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NEW STAGE OF GEODESY DEVELOPMENT: INVESTIGATION OF EARTH BLOCKS DEFORMATION IN REGIONS OF COAL DEPOSITS DEVELOPMENT

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The new stage of geodesy development is shown to comprise investigation of time changes as concerns Earth blocks deformations in the regions of coal deposits development. It has been ascertained that each new stage of geodesy development requires improvement of instruments and new techniques. New technological solutions on improving the geodynamic networks on testing areas are offered.

Key words: Earth crust block, grade, geodynamic testing area, deformation.

NORMAL ACCIDENTAL MEASUREMENT ERRORS IN GEODETIC NETWORKS AND LEAST-SQUARE METHOD ASSESSMENT

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The problem under consideration deals with normal accidental measurement errors compensation by least-squares method estimation . The authors present measurement compensation results for some types of geodetic constructions as concerns measurements distorted by normal accidental pseudo-errors. Modeling proves that the least-square method assessment may compensate for the errors.

Key words: normal pseudo-errors of measurements, least-square method assessment.

NEW METODOLOGIES IN PROJECTION OF LAGRANGE

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The modern technologies in the field of geodesy and geographical information system are important in surveying work; this paper presents a system of coordinates in projections by harmonic equations or united projections, which has five projections (Mercator, Lambert, Russell, Lagrange, and the compound projection) in one zone coordinate system. The theory of the projection by harmonic equations as well as Lagrange projection has eight direct algorithms defined by Professor Vladimir Podshivolev 1998 with a very complicated method.

A new methodology has been established for Lagrange projection with unlimited direct algorithms. This method is more simple as well as more accurate than the other methods.

Key words: Mercator projection, Russell projection, Lagrange projection, algorithms, system, distortion.

CORRELATION OF ACCIDENTAL MEASUREMENT ERRORS FUNCTIONS

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The authors investigate correlation of repeated determinations of polygon traverse points coordinates as functions of random measurement errors.

Key words: correlation, coordinates, analysis, differences, errors, functions.

STUDY OF ACCURACY IN TRIGONOMETRIC LEVELING BY METHOD “FROM THE MIDDLE” WHEN SIGHTING OVER DIFFERENT UNDERLYING SURFACES

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The results of the research are presented as concerns leveling by inclined ray on the plane surface using high-precision total station for 60 to 340 m distances. The investigation was conducted along the road with directional ray transmitted over three underlying surfaces: sand, grass and asphalt.

Key words: trigonometric leveling, total station leveling, height.

FACTORS AFFECTING TRUE ALTITUDE DETERMINATION ACCURACY BY PHOTOGRAMMETRIC TECHNIQUES FOR HELICOPTER EXTERNAL PLATFORM OF AERIAL GEOPHYSICAL STATION

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The factors affecting the accuracy of true altitude determination by photogrammetric techniques are considered as concerns aerial geophysical platform.

Key words: true altitude, altimetry, geodetic dataware, technique, photogrammetry.

SIGHTING ACCURACY STUDY FOR STEREOMODEL POINTS DEVELOPED BY HIGH-RESOLUTION SATELLITE IMAGES WITH DIFFERENT IMAGE EXPANSIONS

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The paper presents research results as concerns sighting the stereo-model points. The model was constructed by super-high-resolution satellite images with different zoom-ins.

Key words: satellite images, sighting, accuracy estimation.

IMPROVEMENT OF STATE PROPERTY CADASTRE MAINTENANCE MODEL IN RUSSIA

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Main problems of current property cadastre model in Russia are considered. The way to solve them is offered. The functions of cadastre maintenance are to be distributed between federal bodies for cadastral registration and those of the subjects of R.F.

Key words: cadastre, principles of cadastre development, GIS.

REGIONAL STANDARDS OF URBAN DESIGNING: PRINCIPLES OF DEVELOPMENT

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The principles of developing regional standards for urban designing are substantiated. They are aimed at subject externalia application for the benefit of people and economy.

Key words: sanitary-and-epidemiologic requirements, functional and territorial zones, externalia, Earth's fate, water factor.

RATIONAL LAND USE AS A PROBLEM OF GIS SPATIAL ANALYSIS

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The problem of land use is considered from the point of view of geodesy and geoinformatics as every land unit is a geospatial object with a wide range of attributive signs both spatial and semantic. When taken into account they allow for creating the system of indices for actual and potential efficiency of the unit use.

Key words: rational use, land unit, geospace, attributive signs, system of indices.

EXPERIENCE OF ENTERING ZONES OF SPECIAL USE CONDITIONS INTO STATE PROPERTY CADASTRE

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The experience of describing the location and entering the boundaries of protected cultural heritage zones of Novosibirsk territory into the state property cadastre is considered. The requirements and criteria for creating digital model of land management units are offered.

Key words: description, land management unit, boundary plan, requirements, criteria.

FEATURES OF CADASTRAL REGISTRATION OF PROPERTY UNIT PARTS WHEN CONCLUDING LEASE CONTRACT

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The authors deal with some features of cadastral registration of property unit parts when concluding lease contracts subject to state registration.

Key words: state cadastral registration, property units parts, technical plan.

SOCIAL COMFORT OF POPULATION: CALCULATION OF INDEX TO IMPROVE REAL PROPERTY EVALUATION SYSTEM

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The concept of integral index for population social comfort is considered. The necessity of applying this index for calculating the real estate tax is proved. Basic indices of population social comfort are described. They may be calculated on the basis of GIS-analysis of the territory.

Key words: social comfort, real estate tax, infrastructure, cadastral evaluation.

HEAT MODEL OF PHOTODETECTOR DAMAGES DUE TO HIGH-POWER NANOSECOND LASER EMISSION

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The review of the research on the process of laser irreversible destructive effect on photodetector elements is presented. The heat model of detectors laser blinding is considered. Assessed results of photoemission- and photoelectric receiver radiation resistance are shown.

Key words: photodetector laser damage, radiation resistance, photoemission- and photoelectric devices, IR spectrum.

LIGHT SCATTERING FROM LASER CERAMICS SURFACE

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The research results concerning optical and spectroscopic characteristics of laser ceramics materials are presented. The ceramic surface integral scattered intensity is shown to be about 98% of incident radiation.

Key words: laser ceramics, integral scattered intensity, rare-earth elements, diffuse scattering.

RESEARCH OF REAL VELOCITEIS OF OPTICAL WAVES BY THE RESULTS OF PRECISE INTERFEROMETER AND OPTICAL RANGE FINDER MEASUREMENTS

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The paper presents an experimental confirmation of the fact that in dispersive media only group wave velocities may exist. Application of phase wave velocities in current laser ranging results in additional errors. It is noted that any experimentally measured refractive index of dispersive medium is actually a group index which is wrongly referred to as ”a phase refractive index”. To realize practical importance of this research special attention should be paid to the correct formulas to be used for determining the group refractive index of optical waves in atmosphere.

Key words: laser ranging, dispersive media, troposphere, group velocity, phase velocity, electromagnetic wave modulation, deterministic signals, laser interferometer, laser tracker, optical range-finder refractometer.

MAXIMUM SPEED OF SOLID CUMULATIVE JET

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Maximum speed of solid cumulative jet in hypercumulative charge is shown as considerably exceeding gas-dynamic speed limit.

Key words: cumulative jet, cumulative charge, jet speed.

RETROSPECTIVE MAPS OF SETTLEMENT LANDS SOIL COVER TO BE USED IN CARTOGRAPHIC PRODUCTS CLASSIFICATION

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Some types of map classification are offered. The map under consideration may be made when reconstructing soil cover of the settlement for economic purposes. With classifications according to purpose, territory extent and forecasting taken into account the map becomes a specialized one, presenting land resources, i.e. retrospective map of settlement soil cover

Key words: maps classification, thematic maps, special maps, retrospective maps.

CLASSIFICATION AND SUBSTANTIATION OF CONVENTIONAL SIGNS FOR ROOFS IN 3D MAPS OF VIETNAM BASED ON FENG-SHUI AND U-SIN

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The paper presents classification of houses and structures roofs in Vietnam. The colours and conventional signs structure for roofs in 3D cartographic images are substantiated. The solutions are based on the propositions of Feng-Shui and U-Sin from ancient Chinese philosophy popular in South-East Asia. Both concepts and their interrelation are considered in brief. Some drawings and tables to illustrate the offered solutions are presented.

Key words: conventional signs, houses roofs, colour and structure, 3D maps, Vietnam, U-Sin, Feng-Shui.