"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 015 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0124458

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE UV SPECTRA OF PHNO SUB2 (I) WITH P. ANISIDINE (II), PH SUB2 NH (III) AND PH SUB2 CH SUB2 (IV) IN ETOH WERE STUDIED OVER 210-330 NM. NO INTERACTION WAS FOUND FOR I-IV SOLNS., BUT, BASED ON INCREASE IN OPTICAL D. COMPARED WITH ADDITIVE SPECTRA OF COMPONENTS, COMPLEX FORMATION OF THE DONOR ACCEPTOR TYPE BETWEEN THE NITRO AND AMINO GROUP WAS OBSD. FOR I-II AND I-III SOLNS. FOR I-II, A 1:1 AND FOR I-III A 2:3 COMPLEX IS FORMED, WITH THE EQUIL. CONSTS. 0.7-1.2 0.4 L.-MOLE, RESP. FACILITY: ROSTOV. NA DONU INST. INZH. ZHELEZNODOROZH. TRANSP., ROSTOV ON DON, USSR.

UNCLASSIFIED

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USSR UDC 621.357.4.669.3-416

KUZMETSOVA, O. M., KLYUYEVA, K. M., and TRESNYAKOV, I. I.

"The Etching of Copper Coil in Ammonium Persulfate Solutions"

Obmer opytom b radioproa-ste (Exchange of information in the Radio Industry), Vyp 11, Moscow(?), 1972, pp 47-48 (from Referativnyy Zhurnal -- Khimiya, No8 (II), 1973, Abstract No 8L276 by V. V. Grinina)

Translation: Using a constant potential, the mechanism of the process of etching the copper coil was studied in the following solutions: 300 g/l $(NH_4)_2S_2O_8$, 1 ml/l of 0.68% solution of $Hg(NO_3)_2$, and 30 ml/l of H_2SO_4. It was shown that the etching of the copper occurs through the stage of formation of Cu^+, the process being controlled by diffusion. A large amount of etching may be accomplished with a corresponding decrease in the reliability of the process by increasing the temperature of the solution and adding an oxidizing agent to it.

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USSR

UDC 531.3:534.1

KUZ'MICH, A. N., PUZIKOV, A. A. and SOKOLOV, YE. N.

"Some Questions of the Damping of Laminated Plates"

Kiev, Rasseyaniye energii pri kolebaniyakh mekh. sistem (The Dissipation of Energy During Oscillations of Mechanical Systems, Collection of Works), Nauk. dumka, 1972, pp 222-230 (from Referativnyy Zhurnal -- Mekhanika, No 4, 1973, Abstract No 4V332 by E. I. Sokolov)

Translation: Some results of theoretical and experimental investigations of the bending oscillation of thin plates, the material of which possesses hereditary characteristics, are presented. In order to describe these characteristics the use of the Boltzman-Volterra theory of heredity is proposed

$$\sigma(t)=E[\varepsilon(t)-\int_0^t R(t-s)\,\varepsilon(s)\,ds \qquad (1)$$

where $\sigma(t)$ is the stress; $\varepsilon(t)$ is the linear deformation; E is the instantaneous module of elasticity; $R(t-s)$ is the center of relaxation, for the calculation of which a theoretical-experimental method was worked out, the algorithm of which is presented below.

If for deducing an equation, describing the transverse oscillation of a plate, relationship (1) is used, and the equation obtained is reduced to the

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KUZ'MICH, A. N., Rasseyaniye energii pri kolebaniyakh mekh. sistem, 1972, pp 222-230

method of separation of variables $w(x,y,t)=W(x,y)\,\phi(t)$, in which $w(x,y,t)$ is the sag of the plate, then we obtain two equations, one of the plate oscillation and the other the function (t)

$$\phi(t)+w^2\phi(t)-w^2\int_0^t \phi\, s[\phi(s)+\phi(s)]\,R(t-s)\,ds=0 \qquad (2)$$

here w is the characteristic frequency of an ideally elastic plate. Inasmuch as obtaining the form of the function $\phi(t)$ in experimental investigations is sufficiently simple (its graph is a vibrogram of oscillation of points of the normalized plate), so from (2) it is possible by well known methods to find the form of the function $R(t-s)$. Equations of type (2) are obtained for homogeneous and three-layer plates with a filler under shear stress, and external layers under shear and tensile stress. The further content of the work concerns only experimental results on the determination of the function $\phi(s)$ for partial cases with certain conclusions on the vibration-absorbing properties of the investigated constructions of plates and their materials. (14 bibliographic entries)

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USSR UDC: 622.232.5:622.234.5

KUZ'MICH, I. A. and BRUNS, S. A.

"Maximum Area of a Slit Formed by Water Jets in a Mountain Massif"

Moscow, Doklady Akademii nauk SSSR, vol 204, No 6, 1972, pp 1341-1342

Abstract: It has been established by experimental research on the destruction of rock by water jets that the side surface of the eroded slit or fissure increases per unit time as a function of the displacement velocity of the jet, with the hydrodynamic parameters constant, until it reaches a particular point. It then begins to fall off. Since this dependence has not as yet received a clear mathematical statement, the purpose of this article is to determine the displacement velocity corresponding to the maximum increase in side surface of the slit per unit time, and the function of this determination is to verify conclusions theoretically reached by the authors in an earlier paper in this same journal (204, No 5, 1972). A table is given of displacement velocities corresponding to various types of rock. The authors are connected with the A. A. Skochinskiy Mining Institute.

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USSR

UDC 612.825.4+612.11/12

LANDORENKO, L. T., KUZ'MICH, N. S., and MOKZHUKHIN, A. S., Department of Normal Physiology, Academy of Military Medicine imeni S. M. Kirov, Leningrad

"Hematological Characteristics of Emotional Stress in Parachute Jumping"

Leningrad, Fiziologicheskiy Zhurnal USSR, No 8, 1971, pp 1,140-1,144

Abstract: The quantity of red and white blood cells was determined in 130 males before and after parachute jumps. Some of the men made a parachute jump for the first time while others had previously made as many as 790 jumps. In those with little or no experience in jumping, the RBC count increased slightly before and after a jump whereas the number of eosinophils, lymphocytes, and monocytes decreased, especially before a jump. These hematological changes were much less pronounced in the veteran parachutists. The decrease in leukocytes is ascribed to excitation of the hypophyseal-adrenal system resulting from emotional stress.

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USSR UDC: 532.525.2

ABRAMOVICH, G. N., KUZ'MICH, V. B., SEKUNDOV, A. N., SMIRNOVA, I. P., Moscow

"Experimental and Theoretical Study of a Supersonic Jet Near a Wall in an Accompanying Supersonic Flow"

Moscow, Izv. AN SSSR: Mekhanika Zhidkosti i Gaza, No 4, Jul/Aug 72, pp 25-32

Abstract: Experiments were done in a supersonic ($M = 2-4$) continuous action wind tunnel. A flat jet was blown in along a plate located in the middle of the working section of the tunnel through a specially shaped nozzle with an output section 2 mm high and a throat 0.8-0.9 mm high. The end of the nozzle was 80 mm away from the sharpened leading edge of the plate. The plate was 200 mm wide and 400 mm long. Two modes of flow were considered. The Mach number in the initial section of the jet for both modes was $M_1 = 2.18$. The Mach number of the accompanying flow, the static pressure in the working section of the tunnel, and the Reynolds number determined with respect to the height of the nozzle and the oncoming flow parameters were respectively: $M_2 = 2.7$, $p = 38.6$ mb,

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ABRAMOVICH, G. N. et al., Izv. AN SSSR: Mekhanika Zhidkosti i Gaza, No 4, Jul/Aug 72, pp 25-32

Re = 15 500 for the first mode, and M_2 = 3.8, p = 18.1 mb, Re = 17 800 for the second mode. The stagnation temperature in the jet and the accompanying flow was about 300°K. The velocity distribution was determined with respect to the fields of dynamic pressures found by means of an ordinary gauge with transverse dimension of 0.35 mm. Vent holes were used for measuring the static pressure on the plate. The concentration in the supersonic flow was measured by a method based on determining the thermal conductivity of the mixture flowing through the gauge as a function of concentration. Non-self-similar isobaric flow was numerically calculated in the boundary layer approximation using the equation for turbulent viscosity as the closure relation. A comparison of the experimental and theoretical results showed that the proposed analytical method is applicable to description of turbulent compressed flows.

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USSR UDC 576.851.45.077.2

VEYNBLAT, V. I., and KUZ'MICHENKO, I. A., All-Union Antiplaque Scientific Research Institute Mikrob, Saratov

"The Mechanism of Accumulation and Excretion of Capsular Antigens by Pasteurella pestis (the Role Played by the Cell Wall)"

Moscow, Zhurnal Mikrobiologii Epidemiologii i Immunobiologii, No 11, 1972, pp 102-106

Abstract: The ability of plaque microbes to accumulate and excrete the capsular antigens in the presence of penicillin which is capable of damaging the cell wall was studied. The effect of penicillin was compared with that of chloramphenicol, actinomycin D, and glycolol. The strain EV (Ca-dependent) and its Ca-independent variants, EV_1, EV_5, and EV_{20} were used in experiments. Penicillin in a concentration of 1 μg/ml transformed the majority of the rod-shaped plague cells into gigantic treadlike shapes. When its concentration was increased to 10 μg/ml the microbial population contained many sphere-shaped cells, the amount of which increased with an increase in penicillin concentration. This was true for both the Ca-dependent and Ca-independent cells. Penicillin in a concentration of 1 μg/ml culture medium did not influence noticeably the growth of plague cells, concentration of protein and RNA in them 1/2

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VEYNBLAT, V. I. and KUZ'MICHENKO, I. A., Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 11, 1972, pp 102-106

but decreased the amount of capsular antigen on the cell surfaces and in the cultivation medium (free fraction 1) compared with control (medium without antibiotics). There was more fraction 1 in suspensions of Ca-independent cells compared with Ca-dependent. Similar results were obtained with larger doses of penicillin. In the presence of chloramphenicol and especially of actinomycin D a definite suppression of cell growth was observed, as well as decreased amount of total protein. Actinomycin D inhibited the synthesis of RNA, as opposed to chloramphenicol. Both these antibiotics inhibited almost completely the synthesis of the capsular antigens in all cells, regardless of their relation to Ca. Cells grown in the presence of penicillin and destroyed by sodium dodecylsulfate (1%) showed much higher concentration of capsular antigen (general fraction 1) regardless of their relation to Ca. This means that the synthesis of capsular antigens was not inhibited by penicillin but their release from cells was dependent on the cell walls (damaged, unbroken, or completely destroyed). The amount of free fraction 1 and general fraction 1 differed very little in cells grown in the presence of chloramphenicol and actinomycin D and destroyed by sodium dodecylsulfate. Glycocol in a 10 mg/ml concentration medium influenced to some extent the synthesis of total protein and RNA but the synthesis of the capsular antigens was greatly reduced among Ca-dependent cells.

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USSR UDC 632.4:585.13:633.11

KACHALOVA, Z. P. and KUZ'MICHEV, A. A., Timiryazev Agricultural Academy, Moscow

"Incidence of Cover Smut of Wheat and Distribution of Affected Ovaries in the Ear"

Leningrad, Mikologiya i Fitopatologiya, No 4, 1972, pp 347-353

Abstract: Study of several spring (Lyutestsens 62, Krasnozernaya) and winter (PPG-186, Mironovskaya 808) wheat varieties infected with covered smut showed that the pathogen Tilletia caries spreads diffusely through the plant but does not penetrate all the ovaries of the forming spike, thereby determining the extent of infection of the spike. Early planting of spring wheat increases both the number of infected spikes and the extent of infection. Spikes on lateral shoots of 2-, 3-, and multistem plants are generally the most affected. Within a spike, the center is most affected; within a spikelet, the third and fourth ovaries. The presence of partly affected spikes, spikelets, and grains is related to the physiological and biochemical state of the plants, which is dependent, in turn, on the varietal characteristics and conditions under which the ovaries are formed.

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USSR UDC: 621.383.003.3

GLAZKOV, M. M., KUZ'MICHEV, G. P., ONEGIN, Ye. Ye., VOLOS, V. F.

"A Method for Wireless Assembly of Semiconductor Devices"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 16, Jun 71, Author's Certificate No 303677, Division H, filed 1 Sep 69, published 13 May 71, p 191

Translation: This Author's Certificate introduces: 1. A method for wireless assembly of semiconductor devices. The procedure includes the operations of making contact conductor frames, connecting them to the crystals, connection to external leads, and hermetic sealing. As a distinguishing feature of the patent, the precision and reliability of assembly are improved by stamping contact leads of variable cross section on a tape with the formation of lugs on the ends of the leads, and etching the tape in an etchant solution until the tapered sections between the contact leads are eaten away. 2. A modification of this method distinguished by the fact that a reinforcement ring is fastened to the contact leads after they have been stamped on the tape.

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UDC: 621.396.6-181.5(088.8)

ONEGIN, Ye. Ye., LIFLYAND, V. N., KUZ'MICHEV, G. P.

"A Method of Wireless Assembly of Semiconductor Devices"

USSR Author's Certificate No 269317, filed 24 Jun 68, published 13 Jan 71 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V272 P)

Translation: A method is proposed for noncontact assembly of semiconductor devices on a dielectric substrate. The method involves attaching the contact areas of the semiconductor crystal to the current-conducting lines of a printed circuit board, connecting the current-conducting lines to the external leads, and sealing the device. To improve the quality of the devices, a relief image is produced on the dielectric substrate, and a current-conducting paste layer is applied to the elements of this image.

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UDC: 669.715.046.54/55

KUZ'MICHEV, L. V., MALINOVSKIY, R. R.

"Refining of Aluminum Alloys by Blowing Through a Mixture of Gas with Flux"

Moscow, Tsvetnyye Metally, No 8, Aug 73, pp 43-45.

Abstract: When a mixture of natural gas with a powder of a low-melting point salt flux acts on a melt, both hydrogen and oxide inclusions are removed simultaneously. The neutral gas is mixed with a fine salt flux powder (for example, ordinary cryolite-containing flux) and the mixture is blown through the melt being refined in order to suppress oxide film formation. This is achieved by the fact that the powder flux quickly melts and covers each bubble with a liquid salt film, which cleans the surface of the bubble of any oxide particles, adsorbing and dissolving them, preventing direct contact between the metal melt and any water vapor present in the refining gas. The hydrogen from the metal diffuses through the film of liquid flux into the gas bubble significantly more rapidly than when a dense oxide film is present around the bubble as when ordinary inert gas, contaminated with oxygen and water vapor, is blown through the melt.

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1/2 012

UNCLASSIFIED

TITLE--ON THE SOLUTION OF THREE PARTICLE INTEGRAL EQUATIONS BY THE SEPARABLE EXPANSION METHOD -U-

PROCESSING DATE--04DEC70

AUTHOR-(03)-KHARCHENKO, V.F., PETROV, N.M., KUZMICHEV, V.E.

COUNTRY OF INFO--USSR

SOURCE--PHYS. LETTERS B (NETHERLANDS), VOL. 32B, NO. 1, P. 19-22 (25 MAY 1970)

DATE PUBLISHED--25MAY70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELEMENTARY PARTICLE, INTEGRAEQUATION, ALGEBRAIC EQUATION, PAIR THEORY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605030/E02 STEP NO--NE/0000/70/032/001/0019/0022

CIRC ACCESSION NO--AP0141849

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 012

CIRC ACCESSION NO--AP0141849 UNCLASSIFIED PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. USE OF A SEPARABLE EXPANSION FOR THE TWO PARTICLE T MATRIX REDUCES THE PROBLEM OF THREE PARTICLES WITH PAIR INTERACTION TO A SET OF ONE DIMENSIONAL INTEGRAL EQUATIONS. BY THE SUBSEQUENT SEPARABLE REPRESENTATION OF KERNELS OF SUCH INTEGRAL EQUATIONS (BASED ON THE BATEMAN METHOD) THE PROBLEM OF THREE IDENTICAL PARTICLES IS REDUCED TO THE SOLUTION OF ALGEBRAIC EQUATIONS. (1) REFS).

FACILITY: ACAD. SCIS., UKRAINIAN SSR, KIEV, USSR.

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ADERIKHIN, V. P., et al., Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 12, Apr 72, Author's Certificate No 334574, Division G, filed 22 Dec 70, published 30 Mar 72, p 184

connects the output of the scaler in the function servo system to the second input of the logic device, and through a delay line to the controlling inputs of the servo system switches. The memory unit is connected to the output of the logic device.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR

UDC 621.373.826:621.317.78

GUZHVA, V. G., ZINCHENKO, R. I., KOKODIY, N. G., KUZ'MICHEV, V. N.

"High-Speed Laser Radiation Pulse Energy Meter"

Radiotekhnika. Resp. mezhved. temat. nauch.-tekhn. sb. (Radio Engineering. Republic Interdepartmental Schematic Scientific and Technical Collection), No 19, 1971, pp 140-144 (from RZh-Radiotekhnika, No 1, 1972, Abstract No 1D457)

Translation: This instrument is designed for measuring the pulse energy and also the mean radiation power of lasers operating in the free generation mode and in the Q-factor modulation mode. About 9 percent of the transmitted radiation is shunted to the pyroelectric sensor which converts the radiation pulse to a voltage pulse with a duration of several milliseconds and with an amplitude proportional to the radiation pulse energy. The voltage pulse amplitude is measured by a peak volt meter. The measurement time was 2 seconds, and the time between measurements was 15 seconds. The instrument is calibrated by a calorimetric meter. The total error was $(-2 \pm 8)\%$. There are 4 illustrations and a 4-entry bibliography.

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USSR

UDC: 621.391.883.2

[redacted]

"Effect of Pulse Shape on the Interference Immunity of Differential Signal Reception"

V sb. Materialy Nauch.-tekhn. konf. Leningr. elektrotekhn. in-t svyazi. Vyp. 1 (Materials of the Scientific and Technical Conference of Leningrad Electrical Engineering Institute of Communications--collection of works, No 1), Leningrad, 1971, pp 169-173 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3A35)

Translation: Existing single-sample methods of pulse signal reception (e.g. PCM-TD) do not always meet requirements for interference immunity of reception. In this connection, the author considers the question of the possibility of improving the interference immunity of reception of pulse signals by using a two-sample differential method of optimum reception.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR

UDC 621.385:530.145.6:622

YEGOROV, K. P., MAKKAVEYEV, V. I., KUZ'MICHEV, V. N.

"Optical Beam Wave Guide"

USSR Author's Certificate No 274413, Filed 25 Sep 63, Published 6 Oct 70 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4D439P)

Translation: An optical beam wave guide is proposed with automatic regulation of the position of the optical systems. It contains a system of lens, prism and mirror devices arranged in a climate-control tube. In order to insure constancy of the position of the correcting systems required to maintain the direction of the coherent light beam, the correcting systems are made to rotate in two mutually perpendicular directions the constancy of the position of which is maintained by an automatic position control system.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR

UDC 621.391:519.2

KUZMICHEV, V. N.

"Noise-Proofness of a PCM-VD Regenerator with High Signal/Noise Ratios Considering the Shape of the Coded Pulses"

Materialy nauchno-tekhn. konferentsii, Leningr. elektrotekhn. in-t svyazi, Vyp. 2 (Materials of the Scientific and Technical Conference, Leningrad Electrotechnical Communications Institute, Vyp. 2), Leningrad, 1970, pp 123-128 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A56)

Translation: This article contains an investigation of the problems of the effect of the shape of code pulses on noise-proofness of regenerators of systems with PCM-VD. An expression is obtained for the probability of error in detection of the code pulses with $\cos^n$ shape and large signal/noise ratios. A graphical relation is presented for this probability as a function of the pulse parameters and operating conditions of the regenerator.

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UDC 621.3.049.75

KOPYLOV, S. G., KAZAKOV, S. N., YEGUNOV, A. V., KUZ'MICHEV, V. S., MELIK-OGANDZHANYAN, P. B., IGNATOV, B. M., FEDOTOV, V. A., YUROVLEV, YE. G.

" Multilayer Printed Board"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 16, 8 May 70, p 43, Patent No 270029, Filed 4 Mar 68

Translation: This Author's Certificate introduces a multilayer printed board containing alternating layers of dielectric and electrically conducting material designed for mounting integral circuits with flat leads in which grooves are cut out on both sides of the integral circuit. The interlayer connections are made in these grooves. They are executed by welding or soldering. The model is distinguished by the fact that in order to insure high density of arrangement of highly reliable interlayer connections with a minimum number of them and also to lower the labor involved in manufacturing the boards, the interlayer connections are executed in the form of bunches of printed conductors made during the process of pressing the multilayer printed board, and the number of bunches leading into the groove is determined by the number of leads of the integral circuits mounted on the board.

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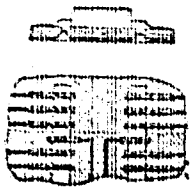
KOPYLOV, S. G., et al., Otkrytiya, Izobreteniya, Promyshlennyye Obrazcy, Tovarnyye Znaki, No 16, 8 May 70, p 43, Patent No 270019, Filed 4 Mar 65



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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR

UDC 621.785.661.65

KUZ'MICHEV, Yu. S., LUPAKOV, I. S., BOROK, B. A., and GAVRILOVA, V. K., Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Investigation of the Effect of Boron on the Thermal Conductivity and Thermal Expansion of Titanium"

Kiev, Poroshkovaya Metallurgiya, No 8, Aug 70, pp 78-82

Abstract: Results are presented of an investigation of the effect of boron on thermal conductivity and linear expansion of titanium. The investigation was carried out by the comparative method using samples containing 1, 2, 3, and 4 wt. % boron. Boron increased the thermal conductivity of titanium. The thermal conductivity of titanium with boron, derived experimentally was somewhat higher than the rated one based on the heterogeneity of the alloy and if it is considered that the alloy consists of a solid boron solution in titanium and titanium diborides. The coefficient of linear expansion of titanium decreased appreciably with the intrpduction of boron into it.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

KUZ'MICHEVA, N. A.

Aerological Radiosonde

This article briefly describes the new RKZ-5-2 aerological radiosonde. In contrast to the RKZ-2 aerological radiosonde used in network observations, in the RKZ-5-2 radiosonde the temperature and humidity measurement frequencies are reduced by approximately half. The pedestal frequency is 1000 cps. The duration of the meteopauses varies from 250μ sec to half their repetition rate. The RKZ-5-2 radiosonde uses the same temperature unit as in the RKZ-2 network radiosonde. The switching device is an electromechanical commutator with a miniaturized electric motor. Tests of the RKZ-5-2 radiosonde in combination with the "Meteorit-2" radar were very encouraging.

(Abstract: "RKZ-5-2 Aerological Radiosonde," by N. N. Grushin, G. E. Kuzenkov and N. A. Kuz'micheva, Moscow, Trudy Tsentral'noy Aerologicheskoy Observatorii, No 102, 1971, pp 139-140)

[From: Moscow, Referativnyy Zhurnal, Geofizika, Svodnyy Tom, No 10, 1971, 10B41]

JPRS 57277
29 Nov 71

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--ANOMALIES OF MAGNETIC PROPERTIES OF VANADYL (VO PRIME2POSITIVE) MONO AND DICARBOXYLATES -U-

AUTHOR-(04)-KALINNIKOV, V.T., ZELENTSOV, V.V., KUZMICHEVA, O.N., AMINOV, T.G.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(3) 661-5

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MAGNETIC SUSCEPTIBILITY, TEMPERATURE DEPENDENCE, CARBOXYLIC ACID, VANADIUM COMPLEX, PARAMAGNETIC ION, EXCHANGE REACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/0776 STEP NO--UR/0078/70/015/003/0661/0665

CIRC ACCESSION NO--AP0104222

UNCLASSIFIED

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UNCLASSIFIED PROCESSING DATE--18SEP70

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CIRC ACCESSION NO--AP0104222

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AMONG 26 STUDIED VO PRIME2POSITIVE MONO AND DICARBOXYLIC ACID COMPLEXES, ONLY THE MAGNETIC SUSCEPTIBILITY (CHI M) OF VO PRIME2POSITIVE FORMATE HYDRATES AND VO PRIME2POSITIVE MALONATE HAD CURIE WEISS TEMP. DEPENDENCES WITH POS. WEISS CONSTS. THE REMAINING VO PRIME2POSITIVE COMPLEXES OF ALKYL OR ARYLCARBOXYLATES HAD TEMP. INDEPENDENT CHI M. AT ROOM TEMP., THEY HAD LOW MU SUBEFF, WHICH DECREASED GRADUALLY WITH TEMP. THIS PHENOMENON IS EXPLAINED BY AN ISOTOPE INTERACTION IN THE LINEAR CHAIN OF PARAMAGNETIC V (IV) IONS WITH A LARGE (N IS LARGER THAN OR EQUAL TO 10) EVEN NO. OF NUCLEI. THE EXCHANGE INTEGRALS OF THESE COMPOS. ARE 170-290 CM PRIME NEGATIVE1.

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USSR UDC 541.451:546.791

KUZ'MICHEVA, YE. U., KOVBA, L. M., and IPPOLITOVA, YE. A.

"Oxidation of Uranium Dioxide at Temperatures Below 270°C"

Leningrad, Radiokhimiya, Vol 13, No 6, 1971, pp 852-857

Abstract: The starting material was obtained by reduction of mixed oxides $\alpha UO_3 \cdot H_2O$ at 800-900°; the reduced product had the composition $UO_{2.01-2.03}$. Phase composition and chemical analysis of the products obtained from air oxidation in temperature range 100-270°C were carried out. Oxidation of UO_2 in the range 100-150°C leads to the formation of tetragonal phase β-U_3O_7 with a c/a ratio of 1.01-1.02. Further oxidation in the range 180-250° leads to the formation of γ-U_3O_7, the the c/a ratio increasing to 1.027-1.032. At 270° UO_2 oxidizes to $UO_{2.473}$ in about three hours. Concurrently with γ-U_3O_7 there forms a rhombic phase $U_8O_{21\pm x}$ in which c/a = 1.697. Continuation of the oxidation of the oxidation at this temperature yields $UO_{2.703}$ with traces of γ-U_3O_7. The overall oxidation route of UO_2 may be represented as follows: UO_2

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USSR

KUZ'MICHEVA, YE. U., et al., Radiokhimiya, Vol 13, No 6, 1971, pp 852-857

$$\xrightarrow{100\text{-}150} \beta\text{-}U_3O_7 \; (c/a=1.01) \xrightarrow{180\text{-}250} \gamma\text{-}U_3O_7 \; (c/a=1.027) \xrightarrow{260} U_8O_{21+x} \; (c/a=1.657)$$

$$\xrightarrow{>270} U_3O_{8+x} \; (c/a=1.689)$$

Experimental data failed to show formation of U_4O_9, α-U_3O_7 or δ-U_3O_7. The data support a two-stage diagram of the oxidation process of uranium oxide.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR

KUZ'MIN, A. A., VINOKUROV, V. M.

UDC 621.375.4

"Matrices of A- and T-Parameters of a Cascade of Distributed Amplifiers With Different Structures"

Tr. Tomsk. in-ta radioelektron. i elektron. tekhn. (Works of the Tomsk Institute of Radio Electronics and Electronic Technology), 1971, 11, pp 59-70 (from RZh-Radiotekhnika, No 11, Nov 71, Abstract No 11D36)

Translation: Among the most promising wide-band and selective microwave amplification devices are amplifiers based on the principle of cophased addition of the powers of separate oscillators, in particular distributed amplifiers. At the present time, distributed amplifiers have been developed with a passband of the order of 1 GHz; it is expected that the passband will be extended to several GHz. The necessity has arisen for describing parameters extensively used on superhigh frequencies by means of external waves. Expressions are given which relate the wave matrices of T-transmission for various distributed amplifier structures to each other and to the corresponding classical matrices of A-transmission; transmission wave matrices are also derived for distributed amplifiers of various strucutres. Bibliography of six titles. F. U.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR UDC: 621.396.677

KUZ'MIN, A. A.

"On Calculating the Emission Characteristics of Pencil-Beam Arch Antennas"

V sb. Antenny (Antennas--collection of works), vyp. 10, Moscow, "Svyaz'", 1971, pp 12-26 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5B33)

Translation: The author considers the spatial directional radiation patterns of arched antenna arrays using the Anger and Dommel-Weber functions. Simple relationships are found for calculating the width of the main beam, and the position and magnitude of the aperture side lobes of arched antenna arrays with uniform amplitude distribution and isotropic radiators. An estimate is made of the effect which the discreteness of the radiator arrangement has on the shape of the radiation pattern of the arched antenna array. Seven illustrations, bibliography of ten titles. Author's abstract.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 019 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--OBSERVATION SYSTEM OF THE 70-GEV PROTON SYNCHROTRON -U-

AUTHOR-(05)-BOLSHAKOV, YU.D., GERTSEV, K.F., IVANOV, YU.S., KUZMIN, A.A., RUBCHINSKIY, S.M.

COUNTRY OF INFO--USSR

SOURCE--(CERN-TRANS-69-23) NTO-6827

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PROTON ACCELERATOR, SYNCHROTRON, PARTICLE MOTION, TRAJECTORY MEASUREMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1985/0787 STEP NO--UR/0000/70/000/000/0001/0012

CIRC ACCESSION NO--AM0101160

UNCLASSIFIED

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 019 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AM0101160

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE BEAM ORBIT OF THE IHEP SYNCHROTRON IS DETERMINED BY MEASURING THE DISPLACEMENT OF THE CENTER OF GRAVITY OF ACCELERATED PARTICLE BUNCHES WITHIN 85 AZIMUTH POINTS. A SPECIAL SYSTEM IS DESCRIBED WHICH ALLOWS A DETERMINATION OF THE POSITION OF THE CLOSED ORBIT, AS WELL AS THE FREQUENCY, AMPLITUDE, AND PHASE OF THE COHERENT BETATRON OSCILLATIONS. THE EQUIPMENT ASSURES A PRECISION MEASUREMENT OF THE ORBIT DEPALCEMENT OF PLUS 15 TO 7 PERCENT PLUS 1 MM FOR AN INTENSITY OF 10 PRIME11 TO 10 PRIME14 PROTONS AND 10 TO 15 PERCENT FOR AN INTENSITY OF 10 PRIME10 PROTONS. FACILITY: AKADEMIYA NAUK SSSR, MOSCOW. RADIOTEKHNICHESKII INSTITUT.

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USSR

ADO, YU. M., ZHURAVLEV, A. A., LOGUNOV, A. A., MYAE, E. A., NAUMOV, A. A., PISAREVSKIY, V. YE., ROGOZINSKIY, V. G., TVSHABRAMISHVILI, K. Z., SHUKEYLO, I. A., BOYKO, S. N., KOMAR, YE. G., MALYSHEV, I. P., MOZIN, I. V., MONOSZON, N. A., MOZALEVSKIY, I. A., SPEVAKOVA, F. M., STOLOV, A. M., TITOV, V. A., VODOP'YANOV, F. A., KUZ'MIN, A. A., KUZ'MIN, V. F., MINTS, A. L., RUBCHINSKIY, S. M., UVAROV, V. A., GUTNER, B. M., ZALMANZON, V. B., PROKOP'YEV, A. I., and TEMKIN, A. S.

"Some Results of the Overall Adjustment and Start-up of the 70-Gev Proton Synchrotron of the Institute of High-energy Physics"

Moscow, Atomnaya Energiya, Vol 28, No 2, Feb 70, pp 133-138

Abstract: The physical part of the plan for the 70-Gev proton synchrotron was executed by the Institute of Theoretical and Experimental Physics. The electromagnet with feed system, the vacuum chamber, and the injection devices were developed at the Scientific Research Institute of Electrophysical Apparatus imeni D. V. Yefremov. The radio-electronic systems for acceleration process control and generation of

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

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ADO, YU. M., et al., Atomnaya Energiya, Vol 28, No 2, Feb 70, pp 132-138

the accelerating field, as well as the radiotechnical measurement and beam observation systems, were developed by the Radiotechnical Institute of the Academy of Sciences USSR. "Tyazhpromelektroproyekt" [State Planning Institute for the Planning of Electrical Equipment for Heavy Industry] designed the general-purpose electrotechnical devices and cable connections. The plan for the construction complex of the accelerator was developed by the State All-Union Planning Institute. The construction of the accelerator was under the general supervision of the State Committee for the Use of Atomic Energy USSR. The adjustment of individual systems and the overall adjustment and start-up of the accelerator were carried out by the Institute of High-energy Physics and the developers of the accelerator systems. The basic beam work was done by the Institute of High-energy Physics with the participation of the Radiotechnical Institute. The construction of the accelerator was begun in 1960, and all the basic construction and assembly work was completed at the beginning of

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR

ADO, YU. M., et al., Atomnaya Energiya, Vol 28, No 2, Feb 70, pp 132-138

1967. At the initial stage of construction, before the formation of the Institute of High-energy Physics in 1963, the work was coordinated by the Institute of Theoretical and Experimental Physics. The linear accelerator injector was started on 28 July 1967, the operation of the individual systems was adjusted by September 1967, and the physical start-up of the accelerator was accomplished on 14 October.

A description is given of the work done to adjust the annular electromagnet (including the electromagnet cooling and feed systems), the injection system (consisting of matching channel and injection device), the vacuum system, the radioelectronic system (including the accelerating field generation system, the acceleration process control system, and the radiotechnical measurement system), and the beam observation system (which provides for beam observation in the first revolution and during acceleration). In the physical start-up of the accelerator the main efforts were directed towards obtaining accelerated protons of the planned energy, and the problem of obtaining high

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

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ADO, YU. M., et al., Atomnaya Energiya, Vol 28, No 2, Feb 70, pp 132-138

intensity of the accelerated proton was not raised.

The article gives a listing of the principal parameters of the proton synchrotron, as well as a schedule of the individual stages of the start-up of the accelerator. Photographs include a view of the part of the ring hall in the beam injection area and a general view of the hall of ignitron rectifiers.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--RADIO FREQUENCY CONTROL SYSTEM FOR THE BEAM OF THE 70 GEV PROTON SYNCHROTRON -U-

AUTHOR-(04)-IVANOV, YU.S., KALININ, V.A., KUZMIN, A.A., CHIRKOV, S.V.

COUNTRY OF INFO--USSR

SOURCE--(CERN TRANS 69-24) NTO 6823. 11P. DEP. CFSTI

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SYNCHROTRON, PROTON, FREQUENCY CONTROL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/1912 STEP NO--UR/0000/70/000/000/0001/0011

CIRC ACCESSION NO--AT0127313

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0127313

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SYSTEM FOR THE CONTROL OF THE RADIOFREQUENCY BY USE OF THE BEAM IS BASED ON THE REGULATION OF THE FREQUENCY OF THE PILOT GENERATOR BY SIGNALS PROPORTIONAL TO THE RADIAL DISPLACEMENT OF THE BEAM WITH RESPECT OT THE NOMINAL ORBIT AND PROPORTIONAL TO THE DEPHASING OF THE CENTER OF GRAVITY OF THE BEAM WITH RESPECT TO THE ACCELERATOR FIELD. THE CONTROL SYSTEM IS DESCRIBED AND ITS OPERATIONAL EFFICIENCY IS DISCUSSED. FACILITY: AKADEMIYA NAUK SSSR, MOSCOW. RADIOTEKHNICHESKII INSTITUT.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 034 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--THE ATMOSPHERE OF THE PLANET VENUS -U-

AUTHOR--KUZMIN, A.D.

COUNTRY OF INFO--USSR, UNITED STATES

SOURCE--INTERNATIONAL UNION OF RADIO SCIENCE, SYMPOSIUM ON PLANETARY ATMOSPHERES AND SURFACES, WOODS HOLE, MASS., AUG. 11-15, 1969, RADIO

DATE PUBLISHED--------70

SUBJECT AREAS--ASTRONOMY,ASTROPHYSICS, SPACE TECHNOLOGY

TOPIC TAGS--VENUS PLANET, PLANETARY ATMOSPHERE, CHEMICAL COMPOSITION/(U)VENUS 6 VENUS PROBE, (U)VENUS 5 VENUS PROBE, (U)VENUS 4 VENUS PROBE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/2109 STEP NO--FR/0000/70/005/000/0339/0345

CIRC ACCESSION NO--AP0125693

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 034 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0125693

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SURVEY OF MODERN DATA ON THE ATMOSPHERE OF THE PLANET VENUS. DATA COLLECTED DURING THE VENERA 4, 5, AND 6, AND MARINER 5 MISSIONS ARE REVIEWED, COMPARED, AND ANALYZED. THE DATA REFER TO CHEMICAL COMPOSITION OF THE ATMOSPHERE, TEMPERATURE, PRESSURE AND DENSITY IN THE ATMOSPHERE, TEMPERATURE DIFFERENCES BETWEEN THE DAY AND NIGHT SIDES OF THE PLANET, WATER VAPOR AND CLOUDS, AND THE UPPER ATMOSPHERE. SOME RESULTS ARE TABULATED AND PLOTTED GRAPHICALLY.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 042 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--LOWER ATMOSPHERE OF VENUS FROM RADIO ASTRONOMICAL AND SPACE MEASUREMENTS -U-

AUTHOR-(04)-KUZMIN, A.D., NAUMOV, A.P., SMIRNOVA, T.V., VETUKHNOVSKAIA, YU.N.

COUNTRY OF INFO--USSR

SOURCE--PLENARY MEETING. 13TH LENINGRAD, USSR, MAY 20-29, 1970, PAPER. 11P.

DATE PUBLISHED-------70

SUBJECT AREAS--ASTRONOMY,ASTROPHYSICS, ATMOSPHERIC SCIENCES

TOPIC TAGS--VENUS PLANET, PLANETARY ATMOSPHERE, ATMOSPHERIC MODEL, RADIO ASTRONOMY, RADAR OBSERVATION, LOWER ATMOSPHERE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/0548 STEP NO--UR/0000/70/000/000/0011/0011

CIRC ACCESSION NO--AT0126295

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 042 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AT0126295

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISCUSSION OF TWO MODELS FOR THE LOWER ATMOSPHERE OF VENUS TAKING INTO ACCOUNT AN ANALYSIS OF RADIO ASTRONOMY AND RADAR MEASUREMENTS BASED ON DATA OF THE SOVIET SPACECRAFT VENERA 5 AND 6. THREE INDEPENDENT EVALUATIONS OF THE PRESSURE AND THE TEMPERATURE OF THE VENUS ATMOSPHERE ARE MADE. AN ADIABATIC MODEL WITH RELATIVE ABUNDANCE OF WATER VAPOR OF 0.5PERCENT AND A MODEL WITH AN ISOTHERMAL NEAR SURFACE REGION AT A TEMPERATURE OF 600DEGREESK ARE DESCRIBED. FACILITY: AKADEMIIA NAUK SSSR, FIZICHESKII INSTITUT, MOSCOW, USSR.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 049 UNCLASSIFIED PROCESSING DATE--02OCT70

TITLE--THE PLANET VENUS UPDATED REVIEW OF INFORMATION ON VENUS -U-

AUTHOR-(02)-VETUKHNOVSKAYA, YU.N., KUZMIN, A.D.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, ASTRONOMICHESKIY VESTNIK, VOL. IV, NO. 1, 1970, PP. 8-23

DATE PUBLISHED-------70

SUBJECT AREAS--ASTRONOMY,ASTROPHYSICS, SPACE TECHNOLOGY

TOPIC TAGS--PLANET VENUS, PLANETARY ATMOSPHERE, RADIO BRIGHTNESS TEMPERATURE, RADAR REFLECTION, ELECTRON DENSITY, IONOSPHERE/(U)VENUS 4 VENUS PROBE, (U)VENUS 5 VENUS PROBE, (U)VENUS6 VENUS PROBE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1991/1298 STEP NO--UR/0454/70/004/001/0008/0023

CIRC ACCESSION NO--AP0110991

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 049 UNCLASSIFIED PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0110891

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ASTRONOMICAL OBSERVATIONS, THEORETICAL RESEARCH AND SPACE EXPLORATION OF RECENT YEARS HAVE MADE OBSOLETE BOOKS AND REVIEWS ON VENUS WHICH WERE PUBLISHED QUITE RECENTLY. THE AUTHORS HAVE DRAWN ON 95 RECENT SOURCES IN COMPILING THIS COMPENDIUM OF UP TO DATE INFORMATION ON THAT PLANET. PART I GIVES THE MOST RELIABLE DATA ON THE MOTION, MASS, SIZE, FIGURE AND TOPOGRAPHY OF VENUS. PART II IS CONCERNED WITH THE PLANETARY ATMOSPHERE (CHEMICAL COMPOSITION, TEMPERATURE AND PRESSURE, TEMPERATURE DIFFERENCE ON THE DAYTIME AND NIGHTTIME SIDES OF THE PLANET, CLOUDS, UPPER ATMOSPHERE). TABLE 1 GIVES VARIOUS DETERMINATIONS OF THE RADIUS OF THE VENUSIAN SURFACE; TABLE 2, CHEMICAL COMPOSITION OF THE VENUSIAN ATMOSPHERE AS MEASURED BY VENERA-4,5,6; TABLE 3, MEASUREMENTS OF THE DIFFERENCE IN BRIGHTNESS TEMPERATURES OF THE ILLUMINATED AND UNILLUMINATED SIDES OF VENUS AVERAGED OVER THE VISIBLE DISK. FIG. 1 SHOWS THE PROFILE OF THE SURFACE ELEVATION OF THE EQUATORIAL REGION OF VENUS; FIG. 1, MAP OF THE REFLECTIVITIES OF THE VENUSIAN SURFACE; FIG. 3, EXPERIMENTAL AND COMPUTED DEPENDENCE OF BRIGHTNESS TEMPERATURE OF VENUS ON WAVELENGTH; FIG. 4, EXPERIMENTAL AND COMPUTED DEPENDENCE OF EFFECTIVE CROSS SECTION OF RADAR REFLECTION ON WAVELENGTH FOR AN ATMOSPHERE CONTAINING 95PERCENT CO SUB2 AND 0.4PERCENT H SUB2O; FIG. 5, ELECTRON DENSITY DISTRIBUTION IN VERTICAL CROSS SECTION OF THE VENUSIAN IONOSPHERE, DAYTIME AND NIGHTTIME SIDES. FACILITY: PHYSICS INSTITUTE ACADEMY OF SCIENCES USSR.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ANALYTICAL CHARACTERISTICS OF A CYCLOIDAL TYPE MASS SPECTROMETER MKH1203 -U-

AUTHOR-(05)-KUZMIN, A.E., KRIVTSOV, B.S., POLYAKOVA, A.A., RAFALSON, A.F., KHMELNITSKIY, R.A.

COUNTRY OF INFO--USSR

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SOURCE--ZAVOD. LAB. 1970, 36(2), 243-5

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MASS SPECTROMETER, ATOMIC MASS, QUANTITATIVE ANALYSIS, ERROR ANALYSIS/(U)MKH1203 MASS SPECTROMETER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1192 STEP NO--UR/0032/70/036/002/0243/0245

CIRC ACCESSION NO--AP0124846

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124846

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE APP. HAS BEEN DESIGNED FOR A PERIODIC ANAL. OF THE COMPN. OF LIQ. AND GASEOUS SAMPLE IN THE RANGE OF 2-150 AT. MASS UNITS WITH A VAPOR PRESSURE LARGER THAN OR EQUAL TO 30 MM HG AT 100DEGREES. ITS USE IS ADVANTAGEOUS IN THE ANAL. OF MICROADMIXTS. AND IN THE ANAL. OF MIXTS. OF POLAR COMPDS.; HOWEVER, IT CAN BE USED ALSO FOR A RAPID ANAL. OF LIQS. AND FOR SOME KINDS OF ISOTOPIC ANAL. THE MKH1203 HAS A LOW BACKGROUND AND LOW SORPTION OF THE ANALYZED COMPDS. ON THE INTERNAL SURFACE. TO PUMP OUT COMPDS. WITH ORDINARY SORPTABILITY TO 0.01PERCENT OF THE INITIAL CONCN., TAKES 3 MIN AND COMPDS. STRONGLY ADSORBED TO 0.2PERCENT OF INITIAL CONCN., 15 MIN. THE SENSITIVITY FOR AR IS 10 NEGATIVE PRIME4 AND 0.05PERCENT IN RECORDING THE MASS SPECTRA BY MEANS OF A VACUUM TUBE POTENTIOMETER AND LIGHT BEAM OSCILLOGRAPH, RESP. THE RELATIVE REPRODUCIBILITY OF THE MASS SPECTRUM OF C SUB4 H SUB10 WITHIN 1 MONTH IS 1PERCENT. THE RELATIVE ANAL. ERROR DEPENDS ON THE COMPN. OF THE ANALYZED MIXT. AND VARIES WITHIN 1-5PERCENT AT THE COMPONENT CONCN. OF LARGER THAN OR EQUAL TO 10 MOLE PERCENT. IN THE ANAL. OF MIXTS. CONTG. C SUB6 H SUB6, PHME, NONANE, TRICHLOROETHYLENE, AND ET SUB2 O, THE MAX. ERROR WAS SMALLER THAN 2PERCENT.

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USSR

UDC 537.591.15

VERNOV, S. N., Y'EGOROV, T. A., Y'EFIMOV, N. N., KOLOSOV, V. A., KORYAKIN, V. D., KRASIL'NIKOV, D. D., KUZ'MIN, A. I., KULAKOVSKAYA, V. P., MAKSIMOV, S. V., NESTEROVA, N. M., NIKOL'SKIY, S. I., ORLOV, V. A., SLEPTSOV, I.YE., SIZOV, V. V., KHRISTIANSEN, G. B., and SHAMSUTDINOVA, F. K.

"Preliminary Results of Recording Extensive Showers on a Recording Array in Yakutsk"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2098-2101

Abstract: Experiments are described in which attempts were made at determining the energy spectrum, composition, and anisotropy of cosmic rays within the range of energy 10^{17} to 10^{18} ev. It is desired to extend the range to cover 10^{19} ev and above. Of a particular interest are the following problems: do the rays originate within the Galaxy or in metagalactic regions, what is the direction from which they arrive, and how Čerenkov radiation produced by them is distributed within the atmosphere. The test equipment consists of 13 recording points distributed over an area of 3 km², with a central synchronotrol point. The output spectrum was measured over a period of 29.5 hours. 82 showers were noted during that period, with the axes falling within the

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VERNOV, S. N., et al., Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2098-2101

array area. The orientation of the axis was found by the "triangulation" method, comparing the time of arrival of the showers at different recording points. An analytic expression is given in the paper for the integral output spectrum of extensive showers at sea level for the interval of N between 2×10^7 and 2×10^8. The intensity, determined with this formula, appears to be 2 to 3 times as great as recorded elsewhere. Distribution of Cerenkov light with respect to the shower axis was determined by observations conducted on clear, moonless nights. It was found to be similar to that of the primary gamma quanta, but it decayed with the distance from the axis more slowly than the amount of charged particles ($R^{-2.5}$ as against $R^{-3.3}$ for charged particles).

Examination of the energy spectrum of primary particles lead to the conclusion that the electromagnetic component is responsible for 80% of it. Dependence of primary energy on the output N was established, and on the basis of this relation the integral spectrum was computed. The coefficient connecting these two magnitudes was found to be twice as high as the one previously accepted elsewhere.

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VERNOV, S. N., et al., Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 10, Oct 71, pp 2098-2101

In the final analysis, variation of Čerenkov light at the primary particle energy of 3.6×10^{16} ev and the output (intensity) of 1.5×10^{7} particles at sea level is given, as well as the expected distribution of the nuclear components of primary rays.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/3 . 024 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--AURORAL PROTONS AND RESONANCE CONCEPT OF SUBSTORMS -U-

AUTHOR-(05)-GALPERIN, YU.I., GLADYSHEV, V.A., GUREVICH, A.V., KUZMIN, A.K., POKOMAREV, YU.N.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, KOSMICHESKIYE ISSLEDOVANIYA, VOL VIII, NO 3, 1970, PP 457-460

DATE PUBLISHED--------70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, ASTRONOMY,ASTROPHYSICS

TOPIC TAGS--AURORA, PROTON, MAGNETOSPHERE, ELECTRIC FIELD, SOLAR WIND, GEOMAGNETIC STORM, PROTON RESONANCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/0508 STEP NO--UR/0293/70/008/003/0457/0460

CIRC ACCESSION NO--AP0132711

UNCLASSIFIED

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/3 . 024 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132711

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS PROPOSE A "RESONANCE" CONCEPT OF THE APPEARANCE OF A SUBSTORM. IT CAN BE SUMMARIZED AS FOLLOWS: 1) THERE IS A MORE OR LESS STATIONARY QUASITRAPPED COMPONENT OF AURORAL PROTONS (AND POSIBLY ELECTRONS) WITH A CHARACTERISTIC ENERGY OF ABOUT 10 KEV, HAVING A STRUCTURELESS "BACKGROUND" SPACE DISTRIBUTION. 2) THIS CHARACTERISTIC ENERGY OF AURORAL PARTICLES IS THE "RESONANCE" ENERGY OF QUASITRAPPED PROTONS OF THE RING CURRENT AND AURORAS. 3) IT IS POSTULATED THAT THERE IS AN ACCUMULATION OF THE RESONANCE COMPONENT IN THE EVENING AND NIGHTTIME REGIONS OF THE "SACK" AS A RESULT OF THE ASYMMETRICAL INJECTION OF THESE PARTICLES INTO QUASITRAPPED TRAJECTORIES, THE APPEARANCE OF A RING CURRENT AS A RESULT OF THIS ASYMETRY, AND AS A RESULT, THE GENERATION OF A LARGE SCALE SELF CONSISTENT ELECTRIC FIELD IN THE MAGNETOSPHER. 4) IT IS POSTULATED THAT THE INCREASE IN DENSITY OF RESONANCE PARTICLES WITH THEIR ACCUMULATION IN THE REGION OF THE "CUSP" OR "SACK" ABOVE SOME CRITICAL VALUE GIVES RISE TO THE PHENOMENON OF A "MAGNETOSPHERIC EXPLOSION," A SUBSTORM, AND SUCH A PROCESS CAN BE REPLATED WITH CONTINUATION OF "PUMPING" OF THE MAGNETOSPHERE WITH RESONANCE PARTICLES. 5) IT IS POSTULATED THAT THERE IS A SELECTIVITY OF THE REACTION OF THE EARTH'S MAGNETOSPHERE TO THE APPEARANCE OF PARTICLES WITH ENERGIES CLOSE TO "RESONANCE" IN THE SOLAR WIND FLOWING AROUND IT.

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3/3 024 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132711

ABSTRACT/EXTRACT--6) IT IS POSTULATED THAT THE PHENOMENON OF A LAG IN MAGNETIC STORMS IN COMPARISON WITH THE ACTIVE HELIOPHYSICAL PROCESSES RESPONSIBLE FOR THEM IS DETERMINED BY THE TIME OF INTERPLANETARY SPACE PROPAGATION OF THAT COMPONENT OF A "CORPUSCULAR STREAM" EJECTED FROM THE SUN WHICH IS RESPONSIBLE FOR "RESONANCE" IN THE EARTH'S MAGNETOSPHERE. THIS CONCEPT DOES NOT PRECLUDE PROCESSES LEADING TO THE APPEARANCE OF TYPICAL SHARPLY DEFINED AURORAL ZONES, USUALLY SITUATED ALONG THE AURORAL OVAL AND CAUSED BY THE INJECTION OF PARTICLES WITH A CHARACTERISTIC ENERGY 1-5 KEV AND HIGH ENERGY PARTICLES (UP TO 10 PRIME2 -10 PRIME4 KEV), WHOSE INTERPRETATION EVIDENTLY REQUIRES A DETAILED EXAMINATION OF OSCILLATORY AND OTHER COLLECTIVE PROCESSES IN MAGNETOSPHERIC PLASMA.

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USSR UDC 621.039.51

KHROMOV, V. V., KUZ'MIN, A. M., KASHUTIN, A. A., and SILAYEV, YU.V.

"Calculation Optimization Complex for Fast Nuclear Reactors (ROKBAR)"

Fiz. Yadern. Reaktorov (Nuclear Reactor Physics -- collection of works), No 2, Moscow, Atomizdat Press 1970, pp 3-16 (from Referativnyy Zhurnal-Yadernyye Reaktory, No 3, 1971, Abstract No 3.50.63)

Translation: The ROKBAR program for optimization of fast nuclear reactors has been written for the M-20 computer at the Moscow Engineering Physics Institute. The ROKBAR program allows sequential search for the optimal version of a fast reactor considering its thermal, strength, and neutron physical characteristics while avoiding variant calculation. The program is based on an algorithm of gradient search for an optimal version using formulas from the theory of small perturbations and linear programming. The authors preferred this method of optimization above other methods (dynamic programming, the maximum principle of Pontryagin), since it is most universal and has been developed in sufficient detail. The

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KHROMOV, V. V., et al., Fiz. Yadern. Reaktorov, No 2, Moscow, Atomizdat Press 1970, pp 3-16 (from Referativnyy Zhurnal-Yadernyye Reaktory, No 3, 1971, Abstract No 3.50.63)

creation of the ROKBAR optimization complex was facilitated by the experience in the planning of fast nuclear reactors accumulated at the Institute of Physics and Power Engineering. Optimization studies of a BN-350 nuclear reactor have shown that 2 to 3 minutes of M-20 computer machine time is required for each step in the search, the total time expended for optimization of the nuclear reactor being not over 1.5 hr. Studies performed using the ROKBAR program have shown that it is a reliable and effective tool for the search for optimal compositions of fast nuclear reactors. 9 biblio. refs.

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KHROMOV, V. V., KUZ'MIN, A. M., KASHUTIN, A. A., and SILAYEV, YU.V.

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KHROMOV, V. V., et al., Fiz. Yadern. Reaktorov, No 2, Moscow, Atomizdat Press 1970, pp 3-16 (from Referativnyy Zhurnal-Yadernyye Reaktory, No 3, 1971, Abstract No 3.50.63)

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USSR

UDC 612.039

KUZ'MIN, A. M., KASHUTIN, A. A., SILAYEV, Yu. V., and KHROMOV, V. V.

"Solution of Certain Optimization Problems for Fast Reactors"

V sb. Fiz. yadern. reaktorov (Physics of Nuclear Reactors — Collection of Works), No 2, Moscow, Atomizdat, 1970, pp 17-32 (from RZh-Fizika, No 4, Apr 71, Abstract No 4V526)

Translation: Problems illustrating the possibilities of the ROMBAR program and giving an idea of the nature of solutions and the optimization of high-power fast reactors are described. Reactors with oxide fuel and sodium coolant are considered; the core consists of two regions with different concentrations of fissionable isotopes. The following problems are solved: 1. the minimum of the critical mass for a constant reactor power. In seeking the optimum the dimensions of the fuel elements and the assembly, the dimensions of the core regions, the step of the fuel element lattice, the velocity of the coolant, and the concentration of fissionable isotopes were varied. Results are presented for reactors with an electric power from 500 to 2500 Mw. The minimum critical mass is achieved for very high values of the maximum thermal stress, which drops from 2590 to 2050 kw/l with an

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KUZ'MIN, A. M., et al, Fiz. yadern. reaktorov (Physics of Nuclear Reactors -- Collection of Works), No 2, Moscow, Atomizdat, 1970, pp 17-32 (from RZh-Fizika, No 4, Apr 71, Abstract No 4V526)

increase in power in this range, so that the value of the minimum critical mass increases by a factor of 4 with the rise in power. The minimum of the critical mass is achieved for a flattening coefficient of ~0.1. 2. The minimum of the doubling period of the breeder reactor system. It is shown that in this case the doubling period drops with a rise in reactor power and can be decreased by holding a constraint on the average heating of the coolant and also through creating a weakly stressed active section in the center of the reactor or a zone with raw material. 3. The minimum expenditure of plutonium to ensure a given rate of development of nuclear power. The results of calculations are given and discussed. Experience accumulated in the process of optimization studies with the aid of the ROKBAR program is discussed, and recommendations are made on the selection of a plan for the solution of optimization problems taking into account thermophysical and strength relationships. S. M. Zaritskiy.

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UDC 621.039

KHROMOV, V. V., KUZ'MIN, A. M., KASHUTIN, A. A., and SILAYEV, Yu. V.

"Computational Optimization Complex for Fast Atomic Reactors (ROKBAR)"

V sb. Fiz. yadern. reaktorov (Physics of Nuclear Reactors — Collection of Works), No 2, Moscow, Atomizdat, 1970, pp 3-16 (from RZhFizika, No 4, Apr 71, Abstract No 4V528)

Translation: A program for the M-20 computer is described that is intended for finding the optimal version of a fast power reactor considering the interrelationship of its thermal, strength, and neutron-physics parameters. The algorithm for gradient search is achieved through the use of formulas of the theory of small perturbations and linear programming (the method of consecutive shortening of discrepancies). Following are considered given in the optimization: reactor power, the form and properties of the fuel and structural materials, the coolant circuit and the coolant, the structural solution, the maximum temperature of the coolant at the output of the core, and the parameters of the external fuel cycle. The ROKBAR program makes it possible to optimize the doubling time of fast reactors, the critical mass, the coefficient of nonuniformity of the heat release field, the energy

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KHROMOV, V. V., et al, Fiz. yadern. reaktorov (Physics of Nuclear Reactors — Collection of Works), No 2, Moscow, Atomizdat, 1970, pp 3-16 (from RZh-Fizika, No 4, Apr 71, Abstract No 4V528)

intensity of the fuel in the cycle, etc., and also any combination of these quantities. Two-dimensional cylindrical reactors having no more than 2 zones with respect to height and several zones with respect to radius can be considered. To satisfy the optimality criterion, one can change the following controlling parameters: the height of the core, the thickness of the individual zones, the dimensions and step of the fuel elements, the velocity of the coolant, the enrichment of the fuel, and the volume of boron rods for compensation of reactivity. Constraints are imposed on the region of change of the controlling parameters and on several quantities which have a functional dependence on the reactor parameters. S. M. Zaritskiy.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR

UDC 662.62

YERMOLENKO, I. N., Corresponding Member of the Academy of Sciences Belorussian SSR, MALASHEVICH, ZH. V., BEZUKH, B. A., and KUZ'MIN, A. N., Institute of General and Inorganic Chemistry, Academy of Sciences Belorussian SSR, and Institute of Physics, Academy of Sciences Belorussian SSR

"Plasma Effect on Carbon and Metallocarbon Fibers"

Minsk, Doklady Akademii Nauk BSSR, Vol 17, No 5, May 73, pp 431-433

Abstract: The action of plasma from a non-electrode high-frequency induction discharge was studied for carbon fibers produced by pyrolysis of oxidized cellulose and its salts. Helium was used as the plasma material. The effect of metals added to the carbon fibers on the natyre of plasma radiation was also studied, and a detailed analysis of the spectra showed the time of plasma radiation before the metals were affected, which revealed the presence of non-nolatile compounds of metals in the carbon fibers. X-Ray diffraction studies of metallocarbon (Al, Ce, Cr) samples yielded pictures of completely amorphous substances, i.e., the high temperatures acting on metallocarbon fibers for a short time, (1-3 min) does not lead to the formation of crystalline Al, Ce, Cr or their compounds and does not graphitize the carbon residue. Samples 1/2

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YERMOLENKO, I. N., et al., Doklady Akademii Nauk BSSR, Vol 17, No 5, May 73, pp 431-433

subjected to a longer plasma treatment (10-15 min) had traces of erosion, which may have formed from the action of radiation and thermal fluxes. Thus, it is possible to use a plasma treatment mode which will not cause deep structural alterations in the volume of a carbon fiber and is an important consideration in the modification of carbon fiber surfaces. One figure, one table, 12 bibliographic references.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 011 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--DYNAMICS OF SYSTEMS OF CONTROL AT LOWER LIMIT OF RANGE OF CONTROLLING UNDER NONLINEAR DAMPING -U-

AUTHOR-(05)-DANILOV, YU.A., KAZMIRENKO, V.F., KUZMIN, A.N., PARFENOV, A.S., PETROV, YU.A.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEKHANIKA, 1970, NR 3, PP 162-173

DATE PUBLISHED--------70

SUBJECT AREAS--MATHEMATICAL SCIENCES, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--DYNAMIC SYSTEM, NONLINEAR AUTOMATIC CONTROL SYSTEM, HARMONIC FUNCTION, LINEAR APPROXIMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1474 STEP NO--UR/0103/70/000/003/0162/0173

CIRC ACCESSION NO--AP0106230

UNCLASSIFIED

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 011 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0106230

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERE ARE CONSIDERED CONTINUOUS CONTROL SYSTEMS WITH NONLINEARITIES EXISTING IN THE LOADING OF THE EXECUTIVE COMPONENT THE INFLUENCE OF WHICH IS ESSENTIAL AT THE LOW SPEEDS OF THE MOVEMENT. THE METHOD OF HARMONIC LINEARIZATION IS USED TO DETERMINE THE CONDITIONS OF THE ORIGIN OA AUTO OSCILLATIONS AS WELL AS THE POSSIBILITY OF USING THEM TO ACHIEVE THE EFFECT OF VIBRATIONAL LINEARIZATION. THE RESULTS OF THE INVESTIGATION HAVE BEEN EXPERIMENTALLY PROVED.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR UDC: 621.391.883.2

KUZ'MIN, B. I.

"Analysis of the Equivalent Threshold Sensitivity of the Output Devices of a Compensation Frequency Telegraphy Receiver"

Tr. Gor'kov. politekhn. in-ta (Works of Gor'kov Polytechnical Institute), 1971, 27, No 11, pp 64-68 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3A29)

Translation: A survey of the results of analysis of interference immunity of compensation frequency telegraphy done by a number of authors (including the author of this paper). One illustration, bibliography of six titles. N. S.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

1/2 022 UNCLASSIFIED PROCESSING DATE--09OCT70

TITLE--ROENTGENOLOGICAL STUDY OF VEINS OF THE LOWER EXTREMITIES AND PELVIS -U-

AUTHOR-(03)-KUZMIN, D.S., VEDENSKIY, A.N., LEVASHOV, YU.N.

COUNTRY OF INFO--USSR

SOURCE--VESTNIK KHIRURGII IMENI I. I. GREKOVA, 1970, VOL 104, NR 5, PP 52-57

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--RADIOLOGY, VEIN, EDEMA, DIAGNOSTIC METHODS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1990/1016 STEP NO--UR/0589/70/104/005/0052/0057

CIRC ACCESSION NO--AP0109167

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

2/2 022 UNCLASSIFIED PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0109167

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN THE PAPER THE EXPERIENCE WITH ROENTGENOLOGICAL STUDY OF VENOUS SYSTEM OF THE LOWER EXTREMITIES IN 710 PATIENTS AND PELVIC VEINS IN 86 PATIENTS IS SUMMARIZED. THE TECHNIC OF ASCENDING (DISTAL) VENOGRAPHY IN TWO PROJECTIONS, AS WELL AS FUNCTIONAL DYNAMIC, RETROGRADE (DESCENDING) AND PELVIC VENOGRAPHY ARE PRESENTED. EMPHASIS IS LAID ON INDICATIONS AND CONTRAINDICATIONS TO VARIOUS KINDS OF VENOGRAPHIC INVESTIGATION OF VEINS OF THE LOWER EXTREMITIES AND PELVIS IN PATIENTS WITH POSTTHROMBOPHLEBITIC SYNDROME VARICES AND EDEMA OF NON VENOUS ORIGIN. FACILITY: RENTGENOLOGICHESKOGO OTD. AND OTD. FLEBOLOGII KHIRURGICHESKOY KLINIKI LENINGRADSKOGO ORDENA TRUDOVOGO KRASNOGO ZNAMENI N-I INSTITUTA GEMATOLOGII I PERELIVANIYA KROVI.

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USSR UDC: 548.735.46

KUZ'MIN, E. A., BOCHKOVA, R. I., SAF'YANOV, Yu. N., GOLOVACHEV, V. P., and BELOV, N. V.

"Systematic Analysis of the Paterson Function on the Basis of Crystal Symmetry"

Moscow, Kristallografiya, vol 18, No 4, 1973, pp 681-688

Abstract: This paper, bearing the subtitle "Principles of Rhombus Degeneration in the Vector Systems of Lower Syngony Crystals," is the fifth installment of a series bearing the general title given above. The function of the present installment is to consider cases of the degeneration of rhombi for variants of a particular cut, in Fedorov groups of crystals having lower syngonies with three and a family of symmetry elements. The degeneration of rhombi in Fedorov groups with a single symmetry element was examined in an earlier paper (E. A. Kuz'min, et al, Sb. Patersonovskiye metody rasshifrovki struktur -- Collection of Works on Paterson Methods of Structure Interpretation -- "Shtiintsa," Kishinev, 1972). The results obtained in that article are here extended to groups with several such elements. The authors thank V. V. Ilyukhin for his participation in the discussion of the results.

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USSR UDC 548.735.46

KUZ'MIN, E. A., GOLOVACHEV, V. P., ILYUKHIN, V. V., BELOV, N. V., Gor'kiy State University, Crystallography Institute of the USSR Academy of Sciences

"Systematic Analysis of the Patterson Function Based on Crystal Symmetry. IV. Interpretation of the Patterson Syntheses of Low-Syngony Crystals"

Moscow, Kristallografiya, Vol 18, No 1, 1973, pp 54-62

Abstract: An algorithm is presented in analytical form for isolation of the rhombuses of the peaks, matching the basic and satellite rhombuses, and also recording the base segment in the basic system for low-syngony crystals. The algorithm makes it possible to check for the presence of all peaks joined into rhombuses and generated by 2k atoms in the Patterson function. The final step is isolation of the singularity which completely defines the origin in the given specific Fedorov group with respect to the initial segment. A necessary condition is the presence of all peaks of the rhombuses. If at least one of the vectors (peaks) is absent, the final point simply is not isolated. In the centered lattices several points are isolated, but they are related by the corresponding translations. If only the Roentgen group is known, the analysis is

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KUZ'MIN, E. A., et al., Kristallografiya, Vol 18, No 1, 1973, pp 54-62

carried out within the framework of the Fedorov groups entering into it, and during the analysis process the true one is established. Inasmuch as after isolating the rhombuses the position of the initial (base segment) is obtained, the coordinates of the 2k atoms are established. Their position must be used to isolate the entire structure by the M_{2k} rank minimization function.

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USSR UDC: 548.735.46

KUZ'MIN, E. A., GOLOVACHEV, V. P., and BELOV, N. V.

"System Analysis of the Patterson Function on the Basis of Crystal Symmetry"

Moscow, Kristallografiya, vol 17, No 3, 1972, pp 477-483

Abstract: This paper, subtitled "Using Peak Rhombs for Determining Structural Fragments," is the second part of a work the initial section of which was published in the same journal noted above (3, 3, 1958, p 269). The subject of the series is the analysis of the Patterson function based on fundamental and vector systems of segments, through which a fragment of the structure of 2k atoms, where k is the coordinate of the atoms, is obtained. The use of peak rhombs, as described in this paper, is a more graphic way of representing bond peaks. It is noted that the conclusions of this paper are applicable to arbitrary symmetries, although the detailed analysis it presents is for Fedorov groups of lower syngony. The paper describes the method for localizing the peak rhombs, through which the coordinates of pairs of nonequivalent atoms with ordinary n-significance can be determined, and discusses fundamental and satellite peak rhombs. The authors are associated with the Gorkiy Physicotechnical Research Institute.

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USSR UDC 548.735.46

KUZ'MIN, E. A., GOLOVACHEV, V. P., and BELOV, N. V., Gor'kiy Physicotechnical Research Institute

"Systematic Analysis of Patterson Function on the Basis of Crystal Symmetry. I. Vector Systems of Sections"

Moscow, Kristallografiya, Vol 16, No 5, Sep-Oct 71, pp 875-881

Abstract: An earlier article by the authors extended the peak triple theorem to cover twofold symmetry elements. The representations of this article are generalized in the present article for the case of arbitrary symmetry. A systematic analysis procedure which makes the fullest use of Patterson function properties for symmetric crystals is the simultaneous consideration of the peaks of two connectives and the peaks of their interaction, as a result of which it is possible to combine Patterson peaks into pairs of rhombuses for each symmetry operation. Each symmetry element of the space group is characterized by "its own" rhombus of peaks, which occupies a characteristic position in the vector system. The centers of the rhombuses retain the plane and

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KUZ'MIN, E. A., et al., Kristallografiya, Vol 16, No 5, Sep-Oct 71, pp 875-881

linear concentrations inherent in the given Fedorov group. This makes it possible to use the rhombuses of peaks for a clearer determination of the space group of a crystal from its Patterson function.

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KHARITONOV, Yu. A.; KUZ'MIN, E. A.; BELOV, N. V. (Institute of Crystallography, USSR Academy of Sciences; Gor'kiy Physics-Engineering Research Institute)

"Determination of the Crystalline Structure of Sodium Bichromate $Na_2Cr_2O_7 \cdot 2H_2O$"

Moscow, Kristallografiya; September-October, 1970; pp 942-8

ABSTRACT: The authors determined the monoclinic cell and the space group of aqueous sodium bichromate: a = 6.21; b = 10.90; c = 12.94 Å; β = 95°.

Heavy atoms of chromium were found from an analysis of the three-dimensional Patterson function. Light atoms of sodium and oxygen were localized in a series of three-dimensional syntheses of the electron density. The structure is characterized by 77 independent position parameters. A crystallochemical description of the structure consisting of chains of sodium octahedrons connected in the framework by diortho groups of Cr_2O_7 is given.

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UDC 548.736

KUZ'MIN, E. A., ILYUKHIN, V. V., and BELOV, N. V., Academician, Gor'kiy State University imeni N. I. Lobachevskiy, Institute of Crystallography of the Academy of Sciences USSR, Moscow

"Certain Regularities in the Position of Maxima in Separation Functions in the Presence of Multiple Peaks in the Vector System (General Case, Fedorov P1 Group)"

Moscow, Doklady Akademii Nauk SSSR, Vol 196, No 5, 11 Feb 71, pp 1080-1083

Abstract: It is shown that the classical Wrinch-Buerger method of identifying point vector systems and finding the base system should be considered as only the first part of a general algorithm for identifying vector systems. The algorithm developed by Wrinch and Buerger assumed the absence of overlapping and multiple peaks in the vector system. This is written analytically in the form

$$(r_n - r_m) - (r_q - r_p) \neq 0,$$
$$r_{mn} \neq r_{pq}.$$

The inequalities (1) and (1') are a particular case of the more general condition

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KUZ'MIN, E. A., et al., Doklady Akademii Nauk SSSR, Vol 196, No 5, 11 Feb 71, pp 1080-1083

$$(r_j - r_i) - \{(r_n - r_m) - (r_q - r_p)\} \neq 0, \quad (1)$$

$$r_{ij} \neq r_{mn} - r_{pqn} \quad (2')$$

This condition is necessary and sufficient for separation of the base system from the vector system according to the algorithm. Success in identification of the vector system is then guaranteed and no extraneous points arise in the separation functions if vectors satisfying conditions (1) and (2) are selected as shift vectors. The condition of only one common point (at the ends) of two segments $i_1 = i_2 = i$ leads to a triangle, the separation of which is written in the form of a system of two equations

$$r_{ij_1} = r_{mn} - r_{pqr}$$

$$r_{ij_2} = r_{mn} - r_{pqr}.$$

This system gives a condition for the separation of points mn upon shifts by the vectors r_{ij_1} and r_{ij_2}. This system of equations is generalized for the case of polygons of any rank.

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1/2 024 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--CRYSTAL STRUCTURE OF SYNTHETIC SODIUM YTTRIUM ORTHOGERMANATE NAY(GEO SUB4) -U-

AUTHOR-(04)-KUZMIN, E.A., MAKSIMOV, B.A., ILYUKHIN, V.V., BELOV, N.V.

COUNTRY OF INFO--USSR

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UNCLASSIFIED

CIRC ACCESSION NO--AP0104229 PROCESSING DATE--18SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STRUCTURE OF NAYGEO SUB4, ISOMORPHOUS WITH NAYSIO SUB4, WAS DETD. BY SINGLE CRYSTAL X RAY METHODS. THE ORTHORHOMBIC LATTICE PARAMETERS ARE A 5.32, B 11.49, AND C 6.49 ANGSTROM; THE SPACE GROUP IS PBN2 SUB1; AND Z EQUALS 4. THE Y ATOM IS SURROUNDED BY 6 O ATOMS AT THE CORNERS OF AN OCTAHEDRON; Y-O DISTANCES ARE 2.25-2.44 ANGSTROM. THE NA COORDINATION POLYHEDRON CONTAINS 6 O ATOMS AT DISTANCES OF 2.24-2.65 ANGSTROM. GE IS TETRAHEDRALLY COORDINATED (GE-O EQUALS 1.66-1.81 ANGSTROM). MARY FRANCES RICHARDSON

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USSR UDC 549.76

GOLOBACHEV, V. P., KUZ'MIN, E. A., KHARITONOV, Yu. A., and BELOV, N. V., Academician, Gor'kiy Research Physicotechnical Institute at Gor'kiy State University imeni N. I. Lobachevskiy, Institute of Crystallography of the Academy of Sciences USSR, Moscow

"Crystalline Structure of Potassium Tetrachromate $K_2Cr_4O_{13}$"

Moscow, Doklady Akademii Nauk SSSR, Vol. 192, No. 6, 21 Jun 70, pp 1272-1274

Abstract: $K_2Cr_4O_{13}$ crystals were grown from an aqueous solution, and two samples 0.1 × 0.2 × 0.2 mm^3 and 0.2 × 0.2 × 0.4 mm^3 covered with a protective celluloid film gave a good diffraction pattern. The parameters of an elementary cell were: a = 8.71, b = 7.75, and c = 9.37 Å; β = 93°. The coordinates of the basal atoms, 55 independent position parameters, are given in a table. The temperature correction for all atoms was 1.3 $Å^{-2}$.

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GOLOBACHEV, V. P., et al, Doklady Akademii Nauk SSSR, Vol 192, No 6, 21 Jun 70, pp 1272-1274

$K_2Cr_4O_{13}$. Coordinates of Basal Atoms

Atom	x/a	y/b	z/c	Atom	x/a	y/b	z/c
Cr_1	0,441	0,439	0,335	O_5	0,959	0,562	0,332
Cr_2	0,434	0,105	0,102	O_6	0,263	0,568	0,333
Cr_3	0,759	0,930	0,829	O_7	0,070	0,244	0,208
Cr_4	0,095	0,429	0,383	O_8	0,119	0,633	0,050
K_1	0,796	0,405	0,104	O_9	0,647	0,349	0,106
K_2	0,079	0,892	0,246	O_{10}	0,448	0,311	0,406
O_1	0,906	0,064	0,802	O_{11}	0,425	0,070	0,238
O_2	0,588	0,069	0,001	O_{12}	0,750	0,128	0,309
O_3	0,282	0,103	0,907	O_{13}	0,767	0,779	0,093
O_4	0,578	0,563	0,345				

Six bridge distances were identified among the Cr-O distances:

$$Cr_1 - O_6 = 1{,}91, \quad Cr_1 - O_9 = 1{,}83, \quad Cr_1 - O_5 = 1{,}75,$$

$$Cr_2 - O_9 = 1{,}96, \quad Cr_2 - O_2 = 1{,}70, \quad Cr_3 - O_2 = 1{,}84 \text{ A}.$$

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UDC 548.734

KUZ'MIN, E. A., GOLOVACHEV, V. P., Academician BELOV, N. V.
(Gorkiy Physico Technical Institute, Gorkiy State University imeni N. I. Lobachevskiy; Institute of Crystallography, Academy Sciences USSR, Moscow)

"Details of Patterson's Syntheses Directly Related to Elements of Structural Crystal Symmetry"

Moscow, Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR), Vol 192, No 1, pp 86-89

Abstract: Patterson crystallographic function peaks are of two kinds: bond peaks that determine the distance between symmetrically equivalent atoms and interaction peaks that determine the vector between differently bound atoms. A triple-peak theorem permits analysis of many structures, especially the structural elements of the second order.

A geometric procedure is developed to show the elementary system of triple peaks as a set of n segments, where n is the number of the symmetry group. The first segment connects two differently-bonded

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KUZ'MIN, E. A., et al, Doklady Akademii Nauk SSSR, Vol 192, No 1, pp 86-89

atoms, and succeeding segments extend to all of the symmetry elements of this group. The vector system becomes a set of representations of all points of the system of the initial segment. Such a vector system is shown graphically for the space groups P1, P2, Pm, and others. The resulting figures are rhombuses.

The representation of Patterson peaks in vector form was found extremely useful in analyzing the structure of sodium bichromate.

The authors thank S. V. Borisov and V. V. Ilyukhin for valuable discussions concerning certain assumptions and the results obtained.
Orig. art. has 2 figs. and 5 refs.

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USSR

UDC 548.736

GOLOVACHEV, V. P., DROZDOV, Yu. N., KUZ'MIN, E. A., and BELOV, N. V., Academician, Gor'kiy Physicotechnical Institute at Gor'kiy State University imeni N. I. Lobachevskiy

"Crystalline Structure of Fenaksite $FeNaK[Si_4O_{10}]$ ($KNaFe[Si_4O_{10}]$)"

Moscow, Doklady Akademii Nauk SSSR, Vol. 194, No. 4, 1 Oct 70, pp 818-820

Abstract: A structural study was made of the Khibinskiy mineral fenaksite- K, Na, Fe-silicate- discovered in 1959 by M. D. Dorfman. The initial model of fenaksite structure was obtained from an analysis of the three-dimensional Patterson function. Seven peaks of the Patterson function were used and it was possible to distinguish a basic system containing 11 peaks, but they could not be identified on the basis of the Patterson function. The final values for all 51 position parameters are given in the Table:

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GOLOVACHEV, V. P., et al, Doklady Akademii Nauk SSSR, Vol 194, No 4, 1 Oct 70, pp 818-820

Atoms	x/a	y/b	z/c	Atoms	x/a	y/b	z/c
K	0,140	0,809	0,010	O_3	0,632	0,424	0,357
Na	0,525	0,270	0,410	O_4	0,434	0,336	0,250
Fe	0,049	0,289	0,407	O_5	0,798	0,336	0,270
Si_1	0,669	0,913	0,213	O_6	0,790	0,510	0,180
Si_2	0,230	0,634	0,270	O_7	0,033	0,659	0,105
Si_3	0,380	0,304	0,131	O_8	0,175	0,083	0,315
Si_4	0,803	0,632	0,273	O_9	0,760	0,055	0,436
O_1	0,630	0,856	0,041	O_{10}	0,251	0,002	0,237
O_2	0,294	0,457	0,133				

Figures are given showing the crystalline structure of ferrosilite in polyhedra; the basic architectural component of the structure was a tubular silicon-oxygen radical $[Si_8O_{20}]_\infty$ of a new type. Similar tubular radicals were observed in narsarsukite in 1960 and in kanasite in 1969.

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KUZ'MIN, E. A.; ILYUKHIN, V. V., and Academician BELOV, N. V. (Gor'kiy State University imeni N. I. Lobachevskiy and the Institute of Crystallography, Academy of Sciences USSR, Moscow)

"Separation of the Basic System from the Vector System, Using the Double Peak (General Case: The Fedorov P1 Group)"

Moscow, Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR), Vol 193, No 3, 1970, pp 579-582

Abstract: A graphic method is demonstrated for deriving a basic system (BS) of crystallographic points from a vector system (VS), in which the number of initial vector peaks $N_1 = 2$: i.e., when two pairs of N points of the BS having coordinates $x_1, y_1, z_1, \ldots, x_4, y_4, z_4$ satisfy the conditions $r_{12} = r_{34}$ (and consequently $r_{13} = r_{24}$).

A two-vector system is superimposed on a basic system of 6 points, and parallelograms are drawn that uniquely locate additional points. By translating the figures along the vector lines, additional points as well as the centers of symmetry are determined. Other vectors, based on geometric principles, are

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KUZ'MIN, E. A., et al, Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR), Vol 193, No 3, 1970, pp 579-582

drawn. The algorithm for performing the graphic construction is given, and the corresponding matrixes are presented.

Orig. art. has 4 figs. and 5 refs.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR UDC: 621.396.677.012.12

KUZ'MIN, E. I.

"On an Effective Shape of Polar Diagrams for Antennas With Oblique Re-Entry Probing of the Ionosphere"

Tr. ucheb. in-tov svyazi. M-vo svyazi SSSR (Works of Academic Institutes of Communications. Ministry of Communications of the USSR), 1971 vyp. 54, pp 186-188 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3B7)

Translation: A relation is found for the input power of a reception device as a function of the width of the polar diagrams of the antennas in the horizontal plane. It is noted that an energy gain is possible with simultaneously narrowing of the polar diagrams of the receiving and transmitting antennas in the horizontal plane. Bibliography of two titles. V. S.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR UDC 621.371.1:550.388.2

KOLTSOV, V. V., KUZMIN, E. L.

"Qualitative Interpretation of the Data from Reflected-Oblique Probing of the Ionosphere"

Materialy nauchnotekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi. vyp. 3 (Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute, vyp. 3), Leningrad, 1970, pp 261-265 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A283)

Translation: This article contains an investigation of experimental results with respect to reflected-oblique probing of the ionosphere with short pulses. Approximate estimates of the critical frequencies and active altitudes corresponding to the leading edge of each maximum scattered signal are presented.

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KUZ'MIN, G., and IONESYAN, A.

"Two Seminars on the Sanitation of Livestock Farms Affected With Tuberculosis and Brucellosis"

Moscow, Veterinariya, No 10, 1971, pp 122-124

Abstract: The RSFSR Ministry of Agriculture sponsored two seminars for scientists and practical workers in July, 1971 in the cities of Barnaul and Ul'yanovsk. The principal speaker was L. L. Verteletskiy of the RSFSR Ministry of Agriculture, who analyzed the epizootic situation in various parts fo the RSFSR and summarized the accomplishments of veterinary organizations and specialists during the past 10 years in organizing and carrying out measures to control tuberculosis and brucellosis. He also discussed the requirements for sound organization of efforts to protect farms against infectious diseases, brucellosis and tuberculosis in particular, and the common shortcomings in this respect. Professors Y. S. Orlov and V. YE. Shurevskiy of the All-Union Institute of Experimental Veterinary Medicine lectured on the principal methods of eradicating brucellosis and tuberculosis.

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USSR UDC 669.71.042.6

YEROFEYEV, A. T., KUZ'MIN, G. G., ZOLOTUKHIN, V. A.

"Casting of Large Aluminum Ingots Weighing Up to 2 t by Continuous Casting Methods"

Tekhnol. Legkikh Splavov. Nauchno-tekhn. Byul. VILSa [The Technology of Light Alloys, Scientific and Technical Bulletin of the All-Union Institute of Light Alloys], 1970, No. 6, pp. 93-94. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G140 by G. Svodtseva).

Translation: The technology developed for production of Al ingots weighing up to 2 t allows labor consumption to be reduced to 10.72 rubles per ton (as against 12.92 rubles per ton for 15-kg ingots). The losses to oxidation during melting are decreased by 10-15%, since the total surface area subjected to drop formation and oxidation is 5.8 times less than for the 15-kg ingots. A technological plan for production of large ingots is described.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002201710008-0

USSR UDC 621.165-233.001.5

SEREZHKINA, L. P., KUZ'MIN, G. I.

"Load on Turbine Thrust Bearings During Transient Modes

"Kotel'n. i turbin. ustanovki energ. blokov" (Boiler and Turbine Installations of Power Units) Moscow "Energiya", 1971, pp 201-205 (from Referativnyy Zhurnal-Turbostroyeniye, No 10, Oct 71, Abstract 10.49.51)

Abstract: Results are presented of an experimental study on transient processes of axial forces carried out jointly at the All Union Institute of Heat Engineering (VTI) and the Khar'kov Turbogenerator Plant im. S.M. Kirov (KhTGZ). A load drop from a nominal down to 30% value, produces a short time load on thrust bearing of a K-300-2400 KhTGZ turbine, equal to 46 ton/sec, and 42 ton/sec for a K-200-130 turbine. The indicated load values being high, so it is necessary to check the load carying capacity of power unit bearings in considering the problem of utilizing these turbines for sustaining synchronous stability of power systems. 5 figures.

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USSR UDC: 621.396.69:621.319.4

DUKMASOV, V. B., YEKIMOV, V. V., KUZ'MIN, G. M., PUCOVKIN, P. H.

"An Electromagnetic Powder Clutch as a Braking Element in Capacitor Winding Lathes"

Elektron. tekhnika. Nauchno-tekhn. sb. tekhnol. i organiz. proiz-va (Electronic Technology. Scientific and Technical Collection. Technology and Organization of Production), 1970, vyp. 4 (36), pp 54-60 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V364)

Translation: The authors discuss solution of the problem of maintaining constant tension on ribbons when winding sections of radio capacitors by using an electromechanical braking element -- a powder electromagnetic clutch of original design. A basis is given for selection of this type of braking element. A description is given of the design and materials on testing an experimental model of the clutch. Recommendations are given on its use. Resumé.

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Reliability Theory

USSR UDC: 621.396.6.002:658.5

POMUKHIN, N. P., SKUDARNOV, M. Ye., KUZ'MIN, G. M., CHERNYAVSKIY, Ya. M., POKROVSKIY, V. P.

"A Data Collection and Processing System for Operational Control of Radio Component Production Lines"

Elektron. tekhnika. Nauchno-tekhn. sb. Tekhnol. i organiz. proizvo (Electronic Technology. Scientific and Technical Collection. Technology and Organization of Production), 1970, vyp. 4 (36), pp 94-101 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V331)

Translation: The system makes it possible to monitor the operation of equipment, to take account of the number of good and rejected articles, to check their quality, to check on the course of technological processes, to give a light-panel display on the course of plan fulfilment, and to collect statistical data on operation of the line with electric typewriter printout. Resumé.

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UDC: 621.375.826

USSR

KARLOVA, Ye. K., KARLOV, N. V., KUZ'MIN, G. P.

"Self-Modulation of the Emission of a High-Power CO_2 Pulse Laser With Switching of Nonlinear Absorption"

Kratkiye soobshch. po fiz. (Brief Reports on Physics), 1972, No 6, pp 18-22 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12B147 by A. K.)

Translation: When power of the order of 1 MW was reached in the cavity of a CO_2 laser, the effect of self-modulation of stimulated emission was observed. By using NaCl or KRS-5 crystals which are fairly transparent in the infrared region with transverse excitation of the cavity, pulses of 10 μs duration were converted to a series of short regular spikes. The resultant effect is attributed to thermal self-focusing in the crystals. The presence of a train of pulses separated by 10-20 μs is determined by thermal relaxation of the medium. To achieve the spike mode of emission, the relaxation time of the absorber must be longer than the time constant of the active medium of the laser.

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UDC: 621.643.001.5

KUZ'MIN, G. P., Institute of Geocryology, Yakutsk

"Influence of Cracks in Frozen Soil on Deformation of Underground Pipes"

Moscow, Stroitel'stevo Truboprovodov, No 9, Sep 70, pp 16-18

Abstract: Experimental studies have been made of the influence of deformation of the Taas-Tumus-Yakutsk gas pipeline as a result of cracks appearing in the permafrost. The tests showed that when there is a free vertical plane in the form of a slit, even if the changes in temperature stresses in the surface layer of the frozen soil are low both in rate and magnitude, significant deformation of the underground pipeline arises. Under certain conditions the additional stresses in the walls of the pipeline arising as a result of cracks in frozen soil can cause damage to the pipe.

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Corrosion

UDC 621.791.052:620.193

USSR

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"Influence of Alloying Elements on Corrosion Resistance of Monel Alloy Welded Joints"

Moscow, Svarochnoye Proizvodstvo, No 8, 1972, pp 35-37

Abstract: Results are presented from a study of the influence of alloying of moneltype metals with aluminum, titanium, and manganese on the structure and corrosion resistance of welded joints in gaseous hydrogen fluoride. The corrosion resistance of these welded joints depends to a significant extent on the type and quantity of alloying elements introduced to the seam metal. Alloying with aluminum (up to 0.45%) causes some increase in corrosion rate, while greater aluminum contents results in a decrease. As titanium is introduced, the corrosion rate increases continually. A significant decrease in the corrosion rate is observed as the content of magnesium in the seams is increased.

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USSR

UDC 621.791.048

KUZ'MIN, G. S., and DOBRYNIN, V. P., Perm' Polytechnic Institute, and ISACHENKO, V. A., Motor Construction Plant imeni Ya. M. Sverdlov

"Ceramic Flux for Automatic Welding of Nickel with Steel"

Kiev, Avtomaticheskaya Svarka, No 1, Jan 72, pp 59-61

Abstract: High-quality welded joints of nickel with low-carbon MSt.3 steel and Kh18N10T stainless steel can be produced by using a newly developed ceramic flux in connection with the Sv-04Kh19N9 wire. The slag system of this flux provides for good formation of the seam, stable arc burning, and separability of the slag skin. In connection with various fused fluxes, the Sv-04Kh19N9 wire makes it possible to alloy seams with up to 7-12% Cr. Also given are the chemical composition of the seams in welding of nickel with low-carbon MSt.3 steel with the flux and Sv-04Kh19N9 wire and the optimum relations of the components in the charge of the flux. Microstructures of welded seams demonstrate their high quality. Three illustrations, three tables, two bibliographic references.

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USSR

UDC: 621.791:549.21:669.24

LAZARSON, E. V. (Engineer), KUZ'MIN, G. S. (Candidate of Technical Sciences) and PINEGIN, YE. G. (Engineer), Perm' Polytechnic Institute

"Carbon Behavior in Welding Nickel and Nickel-Carbon Alloys"

Moscow, Svarochnoye proizvodstvo, No 1, Jan 72, pp 10-12

Abstract: This study concerns the interaction of carbon of the parent metal with the oxygen of the gas phase in welding nickel and nickel-carbon alloys containing 0.3 to 0.84% C. Included in the study was also the relation of the carbon content in the metal with the latter's tendency to porosity. The specimen plates were welded by the nonconsumable electrode method without alloying additions. The protective atmosphere was a mixture of argon with oxygen. The latter was added to study the burn-out of carbon. In inert-gas shielded welding an increase in carbon concentration in the base metal raises the coefficient of carbon transfer to the weld metal along an exponential curve. In oxygen-shielded welding the minimum coefficient of carbon transfer is observed at a specific ratio of carbon concentration in the base metal to the oxygen content in the gas phase. With an increase of

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KUZ'MIN, G. S., and BAZHIN, S. N., Svarochnoye proizvodstvo, No 2, Feb 72, pp 32-33

requires steps to ensure its combination with the welds for high-temperature service. Addition of certain amounts of Ti together with C to nickel welds resulted in a marked increase of the plastic properties of the welds. (4 illustrations, 7 bibliographic references)

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Heat Treatment

USSR

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USSR

LAZARSON, E. V. (Engineer), et al, Svarochnoye proizvodstvo, No 1, Jan 72, pp 10-12

the carbon content in the metal, the process of decarburization takes on a surface nature. Oxygen transport through the gas phase layer adjoining the weld pool surface becomes the limiting component of interaction. An increase of carbon concentration in the weld pool at first raises the porosity and then leads to its reduction. It is suggested that high-carbon metals be used for obtaining nonporous welds. (7 illustrations, 1 table, 7 bibliographic references).

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