

## ABSTRACTS

### Radioelektronika i informatika. 2004. № 4

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UDC 517.958:535.4

**Estimation of the probe packet fluctuation in radio acoustic sounding method** / A.Yu. Panchenko // Radioelektronika i informatika. 2004. № 4. P.4-9.

Results of analytical investigation and numerical simulation demonstrating the relation between the parameters of the signal being received and acoustic packet parameter variations are given. The main factors defining turbulence parameters, which can be quantitatively estimated with the radio acoustic sounding method, are singled out. The estimation of requirements to the equipment of the radio acoustic sounding system is cited.

Fig. 8. Ref.: 8 items.

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UDC 621.396.2.: 621.316.2

**Spectral estimation of non-Gaussian signal with cumulant functions in presence of Gaussian white noise** / V.A. Tykhonov, K.V. Ntrebenko // Radioelektronika i informatika. 2004. № 4. P. 10-14.

The difference equations of the generalized cumulant autoregressive predictive model are given in the article. Properties of cumulant and moment functions are described. The equations for the fourth order of the generalized cumulant autoregressive predictive model are obtained. Precision analysis of non-Gaussian process spectral estimation in presence of Gaussian white noise is realized.

Tab. 1. Fig. 3. Ref.: 12 items.

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UDC 621.372.832

**Energy characteristics of multi-element resonator-slot radiators** / V.A. Katrich // Radioelektronika i informatika. 2004. № 4. P.14-17.

The problem of magnetic current distribution in the resonator-slot structure have been solved by the magnetomotive forces method. Such structure constitutes the coupling slots situated in the common wall of infinite rectangular waveguide and rectangular resonator in the opposite wall of which was cut radiating slot. The numerical calculation was carried out and energy characteristics plots were represented.

Fig. 5. Ref.: 12 items.

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УДК 621.385.69

**The eigenvalue equation and the quality of the cylindrical cavity with two independent elements of tuner** / N.I. Slipchenko // Radioelektronika i informatika. 2004. № 4. P.14-17.

The boundary electrodynamics problem for the Maxwell's equations in the cavity with the internal limiting surface of the complex form was considered. The partial regions of the cavity can contain the stationary dielectrics. As a result of solving the eigenvalue equation has been obtained. The formula for the Q-factor of the cavity was resulted.

Fig. 1. Ref.: 17 items.

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UDC 517.958:541.14

**KinFitSim (Version 2.1) – a Powerful Tool for Kinetic Simulation of Any Reaction Mechanism and Fitting of Any Number of Pairs of Theoretical and Experimental Data Sets** / I.B. Svir, O.V. Klymenko, A.I. Oleinick, M.S. Platz // Radioelektronika i informatika. 2004. N.4. P.22–25.

The new version of KinFitSim (2.1) presented in the article has many advantages in comparison with previous versions of KinFitSim and other programs that are currently available. The principal advantages are the *automatic simulation regime* in the Kinetic Simulator, which allows simplification of the kinetic simulation for users of any mathematical skill, and a possibility to fit several pairs of theoretical and experimental curves simultaneously in the Fitting Simulator.

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

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UDC 543.083/084

**Numerical-analytical model of effective dielectric permeability on the MICROWAVE of structurally non-uniform objects** / Yu.Ye. Gordiyenko, V.P. Gerasimov, Hammoud Fadi // Radioelektronika i informatika. 2004. № 4. P. 26-31.

The opportunity of construction of model of effective dielectric permeability real fine-dyspersated structures is considered on the basis of their representations layer non-uniform structure in a field of longitudinal electric fluctuations of the microwave of the resonator of model layer the non-uniform environment. Numerical researches have shown that an imaginary part of effective dielectric permeability, as against real, remains invariant in some area of change of values of density dielectric permeability's a component of environment.

Fig. 8. Ref.: 15 items.

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UDC 621.382.323

**Silicon Schottky barrier FET with submicron scales. Part 2. Modelling results** / S.A. Zuev, V.V. Starostenko, V. Yu. Tereschenko, G.I. Churyumov, A.A. Shadrin // Radioelektronika i informatika. 2004. № 3. P. 31-33.

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.

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UDC 621.396

**Problems of efficiency of xDSL networks** / A.A. Astrakhantsev, A.V. Omelchenko, I.N. Presnyakov // Radioelektronika i informatika. 2004. № 4. P.34-38.

The analysis of the characteristics of algorithms of signal processing of technologies xDSL is spent and the diagram describing each of these algorithms on power and frequency efficiency is constructed. The variant of implementation of one of perspective, but closed algorithms is offered.

Tab. 3. Fig.11. Ref.: 3 items.

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УДК 681.30001.57

**Conversion of difference equations of linear digital filters of the parallel shape of implementation to Whole-Number and Whole-Counting a view** / O.I. Filippenko // Radioelektronika i informatika. 2004. № 4. P.39-45.

The method of conversion of the linear difference equations describing linear digital filters of the parallel shape of realization, to the Whole-Number (WN) and the Whole-Counting (WC) a view is offered to an discussion. Theoretical terminating connections are confirmed by examples.

Fig. 6. Ref. 9 items.

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UDC 681.51:621.9.048

**Automation of moving of purveyances at forming of functional layers** / G.V. Kanashevich, M.P. Rood, V.A. Vashchenko, V.P. Boyko, M.O. Bondarenko // Radioelektronika i informatika. 2004. № 4. P.46-49.

Actuality and importance of automation of management of moving of purveyances at forming of smooth surfaces and functional layers for optoelectronics and integral optics in optical materials is grounded by an electron-beam method, and the developed automatic system is described.

Fig. 3. Ref.: 12 items.

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UDC 004.032.26

**Dynamic change of training methods of artificial neural networks.** / D.O. Kolesnikov, L.I. Konstantinova // Radioelektronika i informatika. 2004. № 4. P.50-51.

The speed increasing of neural networks training has big meaning for the theory and practice of neural networks. In the article the computing experiment is represented which results shows that in some cases with the help of dynamic change of training methods it is possible to achieve increasing in the speed of neural networks training. The common scheme of such training is given.

Fig. 1. Ref.: 2 items.

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UDC 681.5

**Situation classifiers power object control at condition understate** / A. D. Polonsky // Radioelektronika i informatika. 2004. № 4. P.52-55.

It is suggested the method for analytic designing and electrical synthesis of situation classifiers with self-instruction of identification of relations among states of control objects under conditions of indefiniteness.

Tab. 1. Fig. 8. Ref.: 7 items.

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UDC 519.21

**The random graph evolution in small world's system** / V.A. Shershen // Radioelektronika i informatika. 2004. № 4. P.55-57.

There were existing methods of the random graphs investigation considered. The task of finding probability of existence path between two random chosen vertexes has been decided for different condition of the graph evolution.

Ref.: 4 items.

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UDC 517.9+519.633

**Mathematical and computer modeling of some filtration currents** / M.V. Sidorov, A.V. Storozhenko // Radioelektronika i informatika. 2004. № 4. P. 58-61.

The flat filtration current under the hydraulic structure is considered. For the decision of this task, the approached method based on methods of R-functions and Ritz is offered. The approached decision for several areas is received.

Fig. 4. Ref.: 5 items.

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UDC 681.32

**Testing of Re-synthesized Cores** / Eduardas Bareisa, Vacius Jusas, Kestutis Motiejunas, Rimantas Seinauskas // Radioelektronika i informatika. 2004. № 4. P.62-68.

In this paper we consider the impact of circuit realization on the fault coverage of the test set. Our experiments with combinational circuits show that the test sets generated for a particular circuit realization fail to detect in average only less than one and a half percent of the stuck-at faults of the re-synthesized circuit but in some cases this figure is more than nine percent.

Tab. 10. Ref.: 14 items.

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UDC 681.32

**Spherical multiprocessor PRUS for emulation of Boolean equation** / S. Hyduke, V.I. Hahanov, V.I. Obrizan, Y.A. Kamenuka // Radioelektronika i informatika. 2004. № 4. P.69-78.

This paper offers high-performance technology for processing Boolean equations, based on Compiler Synchronized Parallel-processor Network-based Logic Device PRUS (Programmable Unlimited Systems) - single-bit spherical multiprocessor, which implemented into ASIC. This technology allows to perform parallel, sequential and pipelined Boolean equations processing using AND, OR, NOT, XOR operations.

Fig. 13. Ref.: 17 items.

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UDC 5.392: 5.35 (075.8): 5.38.9: 621.375.7

**Application multifunction pазone of devices in monitoring systems and diagnostics of complicated objects** / M.F. Bondarenko, P.I. Cherednikov, A.D. Menyaylo, E.V. Khomyakov, M. Abderrazik // Radioelektronika i informatika. 2004. № 4. P.79-87.

The monitoring system and diagnostics of complicated objects is developed on the basis of multifunction pазone of devices. On the basis of elected methods the analytical and experimental dynamic parameters quick-acting base multifunction pазone of devices are received. The received results can be used at diagnostics both forecasting of state of electronic and telecommunication systems, and also in systems of queuing.

Tab. 1. Fig. 14. Ref.: 16 items.

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UDC 681.3

**Evaluation of lower level LAN properties of CIS (Centralized Information System) for power generating unit VVER-1000.** /V.V.Yeliseyev // Radioelektronika i informatika. 2004. № 4. P.88-93.

The article considers issues of information exchange organization in the connection-to-object systems (COS) of CIS for nuclear power plant power unit with reactor type VVER-1000 (water-moderated power reactor). On the basis of analytical, numerical and statistic models of COS LAN the evaluations of LAN functioning quality with various COS parameters have been obtained. The article gives practical recommendations concerning achieving and choosing LAN properties, which lead to the maximum level of chosen quality criterion of LAN functioning.

Tab. 6. Fig. 6. Ref.: 7 items.

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UDC 681.324

**Quantum method of decision making on the basis of a prohibition logical network** / I.V. Varfolomeeva // Radioelektronika i informatika. 2004. № 4. P.93-99.

The new quantum method of decision making is offered within the framework of t-quantum knowledge engineering. In the given method under the constructed implicative knowledge base the prohibition logical network of a conclusion of solutions which is simultaneously the knowledge base and the gear of identification decision making is under construction.

Fig. 3. Ref.: 3 items.

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UDC 681.324.01

**Internet information protection** / V. P. Nemchenko, Dao Tkhon Fyong // Radioelektronika i informatika. 2004. № 4. P.99-102.

Some most spread types of network attacks which can occur in the Internet are parsed. Vulnerabilities of network protocols which can provoke of attacks are analyzed. The possibilities of the attacks realization elimination are shown. Perspectives of new generation stack protocols TCP/IPv6 usage are given.

Fig. 3. Ref.: 2 items.

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UDC 681.326

**Methods and development tools of digital systems on chip. Analytic review** / V.I.Hahanov, O.A. Egorov, M.O. Kaminska, I.V. Hahanova // Radioelektronika i informatika. 2004. № 4. P.102-117.

It is proposed review of the methods and development tools of digital system on chip (SoC).Analysys of present digital designs modeling,verification, synthesis tools for further implementation in silicon. It have been observed of different systems on chip design technologies. There were analysed ways of the expansion of Ukrainian IT market.

Tab. 1. Fig. 24. Ref.: 51 items.

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UDC 519.711.3:519.68

**About relations coherence in information systems** / Lugansky A.M., Mashtalir V.P., Putiatina A.E., Shlyakhov V.V. // Radioelektronika i informatika. 2004. № 4. P.118-121.

Properties of equivalence relations induced by arbitrary n-tuple relations are formalized for information systems modelling. Coherence matrixes of relations are introduced and studied. Results application in multialgebraic systems details are discussed.

Ref.: 11 items.

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UDC 004.4:621.311

**Research of digital watermark embedding in a format is investigated.** / Z. Dudar, M. Zbitneva // Radioelektronika i informatika. 2004. № 4. P.121-126.

There is considered the description of format JPEG: markers APP0-APPF, DQT, EOI, SOF, DHT, SOS. There is analyzed of the opportunity and quantity of bits which can be introduced in a format. There is described developed method of embedding of digital watermark in format JPEG .

Tab. 2. Ref.: 8 items.

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UDC 519.67

**Comparative parameters of the G-projection method of rectangles placement** / S.I. Yaremchuk, L.V. Rudyuk // Radioelektronika i informatika. 2004. № 4. P.126-129.

The problem of optimal rectangles placement in rectangular area is given. The possibility of given problem replacement by series of subproblems is proved. The Rozen method for chosen subproblem solution is given, the theorem about method time complexity is given and proved. The main idea and algorithm of developed G-projection method for chosen subproblem solution is given, the theorem about method time complexity is given and proved.

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

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UDC 621.391: 517. 518:510.52

**The operators of finite three-dimensional Fourier Transform** / O.M. Lytvyn, V.M. Udovichenko // Radioelektronika i informatika. 2004. № 4. P.130-133.

The operators of finite three-dimensional discretely-continuous Fourier Transform on the basis of piecewise constant splines were investigated. These operators are precise on trigonometric polynomials of corresponding degree. Their interpolation properties are researched. The example is given.

Tab.1. Ref.: 12 items.

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UDC 519.713

**Form and description policies access method to computer network resources** / Sayenko V.I., Golubev A.S.// Radioelektronika i informatika. 2004. № 4. P.134-139.

Policies were split into users and resources policies for simplification. We form global policies for resource first and then specify them by user policies. It was implemented global, local and executive management methods.

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

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UDC 621.391:51.142

**Summation of double series by methods in RKHS** / S.V. Chumachenko // Radioelektronika i informatika. 2004. № 2. P.122-125.

The series summation methods in Reproducing Kernel Hilbert space (RKHS) is applied to summation of double series. By theorem proving having theoretical and practical means the new results for three double series are determined.

Fig. 2. Ref.: 13 items.

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UDC 517.9

**Mathematical model of liquid filtration in fissured porous rocks with distributed external source** / L.A. Vlasenko // Radioelektronika i informatika. 2004. № 4. P.144-149.

A mathematical model of liquid filtration in fissured porous rocks with distributed external source is described. The equation for pressure in fissures is obtained. Existence and uniqueness conditions for a solution of the initial value problem are indicated. A numerical method to solve the initial value problem is given.

Fig. 3. Ref.: 11 items.

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UDC 539.87

**Principles of organization of adaptive fuzzy system of regulation of parameters of text flow** / Alhalaybeh Ayman // Radioelektronika i informatika. 2004. № 4. P.150-155.

The principles are considered of building of adaptive system of regulation of parameters of text flow, containing three embedded loops of fuzzy control. The system is intended for training the speed of reading the text.

Fig 2. Ref.: 5 items.

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UDC 621.321.96

**Is whether opportunity of increase quality jamproof modern radar-tracking: station** / B.V. Khabrostin, O.O. Martinchuk, D.V. Fomenko // Radioelektronika i informatika. 2004. № 4. P.155-159.

It is offered to consider sans and opportunities such method of radiolocation, as the full polarization probing by modern radar-tracking station. The full polarization probing by radar can considerably expand it functional possibility.

Tab. 5. Ref.: 8 items.

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UDC 519.713: 631.411.6

**Determination of correlation between contents of heavy metals in the soils of different ecological systems for solution of problems of mathematical simulation in the ecological monitoring** / T.V. Kozulia, L.V. Glushkova, Z.V. Shtitelman // Radioelektronika i informatika. 2004. № 4. P.159-164.

Potentialities of determination of mathematical models of influence on the accumulation of pollutants (heavy metals), which are different chemical nature, in the soils of the various ecological systems for solution of problems of ecological monitoring of environment were considered in the article. Mathematical models of connection of contents of heavy metals, tendencies of conducts of pollutions were considered in the result of statistic analysis of the information of physical – chemical investigates of the soils of different ecological systems.

Tab. 7. Fig. 1. Ref.: 9 items.