

## ABSTRACTS

**R.A. Bashmakov, K.P. Isaev, R.S. Yulmukhametov**

ON GEOMETRIC CHARACTERISTICS OF CONVEX FUNCTIONS AND LAPLACE INTEGRALS

**Abstract.** In many problems of analysis the second derivatives are used to characterize the convexity of the function that imposes serious restrictions on a class of considered functions. This paper introduces the geometric characteristics of convexity, which from our point of view are more natural in the study of weighted spaces of functions. In the one-dimensional case, the problem is considered in more detail and we define the various characteristics, which are in a sense equivalent. As an application we study the asymptotic behavior of multidimensional Laplace integral.

**Keywords:** convex functions, Young's conjugate function, Laplace transform.

**G.E. Berikhanova, B.E. Kanguzhin**

RESOLVENT OF FINITE-DIMENSIONAL PERTURBED OF THE CORRECT PROBLEMS FOR THE BIHARMONIC OPERATOR

**Abstract.** In this work we give a complete description of the well-posed solvability of boundary problems for biharmonic operators in a circle. Then written out their finite perturbations, which also well-posed solved. Formulas are given the resolvent of the operator.

**Keywords:** modeling of plates, correct problem, Dirichlet problem, biharmonic equation, Green function, resolvent operator.

**I.M. Bikkulov, F.Kh. Mukminov**

CLASSES OF UNIQUENESS FOR SOLUTIONS OF THE RICKYIES PROBLEM TO FOURTH AND SIXTH ORDER ELLIPTIC EQUATIONS

**Abstract.** The Rickyies-1, 3 problem with the Dirichlets boundary condition and the third one for fourth and sixth orders elliptic equations in unbounded domain is considered. Wide classes of uniqueness depending on domain geometry for this problem are established. For the Rickyies-1 problem with the Dirichlets boundary condition examples of non-uniqueness are constructed. The examples confirm an exactness of the suggested classes of uniqueness.

**Keywords:** classes of uniqueness, Rickyies problem, elliptic equation.

**A.M. Dilmukhametova, A.U. Mullabaeva, V.V. Napalkov**

GENERALIZED FOCK SPACE

**Abstract.** We introduce a generalized Fock space and consider main properties of this space. There is found an adjoint operation to operation of multiplication on variable  $z$ . Also there are defined eigenfunctions of adjoint operator. We study a generalized Laplace transformation and problem of construction of basis for introduced space.

**Keywords:** the Fock space, an adjoint operator, the Laplace transformation, basis of the space, order and type of entire functions, the generalized differential operator.

**M.N. Dmitriev, E.I. Romenski**

WENO/RK METHOD FOR MODELLING ELASTIC WAVES

**Abstract.** High accuracy WENO-Runge-Kutta numerical method is developed for solving linear elasticity equations written in the form of hyperbolic system of conservation laws. Methods up to the 5th order in space and 4th order in time have been considered. Numerical results obtained for some test problems by the developed methods are much more accurate in comparison with those obtained by the commonly used Virieux scheme of the second order in space and time. Implementation of the PML strategy into the developed methods is also considered.

**Keywords:** linear elasticity, elastic waves, high-accuracy methods.

**K.P. Isaev**

RIESZ BASES OF EXPONENTS IN BERGMAN SPACES ON CONVEX POLYGONS

**Abstract.** We study the existence of Riesz bases of exponents in Bergman spaces on convex bounded polygons. The bases were constructed.

**Keywords:** series of exponents, Riesz bases, Bergman space.

**A.S. Krivosheyev**

AN ALMOST EXPONENTIAL BASIS

**Abstract.** It is studied an almost exponential consequences of holomorphic functions in convex domain. We consider the series on systems of such functions. It is described a space of coefficients's consequences of these series.

**Keywords:** holomorphic function, convex domain, exponent, basis.

**V.V. Napalkov, A.A. Rumyantseva, R.S. Yulmukhametov**

COMPLETENESS OF EXPONENTIAL SYSTEMS IN WEIGHTED SPACES ON REAL AXE

**Abstract.** It is studied the completeness of exponential systems  $\exp(\lambda_k t)$  in the Hilbert space  $L_2(\mathbb{R}; a|x|^\alpha)$ , where  $\alpha \in (1; 2]$ ,  $a > 0$ . We obtain both the necessary and sufficient conditions of completeness in terms of system  $\lambda_k$ .

**Keywords:** completeness of exponential systems, Fourier-Laplace transform, convex function, entire function.

**A.Yu. Timofeev**

WEIGHTED SPACE OF FUNCTIONS IN THE THEORY OF GENERALIZED  
CAUCHY-RIEMANN EQUATION

**Abstract.** In the paper is studied the weighted space of functions from the theory of generalized Cauchy-Riemann system with a singular coefficients. The link is stated whith other space of functions. The conjugate space is described.

**Keywords:** generalized Cauchy-Riemann equation, weighted space of functions, quasi-konvex functions, conjugate space.