

ABSTRACTS
Radioelektronika i informatika. 2004. № 3

UDC 735.361.22

Physical model of scattering of a laser radiation from statistically rough metal surfaces with large-scale heterogeneities / V.N. Shmarov // Radioelektronika i informatika. 2004. № 3. P. 4-9.

The approximate physical model of a reflection of an optical radiation from statistically rough surfaces is constructed, for which the parameters of a grain considerably exceed a wavelength of a sounding radiation, and the reflection coefficient is close to unit. The indicatrix of ambient light is investigated for conditions of a distant zone disregarding of boundary effects for desired supposition, that on a statistically rough surface the effects of volumetric scattering do not happen.

Fig. 10. Ref.: 18 items.

UDC 621.372.8

Waveguide-dielectric resonators of complex form. Analytical calculation / Н.И. Слипченко // Radioelektronika i informatika. 2004. № 3. P. 9-13.

The analytical calculation of waveguide-dielectric resonators of two phylums is given. For each of them the systems of linear algebraic equations of common kind are obtained from which reflection and transfer coefficients can be obtain.

Fig. 2. Ref.: 9 items.

UDC 517.958:532/534

Improvement in the theoretical models representing scattered waves in heterogeneous moving medium / A. Yu. Panchenko // Radioelektronika i informatika. 2004. № 3. P. 14-20.

The model of the scattered field elementary source, which makes it possible to derive the resulting expressions with a relative ease and to describe the field at close range from the heterogeneity reasonably fair, is offered. Comparative calculations of the fields scattered by the spherical heterogeneities are presented. Singularities of the fields scattered by thermal and dynamic heterogeneities are considered, the known directions are analyzed and the possible directions of developing the approaches to the mathematical description of the scattered field in weakly heterogeneous turbulent media are considered.

Fig. 6. Ref.: 9 items.

UDC 658. 51. 011.56

Vehicle form coefficient determination Method of complicated configuration / Sinotin A.M. // Radioelektronika i informatika. 2004. № 3. P. 20-22.

Are Brought calculation dependences for determination of vehicle form coefficient of complicated configuration. Is Given appraisal of possible method errors and methods of their possible reduction.

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

UDC 535.41 : 621.396

The substantiation of the statistical properties for correlation functional of the incoherent scatter signal / A.S. Mazmanishvili, V.A. Puliaiev // Radioelektronika i informatika. 2004. № 3. P. 23-27.

The description of a processing logic of the ionospheric data received by a method of the incoherent scatter radio wave in SHF range is adduced. On the basis of the analysis of Markovian processes the obtained analytical expressions for a characteristic function of a signal. With their help for the first time obtained elementary probability law of random values of ordinates of the ISS correlation functional. The obtained information allows to set a confidence coefficient of mathematical manipulations and to minimize calculations errors

Fig. 7. Ref.: 7 items.

UDC 517.9

Impulsive differential algebraic equations in mathematical models of electrical networks / L.A. Vlasenko // Radioelektronika i informatika. 2004. № 3. P. 27-31.

Electrical networks are simulated by impulsive differential algebraic equations (IDAEs). Existence and uniqueness theorems for IDAEs are obtained. Results are applied to calculate currents and tensions of impulsive electrical networks.

Fig. 3. Ref.: 13 items.

UDC 621.385.64

The comparison of numeric solution Poisson equation in Cartesian and cylindrical coordinates systems / G.I. Churyumov, Yu.L. Starchevskiy, O.G. Lebedev, N.I. Novikov // Radioelektronika i informatika. 2004. № 3. P. 32-37.

In this work the sharp of numeric solution Poisson equation in Cartesian and cylindrical coordinates estimates. The Three dimensional numeric solutions of potential distribution in work space of magnetron gun confirm analytic conclusions concerned to the sharp are shown. The optimization way of calculation the exist mathematics models is given.

Fig. 10. Ref.: 5 items.

UDC 621.375.9

Composite oscillations of simple systems with S-type current-voltage characteristics in performance / P.P.Loshickiy, N.A. Nikolov, Al Singlavi Sh. // Radioelektronika i informatika. 2004. № 3. P. 37-41.

This work deals with stochasticity transformers, where electric devices with S-type current-voltage characteristics act as active elements. These are known to possess some sluggishness while switching. It was shown that in stochasticity transformers built on avalanche diode, the mechanism of transition to stochastic oscillations is connected with non-linear temperature dependence of diode differential mount. In stochasticity transformers built on neon tube or dinistor, the mechanism of transition to stochasticity is due to breakdown voltage fluctuations. However, these two mechanisms of transition to stochastic oscillations obey the same regularities.

Fig. 6. Ref.: 6 items.

UDC 517.958:541.14

Methods of definition of rigidity and indispensable accuracy of a numerical integration of models of homogeneous chemical processes / A.V. Klymenko // Radioelektronika i informatika. 2004. № 3. P. 42-47.

Two algorithms for the determination of the required accuracy of numerical integration of the systems of ordinary differential equations, which represent mathematical models of homogeneous chemical processes, and for the definition of their stiffness are developed. The determination of the necessary integration accuracy is justified by the proof of the corresponding theorem.

Fig. 2. Ref.: 11 items.

UDC 621.382.323

Silicon Schottky barrier FET with submicron scales. Part 1. Mathematical model / S.A. Zuev, V.V. Starostenko, V. Yu. Tereschenko, G.I. Churyumov, A.A. Shadrin // Radioelektronika i informatika. 2004. № 3. P. 47-53.

A mathematical model of silicon Schottky barrier FET with submicron scales is developed. The model allows to calculate the integral and differential characteristics taking into account the transport and localization processes as well as an investigation of different operating modes. The simulation carries out by PIC method in kinematical approximation.

Fig. 3. Ref.: 14 items.

UDC 519.713

Investigation of negative dispersion in chirping mirrors of arbitrary order / V.V. Lysak, I.A. Sukhoivanov, S.O. Yakushev, A.V. Shulika // Radioelektronika i informatika. 2004. № 3. P. 54-59.

We present numerical calculation of N order-chirping mirrors with chirp in the layer thicknesses and refractive indexes using the transfer matrix method. The combination for parameters of layers for minimum dispersion is found. Analytical form of the transfer matrix for the structure with this configuration is derived.

Fig. 6 Ref.: 7 items.

UDC 621.391, 681.327.12

Recognition of phoneme in speeches / I.N. Presnjakov, S.V. Omelchenko // Radioelektronika i informatika. 2004. № 3. P. 59-63.

Considered row of recognition algorithms phonemes of speech. Bowed comparative row analysis out of recognition algorithms with use of reverberation coefficients and sections areas relation logarithm of vocal high road.

Tab. 2. Fig. 3. Ref.: 7 items.

UDC 621.396.96

Technique of distribution of means at a nonadditive parameter of efficiency and coupled systems of limitations / A.I. Kovalenko, C.M. Piskunov, V.M. Reshetnik, I.F. Tsapkov // Radioelektronika i informatika. 2004. № 3. P. 64-66.

In the article the technique of distribution of different resources expanding usage area of a maximum unit method is considered, with a no additive parameter of efficiency, by coupled systems of non-linear and linear limitations on integer parameters of the distribution plan.

Ref.: 4 items.

UDC 004.78

The analysis and synthesis problems of complex objects holonic control systems / I.V. Shostak, A.S. Topal, A.N. Ustinova // Radioelektronika i informatika. 2004. № 3. P. 66-69.

In this article the analysis and synthesis problems of complex objects holonic control systems are discussed on example of domestic manufacturing enterprises. The list of theoretical and applied task concerning building of intellectual manufacturing systems with holonic structure are given. The fragments of ontologies of manufacturing control processes and production section functioning as conceptual part of holonic structure are shown. This structure can be implemented as multiagent system.

Ref.: 8 items.

UDC 618.514.01:517.977.5

The task of dynamic synthesis with vector control / A.E. Radievski // Radioelektronika i informatika. 2004. № 3. P. 70-74.

Within the procedure of analytical construction of optimal regulators we consider the problem of dynamic synthesis for object with with vector control and additive perturbation actions.

Ref.: 10 items.

UDC 621.396.96

Bases of construction neuronizing of recognizing systems / V.M. Solovyev // Radioelektronika i informatika. 2004. № 3. P. 75-78.

Clause is devoted to a urgent theme - construction neuronizing of recognizing systems (NRN), tasks, focused on the decision, of diagnosing of radioelectronic engineering. In clause the new method of construction NRN, based on formal synthesis neuronizing of a network is offered.

UDC 519.713:681.326

Design of compositional microprogram control units with maximal encoding of inputs / Alexander A. Barkalov, Remigiusz Wiśniowski // Radioelektronika i informatika. 2004. № 3. P.

The method of optimization of logic circuit of compositional microprogram control unit with sharing of the codes is proposed. Method is based on the transformation of the pairs (code of operational linear chain, maximal code of input) in the addresses of the input of operational linear chain. The method of design and example of its application is proposed.

Tab. 4. Fig. 3. Ref.: 4 items.

UDC 519.713:681.326

Synthesis of mealy FSM with transformation of system of microoperations in excitation functions / A. Barkalov, A. Bukowiec // Radioelektronika i informatika. 2004. № 3. P. 82-85.

The method of hardware optimization of Mealy FSM is proposed. Method is based on the representation of the system of excitation functions terms as the pairs of microinstruction in the initial state, microinstruction in the state of transaction and unitary encoding of microoperations. An example of application of proposed method is given.

Tab. 4. Fig.4. Ref.: 6 items.

UDC 519.713:681.326

Test quality increasing with Boundary Scan technology/ V.I. Hahanov, M.A.Kaminska, A.A. Yegorov, I.A. Pobizhenko // Radioelektronika i informatika. 2004. № 3. P. 85-90/

Test quality improving method of during digital circuit simulation is proposed. Method is founded on IEEE 1149.1 Boundary Scan technology and testability analysis for implementation additional observation lines (variables) which is calculated with CAMELOT method.

Tab. 2. Fig. 10. Ref.: 6 items.

UDC 519.713.4

Adaptive test generation from a non-deterministic FSM / M.Yu. Dorofeeva, A.F. Petrenko, Vetrova M.V. Petrenko, N.V. Yevtushenko // Radioelektronika i informatika. 2004. № 3. P.

In the paper, we propose a test derivation method from a nondeterministic specification Finite State Machine (FSM). Each Implementation Under Test (IUT) is assumed to be a deterministic FSM over the same input and output alphabets. Moreover, a test suite is adaptive, i.e., the next test case depends on the response of an IUT to the previous test cases.

Fig. 7. Ref.: 6 items.

UDC 517.9

The analysis of the dynamics of the numbers of competing species with periodically changing characteristics of the processes / V.A.Dikarev, I.G.Yalovega // Radioelektronika i informatika. 2004. № 3. P. 96-98.

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 with the characteristics being periodically changed has been carried out.

Fig. 7. Ref.: 3 items.

UDC 004.932.2

Development of model of placing of images in databases / R.T. Gazimov // Radioelektronika i informatika. 2004. № 3. P. 99-103.

The formal raising of task of development of model of placing of images in databases is examined in the article. Within the framework of decision of this task, image is selected as an object of experience, its entrance, intermediate and output variables are determined. On the basis of some from these variables, it is suggested to form the model of presentation of image as a cortege for storage of him in databases. After formalization of entrance and intermediate variables the physical raising of task of search of images in the databases is brought on the basis of the offered model.

Tab. 1. Fig. 4. Ref.: 7 items.

UDC 681.31

Process analysis and data-processing models in automated systems / V.Ye. Kucherenko // Radioelektronika i informatika. 2004. № 3. P. 103-107.

The models of data and knowledge analysis and the models of decision making on basis of modified E-nets with controlled structure are examined. The interpretation of model components, allowability of model ties are offered. The recommendations of their practical usage are proposed.

Fig. 1. Ref.: 9 items.

UDC 621.391:51.142

The numerically - analytical substantiation of a method of reproducing transformations / S.V. Chumachenko // Radioelektronika i informatika. 2004. № 3. P. 107-109.

The method of reproducing transformations is developed. The numerical substantiation of the proposed approach is given on an example two most used in engineering and mathematical calculations of functions - Bessel and normal distribution.

Tab. 2. Ref.: 14 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. № 3. P.110-115.

The paper considers the processes of interaction between the electromagnetic fields with excitable electromagnetic waves of super high frequency range (with carrying frequency) 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. 3. Ref.: 6 items.

UDC 539

Materials and Properties for Forming Information Biological Structures / A.A. Novikov, L.V. Novikova, O.V. Voronenko, O.M. Korolenko // Radioelektronika i informatika. 2004. № 3. P. 115-117.

Dependency of time of irradiation is installed on importanced sent to samples of flow to heats. Studied possibility of use numerous flow for shaping determined beam and heat floors for the reason creation on its base of therapeutic applicator.

Fig. 4. Ref.: 2 items.

UDC 621.391

The spectral component number optimization criteria for Karhunen-Loeve transformation when calculating the differential probability of correct recognition / B.O. Kapustiy, B.P. Rusyn, V.A. Tayanov // Radioelektronika i informatika. 2004. № 3. P. 118-121.

The algorithm to determine the minimal number of spectral components of the Karhunen-Loeve transformation ensuring the admissible value of the probability of existence of the correct object in the confidence interval boundary when solving the clustering object tasks has been developed. The detecting procedures of correct objects in the confidence interval boundary, when this object takes first or other positions is offered. The expression for the evaluation of the energy economy degree has been built. The payoff time calculation on clustering objects has been evaluated. The conclusion about the strategy to guarantee the admissible level of the confidence probability has been made.

Tab. 2. Ref.: 4 items.

UDC 621.383.8:621.396.96:621.396.6

Informational estimation and extraction of color images' fragments / V.G.Ivanyuk, O.V.Kapshiy, R.Ya.Kosarevych, G.Lau // Radioelektronika i informatika. 2004. № 3. P. 122-125.

Expressions for analyzing and segmentation of images are derived from formula of information quantity of color images. Two algorithms for color images processing are proposed basing on these expressions. These algorithms are used in developed software that carried out analysis of images of materials microstructure.

Ref.: 3 items.

UDC 519.863.001.63

Adaptive process engineering of the fuzzy analysis of real estate market dynamics / V.A. Tazetdinov // Radioelektronika i informatika. 2004. № 3. P. 126-129.

The definition of plant real estate evaluation problem according to a process engineering adaptive to conditions of an exterior medium is considered. The methods of structural and parametrical identification of value assotiation of habitation from the interior and exterior factors are offered.

Fig. 1. Ref.: 6 items.