

Abstracts

Electrical Mashines and Apparatus

- Bolukh V.F., Markov A.M., Luchuk V.F., Shchukin I.S.* 5
An engineering technique for calculating performance characteristics of electromechanical impulse induction converters
An engineering numerical-analytical technique for calculating performance characteristics and parameters of electromechanical impulse induction converters with liquid-nitrogen-cooled windings is suggested. A block diagram of the calculation algorithm is given, the algorithm taking into account considerable change and interdependence of electrical, magnetic, thermal, and mechanical parameters within a short-time operating cycle. All critical design parameters with accessory parameters affecting the calculation errors are presented.
Key words - **electromechanical impulse induction converters, cryogenic cooling, engineering calculation technique.**
- Byalobrgeskiy A. V.* 11
Features of dynamic operation modes in DC generators.
The features of dynamic characteristics of DC generator are considered. A method taking into account magnetic properties of electrical engineering steel by introduction of eddy current contour into its equivalent chart is described. The method allows to define time factor of the system taking into account influencing of eddy currents.
Key words - **DC generator, dynamic characteristic, eddy currents.**
- Vaskovsky Ju.N., Gibel Ju.A.* 16
Simulation of dynamic modes in electromechanical transformers by chain-field methods using the MATLAB-FEMLAB system".
The numeral methods of solving chain-field equations describing the dynamic modes of electromechanical transformers are considered. Efficiency of a variables division method and preferences of modern calculable complex "MATLAB-FEMLAB" at its realization are shown.
Key words - **electromechanical transformer, dynamic modes, simulation, chain-field methods, complex "MATLAB-FEMLAB".**
- Golenkov G. M.* 21
The modeling of propulsion performance characteristics of linear induction motors.
Edge effect influence on the parameters of the linear induction motor is investigated. Mathematical equation of electromagnetic power in function of the motor constructive characteristics is obtained.
Key words - **linear induction motor, electromagnetic power, edge effect.**
- Degtev V.G. Shulgin D.N.* 23
Synthesis of winding with diminished straight revolved harmonics in magnet-moving forces.
The structure synthesis of winding system with possibility of adjusting their magneto moving force harmonic composition is fulfilled, their properties are investigated and recommendations on their choice are formulated. The two-layer two-pole winding in 48 stator grooves, used in experimental sample of short-lock asynchronous motor, is designed. Comparative analysis technical and economical indexes of experimental and serial engines are resulted.
Key words - **asynchronous motor, two-layer winding, two-pole winding, magneto moving force, harmonic.**
- Dorohov A.V.* 26
Dynamics characteristics of wind turbines induction generators at connecting them to network through damping resistance with his subsequent shunting.
Using before developed method the numeral experiment is conducted and dependence on peak currents and moments of asynchronous generator with damping resistor entered in its stator chain at connecting to network are set. Recommendations on optimization of connecting procedure are given. The phenomena concomitant to the transitional process are described.
Key words - **wind turbines induction generator, stator, transitional process, damping resistor, peak current, peak moments.**
- Zablodsky N.N.* 32
Forming of output descriptions of the poly-module electro-thermo-mechanical system.
Methodology of output mechanical and thermal characteristics synthesis in poly-module electro-thermo-mechanical system is offered. The methodology used concept of poly-weight kinematic subsystem and pinch-analysis for a heat-exchange subsystem.
Key words - **electro-thermo-mechanical system, pinch-analysis, massive rotor, planning.**
- Zavgorodniy V.D.; Moroz W.I.; Petrova O.A.* 36
Quantum mechanical model of induction type angle transducers (Part 4. Comparative analysis of output signals processing methods).
Comparative analysis of output signals processing methods in induction type angle transducer is resulted. New processing procedures, increasing resolution and accuracy of angle-measuring systems used in quantum-optical location and remote control environment devices are suggested.
Key words - **induction type electromechanical angle transducer, code-pulse measuring system, angle-to-digital converter.**
- Karpovich O.Y., Onischenko O.A.* 42
Computer-based dynamic properties investigation of switched reluctance motor.
The computer-based model of switched reluctance motor for dynamic properties investigation and the results of experiments with the model are presented. The model permits to carry out calculations of electromagnetic and electromechanical processes taking into account of inverter switching peculiarities, to estimate the mechanical and dynamic characteristics of designing motor and to work up the algorithms of switches control.
Key words - **switched reluctance motor, computer-based model, dynamic properties investigation, simulation.**
- Kotysh A.I., Pleshkov P.G.* 46
Conditions of development ferromagnetic resonance in air networks with voltage trans-

formers NAMI.

The article is devoted to a problem of solution reliable operation of type NAMI voltage transformers in electric networks with insulated neutral. Limit conditions of development ferromagnetic resonance are defined. This is very important for analytical solution of ferromagnetic resonance processes.

Key words - voltage transformer, electric network, ferromagnetic resonance.

Kuchinsky K. A.

Thermomechanical parameters of stator winding isolation at starting of turbogenerator.

A technique allowing calculating thermomechanical parameters of isolation in the stator winding of turbogenerator TGV-200 by finite elements method is described. Moving and tensions of the turbogenerator bar in his active and frontal parts, arising up in the process of starting, is explored, and results are presented.

Key words - turbogenerator, stator winding, isolation, thermomechanical parameters, calculating.

Larin A.M., Lamary A., Larina I.I.

Experimental determination of conductivity frequency characteristics in an asynchronous machine at different levels of its magnetic chain satiation.

The basic principles of a method for determining the frequency characteristics in an asynchronous machine reflecting varies magnetic satiation levels of its magnetic system are given. The method is based on experimental data recorded at applying varies three-phase voltage values to the terminals of rotating or motionless the asynchronous machine.

Key words - asynchronous machine, magnetic system, satiation, conductivity, frequency characteristic.

Milykh V.I., Polyakova N.V.

Analysis of phase relationships of electromagnetic parameters in a turbogenerator on the basis of magnetic fields numerical calculation.

In a turbogenerator, phase relationships of magnetic linkage and EMF of its three-phase winding are determined by means of numerical calculations. Magnetic fields are estimated independently for turbogenerator's rotor and stator windings. The resulting magnetic field is computed at load conditions.

Key words - turbogenerator, phase relationship, magnetic field, numerical calculation.

Petrushin V.S., Yakimets A.M., Kobrin V.L.

Heat calculations of asynchronous engines intended for adjustable-speed electric drives, in their non-stead modes.

The universal equivalent heat circuit, which allows carry out heat calculations at non-stead modes of asynchronous motors with various cooling systems, is proposed. The use of the circuit for asynchronous motors of adjustable-speed electric drives is considered.

Key words - asynchronous motor, adjustable-speed electric drives, heat calculations, non-stead modes.

Russova N. V.

Synthesis of symmetric Π -figurative two-bobbin electromagnets of constant voltage by integrated criterion of quality.

The synthesis algorithm of symmetric Π -

figurative electromagnets by integrated criterion of quality is surveyed. Polynomial dependences of basic geometrical dimensions in the electromagnets' magnet system and technical-operation parameters, providing the minimum of additive optimum criterion, are resulted.

Key words - electromagnet, synthesis, optimization, criterion.

Rimsha V.V.

Mathematical modeling of linear switched reluctance motors.

The base constructions of the linear switched reluctance motors are offered. The mathematical model of the process of the electromechanical convert of energy is present. Equations for the electromagnetic forces in the linear switched reluctance motors in linear case are obtained. The calculation results obtained for magnetic fields and electromagnetic forces in 2D and 3D nonlinear cases are considered.

Key words - linear switched reluctance motors, magnetic field, electromagnetic forces, calculation.

Samoilov G.A.

Universal program for the analysis of three-phase windings of any types.

The universal analysis algorithm of three-phase windings is considered. Its realization in a soft ware is given a special attention. The program worked out on the basis of the algorithm is shown.

Key words - inductor motor, winding, harmonic, model.

Stavinsky A.A., Plakhtyr O.O., Stavinsky R.A.

The quality parameters at structural optimization of spatial electromagnetic systems for tree-phase transformers, reactors and throttles.

Structural features, methods of improvement and parameters of designer-technological decisions applied in spatial electromagnetic systems of static induction devices are considered.

Key words - spatial electromagnetic systems, constructive-technical decisions, quality parameters.

Harchishyn B.M.

Synthesis of electro-magnetic transformers with the genetically modified constructions.

Synthesis of electro-magnetic transformers constructions using permanent magnets is resulted. The considered transformers are used in hydro-amplifiers and characterized by improved power indexes and minimized dimensions.

Key words - electro-magnetic transformer, permanent magnet, geometric modeling.

Chuvankov V.Ju., Chuvashov V.A., Jelezniakov A.V., Papazov Ju.N., Medvedev Ju.L., Chuvashov I.V., Demchenko V.N., Len A.T.

Explosion-proof AC motor with the casting copper winding on rotor: electromagnetic moment at the stochastic loading.

An explosion-proof AC motor with the casting copper winding on rotor is considered. The method of determination of electromagnetic moment of the motor at its stochastic loading is offered. The method allows choosing optimum parameters of the motor, raises its power indexes and reliability.

Key words - explosion-proof AC motor, casting copper winding, electromagnetic moment, modeling.

72

48

52

59

65

69

77

79

83

87

Shinkarenko V. F., Avgustinovich A. A.

Genetic analysis and systematization of induction machines with translational motion (plane genus).

The importance and urgency of investigations on the problem of electrical machines systematization are shown. An analysis of formation and evolution of taxonomic structure of systematization is carried out on the basis of the proposed genetic model. A genome is decoded and species composition classified for the induction machines of the genus of plane ones. Results of genetic analysis of the implicit species of plane induction machines are presented. Information concerning structure of such machines is absent at a given stage of evolution of structural electromechanics. The expected structurization within the genus is predicted.

92

Key words - systematization of electrical machines, family of induction machines, genus of plane, genetic model of systematization, genetic analysis, phylogenetic tree of the genus, evolution prediction.

High Electrical and Magnetic Field Engineering

Baranov M.I.

101

Calculation of crater on the aircraft metallic sheathing caused by electro-thermal destruction at a direct lightning stroke.

The approach mathematical model of electro-thermal destruction in the aircraft metallic sheathing at a direct lightning stroke is offered. Analytical correlations for single crater geometrical dimensions, volume and mass of the sheathing lost material are got on condition of single current impulse of the lightning having a complicated form.

Key words – flying aircraft, metallic sheathing, lightning direct stroke, electrothermal destruction, crater.

Electric Transport

Chvorost N.V., Panasenko N.V.

104

Electric railways: stages and prospects of development.

The centenary period of railways electrification in the world is analyzed. Perspective ways of electric draft systems perfection for Ukraine railways in XXI century are considered.

Key words – electric railways, system of electric draft, traction electro supply, a rolling stock, the semi-conductor converter, the asynchronous electric motor.

Education Structure in "Electrical Engineering" and "Electromechanics"

Verbovoj A.P., Verbovoj P.F.

115

Structures of textbooks on electric machines and apparatus

At implementation of research projects on creation of asynchronous machines with improved starting, regulating and dynamic properties the row of new information, factors and laws is got. The separate publications authors suggest plugging in new textbooks. These textbooks compositions, structures and short descriptions are brought.

Key words – electric machines and apparatus, textbooks, short descriptions.

Information

The "Juzhabel" Factory – 60 years

122