

ABSTRACTS

N.K. Bakirov

TESTING HOMOGENEITY AND SYMMETRY FOR MULTIVARIATE DATA

Abstract. Testing of non-parametrical hypotheses for multivariate data is considered.

Keywords: testing non-parametrical hypotheses for multivariate data.

A.M. Gaisin

CLASSES OF DIRICHLET SERIES WITH REAL COEFFICIENTS DEFINED BY CONVEX MAJORANTS OF A GROWTH

Abstract. Behaviour of Dirichlet series with real coefficients the growth of which is bounded by certain convex majorant is learned here. Asymptotic estimate on positive ray outside of certain zero density set has been obtained.

Keywords: Dirichlet series, the convex majorant of a growth.

Yu.N. Drozhzhinov, B.I. Zavalov

ASYMPTOTICALLY QUASI-HOMOGENEOUS GENERALIZED FUNCTIONS AT THE ORIGINE

Abstract. Generalized functions having quasiasymptotics along special groups of transformations of independent variables in the asymptotic scale of regularly varying functions are said to be asymptotically homogeneous along these transformations groups. In particular, all "quasihomogeneous" distributions have this property. A complete description of asymptotically homogeneous in the origin distributions along a transformation group determined by a vector $a \in \mathbb{R}_+^n$ is obtained (including the case of critical orders). Special distribution spaces are introduced and investigated to this end. The results obtained in the paper are applied for construction of asymptotically quasihomogeneous solutions of differential equations whose symbols are quasihomogeneous polynomials.

Keywords: Generalized Functions, Asymptotically homogeneous functions, tauberian theorems, quasiasymptotic form, regularly varying functions.

S.A. Kochetkov, S.A. Krasnova, V.A. Utkin

RE-DETERMINATION MOTION IN SLIDING MODE BY USING FEEDBACK

Abstract. The control objects described by differential equation with discontinuous right-hand side are considered in the paper. The sliding mode can arise in the state space of the system, when control inputs are realized by means of ideal relay. The regularization of system behavior is not trivial problem in sliding mode, because right-hand side of differential equation is not fulfilled Lipschitz and Caratheodory conditions. The new method of regularization of sliding mode motion is proposed in the paper.

The main idea consists in taking into account nonlinearities of relay and using high-gain feedback. It is shown that width of nonlinear zone of relay can be parametrized by gain coefficients of feedback. The regularization of motion in sliding mode is obtained with gain coefficients tends to infinity.

Keywords: differential equation with discontinuous right hand side, sliding mode control, regularization of the problem.

O.A. Krivosheyeva

THE SINGULAR POINTS OF SERIES OF EXPONENTS ON THE BOUNDARY OF CONVERGENCE DOMAIN

Abstract. We study singular points of series of exponents. The result which is special cases of results of G. Hadamard, E. Fabry, V. Bernstein, G. Polya, is obtained. At that we construct the special function, it has not singular points on a boundary of convergence domain of it's own series. This function is the generalization of special function from the theory of Dirichlet's series on a case of general series of exponents.

Keywords: series of exponents, convex domain, singular point.

V.I. Lebedev

ON TRIGONOMETRIC FORM OF TCHEBYSHEV ALTERNANCE THEOREMS AND ON PHASE ITERATIVE METHOD OF FINDING BEST APPROXIMATIONS WITH WEIGHT

Abstract. The article contains generalization of phase method of finding best approximations for function (in $C[-1.1]$) with weight by use of tchebyshev system of functions, rational functions and trigonometric polynomials. In the article P. L. Tchebyshev's alternance theorems have been attached analytical and constructive trigonometric form of weighted error $r(x)$ representation by means of phase function $\psi(\theta): E \cos(m\theta + \psi(\theta)), x = \cos \theta$. Have been formulated iterative methods of finding approximation parameters. Mentioned numerical calculations examples reveal a high efficiency of suggested solution method of those formulated extremal problems.

Keywords: T-systems, rational functions, trigonometric polynomials, formula of tchebyshev alternance, best approximations, phase iteration method.

S.G. Merzlyakov

THE BASIS PROPERTY OF PSEUDOPOWER SEQUENCES OF POLYNOMIALS

Abstract. We study the problem of basis property of sequences of polynomials, in a sense similar to the system of powers z^n .

Keywords: sequence of polynomials, the space of holomorphic functions.

Yu.M. Nechepurenko, G.V. Ovchinnikov

UPPER BOUNDS FOR THE SOLUTION NORMS OF THE HERMITIAN ODAE SYSTEMS

Abstract. New reachable bounds for the solution norms of the Hermitian systems of ordinary differential and algebraic equations (ODAEs) are proposed and justified. Matrices possessing properties similar to those of pseudo-inverse ones are defined based on the Cauchy integral theorem. These matrices are used to obtain systems of ODEs corresponding to the finite eigenvalues of the original systems. We show that the proposed upper bounds can be computed with known numerical algorithms and compare them with ones based on the Lyapunov equations.

Keywords: systems of ordinary differential and algebraic equations, initial value problems, reachable upper bounds, pseudo-inverse matrices, spectral projectors, Lyapunov equations.

A.B. Khasanov, A.A. Reyimberganov

ABOUT THE FINITE DENSITY SOLUTION OF THE HIGHER NONLINEAR SCHRÖDINGER EQUATION WITH SELF-CONSISTENT SOURCE

Abstract. In this work is shown that the "finite density" solution of the higher nonlinear Schrödinger equation with self-consistent source, can be found by the inverse scattering problem for the Dirac's type operator.

Keywords: linear operator, inverse scattering problem, scattering data, eigenvalue, eigenfunction.