

ABSTRACTS

Theoretical electrical engineering and electrophysics

GUDYM V.I., YURKIV B.M., POSTOLYUK A.Ya., SAMBORSKIY O.V. (Lviv) **A method of contour-nodal coordinates for electrically uncoupled circuits with mutual-inductive couplings**

The article develops a method of contour-nodal coordinates for analysis of network circuits electrically uncoupled with an arbitrary structure of mutual-inductive couplings between the branches. Algorithm of state equations forming in contour-nodal coordinates for analysis of electric circuits modes at the level of active values of voltages and currents as to network circuits of complex structure is elaborated. The given algorithm can be successfully applied for state equations forming with the purpose of analysis of electric circuits modes in instantaneous coordinates.

Conversion of electric energy parameters

TIKHOVOD S.M., AFANASYEVA I.O., KORNUS T.M. (Zaporozhye) **Development of a computer program of thyristors electromagnetic circuits simulation**

The Colo system of computer simulation of electromagnetic processes in complex nonlinear magnetoelectric circuits is elaborated. Support of power thyristors simulation is implemented into the Colo system.

BOIKO V.S., KUDRUA E.A., SHULYAK A.A. (Kyiv) **Computation of control and commutating angles in a compensating conversion system with an adjustable switching device**

The results of investigation of electromagnetic process in a conversion system of a compensating type, which switching unit contains a three-phase capacitor battery and power keys combining functions of the device of condensers recharging and control of a technological process in load, are presented. Special features of commutation relations composition used for computation of control and commutation angles of power rectifiers is considered according to different modes of load operation.

SHAPOVAL I.A. (Kyiv) **A double-way feed machine with a matrix converter in the modes of a generator and an engine**

The results of experimental tests of a double-way feed machine with a matrix converter supply of a rotary circuit are presented. Algorithms of a double-way feed machine and a matrix converter control are implemented in a real-time mode using DSP-controller. An experimental bench for a double-way feed machine control is described. Experimental investigations showed that control algorithms of a double-way feed machine guarantee working of the given moment at simultaneous provision of a power factor of a stator circuit close to a unity.

Electromechanical energy conversion

TITKO A.I., FEDORENKO G.M. (Kyiv), GRUBOY A.P., TCHEREDNIK V.I. (Kharkov) **Electrodynamical efforts in frontal parts of a rotor and a stator winding of a turbo-generator at transients in self-synchronization modes**

The methodology of electrodynamic efforts computation, which have an influence on current-carrying elements including a rotor and a stator windings of generators at transient processes in dynamic modes, is given. Analysis of such forces effect on frontal parts of a rotor and a stator windings of a generator of 250 MW capacity at unsuccessful switching on of the generator at synchronization is made.

Electric power systems and installations

STOGNIY B.S., TANKEVICH E.N., VARSKIY G.M., YAKOVLEVA I.V. (Kyiv), RYABCHUK S.V. (Khmelnitsky) **A mathematical model of a measuring current transformer on the basis of new magnetic materials**

B-H curves of a strip ring-type magnet of the nanocrystalline alloy MM-11 are investigated. A mathematical model of a current transformer with such a magnet in the form of a structure chart of a follow-up system is made. Taking into account the obtained results of investigations a current transformer with the given minimum value of a rated safety factor of devices of its secondary winding is computed and made. Conformity of its metrological characteristics with the given values is experimentally proved.

Electrotechnological complexes and systems

GORISLAVETS Yu.M., GLUKHENKY A.I. (Kyiv) **Electrodynamical parameters of a rotary motion system of liquid metal of induction hot air furnace**

A mathematical model for numerical computation of magnetohydrodynamic processes is elaborated for an induction melting furnace equipped with a system of electromagnetic rotation of liquid metal in channels. A specific electromagnetic moment and an a cross-section of a cylindrical channel averaged angular velocity of liquid metal depending on a supply voltage are determined as a result of solution of an associated circuit-field problem of an electromagnetic field computation together with equations of hydrodynamics.

Information-measuring systems in power engineering

LEVYTSKY A.S., NOVIK A.I., KOCHETKOV S.I. (Kyiv) **Capacitive cells for measurement of dielectric characteristics of rocks**

Capacitive cells for measurement of dielectric characteristics of hard rocks and minerals are proposed.

BORISENKO A.N. (Kharkiv) **Questions of diagnostic characters choice for control and diagnostic systems of diesel-generators**

Identification of defects, construction of decision rules and forming of training totalities for control and diagnostic systems of diesel-generators on the basis of a linear periodic random process (LPRP) theory.

ZAITSEV E.A., KONONENKO A.G., MASJURENKO Yu.A., NIZHENSKY A.D., LATENKO V.I., ORNATSKY I.A. (Kyiv) **Specific errors of phase-frequency laser distance meters**

Measuring errors arising in a case of application of a phase-frequency method of ranging in laser range finding are considered. Measures for their diminishing are proposed.

To the 110th anniversary of National Mining University

PIVNYAK G.G. (Dnipropetrovsk) **National Mining University - 110 years of educational work and scientific efforts**

Analysis of educational work and scientific efforts of the National Mining University since the period of its establishment is made. Description of the research activities and developments fulfilled by the scientists of the University in the field of electrical and power engineering is given.

PIVNYAK G.G., BESHTA O.S., KHILOV V.S. (Dnipropetrovsk) **Development of a method of successive correction with application of fuzzy control for an electric drive of a boring rig rotation**

Frequency characteristics of a control object of a spinner drive of a boring rig are investigated. Characteristic frequencies of additional transfer members caused by elastic properties of transmission are found. Control algorithms suppressing fluctuations in a control system are found. Ideas of neuro-fuzzy control for fluctuations suppression in a control system are used.

BESHTA A.S., AZJUKOVSKY A.A. (Dnipropetrovsk) **A choice of the rational way of water delivery adjustment by a pumping unit**

Analysis of power efficiency of application of a controlled-velocity electric drive for rotary pumps is made. Guidelines for a choice of the rational way of a pump productivity adjustment are formulated.

PIVNYAK G.G., KOZHEVNIKOV A.V. (Dnipropetrovsk) **A symbolic method of transient processes analysis in DC contact system at nonzero entry conditions**

A symbolic method of transient processes analysis in DC contact system at nonzero entry conditions is described. The method includes obtaining of analytical solutions regarding images of current and voltage distributions, their analytical or numerical inversion for originals finding. Design correlations and simulation results are given.

MESCHERYAKOV L.I. (Dnipropetrovsk) **Improvement of dataware of electrotechnical complexes and systems**

Principles of dataware expansion of electrotechnical complexes and systems on the basis of asymmetric functions are stated.