Abstracts

Theoretical electrical engineering and electrophysics

SHYDLOVSKA N.A., KRAVCHENKO O.P., SAMOILENKO V.G., POTOROCHA V.V. (Kyiv) **A new algorithm of processes research in nonlinear discharge circuits** An algorithm of a nonlinear differential equation, which describes processes in a nonlinear discharge circuit, is proposed. The advantage of the proposed method is in a possibility of analysis of both an oscillatory and a capacitor discharge.

REZINKINA M.M. (Kharkiv), SCHERBA A.A., PERETYATKO Yu.V. (Kyiv) **Numeral computation of three-dimensional electric fields in open areas by means of absorbing boundary conditions** A possibility of absorbing boundary conditions application for numerical computation with finite-difference methods of three-dimensional low-frequency electric fields in open areas is investigated. A case of a low-frequency field source location inside a rated operating area corresponding to a traditional application of the method of well coordinated layers is considered. A method of absorbing boundary conditions application in a case of a field source location outside a computation area - when a prototype system is in an external homogeneous electric field - is proposed.

BARANOV M.I. (Kharkiv) **Quantum-mechanical approach at heating temperature computation of a conductor with electric conduction current** Approximate computational quantum-mechanical correlations for maximum temperature estimation of inhomogeneous longitudinal heating of a thin metal conductor with constant or variable (pulse) electric conduction current are proposed. Experimental check of the obtained results of quantum-mechanical thermal computation of "hot" and "cold" longitudinal areas of a thin steel zinc-coated wire with constant conduction current of high density is carried out.

Conversion of electric energy parameters

ORLOVSKY I.A. (Zaporozhje) **Authentication of inner parameters of a thyristor electric drive of constant current by its patterns on recurrent neural networks** Analysis of investigations on intelligence systems for constant current thyristor electric drives control (CCTED) application shows that in the most cases a control system adjustment is made on a pattern of a unit. It causes a necessity of preliminary getting of CCTED pattern. The article presents dependences for inner CCTED parameters computation by the values of weighting factors of its patterns on recurrent neural networks.

FEDIY V.S., NAMESTNIK S.G. (Kyiv) **Investigation of a three-phase valve-reactor source of reactive power (RPS) in an inductive and a capacitive mode** Influence of control pulses frequency and phase in a three-phase RPS on the basis of a successive RLC - a contour and a valve switchboard, which switches inductance of this contour cyclically on a lagging phase of a supply network, a quantity of the main harmonic and non-sine of a network current (at operation in an inductive and a capacitive mode), is investigated.

Electromechanical energy conversion

MAKARCHUK O.V. (L'viv) **A mathematical model of ac electronic motor with constant magnets** A computation algorithm of electromechanical transient processes of ac electronic motor with constant magnets is considered. The results of mathematical experiments are given.

YAROSLAVTSEV M.I. (Cherkassy) **Increase of adjustment accuracy of a tractive force of a linear inductor motor** A circuit of a linear inductor motor with teeth slant which, as compared to an ordinary circuit of a linear inductor motor, permits to increase substantially accuracy of a tracking effort adjustment of a linear inductor motor with frequency-current control is proposed.

Electric power systems and installations

BUTKEVICH O.F. (Kyiv) **Problem-oriented monitoring of the UPS modes of Ukraine** Problems of creation of a problem-oriented monitoring system of the UPS modes of Ukraine are considered. The main purpose of the system is a decision of the most relevant problem in the aspect of operation by the modes of UPS of Ukraine - evaluation of safety of its state in a real time. Primary tasks concerning creation of the reference system and requirements to information-model provision of their decision are determined.

VOLKOV A.V., MIROSHNICHENKO O.G. (Zaporozhje) **Specified computation of losses components in a power system caused by reactive power of a separate power consumer** Specified analytical dependences for computation of losses components of active power in a power system (with parallel or series-parallel sections connection in it) caused by reactive power of a separate power consumer are proposed. These dependences take into account current load of a power system sections with reactive power, distribution of the latter in nodes and sections of a power system, and also - mutual compensation of consuming and generating reactive power of neighbor power consumers in a power system nodes.

CHABAN A. (L'viv) **Mathematical model of a load center with a transformer and turbo-sets** A mathematical model of a load center with a transformer and turbo-sets as its elements is proposed. Differential equations of the system are presented in a normal form Cauchy. Results of computer simulation are used for analysis of a load center modes.

BRZHEZITSKY V.O., KIKALO V.M., PROTSENKO O.R. (Kyiv) **Frequency responses of high-voltage potential dividers** Special features of frequency responses of a high-voltage potential divider caused with non-identity of structural elements of its high-voltage shoulder are considered.

PEKUR P.P. (Kyiv) **Regime limitations on parameters of wind- electric installations operation under load** A field of a relative aerodynamic moment change of wind-electric installations (WEI) rotor with asynchronous and synchronous generators, which corresponds to a generator mode of operation and has no overloads of electric machines caused by wind speed pulsations, is determined. Analytical formulae for the limits of an operating field on aerodynamic characteristics are obtained. Ranges of operating wind velocities are set and influence of WEI parameters on the quantity of these ranges is analyzed.

BESHTA O.S., BABENKO T.V. (Dnipropetrovsk) **An expert support system of decision making in conditions of uncertainty for units of a technological complex** Results of theoretical and practical investigations on synthesis of intelligence systems of decision making support on a neuronet basis for problems solution of technological processes control of ceramics are given.