

ABSTRACTS

Radioelektronika i informatika. 2005. № 1.

UDC 517.958:537.8

Excitation of a 3-D irregular and unclosed structure / V.A.Doroshenko // Radioelektronika i informatika. 2005. № 1. P.4-8.

An approach for solving a problem of electromagnetic scattering on a complex semi-infinite thin perfectly conducting surface with longitudinal slots is proposed. Source field varies in time according to a given function. The approach is based on using the Meler-Fock integral transforms and the semi-inversion method. It is showed, that the given electromagnetic problem is equivalent to a linear algebraic equations system of the second kind. Analytical solutions are obtained for some cases of the cone structure.

Fig. 3. Ref.: 11 items.

UDC 517.87; 537.958

Mathematical model of microwave electromagnetic field nonlinear interaction with semiconductor structures / N.I. Spipchenko // Radioelektronika i informatika. 2005. № 1. P.9-14.

Quasi-static approach algorithm of problem of the resonant frequencies obtaining of fiber resonator is constructed. Resonator is laden by semiconductor structure. Both the zone curvature at the surface of above structure and the nonlinear interaction character of free charges with microwave field are taken into attention.

Fig. 1. Ref.: 5 items.

UDC 517.9

Numerical-analytic model of evolution of electromagnetic field in a waveguide with dispersive medium / L.A. Vlasenko // Radioelektronika i informatika. 2005. № 1. P.14-20.

A mathematical model of evolution of electromagnetic field in a waveguide with layered dispersive medium is described. A partial differential equation of non-Cauchy-Kovalevskaya type arises by separating variables in an initial-value problem for Maxwell's equations. An existence and uniqueness theorem for the corresponding mixed problem is obtained. A numerical method to find a solution is given.

Fig. 4. Ref.: 14 items.

UDC 621.317

Criteria of the samples permanency for data processing algorithms of the digital oscilloscopes /N.G. Baranov, I.I.Kluchnik, M.A. Lodigin // Radioelektronika i informatika. 2005. № 1. P.20-22.

Presented criterion C is not only one criterion for data comparison. Its effectiveness can be evaluated by comparison with other criterions. This article presents results of the work. Also metrological features of the criterion have been presented.

Fig. 5. Ref.: 4 items.

UDC 621.385.6

Evolution of Signal Spectra During Transient Processes in Crossed-Field Generators and Amplifiers / A.V. Vasyanovich, A.V. Gritsunov, O.G. Lebedev, G.I. Churyumov // Radioelektronika i informatika. 2005. № 1. P.22-28.

A time evolution of output signal spectra in transient modes of the magnetrons and the amplitrans is considered. A subexcitation of the natural mode of a re-entrant electron beam by the RF line field during the tubes starting is ascertained, that produces two harmonics with different frequencies at the tube output. A spectrum of the magnetron is investigated at the time of the operating mode hopping.

Fig. 5. Ref.: 9 items.

UDC 621.375.9

Parametric up converter of EHF-band / O.N. Sukhoruchko, A.I. Fisun, O.I. Belous // Radioelektronika i informatika. 2005. № 1. P.29-31.

The study of parametric frequency converter in the short part of millimeter wave band has been carried out. The device of two-circuit parametric amplifier based on the counter signal and pumping waveguides is used. The frequency doubling and conversion modes up to 120 GHz are experimentally determined.

Fig. 4. Ref.: 5 items.

UDC. 621.396

Method of input of a monitoring signal in a monopulse direction finder / A.N. Zajchenko, G.P. Sumkin, A.P. Vereshchak, A.B. Danilin, Y.A. Kolesnikov, V.I. Tolkachev // Radioelektronika i informatika. 2005. № 1. P.31-34.

Method of input of a monitoring signal for calibration gain and phase characteristics of paths of a monopulse direction finder it is offered. It allows building a monopulse direction finder with separate receivers in which influence not identity of gain and phase characteristics of paths is excluded. Requirements on identity and stability of parameters are not showed to them.

Fig. 2. Ref.: 15 items.

UDC 717.958:535.4

Diffraction model of radio acoustic sounding for short distances / A. Yu. Panchenko // Radioelektronika i informatika. 2005. № 1. P.35-39.

The rigorous solution of the problem of electromagnetic waves scattering on heterogeneities of air permittivity caused by acoustic waves' passages on radio acoustic sounding is offered. The presented approach makes it possible to solve the problem of receiving meteorological information on the lower section of sounding for RAS systems.

Fig. 4. Ref.: 5 items.

UDC 621.315.592

Analysis of processes of heat-mass transfer in case of growing silicon bars taking into account the thermal and construction parameters of growth setup / A.P. Oksanich, S.E. Pritchkin, O.V. Vasheruk // Radioelektronika i informatika. 2005. № 1. P.40-47.

An article is devoted to the questions of mass transfer in case of growing silicon bars in the growth plant taking into account influencing thermal and construction materials. Be analyzed and definite basic factors and parameters of the growth plant having influence on forming a thermal field in the thermal knot and growing bar, be definite to conformity to the allocation's law of thermo-resilience tensions, admixtures in the growing bar.

Tab. 1. Fig. 7. Ref.: 14 items.

UDC 517.958:536.71

Simulation of Diffusion-Convection Processes in Microfluidic Channels / O.V. Klymenko, A.I. Oleinick, C.A. Amatore, I.B. Svir // *Radioelektronika i informatika*. 2005. № 1. P.47-53.

A conformal mapping approach for the numerical simulation of diffusion-convection processes at double band electrode assemblies operating in a microfluidic channel and an optimization procedure for simultaneous fitting of any number of pairs of theoretical and experimental current curves are described.

Tab. 2. Fig. 3. Ref.: 18 items.

UDC 514.753

The method of regular covering of rectangle by congruent circles taking account additional restrictions/ Pankratov A.V., Patsuk V.N., Romanova T.E., Shekovtsov S.B. // *Radioelektronika i informatika*. 2005. № 1. P.54-58.

The article considers a problem of a covering of rectangle by minimal number of congruent circles. Taking into account restrictions on minimal distances between the centers of circles and the centers of circles and the frontier of region. For solving the problem a lattice covering methods except for frontier of the rectangle are developed.

Fig. 7. Ref.: 7 items.

UDC 519.859

Solution searching of the problem of circles packing into a convex polygon by means a modified decremental neighborhood method / A.M. Chugay // *Radioelektronika i informatika*. 2005. № 1. P.58-63.

Within the field of optimal cutting, packing and placement problems the problem of optimal circles packing has high importance. The paper considers the problem of packing equal circles into a convex polygon. The mathematical model of problem is built. Based on peculiarities of the mathematical model a solution method is offered. The method includes three basic stages: construction of extreme points; search of best extreme points by means the modified decremental neighborhood method; local optimization which use extreme points with greatest values of a criterion function as starting points. Numerical result is given.

Tab. 1. Fig. 2. Ref.: 12 items.

UDC 658.562.3

Method of Determination of Key Indexes for Processes of Quality Management System /L. Vitkin, G. Khimicheva // *Radioelektronika i informatika*. 2005. № 1. P.63-66.

The author considers a problem of definition from a plenty of parameters, which describe the cooperating and interconnected processes of organization, key parameters, influencing on final result. The application of the matrix analysis and elements of graf theory has permitted to construct optimum on structure of the graf of system of parameters of processes, of which the activity of organizations consists. The offered universal approach of definition of entrance, intermediate and initial parameters of processes permits to optimize and to increase efficiency of the control and management of processes of organization.

Tab. 1. Fig. 2. Ref.: 2 items.

UDC 519.6:514.1

Properties of composition images of classes combinatorial sets under mapping to euclidean space / Grebennik I, // Radioelektronika i informatika. 2005. № 1. P.66-70.

Combinatorial sets of complex structure to be composition images of combinatorial sets (k-images) are investigated. The classes of k-images of combinatorial sets based on permutations, arrangements and combinations - sets of pair permutations, pair arrangements and pair combinations - are introduced. Properties of proposed sets of k-images under mapping to Euclidean space are investigated.

Ref.: 7 items.

УДК 519.854

Unconditional optimization task of the fractionally-linear special purpose function on the polypermutation: transition to the linear conditional task on the special combinatorial set // O. Yemets', N.Romanova // Radioelektronika i informatika. 2005. № 1. P.70-73.

The article contains raising the task of maximization of fractionally-linear function on the set of polypermutation without additional limitations. Transition out to the conditional optimization task with a linear having a special purpose function is carried. A theorem is proved about the equivalence of decisions of initial and got tasks. Some properties of combinatorial polyhedron, built linear task on the special combinatorial sets. are explored, namely: type of the system, that it is describes by that its compatibility.

Ref.: 14 items.

UDC 519.714.5

Interpreted Hierarchical Petri Nets in Digital Controller Design / G. Andrzejewski, A.G. Karatkevich // Radioelektronika i informatika. 2005. №1. P.74-79.

An approach to describe behavior of the embedded systems of logical control implementing concurrent algorithms is considered. A strictly defined model based on interpreted hierarchical Petri nets is used for specifying the control algorithms. The model allows efficient implementation in microcontrollers. Analysis and verification of the concurrent systems are discussed; the analysis algorithms for the considered model are presented.

Fig. 2. Ref.: 15 items.

UDC 519.7

The algebra of predicates and predicate operations / M.F. Bondarenko, Z.V. Dudar, N.T. Protsay, V.V. Cherkashyn, V.A.Chikina, Yu.P. Shabanov-Kushnarenko // Radioelektronika i informatika. 2005. № 1. P. 80-86.

The algebra of predicates and predicate operations which is recommended as base analytical language of computer science and as the basic means of the formal description of mechanisms of intelligence is described.

Ref.: 7 items.

UDC 519.7

On the modified categories / M.F.Bondarenko, Z.V. Dudar, A.A. Ivanilov, V.V. Manikin, Ju.P. Shabanov-Kushnarenko // Radioelektronika i informatika. 2005. № 1. P.87-99.

Concepts of the modified category are entered, its connection with concept of a classical category is considered. The modified categories theory development problem is formulated.

Fig. 11. Ref.: 6 items.

UDC 681.518

Models of the activities of information tasks in a computer network / V.I.Sayenko, M.V.Vasilenko // Radioelektronika i informatika. 2005. № 1. P.99-103.

The activities of the set of software programs, that are combined as information tasks, are formalized. There has been proposed model and criteria of the activities. Questions on practical useable are considered.

Fig. 4. Ref.: 6 items.

UDC 519.21

Limit system characteristics which evolution described by graph / V.N. Shershen // Radioelektronika i informatika. 2005. № 1. P.103-106.

The problem of complex system modeling is investigated. The method of discovery is based on the random graph approach. Research was carried out by the example of Internet.

Fig.1. Ref. 5 items.

UDC 519.7

Binarization of the morphological relation of adjectives full names declination / Kozyaev L.L., Shabanov-Kushnarenko S.Yu. // Radioelektronika i informatika. 2005. № 1. P.106-111.

The method of algebrological structures construction is considered. This method can be put to use in logical networks. Example of algebrological formalization of unpossessive adjectives declination process is given in this article. The paradigmatic table of adjectives word-formations and the method of algebrological notation binarization is elaborated. The described method can be used for semantic structure representation of adjectives.

Tab. 8. Ref.: 2 items.

UDC 621.391:51.142

Numerical substantiation of a Series Summation Method in RKHS / S.V. Chumachenko // Radioelektronika i informatika. 2005. N 1. P. 111-114.

Numerical results which show validity of some identities which are received by a Series Summation Method in RKHS are resulted.

Fig. 7. Ref.: 7 items.

UDC 681.3

Activity algorithm of innovation structure participants / Ali Naef Kalil Al Hjoj // Radioelektronika i informatika. 2005. № 1. P.115-118.

The algorithm of a rating of efficiency of activity of the participants of corporate group is offered. It allows to evaluate the effective strategy of each participant before appearance innovation of firm and ambassador.

Fig. 2. Ref.: 3 items.

UDC 004.272.43

Productivity of an indirect multistage network at presence of the hot traffic for final channels / V.N. Evgraphov // Radioelektronika i informatika. 2005. № 1. P.119-122.

Multistage interconnection networks are used to connect processors to memories in shared memory multiprocessor systems. The performance evaluation of such networks is usually based on the assumption of uniform memory reference pattern. Hot spots in such networks give rise to non-uniform memory reference pattern and result in a degradation in performance. Analytical model for performance evaluation of multistage networks has been developed in this paper.

Fig. 3. Ref.: 3 items.

UDC 343.977.33+681.3.068

Comparison of fuzzy & classical verbal portrait methods /A.A. Kargin, A.V. Grigoriev // Radioelektronika i informatika. 2005. N 1. P. 122-125.

This article is dedicated to the problem of representing information of outward form based on verbal portrait method & finding an unknown person in DB by witness evidence. New approach named fuzzy verbal portrait & based on fuzzy sets theory is proposed. The results of comparison of classical & fuzzy methods are adduced.

Fig. 2. Ref.: 5 items.