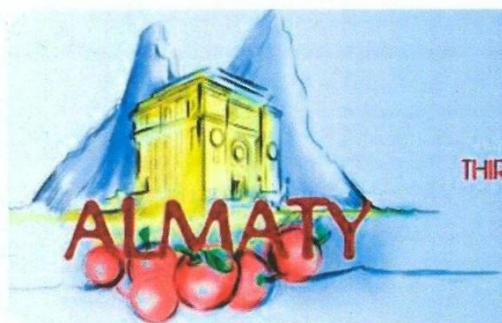


**Third International Conference on  
Analysis and Applied Mathematics  
ICAAM 2016**

**THE ABSTRACT BOOK**



**ICAAM 2016**

THIRD INTERNATIONAL CONFERENCE ON ANALYSIS AND APPLIED MATHEMATICS  
Institute of Mathematics and Mathematical Modelling

September 7-10, 2016, Almaty, Kazakhstan

**07-10 September 2016**

**Institute of Mathematics  
and Mathematical Modelling  
Almaty, Kazakhstan**

УДК 517.9 (043.2)

ББК 22.161

Т 45

Third International Conference on Analysis and Applied Mathematics (ICAAM 2016): THE ABSTRACT BOOK. (Тезисы докладов) / Ред. Allaberen Ashyralyev. – Алматы: Институт математики и математического моделирования, 2016. – 325 с.

ISBN 978-601-280-766-0

Т 45

The conference is organized biannually. Previous conferences were held in Gumushane, Turkey in 2012 and in Shymkent, Kazakhstan in 2014.

The aim of the International Conference on Analysis and Applied Mathematics (ICAAM) is to bring mathematicians working in the area of analysis and applied mathematics together to share new trends of applications of mathematics. In mathematics, the developments in the field of applied mathematics open new research areas in analysis and vice versa. That is why, we plan to found the conference series to provide a forum for researches and scientists to communicate their recent developments and to present their original results in various fields of analysis and applied mathematics.

Web page: <http://icaam-online.org>

УДК 517.9 (043.2)

ББК 22.161

ISBN 978-601-280-766-0

© Third International Conference  
on Analysis and Applied Mathematics  
ICAAM 2016

## Conference Sections and Minisymposiums :

- Analysis
- Applied Mathematics
- Mathematics Education
- Other Topics (Algebra, Geometry, Topology...)
- Minisymposium:Mathematical Modelling
- Minisymposium:Spectral Theory of Differential Operators
- Minisymposium:Dynamical Systems

## Invited Speakers

- Prof. **Alexander Ivanovich Aptekarev**, Director of the Keldysh Institute of Applied Mathematics of Russian Academy of Sciences, Moscow, Russia
- Prof. **Shavkat Arifdzhanovich Alimov**, Head of the laboratory of mathematical modeling and Chief Scientist of the Malaysian Institute of Microelectronic Systems (MIMOS) in Kuala Lumpur, Malaysia
- Prof. **Ravi Agarwal**, Texas A & M University, USA
- Prof. **Vasilii Nikolaevich Denisov**, Lomonosov Moscow State University, Faculty of Computational Mathematics and Cybernetics, Russia
- Prof. **Mokhtar Kirane**, Universitet de La Rochelle, La Rochelle, France
- Prof. **Ljubisa D.R. Kocinac**, University of Nis, Serbia
- Prof. **Vladimir Alekseevich Levin**, Head of the Department of Computational Mechanics, Mechanics and Mathematics Faculty, Lomonosov Moscow State University, Russia
- Prof. **Nedyu I. Popivanov**, The Faculty of Mathematics and Informatics, University of Sofia "St. Kliment Ohridski", Bulgaria
- Prof. **Mikhail Vladimirovich Ruzhansky**, Department of Mathematics, Imperial College London, UK
- Prof. **Alexander Leonidovich Skubachevskii**, Head of Department of "Differential Equations", Peoples Friendship University of Russia, Moscow, Russia
- Prof. **Andrei Andreevich Shkalikov**, Head of the Laboratory of operator models and spectral analysis, Lomonosov Moscow State University, Russia
- Prof. **Iskander A. Taimanov**, Chair of Geometry and Topology, Novosibirsk State University, Head of the Laboratory of Dynamical Systems, Sobolev Institute of Mathematics, Russia

**COMMITTEES****HONORARY CHAIR**

- Prof. **Tynysbek Kalmenov**, Institute of Mathematics and Mathematical Modelling, Kazakhstan

**CHAIRS**

- Prof. **Allaberen Ashyralyev**, Emeritus Professor, Turkey and Turkmenistan
- Prof. **Mukhtarbay Otelbaev**, Institute of Mathematics and Mathematical Modelling, Kazakhstan

**CO-CHAIRS**

- Prof. **Makhmud Sadybekov**, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Assoc. Prof. **Abdullah S. Erdogan**, Turkey

**INTERNATIONAL ADVISORY BOARD**

- Prof. Mahmoud Abdel-Aty, Zewail City of Science and Technology, Egypt
- Prof. Ravi P. Agarwal, Texas A&M University, USA
- Prof. Shavkat Alimov, The Institute MIMOS, Malaysia
- Aslanbek Amrin, Ministry of Education and Science of the Republic of Kazakhstan, Kazakhstan
- Prof. Alexander Aptekarev, Keldysh Institute of Applied Mathematics, Russia
- Prof. Ravshan R. Ashurov, Institute of Mathematics of Academy of Science, Uzbekistan
- Prof. Sergey V. Astashkin, Samara State University, Russia
- Prof. Takir Balykbaev, Executive Office of the President of the Republic of Kazakhstan, Kazakhstan
- Prof. Feyzi Basar, Turkey
- Prof. Nazarbai Bliev, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Martin Bohner, Missouri University of Science and Technology, USA
- Prof. Valry C. Covachev, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Bulgaria
- Prof. Vasilii Denisov, Lomonosov Moscow State University, Russia
- Prof. Askar Dzhumadil'daev, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Lyudvig Faddeev, St. Petersburg Department of Steklov Mathematical Institute, Russia
- Prof. Sergei Kharibegashvili, A. Razmadze Mathematical Institute, Georgia
- Prof. Stanislav Kharin, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Mokhtar Kirane, University of La Rochelle, France
- Prof. Michael Klivanov, The University of North Carolina at Charlotte, USA
- Prof. Ljubisa D.R. Kocinac, University of Nis, Serbia

- Prof. Ismail Kucuk, American University of Sharjah, UAE
- Prof. Vladimir Levin, Lomonosov Moscow State University, Russia
- Prof. Hongyu Liu, Hong Kong Baptist University, Hong Kong
- Prof. Ihor Lubashevsky, University of Aizu, Japan
- Prof. Alexey Lukashov, Saratov State University, Russia
- Prof. Eberhard Malkowsky, University of Giessen, Germany
- Prof. Mohammad Mursaleen, Aligarh Muslim University, India
- Prof. Adam Nakhshuev, Institute of Applied Mathematics and Automation, Russia
- Prof. Zuhair Nashed, University of Central Florida, USA
- Prof. Sandra Pinelas, Academia Militar, Portugal
- Prof. Sergey Piskarev, Lomonosov Moscow State University, Russia
- Prof. Nedyu Popivanov, University of Sofia "St. Kliment Ohridski", Bulgaria
- Prof. Reimund Rautmann, University of Paderborn, Germany
- Prof. Mikhail Ruzhansky, Imperial College London, UK
- Prof. Reza Saadati, Islamic Azad University, Iran
- Prof. Valery Sergejevich Serov, University of Oulu, Finland
- Prof. Andrei Shkalikov, Lomonosov Moscow State University, Russia
- Prof. Yury Shestopalov, Karlstad University, Sweden
- Prof. Alexander Skubachevskii, Peoples Friendship University of Russia, Russia
- Prof. Pavel Sobolevskii, Hebrew University, Israel & Universidade Federal do Ceara, Brazil
- Prof. Hari M. Srivastava, University of Victoria, Canada
- Prof. Iskander Taimanov, Sobolev Institute of Mathematics, Russia
- Prof. Murat Zhurinov, National Academy of Sciences of the Republic of Kazakhstan, Kazakhstan

**INTERNATIONAL ORGANIZING COMMITTEE**

- Prof. Ljudmila Alexeyeva, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Fikret Aliiev, Baku State University, Azerbaijan
- Prof. Tolegen Amanbaev, M. Auëzov South Kazakhstan State University, Kazakhstan
- Prof. Anar Asanova, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Bektur Baizhanov, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Daurenbek Bazarkhanov, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Maktagali Bektemesov, Al-Farabi Kazakh National University, Kazakhstan
- Prof. Amantay Berzhanov, Zhubanov State University, Kazakhstan
- Prof. Yessen Bidaibekov, Abai Kazakh National Pedagogical University, Kazakhstan
- Prof. Galina Bizhanova, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Nurzhan Bokaev, Gumilev Eurasian National University, Kazakhstan
- Prof. Huseyin Cakalli, Maltepe University, Turkey

- Prof. Claudio Cuevas, Federal University of Pernambuco, Brazil
- Prof. Gennadii Demidenko, Sobolev Institute of Mathematics, Russia
- Prof. Huseyin Demir, Ondokuz Mayıs University, Turkey
- Prof. Muvasherhan Dzhenaliev, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Dulat Dzhumabaev, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Assoc. Prof. Okan Gercek, Turkey
- Assoc. Prof. Selim Guvercin, Suleyman Demirel University, Kazakhstan
- Prof. Baltabek Kanguzhin, Al-Farabi Kazakh National University, Kazakhstan
- Prof. Viktor Korzyuk, Institute of Mathematics of the NAS of Belarus, Belarus
- Prof. Bakhytbek Koshanov, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Aleksandr Kozhanov, Sobolev Institute of Mathematics, Russia
- Assoc. Prof. Leonid Kritskov, Lomonosov Moscow State University, Russia
- Prof. Misir Mardanov, Institute of Mathematics and Mechanics of the National Academy of Sciences of Azerbaijan, Azerbaijan
- Prof. Mukhammed Meredov, Turkmenistan
- Prof. Saltanbek Mukhambetzhano, Al-Farabi Kazakh National University, Kazakhstan
- Prof. Oktay Mukhtarov, Gaziosmanpasa University, Turkey
- Prof. Musakhan Muratbekov, Taraz State Pedagogical Institute, Kazakhstan
- PhD. Daulet Nurakhmetov, S. Seifullin Kazakh AgroTechnical University, Kazakhstan
- Prof. Erlan Nursultanov, Kazakhstan Branch of Lomonosov Moscow State University, Kazakhstan
- Prof. Ryskul Oinaruly, Gumilev Eurasian National University, Kazakhstan
- Prof. Kordan Ospanov, Gumilev Eurasian National University, Kazakhstan
- Prof. Pavel Pankov, International University of Kyrgyzstan, Kyrgyzstan
- Prof. Arsen Pskhu, Institute of Applied Mathematics and Automation, Russia
- Prof. Nusrat Radjabov, Tajik State National University, Tajikistan
- Prof. Stasys Rutkauskas, Institute of Mathematics and Computer Science, Lithuania
- Prof. Makhmud S. Salakhitdinov, National University of Uzbekistan, Uzbekistan
- Prof. Abdizhahan Sarsenbi, M. Auezov South Kazakhstan State University, Kazakhstan
- Assoc. Prof. Merey Sarsengeldin, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Vladimir Savchin, Peoples' Friendship University of Russia, Russia

- Prof. Mirbolat Sikhov, Al-Farabi Kazakh National University, Kazakhstan
- Prof. Esmuhanbet Smailov, Institute of Applied Mathematics, Kazakhstan
- Prof. Alexandr Soldatov, Belgorod State University, Russia
- PhD. Durvudkhan Suragan, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Murat Ramazanov, Buketov Karaganda State University, Kazakhstan
- Prof. Pavel Terekhin, Saratov State University, Russia
- Prof. Marat Tleubergenov, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Prof. Nazerke Tleukhanova, Gumilev Eurasian National University, Kazakhstan
- Prof. Batirkhan Turmetov, A. Yasavi International Kazakh-Turkish University, Kazakhstan
- Prof. Umirbaev Ualbay, Wayne State University, USA
- Prof. Victor G. Zvyagin, Voronezh State University, Russia

#### TECHNICAL PROGRAM COMMITTEE

- Asst. Prof. Necmettin Aggez, Turkey
- Assoc. Prof. Deniz Agirseven, Trakya University, Turkey
- Meyram Akhymbek, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Gaukhar Arepova, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Assoc. Prof. Maksat Ashyraliyev, Baheehir University, Turkey
- Asst. Prof. Abil Aubakirov, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Samat Kassabek, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Aidyn Kassymov, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Assoc. Prof. Mehmet Emir Koksul, Ondokuz Mayıs University, Turkey
- Asst. Prof. Yildirim Ozdemir, Duzce University, Turkey
- Lecturer Ali Ugur Sazaklioglu, University of Turkish Aeronautical Association, Turkey
- Asst. Prof. Fatma S. Ozesenli Tetikoglu, Turkey
- Berik Torebek, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Nurgissa Yessirkegenov, Institute of Mathematics and Mathematical Modelling, Kazakhstan
- Asst. Prof. Ozgur Yildirim, Yildiz Technical University, Turkey

## FOREWORD

The Organizing Committee of ICAAM and Institute of Mathematics and Mathematical Modelling are pleased to invite you to the Third International Conference on Analysis and Applied Mathematics, ICAAM 2016. The meeting will be held on September 7-10, 2016 in Almaty, Kazakhstan. This conference is dedicated to 70th birthday of Prof. Tynysbek Kalmenov.

The conference is organized biannually. Previous conferences were held in Gumushane, Turkey in 2012 and in Shymkent, Kazakhstan in 2014. The proceedings of ICAAM 2012 and ICAAM 2014 were published in AIP (American Institute of Physics) Conference Proceedings. Institute of Mathematics and Mathematical Modelling is pleased to host the third conference which is focused on various topics of analysis and its applications, applied mathematics and modeling.

The conference will consist of plenary lectures, mini symposiums and contributed oral presentations. The proceedings of ICAAM 2016 will be published in AIP (American Institute of Physics) Conference Proceedings. Selected full papers of this conference will be published in peer-reviewed international journals:

- FILOMAT (Science Citation Index),
- BOUNDARY VALUE PROBLEMS (Science Citation Index),
- CONTEMPORARY ANALYSIS AND APPLIED MATHEMATICS.

The aim of the International Conference on Analysis and Applied Mathematics (ICAAM) is to bring mathematicians working in the area of analysis and applied mathematics together to share new trends of applications of mathematics. In mathematics, the developments in the field of applied mathematics open new research areas in analysis and vice versa. That is why, we plan to found the conference series to provide a forum for researches and scientists to communicate their recent developments and to present their original results in various fields of analysis and applied mathematics. The Conference Organizing Committee would like to thank our sponsors. The main organizer of the conference is Institute of Mathematics and Mathematical Modelling, Almaty, Kazakhstan. The conference is also supported by Al-Farabi Kazakh National University, Almaty and L. N. Gumilyov Eurasian National University, Astana, Kazakhstan. We would like to thank Institute of Mathematics and Mathematical Modeling, Al-Farabi Kazakh National University and L. N. Gumilyov Eurasian National University for their support. We also would like to thank to all invited speakers, International Organizing Committee, International Organizing Committee, and Technical Program Committee Members. With our best wishes and warm regards,

Chairs:

Prof. Allaberen Ashyralyev

Prof. Mukhtarbay Otelbaev

## CONTENTS

70th anniversary OF TYNYSBEK SHARIPOVICH KAL'MENOV	17
<b>1 ANALYSIS</b>	<b>23</b>
<i>Akbota ABYLAYEVA</i> Weighted estimates for the integral operator with a logarithmic singularity	24
<i>Akbota ABYLAYEVA</i> Criterion of the boundedness of a fractional integration type operator with variable upper limit in weighted Lebesgue spaces	25
<i>Seyed Masoud AGHAYAN, Ahmad ZIREH</i> Common best proximity points in complex valued metric spaces	26
<i>Meiram AKHYMBEK, Makhmud SADYBEKOV</i> On a difference scheme for nonlocal heat transfer boundary-value problem	27
<i>Gabdolla AKISHEV</i> Estimations of the best $M$ - term approximations of functions in the Lorentz space with constructive methods	28
<i>Abdigali SH. AKYSH</i> The maximum principle for the Navier-Stokes equations	29
<i>Serik A. ALDASHEV, Erlan T. KITAYBEKOV</i> The correctness Dirichlet problem in a cylindrical domain for three-dimensional elliptic equations with type and order extinction	30
<i>Javid ALI</i> Relation theoretic metrical fixed point theorems with an application	31
<i>Alexander I. APTEKAREV</i> The Steklov problem and estimates for orthogonal polynomials	32
<i>Allaberen ASHYRALYEV, Fatih Sabahattin TETIKOGLU</i> The positivity of the difference operator with periodic conditions and its applications	33
<i>Anar ASSANOVA</i> On the unique solvability of a nonlocal problem with integral conditions for the system of partial differential equations of second order	34
<i>Nilupar ATAKHAN</i> Asymptotical estimation of boundary value problems for singularly perturbed integro-differential equations	35
<i>Anatoly ATTAEV</i> Boundary value problems for loaded hyperbolic equations	36
<i>Sh. BAITUYAKOV, Zh. BAITUYAKOVA, M. ILYASOVA</i> On the boundedness of the periodic Hilbert transform on generalized periodic Morrey spaces	37
<i>Sholpan A. BALGIMBAYEVA</i> Recovery of partial differential operators on classes of periodic functions with mixed smoothness	38
<i>Feyzi BAŞAR</i> Domain of the composition of some triangles in the space of $p$ -summable sequences, $(0 < p \leq 1)$	39
<i>Feyzi BAŞAR, Hüsametdin ÇAPAN</i> On some spaces of $q$ -bounded double sequences	40
<i>Dauren BAZARKHANOV</i> Fourier widths of some function classes associated with $m$ -multiple Haar system	40

<i>Turdebek N. BEKJAN</i> Noncommutative Holder-type inequalities . . . . .	41	<i>Symbat KABDRAKHOVA</i> Algorithm of finding of a solution bounded on stripe of linear hyperbolic equation with the mixed derivative . . . . .	62
<i>K.A. BEKMAGANBETOV, YE. TOLEUGAZY</i> Interpolation properties of anisotropic Nikol'skii-Besov spaces and embedding theorems . . . . .	42	<i>Bakhtiyor J. KADIRKULOV, Jambul A. SERIKBAEV</i> On boundary value problem for the fourth order mixed type equation with fractional derivative . . . . .	63
<i>Sh. BILALL, S. Kh. SHALGINBAYEVA</i> Weighted inequality of Hardy type . . . . .	43	<i>Bakhtiyor KADIRKULOV, Jambul SERIKBAEV</i> On boundary value problem for the fourth order mixed type equation with fractional derivative . . . . .	64
<i>Nurzhan BOKAYEV, Victor BURENKOV, Dauren MATIN</i> On the compactness of set in generalized Morrey spaces . . . . .	44	<i>Burkhan KALIMBETOV, Dinmukhambet SAPAKOV</i> Asymptotics solutions of a singularly perturbed integro-differential problem with rapidly oscillating coefficients . . . . .	65
<i>Huseyin CAKALLI, Mikail ET, Hacer SENGUL</i> A variation on lacunary statistical quasi-Cauchy sequences . . . . .	45	<i>Tynysbek KAL'MENOV, Makhmud SADYBEKOV</i> On a problem of the Frankl type for an equation of the mixed parabolic-hyperbolic type . . . . .	66
<i>Ekrem SAVAS, Huseyin CAKALLI</i> Ideal statistically quasi Cauchy sequences . . . . .	46	<i>Aigerim KALYBAY, Saltanat SHALGINBAYEVA</i> Weighted multiplicative estimate for norm of discrete Hardy operator . . . . .	67
<i>Nurlan DAIRBEKOV, Oleg PENKIN, Lyazzat SARYBEKOVA</i> Solvability of the Dirichlet problem for the $p$ -Laplacian on stratified sets . . . . .	47	<i>Aigerim KALYBAY, Saltanat SHALGINBAYEVA</i> Weighted additive estimate for norm of discrete Hardy operator . . . . .	68
<i>Muratkhan DAUYLBAYEV, Aziza MIRZAKULOVA</i> Asymptotic estimates of the solution of the Cauchy problem for singularly perturbed integro-differential equations . . . . .	49	<i>Huseyin KAPLAN, Huseyin CAKALLI</i> Variations on strongly lacunary quasi Cauchy sequences . . . . .	69
<i>Gennadii DEMIDENKO</i> Weighted Sobolev spaces, quasielliptic operators and equations not solvable with respect to the highest-order derivative . . . . .	50	<i>Valery V. KARACHIK, Berikbol T. TOREBEK</i> On an Uniqueness and Correct Solvability of the Biharmonic Boundary Value Problem . . . . .	70
<i>Vasilii N. DENISOV</i> The stabilization rate of a solution to the Cauchy problem for parabolic equation with lower order coefficients . . . . .	51	<i>Mahmut KARAKUS</i> On Generalized Quasi-Convex Bounded Sequences . . . . .	71
<i>Guinar DILDABEK, Isabek ORAZOV</i> On the solvability of a nonlocal boundary value problem for the Laplace operator with opposite flows at the part of the boundary . . . . .	52	<i>Mahmut KARAKUS</i> On $AK(S)$ and $AB(S)$ Properties of a $K$ -Space . . . . .	71
<i>Sirojiddin DJAMALOV</i> About the correctness to some nonlocal boundary value problem for the equation of the mixed type of the first kind and the second order in space . . . . .	53	<i>Mahmut KARAKUS</i> On $q^\lambda$ and $q_0^\lambda$ Invariant Sequence Spaces . . . . .	72
<i>Zhanat DZHOBULAeva</i> Solution of the linearized nonregular free boundary problem for the parabolic equations . . . . .	54	<i>Shakhobiddin T. KARIMOV</i> Solution of a Cauchy problem for iterated generalized two-axially symmetric equation of hyperbolic type . . . . .	73
<i>Dulat S.DZHUMABAEV, Bayan B. MINGLIBAYEVA</i> Properties of an isolated solution to a nonlinear boundary value problem with parameters . . . . .	55	<i>Gulden KARSHYGINA, Alus IGENBERLINA, Zauresh SULEYMENOVA</i> On the sufficient condition for embedding of generalized Lizorkin-Triebel spaces . . . . .	74
<i>Abdullah Said ERDOGAN, Ali Ugur SAZAKLIOGLU, Aliaberen ASHYRALYEV</i> Unique solvability of an inverse problem for a semilinear equation with final overdetermination . . . . .	56	<i>Ernek KHAIRULLIN</i> About one special boundary value problem for multidimensional parabolic integro-differential equation . . . . .	75
<i>Nurzhan E. ERZHANOV</i> Green's function of a heat problem with a periodic boundary condition . . . . .	57	<i>M.KOSHANOVA, K.I.USMANOV, B.TURMETOV</i> About solvability of some boundary value problems for Poisson equation in the ball . . . . .	76
<i>Leonid FALALEEV</i> On the properties of operators with the semi-power type lacunas . . . . .	58	<i>Vladimir V. KOVRIZHKIN</i> On weak solutions of the Dirichlet problem for the Tricomi equation . . . . .	76
<i>Vladimir E. FEDOROV, Roman R. NAZHIMOV, Dmitriy M. GORDIEVSKIKH</i> Initial value problem for a class of fractional order inhomogeneous equations in Banach spaces . . . . .	59	<i>Aleksandr KOZHANOV</i> Global solvability in some models related to equations of Sobolev type . . . . .	77
<i>Ulsada ISKAKOVA</i> On an illposed model of oscillations of a flat plate with a variety of mounts on opposite sides . . . . .	60	<i>Leili KUSSAINOVA, Bakhytty KOSHKAROVA</i> Oscillation and nonoscillation of half-linear second order differential equation with alternating potential . . . . .	78
<i>Daniyal ISRAFILOV, Ahmet TESTICI</i> Approximation properties of some summation methods in the Smirnov classes with variable exponent . . . . .	61	<i>Damir KURMANBAEV</i> Soliton deformations of some minimal surfaces . . . . .	79

<i>Nurgul KYDYRMINA</i> Necessary and sufficient condition that function belong to the Nikol'skii-Morrey space $H^{(\sigma)}M_{p, \sigma_1}^\lambda$ . . . . .	80
<i>Alisher MATYAKUBOV</i> Cauchy problem for a nonlinear degenerate parabolic system not in divergence form . . . . .	81
<i>Mussakan MURATBEKOV, Sabit IGISINOV, Abai SHYRAKBAEV</i> On separability of a differential operator of non-classical type in an unbounded domain . . . . .	82
<i>Mussakan MURATBEKOV, Madi MURATBEKOV</i> On spectral properties of a Schrödinger operator with a negative parameter . . . . .	83
<i>Ergashboy MUKHAMADIEV, Alishon NAIMOV</i> On solvability of a class of nonlinear two-point boundary value problems . . . . .	84
<i>Kairat MYNBAEV</i> Convergence of kernel density estimators on compact sets . . . . .	85
<i>Mostepha NACERI, Amir ELHAFFAF</i> Existence and nonexistence of positive solutions for singular $n$ th-order three-point nonhomogeneous boundary value problem . . . . .	86
<i>Igor NOVIKOV</i> Riesz Lemma and Bernstein Polynomials deformations of some minimal surfaces . . . . .	87
<i>Erlan NURSULTANOV, Nazerke TLEUKHANOVA</i> Summability of the Fourier coefficients of functions from anisotropic Lorentz space . . . . .	88
<i>Ryskul OINAROV, Ainur TEMIRKHANOVA</i> Integral operators with two variable integration limits on the cone of monotone functions . . . . .	89
<i>Ryskul OINAROV</i> Additive and multiplicative weighted estimates of intermediate integral operator . . . . .	90
<i>Gulaiym ORALSYN</i> Inverse coefficient problems for one-dimensional heat transfer with a preservation of medium temperature condition . . . . .	91
<i>Issabek ORAZOV, Saltanbek AYAZ</i> Construction of mathematical models of extraction processes with nonlocal conditions by a spatial variable . . . . .	92
<i>Kordan OSPANOV</i> Nonlocal estimates for solutions of a singular higher order differential equation . . . . .	93
<i>Kordan N. OSPANOV, Assylbek ZULKHAZHAY</i> Coercive solvability of degenerate system of second order difference equations . . . . .	94
<i>Sergey PISKAREV</i> Approximation in time of fractional equations . . . . .	95
<i>Marina PLEKHANOVA</i> Sobolev type equations of time-fractional order with periodical boundary conditions . . . . .	96
<i>Nedyu POPIVANOV</i> Pohozaev identities and applications for quasilinear equations of mixed elliptic-hyperbolic type . . . . .	97
<i>Arsen PSKHU</i> To the theory of linear ordinary differential equations of fractional order with constant coefficients . . . . .	98

<i>Asghar RANJBARI</i> Some properties of linear operators in locally convex cones . . . . .	98
<i>Ludmila PULKINA</i> Some problems with nonlocal conditions for hyperbolic equations . . . . .	99
<i>Nusrat RAJABOV</i> To theory one class of integral equation by tube domain . . . . .	100
<i>Alexander ROGOVOY</i> About solutions properties of Tricomi problem for Gellerstedt equation . . . . .	101
<i>Ekrem SAVAS</i> On $I_\lambda$ -statistical convergence of weight $g$ . . . . .	102
<i>Ekrem SAVAS</i> Asymptotically $I_\lambda$ -Statistical Equivalent Sequences of weight $g$ . . . . .	103
<i>Djamila SEBA, Rebai HAMZA</i> Weak solutions for nonlinear fractional differential equations with fractional separated boundary conditions in Banach spaces . . . . .	104
<i>S. SHAIMARDAN</i> Hardy-type inequality for a fractional integral operator in $q$ -analysis . . . . .	105
<i>Yu.R. SHPADI, A.A. KAVOKIN, A.T. KULAKHMETOVA</i> On the applicability of Picard's successive approximations to the numerical solving the problem of heat transfer in domain, degenerate at the initial time . . . . .	106
<i>Yesmukhanbet SMAILOV</i> The Hardy-Littlewood type theorems in Besov spaces with the Haar basis . . . . .	107
<i>Alexander P. SOLDATOV</i> Integrals with homogeneous - difference kernels on the plane and their applications . . . . .	108
<i>Zhaksylyk TASMAMBETOV</i> Confluent hyper geometric function and two variables Laguerre polynomials as a solutions of Wilczynski type system . . . . .	108
<i>Svetlana TEMESHEVA</i> On one algorithm to find a solution to a linear two-point boundary value problem . . . . .	110
<i>Balwant Singh THAKUR</i> On the convergence of some iterative algorithms to approximate fixed points of nonexpansive mappings . . . . .	111
<i>Ainur TEMIRKHANOVA</i> Oscillation of second order half-linear difference equation and discrete Hardy inequality . . . . .	111
<i>Agila TLEULESOVA</i> Periodic boundary value problem for a system of ordinary differential equations with impulse effects . . . . .	112
<i>Zhanuzak TOKIBETOV, Gulzhan ABDUAKHITOVA, Ulbike KUSHERBAYEVA</i> About sedately growing solutions of one generalized Cauchy-Riemann system . . . . .	113
<i>Batirkhan Kh. TURMETOV, Berikbol T. TOREBEK</i> On a class of fractional elliptic problems with an involution perturbation . . . . .	114
<i>Orhan TUĞ, Feyzi BAŞAR</i> Four-dimensional generalized difference matrix and some double sequence spaces . . . . .	115
<i>Orhan TUĞ, Feyzi BAŞAR</i> Four-dimensional generalized difference matrix and almost convergent double sequence spaces . . . . .	116

Faruk UYGUL Multiplier Amenability of Banach Algebras . . . . .	117
Vijay Kumar VYAS $q$ -Sumudu transforms of basic generalized hypergeometric functions . . . . .	117
Vladimir VASILYEV On periodic wave factorization . . . . .	118
Aizhan YDYRYS, Nazerke TLEUKHANOVA On multipliers of Fourier series in the Lorentz space . . . . .	119
Alibek YESKERMESSULY About the defect indices of fourth-order differential operator with rapidly oscillating coefficients . . . . .	120
Nurgisla YESSIRKEGENOV On a problem for wave equation with data on the whole boundary . . . . .	121
<b>2 APPLIED MATHEMATICS</b> . . . . .	123
Akmaral ABDIGALIYEVA, Zhailaubai ZHUBATOV, Dauren ZHAKH-BAYEV High order finite-difference method for simulation isotropic turbulence flow . . . . .	124
Emmanuel ADEYEFA, R.O. FOLARANMI A new class of orthogonal polynomials (Adeolu polynomials) for derivation of initial value solvers . . . . .	125
D. ALIBIYEV, G. KHAKIMZYANOV, A. KAZHIKENOVA, E. IBRAEVA Spreading of flame front I by the predictor-corrector scheme . . . . .	126
Allaberen ASHYRALYEV, Begench GURBANOV, Ramil SALIMOV The identification problem for hyperbolic Schrödinger equation . . . . .	127
Allaberen ASHYRALYEV, Ramil SALIMOV, Begench GURBANOV Fractional derivatives and fractional integrals linked to the fractional powers of positive operators . . . . .	128
Allaberen ASHYRALYEV, Fatma Songul OZESENLİ TETIKOĞLU, Tu-lay KAHRAMAN Source identification problem for an elliptic-hyperbolic equation . . . . .	129
Allaberen ASHYRALYEV, Baktygul KARABAEVA, Abdizhahan SARSENBI Stable difference scheme for the solution of an elliptic equation with the involution . . . . .	130
Allaberen ASHYRALYEV, Bahriye KARACA A note on the Dirichlet problem for model complex partial differential equations . . . . .	131
Allaberen ASHYRALYEV, Uelker OKUR Crank-Nicolson difference scheme for the stochastic parabolic equation with the dependent operator coefficient . . . . .	132
Kadriye AYDEMİR, O. Sh. MUKHTAROV, Hayati OLGAR Differential operator equations with interface conditions in modified direct sum spaces . . . . .	133
Anvar AZIMOV, Syrym KASENOV, Daniyar NURSEITOV, Simon SEROVA-JSKY Inverse problem for the Verhulst equation of limited population growth with discrete experiment data . . . . .	134
Kheiroddine BELAKROUM, Allaberen ASHYRALYEV, Assia GUEZANE-LAKOUD A note on the nonlocal boundary value problem for a third order partial differential equation . . . . .	135
Galina BIZHANOVA Solution of the free boundary problem for the parabolic equations with unknown temperature and velocity . . . . .	136

M.B. BORIKHANOV, B.Kh. TURMETOV On construction of solutions of linear fractional differential equations with constant coefficients . . . . .	136
Hakima BOUHADJERA More general common fixed point theorems under a new concept . . . . .	137
Ebru ÇOPUROĞLU, Bahtiyar A. MAMEDOV Analytical treatment of two-center overlap integral with respect to same screening constants over Slater-type orbitals . . . . .	137
Azhibek DASIBEKOV, Azimkhan ABZHAPBAROV, Perusa DUISEBAYEVA, Aigul POLATBEK Problems of the theory of the consolidation solved in the special functions . . . . .	138
Michael DMITRIEV, Dmitry MAKAROV The near optimality of the stabilizing control in a weakly nonlinear system with state-dependent coefficients . . . . .	139
Yıldırım OZDEMİR, Sevilyay ERDOĞAN Numerical solution of the hyperbolic-Schrödinger . . . . .	140
K. ESHKUVATOV, F. S. ZULKARNAIN, Z. MUMINOV, N. M. A. NIK LONG Convergence of Modified Homotopy Perturbation Method for Fredholm-Volterra Integro-Differential Equation of order $m$ . . . . .	141
Assia GUEZANE-LAKOUD, Rabah KHALDI Successive approximations to solve higher order fractional differential equations . . . . .	142
Parkhondeh HOSSEINI SHEKARABI, Hamed HATAMI Operational matrices for finding numerical solution of stochastic differential equations arisen in financial mathematics . . . . .	143
Djamila ISKENDEROVA, Aibek TOKTORBAEV Problem with inhomogeneous boundary values for the equations of magnetic elektrogazodinamik . . . . .	144
Aizhan ISSAGALI, Auzhan SAKABEKOV Principle of Mass Conservation for the Boltzmann's Moment System of Equations in Fourth Approximation . . . . .	145
Aizhan ISSAGALI, Auzhan SAKABEKOV On the well-posedness of the Boltzmann's moment system of equations in fourth approximation . . . . .	146
V.KARACHIK, S.MASANOV, B.Kh.TURMETOV On solvability of some boundary value problems for a biharmonic equation with periodic conditions . . . . .	147
Syrym KASENOV, Altyn NURSEITOVA, Daniyar NURSEITOV A conditional stability estimate of continuation problem for the Helmholtz equation . . . . .	148
Hossein Jabbari KHAMNEI, Roghaye MAKOUYI Recurrence relation for the moments of order statistics from a beta-Pareto distribution . . . . .	149
Amir KHAN, Gul ZAMAN The Motion of Fractional Order Jeffrey Fluid Model . . . . .	150
Anna KORNEEVA, Vladimir SHAIDUROV Computational algorithms for analysis of data from thin-film thermoresistors on a radio-electronic printed circuit board . . . . .	151
Bakytbek D. KOSHANOV, Gulzhasira D. SMATOVA On solvability of boundary value problem of magnetic gas dynamics with cylindrical and spherical symmetries . . . . .	152
Sanjeev KUMAR, Sanjay CHAUDHARY Diffusion equation model for the tumors cell density and immune response . . . . .	153



<i>Selahattin MADEN, Tamilla I. NASIROVA, Ulviyya Y. KARIMOVA</i> Investigation of Laplace transforms for Erlangen distribution of the first passage time into zero level of the semi-Markov random process with positive tendency and negative jumps . . . . .	153
<i>Iman MAKHDOOM, Parviz NASIRI, Abbas PAK, Masoud YARMOHAMADI</i> Statistical inference for the parameter of Burr-type 2 model using vague information as fuzzy data . . . . .	155
<i>Aigul MANAPOVA</i> Differentiation of the functional in an optimization problem for diffusion and convective transfer coefficients of elliptic imperfect contact interface problems . . . . .	156
<i>H. MOGHADDASI, K. KHALIFEH, A.H. DAROONEH</i> Ranking DNA words Using Nonextensive Statistical Mechanics . . . . .	157
<i>O. Sh. MUKHTAROV, Hayati OLĠAR, F. S. MUHTAROV</i> Positiveness of second order differential operators with interior singularity . . . . .	158
<i>Zahir MURADOGLU</i> Transmission conditions for biharmonic equations with discontinuous coefficients and numerical solution of boundary value problem . . . . .	159
<i>Hayati OLĠAR, O. Sh. MUKHTAROV, Kadriye AYDEMİR</i> Some properties of eigenvalues and generalized eigenvectors of one boundary-value problem . . . . .	160
<i>Nurgul ORUMBAYEVA, Beybitgul SHAYAKMETOVA</i> On a method of finding a solution of semi-periodic boundary value problem for hyperbolic equations . . . . .	161
<i>Yildirim OZDEMİR, Mustafa ALP</i> A note on numerical solution of the parabolic-Schrödinger equation . . . . .	162
<i>Elif OZTURK BEIGMOHAMMADI</i> Well-posedness of high order of accuracy difference scheme . . . . .	163
<i>Alexandr PANOV</i> Rank 0 invariant solutions of dynamics of two-phase medium . . . . .	164
<i>Yildirim OZDEMİR, Esra PEKONUR</i> Numerical solution of the elliptic-Schrödinger equation . . . . .	165
<i>Sergey PYATKOV</i> On parabolic inverse problems with overdetermination data on spatial manifolds . . . . .	166
<i>S. REZAEI, A.H. DAROONEH</i> Statistical property of earthquakes network: active and passive points . . . . .	167
<i>Azimbay SADULLAEV, Bakhrom ABDULLAEV</i> Monge-Ampere equation and pluripotential theory . . . . .	168
<i>Auzhan SAKABEKOV, Yerkanat AUZHANI</i> Maxwell-Auzhan boundary conditions for Boltzmann's moment system equations in third approximation . . . . .	170
<i>Kanat SHAKENOV, Marzhan SULTANOVA</i> Numerical solution of the relaxational filtration model in relaxationally-compressed porous environment realized by the linear Darcy law by Monte Carlo and probability difference methods . . . . .	171
<i>S. SHARIPOV, KUB.S. SHARIPOV, KAD.S. SHARIPOV</i> New Economy Form (NEF) as a Plan-Market Economy . . . . .	172
<i>Alexander L. SKUBACHEVSKII</i> Initial-Boundary-Problems for Vlasov-Poisson Equations with Homogeneous Magnetic Field . . . . .	173

<i>Nurlan TEMIRBEKOV, Amankeldy TURAROV</i> Numerical solution of the multiphase one dimensional model of gas lift process . . . . .	173
<i>Almas TEMIRBEKOV</i> Numerical implementation of the method of fictitious domains for elliptic equations . . . . .	175
<i>A.N. TYUREKHODJAYEV, G.U. MAMATOVA</i> The gyroscope movement with variable moments of inertia . . . . .	176
<i>Koray TÜRK, Allaberen ASHYRALYEV, Deniz AĠIRSEVEN</i> On the stability of the telegraph equation with time delay . . . . .	177
<i>Mesut URUN, Allaberen ASHYRALYEV</i> Determination of a control parameter of the r-modified Crank-Nicholson difference scheme for the Schrödinger equation . . . . .	178
<i>Ozgur YILDIRIM, Meltem UZUN</i> On the analytical solution methods for sine-Gordon equation . . . . .	179
<i>Ozgur YILDIRIM, Meltem UZUN</i> On the numerical solution of sine-Gordon equation . . . . .	180
<i>Gulmira K. ZAKIR'YANOVA</i> Dynamic analogues of Green and Gauss's formulas for unsteady dynamics of anisotropic elastic medium at antiplane deformation . . . . .	181
<i>Uzak ZHAPBASBAYEV, Gaukhar RAMAZANOVA, Madina ZHAKENOVA</i> Optimization of turbulent flow in a radial reactor with fixed bed . . . . .	182
<i>Sailaubay ZHUMATOV</i> Instability of control system in the neighborhood of program manifold . . . . .	183
<i>Amir Hadi ZIAIE</i> Role of non-commutative geometry in gravitational collapse scenarios . . . . .	184
<b>3 MATHEMATICS EDUCATION</b> . . . . .	185
<i>Bayramsoltan ANNADURDYEVA, Nursoltan NURMYRADOVA</i> Geometry study using the interactive whiteboard . . . . .	186
<i>Maral A. ASHYRALYEV, Abdyresul N. CHARYYEV</i> Usage of recognizing algorithm handwriting in mathematical education . . . . .	187
<i>Yessen BIDAIBEKOV, Victor KORNILOV, Guldina KAMALOVA, Nargima AKIMZHAN</i> Fundamentalization of mathematical knowledge while teaching students inverse and incorrect problem . . . . .	188
<i>Yessen BIDAIBEKOV, Guldina KAMALOVA, Bektas BOSTANOV, Kairat UMBAEVA</i> Geometric heritage of al-Farabi in education . . . . .	189
<i>Yessen BIDAIBEKOV, Vadim GRINSHKUN, Guldina KAMALOVA</i> Features and advantages of training teachers to use means of informatization to profile teaching mathematics . . . . .	190
<i>Abdyresul N. CHARYYEV, Maral A. ASHYRALYEV</i> Value of new technologies in improving the branch of learning . . . . .	191
<i>Burkhan KALIMBETOV, Indira OMAROVA</i> Formation of project and research skills of students in calculation of limits . . . . .	192
<i>Bahytgul KASKATAEVA, Yessen BIDAIBEKOV, Nurbol ABISHEV</i> Methods of professionally-oriented training of complex function theory . . . . .	193
<i>Margarita KLUNNIKOVA, Nikolai PAK, Tatyana PUSHKARYEVA, Tatjana STUPINA</i> Student-centered model for teaching numerical methods course . . . . .	194

<i>Dosymkhan RAKHYMBEK, Marzhan ABDUALIYEVA, Nurlibai MADIYAROV, Shadyar ALTYNBEKOV</i> Didactic bases of system formation of learners' methodological knowledge	195
<i>Beybitgul SHAYAKHMETOVA, Nurgul ORUMBAYEVA, Sholpan OMAROVA</i> Analysis of theoretical and methodological bases of teaching object-oriented programming languages in higher school	196
<i>Simon SEROVAJSKY</i> History of mathematics and its teaching in higher school	197
<i>Aigerim ZHANBOLOVA, Bogdat ZHANBUSINOVA, Gaukhar ISKAKOVA, Kelbet SHAUKENOVA, Beybitgul SHAYAKHMETOVA</i> Methodological questions of filling the virtual university program modules	197
<b>4 OTHER TOPICS</b>	199
<i>Nursadyk AKANBAY</i> Furstenberg type theorem for a multiplicative product of Markov random matrices	200
<i>Nursadyk AKANBAY, Zoiya SULEYMEENOVA, Samal TAPEEVA</i> On asymptotic normality of solutions of the Cauchy problem of a parabolic equation with random right side	201
<i>Valentina ALEKHINA, Ilya STARODUMOV, Oleg STARODUMOV</i> Modeling of thorium transport by the water flow in the river Kechi-Kemin	202
<i>Bektur BAIZHANOV</i> TOne-types in ordered theories	203
<i>Cigdem GUNDUZ ARAS, Sadi BAYRAMOV</i> On the Tietze extension theorem in soft topological spaces	204
<i>Cigdem GUNDUZ ARAS</i> A study on intuitionistic fuzzy supra soft topological spaces	205
<i>Yu. FATEEV, D. DMITRIEV, V. TYAPKIN, N. KREMEZ, V. SHAIUROV</i> The probability distribution function for the sum of squares of independent random variables	206
<i>Assylbek ISSAKHOV</i> Hyperimmunity and $A$ -computable universal numberings	207
<i>Seyit KERIMKHULE</i> A system dynamics model to forecasting of the United States gross savings	208
<i>Ljubiša D.R. KOČINAC</i> Selections, games and Karamata theory	209
<i>Damir KULBAEV, A.Z. ABDENOV</i> Application of the theory of games for selection of effective defense	210
<i>Beibut KULPESHOV</i> Binarity for almost $\omega$ -categorical quite $\alpha$ -minimal theories	211
<i>Ainur KUSSAINOVA, Tamara ZHUKABAYEVA, Abai JUSSUPOV, Kazizat ISKAKOV, Zhanar ORALBEKOVA</i> Prospective study on the potential of big data in railways	212
<i>Bahtiyar Akber MAMEDOV, Elif SOMUNCU, Iskender M.ASKEROV</i> An Efficient Method for the Determination of Fourth Virial Coefficient with Lennard-Jones (12-6) Potential and Its Application	212
<i>K. MOTARJEM, M. MOHAMMADZADEH, A. ABYAR</i> Analyzing High-Dimensional Survival Data Using Random Forests	213
<i>Ilya STARODUMOV, Nikolai KROPOTIN</i> Features in simulation of crystal growth using the hyperbolic PFC equation and the dependence of the numerical solution on the parameters of the computational grid	214

<i>Iskander A. TAIMANOV</i> The Moutard transformation of two-dimensional Dirac operators and the Mobius geometry	216
<i>Marat TLEUBERGENOV, Gulmira VASSILINA</i> On stochastic stability of the integral manifold under permanently acting random perturbations	217
<i>Ualbai UMIRBAEV</i> Automorphisms of differential polynomial algebras	218
<i>Vassily VOINOV, Natalya PYA, Rashid MAKAROV, Yevgeniy VOINOV, Rosa RAKHIMOVA</i> Combining goodness of fit tests for multivariate normality	219
<i>Aibat YESHKEYEV, Olga ULBRIKHT</i> The stability of forcing companion for center of Jonsson set's fragment	220
<i>Aibat YESHKEYEV, Naugul SHAMATAYEVA</i> Categorical Jonsson fragments in existentially prime convex Jonsson theory	221
<i>Aibat YESHKEYEV, Maira KASSYMETOVA</i> Strongly minimal fragments in existentially prime convex Jonsson theory	222

## 5 MS1: MATHEMATICAL MODELLING 223

<i>Kamil AIDA-ZADE, Anar RAHIMOV</i> Numerical solution to inverse source problems for hyperbolic equation	224
<i>Aldyn AITZHAN, Medet INKARBKOV, Asetzhan KOLDAS, Aidarkhan KALTAYEV</i> Implementation of scalar filtered density function for large eddy simulation of turbulent reacting flow using a high-order discontinuous Galerkin method	225
<i>Lyudmila ALEXEYEVA, Makpal AHMETZHANOVA, Gulnar KAYSHI-BAYEVA</i> Dynamics of the massif in the vicinity of the tunnel any profile of section under action of transport loadings	226
<i>F.A. ALIEV, N.S. HAJIEVA, N.A. SAFAROVA, M.F. RAJABOV</i> An asymptotical method for determining hydraulic resistance coefficient of gas-lift process	227
<i>Tulegen AMANBAEV, Gamidulla TILLEUOV, Bibigul TULEGENOVA</i> Modeling and calculation of flotation process in one-dimensional formulation	228
<i>Mersaid ARIPOV</i> The Fujita type a critical exponent for a double nonlinear parabolic equation and system	229
<i>Nurgali ASHIRBAYEV, Zhansaya ASHIRBAYEVA, Azimkhan ABZHAPBAROV, Manat SHOMANBAYEVA</i> The features of a non-stationary state of stress in the elastic multisupport construction	230
<i>Nurgali ASHIRBAYEV, Zhansaya ASHIRBAYEVA, Turlybek SULTANBEK, Raina BEKMOLDAYEVA</i> Modeling and solving the two-dimensional non-stationary problem in an elastic body with a rectangular hole	231
<i>Galitdin B. BAKANOV</i> On the stability estimation of differential-difference analogue of the integral geometry problem with a weight function	232
<i>Arzu ERDEM COSKUN, Cigdem GUNDUZ ARAS, Ayse SONMEZ, Huseyin CAKALLI</i> Soft matrices on soft multisets in an optimal decision process	233

<i>Evgeny DEREVTSOV, Svetlana MALTSEVA, Ivan SVETOV, Murat SULTANOV</i> On a problem of reconstruction of a discontinuous function by its Radon transform . . . . .	234
<i>Medet INKARBEBEKOV, Aydyn AYTZHAN, Aidarkhan KALTAYEV</i> A new combined DG-MC solver for large eddy simulation of reacting turbulent flows . . . . .	235
<i>Bakhtiyar ISMAILOV, Khairulla ISMAILOV, Saule MELDEBEKOVA</i> On a method of mathematical modeling of the pyrolysis process to produce nanomaterials from natural gas . . . . .	236
<i>Alibek ISSAKHOV</i> Mathematical modeling of the thermal effect on the aquatic environment from thermal power plant by using two water discharged pipes . . . . .	237
<i>Ibragim KALIEV, Saltanbek MUKHAMBETZHANOV, Gulnara SABITOVA, Anghyz SAKHIT</i> Mathematical modeling of non-equilibrium sorption . . . . .	238
<i>Alex KAVOKIN, Targyn NAURYZ, Nuserke BIZHIGITOVA</i> Exact solution of two phase spherical Stefan problem with two free boundaries . . . . .	239
<i>Aigul Sh. KAZHIKENOVA, D.B.ALIBIYEV, E.S. IBRAYEVA</i> Mathematical modeling of the temperature dependence of molten viscosity of metal according to the concept of chaotized particles . . . . .	240
<i>Stanislav N.KHARIN, Mery M.SARSENGLDIN, Samat KASSABEK</i> The mathematical models of electromagnetic field dynamics and heat transfer in closed electrical contacts including Thomson effect . . . . .	241
<i>Khonatbek KHOMPYSH, Sharypkhan SAKHAEV</i> Solvability of a stationary problem of magnetohydrodynamics . . . . .	242
<i>Sonu LAMBDA</i> Mathematical modelling and control theory analysis of artificial satellite . . . . .	243
<i>Vladimir LEVIN, Pavel GEORGIEVSKIY</i> New effects for high speed collision of blunt bodies with atmospheric inhomogeneities . . . . .	244
<i>Vladimir LEVIN, Ivan MANUYLOVICH, Vladimir MARKOV</i> Initiation of 3D Detonation in Supersonic Flows in Channels of Special Geometry . . . . .	246
<i>Altyn MAKASHEVA, Altynshah NAIMANOVA</i> Supersonic multi-species flow with particle dispersion on a mixing layer . . . . .	247
<i>Ernazar NYSSANOV, Marina SAPRYGINA</i> Modeling and solving an optimization problem of supply of chemical raw materials . . . . .	248
<i>Anna PYRKOVA, Anatoly IVASHCHENKO, Raigul NIYAZOVA</i> Fragmenting of algorithm for solving the problem of clustering miRNA families . . . . .	249
<i>Bolatbek RYSBAIULY, Abilmazhin ADAMOV</i> Iterative method of finding hydraulic conductivity characteristics of soil moisture . . . . .	250
<i>Makhmud SADYBEKOV, Abdizhahan SARSENBI, Aizhan TENGAYEVA</i> Spectral properties of a Laplace operator with Samarskii-Ionkin type boundary conditions in a disk . . . . .	251
<i>Makhmud SADYBEKOV, Nurgissa YESSIRKEGENOV</i> Spectral properties of a Laplace operator with Samarskii-Ionkin type boundary conditions in a disk . . . . .	252
<i>Mery M.SARSENGLDIN, Stanislav N.KHARIN, Hassan NOURI</i> Analytical solution of two-phase spherical Stefan problem by heat polynomials and integral error functions . . . . .	253

<i>V. SHAIUROV, Viktoriya KORNENKO, A. VYATKIN</i> The mathematical modeling of grouping the dipole water clusters . . . . .	254
<i>Nurtoleu SHAKHAN, Asel BEKETAEVA, Altynshah NAIMANOVA</i> Simulation of shock wave boundary layer interaction in flat channel with jet injection . . . . .	255
<i>R.Y. SHIKHLINSKAYA, S.M. SALIMOV</i> Application of fuzzy logic for matching modes use of wind power plant with an electrical load schedule . . . . .	256
<i>Ivan SVETOV, Svetlana MALTSEVA, Anna POLYAKOVA</i> Numerical solution of 2D-vector tomography problem using the method of approximate inverse . . . . .	257
<i>Kanat TULENOV</i> Duality property of the noncommutative $\ell_\infty$ and $\ell_1$ valued symmetric Hardy spaces . . . . .	258
<i>Kanat TULENOV, Dostilek DAUITBEK</i> Lateral boundary conditions for the Klein-Gordon-Fock equation . . . . .	259
<i>Ainur ZHUMALI</i> A modelling the dynamics of in-situ leaching process at the microscale . . . . .	260

## 6 MS2:SPECTRAL THEORY OF DIFFERENTIAL EQUATIONS 261

<i>Aizat AIMAKHANOVA, Saltanat SHALGINBAYEVA, Lyazzat ZHUMANOVA</i> The first regularized trace of integro-differential Sturm-Liouville operator on the segment with punctured points at integral perturbation of transmission conditions . . . . .	262
<i>Shavkat ALIMOV</i> On the solvability of differential equations in logarithmic scale of Hilbert spaces . . . . .	263
<i>Meiramkul AMANGALIYEVA, Muvasharkhan JENALIYEV, Kanzharbek IMANBERDIYEV, Murat RAMAZANOV</i> On spectral problems for loaded two-dimension Laplace operator . . . . .	264
<i>Meiramkul AMANGALIYEVA, Muvasharkhan JENALIYEV, Madi ERGALIYEV, Murat RAMAZANOV</i> Spectrum of Volterra integral operator of the second kind . . . . .	265
<i>Gaukhar AREPOVA</i> On a regular problem for an elliptic-parabolic equation with a potential boundary condition . . . . .	266
<i>Allaberen ASHYRALYEV, Abdulgafur TASKIN</i> Structure of fractional spaces generated by the two dimensional neutron transport operator . . . . .	267
<i>Allaberen ASHYRALYEV, Abdisalam SARSENBI</i> Green's function of the second order differential operator with involution . . . . .	268
<i>Bazarkan N. BIYAROV, Gulnara K. ABDRASHEVA</i> Bounded perturbations of the correct restrictions and extensions . . . . .	269
<i>Ziganur FAZULLIN, Irina NUGAEVA</i> On spectrum of perturbed two-dimensional harmonic oscillator in a strip . . . . .	270
<i>Tuba GULSEN, Etibar S. PANAKHOV</i> Dirac systems that contain discontinuity conditions . . . . .	271
<i>Nurlan IMANBAEV, Makhmud SADYBEKOV</i> Stability of basis property of a type of problems with nonlocal perturbation of boundary conditions . . . . .	272
<i>Muvasharkhan JENALIYEV, Murat RAMAZANOV</i> On a homogeneous parabolic problem in an infinite corner domain . . . . .	273

Tynysbek Sh. KALMENOV, Durvudkhan SURAGAN and Bolys SABITBEK Spectral geometry inequalities for Schatten $p$ -norms of compact operators	274
Tynysbek KAL'MENOV, Gaukhar AREPOVA On a heat transfer model for the locally inhomogeneous initial data	275
Baltabek KANGUZHIN, Niyaz TOKMAGAMBETOV A uniqueness theorem of a boundary inverse problem of a differential operator on an interval with integro-differential boundary conditions	276
Baltabek KANGUZHIN, Gulzat NALZHUPBAYEVA On identities for eigenvalues of a well-posed perturbation of the Laplace operator in a punctured domain	277
Baltabek KANGUZHIN, Dostilek DAUITBEK On first eigenvalue of Laplace operator	278
Baltabek KANGUZHIN, Lyalya ZHAPSARBAYEVA Estimates of the eigenvalues of operator arising in swelling pressure model	279
Akylbek KERIMBEKOV The resolvent equation of nonlinear Fredholm integral equations	280
Leonid KRITSKOV, Abdizhahan SARSENBI On Spectral Properties of Perturbations of the Operator $-u''(-x)$ with Initial Data	281
Daulet NURAKHMETOV Well-posed problems for the Laplace operator in the multiply connected domains	282
Michael RUZHANSKY Very weak solutions to wave equations	283
Bolys SABITBEK, Durvudkhan SURAGAN An embedding theorem of Sobolev type spaces on stratified Lie groups	283
Makhmud A. SADYBEKOV, Aidyn A. KASSYMOV An isoperimetric inequality for heat potential and heat equation	284
Makhmud A. SADYBEKOV, Berikbol T. TOREBEK On some spectral inequalities for a nonlocal elliptic problem	285
Makhmud SADYBEKOV, Abdizhahan SARSENBI, Aizhan TENGAYEVA Spectral properties of a Laplace operator with Samarskii-Ionkin type boundary conditions in a disk	286
Makhmud SADYBEKOV, Nurgissa YESSIRKEGENOV Spectral properties of a Laplace operator with Samarskii-Ionkin type boundary conditions in a disk	287
Abdizhahan SARSENBI The theorem on the basis property of eigenfunctions of second order differential operators with involution	288
Amir SHALDANBAYEV, Manat SHOMANBAYEVA, Asylzat KOPZHASSAROVA Solution of a singularly perturbed Cauchy problem for linear systems of ordinary differential equations by the method of spectral decomposition	289
Andrei SHKALIKOV Differential operators with singular coefficients	290
Aizhan TENGAYEVA, Gulnar DILDABEK Existence of eigenvalues of problem with shift for an equation of parabolic-hyperbolic type	291
Kanat TULENOV Duality property of the noncommutative $l_\infty$ and $l_1$ valued symmetric Hardy spaces	292
Kanat TULENOV, Dostilek DAUITBEK Lateral boundary conditions for the Klein-Gordon-Fock equation	293
Nurgissa YESSIRKEGENOV Euler-Hilbert-Sobolev spaces on homogeneous groups	294

<b>7 MS3:DINAMICAL SYSTEMS</b>	<b>295</b>
Nurlan ABIEV On a dynamical system relating to the Ricci flow on Aloff-Wallach spaces	296
Serikbai A. AISAGALIEV, A.M. AYAZBAYEVA Investigation on absolute stability of regulated systems in a simple critical case	297
Serikbai A. AISAGALIEV, A.M. AYAZBAYEVA Controllability of process described by system of linear integro-differential equations with restrictions	298
Daulet Sh. AKHMEDOV, Almat S. RASKALIYEV Localization of an air target by means of GNSS-based multistatic radar	299
Hikmet AKHUNDOV, Mutallim MUTALLIMOV Gradient in the optimal control problem described by the differential equations	300
F.A. ALIEV, N.A. ALIEV, A.P. GULIEV, K.G. GASIMOVA Time frequency method of solving one boundary value problem for a hyperbolic system and its application to the oil extraction	301
Allaberen ASHYRALYEV, Kadriye Tuba TURKCAN, Mehmet Emir KOKSAL On Numerical Solutions of Telegraph Equations with the Dirichlet Boundary Condition	302
Gusel BAYBULATOVA Optimal control problem for the degenerate phase field system of equations	303
Yulia DANIK About the robustness of the middle stabilizing controller for quasi-linear state dependent coefficients discrete-time systems	304
F.G. FEYZIEV, G.H. MAMMADOVA, F.N. NABI-ZADE On a controllability for a class of 2D-linear modular dynamic systems with periodic parameters	306
Allaguly GURBANLYYEV On the systems of rational difference equations	307
Zainel MURZABEKOV Design of PI regulators for dynamic systems with constrained control and fixed endpoints of trajectories	308
Zainel MURZABEKOV, Shamshi AIPANOV, Saltanat USUBALIEVA Optimal control problem for the three-sector economic model of a cluster	309
Zhussip SULEIMENOV The method of accelerated convergence for constructing conditional-periodical solutions	310
Mikhail M. TUROV Martinet-Ramis modulus for one Quadratic System	311
Kuralay YESMAKHANOVA, Gaukhar SHAIKHOVA, Guidana BEKOVA Soliton solutions of the Hirota equation	312

<b>AUTHOR'S INDEX</b>	<b>313</b>
-----------------------	------------

## TO 70TH ANNIVERSARY



May 2016 was the 70th anniversary of Tynysbek Sharipovich Kal'menov, the outstanding Kazakhstani mathematician, the academician of the National Academy of Sciences of the Republic of Kazakhstan.

He was born in the South-Kazakhstan region of the Kazakh SSR, in the village Koksak of Lenger district, on May 5, 1946.

### Inverse problem for the Verhulst equation of limited population growth with discrete experiment data

Anvar AZIMOV <sup>1</sup>, Syrym KASENOV <sup>2</sup>, Daniyar NURSEITOV <sup>3</sup>,  
Simon SEROVAJSKY <sup>4</sup>

<sup>1</sup> *Department of Differential Equations and Control Theory, al-Farabi Kazakh National University, Almaty, Kazakhstan*

*E-mail: anvar.aa@mail.ru*

<sup>2</sup> *Department of Methods of Teaching Mathematics, Physics and Computer Science, Abai Kazakh National Pedagogical University, Almaty, Kazakhstan*

*E-mail: syrym.kasenov@mail.ru*

<sup>3</sup> *National Open Research Laboratory of Information and Space Technologies, Kazakh National Research Technical University after Satpuyev, Almaty, Kazakhstan*

*E-mail: nurseitovdb@gmail.com*

<sup>4</sup> *Department of Differential Equations and Control Theory, al-Farabi Kazakh National University, Almaty, Kazakhstan*

*E-mail: serovajskys@mail.ru*

**Abstract:** Verhulst limited growth model with unknown parameters of growth is considered. These parameters are defined by discrete experiment data. This inverse problem is solved with using gradient method with interpolation of data and without it [1,2]. Approximation of the delta-function is used for the latter case. As an example the bacteria population *E.coli* is considered.

We consider the evolution of biological species in limited habitat. The given system is described by Verhulst equation. The coefficients of the equations are unknown. We would like to determine it from an inverse problem by using the results of the experiment. The data are distributed discretely. The inverse problem is transformed to an extremum one. This problem is solved by gradient method. The gradient of the given functional depends on the solution of the adjoint system. The adjoint equation includes delta-functions due to the discreteness of the data. This difficulty can be leave out by the interpolation of the data. This inverse problem is solved by using gradient method with interpolation of data and without it. The delta-function is approximated by Gauss formula [3]. The calculation are realized for the exact values of data and with noised data. The calculation accuracy is high enough for both cases and algorithms. We find also the parameters of growth for bacteria population *E.coli* by real experiment of Scientific Centre of Anti-infectious Drugs (Almaty).

**Keywords:** Verhulst equation, inverse problem, delta-function

**2010 Mathematics Subject Classification:** 34A34

#### References:

- [1] Kabanikhin S. (2011). *Inverse and Ill-posed Problems. Theory and Applications*. Berlin, Boston: De Gruyter, 2011.
- [2] Kabanikhin S.I., Shishlenin M.A., Nurseitov D.B. et al. Comparative analysis of methods for regularizing an initial boundary value problem for the Helmholtz equation // *Journal of Applied Mathematics*, Vol.2014, p. 7, 2014.
- [3] Gelfand I.M., Shilov G.E. *Generalized Functions. Properties and Operations*, 400p., 1980.

## A conditional stability estimate of continuation problem for the Helmholtz equation

Srym KASENOV <sup>1</sup>, Altyn NURSETTOVA <sup>2</sup>, Daniyar NURSETTOV <sup>3</sup>

<sup>1</sup> *Department of Methods of Teaching Mathematics, Physics and Computer Science, Abai Kazakh National Pedagogical University, Almaty*

*E-mail: srym.kasenov@mail.ru*

<sup>2</sup> *Department of Methods of Teaching Mathematics, Physics and Computer Science, Abai Kazakh National Pedagogical University, Almaty*

*E-mail: altynna@mail.ru*

<sup>3</sup> *National Open Research Laboratory of Information and Space Technologies, Kazakh National Research Technical University after Satpayev, Almaty*

*E-mail: nurseitovdb@gmail.com*

**Abstract:** In this paper we consider the continuation problem for the Helmholtz equation. The main result is a conditional stability estimate for a solution to the considered problem. The estimate shows that the closer solution to the surface is more stable.

We consider the initial boundary value problem for the Helmholtz equation in the domain  $\Omega = (0, l) \times (0, \pi)$  [1]:

$$(1) \quad u_{xx} + u_{yy} + k^2 u = 0, \quad (x, y) \in \Omega,$$

$$(2) \quad u_x(0, y) = 0, \quad u(0, y) = f(y), \quad y \in [0, \pi],$$

$$(3) \quad u_y(x, 0) = u_y(x, \pi) = 0, \quad x \in [0, l],$$

where  $k, l$  are given constants. It is required to find a function  $u(x, y)$  in  $\Omega$  from  $f(y)$ . The main theoretical result is the following

**Theorem.** Assume that for  $f \in L_2(0, \pi)$  there exists a solution  $u \in L_2(\Omega)$  to the problem (1) – (3), then the following estimate holds [2]:

$$\|u\|_{L_2(\Omega)}^2 \leq \left( \|q\|^2 + \|f_y\|^2 - \frac{k^2}{2} \|f\|^2 \right)^{\frac{1}{2}} \left( \|f\|^2 + \|f_y\|^2 - \frac{k^2}{2} \|f\|^2 \right)^{\frac{1-\varepsilon}{2}} e^{2x(l-x)} - \|f_y\|^2 - \frac{k^2}{2} \|f\|^2,$$

where  $\|u\|_{L_2(\Omega)}^2 = \int_0^\pi \int_0^l u^2(x, y) dx dy$ .

**Keywords:** Helmholtz equation, stability estimate, inverse problem

**2010 Mathematics Subject Classification:** 35R30

### References:

- [1] Kabanikhin S., *Inverse and Ill-posed Problems. Theory and Applications*. Berlin, Boston: De Gruyter, 2011.
- [2] Lavrent'ev M.M., Savel'ev L.Y., *Operator Theory and Ill-Posed Problems*, De Gruyter, Germany, 680 p., 2011.