**SECTION I. technical sciences**

УДК 519.87:[629.5.03:629.563.3]

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**MATHEMATICAL PRINCIPLES OF SIMULATION
OF POWER PLANT’S CONTROL SYSTEM AT DRILLSHIP**

Based on ship’s power plant decomposition as an object of mathematical modeling we demonstrated the structure of the local systems and various control functions of thrusters of combined propulsion systems at drilling vessels with dynamic restrictions of positioning systems, controlling vessel’s position and course under the influence of disturbances’ vector. Using non-linear matrix inequalities allowed to solve the problem of optimal distribution of thrusters traction by moment control method and capacity of the propeller and the engine, which will improve performance, stability and capacity of the ship's electric powerplant while increasing the positioning accuracy. The problem of optimal distribution of strictly aimed rods azimuthally rotating thrusters is solved by quadratic optimization method online DP system in the time domain.

**Key words:** power plant, mathematical modeling, control function, dynamic positioning, matrix inequalities, online optimization.

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ELECTROMECHANICAL STABILIZATION SYSTEM
OF CUTTING POWER WITH FUZZY CONTROLLER

The paper deals with the application of fuzzy-regulator for feed electric drive control in the automated system, which maintains the cutting power of machine-tool on required level and increases machine tool productivity. The results of computer simulation of the system are presented.

Key words: fuzzy-regulator, feed, electric drive, cutting power, machine tool, computer simulation.

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**RESEARCH OF ASYNCHRONOUS ELECTRIC MOTOR MODEL
ON LOADING POSSIBILITY BY MEANS OF UNDERFREQUENCY
OF FEEDING VOLTAGE**

In this article the method of asynchronous electric motor loading without use of additional loading is considered. The given method wasn't used before due to the lack of specialized load stands. At present semiconductor frequency converters allowing to change electric drive coordinates in wider range became widespread. Change of voltage frequency influences directly the moment on the machine’s shaft and electric motor current. Applying these properties it is possible to obtain average current and the moment equivalent to rated current and the moment required for machines’ test after repair. Mathematical model of asynchronous electric motor with possibility of change of the listed parameters was developed by authors to test this hypothesis. Then the model was transferred to Simulink program for implementation of fast calculations. Besides, the main properties of electromechanical system of asynchronous engine by means of vector diagram are examined in the article for an explanation and understanding of loading process and experiments results. We also revealed the main adverse effects of dynamic modes. The obtained curves of currents and moments don't exceed the set threshold value and aren't dangerous for mechanical assemblys of the machine. Results obtained from carried out experiments prove the possibility of receiving rated current of the electric motor without mechanical load at cyclic transfer of the machine to a short-time generator mode.

**Key words:** asynchronous motor, dynamic loading, opposition circuit mode, electric current, mechanical output, moment, switching, power frequency.

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**THE CHARACTERISTICS OF SHEAR FLOW IN KURIL-KAMCHATKA
ISLAND ARC SUBDUCTION ZONE CONSIDERING NONLOCAL PROPERTIES
OF A SEISMIC PROCESS**

The article proposes the investigation of shear flow nonlocal deformation effects in Kuril-Kamchatka island arc subduction zone (magnitude values are 4,9–7,7, area is 50°–60° N, 156°–166° E, sample volume is 221 events) on the basis of a statistical model built according to the Global CMT catalog for the period of 1976–2005.

**Key words:** statistical methods, spatio-temporal laws, shear flow, nonlocal deformation characteristics.

УДК 681.5:621.3

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**MODELS, METHODS AND ALGORITHMS OF DEFECT FINDING
IN MULTICOMPONENT ELECTRIC STRUCTURES**

Methods and algorithms of defects localization in the branched structures of electrical devices described in the article are based on the structural – analytical diagnosis models developed by the author. The technique of defect finding in multicomponent electric circuits created on the basis of obtained model is realized with the help of the sequential logic analysis of circuit functional layout of the unit under test followed by its comparison with the object layout containing defects. Analytical transformations are executed in the matrix form convenient for information processing in computer. The algorithms created with the developed technique allow to mark out inoperative components of the diagnosed device in an automatic mode. Feature of the created model is that the identification technique developed on its basis allows to specify system status with the help of control of the limited quantity of transmission channels of a test signal at any complexity of the observed system. Machine methods and formation algorithms of the main observed features based on matrix-topological representations of the system’s model are developed. Theoretical and methodological estimation aspects of diagnosis error are considered.

**Key words:** localization, identification, matrix, feature, model, parameter, column.

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**TRANSMITTING ANTENNAS OF ROTATING POLARIZATIO**N **IN A DECAMETER RANGE**

The use of rotating polarization waves in decameter range allows to solve a number of problems, such as increase in throughput of communication channels, qualitative broadcasting organization in under-populated and hard-to-reach areas, localization of electromagnetic emission sources of small spectral density. Practical use of the similar approach is connected with necessity of realization of the device which would provide emission of an electromagnetic wave with polarization close to circular in a broad brand and solid angles. The ways of this problem solution on the basis of flat spirals use are given in the article.

**Key words:** short- wave antennas, rotating polarization.

УДК 664.95: 639.211.2

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**INFLUENCE OF PRODUCTION CHARACTERISTICS
OF RED SALMON DAINTY ON ITS STORAGEABILITY**

We analyzed decrease methods of preserving substances content with keeping established expiration dates for light salted smoked products made of Far Eastern salmon. The use of spicery with bactericidal and bacteriostatic effect and also freezing makes it possible to keep up products quality during the whole period of storage.

**Key words:** salting, Far Eastern salmon, phenol, spectrum of absorption expiration dates.

**SECTION II. biological sciences**

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**DEVELOPMENT PACE OF FRY’S GONADS OF DIFFERENT SPECIES
OF PACIFIC SALMON IN EARLY SEA LIFE PERIOD IN 2010–2012**

We demonstrated the difference in development pace of salmon ovaries with different life cycles on the basis of histological analysis of fry’s gonads of Pacific salmon in early sea life period. Three critical periods characterized by the similar external factors which influence fish and physiological changes of organism were determined. Accelerated rate of fry’s ephebic oocytes rise in early sea life was observed during the year with high thermal conditions (summer. 2011) which makes it possible to expect accelerated maturation rate and also relatively high female fish fecundity of the given generation of silver salmon, cherry salmon and king salmon. Elevated environmental temperature at the early sea stages of ontogeny doesn’t influence fecundity formation of red salmon greatly.

**Key words**: Pacific salmon, oocytes, pace of gonads development, fry, early sea life period.

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**BROWN ALGA SACCHARINA BONGARDIANA AS AN INDICATOR
OF ECOLOGICAL STATE OF OIL POLLUTED PLACES IN AVACHA BAY
(SOUTHEASTERN KAMCHATKA)**

The article includes observations concerning , presence of oil products, phenols and heavy metals (Zn, Cu, Pb, Ni, Cd) in water, soil and Laminaria *Saccharina bongardiana.* The material for analysis was collected in the places of fleet bunkering and transshipment of oil products located along town part of Avacha Bay coast. Weexamined 5 similarplaces. 2 more sampling pointslocated a long way from source of anthropogenic pollutionwere chosen in the inner part of the bay. One sampling point was outside of Avacha Bay, in the bay Spaseniya. The fact that pollution content in water isn’t safe pollution index was stated. It is safer to estimate it by concentration of pollutants in soil and algae.

**Key words:** Laminariales, *Saccharina bongardiana,* anthropogenic pollution, heavy metal, phenol, petroleum oil, Avacha Bay, southeastern Kamchatka*.*

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**CULTIVATION OF AMPHIPODA *LOCUSTOGAMMARUS LOCUSTOIDES* (BRANDT, 1851)
IN STAGNANT SEA WATER**

Results of rearing of *Locustogammarus locustoides* in laboratory are presented. The requirements of this Gammarid species to the main environment parameters were studied. The species can be widely used as an object of cultivation in coastal farms due to its eurybiontic, pantophagy and also easy accessibility for collection and maintenance. Special design of nursery unit is proposed.

**Key words:** crustaceans, experience, experiment, parameters, survival rate, diet, concentration, substrate.

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**SOME DATA ABOUT PACIFIC SALMON (GENUS ONCORHYNCHUS)
INFECTION BY ENDOPARASITES AND ABNORMALITIES IN THE MARINE WATERS**

22813 samples of Pacific salmon – pink, chum, sockeye, coho and chinookcaught in the Okhotsk and Bering sea and north-western Pacific ocean during their feeding period and anadromous migration were investigated in 1989, 1994–1996. There were cases when sockeye, chum, coho and chinook salmon were infected by endoparasites. The Pacific salmon also had the following abnormalities: deformations of scale and scale structure; absence of pectoral, pelvicand part of caudal fins; deformation of vertebral column; liver anaemia; gonads abnormalities and hermaphroditism.

**Key words**: anadromous Pacific salmon, parasites, abnormalities, Kamchatkan waters.

**SECTION III. socio-economic AND PUBLIC sciences**

УДК 338.45:639.2

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**BUSINESS-PARTNERSHIP AS THE FACTOR OF EFFECTIVENESS
INCREASE OF LOGISTIC PROCESSES OF THE FISHERY BUSINESS**

The article deals with the role of intercompany cooperation in ensuring competitiveness of fishery business- structures and strategy implementation of the logistic support of their steady functioning.

**Key words:** intercompany cooperation, fishery business-structures, integration, logistic providers, joint enterprise, logistic chains.

УДК 338.242

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**INJECTION** **MANAGEMENT** **AS A TOOL OF INNOVATIVE ECONOMY**

Proposed management tool of economic and social systems – injection management – allows to solve problems of attracting and making effective use of resources, foster and promote the internal capacity of the system, the timely elimination of the internal problems of the control object. The conditions, the algorithm and some possible future applications of injection management and injection planning are defined.

**Key words**: **injection** management, **injection, injection** planning.

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**THE ISSUES OF LOCAL BUDGETS FORMATION
AND INTERBUDGETARY RELATIONS**

In the paper one can trace the depelopment of local government budget problems, origins of its deficit and imbalance and also the role of modifications and amendments that were passed by the State Duma of the Russian Federation in the Federal law №131-FL "About general principles of organization of local government in the Russian Federation" of October, 6, 2003.

**Key words:** municipalities, budget, subsidy.