

ABSTRACTS

Theoretical electrical engineering and electrophysics

BOZKO I.V., FALKOVSKY N.I., ARISTOV Yu.V., BELINSKY V.V. (Kyiv) Influence of humidity and air motion on properties of a positive corona

Influence of humidity and air motion rate of an atmospheric pressure on a corona discharge from a multi-needle anode to the plane is investigated. It is determined that with elimination of water steams content from 11 to 0,1 mg/l in one and a half times a corona current and power efficiency of ozone generation increase. Expulsion of turbulent air stream along a discharge axis causes additional increase (~ 20%) of these parameters.

ASSUIROVD.A. (Kharkov) An external magnetic field control of engineering objects with the sources of a control field of a surface-distributed type

Application of control current circuits, placed on a surface of an engineering object, is grounded for solution of a control problem of an external magnetic field of an object, and algorithms of currents control of circuits are obtained at a magnetic field control fulfillment in an open-loop system.

LJUTENKO L.A., MIKHAILOV V.M. (Kharkiv) Influence of a pulse shape of an external magnetic field on electrodynamic efforts deforming a cylindrical shell

Change of a pulse magnetic field pressure influencing on a cylindrical conducting shell at an oscillatory and aperiodic discharge of a capacitive storage at an external inductor is investigated. Penetration of an axial magnetic field into a shell for an external magnetic field shell in the form of a "sheared" exponentially attenuating sinusoid is computed. Influence of a "sheared" moment of a part of the first half-wave of such a pulse on a value of negative pressure extending a shell is shown.

STADNIC I. P., FILIPPOV D.M. (Simferopol') A method of SLAE computation of static plain- parallel fields in piece-homogeneous environments (secondary sources: simple layer of charges; piece-permanent and piece-linear approximations)

A derivation of a system of linear algebraic equations by application of a continuity principle of a magnetic flux in an integral form for a magnetic field computation in a piece-homogeneous environment at piece-permanent and piece-linear approximations of magnetic charges density is proposed. It permits to increase essentially accuracy of a field computation at a very few number of a boundary discretizations. Time of account also decreases. The method is applied for any other static plain-parallel fields computation.

REZINKINA M.M., SCHERBA A.A. (Kyiv) Analysis of external low frequency electromagnetic fields influence on bioelectric activity of a human's cerebrum

Computations of electric potentials levels in neurons of a human's cerebral cortex at external low-frequency electromagnetic fields application are made by means of Hodgkin-Huxley model. These computations showed that flowing of low frequency currents ($f \sim 10 - 1000$ Hz) even of a permitted density ($J = 10$ mA/m²) through a membrane could cause change of neurons potentials levels in comparison with a case of an external electromagnetic field absence.

Conversion of electric energy parameters

OLESCHUK V., SIZOV A., PROFUMO F., PRUDEAK R., TENCONI A. Synchronous PWM control of symmetrical split-phase induction machines

Analysis of operation of symmetrical six-phase drives on the base of split-phase machine, supplied from the inverter with synchronized space-vector pulsewidth modulation (PWM), has been performed. Simulations give the behaviour of the systems with continuous and discontinuous versions of synchronized PWM.

FEDIY V.S., NAMESTNIK S.G. (Kyiv) Three-phase rectifier-reactor source of reactive power (SRP)

Influence of frequency and phase of control pulses in a three-phase SRP on the basis of a successive RLC - a circuit and a rectifier switchboard, which switches cyclically inductance of this circuit to a leading phase of a supply line, to the main harmonic value and non-sinusoidality of public current of network current (at operation in an inductive and a capacitive modes), is investigated.

PROSKUDIN V.N., BOLOTASHVILI A.A., SAPON V.I., PENTEGOV I.V., STEMKOVSKY E.P., SHEIKOVSKY D.A. (Kyiv) Power supply source of constant current of a smelting furnace on a basis of three single-phase rectifiers

It is shown that it is possible to create a power source of constant current of a smelting furnace from three single-phase rectifiers that have thyristor regulators in a primary chain of step-down transformers and uncontrollable valve bridges in a secondary chain of these transformers. Such power supply source provides high degree of operating reliability of a device. For computation of the main electric values a computation method of a device at back emf is applied: a range of possible voltage values at a furnace, in which the method is just, is found.

Electromechanical energy conversion

ANTONOV A.E., PETUKHOV I.S. (Kyiv) Comparative analysis of excitation systems of electromechanical converters

A comparative analysis of excitation systems of magnetic and electromagnetic types for electromechanical energy converters is conducted by means of a mathematical simulation. Conditions of the created magnetic fluxes equality are determined.

AKININ K. P. (Kyiv) Computation of adjusting systems of rotation frequency of motors with pulse primary sensors

Special features of pulse systems construction of automatic adjustment of a motor rotation frequency are considered. Recommendations for such systems adjusting are elaborated. Examples of adjusting systems computation are given.

KONOPLEV K.G. (Sevastopol') Determination of non-sinusoidality coefficient at pulse control of synchronous generators. Analytical expressions for high harmonics and non-sinusoidality coefficients determination at pulse control of synchronous generators are obtained.

Electric power systems and installations

ZHARKIN A.F., PALACHEV S.A. (Kyiv) Normative adjustment of electric quality in power supply systems of a general purpose of Ukraine and countries of the European Union

A comparative analysis of an inter-standard GOST 13109-97 and the international European standard EN 50160 is conducted. Legislative bases, a field of application, parameters and indices, methods of measurements conduction and standards of electric energy quality of the indicated normative documents are considered.

VOLKOV A.V., MIROSHNICHENKO O.G. (Zaporozhje) Improvement of an electricity user payment for reactive energy

Analysis of ways of improvement of an electricity user payment for reactive power is conducted. Improved and specified methods of the payment are proposed. A qualitative comparison with the working method in Ukraine is made.

STOGNIY B.S., MASLJANIK V.V. (Kyiv) About excitation current components of current transformers with a magnetic core of a nano-crystalline alloy

Periodic and direct components of magnetization current of new current transformers with a magnetic core of a nano-crystalline alloy are determined on the basis of theoretical and experimental investigations.