems for Dynamic Objects Based on Quasilinearization and Sufficient Optimality Conditions

Irkutsk Time	Speakers	Titles of Presentations
	RUSSIA	
17:50–18:10	**Kazimirov A. S., Maleev V. V.** (Irkutsk State University), RUSSIA	Genetic Algorithm for Systems of Boolean Functions Minimization
18:10–18:30	**Kuzmina E. Yu.** (Irkutsk State University), RUSSIA	Representations of Simple Lie Algebras with Vectors Having a Zero Stationary Subalgebra
18:30–18:50	**Akimova A. A.** (South Ural State University), RUSSIA	Mathematical Modelling of Biology Processes Based on the Table of Prime Links in the Solid Torus up to 4 Crossings

Section "Mathematical and Computer Simulation in Physics and Engineering"

Irkutsk Time	Speakers	Titles of Presentations
11:00–11:20	**Satsuk S. A., Komogortsev S. V.** (Federal Research Center Krasnoyarsk, SB RAS) RUSSIA	Micromagnetic Modeling of the Polycrystalline Structure Effect to the Hysteresis Loop in Ferromagnetic Nanowire
11:20–11:40	**Agrafonov Yu. V., Petrushin I. S.** (Irkutsk State University), RUSSIA	Linear Singlet Equation in the Surface Phenomena Physics
11:40–12:00	**Zorigt G., Khenmedekh L., Aldarmaal Ch., Lkhagva O.** (Mongolian University of Science and Technology, National University of Mongolia), MONGOLIA	Antiproton Impact Ionization of Hydrogen Atom: Differential Cross Sections Computed by Coulomb Wave Function Discrete Variable Representation Method
12:00–12:20	**Tinin M. V.** (Irkutsk State University), RUSSIA	Point Source Field in the Plasma Layer with a Linear Profile and Random Irregularities
12:20–12:40	**Kim D. Ch., Ageeva E. T., Afanasiev N. T., Chudaev S. O., Mahro I. G., Medvedeva O. I.** (Bratsk State University, Irkutsk State University, Institute of Solar-	An Operational Method for Calculating the Frequency Fluctuations of a Radio Signal in a Randomly Inhomogeneous Ionosphere

	Terrestrial Physics of Siberian Branch of RAS) RUSSIA	
12:40–13:00	**Afanasiev N. T., Trofimov E. A., Chudaev S. O.** (Irkutsk State University, Institute of Solar-Terrestrial Physics of Siberian Branch of RAS) RUSSIA	Modelling of Turbulent Structure of Plasma Inhomogeneity According to Decameter Data Transionospheric Sensing
13:00–13:20	**Afanasiev N. T., Lukyantcsev D. S.**, (Irkutsk State University), RUSSIA	Modeling of the Characteristics of Behind-the-Limb Radio Bursts at the Presence of a CME
13:20–13:40	**Rastegin A. E.** (Irkutsk State University), RUSSIA	Uncertainty and Certainty Relations for Quantum Coherence with Respect to Design-structured POVMs
13:40–14:00	**Ternovoy M. Yu, Kotovschikov I., Budnev N. M.,** and others (Tunka Collaboration) RUSSIA GERMANY ITALY MONGOLIA	Simulation of the Tunka-Grande, TAIGA-Muon and TAIGA-HiSCORE Arrays for a Search of Astrophysical Gamma Quanta with Energy above 100 TeV
14:00-14:20	**Krivel S. M.** (Irkutsk State University), RUSSIA	Computer Modeling of the Processes of Changing the Characteristics of the Reliability of Systems with Recoverable and Non-recoverable Elements Based on Package of Dynamic Simulation SIMULINK
14:20-14:40	**Krivel S. M., Galushko E. A.** (Irkutsk State University), RUSSIA	Partial Solution of the System of Differential Equations of Spatial Motion of the Ground Effect Vehicle (WIG) Using a Virtual Automatic Control System Based on PID Controllers
14:40-15:00	**Vshivkov Yu. F.** (Irkutsk State University), RUSSIA	Mathematical Model and Assessment of the Possibility of Implementing the Specified Movements of the Ekranoplan in the Vertical Plane

October 22, 2020 (Thursday)

Section "Mathematical and Computer Simulation in Chemistry"

Irkutsk Time	Speakers	Titles of Presentations
11:00–11:15	**Kobychev V. B.** (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Choosing a Solvation Model for Simulating Reactions in KOH(KOBu^t)/DMSO Superbasic Media
11:15–11:30	**Orel V. B., Vitkovskaya N. M.** (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Acetylene *vs* Ketones on the Path to Base-Promoted Assembly of Furans or 6,8-dioxabicyclo[3.2.1]octanes and Cyclopentenols: a Quantum Chemical Study
11:30–11:45	**Bobkov A. S., Vitkovskaya N. M.** (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Assembly of 1*H*-pyrrole from Cyclopentanone Oxime and Acetylene: a Quantum-Chemical Model
11:45–12:00	**Absalyamov D. Z., Vitkovskaya N. M.** (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Quantum-chemical Description of Interactions in the PhNH$_2$/HCCH System in a Superbasic Medium
12:00–12:15	**Kurokhtina A. A., Larina E. V., Vidyaeva E. V., Lagoda N. A., Schmidt A. F.** (Irkutsk State University) RUSSIA	Discrimination of the Mechanistic Hypotheses for Two- and Three-component Cross-coupling Reactions by Using Mathematical Modeling of the Differential Selectivity Patterns
12:15–12:30	**Gnatovsky G. R., Orel V. B., Vitkovskaya N. M**. (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Quantum-chemical Modeling of the Addition of Ethylhydrazine to α,β- and β,γ-unsaturated Ketones

12:30–12:45	**Pradedova A. G., Kobychev V. B**. (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Effect of the Anionic Center Hydration on the Activation Barrier of Intramolecular Nucleophilic Addition in αβ-unsaturated Oximes
12:45–13:00	**Teplyashin N. V., Bobkov A. S., Vitkovskaya N. M.** (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Reaction of *N*-allenyl-1*H*-pyrrole-2-yl-carbaldehyde with Hydroxylamine: a Quantum-chemical Model
13:00–13:15	**Grigoricheva E. K., Skitnevskaya A. D., Gromov E. V., Trofimov A. B.** (Irkutsk State University, Universität Heidelberg, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA GERMANY	Vibronic Coupling in the Pyridine Radical Cation: Nuclear Dynamics Studied Using the Multi configuration Time Dependent Hartree Method
13:15–13:30	**Zubarev A. A., Orel V. B.** (Irkutsk State University, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA	Influence of the Nature of Reagents in the Nucleophilic Addition Reaction of Acetylenes to the C=N Bond of Aldimines: a Quantum Chemical Investigation
13:30–13:45	**Belogolova A. M., Dempwolff A. L., Dreuw A., Trofimov A. B.** (Irkutsk State University, Universität Heidelberg, A. E. Favorsky Irkutsk Institute of Chemistry, Siberian Branch of RAS) RUSSIA GERMANY	A Complex Absorbing Potential Electron Propagator Approach to Resonance States of Metastable Anions