ABSTRACTS

Theoretical electrical engineering and electrophysics

ZOLOTARIOV V.M. (Kharkiv), SHCHERBA A.A.,PODOLTSEV A.D., KUCHERIAVAJA I.N.(Kyiv) **Analysis of high-frequency processes in the cable on the voltage of 330 kW with segmented cable conductor by partial discharges inception in its insulation**. High-frequency processes in power supply cables with polyethylene insulation on the voltage of 330kW with segmented cable conductor are analysed. The mathematical model and numerical calculations of the electromagnetic field and equivalent parameters of the cable in the frequency range of 50 ÷ 10^6 Hz as well as the electrotechnical model of "test unit – power supply cable – standard capacitance" system are developed. Resonance-frequency behaviour of the cable and high frequency signal propagation from partial discharge location along the cable are studied.

ZYRKA S.E., MOROZ Y.I., MOROZ E.Y. (Dnipropetrovsk), TARCHUTKIN A.L. (Zaporizhzhya) **Modelling of transient processes in the transformer with consideration of the magnetic core hysteresis properties**

The method of accounting of hysteresis and dynamic properties of the cold-rolled electrotechnical steel under unrestricted law of induction changes in the magnetic system of the transformer is offered. The model of single-phase transformer that enables the analysis of its operation in complex transient conditions and allows incorporating with external electrical field model is analysed.

KACZOREK T. (Warsaw, Poland) **Recent developments in the theory of fractional positive and cone linear systems.** The overview of some recent developments and new results in the theory of fractional positive and cone one-dimensional (1D) and two-dimensional (2D) linear systems are presented in the article. The state equations and their solution for the fractional continuous-time and discrete-time linear systems are given. Necessary and sufficient conditions for the internal and external positivity of the fractional linear systems are established. The reachability of the fractional linear systems is addressed. A new notation of the cone systems is introduced and methods for computation of such systems are proposed. Positive fractional 2D linear systems are intoduced. Necessary and sufficient conditions for the positivity and reachability are established. The considerations are illustrated with many examples of 1D and 2D linear systems.

Conversion of electric energy parameters

PERESADA S.M., KOVBASA S.N., BOVKUNOVYCH V.S. (Kyiv) **Comparative indirect torque-flux vector control algorithms testings of asynchronous generator.** General methology for comparative torque-flux vector control algorithms testings of asynchronous generator is developed. The proposed methology enables indirect estimation of torque trajectories tracking performances and robustness properties to the rotor active resistance variations. It is shown in the article that robust vector control algorithm guarantees performances and energetic efficiency stabilization on the nominal level under condition of rotor active resistance variations.

MIKHALSKY V.M., SOBOLEV V.M., CHOPYK V.V., SHAPOVAL I.A. (Kyiv) **Definition of harmonic content and quality factors of voltage-source inverter output voltage with application of discontinuous modulation functions for the PWM.** The technique of harmonic content definition of voltage source inverter output voltage with application of different methods of discontinuous submodulation used for PWM is considered. The comparative analysis of quality factors of the output voltage waveforms is performed.

PRYIMAK B.I., TOKARCHUK V.V. (Kyiv) **Determination of conditions of transient function steady character of the system with modified position regulator**. The condition of the steady character of electric drive transient function with modified position regulator is determined. The steady reaction to the task is peculiar to position control systems of industrial robots, metal-working machines, etc.

Electromechanical energy conversion

VASKOVSKY Y.N., HERASKIN A.A. (Kyiv) **Mathematical modelling of electromagnetic fields in short-circuit asynchonous generators with defected rotor winding.** The mathematical model for the analysis of electromagnetic fields in short-circuit asynchonous generators with defected rotor winding is proposed. It is shown that the comparative analysis of magnetic induction spectrogram provides efficient diagnostics of defected rotor winding.

ORLOVSKY I.A. (Zaporizhzhya) **Mathematical models of diesel and synchronous generator of diesel train traction electric drive on neural net.** The article is dedicated to the development of appropriate structures and consideration of effective behaviour for weight coefficients of functional recurrent neural net (FRNN) aimed at introduction of synchronous generators and diesel models with diesel train traction electric drive control system according to their mathematical models and equipment operation.The analysis of developed models as a FRNN by simulation technique is performed and the identification of equipment internal parameters by their weight coefficients is fulfilled.

Electric power systems and installations

ZHURAKHIVSKY A.V., KENS Y.A., YATSEIKOA.Y., MASLIAK R.Y. (Lviv) **Ferroresonant processes in 10 kV electrical networks with different-type voltage transformers.** The ferroresonant processes in 10 kV electrical networks with insulated neutrals consisting different-type voltage transformers are analysed. Some results of calculation are presented.

Information-measuring systems in power engineering

SAVOLIUK A.M. (Kyiv) **Design peculiarities of graphic interface algorithms for low-level universal element of multiparameter measuring systems.** The design peculiaritis of multiparameter measuring systems with application of graphic liquid-crystal displays (LCDs) are considered in the article.