РЕЗЮМЕ/ABSTRACTS

Kuleshova A. V. Mathematical Model of the Spindle Block Belt Drive for High Accuracy Manufacturing Equipment

The methods of generating the mathematical model of the spindle block drive are presented. The model represents the system of differential equations describing two-plane oscillations of the spindle allowing for its bending. By solving the system of equations the amplitudes of two-plane oscillations of the point of the spindle axis are determined using which a trajectory of the axis rotation is built. Adequacy of the model developed is confirmed experimentally. The software is developed which can be used for optimizing design and operating parameters of spindle block drives by the criterion of spindle rotating accuracy.

Shablovski O. N., Krol D. G. Alternating Source of Energy and Generation of Space-Time Temperature Oscillations in Materials with "Heat Memory"

The numerical modeling results for thermal oscillations produced by a volume energy source are presented. Hysteresis and resonance properties for a thermophysical system the behavior of which is described by rheonomic sine-Gordon equation are specified.

Mirenkov V. V., Khizhenok V. F., Rodzevich P. E. The Analysis of the Operation of Cleaning Fan of Grain Combine Harvester KZS-10K

The principle of operation of KZS-10K grain harvester cleaning system is considered and also a comparison of design and experimental data. A theoretical analysis and parameter calculation for the cleaning system fan has been provided. The necessity of optimizing the design of the cleaning system fan of the grain combine harvester is revealed.

Pankov A. A., Tsytrinov A. V., Pankov I. A. International Nuclear Data Center Network and Prospects of Its Use in Nuclear Energy Engineering

This paper provides a brief overview of the existing nuclear data base (DB), and describes the structure of the International Nuclear Data Centres Network (STSYAD). Because the amount of experimental data in nuclear physics is extremely large the article aims to show the way to up-to-date methods of acquaintance with the characteristics of arrays of nuclei through the nuclear data banks accessible through the Web-technologies. In particular, the article describes the methods to extract information on the nuclei and nuclear reactions from nuclear data banks. The data includes information on the masses and energies of the nuclei, of the separation energy of nucleons and clusters, the spectra of states of nuclei, nucleon spin, parity, isospin, charge and mass radii and densities, information about the shape of the nuclei, the cross sections of nuclear reactions, the decay of unstable nuclei. Radiation and nuclear safety and environmental acceptability of nuclear installations depends on the completeness and accuracy of this data. Creating nuclear databases in Belarus will enable to monitor the quality of nuclear data supplied to consumers and ensure that systems of constants used in technical projects meet the current international standards.

Ostrikov O. M. Kinetic Model of Monocrystal Twinning Allowing for Auxiliary Processes of Sliding and Breaking

It is shown in the paper that a kinetic method can become a combiner base for the processes of twinning, sliding and breaking. It has been established that from the point of view of kinetic theory the activity of each of the processes mentioned is determined by the number of dislocation involved in it and the parameter determining the speed of kinetic reaction.

Smorodin V. S. The System of Operational Control of Controllable Probabilistic Technological Processes Simulating

The method of operational control of controllable technological processes is proposed based on unifying the methods of system study in the field of modeling complex technological systems with probabilistic parameters of their operation. Dynamic simulation models of research objects are used as an implementing tool . Their use as a part of interface facilities for a technological cycle will allow to reduce the probability of emergency situation at manufacturing departments.

Doroschenko I. V., Pohulayev M. N., Zakharenko V. S. The Problem of Through Currents of Electromechanical Test Stand Based on Asynchronous Valve Cascade

The influence of through currents on load characteristics of electromechanical test stand based on asynchronous valve cascade is considered in the paper. Recommendations on determining allowable values of through currents which do not impair the stand working capacity are given.

Pohulayev M. N., Vepper L. V. Increasing Resonance Frequency of Bridge Electromagnetic Converters

The analysis of the influence of major design values and electromagnetic parameters on resonant frequency of bridge electromagnetic converters is conducted in the paper. Novel construction schemes of electromagnetic converters with the increased operating speed are offered and the engineering procedure for designing such converters is presented.

Shirokov O. G., Medvedev K. M., Prokhorchyk M. A. The Structure of Automatic Diagnostic System for Power Transformer On-Load Tap-Changing Device

The structure of automatic diagnostic system for power transformer on-load tap-changing device is presented and also a functional scheme of software-technical complex included in it. The criteria and conditions for selecting main components of test section of the structure of the diagnostic system presented are considered. Comparative evaluation of frequency response characteristics of current sensors of various types intended for use in the diagnostic system is presented.

Guminski A. N. “Small-Scale Energy Generation” at the Enterprise and Specific Features of Its Realization

Major problems, arising in the process of introducing the sources of “small-scale energy generation” at industrial enterprises of the Republic of Belarus are considered. Based on real

examples observed in the energy system possible cases of the influence of the sources of "small-scale energy generation" on proper operation of energy facilities are considered. For preventing the situation of getting out of control quite a number of correcting measures are specified intended for meeting the requirements of norms and rules currently in force in designing, construction and operation of on-site energy generating sources at industrial enterprises.

Ivanovskaya I. V., Dragun N. P. What Direction Is It Necessary to Improve Antimonopoly Laws of Belarus in?

The analysis of legal and economic approach to revealing and canceling commodity producer collusion is presented in the paper. The lines of improving methodic basis of antimonopoly legislation are defined including: a) broadening the existing concept of the price collusion consisting in its understanding as the agreement between commodity producers on oligopolistic market having two forms of manifestation each of which characterized by its own conditions for occurrence and vitality, principles, methods and factors providing collusion stability in time; b) necessity of broad use of the results of economic analysis when proving the fact of a price collusion. This enables to develop methodic basis for revealing the occurrence and preventing a price collusion of commodity producers on oligopolistic markets allowing for specific features of all forms of its manifestation and also to estimate the necessity (practicability) of antimonopoly regulation of the markets mentioned.

Goudz E. E. The Outline of Ukraine Innovation Development in the Conditions of Crisis Deformation of the Economic Area

Theoretical, methodological and practical aspects of innovation development of Ukraine in the conditions of crisis deformations of the economic area are considered, monitoring of existing problems in the context of realities of present-day economic science and economic area imbalances is provided. Specifically it is noted that crisis phenomena in the Ukraine economy multiplied the risk of innovation activity suspension. Insufficient level of research and technical sphere funding by the government resulted in reducing the share of completed research and research and technical works in the total amount of gross domestic product in 2004–2010. In 2010 this share approached to the level of the USSR expenses in the early 50-ies and amounted to 0,9 %. Innovation process is delayed by insufficiency of institutional support of innovation activity, which shows itself in non-availability of a developed market environment, particularly in non-complete and unsystematic formation of an appropriate normative legal base for innovation development. The problem of governmental contribution to financial support to the enterprises of innovation sphere is becoming especially important. The priority task of innovation development has to be restructuring of the system of strategic priorities of innovation development with reducing their number and employing those in which Ukraine has significant research groundwork and good prospects.

Khilo Y. P. Diagnosing the Level of Technological Development of the Industrial Complex of the Country as an Underlying Sector of Innovation Economy Formation

The main aspects of applying the methods suggested by the author are considered. The methods are intended for diagnosing the level of technological development for the assessment of present-day condition of the industrial complex of the Republic of Belarus as a fundamental

factor determining the limit of possible increase of industrial production science intensity. The application of these methods for the assessment of export and import operation arrangement is considered. A set of measures is proposed aimed at enhancing technological development of the country based on the optimization of the relationship of science and industry.