

**ABSTRACTS**  
**Radioelektronika i informatika. 2007. № 2**

---

UDC 621.385.6

**Single-mode resonator measuring converters in a general theory microwave diagnostics of materials** / Yu. E. Gordienko, Yu. I. Gud, E. Yu. Koriagina, N. I. Slipchenko // Radioelektronika i informatika. 2007. № 2. P.4-8.

A general theory of ideally single-mode resonator measuring converters for microwave diagnostics of semiconductors and dielectrics is grounded. The fundamental signals of measuring information are described. Their dependence on the inclusion degree of in the field of measuring converters is explored.

Fig. 6. Ref.: 11 items.

---

UDC 681.586

**Microstrip measuring converters for non-destructive microelectronic technics materials microwave diagnostics** / B.G. Borodin, V.V. Ananyin // Radioelektronika i informatika. 2007. № 2. P.9-13.

Possibility of application resonant measuring converters, which based on various types of microstrip resonators, for diagnostics of semiconductors and dielectric substrate was research. Circular and rectangular microstrip resonators have been chosen for examination . Dependence of resonance frequency of microstrip resonators to resistivity, thickness and permittivity of probed sample have been built.

Fig. 10. Ref.: 8 items.

---

UDC 621.396

**Application of correction of a constant of the incoherent scatter radar for the observed data refinement of an electron concentration of ionospheric plasma** / V. O. Pulyayev, V.M. Jysenko // Radioelektronika i informatika. 2007. № 2. P.13-17.

In the article the algorithmic procedures intended for minimization of calculation errors to an electron concentration of the ionospheric environment are offered. Designed rules, according to which at the moment of instability of radio-receiving channel condition of the incoherent scatter radar it is possible to update he constant, using the information of space noise power.

Fig. 5. Ref.: 7 items.

---

UDC 519.8:621.37

**Application and adaptation of method of polynomial maximization for estimation of radio signal parameters on a background of kurtosis of 1-st type 1-st kind noise for unequal distributed sample values**/ V.V.Palagin, D.V. Kulykov // Radioelektronika i informatika. 2007. № 2. P.17-23.

The paper is devoted to application of method of polynomial maximization, which is based on a moment-cumulant description of random variables for finding estimations of radio signal informative parameters, which are received on a background Non-Gaussian noise for unequal distributed sample values. It is shown that nonlinear processing and taking into account non-Gaussian distribution of random variables, lets decrease variance of informative parameters estimations.

Fig. 1. Ref.: 5 items.

---

---

UDC 517.862

**Multi-frequency generation in microstrip lines with Gunn diodes** / L.V. Yurchenko and V.B. Yurchenko // Radioelektronika i informatika. 2007. № 2. P.24-29.

Self-excitation of a chain of Gunn diodes connected by transmission lines and radiating waves into an infinite open line is simulated. Simulations are compared with analytical treatment of a single-diode circuit with a stub.

Fig. 4. Ref.:12 items..

---

---

UDC 621.385.6

**Influence of dielectric layer properties on spectral and resonance descriptions of the open resonators** / G.S. Vorobjov, M.V. Petrovsky, V.O. Zhurba // Radioelektronika i informatika. 2007. № 2. P.30-34.

In work on the basis of comparison of theoretical calculations, being based on the vector and scalar theories of the spheroidal opened resonator (OR) and experimental researches the features of OR are certain with heterogeneity as the dielectric prism (DP) placed in the volume of resonator. Experimentally and conformity to the law of influencing of parameters of DP (thickness and values of dielectric permeability) is in theory set, on the size of change of resonance frequency of basic type of oscillation.

Fig. 5. Ref.: 13 items.

---

---

УДК 621.385.624

**Effect of thermal processes on cathode and anode onto frequency characteristics of continuous magnetrons/** G.I. Churyumov, T.I. Frolova, R.V. Basrawi, K.V. Sivokon' // Radioelektronika i informatika. 2007. № 2. P. 34-44.

The theoretical and experimental outcomes of effect of thermal processes on the cathode and anode of a continuous X - range magnetron on energy and frequency characteristics in different modes of operation are considered. A new physical outcome connected with decrease more than two order of frequency deviation in magnetrons on changing temperature operating mode of an oxide-coated cathode is obtained. The matching of outcomes of simulation with experiment has shown that the decrease of frequency deviation in the magnetrons is connected with decreasing fluctuations of a thermionic emission current emitting with cathode.

Fig. 8. Ref. 30 items.

---

---

УДК 573.86

**Dynamics of electro-thermal processes in the dielectric structures of microcircuits at influence of the electromagnetic fields** / V.V. Starostenko, M.P. Gribsky, D.O. Poletaev, Ye.P. Taran, G.I. Churyumov // Radioelectronics and informatics. 2007. № 2. C. 45-49.

The numeral model of electro-thermal processes advancement in the conducting and dielectric microstructures elements of microcircuits at influence of the microwaves taking into account the thermal losses in dielectric structures is considered. Expressions for specific power of thermal losses in the dielectric structures of microcircuits are described. The dynamics of change of the temperature field in crystal of microcircuit in view of nonuniform heating of metallization and dielectric areas.

Fig. 8. Ref. 10 items.

---

---

UDC 517.9+532.5

**About one method mathematical modeling of viscous flow in bounded simply connected 2D-domains** / A.D. Tevjashev, Gibkina N.V., M.V. Sidorov // Radioelektronika i informatika. 2007. № 2. P.50-57.

Consider the time-independent incompressible viscous flow in simply connected 2D-domains. According to the R-function method and method of successive approximations numerical solution was build.

Tab. 1. Fig.2. Ref.: 23 items.

---

---

UDC 658.012

**Current regression analysis with a ultrashort sliding window** / A.V. Yakunin // Radioelektronika i informatika. 2007. № 2. P.57-60.

The problem of parametrical identification of linear model in the frames of current regression analysis on the basis of MLS is considered. Modifying of recurrent algorithm of estimation is under construction in simultaneous replacement of the out-of-date observation by new in conditions of a matrix of supervision of an incomplete rank. In order to receive the calculation formulas, algebraic transformations of block matrixes and procedures of factorization of matrixes are applied. To devised numerically steady factorization scheme of recurrent estimation of vector of parameters and covariational matrix is supplemented the procedure of recalculation of the length discrepancy.

Ref.: 9 items.

---

---

UDC 004.032.26

**Detection of the engine surge by the self-organizing Kohonen's map** // V.I. Dubrovyn, T.V. Keeprich // Radioelektronika i informatika. 2007. № 2. P.60-62.

Detection of the gas-turbine engine surge using the self-organizing Kohonen's map (SOM) is considered at the stage of block test. Following has been made as consequences of adaptation SOM for this problem. Process trajectory of operating point during 83 mcs was constructed. Dependences between investigated model parameters were set. Components planes of process parameters were compared in forbidden region, so maps were visualized. The research of finding non-staff situation was lead by the mean-square map error.

Fig. 4. Ref.: 7 items.

---

---

UDC 517.928.4

**Qualitative and quantitative analysis of the mathematical model of production of the mixed culture with interaction of commensalisms** / Yalovega I.G. // Radioelektronika i informatika. 2007. № 2. P.62-68.

The mathematical model describing the production of the mixed culture, consisting of two species of yeast, competing for the unique substrate in the throughput system is examined. Possible stationary conditions of the system are found and examined for stability. Limitations of the growth characteristics and entering flows of the substrate and product are received.

Tab. 1. Fig. 2. Ref.: 10 items.

---

---

UDC 621.7.073 - 52

**The methods of taking technical decisions at planning of the technical rigging analyzes** / Nevlyudov I.Sh., Vtorov E.P., Sotnik S.V. // Radioelektronika i informatika. 2007. № 2. P.69-73.

In this article the question of the technological rigging is discussed. The methods of taking technical decisions at planning of the technical rigging are analyzed. Forming of technical decision algorithm is the result, the mathematical model of this process is

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

---

---

UDC 621.3.049:681.3

**Topological routing of PCB nets** / E.I. Litvinova, S.V. Garkushin // Radioelektronika i informatika. 2007. № 2. P.73-79.

Topological PCB model and proposed conditions of appearance and removal of conflicts enable to realize topological and geometrical routing simultaneously. It will permit to decrease route length, via quantity and to improve layout quality.

Fig. 8. Ref.: 3 items.

---

---

УДК 004.4'24

**The comparative analysis of means of development and debugging of the software for various types of microcontrollers** / K.V. Ostrovskiy // Radioelektronika i informatika. 2007 № 2. P. 79-85.

Results of the comparative analysis of means of development and debugging of the software for various types of microcontrollers are offered. For the analysis software packages for all most widespread families of microcontrollers undertake.

Tab. 1. Ref.: 14 items.

---

---

UDC 519.713

**Analysis to efficiency of the methods of the compression of the scene in accordance with different quality criteria** / V.V. Lukin, N.N. Ponomarenko, S.S. Krivenko // Radioelektronika i informatika. 2007. № 2. P. 85-90.

In the last 2 us were designed 2 new criterions - PSNR-HVS and PSNR-HVS-M. As a result earlier conducted experiment was shown that exists it is enough big amount of the types of the distortion, under which broadly used criteria (the metrics), for instance, UQI and SIM, behave inadequate. PSNR-HVS and, particularly, PSNR-HVS-M for considered exhibits better correspond to the nut-visual perception. The New metrics PSNR-HVS-M allows also to take into consideration effect of the mask of the frequencies. In work was also conducted analysis to efficiency of the compression of the scenes at standard JPEG and JPEG2000.

Tab. 6. Fig. 3. Ref.: 16 items.

---

---

UDC 621.391

**Динамическое кодирование трансформант изображений в двухуровневом полиадическом пространстве** / V.V. Barannik, I.V. Hahanova, V.V. Yeliseev // Radioelektronika i informatika. 2007. № 2. С. 90-96.

In this article the method of compression of images on the basis of compact presentation is created component of transformant discrete waves transformations (dwt). Forming of code presentation of transformant is conducted in the dynamic polyadical system. In this case is achieved the additional increase of degree of compression as a result of reduction of volumes of official information.

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

---

---

UDC 681.3

**Hardware Methods to Increase Efficiency of Algorithms for Distributed Logic Simulation**/ Y.V.Ladyzhensky, G.A. Teslenko // Radioelektronika i informatika. 2007. N 2. P. 97-99.

The object of research is methods of hardware implementation of synchronization algorithms for a distributed logical simulation. The goal of research is a reduction of the time verification of digital devices, to provide a reduction of a design costs. Existed hardware acceleration methods of logic simulation, drawbacks and advantages, are discussed. A structural implementation of this algorithm is offered. It is a specialized processor for a distributed logical simulation. A structural scheme of a specialized processor is developed A special software architecture is shown for operating of the simulation system. Existed software simulation systems for distributed logic simulation can be extended using the offered method.

Fig. 3. Ref.: 6 items.

---

---

UDC 62.19:519.7

**Evolutionary synthesis of complex models and processes** / S. Subbotin, A. Oleynik // Radioelektronika i informatika. 2007. N 2. P. 99-104.

Methods of evolutionary search for an informative feature selection and neural network model synthesis are developed. The software which realizes the suggested methods is created. With the help of the offered methods and the developed software the problem of model synthesis for vehicles classification is solved.

Tab. 1. Ref.: 8 items.

---

---

UDC 681.326.7

**Two-multiple errors and method of their exposure by a nonlinear signature analyzer/** Rysovaniy A.N. //

Radioelektronika i informatika. 2007. № 2. P. 104-107.

Considered method of exposure of double errors by a nonlinear signature analyzer in the eventual field of GF(3). The resulted mathematical expressions can in future be used for localization of such class of errors.

Fig. 1. Ref.: 11 items.

---

---

UDC 519.7

**Boolean logic matrix as formulas of algebra of binary predicates** /A. Gvozdinski, N. Yakimova, V. Gubin //Radioelektronika i informatika. 2007. № 2. P. 108-110.

In this article is shown possibility of representation Boolean logic matrixes as binary predicates. Such representation considerably simplifies an entry of matrixes as enables to note them in an analytical aspect as formulas. Such entry facilitates their handing on the computer as such entry requires a smaller amount of memory.

Tab. 5. Refs.: 4 items.

---

---

УДК 528.811 (1-021)

**The influence of low intensity wide-band Microwaves on seeds and corinebacterium** /O.I.Kovalenko, F.V.Kivva, S.V.Kalinichenko// Radioelektronika i informatika. 2007. № 2. P. 111-120.

Possibilities of modification of biological activity of the explored objects and difference of biological response depending on their initial state are considered. The features of the influence EMF in the discrete band of microwave and by the broadband noise signals are found out, and also dependence of efficiency of influence from the general power loading. Possibility is shown partly to restore the lost properties BO by means EMF.

Tab. 3. Fig. 5. Ref.: 22 items.

---

---

UDC 004.932.2

**Controlling cracks volume changes using jpeg compressed images** / V.Ivanyuk, O.Kapshiy, V.Korniy, B.Rusyn // Radioelektronika i informatika. 2007. N 2. P.121-128.

A mathematical model of images based on information theory, namely on principles of image information quantity determination, is proposed. The model use for description of compressed images is shown. Algorithms for selecting and analysing of cracks on materials using their images is proposed. The algorithms use developed model and realize principles of differential approach. Given teoretical expressions describe algorithms that can be used for analyzing images of materials with cracks without decompressing.

Fig. 2. Ref.: 14 items.

---

---

UDC 004.413.4:004/942:007.5:65.011.3:681.518

**An analysis of qualitative and quantitative descriptions of risks evaluation of informative safety in the systems of electronic commerce** / I.V.Rishnyak, V.A. Vysotska // Radioelectronics and informatics. 2007. N 2. P.128-132.

The information which people exchanged through the informative systems is the subject of security. The practical value of informative security provision consists in the development of the model of informative security system's presentation, which on the basis of the scientific-methodical apparatus, would allow solving the tasks of creation, use and evaluation of information security systems' efficiency for the designed and existent informative systems.

Fig. 6. Ref.: 8 items.

---

---

UDC 519.85

**Solving of the one combinatorial packing problem under conditions of uncertain data which are described by fuzzy numbers** / A.A. Roskladka, O.O. Yemets' // Radioelektronika i informatika. 2007. N 2. P. 132-141.

The one problem of Euclidean combinatorial optimization under conditions of uncertainty is considered. Solving methods are formulated. Their estimations are given.

Fig. 7. Ref.: 15 items.

---

---

UDK 519.21

**Process of formation of powder weights in volume of the active liquid** / A.V. Vovk // Radioelektronika i informatika/ 2007. № 2. P. 141-144.

Process of processing of the powder weights which are taking place in volume of an active mix is considered. The mix is processed by pulses which power characteristics change with change of time. The analysis of system of the equations describing this process is made. Connections between disperse characteristics of powder weights and ways of their processing are established.

Tab. 2. Fig. 3. Ref.: 6 items.

---

---

UDC 004.942:621.6:622.691

**Mathematical model and method of non-stationary mode in linear pipeline portion of gas-main pipeline**/ A.D. Tevjashev, I.G. Gusarova, A.V. Kaminska // Radioelektronika i informatika. 2007. N 2. P. 144-150.

In the article is taken comparative analysis of two implicit finite-difference schemes in modeling of non-stationary nonisothermic modes of natural gas transport in multistrand line sections gas-main pipeline. The formulated problem of calculation non-stationary nonisothermic modes of natural gas transport in multistrand line sections gas-main pipeline and presented the algorithms their calculation. For choice optimal finite-difference scheme take the calculation of model problem by following each of the templates of computational grids, both the pipeline section and linear section of multistrand line sections gas-main pipeline.

Tab. 1. Fig. 6. Ref.: 2 items.

---

---

UDC 004.5; 004.7; 004.8

**Realization of decision-making subsystem for prevention and elimination of natural emergencies impacts** /A.Ya.Kuzemin // Radioelektronika i informatika. 2007. N 2. P. 151-154.

The management object information space for realization of the decision-making subsystem for prevention and elimination of the natural emergencies impacts based on the reuse of the closely related similar solutions is offered.

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