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GEODESY AND MINE SURVEYING

INFORMATION SYSTEM BUILD GEOSPATIAL DATA INFRASTRUCTURE FOR ROADS AND RAILWAYS

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In the article information system in building a geospatial data infrastructure for roads and railways, includes the following components: roads, bridges, railways, publishing, and software. The proposed optimal ways of obtaining geospatial data for determining the spatial length of the route, the catchment area control the spatial position of the bridges which can be used in information modeling BIM. The efficiency of the method of determining the length of the route in the design of roads to improve the accuracy of geodetic measurements. In on-line mode, it is possible to determine the actual land area of the watershed and to obtain information to control the spatial position of the bridges. The reliability of the information system is ensured by references to sources of information through hyperlinks to literature and data, published by authors in scientific articles and patents.

Key words: information system, roads, railways, system of knowledge, the spatial length of the route, the catchment area.

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GEODETIC MONITORING OF THE INTENSE DEFORMED CONDITION OF CRUST OF KUZBASS: REGISTRATION AND ACCURACY OF DETERMINING COORDINATES

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The traditional technologies of deformation monitoring check is usually carried out taking into account a range of motion of the crust surface or instrument accuracy. Developed the theory of geodetic monitoring recording stress-strain state of the Earth's crust in the areas of development of coal deposits, not only eliminates this approach, but also takes into account the slow rate of crustal deformation, do not lead to the manifestation of geod ynamic phenomena. Also check the

kinematics of crustal blocks to determine the stress and strain of their condition is performed with the same accuracy that ensured the proposed scheme typical of geodetic constructions. Proposed multistage geodesic constructions on geodynamic polygons in the field of development of the area is determined depending on the geodynamic activity crustal blocks ranks R and R + 1.

Key word: geodetic monitoring, recording, accuracy, geodynamic polygon, kinematics, the blocks of the Earth's crust, rank, geodynamic phenomenon.

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GEODESIC SUPPORT OF GEODYNAMIC MONITORING OF OBJECTS OF SUBSURFACE USE

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Active exploitation of various mineral properties requires regular inspections of their condition. These works are carried out in the form of environmental monitoring. For mineral deposits the study is conducted within the framework of geodynamic monitoring. The most important method of carrying out geodynamic monitoring is a geodetic method. It allows with high precision to perform a quantitative assessment of the characteristics of the displacements, the stress-strain state of the surface layer of the undermined territories.

The method of instrumental geodynamic monitoring displacement of earth surface in Uzelginsky ore deposit, and the results of determination of deformation in the vertical and horizontal planes are presented. Re-observed the spatial coordinates of a reference frame and geodynamic geodetic networks stations using a complex of satellite geodesy. The parameters of the trend of modern geodynamic movements caused by the formation of the basin subsidence. The evaluation of geodynamic activity areas were identified spatial displacement vector of full frames observation station, the graphs of the stress-strain deformation and shear deformation, set discrete mosaic pattern of deformation of the array.

Key words: modern geodynamics, surface displacements, stress-deformed state, instrumental monitoring, observation station, surveying measurements.

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TO THE QUESTION OF USING OF VARIOUS MODELS OF CALIBRATIONS GPS-ANTENNAS, TYPES OF DOMES, MASKS ON THE ANGLE OF ELEVATION AT PROCESSING GNNS-MEASUREMENTS

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The paper presents an analysis of the main factors limiting the accuracy of positioning using GNSS-measurements (especially vertical component), methods of creating models corrective phase variations centers GPS-antenna. Assessing the impact of the relative and absolute calibrations, types of domes and the elevation masks of processing GNSS-measurements performed. The study included 10 treatment vector obtained by a two-day measurements at 13 points of a European network of permanent stations EUREF. Vectors have different lengths, elevation, type of equipment used and the geometry of the satellite constellation. Dependence of changes of azimuth and altitude variations of the components of the phase center of the antenna defined (PCV - Phase Center Variations). The paper shows that to achieve millimeter accuracy prerequisite is the use of absolute calibration of phase centers of the antennas, specify the exact type of antenna, such as the dome and the mask in elevation.

Key words: variations of the phase centers, calibrations, multipath, mask on the angle of elevation, GPS antenna, GNSS-measurement, anechoic chamber, european network EUREF.

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CORRELATED VERSION OF ACCURACY ASSESSMENT EQUALIZATION OF GEODETIC NETWORKS WITH EQUAL OBSERVATIONS BY MEANS OF PSEUDOOPTIMISATION

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In geodetic practice there are many tasks for which it is not necessary to bind to initial solid points, for example, when creating geodetic control with setting out engineering constructions, when observing deformations of engineering constructions and so on. Moreover, in equalizing geodetic networks (especially large) the coefficients of conditional equations are calculated approximately, that can lead to ill conditioning or even singularity of normal system equations. In singularity of normal equation systems the equalizing task by means of least squares does not have a solution. And in improperly stipulated matrix of normal equations' coefficients, the equalization results by means of least squares will probably have strong distortion. That's why this article offers a new approach, based on pseudo-normal optimization method, which successfully solves the tasks mentioned above as opposed to least squares method.

Key words: correlated version, pseudo optimization, pseudo solution, equalization, leveling network, pseudo inverse matrix, recursive algorithm.

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CREATING A LOCAL DIGITAL MODEL OF GEOID HEIGHT IN THE NOVOSIBIRSK REGION

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For the territory of the Novosibirsk region holds the formation and study of the three options of local digital geoid models with a regular grid of latitude and longitude in WGS-84 coordinate system. Formation of local models was carried out using the software «Trimble Bussines Center» (ON TBC) and a global model EGM2008-2,5'. To compute the geoid height at arbitrary points used method of weighted averages of the six units at the two closest to the defined point parallels the regular grid. As a working model of the geoid selected local increments 0,0125° (~ 1,4 km). It is shown that the accuracy of the working model of the geoid and the geoid height calculation method is almost equivalent to the weighted average values of precision of the original model EGM2008-2,5'. Average kvadrticheskaya error deviations from the reference geoid height values for 160 test points, evenly spaced around the territory of the Novosibirsk region amounted to ±2mm.

Key words: global geoid model EGM2008-2,5', a local geoid model, regular grid, step-regular grid, the height of the geoid, the method of weighted averages, Novosibirsk region.

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CARTOGRAPHY AND GEOINFORMATICS

DATA MINING METHODS IN THE REGIONAL SYSTEM OF SPACE MONITORING

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The possibility of constructing a system of space monitoring using data mining techniques such as association and classification methods based on Bayesian decision rule using methods on the basis of the adoption of decision trees are discussed. Examples of regional aerospace monitoring problems (environmental monitoring, regional forest fire monitoring, monitoring of local natural and anthropogenically provoked by events and disasters, and others.) and the corresponding data analysis techniques (regression, anomaly detection, spatial prediction, etc.) with the support of decision-making are discussed. The problems of adaptation of these methods to the archives of remote sensing data, involving as accounting features of data analysis methods, and specific aspects of building monitoring systems are presented. We discuss the example of a structure of transactional data for aerospace monitoring system comprising a set of reading meters (sensors) of a physical quantity, which is valid for sensor placement location in a spatial neighborhood. The approaches to the use of data analysis in systems monitoring using the optional archive transactional data such structure on the state of the environment, formulated conceptual requirements for such a system, its structure and the generalized use of technology to unmanned aerial vehicles.

Key words: data mining, system of aerospace monitoring, remote sensing data, unmanned aerial vehicle, classification, regression, anomaly detection, spatial forecast.

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USER SEGMENT OF UNIFIED TERRITORIAL GEOINFORMATION ENVIRONMENT

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The article deals with the concept and the results of research into the use of resources of the territorial unified geoinformation environment (TUGE) in the economy and the life of society. The paper contains the results of the development tool of reference and analytical GIS (GIS IRA), made under the state contract № 02.740.11.0735 according to the Federal Target Program "Research and scientific-pedagogical personnel of innovative Russia" for 2009–2013, as well as some results of the research "Spatio-temporal modeling environment for socio-economic development of territories", made in the years 2014–2016 according to the state contract (state registration number 01201461633). Studies aimed at exploring the possibility of extending the application of GIS in the user environment, without special preparation of geoinformation. The substantiation of the problem identified, the achievement of these goals, the basic methodological and technological solutions.

Key words: territorial unified geoinformation environment, geographic information system, reference and analytical functions, formalization of processes, web-technologies, cloud technology, the programming system.

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THE METHOD OF CREATING INTEGRATED ELECTRONIC AGRICULTURAL MAPS ON THE TERRITORY OF VIETNAM USING TO REMOTE SENSING FROM SPACE

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Territorial and resource development of Vietnam cannot be performed without mapping the socio-economic problems, including agricultural problems. The method of creating integrated electronic agricultural maps on the territory of North Vietnam according to remote sensing of the Earth from space as a tool for mapping composition, condition and structure of agriculture in the country. Described original technology is the thematic classification of agricultural complexes and objects on satellite images from Landsat 5, 7, 8. The analysis of spectral characteristics of objects on satellite images, compared with data from field surveys. Compiled the error matrix of the result of automatic supervised classification, the results of which were used to assess the spectral analysis of the agricultural objects. Classification accuracy amounted to 92 and 88 %. Given the content of the comprehensive agricultural maps, which gives an idea about the classification, characteristics and structure of agricultural activity in the country.

Key words: agricultural mapping, remote sensing, geographic information system, agricultural systems, interpretation of space images, comprehensive agricultural map, thematic classification of satellite images, the error matrix.

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INTERACTIVE MONITORING OF SPACE-TIME STATE MAN-MADE OBJECTS OF TECHNOLOGY WEBGL

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In this article we describe the multi-agent system determining space-time state of man-made objects. An example of a robotic stand as a prototype multi-agent system. It describes the web-application that renders the spatial position change of the model of man-made object as an absolutely rigid body based on WebGL. In this article the problem of implementation of the module interaction with the user, a decision which is made in stages: - set up sub-system three-dimensional visualization with interactive user functions based on WebGL technology; - Software developed intelligent agents to manage geographic information resources and the organization of communication between the user and multi-agent system. The user is given the opportunity to

request a web-application information on the specific interests of its parameters of man-made object, set its behavior when these parameters deviations from the original, enter the text in the free request form, which is processed by the system, followed by the withdrawal of the answer in the required form.

Key words: multi-agent system, man-made object, space-time state geoinformation resources, web-application, 3D-visualization, WebGL.

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MAPPING EVALUATION INDICATORS ENVIRONMENTAL AND ECONOMIC BALANCE USING GIS TECHNOLOGY

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The possibilities of a joint analysis of remote sensing data processing results, inventory information and statistical reporting Soviet and the Krasnogorsk district of the Altai Territory map for assessment of environmental and economic condition of using natural protection ratios, absolute and relative strength. Running maps produced using MapInfo geographic information system, which greatly facilitates the process, the synthesis of data for the construction of cartographic products. On the basis of the cartographic evaluation of the measurement results, an analysis of indicators of ecological and economic balance. Thus, as a result of the study were identified characteristics of the terrain areas prone to anthropogenic influences, which will within the borders of rural administrations to allocate land with special regime of use and correct ecological and economic status towards balanced and sustainable development. It revealed the feasibility of application for the calculation of indicators of ecological and economic balance of materials of remote sensing data and statistical reporting in the complex.

Key words: sustainable development of areas of ecological and economic balance, remote sensing data processing, cartography, geo-information technologies.

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THE FORMALIZED DESCRIPTION OF CARTOGRAPHICAL PROCESSES IN THE ENVIRONMENT OF GIS FOR AUTOMATED PROCESS OF CREATION OF CARDS BY UNPREPARED USERS

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In article the problem between distribution of instrumental GIS in economy and society and their mastering and application by unprepared users during creation of digital cards in case of the decision of geospatial tasks is marked. The question of a possibility of support of automated creation of cards by unprepared users in the environment of GIS is considered, without facing specific questions of cartography. The study of the matter consisted in the formalized description of cartographical processes in the environment of GIS. Treat such cartographical processes: design of a card, collection of geodata, cartographical display and geospatial analysis. Formalization of cartographical processes consists in their description in the form of functions of standard instrumental GIS. On the basis of a study of the matter the conclusion is drawn that in the environment of GIS it is required to develop an algorithm of design and use of cards in the environment of GIS for a possibility of support of automated creation of cards, and also to provide to unprepared users access to geodata and to formulate standard requests on display of geodata.

Key words: automation of cartographical processes, GIS, formalization of cartographical processes, automated creation of a card, an algorithm of creation of a card, standard requests, design of a card in GIS, use of a card in GIS, the geospatial analysis, geodata.

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LAND MANAGEMENT, CADASTRE AND MONITORING OF LANDS

ZONING AND DELIMITATION LANDS, ADJACENT TO NUCLEAR TEST SITES, FOR PURPOSES OF COMMERCIAL USING (FOR EXAMPLE SEMIPALATINSK TEST SITE TERRITORY)

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Now nuclear tests are forbidden by the international agreement "About Comprehensive Nuclear Test Ban" which was accepted by the 50th session of the United Nations General Assembly in 1996. However, for more than 50th summer history of carrying out testing of nuclear weapon more than 2000 explosions were performed. These tests caused an irreparable loss to ecology of those places where they were made. First of all the main volume of radiation pollution of lands falls on the territories of test nuclear test sites. The list and the main characteristics of the largest nuclear test sites is provided in article. Most of them are preserved and weren't used for a long time. Such parameter as the area and level of radiation pollution of land is an important factor for territory zoning and land surveying for determination of the subsequent directions and opportunities of economic use of lands. On the basis of the made analysis of spatial structures on the lands adjacent to nuclear test sites, traditional housekeeping by indigenous people, and also degree of a demand of the land parcels for industrial and agricultural industry, it's reasonable to use the new term - forced land use on lands of nuclear test sites. The main features of forced land use are given in article. As an example the scheme of distribution of radiation pollution in borders of Semipalatinsk Test Site is made. On the existing classification of zone division of lands by pollution level radionuclides have offered the correction coefficients lowering the cadastral value of land during the cadastral valuation. The conclusion is drawn on need of implementation of monitoring researches on control of the level of radiation pollution and also to control processes of migration of radionuclides.

Key words: forced land use, nuclear tests, lands of nuclear test sites, land zoning, land surveying, cadastral value, technogenic emissions of radionuclides in the environment, pollution of the «Soil-Plant-Water» system.

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QUANTITATIVE ANALYSIS IN DIGITAL SOIL MAPPING FOR NORTHERN BARABA

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Rational using of soil cover in Baraba lowland plain with dominative development of hydromorphic and saline soils must be take of knowledges on its spatial structure. Soil cover of Baraba is very important for agricultural activity in Novosibirsk Region, so it was studied so well during 20th centuary. Now we have significant data on properties, regimes, genesis for main types of soils ans soil complexes in Baraba lowland plain. Influence of ecological factors on the spatial organization of Baraba soil cover is not open in detail, especially in lowland relief forms such as drains and river beds. The part middle-scale map under investigation is on the south periphery of North-Baraba between 55º27′N and 55º37′N and 75º13′E – 78º30′E and correspones 200 km from W to E and 20 km from N to S. Such size gives to see the main particularities in spatial structure of Baraba soil cover and is enouth to determine the influence of climate on sublongitudine trends in quantitative states of soil cover components in Baraba forest steppe. Analysis of digital soil map using GIS means is the most resultative way for quantitative comparison in soil cover structure. Correction of soil contour limits is available now by aerophoto registration on unmanned flying machines. Hydromorphic soils (including subhydromorphic) dominate in soil cover structure of selected fragment of digital soil map for northern forest steppe in Baraba lowland plain where they have 90–98% of a square. Automorphic soils have a little contours on well grenaged upper parts of landscape. The most common there are solonetzes meadows, peats low moor gleic soils, meadow-chernozemic solonetzic soils, meadow alluvial, chernozemic-meadows solonetzic soils. The studies are the basis for the creation of adaptive-landscape-land information systems. Automation of agricultural production management processes will significantly reduce the risks arising from the adverse agro-climatic conditions in the territory of the Novosibirsk region, and the low agricultural value of soils.

Key words: ecological factors, soil cover, quantitative analysis, mapping soil data, Baraba lowland plain, Novosibirsk region, digital soil map, adaptive-landscape-land information systems, solonetz meadow, chernozem meadow, peats low moor gleic soils.

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GEO-ECOLOGICAL BASES OF RATIONAL LAND USE

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Rational land use (land use) is the most important principle and mechanism of modern human activities on the earth, realized by the system of organizational and legal, ecological and economical, technological and social measures and directed to provision of maximal social and economical effect of each kind of land use in condition of normal values' achievement of all other parameters. The most important among them is the ecological parameter, characterizing ecological condition of land use, caused by the influence of abiotic, biotic and anthropometric factors. The basis of forming this parameter is land protection system, being transformed in modern development conditions of land and property relations into the environment protection system surrounding people and their asset complex. From these viewpoints were analyzed scientific and methodological approaches to geoecological evaluation of territory conditions. There were drawn the conclusions about practical acceptability of the technological schemes, suggested by professors S. A. Sladkopevcev, L. K. Zjat'kova, docent. B. V. Seleznev.

Key words: rational land use, land protection, environment, soils, geoecological condition, natural conditions' evaluation, property complex, integral assessment of landscape stability.

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PLANNING AND DEVELOPMENT OF URBAN AREAS

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The aim of this article is to compare the planning and implementation of small-scale projects in areas of urban sprawl where the land is fragmented from the perspective of ownership. This shall be achieved by comparing similar developments in four countries. Two of the countries have a long and continuous experience of private ownership in respect to fragmented land parcels, whilst the two remaining countries are in transition from a central market to a free market, one of which is in the EU and the second is a candidate for accession to the EU. System analysis summarizing information on the regulatory framework and the practical activities of the relevant state authorities is used to produce meaningful conclusions.

Key words: cadaster, land management, urban agglomeration, the master plan, land use and development.

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IMPROVED MONITORING AND ESTIMATION OF FOREST LAND

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It sets out scientific approaches to the justification of the methodology and scientific and technological principles of a comprehensive monitoring and evaluation of forest land. The methodology for monitoring and evaluation of forest land includes the highest priority for conservation, the account-wide spatial and long-term effects, the formation of scientific principles. Scientific principles for monitoring and evaluation of forest lands include fixation and collection, accumulation and systematization of physical indicators, the rationale and the accumulation of economic equivalents, forming a comprehensive assessment criteria.

Key words: the methodology for monitoring, principles of a comprehensive evaluation, forest land, intensively developed territory.

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THE STUDY OF THE POSSIBLE APPLICATION OF QUADROCOPTER FOR SHOOTING THE COASTLINE OF THE FLOODED QUARRY WITH THE PURPOSE OF STATE CADASTRAL REGISTRATION

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To provide flooded quarries in the property, control over their rational use and the implementation of water protection measures requires reliable information on the characteristics of the water bodies, data including the exact location of the coastline. Water boundaries for the place of waste flooded fields are subject to change due to influences of wind and water erosion, and the peculiarities of the hydrological regime of the site, human activities and other factors. Monitoring of sufficiently high dynamics of changes in the shoreline are most effective in imagery obtained with unmanned aerial vehicles. Given the complexity of the coastal terrain and as a result, the need for a significant number of measurements of the coordinates of the characteristic points, the use of orthophoto with a corresponding regulatory documents accuracy based on the materials taken from the quadrocopter.

Key words: coastline, erosion of the surface, horizontal and vertical justification, orthophoto, unmanned aerial vehicle, coastline, relief.

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THE ASSESSMENT OF THE POTENTIAL LANDSCAPE PROTECTION AND EXISTING LANDSCAPES CONDITIONS OF THE SOUTH-EAST OF TRANSBAIKALIA

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The assessment of the potential landscape protection of the South-East of Zabaikalsky kray was conducted. The most man-impacted landscapes by developing of mining industry and by settlement zone were identified. Using GIS technology landscapes with the most at risk of loss were identified. South-East Transbaikalia is one of the most developed areas in Zabaykalsky Kray. Using GIS analysis calculated and ranked into 5 classes of values of the indicators referring to the ability of natural systems to remain stable in the existing natural conditions. In order to assess risks and threats with increasing anthropogenic impact, for each group of landscape were highlighted on the map and calculated the area modified by human impact: elements of mining and industrial complex, road network and settlements. According to the spatial analysis the landscape changing influenced by settlements covers 23% of territories, about 13% of territories are changed under the influence of the mining industry, 1% – by roads and railway impacts. At the same time landscapes of low resistance take about 5% of the territory of the South-East of Zabaikalsky kray, with an average resistance – about 1%, with a high – 78%. Among these landscapes the most at risk of loss are Amur-Sakhalin Geosystems of Argun which are presented in Zabaikalsky kray only in the described territory.

Key words: landscape diversity, landscape protection, human impact, disturbed landscape, protected areas, GIS technology, geographic information system.

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PECULIARITIES OF CADASTRAL ASSESSMENTS OF LANDS OCCUPIED BY INDUSTRIAL OBJECTS AND THEIR TECHNOGENIC POLLUTION

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The article is devoted to the question of objective cadastral land value with application of ecological factors implying methods when carrying out land-evaluation work. Ecological factors in land evaluation is important from the viewpoint of development and improvement of rational land use, land protection and complex ecological monitoring system organization. The implementation of modern methods of technogenic pollution control in calculation of real estate objects' value will allow to determine objective cadastral value of the object depending on its real ecological condition. The article considered both domestic and foreign experience of land ecological condition control when carrying out the work on cadastral value determination of real estate objects. The article formulates the complex of recommendations on improvement of cadastral evaluation of lands, intended to industrial objects, on the basis of their technogenic pollution.

Key words: cadastral evaluation, land-evaluation work, objective results, ecological factors,

technogenic load, ecological monitoring, technogenic-polluted and disturbed lands, industrial objects.

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OPTICS, OPTICAL AND ELECTRONIC DEVICES AND COMPLEXES

TECHNOLOGY OF SHAPED CHARGE ANISOTROPIC LINER MANUFACTURING

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The work is devoted to the technique of shaped charges, in particular for the manufacture of cumulative liner technologies that can be used in punching technique when shooting-blasting in oil or combatant shells or missiles. The method of manufacturing an anisotropic liner shaped charge is described. Thus as the cumulative liner material used mainly copper or copper-based alloys, aluminum or aluminum-based alloys, iron or iron-based alloys.

Key words: shaped charge jet, shaped charge, shaped charge liner, anisotropy, technology, penetration.

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MATHEMATICAL MODEL FOR CALCULATING FACTORS INTERPOLATION AND EXTRAPOLATION MICROWAVE MEASURES FOR WEAKENING COEFFICIENT MODULE REFLECTION

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The urgency of the problem lies in the fact that the development of methods and mathematical models of the measurement s-parameters in the coaxial paths in the scientific and practical aspects enhances the accuracy and adequacy of measuring S-parameters of active microwave circuits, for the improvement of the work of the microwave technology, to ultrahigh frequency range, which in turn, increases the cost-effectiveness of production.

The task of ensuring the continuity of the parameters of standard measures within its operating frequency range these days is one of the important tasks in the field of metrological assurance of measurement of parameters of complex reflection and transmission phase and module in coaxial paths. This problem is due to the fact that the certification standard measures have a finite set of experimentally determined parameters of these measures and the consumer need to know the parameters of the measures at any point of the frequency range. spline- interpolation was used to solve this problem.

A serious drawback of the previously used methods of measurement of radio circuits maintain the unity of their parameters is some isolation from the existing measurement methods and measurement error analysis methods that are not allowed to use the opportunities of high-precision measurement methods and algorithms to improve the accuracy of devices supporting traceability and vice versa.

The purpose of this article - the creation of new methods and mathematical models of high-precision measurement of S-parameters, ensuring their use in any point of the frequency range with high accuracy through the use of spline functions.

Key words: S-parameters, mathematical model, attenuator, attenuation, complex transmission and reflection coefficients, the least squares method, Fourier series.

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OPTO-ELECTRONIC PROCESSING OF IMAGES OF SPHERICAL ELEMENTS

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The aim of this work - experimental substantiation of the benefits of optical image processing above computer in the case of weak images. Radiography is one of the most effective methods of controlling the fuel elements. X-rays pass through the object under investigation and cause a greater or lesser darkening of the film exerted on the opposite side. The visual analysis radiograph to identify all elements of. If you improve the recognizability of the layers and the boundaries between them, for example, pseudocolor encoding, it will be possible to increase the information content of the control. Pseudocolor coding may be an optical or computer. This solves the problem of encoding the selected image fragment with similar brightness (in the case of monochrome images) or colors (for color images). In this paper experimentally compares the possibilities of optical, computer and computer-integrated optical method of image enhancement. As the object of study chosen black and white X-ray microfuel.- The object of the study was a black-and-white X-ray microTVEL. X-ray analysis was carried out in four ways. In the first case, the radiograph was light in a standard way, the protective layer of zirconium is not visible. In the second case, X-ray was illuminated at an angle of 30 degrees. In this case, the third layer of zirconium was seen. In the third case, the primary X-ray treated using FemtoScan computer program. Third zirconium layer is not visible. In the fourth case it is applied consistently optical and computer processing of radiographs.Clearly visible the third layer of zirconium. In the case of weak image analysis application FemtoScan computer program does not allow to identify the external zirconia layer. It should be a joint use of two methods - optical and computer. It is most effective.

Key words: black-and-white roentgenogram, pseudocolor encoding, eye's color response, complementary color, roentgenogram informativeness increasing, spherical elements, images.

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ECOLOGY AND ENVIRONMENTAL MANAGEMENT

COMPUTER ANALYSIS OF LAMINA IMAGES OF *POTENTILLA FRUTICOSA* FOR BIOINDICATION OF URBANIZED TERRITORIES

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The article draws the investigation results of morphological parameters changes of *Potentilla fruticosa* lamina of the plants growing in condition of transport and industry pollution in Novosibirsk. Morphometric parameters of lamina were determined on the basis of computer analysis of their digital images by means of GIS. It is stated that the plants *P. Fruticosa* in response to technogenic impact reveal the reaction, expressing itself in reduction of assimilating bodies, shortening of length of annual twigs and leaf stake, increase of the parameter of fluctuating asymmetry of the terminal lobe of leaf in comparison with background plants. It is shown that the quality of urbanized environment based on the value of fluctuating asymmetry of terminal lobe corresponds to high level pollution, that of background – to low level pollution.

Key words: *Potentilla fruticosa* L., computer analysis method, digital images, morphological parameters, fluctuating asymmetry, lamina, bioindication, transport and industry pollution.

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METHODOLOGY OF SCIENTIFIC AND EDUCATIONAL ACTIVITY

J. W. GOETHE'S IMAGE IN SASHA CHORNY'S POESY

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The article deals with a J.W. von Goethe's image represented in the Sasha Chorny's lyrics «In the German Mecca» and «Goethe». This image is based on the literary tradition of the romantic bi-worldness which presumes splitting a world image in two realities. One of them is a material existence, world of philistines, ordinary people. Another is a kingdom of the spirit which only an artist or dreamer could access to. At the same time he or she is a creature involved with the material existence and realizes his or her duality. As a result the artist's image gets ambivalent. The Goethe's image in the Sasha Chorny's lyrics is built with reference to this ambivalence. There are two «Goethes» consequently. One is from the philistines' world. He has to adjust to his environment, to hide or to escape. Another is a titan, demiurge and rightful lord of the imaginary world created by him.

Key words: dialog of cultures, Russian literature of the XX century, Silver Age of Russian poetry, Sasha Chorny, Goethe's influence, Johann Wolfgang von Goethe, Alexander Pushkin, romantic bi-worldness, genius, philistines, demiurge.

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