

## ABSTRACTS

### *ELECTRICAL APPARATUS*

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*Avtonomova L.V.*

#### **ANALYSIS OF ELECTRO THERMAL STRESS STATE IN HIGH CURRENT SOCED CONTACTS.**

An approach to analysis of electro thermal stress state in V-shaped electric soced contacts is offered. Influence of the contacts parameters on transitive resistance value is investigated by FEM.

*Index terms* – **high current soced contacts, electro thermal stress state, transitive resistance, modeling.**

*Bolukh V.F., Vinnichenko A.I.*

#### **IMPROVEMENT OF A METHOD USED FOR METROLOGIC STATION IN THE STATE FUNDAMENTAL NETWORK.**

The method of absolute value and vertical gradient of the free falling acceleration measurings is offered without mechanical movings. It is necessary for metrological certification of a metrologic station in the State Fundamental Network. The throwing height of a sample body is varied by regulation of excitation voltage in the linear pulse electromechanical converter of induksion-dynamic type.

*Index terms* – **free falling acceleration, measuring, sample body, linear pulse electromechanical converter.**

*Varshamova I.S.*

#### **METHOD OF AUTOMATIC COMPENSATION OF EXTERNAL MAGNETIC FIELD IN ELECTRICAL EQUIPMENT WITH NONSINUSOIDAL CURRENTS.**

Description of automatic method for compensation of the magnetic-field, created by an electrical equipment with nonsinusoidal currents in their power circuits is brought. The method foresees an independent forming of two signals as linear combinations separately for the sine and cosine components of power circuit currents and simplifies regulation of harmonic constituents at the field tuning.

*Index terms* – **electrical equipment, nonsinusoidal currents, external magnetic field, compensation, time structure.**

*Volkova O.G., Lupikov V.S., Bajda Je.I.*

### **DECREASE OF ENERGY RELEASE FROM SURFACES IN HIGH CURRENT EXPLOSIVE CONTACTS AT THEIR SWITCHING.**

Problems of electroerosive wear in high current explosive contacts demand the further perfection of switches namely their switching mechanisms design to decrease energy release from their contacts surfaces. Replacement rotating joints in the mechanisms on rubber-metal hinges can become the effective decision of the problem.

*Index terms* – **switch, high current explosive contacts, energy release, electroerosive wear, rubber-metal hinges.**

*Grigorenko I.V., Tveritnikova O.Je., Korzov I.M.*

### **STAND FOR BASIC CHARACTERISTICS CONTROL IN THERMAL CONVERTERS.**

In close questions of working out and operation of a stand for control of basic characteristics in thermal converters are discussed. Features of temperature measurements by means of thermoresistors and thermocouples and their metrological characteristics are considered.

*Index terms* – **thermal converters, metrological characteristics, control.**

*Emelianov V.L., Grechko A.M.*

### **REVIEW OF VACUUM SWITCHES DESIGNS AND CONTROL SYSTEMS.**

A review of designs and control systems of modern vacuum switches of average voltage which are in demand in the switching equipment market of Ukraine is resulted.

*Index terms* – **vacuum switches, design, control systems, review.**

*Korol E.G., Lupikov V.S., Rudas Ju.D.*

### **OPTIMIZATION OF THE COMPENSATING ELECTROMAGNET WITH FERROMAGNETIC CORE.**

Modeling of the compensating electromagnet with ferromagnetic core, used for reduction of external magnetic fields in electrical equipment are resulted. An optimization technique for the electromagnet sizes choice is offered.

*Index terms* – **electrical equipment, external magnetic field, reduction, compensating electromagnet, ferromagnetic core, optimization technique.**

*Krugliak O.A., Korneev O.O., Grischuk Ju.S.*

### **WORKING OUT AND RESEARCH OF DC SWITCHBOARDS FOR SUBSTATIONS TO 35 KV.**

Stand and algorithm of its work which allow to automate process of tests and researches in DC operative systems are developed.

*Index terms* – **DC switchboards, testing, automatization, algorithm.**

*Lupikov V.S., Varshamova I.S., Maksimenko M.V., Marjenko R.Je., Mihajlenko A.M.*

### **SYNTHESIS OF FUZZY LOGIC REGULATORS FOR FORMING OF CURRENTS IN THE MAGNETIC FIELD ELECTROMAGNETIC COMPENSATOR.**

Process of formation of operating signals in multiple parametre system used for external magnetic field automatic compensation in power equipment is resulted using Fuzzy Logic methods. An example of algorithm for formation of electromagnet current in the automatic compensation system is resulted for the three-phase switchboard.

*Index terms* – **electrical equipment, external magnetic field, compensation, multiple parameter system, Fuzzy Logic.**

## ***ELECTRICAL MASHINES***

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*Galajko L.P., Chalyj A.A.*

### **CHOICE OF POLE STATOR WIDTH AND AIR GAP SIZES IN SWITCH-RELUCTANT MOTOR OF MINER ELECTRIC LOCOMOTIVE.**

In close a choice of width of pole stator width and air gap sizes in switch-reluctant motor of miner electric locomotive by power of 13 kW, frequency of 615 rpm is groanted taking into account as criteria maximum of efficiency and power factor, and minimum phase current and moment pulsation factor. It is swoun that at reduction of the pole width the coil one increases, other motor sizes do not change. Coils number, coil wire diameter and feeding parametres determine as to provide install power. An analysis of such geometrical sizes as the pole width and air gap is resulted in view of the criterion.

*Index terms* – **switch-reluctant motor, pole stator, air gap, choice of sizes, criteria.**

## ***STRONG ELECTRIC AND MAGNETIC FIELDS***

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*Batygin Yu.V., Vorobyov V.V., Gnatov A.V., Gnatova Sh.V., Serikov*

*G.S., Chaplygin E.A.*

### **CALCULATED CHARACTERISTICS OF MAGNETIC-IMPULSIVE SETTING FOR PROCESSING OF METALS BY A SERIES OF IMPULSES.**

Within the article framework an idea of transition from single to frequent power influence in modern magnetic-impulsive technologies is grounded. The principle circuit design of the technological unit is offered provided that current impulses are generated as a serial reiteration. Computation of basic characteristics of charge process in the unit storage capacity is got up provide given time interval and consumable power level. Computation data are complemented by oscillogrammas of real characteristics in charge-discharge processes of the unit.

*Index terms* – **magnetic-impulsive technology, transitional process, current impulses, reiteration.**

## ***ELECTROTECHNOLOGIES USEGE***

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*Akimov L.V., Litvinenko D.G., Vakulenko A.A.*

### **SYNTHESIS OF DOUBLE INTEGRATING SYSTEM FOR VECTOR CONTROL OF ONEMASS ASYNCHRONOUS DRIVE WITH NONLINEAR LOADING.**

In close a complex approach using of polynomial equations methods and quality diagrams of control is realized improving dynamic characteristics in the frequency-guided asynchronous drive with vector control at its nonlinear loading character.

*Index terms* – **asynchronous electric drive, nonlinear loading, vector control, dynamic characteristics.**

*Varshamova I.S., Geljarovskaja O.A., Korol E.G., Krjukova N.V., Lelyuk N.A., Litvinenko V.V., Lupikov V.S., Sedova E.A.*

### **METHODS FOR MULTIGRADIENT DIRECTIONAL COOLING OR WARMING OF SMALL OBJECTS.**

A description of the known metod for multigradient directional cooling or warming of small objects is got up. The metod is realised in the form of two devices providing creation of a variable temperature gradient in its working area with small object located inside, and moving of the object with operated speed in horizontal or vertical directions. The metod can be used for thin regulation of thermodynamic parametres in small objects at their cooling.

*Index terms* – **electrical contacts, small object, cooling, multigradient metod.**

*Dubik V.M.*

### **PROTECTION OF FRUIT CROPS AGAINST INSECTS-WRECKERS.**

Destruction methods of fruit crops wreckers are analysed and their merits and demerits are considered.

*Index terms* – wreckers of fruit crops, destruction, electrophysical methods.

*Kuznetsov B.I., Nikitina T.B., Voloshko A.V., Bovdyj I.V., Vinichenko E.V.*

### **SYNTHESIS OF DIGITAL ROBUST CONTROL SYSTEM IN ROLLING MILLS MAIN DRIVES TAKING INTO ACCOUNT THEIR MUTUAL INFLUENCE THROUGH THE ROLLED METAL.**

The technique of synthesis of digital robust control system of main drives to flattening mills with synchronous motors as a two-mass electromechanical system for the short line and a three-mass electromechanical system for the long line is developed taking into account mutual influence of rental rollers on each other through the rolled metal. An example of dynamic characteristics for such system is given.

*Index terms* - rolling mills, main drives, digital robust control system.

*Mihailjuk V.M., Sebko V.V., Shaporev V.P.*

### **ONE OF POSSIBLE REACTOR DESIGNS FOR REALIZATION OF HIGH-SPEED PYROLYSIS PROCESS IN OF ORGANIC WASTE AND ITS SCHEME.**

An analysis of a reactor with filter-bed for realization of high-speed pyrolysis in granulated firm household wastes is made. Dependence of sizes, hydraulic characteristics and conditions of heat-transfer in the reactor from granules sizes, a case part disclosing corner and kinetic characteristics is established. Basic schemes of the reactor and unit are offered.

*Index terms* - utilization of household wastes, pyrolysis process, reactor, heat-transfer.

*Moroz O.N., Cherenkov O.D.*

### **ANALYSIS OF METHODS USED FOR EXTRACTION OF WOOL GREASE FROM WASH WATER IN PRIMARY WOOL PROCESSING FACTORIES.**

An analysis of existing methods used for extraction of wool grease from wash water is got up and a technological scheme increasing efficiency of the grease extraction is proposed with no deterioration of physical and

chemical properties of raw wool.

*Index terms* – **wool grease, primary processing of raw wool, extractor.**

*Severin V.P., Bolukh V.F., Gordeeva N.A.*

**MATHEMATICAL MODEL OF THE DC ELECTRIC DRIVE FOR DOORS CONTROL IN THE ELECTROROLLING STOCK USING THE LINEAR STEP-BY-STEP MOTOR.**

A mathematical model of the DC drive with linear step-by-step motor for doors control in the electroring stock is developed. It allows to define the drive instant parameters in different modes of its work.

*Index terms* – **DC electric drive, step-by-step motor, mathematical model.**

*Stepuk A.V.*

**MICROWAVE REGENERATION OF DIESEL CLEARING FILTERS.**

Numerical analysis of diesel particulate filters and soot oxidation is resulted. The results confirmed instability of 2.45 GHz HF wave propagation and multiphase harmonic wave excitation. Alternative solution to enhance diesel particulate filtering quality is suggested.

*Index terms* – **diesel particulate filters, soot oxidation, numerical analysis.**

*Cherepnjov I.A., Moroz O.M.*

**STUDYING OF ELECTROMAGNETIC FIELDS INFLUENCE ON DEVELOPMENT OF INFLAMMATORY PROCESSES IN LIVE ORGANISMS IN VIEW OF NONEQUILIBRIUM THERMODYNAMICS.**

A generalised model of a tumour evolution growth in a live organism is offered based on thermodynamics with nonequilibrium parameter. It allows to define external electromagnetic fields influence on character of the tumour growth.

*Index terms* – **electromagnetic fields, living cells, inflammatory process.**