

ABSTRACTS

A.V. Abanin

SAMPLING SETS FOR THE SPACE OF HOLOMORPHIC FUNCTIONS
OF POLYNOMIAL GROWTH IN A BALL

Abstract. We develop a new approach to study sampling sets in the space of holomorphic functions of polynomial growth in a ball in the sense of Horowitz, Korenblum, and Pinchuk (Michigan Math. J., 44:2, 1997). It is based on involving weakly sufficient sets for intermediate inductive limits. By means of this approach we obtain a complete topological description of such sets and, as an application of this description, some new properties of sampling sets of general and special type are established. In particular, the main result of the above mentioned paper on sampling sequences of circles is extended to the multi-dimensional case.

Keywords: sampling sets, weakly sufficient sets, space of holomorphic functions of polynomial growth.

N.N. Aitkuzhina, A.M. Gaisin

EXACTNESS OF ESTIMATES FOR k TH ORDER
OF DIRICHLET SERIES IN A SEMI-STRIP

Abstract. We study the Dirichlet series converging only in a half-plane such that their sequence of exponents admits an extension to a “regular” sequence. We proved the exactness of two-sided estimates for k -order of the sum of the Dirichlet series in a semi-strip whose width depends on the special distribution density of the exponents.

Keywords: k -order of the Dirichlet series in a semi-strip, entire functions with a prescribed asymptotics on the positive axis.

A.R. Bikmetov, V.F. Vil’danova, I.Kh. Khusnullin

ON PERTURBATION OF A SCHRÖDINGER OPERATOR
ON AXIS BY NARROW POTENTIALS

Abstract. We consider a Schrödinger operator on the axis with two complex-valued potentials depending on two small parameters. One these parameters describes the length of the supports of the potentials, while the other corresponds to the maximal values of the absolute values of the potentials. We obtain the sufficient condition ensuring the emergence of an eigenvalues from the threshold of the essential spectrum. The asymptotics for this eigenvalue is constructed.

Keywords: Schrödinger operator, perturbation, asymptotics.

G.G. Braichev

THE EXACT BOUNDS OF LOWER TYPE MAGNITUDE FOR ENTIRE FUNCTION
OF ORDER $\rho \in (0, 1)$ WITH ZEROS OF PRESCRIBED AVERAGE DENSITIES

Abstract. We provide exact two-sided estimates for lower type magnitude of entire functions of order $\rho \in (0, 1)$. The zeroes of these functions have prescribed upper and lower average densities and are arbitrarily distributed in the complex plane or on a ray. We analyze the obtained results and compare them with known facts for entire functions of usual type.

Keywords: type and lower type of an entire function, the upper and lower average densities of the sequence of zeroes.

N.P. Girya, S.Yu. Favorov

VARIOUS DEFINITIONS OF THE SPECTRUM OF ALMOST PERIODIC FUNCTIONS

Abstract. We consider various definitions of spectrum for almost periodic functions in a finite dimensional space for uniform, Stepanov, Weil, Besicovitch metrics. We prove that in these cases the classical definition of spectrum is equivalent to an analogue of definition of Beurling spectrum.

Keywords: Almost periodic function, spectrum, Stepanov metric, Weil metric, Besicovitch metric, Beurling spectrum.

O.A. Ivanova, S.N. Melikhov

ON THE ORBITS OF ANALYTIC FUNCTIONS WITH RESPECT
TO A POMMIEZ TYPE OPERATOR

Abstract. Let Ω be a simply connected domain in the complex plane containing the origin, $A(\Omega)$ be the Fréchet space of all analytic on Ω functions. An analytic on Ω function g_0 such that $g_0(0) = 1$ defines the Pommiez type operator which acts continuously and linearly in $A(\Omega)$. In this article we describe cyclic elements of the Pommiez type operator in space $A(\Omega)$. Similar results were obtained early for functions g_0 having no zeroes in domain Ω .

Keywords: Pommiez operator, cyclic element, analytic function.

B.E. Kanguzhin, N.E. Tokmagambetov

CONVOLUTION, FOURIER TRANSFORM AND SOBOLEV SPACES GENERATED
BY NON-LOCAL IONKIN PROBLEM

Abstract. In this work, given a second order differential operator \mathcal{B} subject to non-local boundary conditions, we assign Fourier transform and convolution to this problem. We study the properties of the introduced convolution and describe the class of test functions. We also introduce Sobolev spaces and obtain Plancherel identity related to operator \mathcal{B} .

Keywords. convolution, Fourier transform, nonlocal boundary condition, test functions, Sobolev space, Plancherel identity, differential operator, Ionkin problem.

Yu.F. Korobeinik

ON SOME PROBLEMS IN THE THEORY OF THE RIEMANN'S ZETA-FUNCTION

Abstract. We determine the principal value of some integrals related to Riemann's zeta-function. We propose a probably new hypothesis which implies the famous Riemann's hypothesis on the absence of zeroes of zeta-function in the half-plane $\operatorname{Re} z > 1/2$, as well as some other facts in the theory of zeta-function.

Keywords: Riemann's zeta-function, theory of residues.

R.Ch. Kulaev

COMPARISON THEOREMS FOR GREEN FUNCTION
OF A FOURTH ORDER BOUNDARY VALUE PROBLEM ON A GRAPH

Abstract. In the work we develop the non-oscillation theory for fourth order equations on a geometric graph arising in modelling of rod junctions. The non-oscillation of an equation is defined in terms of the properties of a special fundamental system of solutions to the homogeneous equation. We describe the relation between non-oscillation property and the positivity of Green function to some classes of boundary value problems for fourth order equation on a graph.

Keywords: graph, differential equation on a graph, non-oscillation, Green function.

Kh.Kh. Murtazin, Z.Yu. Fazullin

FORMULA OF THE REGULARIZED TRACE FOR PERTURBATION
IN THE SCHATTEN-VON NEUMANN OF DISCRETE OPERATORS

Abstract. In the paper we study a formula of the regularized trace for a perturbation in Schatten-von Neumann class $(\sigma_p, p \in \mathbb{N})$ of discrete self-adjoint operators. We prove that the regularized vanishes after deducting $(p - 1)$ terms of perturbation theory if there are no dilating gaps in the spectrum of the unperturbed operator.

Keywords: perturbation theory, regularized trace, discrete operator, spectrum, resolvent.

A.Yu. Trynin

ON SOME PROPERTIES OF SINC APPROXIMATIONS
OF CONTINUOUS FUNCTIONS ON THE INTERVAL

Abstract. We study approximation properties of various operators being the modifications of sinc approximations of continuous functions on an interval.

Keywords: sinc approximation, interpolation functions, uniform approximation.

F.A. Shamoyan

ON A CLASS OF INNER FUNCTIONS IN A HALF-SPACE

Abstract. In the paper we obtain necessary and sufficient conditions for the weight vector function, under which a given inner function is weakly invertible in the weighted functions of holomorphic functions in a tubular domain.

Keywords: weak invertibility, weighted spaces, tubular domain.

O.V. Sherstyukova

THE PROBLEM ON THE MINIMAL TYPE OF ENTIRE FUNCTIONS OF ORDER $\rho \in (0, 1)$
WITH POSITIVE ZEROES OF PRESCRIBED DENSITIES AND STEP

Abstract. We consider the problem on the least possible type of entire functions of order $\rho \in (0, 1)$, whose zeroes lie on a ray and have prescribed densities and step. We prove the exactness of the estimate obtained previously by the author for the type of these functions. We provide a detailed justification for the construction of the extremal entire function in this problem.

Keywords: type of an entire function, upper, lower densities and step of sequence of zeroes, extremal problem.

V.S. Khoroshchak, A. A. Kondratyuk

STATIONARY HARMONIC FUNCTIONS ON HOMOGENEOUS SPACES

Abstract. Stationary harmonic functions on homogeneous spaces are considered. A relation to double periodic harmonic functions of three variables is showed.

Keywords: harmonic function, multiplicatively periodic function, double periodic function, homogeneous space, Klein space, invariant family, stationary element with respect to a subgroup, punctured Euclidean space.

A. Bërdëllima

ABOUT A CONJECTURE REGARDING
PLURISUBHARMONIC FUNCTIONS

Abstract. In this work we present Khabibullin's conjecture in its different equivalent forms. Applying the concept of the integral operator, we transform the original conjecture into a new form which proves to be helpful in studying it by means of the Laplace transform. Using Laplace transform of integral inequalities, we are able to show the uniqueness of a solution that satisfies both inequalities and identity. Furthermore we provide a new proof of Khabibullin's theorem by methods of the Laplace transform and contour integration from complex analysis. However, this method of transform fails to prove the conjecture and a brief reasoning is provided.

Keywords: Khabibullin's hypothesis, integral inequalities, plurisubharmonic function, Laplace transform, complex analysis, contour integration, sharp estimate.