

# Summaries

UDC 519.2:621.391

**Demin N.S., Rozhkova S.V.**  
**QUANTITY OF INFORMATION BY SHANNON IN JOINT  
FILTRATION, INTERPOLATION, AND EXTRAPOLATION  
PROBLEM ON CONTINUOUS-DISCRETE OBSERVATION  
WITH MEMORY**

Information aspect of joint filtration, interpolation, and extrapolation problem of scholastic processes on continuous-discrete observations with fixed memory is considered. Structure of information quantity is investigated.

UDC 330.43

**Belsner O.A., Kritskiy O.L.**  
**IMITATION SIMULATION OF TIME SERIES VALUES BY  
METHOD OF DYNAMIC CONDITIONAL CORRELATION  
ON THE BASES OF LAPLACE'S MULTIDIMENSIONAL  
ASYMMETRIC DISTRIBUTION**

Modification of dynamic conditional correlation is proposed. Modification consists in refusal from the statement on multidimensional normal distribution of increment logarithms of day's quotations of financial instruments due to non-zero values of asymmetry and excess coefficients and using Laplace's asymmetric multidimensional distribution, permitting to simulate linear combinations of one-dimensional chance quantities, which is particularly important at calculation of limit value-at-risk, (VaR) for files of financial instruments.

UDC 681.5

**Zamyatin S.V., Gayvoronskiy S.A.**  
**SOLVING PROBLEM OF POLE LOCATION OF LINEAR  
INTERVAL DYNAMIC SYSTEM IN A SPECIFIED SECTOR**

Characteristic polynomial of the system, in coefficients of which intervally-specified and set parameters are included, is considered. Approach permitting to provide location of dominant pole confinement area of interval system in specified sector and location of the rest poles in the specified area of complex plane is proposed. Numerical illustration is given.

UDC 553.411.071.242.4+550.4

**Kucherenko I.V.**  
**MINERALOGICAL-PETROCHEMICAL AND GEOCHEMICAL  
FEATURES OF NEAR-ORE METASOMATISM IN  
UPPER-SAKUKAN GOLD DEPOSIT (NORTH ZABAICAL).**  
**P. 2. Near-vein metasomatic and geochemical haloes**

The results of studying mineralogical-petrochemical zonality of near-vein metasomatic haloes in Upper-Sakukan deposit are presented, relatively low-volume scales of haloes in the frame of low-gold quartz veins and their belonging to beresite metasomatic formation, the deposits – to gold subformation of gold-uranium-polymetallic beresite ore formation are shown. Distribution of gold, silver, and some accompanying metals in inter-vein area is conditioned by the structure of near-vein metasomatic haloes and deposit shows the regularity being revealed before by this factor, according to which structure and scales of near-vein geochemical haloes depend directly on intensity of hydrothermal changes of the rocks enclosed, but contrast of geochemical abnormalities depends on the degree of gold-bearing of quartz veins. The results obtained are compared with the situation in other mesothermal gold deposits.

UDC 553.3/.4:550.4(571.15)

**Potseluyev A.A., Babkin D.I., Kozmenko O.A.**  
**METALS IN FLUID INCLUSION OF GREISEN DEPOSITS  
(KALGUTINSK DEPOSIT)**

Metals in fluid inclusions in quartz of ore bodies of Kalgutinsk rare-metal deposit (Gornyi Altai). The element with  $n \times (100 \dots 1000)$  mg/kg content prevail, the determining industrial value and geochemical specialization of Mo, W, Cu, Rb, Cs, Cr ores. Relatively high is the content of Th, U,  $\Sigma$ REE, Ag, Hg in the range of  $n \times (1 \dots 10)$  mg/kg. In significantly lower concentrations ( $n \times (0,1 \dots 0,01)$  mg/kg) Ru, Rh, Pd, Os, Au, Re are fixed. Within the main industrial vein 87 regular change of gas content in solution of fluid inclusions is observed that conforms with the data on change of gas content, general fluid mineralization, thickness of vein, fluid-saturation of quartz and graphite distribution. The data obtained permit to suggest that in the area of transportation of reduced fluid metals were in the form of organometallic complexes.

UDC 550.84:553.7

**Shestakov B.I.**  
**HYDROGEOCHEMICAL CHARACTERISTICS  
OF GOLD-ORE HYDROTHERMALYTIC FORMATIONS  
IN THE AMUR REGION**

On the bases of hydrogeochemical investigation during many years in the upper Amur region the integrated hydrogeochemical characteristics of all located in the region gold-ore hydrothermalytic formations was created. The characteristics pointed out permit to determine formation type of suggested gold-ore object by hydrogeochemical data, to forecast its mineral composition, form of ore bodies, and their bank, and other typical formation features. It is particularly important for gold-ore objects not cropping on the surface.

UDC 553.98:551.73(571.1)

**Abrosimova O.O., Kulagin S.I.**  
**FORECASTING COLLECTORS IN THE UPPER PART  
OF PRE-JURASSIC COMPLEX ACCORDING  
TO SEISMOGEOLOGICAL DATA ON THE TERRITORY  
OF EASTERN SLOPE OF KRASNOLENINSKIY VAULT**

The possibility of using complex interpretation of hydrodynamic investigation data of holes, the results of seismic inversion as well as dynamic analysis for revealing collectors in the upper part of pre-Jurassic complex is shown.

UDC 523.684

**Otmakhov V.I., Varlamova N.V.,  
Manankov A.N., Lapova T.V.**  
**PHYSICO-CHEMICAL RESEARCH OF TECTITES  
FOR THE SAKE OF SPACE MONITORING**

By means of atom-emission analysis, UR-spectroscopy and ESR the peculiarities of chemical composition and structure of glassy cryptoexplosion materials were investigated. The research was carried out to state the difference of tektites and impaktites from earth volcanic glass as well as to explain the conditions of their genesis connected with cryptoexplosion. As a result of investigation performed the connection of the materials examined with cosmic phenomena as well as hypothetically with falling of large meteorites, comets or asteroids was proved, the possibility of their use as a cryptoexplosion indicator was shown.

UDC 533.951

**Grigoryev V.P., Koval T.V.  
MODULATION OF ELECTRON FLUX WITH SUPERLIMITED  
CURRENT IN SYSTEMS OF SPACE DRIFT**

The problem of phase modulation of electron flux in virtual cathodes with additional space drift is considered. The theory is based on parametric interaction of electrons with oscillations of beam self-field in non-linear system. Peculiarities of systems with floating-drift electrons are taken into account and the most optimal mode of critical parameters is studied. Constructing the model of parametric interaction the results of numerical simulation by the method of large particles on formation of virtual cathode are used. The given approach permits to examine electron dynamics and mechanism of phase flux modulation of floating-drift electrons in details depending on system parameters, which is necessary when using such beams to produce powerful microwave generators.

UDC 621.039

**Shamanin I.V., Godovykh A.V.  
STRUCTURE OF RESONANT REGION OF NUCLEI  
<sup>238</sup>U AND <sup>232</sup>Th ABSORPTION AND DEPENDENCE  
OF ITS PARAMETERS ON TEMPERATURE**

Structures of resonant regions in dependencies of neutron absorption section on their energy for even-even nuclei of <sup>238</sup>U and <sup>232</sup>Th are analyzed. Advantages of <sup>232</sup>Th using as a rough nuclide producing nuclear fuel of perspective reactor are theoretically justified. As a result of analysis the reasons for increasing values of reactivity negative temperature effect and optimal water-fuel relation in thermal reactors in case of using thorium-containing nuclear fuel compositions are stated.

UDC 620.179

**Tsitsura V.N., Silanteyv O.I., Alkhimov V.Yu.,  
Kuleshov V.K., Alkhimov Yu.V.  
GAS-DISCHARGE CONVERTER WITH MATRIX STRUCTURE**

The problem of forming visual image in matrix gas-discharge converter of X-radiation is considered. The calculations of blurriness of visual image are made. Frequency-contrast converter characteristics are determined.

UDC 541.18.02

**Vegera A.V., Zimon A.D.  
SYNTHESIS AND PHYSICO-CHEMICAL PROPERTIES  
OF SILVER NANOPARTICLES STABILIZED BY GELATINE**

By means of silver nitrate reduction by sodium borane silver nanoparticles in wide range of initial concentration of reagents were synthesised. Extensive physico-chemical research of synthesised nanosystems was carried out. Stabilizing ability of acid gelatine in the systems involved is considered. Diagram of state in coordinates was constructed: initial concentration of silver nitrate – gelatine concentration.

UDC 542.883

**Kozik V.V., Borilo L.N., Chernov J.B., Lyskova J.A.  
THIN-FILM NANOSYSTEMS ON THE BASES OF ZIRCONIUM  
AND GERMANIUM DOUBLE OXIDES**

Thin films of ZrO<sub>2</sub>-GeO<sub>2</sub> were obtained in the range of concentrations from 0 to 100 mol. % GeO<sub>2</sub> by sol-gel method of film-forming solutions on the bases of zirconium oxochloride and germanium tetrachloride. Physico-chemical processes taking place in solutions and in film formation were investigated. Composition, structure, and properties of films obtained were studied.

UDC 543.253

**Stas I.J., Ivonina T.S.  
ON THE NATURE OF LIMITING STAGE OF ELECTRODE  
PROCESS WITH LEAD IONS IN PRESENCE OF SURFACE  
ACTIVE IONS OF AMMONIUM TETRABUTYL. INFLUENCE  
OF ELECTROMAGNETIC FIELD ON THE DEGREE  
OF PROCESS REVERSIBILITY**

Change of kinetic parameters of electrochemical reactions was stated at introduction of surface-active substances into solution and under the action of high-frequency electromagnetic field. It was shown that in the presence of surface active substances electrode process becomes more reversible. Action of field influences diffusion stage of electrode process to a greater extent and increases reversibility of electrode reaction.

UDC 662.73.012

**Ivanov A.A., Yudina N.V., Lomovskiy O.I.  
INFLUENCE OF MECHANIC-CHEMICAL ACTIVATION ON  
COMPOSITION AND PROPERTIES OF HUMIC ACID OF PEATS**

The possibility of changing yields, composition, and properties of humic acids of high-moor and valley peats after mechanical activation in presence of solid alkali and cellulolytic ferment is shown.

UDC 541.128;66.097

**Galanov S.I., Sidorova O.I., Maximov Yu.M.,  
Kirdyashkin A.I., Gushchin A.N.  
CATALYSTS OF PEROVSKITE STRUCTURE  
ON METAL-CERAMIC CARRIER**

In the reaction of deep oxidation of CO and C<sub>4</sub>H<sub>10</sub> oxide applied catalysts of perovskite structure are examined. Activity of platinum-containing catalyst and oxide systems in deep oxidation are compared. The conclusion is made on the fact that catalyst system containing superstoichiometric manganese is the most appropriate one for using in thermal generators.

UDC 61.01.77

**Ivashkina H.N., Kravtsov A.V., Ivanchina E.D., Sizov S.V.  
DEVELOPMENT OF FORMALIZED DEHYDROGENATION  
MECHANISM OF C<sub>10</sub>-C<sub>13</sub> HIGHER PARAFFINS  
ON Pt-CATALYSTS**

A fundamentally new kinetic model of dehydrogenation process of C<sub>10</sub>-C<sub>13</sub> n-paraffins on the bases of formalized mechanism of hydrocarbon conversion on the surface of Pt-contact is suggested. The model involves deactivation of catalyst owing to coke accumulation in terms of specific character of the stock and conditions of process.

UDC 61.01.77

**Ivashkina H.N., Kravtsov A.V., Ivanchina E.D., Sizov S.V.  
DEVELOPMENT OF COMPUTER SIMULATING SYSTEM  
OF DEHYDROGENATION PROCESS OF C<sub>10</sub>-C<sub>13</sub> n-PARAFFINS**

Computer simulation system of dehydrogenation process of C<sub>10</sub>-C<sub>13</sub> n-paraffin on the bases of formalized mechanism of hydrocarbon conversion on the surface of Pt-catalyst was developed. Given system makes possible to calculate current figures of the process and catalyst during the whole cycle of operation, to carry out prediction calculation of process parameters with regard to specific character of stock and process conditions; to forecast durability of service cycle of dehydrogenation Pt-catalyst operation.

UDC 553.985:547.537:54.02

**Antipenko V.R., Golubina O.A., Goncharov I.V., Nosova S.V.  
COMPOSITION PECULIARITIES OF MONOCYCLIC AROMATIC  
PYROBITUMEN HYDROCARBONS OF IVANOVSK DEPOSIT**

Using the method of chromatographic-mass-spectrometry molecular composition of monocycle aromatic pyrobitumen hydrocarbons at Ivanovsk deposit was analysed. It was stated that in contrast to most of oils and natural bitumens, pyrobitumen is characterised by unusual composition of practically all isobaric-homologous series of this hydrocarbon period. To the number of peculiarities of their composition, firstly, evident predominance of 1-alkyl-2,3,6-trimethylbenzols of  $C_{15}$ - $C_{22}$  composition with isoprenoid chain of irregular composition refers. Such compounds are derivatives of isorenieratene – carotenoid, which is included in anoxygenous photosynthetic green sulphuric bacteria of Chlorobiaceae family (Chlorobium species). Secondly, among alkyl-toluole of  $C_{15}$ - $C_{25}$  composition there is an apparent predominance of orthoisomers, which points out the low level of katageneous conversion of the object. Thirdly, n-alkylbenzols are practically absent in mono-alkylbenzol series. The latter are presented by представлены полным набором изомеров фенилалканов состава  $C_{17}$ - $C_{26}$ . Such compounds in the composition of natural bitumens were identified for the first time.

UDC 665.61

**Gerasimova N.N., Sagachenko T.A.  
NITROGEN-CONTAINING BASES OF DIESEL FRACTION OF  
140...350 °C COMMERCIAL MIXTURE OF JURASSIC OILS IN  
WESTERN SIBERIA BEFORE AND AFTER ITS HYDROFINING**

Distribution of low-molecular nitrogen-containing bases in the initial and hydrofining diesel fractions is studied. It is shown that in the process of hydrofining partial removal of highly-basic nitrogen-containing compounds is achieved. In hydrotreated product high-molecular bases are absent and the content of bases with strongly screened nitrogen atom is sufficiently lower than that in the initial stock. In the content of highly-based compounds of initial and hydrofining diesel fractions  $C_2$ - $C_3$ -alkyl quinolynes and  $C_2$ - $C_4$ -alkyl benzoquinolynes were found out. Process of hydrofining is accompanied by increasing the part of  $C_2$ - $C_4$  low-alkylable quinolynes and decreasing a relative number of quinolynes with more developed alkyl displacement ( $C_5$ - $C_9$ ). Alkylbenzoquinolynes are subjected to redistribution in the less degree. In the initial and hydrotreated diesel fractions  $C_3$ -benzoquinolynes prevails. In the content of alkylbenzoquinolynes of both distillates 2,3- and 2,4-dimethyl-benzo(h)quinolynes and 2,4,6-trimethylbenzo(h) quinolyne are identified. High stability of these structures can be explained by steric problems of nitrogen atom due to the presence of methyl substitute in  $\alpha$ -position.

UDC 678.07.074

**Trufakina L.M.  
INFLUENCE OF FIBROUS AND RIGID FILLING COMPOUND  
ON RHEOLOGICAL AND SURFACE PROPERTIES  
OF POLYMER COMPOSITIONS**

Influence of fibrous and rigid grain filling compounds on rheological and surface properties of polymer compositions on the bases of polyvinyl alcohol and carboxymethyl cellulose is shown. The affect of initial polymer solution concentration and time of complex formation on the properties of polymer complexes at introduction of filling compounds of different nature is stated.

UDC 621.181.001.4:621.18

**Zavorin A.S., Makeev A.A., Lubimova L.L., Tashlykov A.A.,  
Artamontsev A.I., Lebedev B.V.  
ROENTGENODILATOMETRIC TEMPERATURE  
INVESTIGATION OF BOILER TUBE WALL**

The results of thermocycle test of boiler tube sample of steel 20 by roentgenodilatometric method are presented in the form of dependences of internal structural tensions, parameters and coefficients of linear thermal expansions of crystal lattices from temperature. It permits to estimate tube state in the process of operation and after reducing treatment on the bases of determined regularities of inner-structural thermal conversion.

UDC 536.46

**Chashchina A.A., Knyazeva A.G.  
TENSIONS IN THE REACTION ZONE IN THE PROCESS OF MA-  
TERIAL COMBINATION USING SYNTHESIS IN SOLID PHASE**

Model of material combination is proposed on the bases of synthesis in solid phase and estimation of tensions appearing in reaction zone is made in the process of material combination under the conditions homogeneous heat penetration of the sample involved or firing on the edge. Results of numerical calculation show that thermophysical properties of combined materials and combining composition affect qualitative pattern of the process development essentially.

UDC 536.2:532.5

**Kuznetsov G.V., Maximov V.I.  
MIXED CONVECTION IN RECTANGULAR AREA  
WITH LOCAL SOURCES OF MASS INPUT AND OUTPUT IN  
THE CONDITIONS OF HETEROGENEOUS HEAT EXCHANGE**

The results of mathematical simulation of convection of viscid in-condensable liquid in rectangular plane with sources of mass input and output in adjoint substitution in the range of Boussinesq's approximation are presented. The modes of mixed convection in the chamber with two vertical and one horizontal walls of finite thickness, with two sections of liquid input and output and one free surface are investigated. Flat non-stationary problem in the range of Navier-Stokes model for liquid phase and heat conductivity for solid phase is considered. Distributions of hydrodynamic parameters and temperatures using different boundary conditions at outer contour of the plane involved are obtained. It is stated that even moderate heat sink at the exterior boundaries of decision region results in large-scale changes of liquid temperature fields.

UDC 626.039.553.34

**Kuznetsov G.V., Sandu S.F.  
MATHEMATICAL SIMULATION OF HEAT TRANSFER  
IN INSTRUMENT MODULE OF A SPACECRAFT AT SUFFICI-  
ENTLY NON-STATIONARY EXTERNAL HEAT EXCHANGE**

On the bases of the mathematical model developed the calculation experiment in investigation of heat transfer process dynamics in H-information-logic unit of modern communication spacecraft in its orbital operation under sufficiently non-stationary conditions of day-and-night cycle of Sun illumination was carried out. Qualitative estimation of heterogeneity degree of temperature field of both devices of radio-electronic spacecraft equipment and basic elements of instrument module construction was made.

UDC 536.46

**Myrzakulov R., Kozyrbakov M.Zh., Sabdenov K.O.  
INTERRUPTION OF BURNING OF SOLID ROCKET FUELS  
AND EXPLOSIVE SUBSTANCES AT VARYING PRESSURE**

Burning of solid rocket fuels and powders decomposed into gas by means of pyrolysis is considered. The possibility of burning interruption by harmonically varying pressure is shown. The reason of it is the fact that in definite conditions minor pressure fluctuation result in, as a rule, changes of burning velocity of large amplitude. Flame failure takes place at temperature decrease of fuel surface lower than critical magnitude. The research for cases of exothermic and endothermic pyrolysis reaction is carried out.

UDC 536.46+533.6

**Isakov G.N., Subbotin A.N.  
INFLAMMATION AND BURNING OF POROUS BLASTED  
LAYER OF WOODWORKING WASTE IN DIFFERENT  
CONDITIONS OF HEAT-MASS EXCHANGE**

It is proved that in dependence on created conditions of heat-mass exchange in porous layer of wooden waste low and high temperature modes of burning and mode of smouldering at which major mass of gaseous components forming at pyrolysis are released into atmosphere without burning are realized. By means of mathematical model considered in the work one can forecast the modes of burning process, close-burning waste and determine the composition of gaseous products forming in this case.

UDC 621.182:549.01.08

**Buvakov K.V., Zavorin A.S., Gladkov V.J.**  
**MORPHOLOGICAL PECULIARITIES OF ASH OBTAINED BY ENERGETIC BURNING OF BROWN COAL**

The results of structure and composition examination of ash particle surface caught by electrofilter of boiler installation with БК3-420-140  $\Phi$  boiler when burning irsha-borodin coal obtained by using roentgen microanalyzer are presented. By morphological features the types of particles with different surface and volume structure are distinguished, which predetermines a wide range of potential capacity of interaction with gaseous components of burning products among them, including interactions of sorption character.

UDC 678.02:678.057

**Tatarnikov A.A., Gorbunov D.B.**  
**ANALYTICAL CALCULATION OF DYNAMIC CHARACTERISTICS OF SINGLE-SCREW DEVICE WITH CONE SCREW CHANNEL AT PROCESSING RUBBER COMPOUND**

The questions of dynamic characteristic investigations of pressure zone of single-screw device are considered. Technique of analytical calculation of time characteristic in single-screw pressure zone along the «pressure zone supply – unit capacity» channel is developed. Test of applicability of the technique proposed is carried out.

UDC 625.032:534.1

**Osinovskaya V.A.**  
**MAIN PRINCIPLES OF DYNAMIC MODEL FORMATION OF ROAD AND AUTOMOBILE INTERACTION**

The main principles of mechanic-mathematical model formation simulating the process of vertical oscillations of general mechanical scheme «automobile-road» are stated. The sample of such model is presented.

UDC 681.2.08: 531.716

**Goldshstein A.J., Urazbekov J.I.**  
**INFLUENCE OF MOTION VELOCITY ON THE RESULT OF LENGTH MEASUREMENT OF FERROMAGNET PRODUCTS BY METHOD OF MAGNETIC MARK**

Reasons and character of affecting the result of length change of ferromagnetic production by magnetic mark method of product motion velocity are investigated. Technique of decreasing this dependency based on length correction of measuring base according to motion velocity of product and permitting to provide high accuracy of measurement with minor length of measuring base and wide range of changes in motion velocity is proposed.

UDC 621.313

**Kachin S.I., Borovikov Yu.S.**  
**PARAMETER OPTIMIZATION OF DAMPED ARMATURE WINDING**

The possibility of choice of optimal construction for damped armature winding in terms of anticipated conditions of commutation of electric device section is considered. The fact of the highest efficiency of damped winding in conditions of weak undercommutation is shown. It permits to recommend setting-up the operation of electric device just in this condition.

UDC 519.71:622.276

**Sergeev V.L., Sergeev P.V.**  
**IDENTIFICATION OF DRILLING HYDRODYNAMIC PARAMETERS IN TRANSIENT CONDITIONS OF FILTRATION IN TERMS OF PRIOR INFORMATION**

The problem of drilling hydrodynamic parameters in transient conditions of filtration by the method of pressure recovery curve in terms of additional prior information and expert appraisal is considered. The results of precision estimation analysis of seam pressure and seam filtration parameters are presented.

UDC 681.3.06

**Sonkin M.A., Slyadnikov J.J.**  
**ORGANIZATION AND GENERAL TECHNOLOGY OF FUNCTIONING REGIONALLY DISTRIBUTED HARDWARE-CONTROLLED-PROGRAMMED COMPLEXES WITH BATCH COMMUNICATION**

The principles of construction are formulated; the architecture and general technology of integrated information-telecommunication system operation with batch transmission of information along different communication paths for hard accessible objects are formulated. The material is considered applying to the means of data transmission to platform of data collection from coastal and sea base to unified system centres of meteorological information processing.

UDC 519.179.2

**Tsapko S.G., Tsapko I.V.**  
**OBJECT PRESENTATION OF SUBSYSTEM IMITATION MODELS OF COMPLEX ENGINEERING SYSTEM IN E-CIRCUIT TERMS**

The main features determining complexity of technical system are distinguished. It is given definition of object. Application of E-network simulation device is proposed to describe object structure and its interaction with environment. Example of object presentation in terms of E-network is shown. Using attribute designation of E-network to simulate physical interaction of complex system components is proposed. The possibility of using dynamic E-network for simulation of any complex system operation presented in the form of detached object is proved.

UDC 681.3.068

**Zimin V.P., Khomyakov J.A.**  
**VISUALIZATION SUBSYSTEM OF SCIENTIFIC DATA FOR BRAINSTORM SYSTEM FRAME**

The problem of visualization of scientific data in carrying out calculation experiments by means of package of applied programs supported by BrainStorm system frame developed in TPU is discussed. Its solution consisting in development of specialized visualization modules permitting to display and analyse data in graphical form both during the calculation experiments and after them is proposed.

UDC 336.225

**Abramov A.P., Makarov A.I.**  
**IMPROVING TAX ASSESSMENT OF NATURAL PERSONS**

Some theoretical and practical problems of administrating taxes of natural persons are considered. Legislative standards in terms of their correspondence to the demands made are analysed. Ways of increasing efficiency of administrating taxes of natural persons as a part of formation process of budgetary system income are proposed.

UDC 341

**Samovich Yu.V.**  
**ON THE QUESTION OF INTERNATIONAL JURIDICAL PERSONALITY OF INDIVIDUALS**

The paper is devoted to consideration of modern conditions of practice and doctrines in international juridical personality of a natural person as well as opportunities of natural persons as participants of international legal relations.

UDC 658.012.02

**Bobrovskiy S.M., Yanitskaya T.S.**  
**MODEL CONSTRUCTION OF QUALITY MANAGEMENT SYSTEM OF ENTERPRISE ON THE BASES OF METHODS OF STRUCTURAL ANALYSIS**

The technique of construction of structural process model meeting requirements of ISO 9001:2000 standard is considered. Proposed by the authors transitive schemes are applied. The technique permits to obtain the model of processes at enterprise taking into account the requirements of ISO 9001:2000 standard. Using methods of IDEF allows creating an adequate model. The proposed method will be of use at develop-

ment of enterprise process structure, at that of document procedures of quality system as well as in preparation of enterprise for certification.

UDC 658.01

**Chernova Yu.K., Shchipanov V.V.  
FIRST STEPS OF ROBUST DESIGN IN DOMESTIC  
AUTOMOBILE INDUSTRY**

The main idea of robust design on the bases of Taguti's method is considered. Educational program for improving engineers' qualification of open joint-stock company «AVTOVAZ» is described according to robust design and the example of robust design of automobile element is given.

UDC 167.1:316.7

**Nikitina I.V.  
CHARACTER OF MODERN SCIENCE  
AND PROBLEM OF METHOD**

The problem of development of modern science as a nonlinear and tessellated science corresponding to «laser paradigm» is considered. The author stands for the idea of «multimodel approach», which is based on recognition of «model» character of theories and methods. The researcher constructs her method as a subsystem of science combining separate methods in terms of her problem. It is pointed out that a new type methodology in spite of its subjectivity is a consequence of objective changes in social and cultural reality, the part of which is science.

UDC 11

**Kenispayev Zh.K.  
PECULIARITIES OF HUMAN CONSCIOUSNESS**

The problem of consciousness through the prism of the question on meaning of life is analysed. Consciousness as a tool of cognition has some peculiarities the essence of which becomes apparent during cognitive perception of the world by a man. Is there the beginning of cognition and anything that can be a criterion of its finishing? Search for a possible answer to this important question makes up the content of the given paper.

UDC 316.75:14

**Khmylev V.L.  
CONCEPT OF IDEOLOGY AND ITS INTEGRATION  
INTO MODERN EPOCH**

The situation created in science and philosophy with respect to evolution and modern state of ideology notion is defined in short. In contrast to the thesis about «the end of ideology», it is shown that given phenomenon does not lose its role in the modern society and is capable of functioning as a socially organized system.

UDC 801.5

**Zhukova N.S.  
TYPOLOGICAL FEATURES OF VERB SUBSYSTEM  
OF MODERN GERMAN**

Typological features of verb morphology of modern German are shown, namely: syncretism phenomenon, system excessiveness, reflection of category and existence of shintomorphology. They are revealed in comparison of morphological subsystem of modern German language with corresponding subsystems of Russian and English languages and serve as indicators of analytical tendencies in its systems reflecting a gradual transition of some functions from morphology to syntax on the synchronous section.

UDC 808.2:81'373.612.2:808.861

**Nadeina L.V.  
FIGURATIVE COMPREHENSION OF MOTION IN RUSSIAN  
LANGUAGE (on the bases of motion verbs in Russian  
dialects)**

On the dialect material semantics of the verbs denoting progressive, oscillatory, and rotational motion are considered. The author re-

veals the parameters by which the creation of metaphoric images of the given types of motion is made.

UDC 371

**Petrova G.I., Khatkevich S.P.  
CONTEMPORARY MODERNIZATION OF ENGINEERING  
EDUCATION STRATEGY AND TRADITIONS  
OF THE RUSSIAN CULTURE**

Authenticity of engineers' training in the conditions of modern, dynamic, and rapidly changing society is considered. As necessary components of new content of engineering education skills of orientation in changing professional world, adaptation, activation of intellectual work as multiproject, playing, fastening the junctions and boundaries of not only exact, but also humanitarian sciences are proposed.

UDC 796

**Ilyin A.A., Andreyev V.I.  
MONITORING ORGANIZATION OF STUDENTS' PHYSICAL  
QUALITIES DEVELOPMENT BY THE EXAMPLE OF GROUPS  
IN WINTER FOOTBALL**

Monitoring of development parameters of the students' physical qualities in the group of general physical training, specialized group, and group of sport improvement in winter football permitting to reveal the differences in statistically reliable growth of students' physical qualities in these groups (defined by positive dynamics of speed-force qualities, endurance, and quickness), increase of playing skills and success in sport-playing activity of students' teams in winter football is performed.

UDC 373.5

**Smyshlayeva L.G., Sivitskaya L.A., Kachalov N.A.  
ACTIVE EDUCATIONAL TECHNIQUES AS A CONDITION  
OF REALIZATION OF COMPETENT APPROACH IN  
HIGHER SCHOOL**

Appropriateness of using active educational techniques to achieve the purposes of education in modern higher school is grounded. The essence of competent approach in higher professional education is shown. Competent potential of active educational techniques is defined; the experience and prospects of its application in pedagogic practice of TPU are presented.

UDC 373.5

**Kozlova N.V., Chekunov A.Yu., Bondarev A.V., Sinarov I.A.  
STUDENTS' BUSINESS-INCUBATOR AS A SELF-LEARNING  
STRUCTURE OF INNOVATION UNIVERSITY (SUMMERIZING  
WORK EXPERIENCE)**

Effectiveness of students' business-incubator activity as a qualitatively new approach to the problem of training modern specialist with support of theoretical-methodological basis of innovation development strategies and acmeology methods is analysed. The main positive results are defined and shortage of educational practices by the type of self-learning structures is revealed; students' competences stimulating progressive forward personal-professional formation are stated. The content of concrete problems necessary for further development of both the structure and its participants is presented.

UDC 159.9:331.101.3

**Deneko M.V.  
PERSONAL POTENTIAL AS A MOVING FORCE  
OF PROFESSIONAL TEACHER'S DEVELOPMENT**

Professionalism is a particular property of a man as an individual, personality, activity subject to perform complex actions in different conditions effectively, reliably, systematically. The problem of developing individual professionalism of a man is closely connected with the question on potentials of psychological development and resources laid in it, which could be used to solve socially important problem of training professionals. Interconnection of personal potential in the aspect of professional development of a higher school teacher is revealed.

UDC 802.0:378.147

**Sipaylova N.Yu., Maletina L.V.**

**INNOVATION TECHNIQUES: TEACHING IN COOPERATION**

Innovation techniques used in teaching Professional foreign language to students of Tomsk Polytechnic University is presented; its practical significance is shown. The base of the technology described is the theory of context teaching and cooperation of language teachers and teachers of engineering departments.

UDC 621.313(09)

**Rapoport O.L., Muraviev O.P., Tsukublin A.B.**

**THE FIRST SIBERIAN DEPARTMENT OF ELECTRIC MACHINES AND DEVICES OF TOMSK POLYTECHNIC UNIVERSITY IS 75 YEARS OLD**

75-years way of Electric Machines and Devices Department of Electrical Engineering Institute of Tomsk Polytechnic University is pres-

ented. Its achievements in science, education, training specialists including those of high qualification – doctors and candidates of sciences are discussed. At the department Siberian electro-technical school was organized, it develops successfully at present.

UDC 621.313(09)

**Mitayenko A.D.**

**ELECTRICAL DRIVES DEPARTMENT IS 55 YEARS OLD**

Formation and development of Electrical Drives Department of Tomsk Polytechnic University is described. Its contribution to improving electrical-technical education and setting up electrical- technical specialities is presented. The achievements of the department and its outstanding graduates are shown;