USSR

UDC 621.314.58(088.8)

ZINOV'YEV, G.S., POPOV, V.I. [Novosib. elektrotekhn. in-t--Novosibirsk Electrical Engineering Institute]

"Direct Frequency Converter"

USSR Author's Certificate No 253225, filed 15 June 68, published 4 March 70 (from RZh--Elektronika i yeye primeneniye, No 3, March 1971, Abstract No 3B579P)

Translation: A direct frequency converter with artificial switching [kommutatsiya] units for each phase of the load is described. The artificial switching unit consists of two thyristors in series, connected to the phases of the feed voltage across a group of semiconductor diodes (common for all the artificial switching units). The midpoint of the thyristors in series is connected through a series connected capacitor and choke coil to the corresponding phase of the load. In order to decrease the switching losses and increase the reliability of the average current, it is proposed to connect each artificial switching unit across two anti-parallel connected thyristors with the midpoint of the feed net. 2 ill. A.S.
1/1

Phytology

USSR UDC 632.934.1:582.288.42:633.511

POPOV, V. I., SHIBKOVA, N. A., and TKACHENKO, M. P., All Union Scientific Research Institute of Plant Protection, Leningrad

"The Effectiveness of the Fungicide Benleit Against Verticillium Wilt of Cotton"

Leningrad, Mikologiya i Fitopathologia, Vol 4, No 2, 1970, pp 198-200

Abstract: The activity of benleit (Dupont) with respect to Verticillium dahliae, a variety of cotton wilt, was estimated. Direct application of a benleit solution of 50 mg/kg to cultures of the wilt pathogen completely destroyed mycelium and rendered the medium sterile. Treating the seeds by the adhesive method was 100% effective. Treating the soil with various doses of benleit prior to planting was also effective. The most significant experiment consisted of treatment of the soil with benleit in an amount of 80 g/kg 30 days prior to planting, followed by injection of the pathogen into plants, which remained completely protected. Since the pathogen was not in direct contact with the fungicide, it was concluded that the plant roots absorbed the fungicide from the soil, and carried it into the plant, where it killed the injected pathogen. It is therefore the first systemic fungicide effectively inhibiting cotton wilt 100%, and merits further field study with other plants.

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USSR

UDC: 621.3.049.75.669.35

KOSENKOV, A. S., PAVLENKO, G. I., POPOV, V. I.

"An Alloy for Making Microcircuits"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 15, 1970, Author's Certificate No 269226, filed 31 Mar 69, p 38

Abstract: This author's certificate introduces: 1. An alloy for making microcircuits based on copper, manganese and nickel. As a distinguishing feature of the patent, the alloy is designed for producing films with the necessary adhesion and anticorrosion properties, and for increasing the productivity of vaporizing equipment. Titanium is added to the alloy composition and the initial components are taken in the following ratios: manganese 0.5-2%; nickel 1-5%; titanium 0.05-0.5%; the remainder copper. 2. A modification of this alloy in which the distinguishing feature is reduction of the electrical resistance of films by partial or complete substition of cobalt for nickel.

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1/2 025 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--CHANGE IN THE FREEZE RESISTANCE AND STRENGTH OF POLY,VINYL CHLORIDE, FILMS BY THE ACTION OF LOW MOLECULAR WEIGHT LIQUIDS -U-

AUTHOR-(02)-POPOV, V.I., VOSKRESENSKIY, V.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., STROIT. ARKHITEKT. 1970, 13(1), 103-6

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--LOW TEMPERATURE EFFECT, POLYVINYL CHLORIDE, PLASTIC FILM, PHTHALATE, PLASTIC COATING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/0836 STEP NO--UR/0494/70/013/001/0103/0106

CIRC ACCESSION NO--AT0137864
UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0137864

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. POLY(VINLY CHLORIDE) (I) FILMS CONTG. 10-20PERCENT DIOCTYL PHTHALATE (II) HAVE SUFFICIENT FREEZE RESISTANCE AFTER EXPOSURE TO WATER, 10PERCENT NACL SOLN., 10PERCENT H SUB2 SO SUB4 SOLN., OF LIGROIN. LARGER AMTS. OF II IMPART BETTER FREEZE RESISTANCE CHARACTERISTICS, TO I. I IS RECOMMENDED FOR USE IN COATING INDUSTRIAL INTERIORS AND EQUIPMENT. FACILITY: KAZAN. INZH. STROIT. INST., KAZAN, USSR.

UNCLASSIFIED

1/2 028 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--CORRELATION OF NORMAL AND TANGENTIAL STRESSES DURING THE FLOW OF VISCOELASTIC FLUIDS -U-
AUTHOR--POPOV, V.I.

COUNTRY OF INFO--USSR

SOURCE--MEKH. POLIN. 1970, 6(1) 126-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--VISCOELASTICITY, POLYMER RHEOLOGY, MECHANICAL STRESS, STRESS ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFILD
PROXY REEL/FRAME--1992/0345 STEP NO--UR/0374/70/006/001/0126/0123

CIRC ACCESSION NO--AP0111539
UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--020CT70

CIRC ACCESSION NO--AP0111539

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXTRAPOLATION OF THE EXPTL. DATA OF SEVERAL AUTHORS SHOW THAT THE RELATION SIGMA EQUALS GAMMA SUB3 TAU (K. WEISSENBER, 1974; SIGMA IS THE DIFFERENCE BETWEEN NROMAL STRESSES IN THE X X AND Y Y PLANES OF THE VISCOELASTIC BODY, TAU IS THE TANGENTIAL STRESS IN THE Z Z PLANE, AND GAMMA SUB3 IS A COEFF.) DOES NOT HOLD FOR MANY RHEOL. SYSTEMS FOR WHICH, WHEN SIGMA EQUALS 0, TAU NOT EQUAL TO 0. THESE SYSTEMS ARE BETTER REPRESENTED BY TAU EQUALS EXP(MINUS SINGMA GAMMA SUB3 PRIME NEGATIVE), WHERE TAU EQUALS (TAU SUB3 MINUS TAU SUB2) AND SIGMA EQUALS SIGMA-(TAU SUB3 MINUS TAU SUB2). THE PHYS. MEANING OF THE TANGENTIAL STRESS COMPONENTS TAU SUB2 AND TAU SUB3 IS RELATED TO THE INTERWINING OF THE POLYMER CHAINS.

UNCLASSIFIED

1/2 040 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--CALCULATION OF THE RESISTANCE AND HEAT TRANSFER OF A PLATE IN A LAMINAR FLOW OF STRUCTURALLY VISCOUS FLUIDS -U-

AUTHOR--POPOV, V.I.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK, SSSR, SIBIRSKOE OTDELENIE, IZVESTIIA, SERIIA TEKHNICHESKIKH NAUK, FEB. 1970, P. 3-6

DATE PUBLISHED----FEB70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FLAT PLATE, VISCOUS FLOW, APPROXIMATION CALCULATION, BOUNDARY LAYER THICKNESS, FLUID DENSITY, FLOW VELOCITY, THERMAL CONDUCTIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1283 STEP NO--UR/0283/70/000/000/0003/0006

CIRC ACCESSION NO--AP0124934

UNCLASSIFIED

2/2 040 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124934

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEMONSTRATION OF THE POSSIBILITY AND DESIRABILITY OF USING A MEOLOGICAL RELATION TO CALCULATE THE RESISTANCE AND HEAT TRANSFER OF A PLATE IN A LAMINAR FLOW OF A STRUCTURALLY VISCOUS FLUID. EXPRESSIONS ARE OBTAINED FOR AN APPROXIMATE CALCULATION OF THE BASIC CHARACTERISTICS OF A STRUCTURALLY VISCOUS FLOW ON A PLATE. IT IS SHOWN THAT THE LOCAL FRICTION COEFFICIENT AND THE BOUNDARY LAYER THICKNESS ARE DETERMINED NOT ONLY BY THE STRUCTURALLY VISCOUS PROPERTIES OF THE FLOW AND BY THE REYNOLDS NUMBER, BUT ALSO BY THE PRODUCT OF THE DENSITY TIMES THE SQUARE OF THE POTENTIAL FLOW VELOCITY. FACILITY: AKADEMIIA NAUK SSSR, INSTITUT TEPLOFIZIKI, NOVOSIBIRSK, USSR.

UNCLASSIFIED

USSR
LABUSHKIN, V. G., POPOV, V. I., RUZER, L. S.

UDC 543.275:539.1.07.082

"Spectrometric Method of Measurement of Concentrations of Natural Radioactive Aerosols"

Tr. In-t Eksperim. Meteorol. Gl. upr. Gidrometeorol. Sluzhby pri Sov. Min. SSSR [Works of Institute of Experimental Meteorology, Main Administration of Hydrometeorological Service, Counsel of Ministers, USSR], 1972, No 25, pp 121-135, (Translated from Referativnyy Zhurnal, Metrologiya i Izmeritel'naya Tekhnika, No 7, 1972, Abstract No 7.32.903).

Translation: A study is made of a spectrometric method for determination of the concentrations of natural radioactive aerosols in the air, formed as the daughter products of radon and thoron decay. The α and β activity of the dispersed phase of aerosols precipitated on a fine-fiber type LFS-1 (AFA-RSP-10, 20), are measured simultaneously using scintillation spectrometric detection units. It is shown that the use of spectrometric methods to measure the concentration of daughter products of radon and thoron decreases the error and allows the self-absorption of α radiation in the aerosol specimen and dust in the air to be determined at the same time. An apparatus used for measurement of the concentration of natural radioactive aerosols by spectrometric methods is described. 5 Figures; 2 Tables; 27 Biblio. Refs.
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USSR UDC: 621.317.799:621.382.2

VASIL'YEV, V. T., POPOV, V. K.

"A Correlation Instrument for Measuring Noises in SHF Mixer Diodes"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 32, Nov 71, Author's Certificate No 318890, Division G, filed 3 Feb 70, published 28 Oct 71, p 132

Translation: This Author's Certificate introduces a correlation meter for measuring noises in SHF mixer diodes. The unit contains a microwave generator, a hybrid connector, and reference and test diode channels, each of which consists of a diode chamber and an amplifier. The device also incorporates a transport mechanism, an integrator, a balance indicator and a meter. As a distinguishing feature of the patent, provision is made for reducing the influence of SHF heterodyne noises on measurement results in the frequency band, and improving measurement precision. Connected to the output of the test diode channel amplifier is the input of a square-law detector whose output is connected through an auxiliary detector to one of the inputs of a subtractor. The other input of the subtractor is connected to the output of the reference diode channel integrator, and the output is

USSR

VASIL'YEV, V. T., POPOV, V. K., Soviet Patent No 318890

connected to the meter. The input of the microwave generator is connected to the output of a modulator, and an auxiliary output of the test channel amplifier is connected through a controlling amplifier to the regulating input of the reference diode channel amplifier. The controlling amplifier is tuned to the frequency of the modulating oscillations. Priority dates from 7 June 1968.

2/2

USSR UDC 621.9.048.7

OSTROVERKHOV, N.T., POPOV, V.K., STEPUSHINA, V.I.

"Experimental Investigation Of A Narrow Electron Beam With High Power Density At Crossover"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron SVCh (Electronic Technology. Scientific-Technical Collection. Microwave Electronics), 1970, No 7, pp 46-51 (from RZh--Elektronika i yeye primeneniye, No 11, November 1970, Abstract No 11A274)

Translation: The method of a scanning diaphragm is used for investigation of the structure of a thin (20-50 micrometer) electron beam with a power density at crossover of 10^6--10^8 watt/cm^2. The experiments were conducted on the electronoptical system of a unit (typical for industrial conditions) for dimension processing of materials, with an accelerating voltage of 80-100 kv and beam currents of 1-4 ma in a pulse. The measuring diaphragm was produced from monocrystalline tungsten and was cooled by water. After the diaphragm, the electrons of the beam enter into a collector (a Faraday cylinder), and the electron current is displayed on an oscilloscope [ostsillografiruyetsya]. With the aid of a deflecting system, the beam under investigation is expanded at the surface of the diaphragm. The experiments show that the distribution of the current density agrees with a precision up to 10 percent with Gauss' law, and the character of the change of the radius of the electron beam, the current density, and the power density at its smallest cross section is the result of a change of the size and position of the cross over which is shaped by a triode electron gun. I.V.

1/1

USSR UDC: 621.376.5(088.8)

VILKOV, A. N., DANILOV, I. N., POPOV, V. K.

"A Pulse Modulator"

USSR Author's Certificate No 262166, filed 23 Mar 67, published 2 Jun 70 (from RZh-Radiotekhnika, No 11, Nov 70, Abstract No 11D463 P)

Translation: This Author's Certificate introduces a pulse modulator which contains a charging DC voltage source, an ionic commutator based on a thyratron, a video pulse train oscillator which generates signals to control operation of the commutator, and an accumulator in the form of an artificial line. To reduce the inverse voltage on the plate of the thyratron, and to improve operational reliability, the inductance of each cell of the artificial line is shunted by a resistor. V. P.

1/1

USSR

UDC: 621.791.35.037

DYMIN, YE. P., POSKIMIN, V. V., POPOV, V.K., KHUDYCHEV, A. F., and ELBAKIDZE, V. G., Moscow

"Pulsed Electron Beam Welding Equipment"

Moscow, Avtomaticheskaya Svarka, No 8, 1969, pp 55-58

Abstract: The authors discuss the design and operational characteristics of the A852.04, A852.18, and A852.19 electron-optical systems used in a series of electron-beam welding units. A major break-through in this area was the production of a series of electron guns with a perveance $p = (0.3-1)\cdot10^{-7}$ $a/v^{2/3}$, using lanthanum hexaboride cathodes. The main elements of an electron-optical welding system consist of: an electron gun with three electrodes and focusing and deflecting systems. The A852.04 type is the most compact and ensures the minimal focal spot (Ø 0.4mm) for the given class of electron-optical systems. The operation of the system is stable at an accelerating voltage of up to 25 kv and at a beam current of 200 ma. Its vertical travel capacity is 230 mm and the horizontal is up to 120 mm. A852.04 is not equipped with a deflecting system and the entire system is mechanically guided along the working surface. The A852.18 type system is designed to operate at a maximum beam current of 100 ma and at an accelerating voltage of 20 kv. The system is mounted in a special head which

1/2

USSR

DEMIN, YE. P. et al., Avtomaticheskaya Svarka, No 8, 1969, pp 55-58

makes it possible to regulate and fix the angle of inclination with respect to the vertical axis from 0-30°. The A852.19 type system is designed for a maximum beam current of 200 ma and an accelerating voltage of 25 kv. Both A852.18 and A852.19 are equipped with electromagnetic deflecting systems. These systems can operate under continuous, pulse and monopulse regimes. Four types of pulsed electron beam welding units are described: A306.05 (5 kw), A306.07 (2 kw), A306.12 (2 kw), and A306.13 (5 kw). These units are designed to join small parts made from the same or different metals, alloys, including refractory, to seams which must satisfy a high degree of surface finish, vacuum tightness, heat resistance, and vibration strength. These units consist of the following components: an electron-optical system; a high-voltage power and modulation unit; a vacuum chamber with interchangeable drive systems for rotating the work to be welded; a vacuum system with remote control electromagnetic vacuum valves; and a control panel for controlling the process of evacuation and welding. TheA306.05 unit is designed to operate under pulse and continuous conditions at an accelerating voltage up to 25 kv and a beam current of 200 ma, utilizing the A852.04 electron-optical system. The A306.07 is a precision welding unit designed to work under pulse, continuous and single pulse conditions at an accelerating voltage up to 20 kv and a beam current up to 100 ma. Units A306.12 and A306.13 are improved models based on A306.07 and A306.05. The design characteristics and work capacity for the magnetron units are given along with a block diagram for the

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UDC 669.71:472:621.035

DEMIN, A. V., POPOV, V. L., SVOBODA, R. V., LAVROVA, T. V., KOZHEVNIKOVA, N. A., and SHIPKOV, N. N.

"Manufacture of Roasted Anodes for Aluminum Electrolyzers by the Method of Combined Pressing and Roasting"

V sb. Konstrukts. materialy na osnove grafita (Graphite-Base Construction Materials -- Collection of Works), No 6, Moscow, "Metallurgiya" (Metallurgy), 1971, pp 10-13 (from RZh-Metallurgiya, No 1, Jan 72, Abstract No 1G131 by G. Svodtseva)

Translation of Abstract: The results of tests with experimental specimens showed that the method of combined pressing and roasting makes it possible to obtain roasted anodes with elevated physicomechanical and operational characteristics from various raw materials.

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USSR

UDC 621.357.1:669.713.72

DEMIN, A. V., POPOV, V. I., SVOBODA, R. V., LAVROVA, T. V., KOZHEVNIKOVA, N. A., SHIPKOV, N. N.

"Manufacture of Annealed Anodes for Aluminum Electrolyzers by Combined Pressing and Annealing"

Konstrukts. Materialy na Osnove Grapfita [Graphite-Based Structural Materials -- Collection of Works], Moscow, Metallurgiya Press, No 6, 1971, pp 10-13 (Translated from Referativnyy Zhurnal, Khimiya, No 2, 1972, Abstract No 2 L309 from the Resume).

Translation: The possibility is demonstrated of using the method of combined pressing and sintering for the preparation of prismatic specimens of sintered anodes based on various raw materials: type KNPE petroleum coke mixed with pitch, shale, and also individually of non-roasted pitch coke. The properties of the anodes produced are compared with those of anodes type DEZ, anodes from companies in the GDR, FRG and Switzerland, tested under similar conditions. The results indicate that manufacture of anodes by combined pressing and sintering produces anodes with lower oxidizability, subject to considerably less damage upon interaction with CO_2, with compact structure.

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1/2 030 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--THERMAL PROPERTIES OF GLUE SEAMS STUDIED UNDER UNSTEADY STATE TEMPERATURE CONDITIONS -U-
AUTHOR--POPOV, V.M.

COUNTRY OF INFO--USSR

SOURCE--PLAST. MASSY 1970, (6), 70-2

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--GLUE, HEAT CONDUCTIVITY, METAL BONDING, RUBBER ADHESIVE, EPOXY RESIN, PHENOLIC RESIN/(U)VK3 PHENOLIC ADHESIVE, (U)VKL EPOXY ADHESIVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/0706 STEP NO--UR/0191/70/000/006/0070/0072

CIRC ACCESSION NO--AP0136145

UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AP0136145
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE OVERALL HEAT COND. (K) THROUGH THE ADHESIVE LAYER BETWEEN 2 METAL SURFACES WAS DETD. WITH 10-15PERCENT AV. EXPTL. ERROR FOR DURALUMIN BONDED WITH PHENOLIC RUBBER ADHESIVE VK-3 OR EPOXY ADHESIVE VK-1. THE APP. IS DESCRIBED. THE RESULTS AGREED WITH K CALCD. ON THE BASIS OF THE THEORETICALLY DEDUCED EQUATIONS.

UNCLASSIFIED

USSR

UDC: 661.143:546.47'226

SAFIN, N. Z., FOFOV, V. N.

"Investigation of the Preparation of Pure Solutions Using a Vibrodissolver"

Sb. Nauch. tr. VNII lyuminoforov i osobo chist. veshchestv (Collected Scientific Works of the All-Union Scientific Research Institute of Phosphors and Extra Pure Materials), 1971, vyp. 5, pp 158-171 (from RZh-Khimiya, No 7, Apr 72, Abstract No 7L171)

Translation: It is shown that the combination of a fluidized bed in liquids with vibration at a frequency higher than 40 Hz intensifies these processes by a factor of 1.5-2 as compared with processes in a fluidized bed. On the basis of the example of dissolution of ZnO in H_2SO_4 in various concentrations, it is shown that vibration equipment should be used for continuous preparation of a sulfate solution. Graphic material is presented for optimum selection of vibration parameters as a function of production. The possibility of using vibration equipment for preparing a sulfate solution is investigated in the production of ZnS with the use of a mother liquor. Resume.

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USSR

UDC: 661.143:546.47'221

SAFIN, N. Z., POPOV, V. N., ANFIMOV, Yu. A., PODKOLZINA, T. M.

"Equipment for Continuous Synthesis Zinc Sulfide of Improved Quality"

Sb. Nauch. tr. VNII lyuminoforov i osobo chist. veshchestv (Collected Scientific Works of the All-Union Scientific Research Institute of Phosphors and Extra Pure Materials), 1971, vyp. 5, pp 172-185 (from RZh-Khimiya, No 7, Apr 72, Abstract No 7L172)

Translation: The paper demonstrates the technical possibility and feasibility of converting zinc sulfide production to a continuous method. The best indices with respect to reaction rate constants are shown by intensive agitation devices: rotary agitators or equipment with a turbine-type or glandless mixer. The most effective method of washing out sulfides is the method of counterflow repulping on drum-type vacuum filters. Resumé.

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USSR

UDC: 661.143:546.41'185

POPOV, V. N.

"Investigating Regulation of the Precipitation of $CaHPO_4 \cdot 2H_2O$ From Solutions by Various Methods"

Sb. Nauch. tr. VNII lyuminoforov i osobo chist. veshchestv (Collected Scientific Works of the All-Union Scientific Research Institute of Phosphors and Extra Pure Materials), 1971, vyp. 5, pp 151-157 (from RZh-Khimiya, No 7, Apr 72, Abstract No 7L170)

Translation: The author investigates the structure of a suspension of $CaHPO_4 \cdot 2H_2O$. The reproducibility of the pH is verified for various methods of precipitation from solutions. It is shown that agitation must be intensified when using higher concentrations of the starting solutions in synthesizing $CaHPO_4$ for fluorescent compositions. Conditions are determined for controlling precipitation with respect to the pH of a suspension of $CaHPO_4 \cdot 2H_2O$. Resume.

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USSR

UDC: 539.92.04

GOL'DANSKIY, V. I., DZANTIYEV, B. G., POPOV, V. N., and GAVRILOV, K. A.

"Chemical-Radiation Action of Accelerated Multicharge Ions on Gaseous Nitrogen-Containing Systems"

Moscow, Atomnaya Energiya, No. 3, 1971, pp 262-266

Abstract: The purpose of this paper is to help clarify the effect of changes in the linear energy transmission on the chemical-radiation output in chemiconuclear synthesis. An experiment designed to fulfill this purpose is explained in the article; it involves heavy accelerated multicharge ions such as C^{+6}, N^{+7}, and O^{+8} with a full energy in the range of 84-280 Mev, acting on such gases as NO_2 in a system of $N_2 + O_2$, N_2H_4 in ammonia, and HCN in a system of $N_2 + CH_4$. The gases were in motion, flowing at a rate of 100-500 liters per hour. The volume of the ion beam was substantially smaller than the volume of the reactor. Details of the experiment are given, together with drawings of the entire apparatus in schematic form and a cross-section of the reactor. The ions were ac-

1/2

GOL'DANSKIY, V. I., et al, Atomnaya Energiya, No. 3, 1971, pp 262-266

celerated in the cyclotron of the Joint Institute of Nuclear Research laboratory, and curves of the chemical-radiation output as a function of the ion charge, the temperature, and the gas flow velocity are given. The authors express their gratitude to G. N. Flerov for his interest in the work.

2/2

Acc. Nr: AP0038047 Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 1, pp 257-263

PHONON GREEN FUNCTION FOR LOW ENERGIES AND MOMENTA

V. N. Popov

The sequence of perturbation theory diagrams yielding the main contribution to the phonon Green function for low energies and momenta is summed up. The summation reduces to solution of a set of kinetic equations by the Chapman — Enskog method. As a result the Green function acquires some new poles compared to the unperturbed function. Thus a pole corresponding to thermal conductivity appears and in the model in which coulomb interaction is not taken into account poles appear which correspond to second sound.

1/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--DENSITY OF CARBON DIOXIDE IN THE LIQUID PHASE -U-

AUTHOR-(02)-POPOV, V.N., SAYAPOV, M.K.

COUNTRY OF INFO--USSR

SOURCE--TEPLOENERGETIKA 1970, 17(4), 76

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CARBON DIOXIDE, GAS DENSITY, FLUID DENSITY, LIQUID CARBON DIOXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1950 STEP NO--UR/0096/70/017/004/0076/0076

CIRC ACCESSION NO--AP0118912

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0118912
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE D. OF LIQ. CO SUB2 WAS STUDIED BY THE WT. METHOD. A PIEZOMETER WITH AN INTERNAL VOL. OF 245 CM PRIME3 WAS SUSPENDED FROM SCALES. IT WAS CALIBRATED WITH WATER AT 25 AND 30DEGREES AT PRESSURES FROM 1 ATM TO 300 BAR. COM. CO SUB2 WAS USED THAT HAD BEEN PURIFIED SO THAT THE CONTENT OF GASEOUS IMPURITIES DID NOT EXCEED 0.02PERCENT. A TOTAL OF 117 POINTS WAS OBTAINED AT MINUS 50 TO PLUS 30DEGREES. THE MAX. ERROR DID NOT EXCEED 0.086PERCENT.
FACILITY MOSK. ENERG. INST., MOSCOW USSR.

UNCLASSIFIED

1/2 060 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--HEAT TRANSFER AND FRICTION DRAG DURING LONGITUDINAL TURBULENT FLOW PAST A PLATE BY A GAS WITH VARIABLE PHYSICAL PROPERTIES -U-
AUTHOR--POPOV, V.N.

COUNTRY OF INFO--USSR

SOURCE--TEPLOFIZIKA VYSOKIKH TEMPERATUR, VOL. 8, MAR.-APR. 1970, P. 333-345
DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--HEAT TRANSFER, FRICTION LOSS, TURBULENT FLOW, FLAT PLATE, TEMPERATURE EFFECT, GAS DYNAMICS, GAS FLOW, BOUNDARY LAYER, TRANSPORT THEORY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/0486 STEP NO--UR/0294/70/008/000/0333/0345

CIRC ACCESSION NO--AP0137576
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 060

CIRC ACCESSION NO--AP0137576

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DESCRIPTION OF A METHOD OF CAULCULING THE HEAT TRANSFER AND FRICTION DRAG DURING TURBULENT FLOW PAST A PLATE BY A GAS THE PHYSICAL PROPERTIES OF WHICH DEPEND ARBITRARILY ON TEMPERATURE. THE PROPOSED METHOD CAN BE APPLIED NOT ONLY TO A CHEMICALLY HOMOGENEOUS GAS BUT ALSO TO A GAS IN DISSOCIATED OR IONIZED EQUILIBRIUM. MOREOVER, THIS METHOD TAKES MORE ACCURATE ACCOUNT OF THE VARIATION OF THE TANGENTIAL STRESS AND HEAT FLUX DENSITY OVER THE BOUNDARY LAYER CROSS SECTION, IT DOES NOT INVOLVE AN ARBITRARY DIVISION OF THE BOUNDARY LAYER INTO A VISCOUS SUBLAYER AND A TURBULENT CORE, NO ARTIFICIAL ASSUMPTIONS ARE MADE REGARDING THE MIXING LENGTH IN THE CASE OF CONSTANT PHYSICAL PROPERTIES, AND MORE ACCURATE ACCOUNT IS TAKEN OF THE CROSS SECTIONAL VARIATION OF THE TURBULENT TRANSPORT COEFFICIENT. IN THE CASE OF VARIABLE PHYSICAL PROPERTIES IT IS NECESSARY TO INTRODUCE A CERTAIN HYPOTHESIS CONCERNING THE MIXING LENGTH. ON THE BASIS OF THIS HYPOTHESIS A RELATION IS OBTAINED WHICH RELATES THE TURBULENT TRANSPORT COEFFICIENTS FOR THE CASES OF CONSTANT AND VARIABLE PHYSICAL PROPERTIES.

FACILITY: MOSKOVSKII ENERGETICHESKII INSTITUT, MOSCOW, USSR.

UNCLASSIFIED

1/2 016 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--EXPERIMENTAL STUDY OF THE DENSITY OF BORIC ACID SOLUTIONS IN WATE -U-

AUTHOR--POPOV, V.N.

COUNTRY OF INFO--USSR

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CIRC ACCESSION NO--AP0050858

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE D. OF AQ. SOLNS. OF H SUB3 BO SUB3 WAS MEASURED BY A MODIFIED CONST. VOL. (IS SIMILIAR TO 240 ML) PIEZOMETER IN THE HOMOGENEOUS REGION AT IS LESS THAN OR EQUAL TO 98 ATM AND IS LESS THAN OR EQUAL TO 260DEGREES FOR CONCNS. IS LESS THAN OR EQUAL TO 20PERCENT WT. H SUB3 BO SUB3. THE EXPTL. DATA WERE CORRELATED BY THE EQUATION P EQUALS P1 PLUS (2.115 PLUS 8.25 TIMES 10 PRIME NEGATIVE4 T MINUS 2.52-(K PRIME7 PLUS 6)) TIMES 10 PRIME NEGATIVE2 K MINUS 0.1875 TIMES 10 PRIME NEGATIVE2 K PRIME2 PLUS 1.25 TIMES 10 PRIME NEGATIVE4 K PRIME3,. WHERE K EQUALS 20 SUBPW2, P AND P1 ARE DS. (KG-M PRIME3) OF AQ. SOLN. OF H SUB3 BO SUB3 AND WATER, RESP., T IS TEMP. (DEGREEC), AND W2 IS THE WT. FRACTION OF H SUB3 BO SUB3. THE COMPARISON OF THE EXPTL. AND CALCD. VALUES SHOWED A GOOD AGREEMENT (MAX. DEVIATION 0.35PERCENT).

UNCLASSIFIED

Acc. Nr. AP0041350 Abstracting Service: CHEMICAL ABST. 4-70 Ref. Code: 4R 0456

84863f Radiation-chemical synthesis of prussic acid under flow conditions. Dzantiev, B. G.; Popov, V. N.; Smelova, Yu. N. (Inst. Khim. Fiz., Moscow, USSR). *Khim. Vys. Energ.* 1970, 4(1), 80–7 (Russ). Gaseous mixts. of $NH_3 + CH_4$, $N_2 + CH_4$, $NH_3 + C_2H_4$, $N_2 + C_2H_4$, $NH_3 + C_2H_2$, and $N_2 + C_2H_2$ were purified, dried, heated at 20–250° and passed at a rate of 400–900 l./hr through a reactor (vol. = 9.2 l.), irradiated using a electron accelerator (E_e = 600 keV, ~ 10^{13} eV cm^{-2} sec^{-1}, time of the contact of gas with irradn. zone 82–36 sec). Yields are given for the reaction products.

J. Panchartek

REEL/FRAME 19751212

USSR

UDC 536.24

POPOV, V. N., Moscow Power Engineering Institute

"Heat Transfer, Adiabatic Enthalpy (Temperature) of the Wall of a Compressible Fluid in a Circular Tube"

Moscow, Teplofizika vysokikh temperatur, No. 3, May/Jun 72, pp 572-586

Abstract: Noting the small amount of theoretical work concerning the calculation of heat transfer, adiabatic wall temperature, and hydrodynamic resistance in the flow of a liquid in a circular tube, the author considers the stationary, axisymmetric flow in a circular tube of a compressible fluid with arbitrarily varying physical properties under laminar and turbulent flow regimes. He notes that heat exchange and hydrodynamic problems concerning turbulent and laminar flow in a circular tube of a compressible and incompressible fluid are very important for various regions of technology when the effect of dissipation is considerable. An approach is indicated to the solution of the problem of determining the local characteristics of heat exchange, hydrodynamic resistance, and adiabatic wall temperature when the profiles of the heat flow density and the tangential stress in a cross section of the tube are assumed to be

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USSR

POPOV, V. N., Teplofizika vysokikh temperatur, No. 3, May/Jun 72, pp 572-586

known apriori. An approximate solution of this problem for the case of liquid flow far from the input to the tube is obtained on the basis of this approach. The solution is exact in the limiting case of constant physical properties and under a fixed thermal flow density along the tube. Integral expressions are obtained for the Nusselt number, the restitution coefficients, and the coefficient of resistance to friction.

POPOV, V. N.

JPRS 57923

5 January 197[illegible]

EQUATION OF STATE OF A MIXTURE OF HELIUM AND NITROGEN

[Article by V. N. Popov, V. I. Chernyshev; Moscow, Izvestiya [illegible] Nauk SSSR, [illegible] Transport, Russian, No 3, 1971, [illegible] pp 162-164]

Computer analysis of experimental data on the compressibility of helium, nitrogen and their mixtures resulted in the derivation of the equation of state that describes the experimental data in the 273.15–773.15°K temperature range up to a pressure of 400 bar. Comparison of the theoretical coefficients of compressibility and density of a mixture of helium and nitrogen, calculated according to the proposed equation of state, with the experimental values indicates satisfactory agreement in the entire range of temperatures and pressures encompassed by the experiment.

A mixture of helium and nitrogen is used in industry as a heat transfer agent. Therefore hydrodynamic calculations and the solutions of many heat transfer problems require reliable data on the thermic and caloric properties as well as the transfer properties of such a mixture in a wide range of change of the parameters of state.

In this work the equations of state by which detailed tables of the coefficients of compressibility and density were compiled in the 273.15 to 773.15°K temperature range and 50 to 400 bar pressure range are derived through computer processing of experimental data [1-4] for helium, nitrogen and their mixtures.

Equation of state of helium. For the processing of all experimental data on helium in the investigated temperature and pressure ranges we used an equation of state in the form of a polynomial by powers of density

[illegible] (1)

POPOV, V. P.

data link systems

CAROL (S)

JPRS 59662

31 July 1973

All- Communications/ Data Link Systems

TECHNICAL FACILITIES OF THE SIRENA-1 DATA LINK SYSTEM

[Article by Candidates of Technical Sciences V. N. Silayev, O. K. Bazilenko, V. L. Bakhrakh, Yu. F. Bubennov, V. Ye. Khazatskiy, and Engineers A. S. Ipatov, Yu. N. Zhuravitskiy, V. P. Popov; Moscow, Pribory i Sistemy Upravleniya, Russian, No 4, April 1973, pp 1-4]

The rational organization of a data link in geographically scattered systems of the type Sirena [1] largely determines the economic effectiveness of the entire system.

A data link combines into one system the peripheral subdivisions [2] and the technological data processing center (DPC) [3]. The link is a set of channels and technical facilities that provide a high communication channel utilization coefficient, reliable transmission and processing of data and direct multichannel communications. Accordingly, the technical facilities of a link are divided into three groups: data traffic concentration facilities (DTC); data exchange reliability group and multichannel communications group.

Means of Concentrating Data Flows

The purpose of facilities of this group is to ensure economically efficient utilization of uncommutated channels K_c for a given subscriber servicing quality. The prerequisites for extensive application of various data traffic concentration methods in a data link were formulated in [1].

According to the criterion $\Phi = l_i/l_j$ of the ratio of distances between the sources (1-n) and the concentrator K and between the concentrator and DPC, the following methods of traffic concentration may be used (Figure 1): local concentration ($l_i \ll l_j$; $l_i < 100$ m); central traffic concentration ($l_j \ll l_i$; $l_j < 100$ m), concentration of data from geographically scattered points ($l_i \approx l_j$; l_i, $l_j \gg 100$ m). The technical facilities of DTC may be based on the utilization of the principles of commutation of either the channels or the traffic.

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Popov, V.P.

STP's 572 08
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VII-2a. REGULATION OF THE GAS PHASE COMPOSITION FOR GaAs EPITAXY

[Article by V. N. Andreyev, V. P. Popov, A. V. Rybakov, Moscow; Novosibirsk; III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok," Russian, 12-17 June, 1972, p 87]

In order more precisely to define the initial data for the thermodynamic calculations, the magnitudes of the enthalpy and entropy of As_2, the standard enthalpy of GaCl and the melting entropy of Ga were defined by the results of the experiment performed on a quartz membrane manometer.

Considering the mechanism of interaction of the gallium with $AsCl_3$, a system of equations of the yields of the reactions was compiled the solution of which was found on a computer.

It was demonstrated that depending on the methods of diluting the gas mixture with hydrogen the HCl concentration can vary significantly after the source.

As a result of this, on introduction of pure hydrogen after the source, a negative section appears on the GaAs yield curve in the temperature range of 850-800°C, that is, it becomes etching.

The temperature of the beginning of crystallization of GaAs is presented as a function of the experimental conditions.

USSR UDC 536.421.4+536.421.1

LOZOVSKIY, V. N., GERSHANOV, V. Yu., KALINYUK, A. I., NIKOLAYEVA, Ye. A., POPOV, V. P., and UDYANSKAYA, A. I.

"Basic Laws of Silicon Crystallization for a Zone Melt With a Temperature Gradient"

V sb. Kristallizatsiya i faz. prevrashcheniya (Crystallization and Phase Transformations -- collection of works), Minsk, "Nauka i tekhn." 1971, pp 91-97 (from RZh-Fizika, No 9, 1971, Abstract No 9E382)

Translation: The kinetics of a zone melt with a temperature gradient are experimentally investigated in Si-Al, Si-Ag, Si-Au, Si-Fe, Si-Cu, Si-Ni, Si-Sn, Si-Pt systems. Curves expressing the dependence of the liquid zone migration rate on its thickness and temperature are obtained for these systems, the values of the activation energy of zone movement are found, and the effect of the third component on the zone velocity is determined; it is established that, in the region of fine zones and small temperature gradients, the stability of the zone movement is independent of the anisotropy of the solution and the crystallization; in the opposite case the morphology of the zone is determined by slowly dissolving planes of the (111) type. Author's abstract

1/1

USSR UDC: 621.382-181.4

LOZOVSKIY, V. N., POPOV, V. P.

"Zone Melting With a Temperature Gradient as a Method in Semiconductor Technology"

Kiev, Izvestiya VUZov, Radioelektronika, Vol 15, No 1, Jan 72, pp 3-12

Abstract: The authors present the physical and metallurgical principles of zone melting with a temperature gradient. In essence, the method consists in successive recrystallization of layers of solid phase by a liquid zone which moves in the crystal under the effect of a temperature gradient. The liquid zone is enriched by a component which depresses the melting point of the crystal, and the motion of the zone is due to processes within and on the boundaries of the liquid phase. Therefore the method can be used at temperatures considerably below the melting point of the crystal, the movement of the liquid zone does not require moving the heater, the maximum dimensions and form of the liquid zone do not depend on the size and shape of the crystal, and the position of the zone is not directly related to the position of the heater. A liquid zone of any configuration or a set of zones can be created simultaneously in a crystal of simple shape. As the zones move, epitaxial layers of a given geometry are formed

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LOZOVSKIY, V. N., POPOV, V. P., Izv. VUZov, Radioelektron., No 1, 1972, pp 3-12

on the surface or within the initial crystal. A survey is given of applications of this method to the production of electronically heterogeneous structures in semiconductors. The relation between the electrical properties of the semiconductor structures and the zone melting technique is analyzed, and prospects for using the method in semiconductor technology are indicated. It is noted that the method is applicable not only to simple semiconductors, but to silicon carbide, sulfides, selenides, $A^{III}B^{V}$ compounds and so forth, and also to solid solutions. The basic weakness of the method is the lack of research which has been done on migration of liquid micro-inclusions under the effect of the temperature gradient. Four figures, bibliography of nineteen titles.

2/2

USSR

UDC: 661.143:546.48'221

SHCHUL'MAN, V. M., POPOV, V. P., REDCHENKO, V. T., VARAND, V. L., ZEGZHDA, T. V.

"A Thiourea Method of Synthesizing Cadmium Sulfide for Phosphors"

Sb. nauch. tr. VNII lyuminoforov i osobo chist. veshchestv (Collected Scientific Works of the All-Union Scientific Research Institute of Phosphors and Extra Pure Materials), 1971, vyp. 5, pp 144-150 (from RZh-Khimiya, No 7, Apr 72, Abstract No 7L175)

Translation: A hydrogen sulfide free method of synchesizing CdS is developed which is based on deposition of CdS from an aqueous solution of $CdSO_4$ by thiourea in the presence of NH_3. The resultant CdS contains 99% or more of the basic substance, and 10^{-4}% or less of heavy metal impurities (Fe, Cu, Ni and Co combined). The cadmium sulfide synthesized by the thiourea method is suitable for making luminescent compositions of various grades. The diagram for synthesis of cadmium sulfide is given. Bibliography of 13 titles. Resumé.

1/1

UDC 621.315.592.3:669.782

USSR

LOZOVSKIY, V. N., POPOV, V. P., and DAROVSKIY, N. I.

"Investigation of Disruptive Voltage of p-n-Transitions by the Method of Zone Melting With Temperature Gradient on Linear Zones"

Tr. Novocherk. politekhn. in-ta (Works of the Novocherkassk Polytechnical Institute), 1970, 208, pp 57-64 (from RZH-Metallurgiya, No 11, Nov 70, Abstract No 11G386)

Translation: Sb doped n-Si with a resistivity of 0.01 ohm·cm was used. Specimens were cut out in the form of plates 1.2 mm thick and oriented according to facet (110). Linear Al-zones 100 mk in diameter were oriented in the direction [110]. The temperature range varied from 800 to 1250° with temperature a gradient of ~ 100 deg/cm. The change in disruptive voltage of the p-n-transition along the entire thickness of the Si plates was determined at a current density of 5 ma/mm^2 in thin layers of Si (~100 mk). In general, the disruptive voltage of plane silicon p-n-transition changed in the direction of zone motion, a fact related to the initial instability of the zone and diversity of time and temperature conditions of the formation of p-n-transition at different points along the trajectory of the zone. A method is proposed

1/2

USSR

LOZOVSKIY, V. N., Tr. Novocherk. politekhn. in-ta, 1970, 208, pp 57-64 (from RZH-Metallurgiya, No 11, Nov 70, Abstract No 11G386)

for the elimination of nonuniformity of the disruptive voltage of the p-n-transition by additional annealing of the specimen in the field of the temperature gradient after zone melting with the temperature gradient. 2 ill., 11 bibl. entries.

O. Myakisheva

2/2

UDC 621.382.002

USSR

LOZOVSKIY, V. N., NIKOLAYEVA, Ye. A., POPOV, V. P., UDYANSKAYA, A. I., GERSHANOV, V. Yu.

"Concerning the Dimensions and Configuration of Electrically Heterogeneous Structures Obtained by the Zone Melting Method With a Temperature Gradient"

V sb. Vopr. mikroelektroniki (Problems of Microelectronics -- Collection of Works), Kiev, "Nauk. dumka," 1971, pp 163-167 (from RZh--Elektronika i yeye primeneniye, No 10, October 1971, Abstract No 10B429)

Translation: The geometrical characteristics are considered of electrically heterogeneous structures obtained in Si by the zone melting method with a temperature gradient as a function of the dimensions and form of the liquid zone, and also the form of its path. It is shown that zone melting with a temperature gradient makes it possible to form microstructures with diversified dimensions and form: multilayer, perpendicular surfaces of rectangular form; grid structures; cylindrical channels; and others. Using metal sputtering and subsequent photolithography, it is possible to obtain structures of practically any configuration. 1 ill. 5 ref. I.M.

1/1

USSR

UDC 53.07/.08+53.001.5

BOYKO, G. I., POPOV, V. P., FEDORCHENKO, S. N.

"A Sensitive, Stable Differential Voltage Pulse Discriminator"

Tr. Soyuzn. NII priborostr. (Works of the Union Scientific Research Institute of Instrument Building), 1971, vyp. 16, pp 43-55 (from RZh-Fizika, No 4, Apr 72, Abstract No 4A576)

Translation: A description is given of the circuitry and experimental characteristics of a differential discriminator with conversion of the input voltage pulse to current. The discriminator has fairly good stabilization of discrimination levels and width of channels as well as high resistance to amplitude and frequency overloads. The temperature instability of the discrimination level and channel width is calculated. The discriminator has 50 discrimination levels and 10 channel widths from 50 to 500 mv with discrete setting. The integral nonlinearity of the amplitude characteristic is no more than 1%, and the differential nonlinearity is no more than ±4%. The instability of discrimination levels with a change in temperature by ±20°C from the normal is no more than ±1.2 mv/10°C, and the change in channel width is no more than ±1.5 mv/10°C with regard to

1/2

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BOYKO, G. I. et al., Tr. Soyuzn. NII priborostr., 1971, vyp. 16, pp 43-55

measurement error. The resolving time of the circuit is no more than 1 μs. The reference signal is displaced by no more than a single channel with a change in the frequency of statistically distributed signals from 10^3 to 10^5 pulses per second. Resumé.

2/2

UDC 681.3.001.51

USSR

POPOV, V. P.

"Concerning Methods of Solving Differential Equations on Analog Computers"

Sb. tr. Leningr. in-t inzh. zh.-d. transp. (Collected Works. Leningrad Institute of Railway Transportation Engineers), 1971, vyp. 331, pp 20-33 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 9, Sep 72, Abstract No 9B443)

Translation: A procedure is considered which enables determination of the transfer constant of the resolving modules in analog computers by a simple method independently of the scales of the variables (and vice versa) at any time scale. It is shown that the given procedure can be generalized to the solution of nonlinear equations. A method is outlined for determining the scales of variables without trial solutions, and recommendations are made on checking whether the proper action has been taken at any stage in preparing the solution when the operator has not had the necessary experience. Four illustrations, one table, bibliography of one title. Resumé.

1/1

USSR

GRIBOV, V. N., Physicotechnical Institute imeni A. F. Ioffe, Academy of Sciences USSR, and Institute of Theoretical and Experimental Physics, State Committee for the Use of Atomic Energy; MUR, V. D., Moscow Engineering-Physics Institute, and Institute of Theoretical and Experimental Physics, State Committee for the Use of Atomic Energy; KOBZAREV, I. YU., OKUN', L. B., and POPOV, V. S., Institute of Theoretical and Experimental Physics, State Committee for the Use of Atomic Energy

"Properties of Amplitudes With Logarithmically Increasing Interaction Radius"

Moscow, Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

Abstract: A previous article by the authors considered the elastic scattering amplitudes of the particle F(s,t) and antiparticle $\bar{F}(s,t)$ for the case in which the Pomeranchuk equality is violated:

1/4

USSR

GRIBOV, V. N., et al., Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

viz., given $s \to \infty$ the total cross-sections of the interaction with a given target for the particle and antiparticle are constant and do not equal each other

$$\sigma, \bar{\sigma} = \text{const}, \quad \sigma \neq \bar{\sigma}.$$

An analysis was given of so-called self-similar modes in which the behavior of the amplitudes, in essence, is determined by a single variable $\tau = \rho_0 \xi_q$; where $\xi = \ln s$, q is the momentum transfer ($t = -q^2$), and ρ_0 is the length dimensionality param-

USSR

GRIBOV, V. N., et al., Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

eter; and it was shown that the imaginary part of the crossing-antisymmetric amplitude is an alternating function of its arguments ξ and q. The present article considers limitations which are imposed on the amplitude by analyticity and unitarity in the case of constant total cross-sections, as well as those that vary with energy, without any assumption of self-similarity. It is shown that a number of amplitude properties established in the earlier article, particularly the sign alternation of the imaginary part of the crossing-antisymmetric amplitude, obtain even without the assumption of self-similarity. Modes are considered in which the characteristic impact parameters ρ increase with increase in energy (the Pomeranchuk equality is violated, given $\rho \sim \rho_0 \xi$), with a discussion only of those ρ and q for which $\rho/\rho_0 \gg 1$ and $q\rho_0 \ll 1$.

3/4

USSR

GRIBOV, V. N., et al., Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

The authors thank A. A. ANSEL'M, G. S. DANILOV, I. T. DYATLOV, G. T. ZATSEPIN, B. L. IOFFE, A. B. KAYDALOV, and YE. M. LEVIN for useful discussions.

4/4

UDC 621.3.078

USSR

BELYAKOV, V. L., and POPOV, V. S., Leningrad Military Engineering Academy imeni A. F. Mozhayskiy

"The Problem of Analysis and Synthesis of Automatic Control Systems by the Method of Logarithmic Frequency Characteristics"

Leningrad, Priborostroyeniye, Vol XIV, No 7, 1971, pp 53-55

Abstract: The transfer functions of complex automatic control systems often contain fourth-order factors of the following type:

$$\left.\begin{array}{l} \tau^4 p^4 + 2\xi\tau^2 p^2 + 1, \quad \tau^4 p^4 + 1 \\ \dfrac{1}{T^4 p^4 + 2\xi T^2 p^2 + 1}, \quad \dfrac{1}{T^4 p^4 + 1}, \end{array}\right\} \qquad (1)$$

where $0 \leq \xi < 1$. If the system under consideration is an open system, then it is advisable to relate the expressions of form (1) to standard factors and to construct their normalized logarithmic amplitude and phase characteristics. From the normalized logarithmic amplitude characteristics of such

USSR

BELYAKOV, V. L., and POPOV, V. S., Priborostroyeniye, Vol XIV, No 7, 1971, pp 53-55

factors it is easy to construct the logarithmic amplitude characteristics of the control system itself, with almost no computational work involved. Hence, the isolation of standard factors in the form of the expressions in (1) considerably simplifies research on complex automatic control systems by the method of logarithmic frequency characteristics.

2/2

USSR

UDC 621.3.078

BELYAKOV, V. L. and POPOV, V. S.

"Analysis and Synthesis of Automatic Control Systems by the Logarithmic Frequency Characteristic Method"

Leningrad, Izvestiya VUZ -- Priborostroyeniye, No. 7, 1971, pp 53-55.

Abstract: The chief advantage of the use of logarithmic characteristics over ordinary frequency characteristic methods is that they lend themselves to plotting with practically no computation. The authors begin their study by writing the fourth-order coefficients usually contained in the transfer functions encountered when investigating aircraft control, for example. While these coefficients can be expanded into second-order coefficients, it is simpler to plot the frequency characteristics from the fourth-order forms by the logarithmic frequency method, for analyzing and synthesizing automatic control systems, if the normalized logarithmic amplitude characteristics and logarithmic frequency characteristics of those forms are known. A family of normalized logarithmic amplitude characteristics is plotted, from which one can plot the logarithmic amplitude characteristics of a control system whose transfer functions contain the fourth-order coefficients.

USSR

BELYAKOV, V .L., and POPOV, V. S., Izvestiya VUZ -- Priborostroyeniye, No 7, 1971, pp 53-55

The authors are associated with the A. F. Mozhayskiy Military Engineering Academy, Leningrad.

2/2

USSR

GRIBOV, V. N., Physicotechnical Institute imeni A. F. Ioffe, Academy of Sciences USSR, and Institute of Theoretical and Experimental Physics, State Committee for the Use of Atomic Energy; MUR, V. D., Moscow Engineering-Physics Institute, and Institute of Theoretical and Experimental Physics, State Committee for the Use of Atomic Energy; KOBZAREV, I. YU., OKUN', L. B., and POPOV, V. S., Institute of Theoretical and Experimental Physics, State Committee for the Use of Atomic Energy

"Properties of Amplitudes With Logarithmically Increasing Interaction Radius"

Moscow, Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

Abstract: A previous article by the authors considered the elastic scattering amplitudes of the particle $F(s,t)$ and antiparticle $\bar{F}(s,t)$ for the case in which the Pomeranchuk equality is violated:

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GRIBOV, V. N., et al., Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

viz., given $s \to \infty$ the total cross-sections of the interaction with a given target for the particle and antiparticle are constant and do not equal each other

$$\sigma, \bar{\sigma} = \text{const}, \quad \sigma \neq \bar{\sigma}.$$

An analysis was given of so-called self-similar modes in which the behavior of the amplitudes, in essence, is determined by a single variable $\tau = \rho_0 \xi_q$; where $\xi = \ln s$, q is the momentum transfer ($t = -q^2$), and ρ_0 is the length dimensionality param-

2/4

USSR

GRIBOV, V. N., et al., Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

eter; and it was shown that the imaginary part of the crossing-antisymmetric amplitude is an alternating function of its arguments ξ and q. The present article considers limitations which are imposed on the amplitude by analyticity and unitarity in the case of constant total cross-sections, as well as those that vary with energy, without any assumption of self-similarity. It is shown that a number of amplitude properties established in the earlier article, particularly the sign alternation of the imaginary part of the crossing-antisymmetric amplitude, obtain even without the assumption of self-similarity. Modes are considered in which the characteristic impact parameters ρ increase with increase in energy (the Pomeranchuk equality is violated, given $\rho \sim \rho_0 \xi$), with a discussion only of those ρ and q for which $\rho/\rho_0 \gg 1$ and $q\rho_0 \ll 1$.

3/4

USSR

GRIBOV, V. N., et al., Yadernaya Fizika, Vol 13, No 3, Mar 71, pp 670-680

The authors thank A. A. ANSEL'M, G. S. DANILOV, I. T. DYATLOV, G. T. ZATSEPIN, B. L. IOFFE, A. B. KAYDALOV, and YE. M. LEVIN for useful discussions.

4/4

USSR UDC 620.17:669.15'74-194.28'71'27

POPOV, V. S., and POPOV, S. M., Zaporozhye Machine Building Institute

"High-Manganese Steel Alloyed With Molybdenum, Tungsten, and Aluminum"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 2, 1971, pp 65-66

Abstract: The influence of molybdenum, tungsten, and aluminum on the mechanical properties and wear-resistance of austenitic high-manganese steel produced by the electric slag method was studied. The content of carbon in the steels was limited to 0.08-0.12% in order to reveal the influence of the alloying elements on the mechanical properties. The addition of small quantities of molybdenum sharply increases the strength and plastic properties. The hardness and impact toughness remain unchanged. The influence of tungsten up to 0.3% results in an increase in strength by 40%, yield point by 75%, and relative elongation and necking down by 66 and 160% respectively; 0.4-2.4% W causes a reduction in these properties, particularly the yield point. Alloying of a high-manganese alloy with aluminum causes an increase in strength and plastic properties. Molybdenum is the most effective of the alloying elements studied, particularly at 0.3% Mo.

USSR

UDC 669.15-194.629.178.16

POPOV, S. M., and POPOV, V. S., Zaporozh'ye Machine Building Institute imeni V. Ya. Chubar

"Composition of the Metal Matrix of Alloys and Their Wear Resistance in an Abrasive Medium"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 11, Nov 70, pp 23-27

Abstract: A study was made of low-carbon alloys (to 0.1% C) with 1.33-36% Mn, 2.5-34.5% Ni, and 4-22.5% Cr, and of a high-manganese alloy with 22% Mn and chromium alloyed to the limit of solubility in austenite. The wear resistance of the Mn-alloyed alloy is related to the effect of manganese on the change in quantity of the ε-phase, which forms in the surface layer of the alloy in the process of wear. The carbonless chromium martensite and ferrite possess a relatively low wear resistance (20% higher than that of St. 3 steel). An increase in the content of chromium from 2.7 to 12.4% does not lead to increased wear resistance of the G22 carbonless iron-manganese alloy.

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1/2 024 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--ABRASIVE WEAR OF CHROMIUM STEELS -U-

AUTHOR-(02)-POPOV, V.S., NAGORNY, P.L.

COUNTRY OF INFO--USSR

SOURCE--LITEINOE PROIZVOD. 1970, (3), 27-8

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CHROMIUM STEEL, AUSTENITE STEEL, CARBIDE, MARTENSITIC STEEL, WEAR RESISTANT METAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3004/1938 STEP NO--UR/0128/70/000/003/0027/0028

CIRC ACCESSION NO--AP0132200

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0132200

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE WEAR RESISTANCE WAS DETD. BY USING THE STEEL PLATES IN A PRESS FOR THE MANUF. OF CR SUB2 O SUB3,MGO BRICKS. EXPTL. FACINGS FROM THE CR STEEL WERE CAST INTO A METALLIC MOLD PREHEATED TO 300-500EGREES. THE RESULTING STRUCTURE WAS COMPOSED OF A MIXT. OF PEARLITE AND CARBIDES; THIS STRUCTURE EXHIBITED A LOW RESISTANCE TO WEAR. THE BEST WEAR RESISTANCE IS EXHIBITED BY A STRUCTURE OF RESIDUAL, HIGHLY ALLOYED AUSTENITE WITH SOME CARBIDES AND MARTENSITE. TEN STEELS WITH COMPNS. C 1.49-2,80, MN 0.29-0.70, SI 0.15-0.30, AND CR 4.56-13.22 WT. PERCENT WERE HEAT TREATED TO OBTAIN SUCH A STRUCTURE, AS FOLLOWS: PUTTING THE STEELS INTO A FURNACE AT 900-50DEGREES, HEATING AT 50-75DEGREES PER HR TO 1100-1200DEGREES AND HOLDING FOR 30-180 MIN (TO DISSOLVE CARBIDES), AND QUENCHING IN OIL TO 200-500EGREES, ISOTHERMAL HOLDING FOR MORE COMPLETE FORMATION OF CARBIDES WHILE RETAINING THE AUSTENITIC MATRIX, AND FINAL COOLING IN OIL OR AIR. THE STEEL CONTG. C 2.58, MN 0.70, SI 0.15, AND CR 12.65 WT. PERCENT, HAD THE HIGHEST WEAR RESISTANCE, ITS STRUCTURE WAS COMPOSED OF AN AUSTENITIC MATRIX WITH HIGHLY DISPERSED CARBIDES.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE [illegible]

TITLE--METHOD OF GENERATING FUNCTIONS FOR QUANTUM OSCILLATOR -U-

AUTHOR-(02)-PERELOMOV, A.M., POPOV, V.S.

P

COUNTRY OF INFO--USSR

SOURCE--TEORETICHESKAYA I MATEMATICHESKAYA FIZIKA, 1970, VOL 3, NR 3, PP 377-391

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--QUANTUM OSCILLATOR, QUANTUM OSCILLATION, FUNCTION THEORY, FUNCTIONAL EQUATION, TRANSITION PROBABILITY, RELAXATION PROCESS, THERMOSTAT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1247 STEP NO--UR/0646/70/003/003/0377/0391

CIRC ACCESSION NO--AP0124899

UNCLASSIFIED

2/2 019 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124899

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE METHOD OF GENERATING FUNCTIONS HAS BEEN DEVELOPED FOR THE STUDY OF THE QUANTUM OSCILLATOR WITH VARIABLE FREQUENCY OMEGA (T) BEING UNDER THE ACTION OF THE EXTERNAL FORCE F(T). WITH THIS METHOD THE EXPLICIT EXPRESSION IS OBTAINED FOR THE TRANSITION PROBABILITIES OMEGA SUBMFL BETWEEN THE STATES (SHOWN ON MICROFICHE) POSSESSING THE DEFINITE NUMBER QUANTA AT THE BEGINNING (N) OR THE END (M) OF THE PROCESSES. THE DISCUSSION OF HEISENBERG PICTURE AND THE GEOMETRICAL INTERPRETATION CONNECTED WITH IT OF THE DYNAMICAL VARIABLES ON A PHASE PLANE ARE GIVEN. WITH THE AID OF THE PHASE PLANE THE FORMULA OF OMEGA SUBMN IN QUASI CLASSICAL LIMIT (STRONGLY EXICTED OSCILLATOR FOR WHICH M, N.IS GREATER THAN 1) ARE OBTAINED. THE APPLICATION OF THE METHOD DEVELOPED TO THE PROBLEM OF THE RELAXATION OF THE QUANTUM OSCILLATOR INTERACTING WITH THE THERMOSTAT IS ALSO DISCUSSED.

UNCLASSIFIED

1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ON THE MEAN DIFFUSION ESCAPE TIME -U-

AUTHOR--POPOV, V.S.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58, NR 4, PP 1400-1405

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PARTICLE MOTION, PHYSICAL DIFFUSION, BROWNIAN MOTION, FREE PATH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1568 STEP NO--UR/0056/70/058/004/1400/1405

CIRC ACCESSICN NO--AP0106314

UNCLASSIFIED

2/2 015 UNCLASSIFIED

CIRC ACCESSION NO--AP0106314 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PROBLEM OF DETERMINING THE MEAN TIME FOR ESCAPE FROM AN ARBITRARY REGION BY PARTICLES PERFORMING BROWNIAN MOVEMENT OR DIFFUSION IS CONSIDERED. THE DEPENDENCE OF THE DIFFUSION COEFFICIENT ON COORDINATES IS ASSUMED TO BE ARBITRARY. IN THE CASE OF SPHERICAL SYMMETRY THE EXPRESSIONS FOR THE MEAN ESCAPE TIME T AND ITS DISPERSION DELTA T PRIME2 CAN BE REDUCED TO QUADRATURES.

UNCLASSIFIED

1/2 011 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--ELECTRO ENERGY LEVELS AT Z GREATER THAN 137 -U-

AUTHOR--POPOV, V.S.

COUNTRY OF INFO--USSR

SOURCE--PIS'MA ZH. EKSP. TEOR. FIZ. 1970, 11(5), 254-6

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRON ENERGY LEVEL, NUCLEUS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/2002 STEP NO--UR/0386/70/011/005/0254/0256

CIRC ACCESSION NO--AP0120645
UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0120645

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DERIVATION OF AN EXPRESSION FOR ALPHA SUBCR (ALPHA EQUALS ZE PRIME2) (I. POMERANCHUK AND YA. SMORODINSKII, 1945), IN SOLVING THE DIRAC EQUATION IN THE FIELD OF A POINT CHARGE ZE FOR Z GREATER THAN 137 CONTAINS AN ERRONEOUS ASSUMPTION. AN EXPRESSION IS GIVEN FOR CALCG. ALPHA SUBCR AND THE CALCD. VALUES ARE TABULATED FOR THE CHARGE ON, THE SURFACE OF THE NUCLEUS AND FOR AN EQUAL DISTRIBUTION OF THE CHARGE THROUGH THE NUCLEUS. THE VALUES OF ALPHA SUBCR OBTAINED BY P. AND S. ARE ALSO TABULATED. FACILITY: INST. TEOR. EKSP. FIZ., MOSCOW, USSR.

UNCLASSIFIED

AA0044233

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

243719 CURRENT REGULATOR where in series with current using resistances Ż (e.g. voltmeter) is connected effective resistance R and parallel to it the input of current amplifier (with input resistance R_{BX} and amplification factor K). The number of amplifier cascades is such that the input and output currents of the amplifier are in antiphase.

When $\dot{K} = 1 + \frac{R_{BX}}{R}$

the total current used by resistance Ż equals zero.

24.5.67 as 1158323/18-10. YU.S.YAMPOL'SKII & V.S.POPOV. ODESSA POLYTECHNIC. (30.9.69) Bul 17/14.5.69. Class 21e Int.Cl. G 01r.

Odesskiy Politekhnicheskiy Institut

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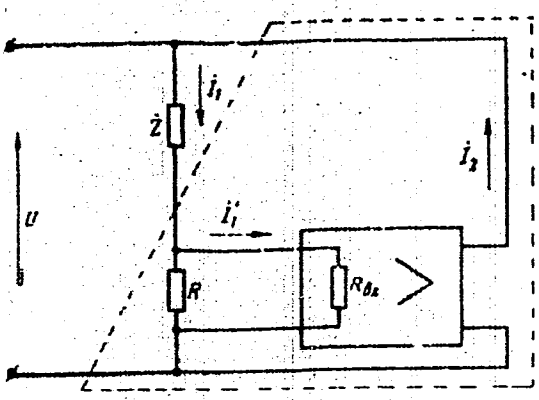

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AA0046986 = POPOV V.S. UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

2/70

243718 VOLTAGE REGULATOR. In parallel with resistance Ż of the load (e.g. amp-meter or measuring instrument using large power) is connected high-impedance divider composed of resistances R_1 and R_2. In series with divider are connected resistances R_3 and output resistance R_i of amplifier. The number of cascades of the amplifier is such that its emf $\dot{E}$ is in phase with input voltage $\dot{U}_{BX}$, and $\dot{E} = \dot{K}\,\dot{U}_{BX}$, where $\dot{K}$ is the amplification factor. When the conditions

(1) $\frac{R_1}{R_2} = \frac{R_i}{R_3}$ (2) $\dot{K} = 1 + \frac{R_1}{R_2}$

are fulfilled, then the fall of voltage in circuit AB equals zero.

24.5.67 as 1158322/18-10. V.S. POPOV & YU.S.YAMPOL'SKII. ODESSA POLYTECHNIC INST. (1.10.69.) Bul 17/14.5.69. Class 21e. Int.Cl. G 01 r.

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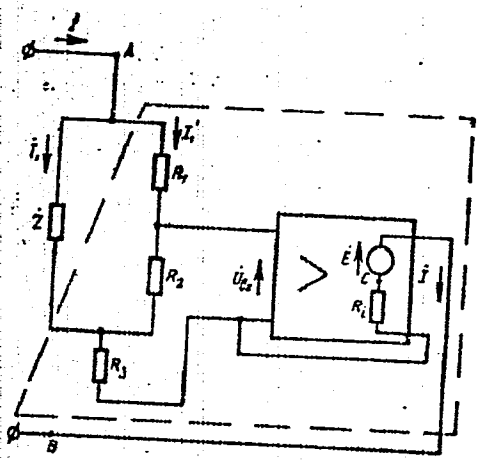
AA0046986

AUTHORS: Popov, V. S., Yampol'skiy, Yu. S.

Odesskiy Politekhnicheskiy Institut



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USSR

UDC: 538.574

POPOV, V. S., YAKIMENKO, I. P., Khar'kov Institute of Radio Electronics

"Concerning the Effect of the Interface on the Spectrum of Incoherently Reflected Waves"

Gor'kiy, IVUZ Radiofizika, Vol 15, No 6, 1972, pp 882-886

Abstract: The spectral distribution of waves incoherently reflected from a semibounded plasma is analyzed by using the electron density correlator calculated with regard to the interface. It is found that the consideration of the boundary leads to additional resonance in the spectrum which is especially pronounced in the case of scattering by long-wave fluctuations. The authors thank G. F. Potishko for doing the computer calculations.

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POPOV, V.V.

EXPERIMENTAL STUDY OF A METHOD FOR THE PARTIAL OXIDATION OF THE PRODUCTS OF MAN'S VITAL FUNCTIONS

/Article by G. S. Sinyak, T. S. Gur'yeva, M. V. Kuz'menko, V. V. Popov and G. I. Chizhikova; Moscow, Aktual'nyye Voprosy Kosmicheskoy Biologii i Meditsiny (Current Problems in Space Biology and Medicine), Nauka, 1972, pp 254-255/

1. At the present time the literature contains information on different technological methods for processing the products of man's vital functions (vacuum drying, thermal drying, biological mineralization, etc.). Each of these methods has its advantages and disadvantages and the method for processing wastes is selected taking into account the specific model of a life support system and the power supply for the system.

2. In some cases it is desirable to carry out a partial oxidation of the products of man's vital functions. This is characterized by:

-- a total decontamination of the initial product,
-- a maximum return of moisture, including pyrogenetic,
-- collection of solid residue suitable for storage, consisting of 70-80% carbon,
-- formation of a gas phase which after catalytic oxidation is safe for plants to breathe,
-- small expenditures of oxygen, 10% of the maximum quantity necessary according to stoichiometric expressions.

3. We carried out an experiment consisting of 70 tests on a definite diet. A total of 1.5-2 hours was expended in processing 150-200 g of product.

4. The use of catalysts made possible a considerable decrease in the oxidation temperature for the vapor phase,

STRS 56,495
102
14 July 72

USSR

UDC 591.484:578.088.5

SIMAKOV, Yu. G., POLUEKTOVA, L. M., and POPOV, V. V., Moscow State University imeni M. V. Lomonosov

"The Effect of Laser Radiation on the Lipid Content of the Frog Crystalline Lens"

Moscow, Izvestiya Akademii Nauk SSSR, Seriye Biologicheskaya, No 4, 1970, pp 609-610

Abstract: Exposure of frog eyes to a focused laser beam (10,600 Å, 0.12 to 0.18 j) produced lamellar cataracts in one-third of the eyes within 48 hours. By the 7th day half of the irradiated eyes had total cataracts. On the third day the cinnamon-brown cortex had acquired a bluish hue, indicating increased lipid content in the affected lens. By the 11th day the cataract-type changes ceased, but the lipids continued to be redistributed, accumulating mostly in vacuoles in affected areas of the lens. By this time the color of the cortex and nucleus was a uniform grayish-blue cataracts did not develop in the eyes of frogs irradiated with 0.04 j, and the lipid content increased only in the areas primarily affected (posterior pole and equator of the lens).

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1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--LEAD IN THE DEVELOPING CRYSTALLINE LENS OF THE FROG -U-

AUTHOR-(02)-SIMAKOV, YU.G., PUPOV, V.V.

COUNTRY OF INFO--USSR

SOURCE--BIOL. NAUKI 1970, (2), 25-9

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--EMBRYOLOGY, FROG, EYE, LEAD COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0927 STEP NO--UR/0325/70/000/002/0025/0029

CIRC ACCESSION NO--AP0129992

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0129992

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PB ACCUMULATED IN THE CRYST. LENS OF FROG EMBRYOS. THE ACCUMULATION BEGINS AT THE STAGE 30 AND LASTS THROUGH THE FOLLOWING 14 STAGES. MOST PB OCCURS IN THE CRYST. LENS CORE; IN THE OUTER LAYER IT WAS PRESENT IN GRANULAR FORM. PB IS SUPPOSED TO PLAY AN INHIBITOR ROLE IN SOME ENZYMIC PROCESSES AND TO HAVE AN INFLUENCE ON THE DEVELOPMENT OF THE EYE CATARACT. FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.373.531.1

LIPMAN, A. A., POPOV, V. V.

"Magnetic-Transistorized Multivibrator with Improved Stability"

Dokl. Nauchno-tekhn. konferentsii po itogam nauchno-issled. rabot za 1968-1969 gg. Mosk. energ. in-t. 1970. Sekts, avtomatiki, vychisl. i izmerit. tekhn. Podsekts. inzh. elektrofiz (Reports of the Scientific and Technical Conference on the Results of Scientific Research Work in 1968-1969, Moscow Power Engineering Institute, 1970, Automation, Computation and Measuring Engineering Section, Engineering Electrophysics Subsection), Moscow, 1969, pp 178-186 (from RZh-Radiotekhnika, No 1, Jan 70, Abstract No 1G173)

[No Abstract]

1/1

1A0052667 POPOV V. Ya.

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 1-70 UR 0482

241636 LOAD LIFT as per No. 219132, differing in having pulleys at the top of each cabin frame with a flexible thread round them having one end fixed to the catcher lever, the other to the top of the cabin. This gives greater accuracy in registering and preventing dangerous misalignments. At the top of each frame 7 are pulleys 14 with flexible thread 15 round them with one end fixed to the catcher lever 16, the other to the top of the cabin cab. If the cabin cab gets out of line with the frames, the cab turns clockwise or anti-clockwise. The initial distance between the ends of thread 15 and pulley 14 increases. The thread is tensed, and acting on the catcher lever, engages the catches. 26.6.67. as 1168023/27-11, Add to 219132 POPOV, V. Ia. and ZHILENKOV, V.G. "Soyuzliftmash" Central Design Bureau. (9.9.69) Bul 14/18.4.69. Class 35a, Int. Cl. B 66b.

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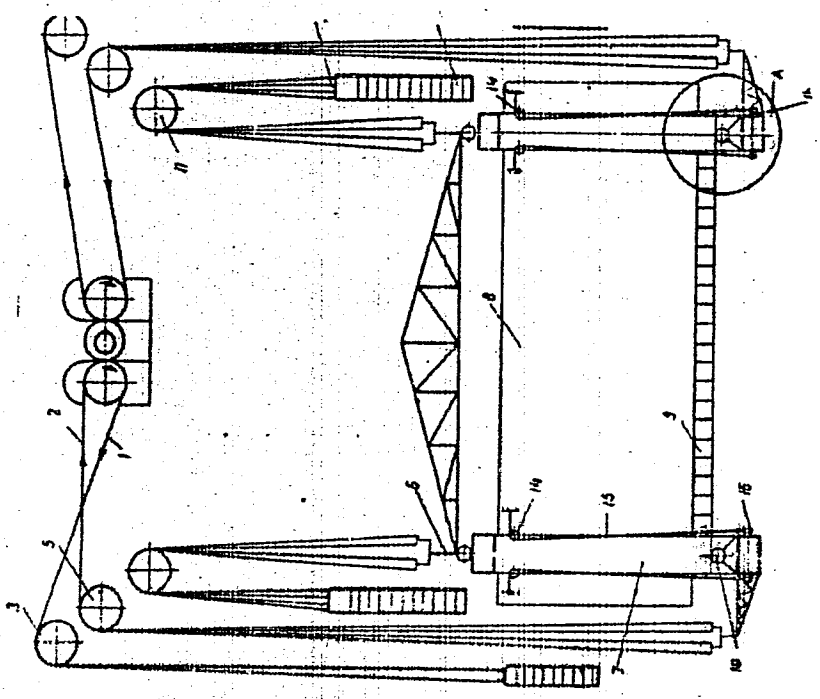

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Popov, V. Ya.; Zhilenkov, V. G.
Tsentral'noye Proyektno-Konstruktorskoye Byuro "Soyuzliftmash"

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19821421

USSR

UDC: 629.7.018:621.365.42

ISKRA, A. L., MALYSHEV, L. A., POPOV, V. Ye., SOBOLEV, A. A.

"A High-Temperature Ohmic Gas Heater"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 10, Apr 73, Author's Certificate No 369449, Division G, H, filed 7 Apr 71, published 8 Feb 73, p 121

Translation: This Author's Certificate introduces a high-temperature gas heater, e. g. for a hypersonic wind tunnel. The device contains a housing with a gas feed system, heating elements of a porous current-conducting material, and a prechamber. The heating elements are made in the form of hollow split coaxial cylinders which form a labyrinth cavity between them. As a distinguishing feature of the patent, the range of operating conditions in the wind tunnel is extended by placing an interchangeable ceramic inset between the labyrinth cavity and prechamber of the heater. The inset has holes through it, and can be changed to vary the route of flow of the gas through the porous heating elements.

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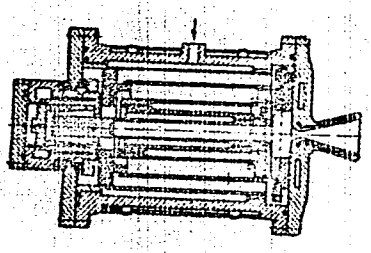
USSR

ISKRA, A. L. et al., USSR Author's Certificate No 369449



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USSR UDC: 533.697

POPOV, V. Ye.

"Gas Condensation in Hypersonic Profiled Nozzles"

Uch. zap. Tsentr. aerogidrodinam. in-ta (Scientific Notes of Central Aerohydrodynamics Institute), 1971, 2, No 6, pp 9-14 (from RZh-Mekhanika, No 5, May 72, Abstract No 5B443)

Translation: The paper presents the results of an experimental study of air condensation in hypersonic profiled nozzles. The condensation temperature is found as a function of static pressure in the flow for a nozzle with an outlet diameter of 150 mm. The logarithmic supersaturation of air is found as a function of a section with homogeneous flow. Decisive parameters are found by which the results determined on a specific nozzle can be extended to nozzles with other dimensions. The minimum attainable stagnation temperature is found as a function of the Mach number of the flow and the stagnation pressure for a nozzle with an outlet diameter of 1 meter. The calculation is done with regard to the real properties of the gas. Bibliography of 9 titles. Resumé.

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USSR UDC 629.7.036.3:533.697.4:533.6

POPOV, V. YE.

"Gas Condensation in Hypersonic Profiled Nozzles"

Uch. zap. Tsentr. aero-gidrodinam. in-ta (Scientific Notes of the Central Aerohydrodynamic Institute), 1971, Vol. 2, No. 6, pp 9-14 (from RZh-Aviatsionnyye i raketnyye dvigateli, No 5, May 72, Abstract No 5.34.126)

Translation: The results of an experimental study of air condensation in hypersonic profiled nozzles are presented. The condensation temperature was obtained as a function of static pressure in the flow for a nozzle with an output cross section of 150 mm in diameter. The logarithmic supersaturation of the flow was determined as a function of the length of the segment with homogeneous flow. The determining parameters were found, making it possible to extend the results obtained for a specific nozzle to nozzles with other dimensions. The minimum permissible values of the stagnation temperature was calculated for a nozzle with an output cross section of 1 m in diameter as a function of M of the flow and the stagnation pressure. The calculation took into account the actual properties of the gas. 7 ill., 9 ref. Resume.

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UDC 629.78.015.018.1

USSR

ISKRA, A. L., POPOV, V. Ye.

"Safety Valve Designed For High Rates of Gas Flow"

Uch. zap. Tsentr. aerogidrodinam. in-ta (Scientific Notes of the Central Aerohydrodynamic Institute) 1971, Vol 2, No 2, pp 126-129 (from Referativnyy Zhurnal, Raketostroyeniye, No 11, Nov 71, Abstract 11.41.195, Resume)

Abstract: Construction of a high speed safety valve designed for high gas flow rates, used in aerodynamic tunnels of periodic operation, which operate from high pressure tanks, is considered. A method of determining the motion of the closing element (cup) and test results of a valve with passage 0.5 m in diameter are presented. It is shown that test results and design data coincide with sufficient accuracy. 3 figures.

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USSR

UDC 621.375.037.733.3

POPOV, Ye. A.

"A Reading Amplifier"

USSR Author's Certificate, No 278760, Filed 14 Jul 67, Published 3 Dec 70 (from Referativnyy Zhurnal -- Avtomatika, Telemekhanika, i Vychislitel'naya Tekhnika, No 8, 1971, Abstract No 8B204 P)

Translation: A reading amplifier is proposed which contains a differential cascade, a bridge circuit, and a tunnel-diode relaxation oscillator. In order to increase the noise immunity of the amplifier and to simplify its design, one winding of the output flip-flop -- the winding that is diagonally connected to the bridge circuit and which is made from inverted tunnel diodes -- is connected in parallel with the tunnel-diode relaxation oscillator. The point of contact between the second winding and the gating-pulse shaper serves as the output of the amplifier.

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UNCLASSIFIED PROCESSING DATE--11SEP70

1/3 030

TITLE--FEATURE ARTICLE ON METEOR SYSTEM. THE METEOR SYSTEM -U-

AUTHOR--POPOV, YE.G., BELOUSOV, S.L., LEONOV, N.G., CHETVERNIKOV, I.A., GRACHEV, YU.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, SOTSIALISTICHESKAYA INDUSTRIYA, 1 FEBRUARY 1970, P 4

DATE PUBLISHED--01FEB70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, SPACE TECHNOLOGY

TOPIC TAGS--METEOROLOGIC SATELLITE, PHOTOGRAPH, METEOROLOGIC STATION, UNMANNED ORBITAL LABORATORY, SPACEBORNE EARTH PHOTOGRAPHY, WEATHER CHART, METEOROLOGIC DATA, COMPUTER APPLICATION/(U)METEOR METEOROLOGIC SATELLITE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0533/70/000/000/0004/0004

PROXY REEL/FRAME--1987/1743

CIRC ACCESSION NO--AN0104926

UNCLASSIFIED

2/3 030 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AN0104926

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SPACE METEOROLOGICAL STATION IN A CIRCUMTERRESTRIAL ORBIC CAN DAY AND NIGHT TRANSMIT WEATHER DATA MAKING IT POSSIBLE TO WARN THE COUNTRY OF IMPENDING DANGEROUS METEOROLOGICAL PHENOMENA. THE INFORMATION IS TRANSMITTED IN THE FORM OF PHOTOGRAPHS. THESE PHOTOGRAPHS CLEARLY PINPOINT THE LOCATION OF STORMS AND THEIR DIRECTION. THE HYDROMETEOROLOGICAL CENTER USSR IS EVEN NOW RECEIVING SUCH INFORMATION FROM A WHOLE SERIES OF METEOR SATELLITES. CREATED ON THE BASIS OF THE LATEST ADVANCES IN SOVIET SCIENCE, IT IS OF THE GREATEST SERVICE IN COMPILING BOTH LONG AND SHORT RANGE FORECASTS. HOWEVER, ALL THIS REQUIRES WELL TRAINED GROUND PERSONNEL, SINCE POOR INTERPRETATION OF THE PHOTOGRAPHS WOULD CANCEL OUT THIS NEW SOPHISTICATED SOURCE OF INFORMATION. A SPECIAL SECTION AT THE HYDROMETEOROLOGICAL CENTER HANDLES SUCH WORK; IT HAS THE RATHER ROMANTIC NAME OF SATELLITE VERTICAL. THE SECTION IS MANNED BY DEDICATED PIONEERS IN THIS NEW BRANCH OF METEORLOGY. ALL SATELLITE DATA MUST BE CORRELATED WITH GROUND DATA FOR COMPILING MAPS OF CLOUD COVER DISTRIBUTION. THE COMPLEX TASK OF INTERPRETING PHOTOGRAPHS CANNOT YET BE AUTOMATED. HOWEVER, PROCESSING OF DATA ON RADIATION FLUXES IS COMPLETELY AUTOMATED. A SPECIAL PROGRAM DEVELOPED AT THE CENTER ENSURES THAT COMPUTERS CAN HANDLE THE VAST AMOUNT OF DATA ON RADIATION IN A VERY SHORT TIME. THE VOLUME OF RADIATION DATA RECEIVED FROM SATELLITES EXCEEDS THAT WHICH IS RECEIVED FROM GROUND STATIONS THROUGHOUT THE COUNTRY. SATELLITE DATA ARE SORTED BY COMPUTER BY TYPES: SOLAR RADIATION, LIGHT REFLECTED BY THE EARTH, RADIATION OF THE EARTH ITSELF, ENERGY OF ELECTROMAGNETIC WAVES.

UNCLASSIFIED

3/3 030 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AN0104926

ABSTRACT/EXTRACT--USING THESE DATA THE MACHINE CAN COMPUTE THE ALTITUDE OF THE UPPER CLOUD BOUNDARY, THE RADIATION TEMPERATURE OF SEAS, THE ATMOSPHERE AND DIFFERENT CONTINENTS. THE VOLUME OF DATA RECEIVED BY THE HYDROMETEOROLOGICAL CENTER IS CONSTANTLY INCREASING. HIGH SPEED, HIGH CAPACITY COMPUTERS ARE BEING BROUGHT IN TO HANDLE THE LOAD. IMPROVED FORECASTING ACCURACY WILL INEVITABLY RESULT. (A PHOTOGRAPH ACCOMPANYING THE TEXT SHOWS THE GENERATION OF A LOW PRESSURE SYSTEM OVER THE PACIFIC OCEAN TAKEN FROM AN ALTITUDE OF 650 KM BY THE "METEOR-2" WEATHER SATELLITE ON 15 JANUARY 1970 AT 0100 HOURS MOSCOW TIME).

UNCLASSIFIED

USSR

UDC: 662.612

POPOV, Ye. I., KASHPOROV, L. Ya., MAL'TSEV, V. M., and BREYTER, A. L.

"Combustion Mechanism of Aluminum-Magnesium Alloy Particles"

Novosibirsk, Fizika goreniya i vzryva, No 2, 1973, pp 240-246

Abstract: An investigation is conducted of the combustion process of single aluminum-magnesium alloy particles under atmospheric pressure. The particles under test contained 5, 10, 20, 50, 70, 90, and 95% magnesium, and were made in spherical form of 100-600 μ in diameter. The method of the experiment was to place the particle to be tested on a sharp tungsten needle and roast it in air or in the flames of mixtures of ammonium perchlorate and in urotropin at temperatures of 2500, 2700, and 3100° K, with the combustion process observed through the cinema camera "Konvas" and the SKS-1. Photographs from the film strips are reproduced, and curves are plotted of the ratio of the particle glow zone radius to the radius of the original particle as a function of time, and of the relative duration of the first combustion stage as a function of the alloy composition. It is found that the combustion proceeds in two stages, with the magnesium burning out chiefly in the first stage and the aluminum in the second.

1/1

UDC 662.611

USSR

ZOPOV, YE. I. and BREYTER, A. L., Moscow

"Flammability of Aluminum-Nickel Powders"

Kiev, Poroshkovaya Metallurgiya, No 5, May 73, pp 101-106

Abstract: The flammability of Al-Ni powders produced by atomization of a molten melt was studied. Attention was given to the following: 1) temperature of powder self-combustion in a layer as determined by differential thermal analysis where the investigated powder was gradually heated in a furnace; 2) combustion temperature of air-suspended powder as determined by directing the powder onto a heated surface in an air medium; 3) minimum concentration limit of explosiveness using a device of original design making it possible to create a uniform concentration of a dust cloud. It was determined that the characteristics of Al-Ni powder combustion depend essentially on their chemical composition. With increased Ni content, the temperature of self-combustion in a layer, temperature of air-suspended combustion, and minimum concentration limit of explosiveness increase continuously. These characteristics also depend on powder dispersity, particle shape, and oxide-film thickness. The mechanisms of combustion for the different characteristics can be explained by the same physical and chemical properties: oxide film penetrability, alloy melting point, chemical activity, and metal volatility. The pyrophoric

USSR
POPOV, YE. I., et al, Kiev, Poroshkovaya Metallurgiya, No 5, May 73, pp 101-106

magnitudes of Al-Ni powders were obtained in order to determine the temperatures and concentrations which can be safely used when working with these powders. 4 figures, 2 tables, 19 bibliographic references.

2/2

UDC 536.46+669.715

USSR

BREYTER, A. L., KASHPOROV, L. Ya., MAL'TSEV, V. M., POKHIL, P. F., POPOV, Yc. I., PEPEKIN, V. I., and STASENKO, A. C., Moscow

"Burning of Single Particles of Aluminum-Magnesium Alloys in the Flame of Oxidizer-Fuel Mixture"

Novosibirsk, Fizika Goreniya i Vzryva, Vol 7, No 2, Jun 71, pp 222—227

Abstract : The burning of single particles of aluminum-magnesium alloys in the tongue of the flame of a mixture of ammonium perchlorate and urotropine of stoichiometric composition (88 % ammonium perchlorate and 12 % urotropine) was experimentally investigated. The investigation results are discussed by reference to photographs of typical tracks of burning particles and diagrams showing the dependences of the inflammation time lag and the particle fraction subjected to explosive burning on particle composition. From the viewpoint of complete burning by modified fuel on aluminum base, alloys with 30—45 % aluminum and 55—70 %

1/2

SR

AREYTER, A. L., KASHPOROV, L. Ya., et al., Fizika Goreniya i Vzryva, Vol 7, No 2, Jun 71, pp 222-227

magnesium are considered to be effective. The characteristics of burning of the metal component are determined by the nature of included metals: the permeability of its oxidic layers, reaction capability, surface activity, volatility, fusing temperature, density change by fusing, and the burning temperature. Five illustr., one table, 16 biblio. refs.

2/2

UDC 519.281

USSR

POPOV, Ye. I., KHAMITOV, G. P.

"The Problem of Modeling of Random Functions"

Tr. Irkutsk. Politekhn. In-ta. [Works of Irkutsk Polytechnical Institute], No 56, 1970, pp 24-40 (Translated from Referativnyy Zhurnal Kibernetika, No 3, 1971, Abstract No 3 V128 by Yu. Pollyak).

Translation: Modeling of a stable random process x(t) with near-Gaussian distribution and correlation function

$$K(p)=\sum_{r=1}^{n}K_r(p), \tag{1}$$

$$K_r(p)=A_re^{-ra|p|}\cos rbp. \tag{2}$$

(A_r, a, b are constants) is reduced to modeling of independent processes $x_r(t)$ with correlation functions $K_r(p)$, r = 1, 2, ..., n, and calculation of

$$x(t)=\sum_{r=1}^{n}x_r(t).$$

1/3

UDC 519.281

USSR

POPOV, Ye. I., KHAMITOV, G. P., Tr. Irkutsk. Politekhn. In-ta., No 56, 1970, pp 24-40

Methods of approximation of correlation functions such as (1) are studied. Modeling of values x_i of process $x(t)$ with fixed one dimensional (not Gaussian) distribution and correlation functions such as (2) is reduced to modeling of a sequence of independent random quantities $\{x_i'\}$ with fixed distribution and ordering of $\{x_i'\}$ according to the following rule. Assume

$$z_j = x'_{j+1},\ j = 1, 2, \ldots, n.$$

$x_1 = x'_1$, $x_k = z_k$, where $|x_1 - z_k| = \min_{1 \le j \le n} |x_1 - z_j|$; $z_k = x'_{n+2}$

. . . . . .

$x_l = z_k$, где $|x_{l-1} - z_k| = \min_{1 \le j \le n} |x_{l-1} - z_j|$; $z_k = x'_{n+l}$

UDC 159.281

USSR

POPOV, Ye. I., KAMITOV, G. P., Tr. Irkutsk. Politekhn. In-ta., No 56, 1970, pp 24-40

The period of attenuating oscillations in (2) is determined by the parameter of the ordering system. A method is also described for ordering $\{x_i'\}$ leading to correlation function (2) where b = 0.

3/3