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Graphite

USSR UDC 546.26-[illegible]

KUROLENKIN, YE. I., VIRGIL'YEV, Yu. S. and CHUBILOV, Yu. B.

"Changes in the Submicroporosity of Structural Graphite Following Irradiation"

Moscow, Izvestiya Akademii nauk SSSR, Neorganicheskiye materialy, Vol 8, No 1, 1972, pp 80-83

Abstract: The study described here deals with the effect of irradiation conditions (temperature and integral flow) on both the formation and redistribution of submicroporosity (radius of inertia, volume and specific pore area) in GMZ graphite. The graphite specimens were irradiated in airtight steel ampoules at temperatures of up to 800°C and dosages up to 7.10^{24} n/cm^2. Narrow-angle x-ray scattering was used to measure the submicroporosity. The porosity of the GMZ graphite is classed into groups whereby the finer pores of ~200 Å are responsible for volumetric crystal growth. On exposure to irradiation, the volume of the finer pores decreases with an increase in dosage. This effect is markedly decreased with increasing irradiation temperatures. (4 illustrations, 5 biblio. references)

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KRUPNIKOV, K. K., [redacted] SAPOZHNIKOV, A. T., SIMANOV, B. N., and SIMONENKO, V. A.

"Calculation of Explosions in Media With Polymorphic Phase Transitions"

Moscow, Doklady Akademii Nauk SSSR, Vol 202, No 2, 1972, pp 300-301

Abstract: The problem of describing the polymorphic phase transitions which occur during strong explosions in dense media can be completely solved in the simplest approximation of thermodynamic equilibrium. The authors limit themselves to the consideration of a strong explosion in a medium having only two modifications. The equation of state of each phase is taken in the form

$$P = P_x(\rho) + P_T, \qquad E = E_x(\rho) + E_T,$$
$$P_x = \frac{\rho_0 c_0^2}{n}(\delta^n - 1),$$
$$P_T = \Gamma c_v \rho T, \qquad (1)$$

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KRUPNIKOV, K. K., et al., Doklady Akademii Nauk SSSR, Vol 202, No 2, 1972, pp 300-301

$$E_x = \frac{c_0^3}{n}\left[\frac{\delta^{n-1} - n}{n-1} + \frac{1}{\delta}\right] + E_0,$$
$$E_T = c_V T,$$

where $\delta = \rho/\rho_0$, c_V = const, E_0 = const, Γ = const. The constants entering into the equation of state are obtained either from theoretical models or from experiments. The boundaries of the phase stability regions are determined from the equality of chemical potentials. The pressure and internal energy in each phase in the continuous flow regions are found from the system of equations

$$dE + P\,dV = 0,$$
$$P = P_x(\rho) + \Gamma\rho(E - E_x).$$

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KRUPNIKOV, K. K., et al., Doklady Akademii Nauk SSSR, Vol 202, No 2, 1972, pp 300-301

which after V integration along the isotherm, which is also an isobar here, takes the form

$$E - E_0 = [T\,dP(T)/dT - P(T)](V - V_0).$$

On the boundaries of the phase mixture region isentropes and shock adiabats experience a sharp bend, which in a number of cases results in the appearance of rarefaction shock waves and the bifurcation of compression shock waves. All these peculiarities were considered in the RAND /Calculation of Adiabatic Nonstationary Motions/ program for the computer-aided calculation of an explosion in a medium resembling quartz with the transition to stishovite:

$$\rho_{01}/\rho_{02} = 0{,}605,\quad c_{01}/c_{02} = 0{,}443,\quad c_{v1}/c_{v2} = 1,$$
$$n_1 = 4,\quad n_2 = 2{,}7,\quad \Gamma_1 = \Gamma_2 = 0{,}55.$$

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KRUPNIKOV, K. K., et al., Doklady Akademii Nauk SSSR, Vol 203, No 2, 1972, pp 300-301

Both phases were considered liquid (without shear stresses), and in the center was a gas bubble with high pressure, the expansion of which simulated a point explosion.

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USSR K UDC 681.333

KUROPTEV, A. A., All-Union "Order of the Lenin" Institute of Preliminary Study and Design and of Scientific Research Imeni S. Ya. Zhuk

"A Device for Remote Observation of the Movement of a Point in a Plane"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 3, 1970, p 129, patent No 260288, filed 20 Dec 68

Abstract: This Author's Certificate introduces a device for remote observation of the motion of a point in a plane. The unit contains two selsyn receivers, a slider, lead screws, gear trains and straightedges. As a distinguishing feature of the patent, accuracy is improved and the device is simplified by making the straightedges with open longitudinal slots and connecting them through the lead screws and gear trains to the selsyn receivers, while the slider carries a point light source and is mounted in the intersecting slots of the straightedges.

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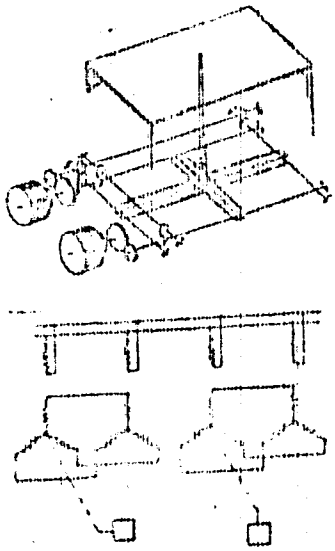
KUROPTEV, A. A., et al., Moscow, Otkrytiya, Imobretaniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 3, 1970, p 129, patent No 260288, filed 20 Dec 68



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USSR UDC 536.24:532.526

DYBAN, Ye. P., EPIK, E. Ya., KUROSH, V. D., KOZLOVA, L. G.

"Heat Transfer and the Boundary Layer on a Curved Surface Under Increased Turbulence of the Free Flow"

V sb. Vopr. obshch. i prikl. fiz. (Problems in General and Applied Physics -- Collection of Works), Alma-Ata, "Nauka", 1972, pp 159-164 (from RZh-Mekhanika, No 6, Jun 72, Abstract No 6B800)

Translation: Results of experiments on the local and average heat exchange at the surface of a cylinder in a transverse air flow under a constant density of the formal flow over its perimeter are presented. If the turbulence of the incident layer is low (less than 0.5%), the results of experiments on heat exchange in the frontal point satisfactorily agree with the theoretical solution. An attempt is made to analyze the characteristics of the development of the boundary layer and heat transfer under increased turbulence of the flow. The feasibility of introducing the Reynolds number determined on the basis of turbulent pulsation of the velocity into the criterial equation is established. 13 ref. Authors abstract.

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USSR UDC 621.438.001.5

ZYSINA-MOLOZHEN, L. M., Doctor of Technical Sciences, and KUROSH, V. D., Candidate of Technical Sciences, Central Boiler and Turbine Institute

"Effect of Turbulence on Transition in the Boundary Layer of Gas Turbine Profiles"

Moscow, Teploenergetika, No 12, 1971, pp 45 -46

Abstract : Results are presented of experimental investigation of the turbulence effect on transition in the boundary layer of typical gas turbine blades. Data of processing experimental results of turbulence measurements in the stator lattice of gas turbine blades under static conditions and conditions of lattice arrangement behind the rotating turbine wheel are discussed by reference to diagrams of characteristic Reynolds numbers (Re) at points of starting (Re_s) and ending (Re_e) transition. The presence of the rotating turbine wheel before the stator effects increased turbulence of the flow entering the nozzle lattice. At

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ZYSINA-MOLOZHEN, L. M., Teploenergetika, No 14, 1971, pp 45-46

values of the turbulence level $\varepsilon > 4.5$ %, according to experiments on the dynamic test bed, a tendency to stabilization of Re_s around the value of 1.2×10^5 was observed. The relative expansion of the transition zone under static and dynamic test conditions of the characteristic parameter of the transition zone $r = Re_s/Re_c$ can be approximately rated by empiric formulas previously (Ibid., No 7, 1969) suggested by one of the authors. Four illustr., three formulas, ten biblio. refs.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002201630012-4

USSR UDC: 8.74

KURGCHENKO, N. I., KOPYLENKO, V. M.

"Conditions of Existence of a Series of Sub-Blocks Which Realize a Given Relay Device"

V sb. Metody postroyeniya inform.-logicheskk. ustroystv (Methods of Constructing Information-Logic Devices--collection of works), Frunze, "Ilim", 1971, pp 140-150 (from RZh-Kibernetika, No 1, Jan 72, Abstract No 1V957)

Translation: Conditions are formulated for noncontradictory realization of a relay device with the aid of a given series of sub-blocks. Requirements are outlined and the basic criteria are given which are necessary in construction of a unified series of sub-blocks for a given class of circuits. Authors' abstract.

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"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R002201630012-4

USSR UDC 621.311.016

IL'IN, V. D., KUROV, B. N., Moscow

"Comparison of the Load Distribution Algorithms Considering Variation of the State of the Power System when Finding the Solutions"

Moscow, Elektrichestvo, No 9, 1972, pp 7-10

Abstract: A study was made of the problem of selecting the load distribution algorithm from among those compared which under the conditions of the specific electric power system will insure an optimal value of the efficiency criterion in the given time interval in the future where the total fuel consumption in the power system is considered to be the comparative efficiency criterion. Failure to consider the possible variation of the state of the power system when finding solutions can lead to erroneous conclusions. A comparison circuit is presented in the form of a set of Fortran-4 programs. Analysis of the results obtained on the Sistema 4-70 digital computer (ICL Company) as applied to an actual power system indicates the essential dependence of the results on the initial data used for the comparison and on the possible variation of the state of the target when finding the solutions.

When developing the software for automated control systems it is necessary to select the algorithms by comparing their efficiency using the initial

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IL'IN, V. D, Elektrichestvo, No 9, 1972, pp 7-10

data reflecting the conditions of functioning of the algorithms in the specific power system. Utilization of the algorithm comparison program during the developmental stage can lead to a significant simplification of the algorithms without lowering their efficiency. The introduction of the set of programs for evaluating the comparative efficiency of the algorithms into the software of automated control systems improves their efficiency since it permits selection of the algorithms corresponding to the variable conditions of functioning of the target object.

The presented mathematical analysis includes formulas for the statement of the problem, comparison of the solutions with and without consideration of the variation of the state of the object, consideration of the random nature of the system load, consideration of the random variation of the distribution vector and consideration of the indeterminancy of the station characteristics.

The general algorithm for estimating the comparative effectiveness of the solutions is as follows: 1) the characteristics of the relative increments are calculated by linear and quadratic approximation of the given characteristics; 2) the optimal distribution is carried out with respect to competing algorithms A_1 and A_2 for a given total system load P_s; 3) the vector components

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IL'IN, V. D., et al, Elektrichestvo, No 9, 1972, pp 7-10

$\overline{P}(A_1)$ and $\overline{P}(A_2)$ are rounded; 4) the values obtained are reduced in accordance with the condition $\sum_{j=1}^{n} P_j^{(0)} = P_s$ by varying the load of the regulating stations [where $P_j^{(0)}$ is the rounded values of the vector components $\overline{P}(A)_1$ and $\overline{P}(A_2)$]; 5) the inexactness of maintaining the values of $\overline{P}^{(0)}(A_1)$ and $P^{(0)}(A_2)$ at the stations is simulated; 6) the random value of the load P'_c is simulated; 7) the vectors obtained in accordance with item 5 from the condition of equality of the total generation to a value of P'_s are balanced; 8) the characteristics of the relative increments are simulated; 9) the comparative effectiveness is calculated. The Monte Carlo method is used in items 5, 6 and 8 of the algorithm.

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UDC: 51

USSR

IL'IN, V. D., KUROV, B. N., and SALYGA, V. I.

"Effectiveness of the Optimal Control of Energy Systems"

Pribory i sistemy avtomatiki. Resp. mezhved. temat. nauch.-tekhn. sb. (Automation Instruments and Systems, Republic Interdepartmental Thematic Scientific-Technical Collection) No 26, 1973, pp 112-116 (from RZh--Matematika, No 7, 1973, Abstract No 7V573)

Translation: The model of a thermal energy system is examined with respect to its application to the problem of optimizing the distribution of the active loads among electric power stations. Various algorithms in the form of programs for an electronic computer are presented. A combination of algorithms in the FORTRAN-4 language is devised. Authors' abstract.

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UDC: 51

USSR

IL'IN, V. D., KUROV, B. N., and SALYGA, V. I.

"Synthesis of Algorithms for Controlling Complex Systems"

Pribory i sistemy avtomatiki. Resp. mezhved. temat. nauch.-tekhn. sb. (Automation Systems and Instruments, Republic Interdepartmental Thematic Scientific-Technical Collection) No 26, 1973, pp 107-111 (from RZh--Matematika, No 7, 1973, Abstract No 7V553)

Translation: The problem of comparing competitive algorithms with a standard algorithm is considered. Criteria of comparative effectiveness and of the comparison condition are formulated. The problem of determining the number of tests for comparing the algorithms in a specified time interval is examined. Conditions are given for comparing solutions; these can be used to choose the most effective algorithm for a given energy system. Authors' abstract.

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UDC: 51

IL'IN, V. D., KUROV, B. N., SALYGA, V. I.

"Synthesis of Algorithms for Controlling Complex Systems"

Pribory i sistemy avtomatiki. Resp. mezhved. temat. nauch.-tekhn. sb. (Devices and Systems of Automation. Republic Interdepartmental Thematic Scientific and Technical Collection), 1973, vyp. 26, pp 107-111 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V553 by the authors)

Translation: The problem of comparing competing algorithms by means of a standard algorithm is considered. A criterion of relative effectiveness and conditions of comparison are formulated. The question of determining the number of tests when comparing algorithms on a given time interval is considered. The given conditions for comparing solutions can be used in selecting the most effective algorithm for a specific energy system.

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UDC: 621.311.010.51.003.1

USSR

[redacted] and [illegible], V. S.

"Sensitivity of Optimal Load Distribution to Indetermination Errors"

Moscow, Izvestiya Akademii Nauk SSSR--Energetika i Transport, No. 1, January-February 1971, pp 72-81

Abstract: This paper investigates the effect of errors on the solutions of power problems, a question to which a great deal of attention has recently been given. To develop the results they accumulated in two earlier papers, the authors consider the mathematical model and the results of an investigation of the sensitivity of optimization algorithms for electric power systems based on the Monte Carlo system. This method consists in computing the optimal value of the optimization algorithm goal function for fixed initial information, and then introducing random errors into the initial information in conformity with the specified distribution law. The goal function values and their deviations from the optimal value are again computed from the newly obtained information, and the

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KUROV, B. M., et al, Izvestiya Akademii Nauk SSSR -- Energetika i transport, No 1, January-February 1971, pp 72-81

mathematical expectation of the goal function deviation, beginning with the specified accuracy values, is estimated through the construction of the constituent intervals. Results of an analysis based on this method are given for the Southern Power Combine, the Donbas Power Combine, and the Uzbek Power Combine, which have 19, 9, and 7 power stations respectively.

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REEL # 16

KRASILNIKOVA, N.Ya.

to

KUROV, B.N.

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