

ABSTRACTS
Radioelektronika i informatika. 2004. №2

UDC 621.371.3

The scattering of electromagnetic waves on linear grating of the resonant magnetodielectric spheres / A.I. Kozar // Radioelektronika i informatika. 2004. № 2. P.4-9.

Solution of the problem about the scattering of the electromagnetic waves on linear grating of resonant spheres were considered. The expressions for the scattered waves are derived.

Fig. 5. Ref.: 5 items.

UDC 621.396.2.: 621.316.2

Estimation of parameters of linear prediction models by power spectrum / V.A. Tykhonov, V.V. Dorovsky, D.Y. Gorelov, E.S. Lykshosherstov // Radioelektronika i informatika. 2004. № 2. P.9-12.

Problem of estimation of autoregression and moving averages models parameters with known power spectrum or gain-frequency characteristic sample was considered. Linear combined equations for calculation of these models parameters were found. Examples of found method usage for different power spectrum or gain-frequency characteristic shapes were given.

Fig. 4. Ref.: 7 items.

UDC 514.14:621.391

Synthesis fractal of signals with use gipocycloid / R.E. Paschenko // Radioelektronika i informatika. 2004. № 2. P.12-16.

On the basis of use of properties gipocycloid the opportunity of reception fractal not differentiation of function is shown which allows to synthesize fractal a signal. It is shown, that the change of space of parameters base gipocycloid allows to change dimension synthesized fractal of a signal.

Fig. 7. Ref.: 8 items.

UDC 539.1.074.3

Composite detection blocks: a new class of devices for control of radiation situation / V.V. Nekrasov, Yu. A. Borodenko, B.V. Grinyov, L.A. Piven, E.M. Selegenev // Radioelektronika i informatika. 2004. № 2. P.17-19.

Presented is a composite r-detection block developed at the STC "Institute for Single Crystals". The block consists of two detectors of "scintillator-photodiode" type and a semiconductor detector.

Tab.2. Fig. 1. Ref.: 3 items.

UDC 658.51.011.56

Beginning of regular thermal regime in anisotropic bodies / Sinotin A.M., Semenez W.W. // Radioelektronika i informatika. 2004. № 2. P. 20-22.

Analytic and experimentally shown generalization possibility of existing calculation determination dependences beginning of regular thermal regime for isotropic bodies and on anisotropic bodies. The Got calculation significances and experimental data will comport satisfactorily.

Tab. 2. Fig. 2 Ref. 5 items.

UDC 621.396.96

Model of the evaluation of the UFD (unmanned flying device) grouping reserve level when carrying air reconnaissance on the base of border level criterion / Yu.G. Danik, S.S. Baagrov, A.A. Nakonechni, N.N. Tkachenko // Radioelektronika i informatika. 2004. № 2. P. 22-25.

Model of the evaluation of the UFD grouping reserve level when carrying air reconnaissance on the base of border level criterion is under consideration. It permits to solve the problem of the choice the rational number of the UFD reserve under different combat activity conditions.

Fig. 3. Ref.: 3 items.

UDC 621.385.64

Dynamic and forming electron cloud in magnetron gun with cold secondary-emission cathode / G.I. Churyumov, Yu.L. Starchevskiy, O.G. Lebedev, Y.B. Isaeva // Radioelektronika i informatika. 2004. № 2. P.25-30.

The system for modeling electron beams in magnetron guns with cold secondary-emission cathode is created. It let us get information about physical processes in gun workspace that we can not get by using measuring instruments this time. The start energy and speed change voltage influence on secondary emission process are observed. Various distributions of particles in time and in workspace that characterize state of electron beam are received.

Fig. 8. Ref.: 7 items.

UDC 621.317

Programmable logic devices based digital oscilloscope /N.G. Baranov, I.I.Kluchnik, M.A. Lodigin // Radioelektronika i informatika. 2004. № 2. P.31-33.

Hardware development, scientific researches, education needs oscilloscopes. Digital oscilloscopes is modern but very expensive devices at today stage. Method, which help to produce digital oscilloscopes of periodic signal with much lower prime cost then competitive devices, offered.

Fig. 6.

UDC 543.083/084

Estimation of directions of optimization of microwave resonator of gauges of control of moisture content of powder materials of electronic technology / Yuri Gordyenko, Hammoud Fadi // Radioelektronika i informatika. 2004. № 2. P.34-38.

In clause the substantiation of principles of construction and optimization of the MICROWAVE resonator sensor controls for the control of moisture content powder materials is submitted. In their basis metrological and operational criteria are fixed. It is shown, that the working range of frequencies is necessary for choosing above 10^{10} GHz. The mathematical parities are given, allowing making theoretical graduation of sensor controls in various ranges of values moisture content.

Tab 1. Fig. 4. Ref.: 11 items.

UDC 621.396.6:004.942

Compensation and optimization when assigning nominal tolerances / G.M. Shilo, A.O. Namlynsky, M.P. Gaponenko // Radioelektronika i informatika. 2004. № 2. P. 39-43.

Procedures of analysis and optimizing for nominal tolerances are given. Interval-structure equations are used. The maximal volume of tolerance spaces and external action coefficients are achieved. It is shown, if the output functions are non-linear the full compensation of external actions are not ensured.

Fig. 2. Ref.: 9 items.

UCD 621.382

Non-destructive technological microwave control parameters of semiconductor structure on the basis of gallium arsenide. / S. V. Babichenko, B. G. Borodin, Yu. Ye. Gordiyenko // Radioelektronika i informatika. 2004. № 2. P.43-47.

The questions of examination an opportunity the determination of conductivity and thickness semiinsulating GaAs substrates and epitaxial films using a cylindrical microwave resonator with H₀₁₂ oscillation mode are considered in the article. Definition of these parameters realize by measuring the Q-factor and level of inclusion the sample in a field of the resonator using of the calibration performances.

Fig. 7. Ref.: 16 items.

UCD 621.385.6.029.6

The analysis of nonlinear interaction of two re-entrant electron beams with an electromagnetic wave of resonance delay line / Frolova T.I., Churyumov G.I., Isaeva E.B. // Radioelektronika i informatika. 2004. № 2. P.47-50.

The numerical results of computer modeling of power performances in the two-stage magnetron for different conditions of its work are considered. The modeling is carried out by a PIC method using multiperiodic, single-wave and non-relativistic approximations. It is shown the interaction of two re-entrant electron beams with electromagnetic wave of resonance delay line is nonlinear and enables to expand area of application of the two-stage magnetron in different advanced radioengineering systems.

Tab. 1. Fig. 6. Ref.: 20 items.

UCD 621.375.8.0.38.825.4 + 621.383

Capture area of charge carriers in low-dimensional semiconductor lasers and amplifiers under small-signal modulation / A. V. Shulika // Radioelektronika i informatika. 2004. № 2. P.51-53.

The space dependence of carrier capture rate by a quantum well (QW) is investigated. Results obtained suggest us for necessity to take into account dependence of capture area from composition of a QW structure as well as its dependence from the operation point.

Tab 1. Fig. 2. Ref.: 9 items.

UDC 519.21

Stabilization of processes of random walks on a set of graphs with the common centre / V.A. Dikarev, T.O. Targoni // Radioelektronika i informatika. 2004. № 2. P. 54-57.

The task about stabilization of process of random walks on a set of graphs having nonempty intersection (centre). By Stabilization of process the authors is considered name such evolution as a result of which, since some instant its basic performances (probability of condition, the probabilities of passage from a condition in a condition) are localized in small neighborhoods with the given centers. In a basis of the analysis, carried out in work, the approach permitting lays to produce stabilization of distribution of inhomogeneous Markov process for anyone, as much as small, time interval.

Ref.: 9 items.

UDC 519.6:514.1

Interval straight line of the space /Grebennik I, Evseeva L, Romanova T. // Radioelektronika i informatika. 2004. № 2. P.57-63.

The concept of the interval straight line in the interval space is introduced. Properties of the straight line are investigated. Two forms of representation of interval straight lines are given: as an intersection of two interval planes and also in a parametrical form. A mapping of the interval straight line into the Euclidian space is realized. This mapping is based on the partition of the interval space and properties of interval operations.

Tab.1. Ref.: 12 items.

UDC 519.21

About simulation of non-stationary random processes through a pair of non-commuting operators / A. Y. Petrova // Radioelektronika i informatika. 2004. № 2. P.64-68.

A new approach to building some classes of non-stationary random processes based on the properties of the commutant of a pair of operators assigning the pattern conception of the random process as a curve in the corresponding Hilbert space is offered. The presentation for correlation functions has been obtained. The rang of non-stationary processes under various conditions applied to commutant of a pair of operators has been calculated.

Ref.: 5 items.

UDC 517.9

The numerical analysis of the solutions of the system of equations of the mathematical model of the process of birth and death of competing populations / I.G.Yalovega // Radioelektronika i informatika. 2004. № 2. P.68-72.

This article examines the system of non-linear differential equations describing the variation of the quantities of two competing forms existing in the common environment. The numerical analysis of the solutions of the pointed problem has been carried out.

Fig. 7. Ref.: 3 items.

UDC 519.6

Analysis of the restoration algorithms of the dependence / V.I. Gritsyuk // Radioelektronika i informatika. 2004. № 2. P. 72-75.

The problem of choice of the estimation algorithm on selection of limited volume is considered. The criterions of order choice of model with account of a priori information are happened. The result of experimental research of various criterions of order choice of model on the base of mean square error of forecast is given.

Tab. 2. Ref.:3items.

UDC 681.32

Co-design Technology System on Chip SOC based on Active HDL 6.2 / V.I. Hahanov, A.A.Yegorov, I.V. Hahanova, O.O. Guz // Radioelektronika i informatika. 2004. № 1. P. 76-81.

An overview of electronic market trends in area of Co-design and Co-verification for System on Chip is offered. New data structure and system simulation for Hardware+Software verification based on HES and ARM processor is given. Process of movie superposition is shown as a sample of co-verification. The advantages of proposed approach are shown.

Fig. 8. Ref.: 24 items.

UDC 681.7.068.4

Use of interference methods for the control of critical surfaces parameters of switching components for fiber optic systems / A.I. Filipenko // Radioelektronika i informatika. 2004. № 2. P. 81-88.

The control of a critical surfaces condition of fiber optic components is carried out by a method of a two-beam interference under the scheme of Michelson interferometer. Ratios that connect surfaces form parameters with characteristics of interference images are resulted. The technique of useful information component distinguishing from a mix of interference signal with noise and a background of measurement that is based on use of bandpass Butterworth filters is offered and investigated.

Fig.14. Ref.: 4 items.

UDC 519.7

On brainlike computers / M.F.Bondarenko, Z.V. Dudar, I.A. Efimova, V.A. Leshchinsky, S.Ju. Shabanov-Kushnarenko // Radioelektronika i informatika. 2004. №2. P. 89-105.

Teaching material on theory of intelligence for support of researches and development of brainlike computers.

Fig. 7. Ref.: 4 items.

UDC 519.688 + 519.683.7

UML Class Diagram Transformation into UFO-Toolkit Model / A.G. Ukrainets // Radioelektronika i informatika. 2004. № 2. P.106-109.

This paper describes integration of well-known CASE-tool Rational Rose and UFO-Toolkit – new tool for the system-object analysis and modeling. The problem of the Rational Rose's class diagram transformation into the UFO-Toolkit's model was solved. The results of this work can give possibility to more effective big program system's basic technology stages processing.

Fig.4. Ref.: 3 items.

UDC 621.391

Analysis of numerical characteristics of the log-likelihood ratio of the MAP decoder / S.I. Prihodko, A.S. Zhuchenko, D.A. Parhomenko // Radioelektronika i informatika. 2004. № 2. P.109-112.

The analysis of numerical characteristics of the log-likelihood ratio of the MAP decoder is lead at a known and unknown dispersion of noise. Connection of numerical characteristics among themselves and with a dispersion of noise on input of the MAP decoder is established.

Fig.5. Ref.: 5 items.

UDC 681.142.36

Visual - algebraic way of minimization of logic functions/ V.G. Rubanov, E.N. Korobkova // Radioelektronika i informatika. 2004. № 2. P.112-115.

The analysis of a way of minimization of logic functions based on transformation of minterms and performance them in a matrix with the next accommodation of elements is carried out.

Ref.: 7 items.

UDC 681.51.007

Image analysis of biological objects on binary cuts / Mashtalir S.V., Megel Yu.E., Putiatin E.P. // Radioelektronika i informatika. 2004. № 2. P.116-121.

Problems of biological objects analysis with use of mathematical morphology methods are considered. An approach to representation of gray-scale images as sets of binary cuts is formulated. As an approximating method algorithm Levenberg-Marquardt is used.

Fig. 4. Ref.: 23 items.

UDC 621.391:51.142

Solving the integral-summatory equations and systems of complex structure by series summation methods in RKHS / S.V. Chumachenko // Radioelektronika i informatika. 2004. № 2. P.122-125.

The approach to series summation methods in Reproducing Kernel Hilbert space (RKHS) is developed. By theorem proving having theoretical and practical means the solutions of the integral-summatory equations and systems of complex structure are determined.

Ref.: 18 items.

UDC 004.985:681.3.06

The strategy of globalization for corporative information systems based on the newest microcomputing technologies / S.V. Yakovlev, V.V.Toryanik // Radioelektronika i informatika. 2004. № 2. P. 126-130.

The creation strategy of global computing information systems was developed. They were intended for corporative level with function of information service for mobile users. The numbers of tactic ways for using the newest digital technologies were offered. These ways were based on Pocket PC as a source unit of information's systems globalization.

Fig. 1. Ref.: 22 items.

UDC 681.518 + 658.511

Application of analysis and modeling technology "UFO" for support of production systems / S.I. Matorin, M.V. Bondak // Radioelektronika i informatika. 2004. № 2. P. 132-135.

The example of using of new systemological analysis and modeling technology (UFO-technology) for analysis of complete set of normative papers, regulating the subdivisions interaction of production enterprise are consider. Work was supported by Economic department of SF «Zavod im. V.I. Malysheva».

Tab. 2. Fig. 2. Ref.: 4 items.

UDC 681.32

Using neuro-connected technologies for optimization in testing pupils knowledge in studying // Babenko N.I., Babichev S.A., Sharko A.V. // Radioelektronika i informatika. 2004. № 2. P.135-140.

The article presents neuro-connected experted system, wich allowes to automatize the proces of testing pupils knowledge aither at the final stage or at the enterim stage. There was proposed a new technodlogy of putting a final mark, taking into account the fact of rise of pupils knowledge at a definite stage of studyng. There was demostrated a high effectiveness of proposed methods in comparison with traditional methods of treatyng the information.

Tab. 2. Ref.: 7 items.

UDC 519.2:368.01

Optimum management by circulating assets taking into account specific of bank / E.V. Slipchenko // Radioelektronika i informatika. 2004. № 2. P. 140-144.

The methods of determination of optimal portfolio of credit resources of bank are considered. The concrete algorithms of optimization of demand on credits are offered.

Tab.1. Fig. 2. Ref.: 4 items.

UDC 519.872

Analysis and optimization of the parameters of the heterogeneous queuing system in trade / N. V. Gibkina // Radioelektronika i informatika. 2004. № 2. P. 145–148.

In this paper heterogeneous queuing system in trade is considered. The methods of determination of optimal parameters of this systems are researched. The problem of the finding of the service optimal plan is decided.

Tab. 1. Fig. 2. Ref.: 5 items.

UDC 543.2

Analisis of interaction of mm-range electromagnetic field and human skin by methods of nonlinear physical acoustics. / Y.V.Chovnjuk, A.V.Ivanovskaya, T.N. Ovsyannikova, B.F. Rud'ko // Radioelektronika i informatika. 2004. № 2. P. 149-154.

The paper considers the processes of interaction between the electromagnetic fields with excitable electromagnetic waves of super high frequency range (with carrying frequency $f > 60$ GHz, $l = 5$ mm) and the living matter in the region of biologically active points used, as rule, by the microwave resonance therapy method. We used the nations and physical applied in acoustics waves and electromagnetic waves with the bioobjects.

Fig. 2. Ref.: 8 items.

UDC 628.83

Problem of building the cartographic information system / V.S.Esilevsky, V.N.Kuznecov, .N.L.Kamenyuk // Radioelektronika i informatika. 2004. № 2. P.155-159.

In work are considered the description of architecture and receiving the decision of main problems of building geoinformation systems, intended for automation of work with cartographic information. In work are considered methods and algorithms for work with unlimited raster and vector images.

UDC 658.5

Modeling of an ecological condition of water object by the decision of the equation of whirligig diffusion / I.S. Muravyova, S.I. Chaynikov // Radioelektronika i informatika. 2004. № 2. P.160-162.

The method of account multiple of basic dilution is considered with modeling influence of dumps on quality of water in reservoirs. The numerical modeling is realized by the decision of the equation of whirligig diffusion. The estimation of influence of an atomic power station on a condition of water object is carried out.

Fig. 3. Ref.: 2 items.

UDC 504. 05

Mesods and means managerment of ecological security in condition arises of ecstremal situation in natural haditat /V.M. Lagutin // Radioelektronika i informatika. 2004. № 2. P.163-168.

The conception of information and analytical system construction is elaborated. The letter embraces environment danger problems in extreme situations in nature habitat to forecast and manage environment security. Anomalies in meteorological factors (pressure, invers situation and toxic ozone), gravitation dynamics and etc. are analyzed. Fliccer law in spectrum of magnetic field variations is experimentally established. Anomalies in the period of the minimum sun activity are of great danger. Complex approach in study of variations of stratospheric ozone and dangerous anomalies of UV sun eruption is developed.

Ref.: 4 items.