SUMMARY

INTERNAL FRICTION IN PTFE-BASED NANOCOMPOSITE MATERIALS FILLED WITH Fe CLUSTER-DOPED CNTs

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The present research deals with the comparative study of internal friction $Q^{-1}(T)$ and shear modulus $G \sim f^2(T)$ temperature spectra of reference (unfilled PTFE) and three new trial nanocomposites based on PTFE matrix filled with 2.5 wt%, 5 wt% and 10 wt% of Fe cluster-doped CNTs. The measurements were performed in vacuum ($\sim 10^{-4}$ torr) using a relaxometer with torsional pendulum at frequencies 0.5÷5 Hz, amplitudes of deformation $10^{-5} \div 10^{-3}$, and the rate of heating ~2˚C/min in the temperature range 20÷400˚C. A pronounced dependence of mechanical relaxation characteristics and transitions in PTFE on the amount of the introduced Fe cluster-doped CNTs, as fillers, was revealed. Particularly, both, β-peak of a crystalline first order transition and α-peak of an amorphous transition, observed in $Q^{-1}(T)$ curves of the unfiled PTFE at 25˚C and 125˚C, are shifted to higher temperatures for ~7˚C, ~15˚C and ~25˚C, respectively, in the cases of the nanocomposites containing 2.5, 5 and 10wt% of the above mentioned filler. Consequently, shear modulus rises considerably, and the activation energies of both β and α relaxation processes in the nanocomposites increase by ~25%. Alteration of the ratio between the β- and α-peak magnitudes depending on the content of the filler, shows that the above mentioned filler suppresses the crystalline first order transition in PTFE.

Keywords: Internal friction, PTFE, nanocomposite, Fe cluster-doped CNT, SEM-EDX, filler, shear modulus.

SUMMARY

SIMULATION OF RADIOMEASUREMENTS USING MULTISIM

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The article describes the capabilities of the multisim for modeling of radio electronic circuitry and the process of radio measurement, also justified the feasibility of its use for teaching and training future Bachelors of Telecommunications.

Keywords: radiomeasurements, modeling, multisim.

SUMMARY

ON QUANTUM, TACHYONS AND SUPERLUMINAL SPEED

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The question about existence of tachyons, or particles moving with superluminal speed, is a fundamental problem of modern physics. Generally, there is an idea as if Einstein's theory of relativity categorically denies superluminal speed. But it is incorrect. Mathematical apparatus of this theory gives a complex version, when a mass is an imaginary volume, and speed ratio v>c. Mass is a dynamic secondary formation resulted from interrelation between electric and magnetic quantum. Inevitable provisions of interrelation are presented in Maxwell's equations. These provisions may be broken. It is resulted in demolition of dynamic structure. Mass terminates existence. Upper speed limit will be vanished. Neutron is magnetic quantum, which has lost contact with electric component of particle. It has no mass. New concept does not deny classical laws of physics, but it only affirms that these laws are lawful only in some range, out of which there is an unknown state for scientists, where the laws of physics containing the mass are not applicable. New vision, methods and instruments are required. In particular, it is possible that tachyon is not only superfast but superstatic too. The well-known elementary particles are locked dynamic structures in some localized space. Their immobility is false. Differently from them, tachyon may be moved to absolute static state in case of zero meaning of their equivalent active forces. In such state, they may be called restons.

Keywords: superluminal speed, absolute immobility, tachyons, lochtahyons.

PRELIMINARY RADIOLOGICAL INVESTIGATION OF ANASEULI SITE

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Radiological contamination represents one of the serious problems for human health and nature. Due to vandal actions at the 1990 s, at western Georgia, the territory of Tea and Subtropical Corp Research Institute was contaminated by different radionuclides. Radiological contamination was discovered at 2006 and afterthought several expert missions from Nuclear and Radiation Safety Service (former name of Agency of Nuclear and

Radiation Safety) were conducted. During the missions, they found contamination with radionuclide ^{137}Cs and areas where broken unsealed ^{14}C sources were discovered. As a result of the missions, experts issued the recommendation for removing the upper layer of the soil. The recommendation was unable to conduct due to the absence of the storage or disposal capacity for cut soil at time of period. At 2013 some remediation activity was conducted on the site. Five underground pits were organized in three locations, where part of contaminated. The dose rate 0.5 μSv/h was used as a radiological criterion, to identify the contamination level. Nowadays radiological contamination still exists at the site and Agency of Nuclear snd Radiation Safety, which represents the regulatory body in Georgia, decide to conduct remediation activities for site release from regulatory control and now remediation project is in its first steps.

Keywords: radiactive, waste, remediation.

SUMMARY

CALCULATION METHODS OF 0,4 KW VOLTAGE NETWORKS HAVING THE SOURCES OF SINUSOID SHAPE DISTORTION OF VOLTAGE AND CURRENT

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It is ascertained that the most efficient method of influence of calculation of non-sinusoidality of current and voltage on additional losses of electricity represents calculation of that replacement scheme, where the distortion loads are represented by n-form harmonic power sources, and network parameters are calculated taking into account the surface effect.

Keywords: harmonica, source of distortion, replacement scheme, non-sinusoidality of the current, loading junction.

SUMMARY

SIMPLIFIED MATHEMATICAL MODEL OF CALCULATION OF ELECTRICAL LOAD OF THE BUILDING

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In the work a simplified mathematical model is offered to solve the problem of calculation of electrical loads of residential houses, which gives the opportunity to be researched with high accuracy the impact of different parameters on the calculation of accuracy of day-and-night schedule of power consumption and loadings of residential houses.

Keywords: mathematical model, load schedule, power consumption, seasonal coefficient.

SUMMARY

DETERMINATION OF RELIABILITY CHARACTERISTICS OF THE NON-REDUCABLE SYSTEM OF GAS DISTRIBUTION NETWORKS AT COLD AND LIGHT RESERVATION AT LOOPING EXISTENCE

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The work deals with the determination of reliability characteristics of the gas distribution networks in cold and lightweight reservation, in the case of looping. The following assumptions are accepted in the work: The switching device of the reserve is absolutely reliable, as for the reserve element (looping) cannot be abort, until it is activated. As a result, there are certain analytical representations describing division of abort risk and probability density of the system.

Keywords: gas distribution network, reliability, cold and light reservation, density function of probability distribution.

SUMMARY

ON THE EFFICIENCY OF THE WIND POWER PLANTS (WPP) IN GEORGIA

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In order to describe the wind power potential in each particular region of Georgia, the Adequacy Coefficient is derived. Based on it, the level of compatibility, between the wind power potential and power system interests of Georgia, is measured. Based on particular example, the effectiveness of the wind power plant for the purpose of power system development is presented.

Keywords: adequacy coefficient, wind power potential.

SUMMARY
THE USE OF CONTOUR BLASTING AT QUARRYING OF ORNAMENTAL STONE TO MAINTAIN THE INTEGRITY OF THE MASSIVE
Chikhradze N.M., Khomeriki S.K., Apriashvili A.G. and Kuchukhidze Z.K.
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The article presents the results of the theoretical research and laboratory and field experiments carried out to determine effect of the ratio between detonation of explosives and the speed of strain wave in rock on destruction degree of monolithic and fissured massifs; optimum ways for obtaining of underground openings' wall and arch final contours, allowing to get uneven surfaces, which uncertainty does not exceed 5 cm. The table and diagram, presented in the article, illustrate the diameters of holes and the distance between them, relationship in the opening, parameters necessary for obtaining ideal, maximum close to project, contours.
Keywords: explosives, long charge, detonator card, detonation of explosive, speed of ware, contour explosive.

HYDROENERGY – THE BASIS OF COUNTRY ECONOMY
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Maastricht University
Abstract. In modern world, the power sector is largely responsible for sustainable development of the particular country. It is the economic backbone of any country. Obviously, the development of energy infrastructure for our country is one of the main directions. Through the construction of HPPs Georgia can offer local and foreign market.instead of one of the cheapest and most traditional energy sources in the world, ecologically pure and at the same time renewable electricity. In addition, energy independence is one of the most important challenges for Georgia both in economic as well as political viewpoints and security. The development of the country is impossible without strong energy sector.
Keywords: hydropower, deficit, ecology, renewable.

SUMMARY
ANAKLIA PORT AND FREE ECONOMIC ZONE
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On the north-east coast of the Black Sea, the deepest 16-meter port in Anaklia will be able to serve the largest, panamax and postpanamax ships. It was called a century project. A free industrial zone adjacent to the Anaklia port will be another important factor for Anaklia's huge potential to simplify trade between Europe and Asia. It will be one of the most important parts of the global project "New Silk Road: One Girdle, One Way", aimed at strengthening of the East and West Infrastructure Connections. Georgia will actually become the gateway between East and West, between North and South. Georgia will become a strong transit, transport, financial, tourist and industrial hub.
Keywords: port, Anaklia, infrastructure, hub, canyon.

SUMMARY
GEOCHEMICAL ENVIRONMENT OF FORMATION OF SPECIFIC CHEMICAL COMPOSITION OF THE MINERAL THERMAL WATERS OF ABASTUMANI
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National Agency of Mines
Specific chemical composition of the mineral thermal waters of Abastumani is determined by the geochemical environment in the areas of deep trench structures of the Achara-Trialeti fold zone and the tectonic breakdown zones of the deep layer, where the waters are formed.
Keywords: ground water, mineral thermal waters, hydrogeochemistry.

SUMMARY
MICROBIOLOGICAL RESEARCH OF THE WATER OF LAKE PALIASTOMI
Abramia G.V., Gverdtsiteli L.V. and Eristavi D.V.
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The microbiological survey of the water of Lake Paliastomi according to epy seasonal migration of migratory birds was carried out.
Keywords: water, bacteria, pollution, migratory birds.

MATHEMATICAL-CHEMICAL INVESTIGATION OF THE INDIUM HALIDES
Karchkhadze M.G. and Gverdtsiteli M.I.
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Indium halides were studied within the scope of GANB-matrices method. Two correlation equationswere derived and investigated. The correlations are satisfactory.
Keywords: indium halides, GANB-matrices method, correlation equations.

SUMMARY
MATHEMATICAL-CHEMICAL INVESTIGATION
OF MONOHYDRIC SATURATED ALCOHOLS
Gverdtsiteli M.I., Sidamonidze N.N., Chachua E.I. and Koiava N.A.
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Tbilisi State Medical University
Within the scope of the GANB-matrices method monohydric saturated alcohols were investigated. The correlation equation was derived. It is satisfactory.
Keywords: alcohols, GANB-matrix, correlation equation.

SUMMARY
MATHEMATICAL CHEMICAL INVESTIGATION OF BIS(DIALKYLARSINO) – 1,4 – DIHYDRONAPHTHALENES
Gverdtsiteli M.I. and Robakidze H.Z.
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Bis (dialkylarsine) – 1,4 – dihydronapthalenes were investigated within the scope of QANB – matrices method. Correlation equation was devided. The correlation is satisfactory.
Keywords: bis(dialkylarsino) – 1,4 – dihydronaphthalenes, QANB – matrices, satisfactoy correlation.

SUMMARY
MODIFICATION OF THE METHODS OF SYNTHESIS OF NON-TOXIC AZEMETHINE
Chelidze N.T., Antia G.R., Matitaishvili T.R., Ochkhikidze N.T. and Elizbarashvili E.N.
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Agricultural University of Georgia
As it is known Schiff bases are well-known catalysts, pigments, dyes, intermediate products in organic synthesis, stabilizing agents for polymers, inhibitors of corrosion and etc. In the present work synthesis of 20 member macroheterocyclic azomethyne compound was studied, which included two steps. For each of them purification resultant of reaction by "bisulfite" method was developed. Which gives capability to extract products with high purity by effortless process. On the other hand, it is possible to regenerate reactant and intermediates for future using.
Keywords: macroheterocyclic, azomethines, dyes.

SUMMARY
THE NEW MODIFIED METHOD OF THE SYNTHESIS OF OLSALAZINE
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Agricultural University of Georgia
We presented modified two-step synthesis of Olsalazine, which was based on conducting diazotization and coupling reactions in the presence of tetrafluoroborate anions. The advantages of using tetrafluoroboricacid instead of hydrochloric acid are: a) significantly increases the solubility of the starting amine and lowers the amount of water in the reaction mixture; b) intermediate diazonium salt is presented as precipitate and it can be isolated and stored for later usage; c) does not require urea or separation of nitrous acid; d) diazocoupling reaction can be carried out in the minimum amount of solvent, which increases the yield of target molecule due to its high solubility in water.
Keywords: nano containers, macroheterocyclic, olsalazine.

SUMMARY

RESISTANCE OF MACHINE OIL "SOLIDIFIED" BY SAWDUST TO THE ACTION OF WATER

Razmadze M.T., Kiknadze G.G., Imnadze P.M., Getsadze T.S., Kvirikashvili Ts.I., Rostomashvili Z.I. and Ambardanishvili O.P.

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The results of additional investigations of solidification of radioactive machine oil by different types of sawdust (being the cheapest material) and of the resistance of "solidified" oil to the action of water have been considered the article.The obtained results prove that the use of sawdust for solidification of radioactive oil is a rather promising and effective method.

Keywords: radioactive machine oil, sawdust, stability.

SUMMARY

THE INFLUENCE OF SEVERAL OUTER CONDITIONS ON PLANT STEADINESS TOWARDS PESTS

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Environment is a significant factor that influences pests on plant steadiness. Outer conditions effect both on insects and plants as a result of which the reaction of insects towards plants changes. Soil and climate conditions are important factors, which can change plant character, so that it reveals steadiness against pests. Outer factors mostly effect on plant hardiness, the quality of which is considerably determined by the bringing-up conditions of the culture and partially by agrotechnical measures.

Keywords: plant, pests, agrotechnical measures, soil and climate.

SUMMARY

GENETIC DEFINITION OF PATHOGENECY AROSING PLANT DISEASE

Kanchaveli Sh.S.

Scientific Research Centre of Agriculture

It is determined that pathogenecy is controlled by several genes. Pathogenecy is characterized by virulental and aggressive features.Virulancy reflects qualitative side of pathogenecy, which is controlled by genes and the relationship between master-plant and pathogen is determined by the interaction between master-plant steadiness genes and pathogen virulancy genes. Features connected with aggressive side (pathogen growth speed in tissues of master-plant, size of damage, the number of formed spores) are determined by polygene system.

Keywords: adverse effect, plant diseases, pathogenic changes.