

**SYSTEM LINK OF STABLE AREA DEVELOPMENT AND ITS
GEODETIC DATAWARE**

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An important role of stable area development geodetic dataware and their system link are shown. Generalized scheme and the scheme of system link of stable area development and its geodetic dataware are given.

Key words: sustainable development of territories, system approach, geodetic dataware.

**THE RESULTS OF GRAVIMETRY AND HIGHLY-ACCURATE LEVELING
APPLICATION FOR HIGH GEODINAMIC RISK AREAS LOCALIZATION
ON HYDROCARBON DEPOSITS**

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The article presents the results of natural geodetic and gravimetric observations on an example of Sporyshevsky geodynamic site. Recommendations on the perfection of technology of work are given.

Key words: gravimetry, precise leveling, aerodynamic ground , bad risk area localization.

**TECHNOLOGY OF PROCESSING OF RESULTS OF GEODETIC
MAINTENANCE 3D SEISMIC PROSPECTING IN TERRITORIES OF OIL
FIELDS AND GAS**

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Is considered the automated "through" technology of processing of results of geodetic main-tenance seismic and Prospecting works on a uniform information basis.

Key words: geodetic maintenance, seismic prospecting, a technique, the automated technology.

FEAFURES OF THE TERRESTRIAL LASER SCANNING FOR THE PURPOSES OF MONITORING OF RAILWAY TUNNELS

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The article describes the principles of investigation of railway tunnels deformations by means of terrestrial laser scanning facilities.

Key words: railway tunnel, terrestrial laser scanner, technology, digital model, inside tunnel sketch, tunnel state estimation.

SYNGULAR ANALYSIS OF SOME SPACE GEODESY TASKS SOLUTION

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The questions of the way of linear equation solution choice are considered, which provide with regular and correct problem statement of complex nonlinear dynamics state parameters evaluation in space geodesy.

Key words: dynamic system, technique of least squares, the system of nonlinear equations, condition number, singular decomposition, solution stability.

TAKING INTO ACCOUNT THE TOPOGRAPHIC MASS ENFLUENCE DURING THE CALCULATION OF PERTURBED POTENTIAL

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In the middle of the previous century M.S. Mlodensky developed the theory of Earth's figure study with the help of the results of ground-based measurements . According to this theory, all measured gravity forces should be corrected, taking into account all Earth's topographic masses. So far, this demand was not

completely followed. Only some corrections, taking into account the limited area relief data, were introduced.

In our work we suggest to take into account all topographic earth's masses, located above the level of reference ellipsoid. For the conservation of condition of given ellipsoid and Earth masses parity it is suggested to correct for normal gravity force which compensates “the withdrawal” of topographic masses.

Key words: shape of the Earth, perturbed potential, reference ellipsoid, quasigeoid, gravity force anomaly, intermediate (topographic) layer.

MATHEMATICAL TREATMENT OF SATELLITE POSITION FOR STATE CADASTRE PROPERTY PURPOSES

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The problem of geodesic satellite nets, exceeding initial geodesic foundation in accuracy, is examined in the article. Algorithms, that allow calculating matrix of weighting coefficients taking into account errors of initial data, are given and their brief analysis is made.

Key words: geodetic net, GPS-measurements, input data errors, origin stations of geodetic nets, correlation matrix, leveling with taking into account initial data errors

RECTANGULAR PLANE COORDINATES TRANSFORMATION

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In the paper a solution of the task of rectangular plane coordinates transformation appeared with the introduction of new local coordinate system in Novosibirsk region is shown. The research of different mathematical models and coordinates transformation techniques has been done under the condition of real manufacturing entity and the results obtained has been analysed. Practical guidelines for the usage of developed by the author techniques are given.

Key words: coordinate system, local coordinate system.

ADAPTIVE ALGORITHM OF EARTH ROTATION MODEL APPROXIMATION

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Adaptive approximation according to required accuracy of classical model of Earth rotation is considered. The adaptive model is adjusted with prescribed by user accuracy with the help of re-placing of twelve rotation angles by three angles of Cardano and Chebyshev's alternance. Consider-able diminution of trigonometric terms number increases the speed of computation and allows to use the model for solving different tasks of space geodesy, connected with numerical integration of differential equation of sputnic's motion.

Key words: Earth rotation model, adaptation, Cardano angles, Chebyshev alternance

MATEMATICAL FORMULATION OF RECENT EARTH CRUST MOTION

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With the example of spatio-temporal changing of the earth's surface point there is represented the technique of general geokinematic parameters study, i.e. earth's surface deformations, which are specified by e displacement in space.

Key words: geodetic level, recent earth crust vertical motion (RECVM), speed of RECVM.

THE RESULTS OF EXPERIMENTAL INVESTIGATIONS OF 3-DIMENSIONAL STANDARDISED VIDEOSTAGE TECHNOLOGY OBTAINING BASED ON AEROSPACE SURVEYING DATA

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The paper is devoted to new kinds of digital geospatial products – 3D to models. Results of experimental works on research of accuracy are resulted the scheme of technology of reception of a measuring three – dimensional videostage on materials of space shootings.

Key words: territory, three-dimensional measuring videostage, DMD, DMO, estimation of accuracy.

BOTH NATURAL AND TECHNICAL COMPLEXES OF OB RIVER SYSTEM IN NOVOSIBIRSK AREA

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The results of system analyses of natural systems, situated within Novosibirsk area Ob river system are given, made with the goal of the consequences of man's industrial and economical activity study. Detailed study of such kind gives reliable and scientifically grounded data, which are necessary for information support of working out the ways of rational natural resources management and environmental protection, ecological capacity evaluation, resistance to anthropogenic impact on the environment and their suitability for practical usage. The role of isolated natural systems undergoing anthropogenic impact monitoring in identification of evaluation criteria of the character of their changings is considered. Systems, including both natural and technical systems at different hierarchic levels and belonging to different branches of industry are described.

Key words: systems, including both natural and technical ones; rational natural resources management, information support, environmental protection.

GEOINFORMATION SUPPORT OF PIPE-LINE FEED SYSTEM IMPACT ON NORTH TERRITORIES LAND RESOURCES EVALUATION

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The fundamentals of negative pipe-line feed system impact on north territories land resources evaluation and traditional ways of natural resources management of aborigine people of small population groups are considered. The components of geoinformation support for this task solution are represented.

Key words: pipe-line transport system, geoinformation support, geoinformation modeling, traditional wildlife management.

МЕТРОЛОГИЯ И МЕТРОЛОГИЧЕСКОЕ ОБЕСПЕЧЕНИЕ

THE ESTIMATION METHOD OF BRIDGE CRANES AND FABRICATED METALS DEFORMATIONS

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In this article the method of bridge cranes and fabricated metals deformations with the use of modern digital methods of registration and processing of measurements (for example, digital leveling instrument) is suggested. This

procedure allows to detect the bending deflection of bridge accurate within 0,2–0,3 mm, and the deformation of fabricated metal within 0,05–0,1 mm.

Key words: methods of measurement of force, bridge crane, digital levelling instruments, metallic structures.

THE DEVELOPMENT OF THE METHOD OF THE MEASURES OF FORCE CERTIFICATION WITH THE HELP OF THE MEASURES OF LENGTH

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In this article the method of standard measure of force certification with the help of the measures of length is suggested, which will allow to get remotely high-precision and reliable measurements and to automatize this process, excluding human error.

Key words: force, measures of force, digital levelling instruments, laser interferometer.

ОПТИКА, ОПТИКО-ЭЛЕКТРОННЫЕ ПРИБОРЫ И СИСТЕМЫ

THE EXPERIMENTAL INVESTIGATION OF BEAMS TORSIONAL OSCILLATION PARAMETERS OF MICROMECHANICAL DIFFRACTION GRATING REFLECTORRAY

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Micromechanical diffraction grating reflectarray can find an application in optoelectronics as a device that controls the intensity of the reflected radiation. A graphical method enables to determinate the angle rotation of beams and other parameters torsional oscillation.

Key words: micromechanical grating reflectarray, torsional oscillation, resonance frequency.

TERMOMECHANICAL PROCESS IN MULTI-LAYER NANOSTRUCTURES INITIATED BY LASER IRRADIATION

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Theoretical models and methods to calculate the thermal fields and thermomechanical in the multilayer structures on substrates exposed to laser step shaped pulse, including, possibility of the account of phase transformations of substance in structure inside layers are investigated. The spatial-temporal distribution of temperatures in a four layer thin-film nanostructure is studied, and values for displacements of outer boundary of the structure which are induced by laser irradiation are obtained.

Key words: laser irradiation, multilayer nanostructure, thermogram.

ГЕОИНФОРМАТИКА

AUTOMATED CLASSIFICATION AS AN EFFECTIVE SOLUTION FOR URBAN-AREA MONITORING APPLICATIONS

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Interpretation of high-resolution images is the key process in urban-area monitoring applications. Automation of this procedure allows to raise the monitoring efficiency. In case of very high-resolution imagery, object-based classification algorithms are becoming more widely used due to their capabilities to analyze both spectral characteristics of the image objects and their spatial parameters (texture, shape, size). The efficiency of these algorithms is exemplified with the satellite images of Ekaterinburg using eCognition software.

Key words: monitoring, automated decoding, algorithm, space photo, classification.

EXPERIENCE OF CREATING THE GEOINFORMATION SYSTEM FOR EMERGENCY MANAGEMENT IN SVERDLOVSK REGION

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The article examines the experience of developing a geoinformation system for emergency management as well as its application in predicting damages and evaluating risks for population (territories).

Key words: emergency, prediction,(forecast), geoinformation system, risk.

КАРТОГРАФИЯ

BIOGEOGRAPHIC MAPPING: RECENT STATE AND RANGE OF APPLICATION FOR PRESERVING AND CONSERVATION BIOLOGICAL RESOURCES

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In the article it is revealed the experience, accumulated by modern biogeographical mapping. The prospects of biogeographical mapping in SSGA are considered.

Key words: biodiversity, biogeographic maps, biological species, ecosystem.

ON THE QUESTION OF THE EARTH'S SURFACE STATE OF STRAIN MAPPING

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The techniques of angle charge and the curvature of the Southern part of Western Siberia speed changing are given.

Key words: recent Earth's crust motion, geokinematic characteristics, horizontal velocity gradient.

ЭКОНОМИКА И УПРАВЛЕНИЕ ТЕРРИТОРИЯМИ

ECONOMICAL EDUCATION AND LABOUR-MARKET DURING MODERNISATION

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In the work a labour market model in Russia for people with economical and technical education is considered with the goal to prove the necessity of its

transformation, because during modernization the demand for technical professions should increase.

Key words: economical education, labour market, modernization of the country's economy, market supply and demand, world depression, elimination of structural unemployment, higher and specialized educational establishment.

EVALUATION OF SIBERIA AND URAL FOREST LANDSCAPES SOCIAL FUNCTIONS

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In the paper it is reviewed the economic evaluation of forests from ecological point of view in consideration of their social functions. The scheme of forests usage differentiation is given, the analyses of social incorporeal benefits natural exponents is made and the transfer from such indicators to their economic equivalents is fulfilled.

Key words: evaluation, social functions, forest landscape, recreation, ecosystem, urban environment, economic equivalents.