Antonova T. M., Hoyenko N. P.

APPROXIMATION OF RATIO OF LAURICELLA FUNCTIONS F_D BY NÖRLUND'S BRANCHED CONTINUED FRACTION IN COMPLEX DOMAIN

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The convergence of Nörlund's branched continued fraction, that is the expansion of ratio of Lauricella hypergeometric functions $F_D^N(a, b_1, b_2, \dots, b_N; c; z_1, z_2, \dots, z_N)$ in the domain $\{\mathrm{Re}\, z_k < 1/2,\ k = \overline{1, N}\}$, when parameters hold $a \geq 0,\ b_i \geq 0,\ i = \overline{1, N},\ 2c \geq a + b_1 + \ + b_2 + \dots + b_N + 1$, is investigated.

Dmytryshyn M. I.

INTERPOLATION OF SPECTRAL SUBSPACES OF TRICOMI DIFFERENTIAL OPERATORS

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The interpolation properties of Tricomi differential operators are established. The spectral decompositions of such operators are given.

Vozna S. M.

ON CONVERGENCE OF CONTINUED J -FRACTION

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The connection between a continued J-fraction and associated continued fraction, obtained from some interpolation problem, has been shown. The convergence of continued J-fraction with partial quotients of the form $\frac{-c_n^2}{ib_n + z}$ has been investigated.

Zagorodnyuk A. V., Chernega I. V.

SYMMETRIES OF ANALYTIC FUNCTION SPACES ON BANACH SPACES

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Algebras of analytic functions on Banach space, which are symmetric with respect to some semi-group of isometric operators, are investigated. Operator of symmetrization, which is a homomorphism of algebras, is constructed.

Yeleyko Ya. I., Zhernovy Yu. V.

ASYMPTOTIC PROPERTIES OF RANDOM EVOLUTIONS CONSTRUCTED ON THE BASIS OF SOLUTIONS FOR SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS

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The work describes as random evolutions on the trajectories of semi-markovian process random wanderings of arbitrary nature system, parameters of which are variable in time onto a finite set of conditions and each condition is described by solutions of Cauchy problem for a system of ordinary differential equations. On the basis of ergodic Skorochod theorem for the processes with markovian interference of the case, the asymptotics of additive function at $t \to \infty$, which determines the mean value of random evolution in time, is found. Random evolution with finite number of opportunities (*sub-conditions*) *for each condition of markovian process is investigated. Evolution for mathematical model of development of populations of biological species is constructed.*

Lozynska V. Ya., M'yaus O. M.

DISTRIBUTIONS OF EXPONENTIAL TYPE AND FUNCTIONAL CALCULUS

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 44-49. – Ref.: 9 names. – Ukr.

Some properties of operator calculus for generators of strongly continuous groups of linear operators on arbitrary Banach spaces are described.

O. Lyzun

ENTIRE FUNCTIONS WITH PRESCRIBED GROWTH

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 50-59. – Ref.: 7 names. – Engl.

Entire function f *with prescribed growth of its main characteristics is constructed in the form of certain infinite product such that*

$$N(r,f) \sim T(r,f) \sim \log m_q(r,f) \sim \log M(r,f) \sim m_2(r,\log|f|) \sim \lambda(r), \quad r \to \infty,$$

where m_q *are* q*-integral means and* $\lambda(r)$ *is a positive, continuous, increasing to* $+\infty$*, and convex with respect to* $\log r$ *function.*

O. V. Verbitsky

ON DUAL VERSION OF WEISFEILER – LEHMAN ALGORITHM

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 60-64. – Ref.: 5 names. – Engl.

We study a simplified variant of the Weisfeiler – Lehman graph canonization algorithm that corresponds to the fragment of the first order logic with bounded number of variables precisely in the same way as the standard variant corresponds to this fragment, enriched with counting quantifiers. We propose a natural dual version of the color refinement subroutine and prove that the dual algorithm has optimum dimension by one exceeding that of the standard algorithm.

Maslyuchenko V. K., Maslyuchenko O. V., Mykhaylyuk V. V.

PARACOMPACTNESS AND LEBESGUE CLASSIFICATION

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 65-72. – Ref.: 12 names. – Ukr.

Generalization of the known Kuratowski – Montgomery theorem about the Lebesgue classification of separately continuous mappings is proposed.

Mytrofanov M. A.

DISTRIBUTIONS ON CUBE IN HILBERT SPACE

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 73-77. – Ref.: 10 names. – Ukr.

We construct a space of distributions on a cube in Hilbert space. We define the operations of differentiation and multiplication on this space.

Novosad Z. G.

COMPOSITION OPERATORS ON SPACES OF ANALYTIC FUNCTIONS ON HILBERT SPACE

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 78-83. – Ref.: 10 names. – Ukr.

The spectral properties of composition operators on Hilbert space of analytic functions, which are defined on the unit Hilbert ball, are investigated. The spectral theorem for such operators is proved.

Pipa G. M., Storozh O. G.

SEMI-SMOOTH RESTRICTIONS OF POSITIVELY DEFINED OPERATOR AND THEIR PROPER EXTENSIONS

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Let L_0 be a closed symmetric positively defined operator in Hilbert space and $L_{\min}$ – its restrictions onto the kernel of auxiliary linear mapping, defined on the energetic space of L_0. In terms of abstract boundary conditions various extensions (self-adjoint, maximal non-negative etc.) of $L_{\min}$ are described.

Skaskiv O. B., Trusevych O. M., Kyrychynska I. B.

ON A SUM AND MAXIMUM TERM OF SERIES SIMILAR TO TAYLOR – DIRICHLET SERIES

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We establish conditions, under which for positive series of the form $F(x) = \sum_{n=0}^{+\infty} a_n e^{\lambda_n x + \tau(x)\beta_n}$ the relation $F(x) = (1 + o(1)) \max \{ a_n e^{\lambda_n x + \tau(x)\beta_n} : n \geq 0 \}$ holds with $x \to +\infty$ outside some exceptional set, where τ is a positive on $[0, +\infty)$ function, λ_n and β_n are positive sequences.

Solomko A. V., Lopushansky O. V., Sharin S. V.

ON TOPOLOGICAL ISOMORPHISM OF DISTRIBUTION ALGEBRA WITH SUPPORTS IN CONE TO COMMUTANT OF SHIFT SEMIGROUP

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 95-99. – Ref.: 4 names. – Ukr.

The properties of dual pair $\langle D'_\Gamma, D_\Gamma \rangle$, associated with classical convolution algebra of Schwartz distributions with supports in the cone $\Gamma \subset \mathbf{R}^n$, are investigated. The operation of cross-correlation with respect to constructed duality is defined. The theorem about topological isomorphism of the convolution algebra D'_Γ to commutant of the (C_0)-semi-group in algebra $L(D_\Gamma)$ on the corresponding space of test functions is proved.

Hentosh O. E.

HAMILTONIAN REDUCTION OF NEUMANN TYPE FOR DAVEY – STEWARTSON SYSTEM

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For the Davey – Stewartson (2+1)*-dimensional nonlinear dynamic system, possessing the triple matrix Lax representation, the method of reducing upon its non-local finite-dimensional solution subspace is developed.*

Guzil' N. I., Lavrenyuk S. P.

PROBLEM WITHOUT INITIAL DATA FOR HYPERBOLIC SYSTEM OF THE FIRST ORDER

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 108-115. – Ref.: 11 names. – Ukr.

In the article the problem without initial data for hyperbolic system of the form

$$u_t + \sum_{i=1}^{l} A_i(x,t) u_{x_i} + C(x,t)u + g(t,u) = f(x,t)$$

in the bounded on the variable x domain is considered. Some sufficient conditions of existence and uniqueness of solution independently of its behavior, when $t \to -\infty$, are obtained.

Pukal'sky I. D.

PROBLEM WITH DIRECTIONAL DERIVATIVE FOR SINGULAR ELLIPTIC EQUATIONS

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 116-123. – Ref.: 4 names. – Ukr.

The existence and uniqueness of the problem with directional derivative for singular non-uniformly elliptic equations without limitation on the power order of coefficient degeneration have been proved in the spaces of classic functions with the power weight. Estimate of the solution to the problem in the corresponding spaces has been found.

Bozhenko B. L., Nagirny T. S.

ON NUMERICAL SOLUTION OF VARIATIONAL PROBLEMS OF LOCAL GRADIENT MECHANICS USING MOVING LEAST-SQUARE APPROXIMATIONS

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 124-128. – Ref.: 10 names. – Ukr.

The basic relations of local gradient thermo-elasticity are formulated. The meshless method for solution and investigation of the corresponding problems of mathematical physics, using moving least-squares approximations, is proposed.

Danoyan Z. N.

INVESTIGATION OF ROOTS OF CHARACTERISTIC EQUATION OF PLANE MAGNETOELASTIC WAVES FOR PERFECTLY-CONDUCTING ANISOTROPIC MEDIA

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 129-137. – Ref.: 9 names. – Russian.

On the basis of the Smirnov – Sobolev's method, the functional-invariant solutions of magnetoelasticity bidimensional equations for perfectly-conducting anisotropic media, representing plane magnetoelastic waves, are studied. The behavior of roots of corresponding characteristic equation, depending upon the values of elastic constants and magnitude of external magnetic field, are investigated in details. It is shown, that the roots of characteristic equation, depending on the above stated parameters, can be of two types: either each root corresponds to the unique interval reality, or one of them is real in two non-crossing intervals, and another is real in one interval.

Kryven' V. A., Yavorska V. I.

PLASTIC ZONES AT SHEAR NEAR RECTANGULAR AND ROUNDED CUTS OF CONSTANT WIDTH

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 138-144. – Ref.: 6 names. – Ukr.

Stressed-strained state of ideal elastico-plastic body with semi-infinite rectangular and rounded cuts of constant width under the conditions of anti-plane strain is investigated. Analytical solutions of the problems are found, the plastic zone development is investigated. It is shown that the zone shape can be approximated by solution of elastico-plastic problem for a semi-infinite crack, when the maximum size of plastic zone several times exceeds the cut width.

Kondrat V. F.

ON STUDIES OF VIBRO-EVOLUTIONARY PHENOMENA IN NONLINEAR MECHANICS OF CONJUGATED FIELDS

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 145-150. – Ref.: 22 names. – Ukr.

We propose a method to obtain an approximate solution to nonlinear problem of mechanics of conjugated fields as applied to vibro-evolutionary phenomena.

Ostudin B. A., Romanenko A. V.

MATHEMATICAL MODELING OF HEAVY-CURRENT BEAM IN SELF-CONSISTENT 3D-FIELD

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 151-162. – Ref.:

19 names. – Ukr.

Basing on the integral equation method, an algorithm for solution of three-dimensional stationary self-consistent problem is constructed. The numerical-analytical approach has been used to define the potential and strength of electric field. The proposed algorithm has been verified on the plane-parallel diode with unlimited cathode capability. Generalization for the case of cylindrical charged surfaces has been considered.

Pyanylo Ya. D., Popovych V. S., Pyanylo A. Ya.

ITERATIVE SCHEME FOR SOLUTION OF NONLINEAR BOUNDARY-VALUE PROBLEMS OF NON-STATIONARY HEAT CONDUCTIVITY TYPE

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 163-167. – Ref.: 10 names. – Ukr.

The iterative scheme for solution of nonlinear partial differential equations of heat conductivity type is proposed. Convergence of the constructed iterative scheme is proved.

Sarkisyan S. V., Pogosyan A. S.

ABOUT MAGNETOELASTIC VIBRATIONS OF TRANSVERSALLY ISOTROPIC PLATES ACCORDING TO SHEAR STRAIN

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 168-172. – Ref.: 8 names. – Russian.

The problem on vibration of transversally isotropic electroconductive plate is investigated in the presence of constant magnetic field, involving cross shear strain. For change of the plate thickness components of electromagnetic field two cases are considered.

Chernukha O. Yu.

ADMIXTURE DIFFUSION IN RANDOMLY NON-HOMOGENEOUS FIBROUS LAYER

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 173-180. – Ref.: 13 names. – Ukr.

Admixture diffusion has been considered in a layer, formed of two phases being different by diffusive properties: matrix and fibrous inclusions, located randomly. The conditions of non-ideal mass contact are imposed on the interphases. The contact initial boundary-value problem is reduced to the non-linear integro-differential equation, which has been solved by the method of successive iterations. Convergence of Neumann series has been proved for this case. The approximate formula is found for concentration, averaged over ensemble of phase configurations.

Zabolotsky M. V., Sheremeta Z. M.

ISSN 0130–9420. Mathematical methods and physico-mechanical fields. – 2004. – 47, No. 2. – P. 181-185. – Ref.: 7 names. – Ukr.

ON INDEX BOUNDEDNESS OF ENTIRE SOLUTION TO ONE DIFFERENTIAL EQUATION

For $l(x) \equiv \text{const} > 1$, the l-index boundedness of entire solution to the differential equation $z^2w'' + (\beta_0 z^2 + \beta_1 z)w' + (\gamma_0 z^2 + \gamma_1 z + \gamma_2)w = 0$ is investigated.

Sheremeta Z. M., Sheremeta M. M.

CONVEXITY OF ENTIRE SOLUTIONS OF ONE DIFFERENTIAL EQUATION

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Conditions on constant coefficients of differential equation $z^2w'' + (\beta_0 z^2 + \beta_1 z)w' + + (\gamma_0 z^2 + \gamma_1 z + \gamma_2)w = 0$, under which the entire solution f of equation and all its derivatives f', f'', … are convex in the unit disk, are investigated.