USSR

UDC 681.325.36

GOLOVCHENKO, A. I., and SHIRENKO, A. P.

"Device for Data Transmission in Digital Computers"

USSR Authors' Certificate No 363093, Cl. G 06f 13/00, filed 5 Apr 71, published 20 Dec 72 (from Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 3, 1973, p 99)

Abstract: The device is for data transmission in residue-system digital computers and contains a local control unit and supplemental data storage unit. A block of reading amplifiers, a number register, receiving register, and logic circuits are series-connected to the outputs in each of the data transmission channels. The unique feature of the device is that, to increase the carrying capacity, the first inputs of two coincidence circuits are connected to some of the outputs of the receiving registers in each of the data transmission channels; the outputs of the coincidence circuits are connected respectively to the output transmission lines for basic and supplemental information, while the second inputs are connected directly through the NOT circuit to the corresponding output of the local control unit, whose outputs are connected to the outputs of the high-order digits of the number registers.

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USSR

UDC 669.046.5

SHIRER, G. B., KOMEL'KOV, V. K., VOINOV, S. G., SHALIMOV, A. G., PECOV, V. G., MOLCHANOVA, A. A., TSIBUL'NIKOV, A. I., and MOKHIR, Ye. D.

"Refining of Ball Bearing Electrical and Martin Steels by Synthetic Lime-Alumina Slag with High Silica Content"

Moscow, V sb. "Sovremennyye problemy kachestva stali" (MISiS). (Collection of Works. Modern Problems of Steel Quality) (Moscow Institute of Steel and Alloys), Izd-vo "Metallurgiya," No 61, 1970, pp 247-249

Translation of Abstract: Results are presented of the refining of ShKh15 steel melted in 100-ton electric furnaces using synthetic slag with high silica content in a ladle. With respect to sulfur content and the level of contamination by sulfide impurities, the obtained steel is similar to metal refined with conventional synthetic slag containing not more than 3% of silica, although the former is more contaminated with oxide and globular impurities. Data are presented on production testing of the described slag at a Martin plant, at which the quality of the 12KhIMF and 20 K steels for pipes was found to be similar to a steel refined with the usual synthetic slag. The production cost of the slag with high silica content is given (It is approximately 30 rubles/ton cheaper than the ordinary slag). 3 tables.

1/1

USSR

UDC:669.046.558.7

PEGOV, V. G., ANISIMOV, M. Ye., SHIRER, G. B., ABRAMOVA, A. A., KOMEL'KOV, V. K., MOLCHANOVA, A. A., VOINOV, S. G., SHALIMOV, A. G., and PRONICHKIN, A.A.

"Influence of Deoxidation of Metal With Silicocalcium and Addition of Soda to Synthetic Slag on Contamination of Type ShKh15 Steel With Nonmetallic Inclusions"

Proizvodstvo Chernykh Metallov [Production of Ferrous Metals--Collection of Works], No 75, Metallurgiya Press, 1970, pp 215-226

Translation: When type ShKh15 steel is made in 100-T electric furnaces with treatment by synthetic slag in the ladle, the addition of 2.5-3.0% calcinated soda allows the content of oxygen in the steel to be reduced by 25% and the contamination with sulfides, oxide, and globular inclusions to be significantly reduced. Deoxidation of ShKh15 steel with silicocalcium 2.0-2.5 kg/T with simultaneous processing with synthetic slag decreases the content of sulfides and oxides, but causes an increase in the content of globular inclusions in the steel. 3 tables; 5 biblio. refs.

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USSR

UDC 518.5:681.3.06

ARONOV, V. I., BELYAYKOV, N. Ye., GORDIN, V. M., LANDA, T. I., SHIRGINOVA, A. I.

"System for Automatic Processing of Anomalies in Three Dimensional Potential Fields Fixed in a Plane or Nonhorizontal Surface"

Tr. Vses. n.-i Geologorazved. Neft. in-t [Works of All-Union Scientific Research Institute for Geological Prospecting and Petroleum], No 103, 1971, pp 161-180, (Translated from Referativnyy Zhurnal, Kibernetika, No 10, 1971, Abstract No 10 V819 by the author's).

Translation: A description is presented of the algorithm and system of programs entitled "Reduction -- perpendicular" for the BESM-4 computer, designed to solve a broad range of problems in prospecting gravimetry and magnetometry: interpolation of observations from an arbitrary network of points to units in a right network, reduction of anomalies on external planes, filtration of random errors and calculation of various transformants of three dimensional potential fields. The technological characteristics of a system of programs and results of experimental calculations of three dimensional theoretical models are presented.

USSR

UDC 616.988.6

ZHILEVICH, A. V. and L. N. SHIRINKINA, Institute of Microbiology imeni Avgust Kirkhenshteyn, Academy of Sciences, Latvian SSR

"Mutagenic Effect of Moloney Sarcoma Virus on Wistar Rat Cells"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, No 7, 1971, pp 62-66

Abstract: Exposure of a culture of rat (Wistar) embryo fibroblasts to Moloney sarcoma virus produced a substantial number of cells with chromosome aberrations, including chromatid and isochromatid breaks. The injuries were random since different chromosomes were affected. In vivo study of tumors induced by Moloney sarcoma virus in young Wistar rats revealed a substantial number of numerical rather than structural aberrations in the chromosomes. In a third series of experiments, spleen cells from tumor-carrying rats were found to have a higher number of aneuploid cells than the control, although the tumor cells were diploid.

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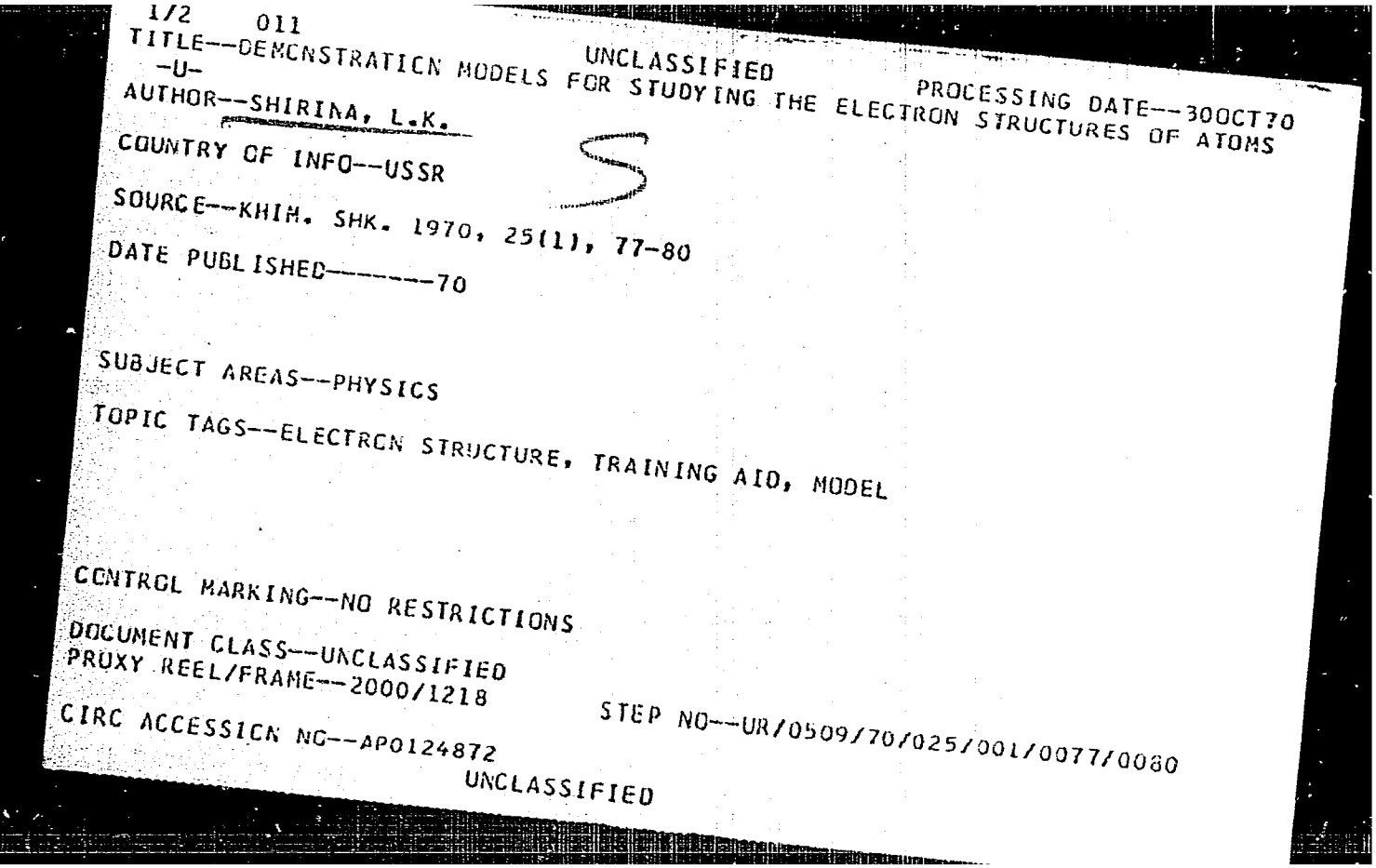

1/2 011 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--DEMONSTRATION MODELS FOR STUDYING THE ELECTRON STRUCTURES OF ATOMS
-U-
AUTHOR--SHIRINA, L.K.

COUNTRY OF INFO--USSR

SOURCE--KHIM. SHK. 1970, 25(1), 77-80

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRON STRUCTURE, TRAINING AID, MODEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1218 STEP NO--UR/0509/70/025/001/0077/0080
CIRC ACCESSION NO--AP0124872
UNCLASSIFIED

2/2 011 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124872

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DESCRIPTION OF SIMPLE ROTATING MODELS OF THE ATOM IS GIVEN. THE CONSTRUCTION OF THE MODELS MADE POSSIBLE THE CONTEMPORARY DEMONSTRATION OF THE FORM OF S AND P ORBITALS OR 1S, 2S, AND 3S ORBITALS OF ELECTRONS OF DIFFERENT ATOMS.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--DYNAMICS OF GAS EVOLUTION AND OF GAS CONTAMINATION WITH DUST IN 100 TON OXYGEN CONVERTERS -U-

AUTHOR-(05)-KRICHEYTSOV, E.A., SHIRINKIN, N.A., REKHTER, V.YA., KUKURUZNYAK, I.S., KITTAYEV, A.T.

COUNTRY OF INFO--USSR

SOURCE--STAL' 1970, 30(2), 113-18

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--METAL OXYGEN CONVERSION, EXHAUST GAS DYNAMICS, STEEL MANUFACTURE PROCESS, METALLURGIC FURNACE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/0203 STEP NO--UR/0133/70/030/002/0113/0118

CIRC ACCESSION NO--AP0115907

UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0115907

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SERIES OF 100 TON CONVERTER HEATS SHOWED A MARKED NONUNIFORMITY OF GAS AND DUST EVOLUTION RATES. THE REASONS FOR THIS ARE DISCUSSED. THE RATE OF OPERATIONS IS DEFINED BY THE CAPACITY OF THE GAS REMOVING INSTALLATION, WHICH MUST BE DESIGNED FOR THE MAX. GAS EVOLUTION.

FACILITY: KRIVOROZH. MET. ZAVOD, KRIVOI ROG, USSR.

UNCLASSIFIED

USSR

UDC 539.3

SHIRINKULOV, T., and NIYAZOV, S.

"Concerning the Calculation of Physically Nonlinear Round Plates, Lying on a Continuous Homogeneous Base and on a Continuous Inhomogeneous Base"

Tashkent, Prochnost' i Seysmostoykost' Sooruzh. -- Sbornik (The Strength and Earthquakeproof Nature of Structures -- Collection of Works), Jan,1971, pp 140-146 (from Referativnyy Zhurnal, Mekhanika, No 2, Feb 72, Abstract No 2V189 by V. I. Shalashilin)

Translation: The article deals with the axisymmetrical deflections of a round plate with account taken of physical nonlinearity; the plate lies on a homogeneous and on an inhomogeneous elastic base of the Winkler type, with exponential change of the modulus of elasticity with respect to the depth of the base. The equation for the settlings of the base is represented in the form of an integral equation. Simultaneous solution of the equations of the deflection of the plate and the settlings of the base is sought in the form of exponential series; recurrent relationships are obtained to determine the coefficients of these series. Results of numerical calculations are presented for a homogeneous base and for an inhomogeneous base.

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USSR

UDC 624.131.43+539.21.084-492.3

SHIRINKULOV, T., and VEDERNIKOV, A. A.

"The Calculation of Frame Structures Lying on an Inhomogeneous Soil Base"

Tashkent, Prochnost; i Seysmostoykost' Sooruzh. -- Sbornik (The Strength and Earthquakeproof Nature of Structures -- Collection of Works), Jan 71, pp 128-139 (from Referativnyy Zhurnal, Mekhanika, No 2, Feb 72, Abstract No 2V547 by G. M. Shefter)

Translation: A procedure is proposed for the static calculation of a frame structure, which lies on an isotropic inhomogeneous elastic semispace, the elasticity modulus of which is an exponential function of the depth with an exponent smaller than unity. The method for calculating a rectangular frame, which is being acted upon by known loads of distributed forces, consists in separating it into several elements; a top crossbar and a bottom one, and two side columns. The unknown bending moments at the angle points are determined from the condition of equality of the deflection angles of the elements forming the angle under consideration. The deflection angles themselves are found by the authors by means of the method of initial parameters. For determining the bending moments in the bottom crossbars, an ordinary differential Euler-Bernoulii equation of a beam is integrated; the beam is in rigid contact with

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USSR

SHIRINKULOV, T., and VEDERNIKOV, A. A., The Strength and Earthquakeproof Nature of Structures -- Collection of Works, Jan 71, pp 128-139

an elastic inhomogeneous semispace, the vertical movement of points in it being given by an infinite series with respect to even Gegenbauer polynomials. For an approximate solution of the problem, only the first three terms of the series are retained.

Results of numerical calculations of the bending moments in a structure having the most characteristic cross sections, for a distributed load and for a concentrated force acting in the center of the bottom crossbar, are presented in the form of a table. Analysis of the numerical information shows that in the calculation of frames, account must be taken of the influence of inhomogeneity of the soil properties, since in the opposite case the calculated values of the bending moments may turn out to be too low, and this decreases the carrying capacity of the structures. Six references.

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USSR

SHIRINKULOV, T.

UDC 539.3

"Calculating Round Slabs on an Elastic Halfspace the Young's Modulus of Which is a Step-Function of Depth"

Tashkent, V. sb. Vopr. mekhaniki. Vyp 6 (Problems of Mechanics. Vol 6 -- Collection of Works), Fan Press, 1970, pp 102-122 (from RZh-Mekhanika, No 10, Oct 70, Abstract No 10 V122)

Translation: This article contains a study of axisymmetric bending of a round isotropic plate of constant thickness freely lying on a non-uniform elastic halfspace without considering friction and under the condition of contact between the plate and the base. The Young's modulus of the halfspace varies with respect to depth according to the law $E = E_m z^m (0 < m < 1)$. The procedure is based on using the Gegenbauer polynomials to represent the reaction to resistance of the base. The solutions of the problems of bending of plates under the effect of uniformly distributed loads and loads uniformly distributed inside a

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USSR

SHIRINKULOV, T., V. sb. Vopr mekhaniki. Vyp. 6, Fan Press, 1970, pp 102-122

concentric circle are presented. The numerical calculations are performed for a plate under the effect of a uniformly distributed load. The results are presented in the form of diagrams of the reactive pressures and bending moments. A comparison is made with the case of a uniform base. The bibliography has 10 entries.

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JPRS 56019
17 MAY 72

SOME METHODOLOGICAL ISSUES IN FORENSIC MEDICINE

[Article by G.I. Tantsyrev, P.P. Shishkovskiy, Akademii Meditsinskikh Nauk SSSR, Russian, No 5, 1972, pp 69-76]

In the era of scientific and technological revolution the role of methodology of scientific research is increasing sharply. It is stressed in the decisions of the 24th Congress of the CPSU, the ideological struggle between bourgeois and Marxist-Leninist world outlook is becoming more acute. Both these processes are specifically manifested in such a branch of scientific knowledge and practical activity as forensic medicine which, in a bourgeois society, has its own "representation" in a number of popular reactionary philosophical and sociological theories. The methodological and ideological acuity of some issues considered by forensic medicine is intensified because of its borderline position. Forensic medicine is intersocial sciences that interact directly with issues dealing with man's social conditions, the theory and practice of justice, protection of life, health, freedom, and dignity.

In this article we shall try to formulate some of the methodological issues in forensic medicine and to demonstrate the unrelenting ideological struggle whose influence also extends over issues in this science. We shall also make a critical analysis of Lombrosianism [Lombrosian ideological criminology] (the so-called anthropological school of criminal law) and its current variant, neolombrosianism. We shall trend in bourgeois law and forensic medicine was an Italian positions, and not from the standpoint of its actual invalidity.

If one tries to formulate the most important methodological issues in forensic medicine, in one of the first places one should mention the correlation between social and biological elements, the problem of quality, the correlation between causes, conditions, and motivation, interaction between structure and function, and others. Of course, all these issues play primarily a general methodological role in all branches of medicine as a complex science. But at the same time, they have specific, "sectorial" distinctions as applied to forensic medicine.

USSR

SHIRINSKIY, V. I. (Moscow) UDC 624.047.4.075.04

"The Stability of a Cylindrical Shell Under the Action of a Nonuniform Radial Load"

Moscow, Stroitel'naya Mekhanika i Raschet Sorruzheniy, No 1, 1971, pp 44-48

Abstract: On the basis of a refined equation of semizero-moment theory, an investigation is made of the stability of a cylindrical shell under the action of a load which changes in a circumferential direction. An approximate method is proposed, by means of which it is possible rapidly, and without error in the dangerous direction, to find the critical parameter of the nonuniform load. Formulas are obtained, which provides sufficient precision for engineering calculations. If the precision yielded by the formulas is insufficient and it is necessary to resort to electronic computers, the information obtained from the formulas may considerably facilitate the machine calculation. 2 figures, 8 bibliographic entries.

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1/2 024 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--CATHODIC REDUCTION OF MANGANESE, II, IONS ON AN AMALGAM ELECTRODE -U-

AUTHOR-(03)-LANGE, A.A., SHIRINSKIKH, A.V., BUKHMAN, S.P.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK KAZ. SSR, SER. KHIM. 1970, 20(2), 68-70

DATE PUBLISHED----------70

SUBJECT AREAS--MATERIALS, CHEMISTRY

TOPIC TAGS--MANGANESE ALLOY, ION, AMALGAM, METAL CORROSION, OXYGEN CATHODE REDUCTION, METAL ELECTRODE, SULFATE, CATHODE POLARIZATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1610 STEP NO--UR/0360/70/020/002/0068/0070

CIRC ACCESSION NO--AP0125232

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0125232

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FOR THE CATHODIC REDN. OF 0.1 AND 0.25M MNSO SUB4 SOLNS. (PH 2.65-6.5), THE POLARIZATION CURVES WERE MEASURED AT A STATIONARY AMALGAM ELECTRODE AT 20DEGREES. NEAR THE EQUIL. POTENTIALS, THE CURVES OF POTENTIAL VS. LOG C.D. EXHIBITED A PLATEAU, ITS LENGTH DECREASED WITH INCREASING PH. THE EFFECT IS CAUSED BY THE CORROSION OF MN AMALGAMS IN ACID SOLNS., AS WAS SHOWN BY THE MEASUREMENTS OF CURRENT EFFICIENCIES. FACILITY: INST. KHIM. NAUK, ALMA ATA, USSR.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--EFFECT OF ESERINE AND PROSERINE ON CHOLINESTERASE ACTIVITY IN VARIOUS SECTIONS OF RAT BRAIN AND HEART -U-

AUTHOR-(04)-MNDZHOYAN, A.L., AMADYAN, M.G., SHIRINYAN, E.A., TSOVYANOVA, S.T.

COUNTRY OF INFO--USSR

SOURCE--BIOL. ZH. ARM. 1970, 23(1), 3-9

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ALKALOID, CHOLINESTERASE, BRAIN, CEREBRAL CORTEX, HEART, ENZYME ACTIVITY

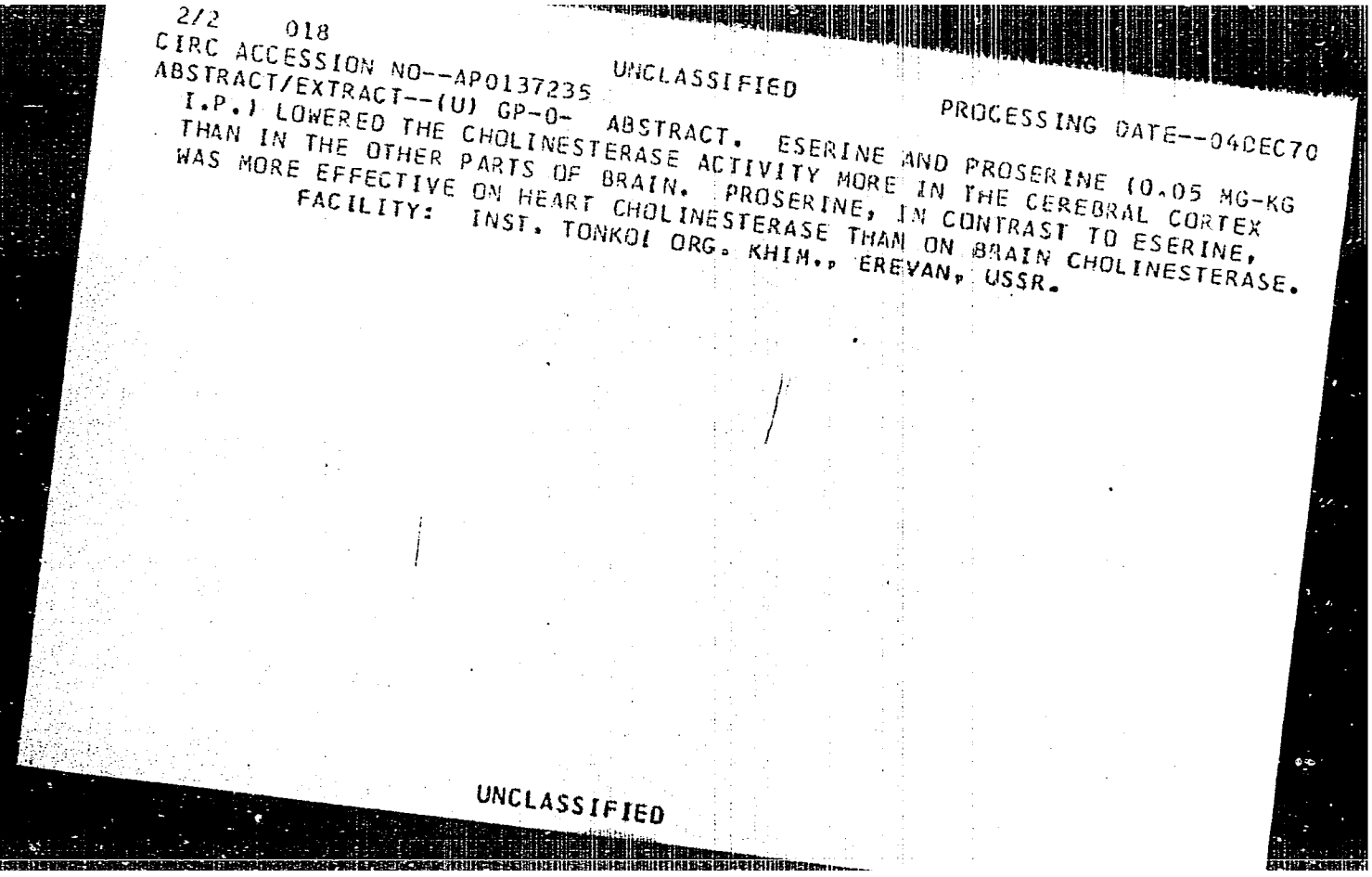
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0036 STEP NO--UR/0427/70/023/001/0003/0009

CIRC ACCESSION NO--AP0137235

UNCLASSIFIED



2/2 018 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0137235

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ESERINE AND PROSERINE (0.05 MG-KG I.P.) LOWERED THE CHOLINESTERASE ACTIVITY MORE IN THE CEREBRAL CORTEX THAN IN THE OTHER PARTS OF BRAIN. PROSERINE, IN CONTRAST TO ESERINE, WAS MORE EFFECTIVE ON HEART CHOLINESTERASE THAN ON BRAIN CHOLINESTERASE.

FACILITY: INST. TONKOI ORG. KHIM., EREVAN, USSR.

UNCLASSIFIED

USSR

UDC 615.477.24:616.12-089.28

SHUMAKOV, V. I., MOGILEVSKIY, E. B., KROL, A. D., ZUBAREV, V. A., SHIRKINA, T. V., and YUGIN, A. A., Scientific Research Institute of Clinical and Experimental Surgery, Moscow

"Model of an Artificial Heart for Intrapericardial Implantation"

Moscow, Meditsinskaya Tekhnika, No 5, Sep/Oct 70, pp 5-10

Abstract: A model is presented of an implantable artificial heart which consists of two mirror halves (right and left), each containing an artificial auricle and an artifical ventricle. The median surfaces of the ventricles are flat so that they may be easily connected after implantation. The overall dimensions of the unit and the volume of its cavities depend upon the heart dimensions of the animal for which the artificial heart is intended. Information is provided concerning the design, development, and testing of the artificial heart unit. Stand tests of implantable models developed by the authors and of control systems for them have made it possible to determine their functional parameters and to select the optimal operating conditions. It has been determined that the models can be used for experiments with total substitution of the pump function of the natural heart. Experiments on calves and dogs have been already initiated.

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USSR

VOLKOV, N. I., ZATSIORSKIY, V. M., KRYLATYKH, Yu. G., MAKSIMOV, N. M., NEVERKOVICH, S. D., SARSANIYA, S. K., CHEREMISINOV, V. N., and SHIRKOVETS, Ye. A., State Order of Lenin Central Institute of Physical Culture

"Physiological Characteristics of Repeated Exercise Done at Different Heart Rates"

Moscow, Teoriya i Praktika Fizicheskoy Kul'tury, No 5, 1971, pp 23-28

Abstract: Lung ventilation, oxygen consumption, and release of "excess" CO_2 were measured in 3 skilled cyclists after repeated exertions on a bicycle ergometer with different lengths of work and rest periods. Each subject performed 5 variations of the experiment at 3 heart rates - 150, 165, and 180 beats/min. The periods of exertion were 1.5, 3, 7.5, 15, and 30 min. The nature of the physiological reactions to the repeated exercise varied considerably with the length of the work and rest periods. Oxygen consumption was highest when the repeated exercise was done at a heart rate of 180 beats/min with work periods of up to 3 min. Lung function was most efficient when the heart rate was over 150 beats/min and the exercise period was less than 7.5 min. Repeated exercise at 165 beats/min for about 7.5 min had the greatest effect on tissue utilization of oxygen.

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1/3 030 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--REFLECTION COEFFICIENT AND FREQUENCY CHARACTERISTICS OF THE E SUBS LAYER -U-
AUTHOR-(04)-DANILINA, E.N., DERGUNOVA, A.A., OVEZGELDYYEV, O., SHIRMAMEDOV, M.
COUNTRY OF INFO--USSR

SOURCE--IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR, SERIYA FIZIKO-TEKHNICHESKIKH, KHIMICHESKIKH I GEOLOGICHESKIKH NAUK, NO 3, 1970,
DATE PUBLISHED--------70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, NAVIGATION

TOPIC TAGS--E LAYER, RADIO COMMUNICATION, IONOSPHERIC STATION, RADIO WAVE ABSORPTION, FREQUENCY CHARACTERISTIC

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/0394 STEP NO--UR/0202/70/000/003/0115/0118

CIRC ACCESSION NO--AP0137487
UNCLASSIFIED

.2/3 030 UNCLASSIFIED PROCESSING DATE--27NOV70
CIRC ACCESSION NO--AP0137487
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WITH RESPECT TO RADIO COMMUNICATION THROUGH THE E LAYER IT IS IMPORTANT TO STUDY THE REFLECTION COEFFICIENT P E SUBS FOR DIFFERENT RATIOS OF THE WORKING FREQUENCY OF SOUNDING F SUBWORK AND THE FREQUENCY CHARACTERISTICS OF THIS LAYER F SUBO E (CRITICAL REFLECTION FREQUENCY) AND F SUBB E SUBS (SCREENING FREQUENCY). FOR THIS PURPOSE DURING THE SUMMER OF 1968 SYNCHRONOUS OBSERVATIONS WERE MADE AT ASHKHABAD USING AN IONOSPHERIC STATION AND AN APPARATUS DESIGNED FOR MEASURING THE ABSORPTION OF RADIO WAVES IN THE IONOSPHERE BY THE A SUB1 METHOD. THE OBSERVATIONS WERE MADE USING THE FOLLOWING PROGRAM: THE IONOSPHERIC STATION OPERATED IN A FIVE MINUTE REGIME AND GAVE THE TIME VARIATION OF F SUBO E SUBS AND F SUBB AND E SUBS. THE APPARATUS FOR MEASURING ABSORPTION OPERATED AT A FIXED FREQUENCY OF 3.0 MC-SEC. 10 MINUTE MEASUREMENTS ALTERNATED WITH 5 MINUTE BREAKS, MAKING IT POSSIBLE TO DETERMINE THE TEMPORAL VARIATIONS P E SUBS. THE INITIAL EXPERIMENTAL DATA WERE PROCESSED BY STANDARD METHODS. SEVEN SERIES OF SIMULTANEOUS MEASUREMENTS WERE MADE WITH A TOTAL DURATION OF MORE THAN 25 HOURS. COMPARISON OF THE TEMPORAL VARIATIONS OF THE FREQUENCY PARAMETERS F SUBO E SUBS, F SUBB E SUBS AND THE REFLECTION COEFFICIENT P E SUBS REVEALS THAT FOR THE MOST PART THE FOLLOWING TENDENCY IS OBSERVED: WHEN F SUBWORK IS LESS THAN OR CLOSE TO F SUBB E SUBS, P E SUBS N 1. IN THESE CASES THE E SUBS LAYER IS A MIRROR REFLECTING LAYER. THE P E SUBS VALUE DECREASES WHEN F SUBWORK IS GREATER THAN F SUBB E SUBS, WHICH IS DETERMINED FOR THE MOST PART BY THE F SUBWORK-F SUBB E SUBS RATIO.

UNCLASSIFIED

3/3 030 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0137487

ABSTRACT/EXTRACT--AS AN EXAMPLE, THE ARTICLE GIVES THE RESULTS OF SIMULTANEOUS CONTINUOUS MEASUREMENTS MADE ON 29 JUNE 1968. THE DATA IN THE ARTICLE ARE OF A PRELIMINARY NATURE BUT THEY SHOW THAT IN CONTRAST TO THE REGULAR LAYERS OF THE IONOSPHERE, THE VALUES OF THE COEFFICIENT OF REFLECTION FROM THE E LAYER AT FREQUENCIES GREATER THAN F SUBB E SUBS ARE DETERMINED BY THE RATIO F SUBWORK-F SUBB E SUBS. CASES OF REGISTRY OF P E SUBS GREATER THAN I WERE NOTED; THESE OCCURRED IN EVERY SERIES. THESE CASES ARE OBSERVED MOST FREQUENTLY WHEN F SUBB E SUBS IS CLOSE TO OR GREATER THAN F SUBWORK, THAT IS, THE CONDITIONS ARE CLOSE TO MIRROR REFLECTION. THESE VALUES OF THE REFLECTION COEFFICIENT ARE ANOMALOUS AND REQUIRE SPECIAL ANALYSIS. FACILITY: INSTITUTE OF PHYSICS OF THE EARTH AND ATMOSPHERE, ACADEMY OF SCIENCES TURKMEN SSR; ASHKHABAD.

UNCLASSIFIED

USSR

ROZENBLYUM, G. D., SHIRMAN, M. V.

UDC 621.373

"Low Frequency Measuring Generators"

Obmen opytom v radioprom-sti (Exchange of Experience in the Radio Industry), vyp. 5, Moscow, 1970, pp 79-82 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9A169)

Translation: This article contains a detailed description of measuring low-frequency generators of the following types: GZ-47, GZ-48, GZ-49, GZ-51 and GZ-54. The basic characteristics of these generators are presented in the table. Certain generators are distinguished by high accuracy with respect to frequency, and others are distinguished by very good shape of the curve, and so on. A new low-frequency generator is mentioned (the type is not named) mastery of which is planned for the near future.

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USSR

SHIRMAN, YA.D., BAGDASARYAN, S.T. UDC 621.391.2

"Analysis Of The Correlation Functions Of Space-Time Broad-Band Signals Received By Linear Antennas"

Radiotekhnika i elektronika, Vol XVII, No 7, July 1972, pp 1392-1398

Abstract: Two-dimensional correlation functions (distance-angle) of space-time broad-band signals are analyzed and compared for three versions of the construction of discrete and continuous linear antennas, with information processing. The three versions are: 1) The antennas is phased in the arbitrary direction θ_p for all harmonic oscillations in the frequency band of some signals with a delay τ_p. Specifically, phasing is performed by delay lines (antenna with time tuning). 2) The antenna is phased in an arbitrary direction only at the center frequency f_0 of the signal spectrum with the aid of a system of phase shifters (antenna with phase tuning). 3) The antenna is phased for all oscillations in the frequency band of the signal, but only in one direction normal to its action (electrically non-tunable broad-band antenna). The dependence is shown of the effective directional diagram on the error signal with respect to the time of arrival, important with the width of its band. 5 fig. 8 ref. Received by editors, 16 June 1971.

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- 2 -

USSR

SHIRMAN, YA. D. UDC 621.391.2

"Some Problems of Detection in the Presence of Gaussian Signal and Noise Statistics"

Moscow, Radiotekhnika i Elektronika, Vol XVI, No 2, February 1971, pp 298-308

Abstract: Optimal detection algorithms for fluctuation distortions of the received oscillations are discussed in this article. Various time relations of the correlation of the fluctuations and signal length are investigated including the case where they are of the same order. The results obtained for time processing are extended to processing in the antenna aperture.

From the calculations, it was concluded that 1) expansions both with respect to orthogonal and with respect to nonorthogonal time functions with random independent coefficients are useful in analyzing the optimal detection of fluctuating signals; 2) optimal time processing splits into coherent and incoherent processing, and it can be performed

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USSR

SHIRMAN, YA. D., Radiotekhnika i Elektronika, Vol XVI, No 2, February 1971, pp 298-308

by means of correlators and optimal filters the output voltages of which are subjected to weighted square summation. 3) Examples are presented which show the variation of the processing schemes as a function of the ratio of the signal length and fluctuation correlation time; cases are investigated where these variables are of the same order and the product $\Pi_{fluctuation}$ T ≃ 1 (where $\Pi_{fluctuation}$ is the fluctuation band and T is the signal duration). 4) The possibility of using the results obtained in antenna statistics for aperture processing is demonstrated.

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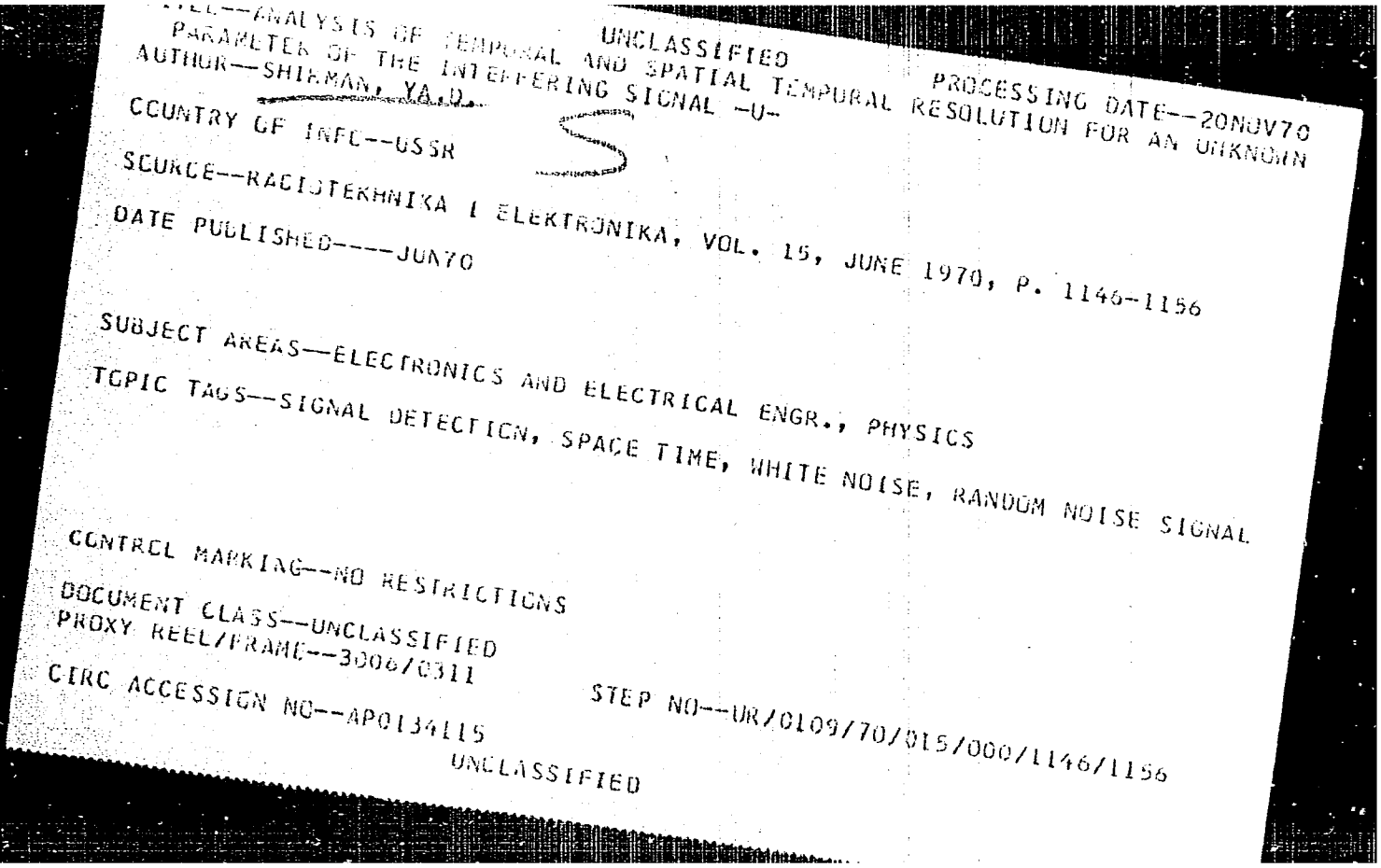


TITLE--ANALYSIS OF TEMPORAL AND SPATIAL TEMPURAL RESOLUTION FOR AN UNKNOWN PARAMETER OF THE INTERFERING SIGNAL -U-

UNCLASSIFIED

PROCESSING DATE--20NOV70

AUTHOR--SHIRMAN, YA.D.

COUNTRY OF INFO--USSR

SOURCE--RADIOTEKHNIKA I ELEKTRONIKA, VOL. 15, JUNE 1970, P. 1146-1156

DATE PUBLISHED----JUN70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., PHYSICS

TOPIC TAGS--SIGNAL DETECTION, SPACE TIME, WHITE NOISE, RANDOM NOISE SIGNAL

CONTROL MARKING--NO RESTRICTIONS

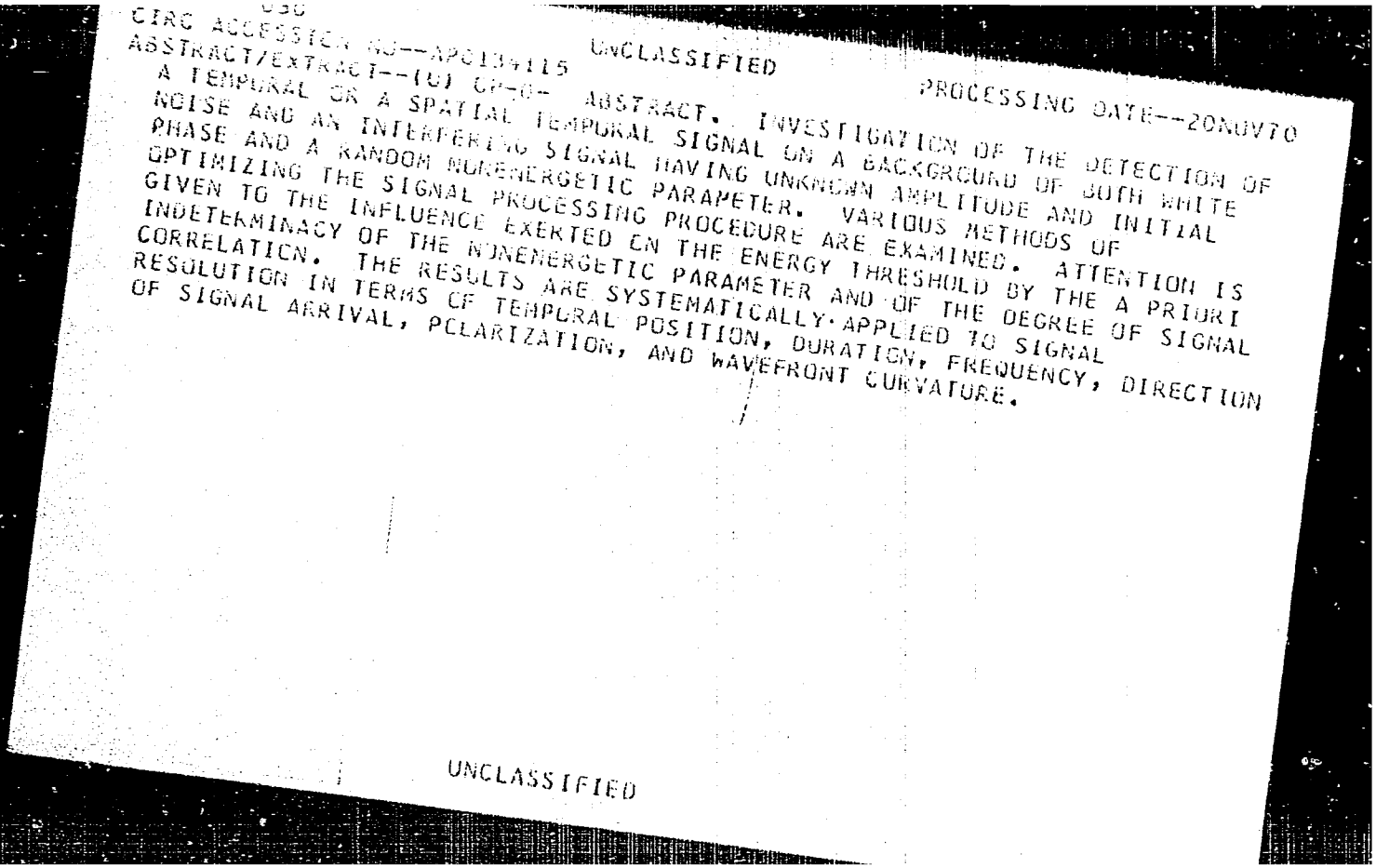
DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0311

STEP NO--UR/0109/70/015/000/1146/1156

CIRC ACCESSION NO--AP0134115

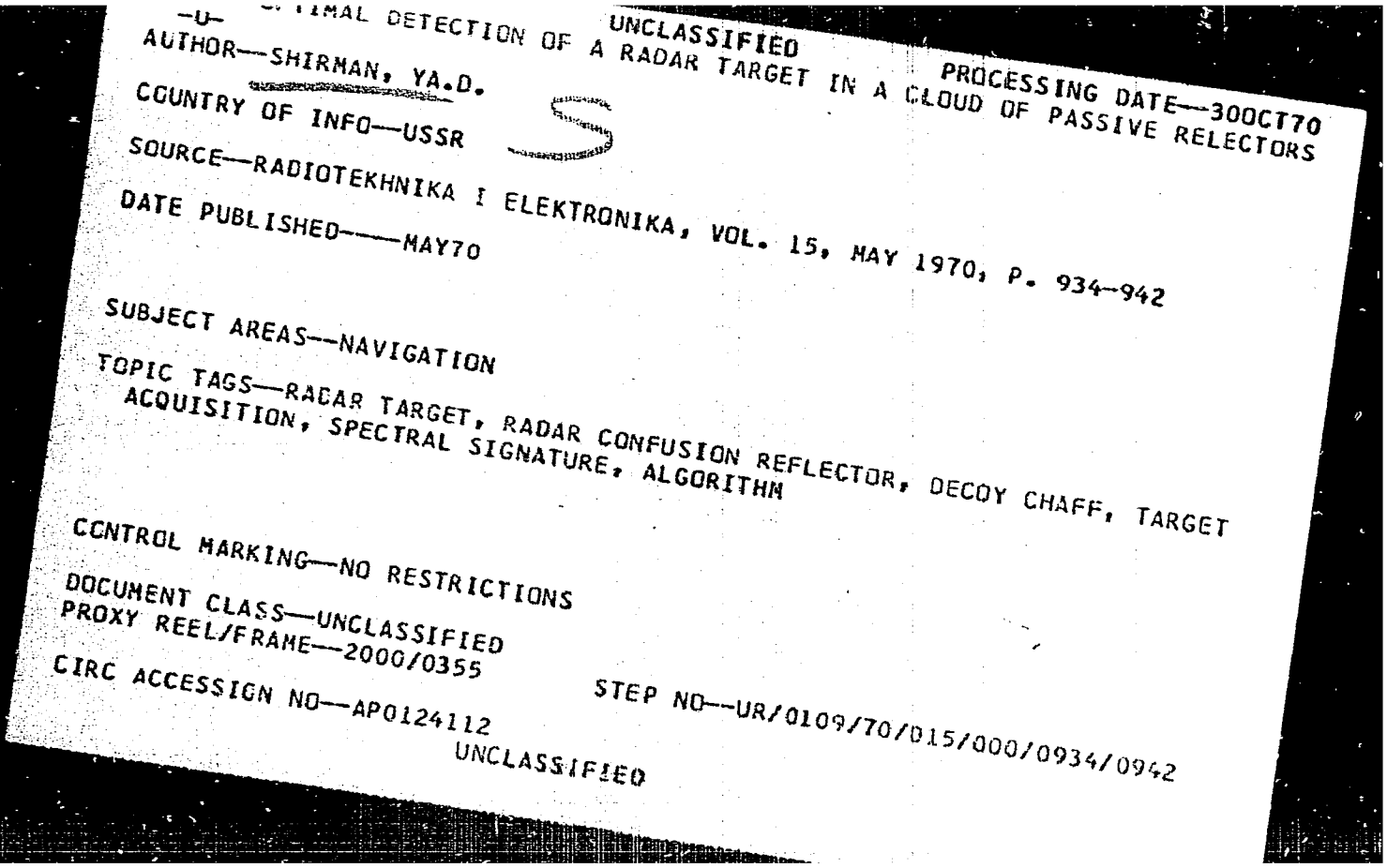
UNCLASSIFIED



CIRC ACCESSION NO--AP0134115 UNCLASSIFIED PROCESSING DATE--20NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION OF THE DETECTION OF A TEMPORAL OR A SPATIAL TEMPORAL SIGNAL ON A BACKGROUND OF BOTH WHITE NOISE AND AN INTERFERING SIGNAL HAVING UNKNOWN AMPLITUDE AND INITIAL PHASE AND A RANDOM NONENERGETIC PARAMETER. VARIOUS METHODS OF OPTIMIZING THE SIGNAL PROCESSING PROCEDURE ARE EXAMINED. ATTENTION IS GIVEN TO THE INFLUENCE EXERTED ON THE ENERGY THRESHOLD BY THE A PRIORI INDETERMINACY OF THE NONENERGETIC PARAMETER AND OF THE DEGREE OF SIGNAL CORRELATION. THE RESULTS ARE SYSTEMATICALLY APPLIED TO SIGNAL RESOLUTION IN TERMS OF TEMPORAL POSITION, DURATION, FREQUENCY, DIRECTION OF SIGNAL ARRIVAL, POLARIZATION, AND WAVEFRONT CURVATURE.

UNCLASSIFIED



-U- UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--OPTIMAL DETECTION OF A RADAR TARGET IN A CLOUD OF PASSIVE RELECTORS

AUTHOR--SHIRMAN, YA.D.

COUNTRY OF INFO--USSR

SOURCE--RADIOTEKHNIKA I ELEKTRONIKA, VOL. 15, MAY 1970, P. 934-942

DATE PUBLISHED----MAY70

SUBJECT AREAS--NAVIGATION

TOPIC TAGS--RADAR TARGET, RADAR CONFUSION REFLECTOR, DECOY CHAFF, TARGET ACQUISITION, SPECTRAL SIGNATURE, ALGORITHM

CONTROL MARKING--NO RESTRICTIONS

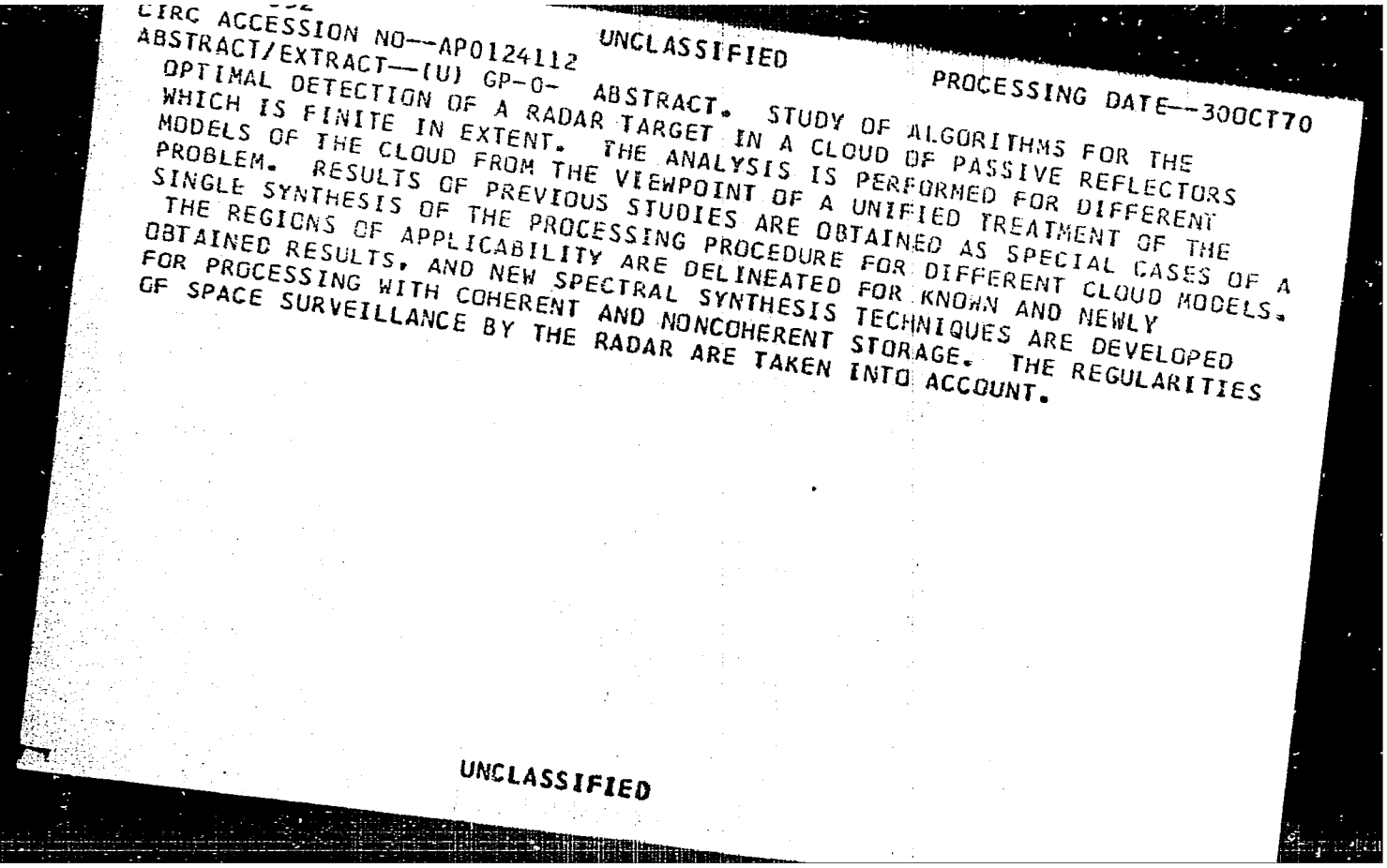
DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0355

STEP NO--UR/0109/70/015/000/0934/0942

CIRC ACCESSION NO--AP0124112

UNCLASSIFIED



CIRC ACCESSION NO--AP0124112 UNCLASSIFIED PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF ALGORITHMS FOR THE OPTIMAL DETECTION OF A RADAR TARGET IN A CLOUD OF PASSIVE REFLECTORS WHICH IS FINITE IN EXTENT. THE ANALYSIS IS PERFORMED FOR DIFFERENT MODELS OF THE CLOUD FROM THE VIEWPOINT OF A UNIFIED TREATMENT OF THE PROBLEM. RESULTS OF PREVIOUS STUDIES ARE OBTAINED AS SPECIAL CASES OF A SINGLE SYNTHESIS OF THE PROCESSING PROCEDURE FOR DIFFERENT CLOUD MODELS. THE REGIONS OF APPLICABILITY ARE DELINEATED FOR KNOWN AND NEWLY OBTAINED RESULTS, AND NEW SPECTRAL SYNTHESIS TECHNIQUES ARE DEVELOPED FOR PROCESSING WITH COHERENT AND NONCOHERENT STORAGE. THE REGULARITIES OF SPACE SURVEILLANCE BY THE RADAR ARE TAKEN INTO ACCOUNT.

UNCLASSIFIED

UDC: 621.391.2:621.396.96

USSR

SHIRMAN, Ya. D.

"Optimal Detection of Radar Targets in a Passive Reflector Cloud"

Moscow, Radiotekhnika i Elektronika, No 5, 1970, pp 934-942

Abstract: Analysis of optimal target detection in a cloud of passive reflectors is conducted in two ways: optimizing the interperiod treatment and ignoring the intraperiod treatment as if no passive noise were present; optimizing the treatment for the whole. The author adopts this second appraoch. By making this choice, he obtains the results of preceding works as particular cases of a single treatment for various cloud models, finds an applicability region for the new as well as the known results, and works out methods of spectral treatment for coherent and incoherent storage. In the course of the first part of this procedure, he derives the computational relationships for four types of cloud model. He concludes that if the resolving power for distance and angular

UDC 624.07:534.1

USSR

SHIRMANOV, V. S.

"Experimental Study of the Work Expended by I-Beam Walls on Local Stability"

Tr. Gor'kov. inzh.-stroit. in-ta (Works of the Gor'kiy Construction Engineering Institute), 1971, vyp. 58, pp 68-73 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10V218)

Translation: The paper presents the results of local stability tests of welded boom girders of I-beam cross section. Loading was done on a 200 ton hydraulic press until loss of the carrying capacity of the girder under a continuously increasing load (or one which increases by steps). Bending was measured by dial indicators, and stresses were recorded by wire resistance gauges with a 10 mm base. A number of singularities of local loss of stability are noted. Experimental results are compared with theoretical relations. B. L. Pelekh.

1/1

USSR

UDC: 621.313.333(083.75)

BERTSOV, G. I., Candidate Technical Sciences; BEREZKOY, Yu. A., OSIPOVICH, V. D., and SELIVIN, [illegible] G., Engineers

"New Government Standard on Explosion-Proof Asynchronous Motors of the VAO Series with Power Ratings of from 132 to 1000 Kilowatts"

Moscow, Elektrotekhnika, No. 2, February 1971, pp 59-60

Abstract: This standard is the second on motors of the VAO series to be stated, the first relating to machines with a power rating of up to 100 kW. The need for the standards was stimulated by requirements for high-power asynchronous electric motors for the growing number of chemical plants, for mining in general and hydraulic mining of coal in particular. Up until recently, the requirements of the national economy for low-voltage explosion-proof electric motors with higher power ratings than 100 kW were satisfied by the MA-36 motor. From the viewpoint of weight and

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USSR

PERTSOV, G. I., et al, Elektrotekhnika, No 2, Feb 71, pp 59-60

energy output, however, the NA-36 is inferior to the best foreign motors. High-voltage explosion-proof electric motors were not put into production in the Soviet Union until 1968. The machines to which the new standard applies were developed by the Institute of the VNIIVE /expansion unknown/ in cooperation with the Elektromash, Sibelektrotyazhmash, and Karl Marx First of May Plants.

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USSR

UDC 547.756'757

AVRAMENKO, V. G., SHIRNYUK T. Ya., and SUVOROV, N. N., Moscow Chemico-Technological Institute imeni D. I. Mendeleyev, Moscow

"Derivatives of Indole. LXXXV. The Willgerodt-Kindler Reaction With 3-Acylindoles"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 6, Jun 73, pp 759-761

Abstract: 3-Acylindoles Ind-C(=O)$(CH_2)_n$H (Ind = 3-indolyl; n = 1-4) (0.01 mole) were subjected to the Willgerodt-Kindler reaction carried out with sulfur (0.02 g-at) and morpholine (0.2 mole) at the boiling point of morpholine. Upon boiling of the reaction products with NaOH in EtOH, 3-indolylalkanic acids Ind-$(CH_2)_n$ COOH were obtained with a yield of 30, 21, 14, and 1% from the ketone with n equal to 1, 2, 3, and 4, respectively. The 3-indolylalkanic acid with n = 1 (3-indolylacetic acid, "heteroauxin") has auxin properties. The thiomorpholides of the indolylalkanic acids with n = 1,2,3, which formed as intermediate products in the first stage of the reaction, were also isolated. On conversion of skatylacetone Ind-$(CH_2)_2$C(=O)Me with S and morpholine, 3-indolylbutyric acid Ind-$(CH_2)_3$. COOH was obtained with a yield of 40-48%.
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USSR

UDC 771.531.3:621.384.326.22

KARIZHENSKIY, Ye. Ya., SHIROBOKOV, A. M., LEVINA, L. A.

"Investigation of Exactness of the Intermittent Motion of a Photographic Film in the Photographic Recording System of an Aircraft Television Camera"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No 12, December 1971, pp 7-10

Abstract: The article deals with the possibility of a gate mechanism of the electromechanical type, and makes a recommendation concerning its employment, in order to provide the intermittent motion of a photographic film in the photorecording system of aircraft television cameras designed for geologic mapping and for the detection of fires. The exactitude of such a system is investigated. It is found that in the frequency range of 5-25 gates/sec, the relative gate-recording error of the gate mechanism does not exceed 5% with a probability of 0.9. Some distortions on the photographic film, introduced by the gate-recording error, are entirely permissible for the indicated case of the employment of aircraft television cameras. The use of gate mechanism in the photorecording devices of aircraft television cameras considerably simplifies their system and design. 3 figures. 2 tables. 4 references.

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1/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--CALCULATION OF A THERMODYNAMIC ACTIVITY COEFFICIENT IN INFINITELY DILUTED SOLUTIONS OF NONELECTROLYTES USING THE THEORY OF FREE VOLUME -U-

AUTHOR-(04)-STEPANOV, V.M., DEVYATYKH, G.G., PANASENKO, A.G., SHIROBOKOV, M.YA.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(2), 445-51

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--CALCULATION, THERMODYNAMIC PROPERTY, HEAT OF VAPORIZATION, ACTIVITY COEFFICIENT, FLUID STATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/1426 STEP NO--UR/0076/70/044/002/0445/0451

CIRC ACCESSION NO--AP0116873

UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0116873

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FOUR EQUATIONS ARE DERIVED FROM COMPUTING THE THERMODYNAMIC ACTIVITY COEFF. ON THE BASIS OF THE FREE VOL. THEORY. THESE EQUATIONS TAKE INTO ACCOUNT THE LOOSENING OF THE STRUCTURE OF A FLUID WITH THE RISE IN TEMP. WHICH CAUSES THE FORMATION OF HOLES IN THE FLUID. DATA COMPUTED BY MEANS OF THESE EQUATIONS WERE IN GOOD AGREEMENT WITH EXPTL. DATA. THE THERMODYNAMIC ACTIVITY COEFF. (GAMMA21) CAN BE COMPUTED FROM THE FOLLOWING: (FORMULA SHOWN ON MICROFICHE). FACILITY: NAUCH.-ISSLED. INST. KHIM., GOR'K, GOS. UNIV. IM. LOBACHEVSKOGO, GORKI, USSR.

UNCLASSIFIED

1/2 016 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--ON PURIFYING COPPER BY ZONE RECRYSTALLIZATION -U-

AUTHOR-(03)-VIGDOROVICH, V.N., MARYCHEV, V.V., SHIROBOKOVA, T.G.

COUNTRY OF INFO--USSR

SOURCE--IZVEST. AKAD. NAUK SSSR, METALLY, MAR.-APR. 1970, (2), 129-134.

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CRYSTALLIZATION, COPPER, METAL ZONE REFINING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/1443 STEP NO--UR/0370/70/000/002/0129/0134

CIRC ACCESSION NO--AP0130376

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 016
CIRC ACCESSION NO--AP0130376
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY ANALYSING THE PHASE DIAGRAMS REPRESENTING THE INTERACTION OF CU WITH VARIOUS IMPURITIES, A GENERAL CLASSIFICATION OF THE IMPURITIES COMMONLY ENCOUNTERED IN CU IS DERIVED WITH A VIEW TO OPTIMIZING THE REFINEMENT OF CU BY THE ZONE RECRYSTALLIZATION METHOD. IN GENERAL, THE EFFICIENCY OF CU REFINEMENT BY THIS METHOD IS INCREASED BY REDUCING THE VELOCITY OF CRYSTALLIZATION (SOLIDIFICATION). THE BEHAVIOUR OF A WIDE RANGE OF IMPURITIES IN CU CORRELATES CLOSELY WITH THEIR POSITIONS IN THE PERIODIC TABLE, WHICH MAY ACCORDINGLY BE USED TO PREDICT THE BEHAVIOUR OF IMPURITIES NOT YET STUDIED. 12 REF.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--PRODUCTION OF ALLOYS WITH A UNIDIRECTIONAL STRUCTURE BY MULTIPLE PASS ZONE RECRYSTALLIZATION -U-

AUTHOR-(03)-VOLPAN, A.YE., MARYCHEV, V.V., SHIROBOKOVA, T.G.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, MAR, 1970, 29, (3), 661-663

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CRYSTALLIZATION, ALUMINUM ALLOY, COPPER ALLOY, MANGESIUM ALLOY, ZINC ALLOY, EUTECTIC MIXTURE, CRYSTAL STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0204 STEP NO--UR/0126/70/029/003/0661/0663

CIRC ACCESSION NO--AP0129460

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0129460

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POSSIBILITY OF PRODUCING ALLOYS WITH UNIDIRECTIONAL STRUCTURE (CONTROLLED EUTECTICS) BY MULTIPLE PASS ZONE RECRYSTALLIZATION IS CONSIDERED IN THE LIGHT OF EXPERIMENTAL TESTS WITH AL,CU AND MG,ZN,AL ALLOYS. BOTH PRIMARY CRYSTALS AND THE EUTECTIC TEND TO BECOME ORIENTED ALONG THE DIRECTION OF MOTION OF THE ZONE. A CERTAIN AMOUNT OF DISORDER SETS IN AT THE ENDS OF THE BARS THUS TREATED; OCCASIONAL DENDRITIC MICRO INHOMOGENEITIES CAN EASILY BE ELIMINATED.

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APPROVED FOR RELEASE: 07/20/2001 CIA-RDP86-00513R002202930001-2"

USSR

UDC 621.382.9

KHORYAK, L. V., and SHIROBOKOVA, Ye. I.

"Study of Film Varicaps Based on Especially Pure Barium Titanyloxalate for Circuits for Control of the Intensity of Brightness of Electroluminophors"

Elektron. tekhnika. Nauch.-tekhn. sb. Materialy (Electronic Technology. Scientific-Technical Collection. Materials), 1970, Issue 8, pp 45-51 (from RZh-Elektronika i yeye primeneniye, No 9, September 1971, Abstract No 9B477)

Translation: The paper studies film varicaps with an increase of nonlinearity $K \geq 20$ based on barium titanyloxalate [titaniloksalata bariya] in combination with film luminophors. Computations are made of the optimum conditions of operation of varicaps in circuits. Experimental data agree with calculated and show that with films, the varicaps can produce a voltage drop at the luminophor of 8 times, which assures a high-contrast image. Use of luminophors and varicaps in film execution made it possible to reduce the control voltage substantially. Summary.

1/1

USSR UDC 681.325.65

SHIROCHENSKIY, A. YE., Moscow Aviation Institute

"Transistor Switch"

USSR Author's Certificate No 308512, Cl. H 03 k 17/00, filed 3 Nov 69, published 11 Aug 71 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 5, May 72, Abstract No 5B134P)

Translation: The invention can be used in digital-to-voltage and voltage-to-digital converters. Transistor switches for switching unipolar voltage are known which contain a switching transistor and a control transistor. However, they are marked by limited switching speed and accuracy. The proposed transister switch, in order to increase switching speed and accuracy, contains a complementary transistor whose emitter is connected to the base of the switching transistor; the collector is connected to the bias voltage source; and the base, to the control transistor load. It also contains an auxiliary transistor and a diode, one output of which is connected to the emitter of the switching transistor, the other to the bias voltage source through the resistor. The common point of the diode and resistor is connected to the collector of the auxiliary transistor, the base of which is connected to the collector of the control transistor, and the emitter to the base resistor of the switching transistor.

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USSR

UDC 621.316.722.1(088.8)

SHIROCHENSKIY, A. YE., KLEYMENOV, V. S.

"Reference Voltage Source"

USSR Author's Certificate No 273303, Filed 6 Mar 69, Published 14 Sep 70 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A263P)

Translation: A reference voltage source is proposed. It contains a regulating semiconductor triode, a DC amplifier and a silicon stabilitron in the emitter network of the DC amplifier. It is distinguished by improved stability of reference voltage.

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USSR UDC 621.315.42:001.5

GODYAK, V.A., IVLEV, A.V., SHIROKHIN, L.A.

"Analysis Of Current Dynamics In Drift Space With Inductive Load"

Radiotekhnika i elektronika, Vol XVII, No 6, 1972, pp 1293-1296

Abstract: A dynamic regime is considered of current passage in a one-dimensional drift space, produced by the accelerating grid of an electron source and a collector between which an inductive load is included. In this case the character of the load applies a limitation to the time dependence of the critical current because in a dynamic regime the retarding potential $V_k = -L\,dI/dt$ originating at the collector can lead to instability of the current in the load L. The critical current equation, the emission current at the surface limited by a space charge, the injection of electrons with fixed energy, and a supplementary source of accelerating voltage are discussed. 1 ref. Received by editors, 12 February 1971.

1/1

USSR

UDC 621.377.622.12

KHAYUSTOV, V. P., SHIROCHKIN, R. S.

"Multiphase Trigger"

USSR Author's Certificate No 294234, Filed 9/06/68, Published 19/03/71, (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, 1971, Abstract No 11 A61 P).

Translation: Multiphase triggers containing cells (C) with positive feedback are known. The circuits of the counting inputs of these devices are rather complex due to the large number of elements involved. The device suggested differs from known devices in that the output light-emitting diode of each C is optically connected to the photodiodes of its own and the subsequent C. This simplifies the circuit of the counting input of the trigger. The circuit consists of a C with positive feedback around the transistor, light-emitting diodes, photodiodes, load resistors, base and emitter resistors. The photodiodes are located so that the light from the light-emitting diodes in their own and the preceding phases falls on their light-sensitive surfaces. When a voltage is fed to the power supply bus and the switch is briefly closed, the transistor of the first C opens. The load current of the transistor of the first C, passing through the common emitter resistor, light-emitting diode, and load resistors of the first C,

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KHAYUSTOV, V. P., SHIROCHKIN, R. S., USSR Author's Certificate No 294234, Filed 9/06/68, Published 19/03/71

causes the light-emitting diode of the first C to glow. The light flux of this light-emitting diode, striking the light-sensitive surface of the photodiodes of the first and second C, sharply decreases their resistance, as a result of which a photocurrent flows through the photodiode of the first C, through an intermediate connector and switch to the input of the transistor of the first C. This photocurrent holds the transistor in the saturated state after the switch is opened. Photocurrent does not pass through the photodiode of the second C, since the intermediate connector to which it is connected is not connected to the power supply by the switch. The load current of the transistor creates a voltage drop across the common emitter resistor, reliably blocking all remaining transistors. The multiphase trigger can remain in this first stable position (first C connected) as long as necessary. In order to switch the multiphase trigger to the next position, the switch is shifted to its opposite position. The photodiode of the second C is then connected through the intermediate connector and switch to the power supply. Since the photodiode is eliminated by the light-emitting diode of the first C, its photocurrent, reaching the input of the transistor of the second C, opens this transistor. Its load current, passing through the load resistors and the light-emitting diode of the second C, causes this diode to glow. The light flux of the light-emitting diode of

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USSR UDC 621.377.622.12

KHAYUSTOV, V. P., SHIROCHKIN, R. S., USSR Author's Certificate No 294234, Filed 9/06/68, Published 19/03/71.

the second C, striking the light-sensitive surface of the photodiodes of the second and third C, maintains the photocurrent of the photodiode of the second C after the light-emitting diode of the first C stops glowing (as a result of this connection of the photodiode of the first C from the power supply by the switch and blocking of the transistor of the first C). No photocurrent flows through the photodiode of the third C, since it, along with the photodiode of the first C and the other odd photodiodes, is disconnected from the power supply by the switch. A blocking potential on the common emitter resistor is now created by the load current of the transistor in the second C. The multiphase trigger can remain in this near stable position (second C connected) as long as desired (until the next control pulse arrives at the switch, reversing its position once more). The transition to subsequent stable positions of the multiphase trigger, the number of which is equal to the number of C, is achieved by the switch in the same manner. 1 Figure.

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UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent 1-70

241876 ELECTROCHEMICAL CONTOUR MACHINING is carried out in chamber 1 containing workpiece 2, and tool-electrodes 3. Dielectfic screen 4 in the gap between the workpiece and the electrode is suspended by elastic element 5, the interelectrode space filled with electrolyte 6. During the machining, the electrodes are vibrated with anamplitude ensuring a soft contact with the workpiece across the dielectric grid 4 with electrolyte trapped in its meshes. This results in anodic dissolution of the machined surface, followed by electrode withdrawal and intensive electrolyte regeneration in the gap.

7.2.68 as 1217763/25-8. A.K. SVINOV et alia(3.9.69) Bul 14/18.4.69. Class 48a. Int.Cl.C 23b.

18

AUTHORS: Svinov, A. K.; Agrest, Ye. A.; Mordekhay, V. M.; Shirokikh, V. G.; and Verpukhovskiy, A. G.

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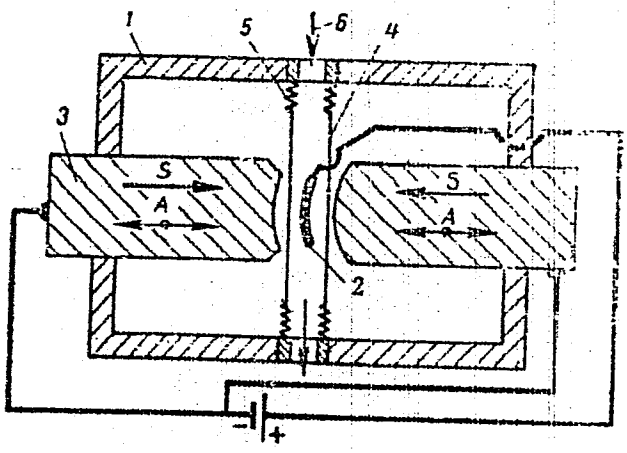
AA0040742



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19750413

AA0040672

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent, 1-70

241875 FINE ELECTROCHEMICAL MACHINING of round parts features a dielectric grid placed at the working surface of the electrode, which revolves due to frictional contact with the component. The grid may be made of hard rubber or other synthetic material, and the electrolyte is pumped into the interelectrode gap. The constant contact of electrodes with the workpiece may be ensured by a counterweight, spring or other means.
5.2.68 as 1216953/25-8. V.G.SHIROKIKH et alia.
(27.8.69) Bul 14/18.4.69. Class 48a. Int.Cl.C 23b.

AUTHORS: Shirokikh, V. G.; Mordekhay, V. M.; Verpukhovskiy, A. G.; and Agrest, Ye. A.

19750272

SHIROKIY, V. V.

COLEEN

100. USSR UDC 621.313.1/.3+621.373 : 001.5+612.833.2

SHIROKIY, V. V.

SO: FOREIGN PRESS DIGEST
29 OCT 1971

"Experimental Research on the Process of Interaction Between Relaxation Oscillators and Limited-Capacity Sources of Energy"

Kiberneticheskiye Aspekty v Izuchenii Raboty Mozga (Cybernetic Aspects of the Study of the Brain's Functioning), Moscow, Nauka Publishing House, 1970, pp 236-244

Abstract: This article sets forth the results of experimental research on the interaction of a power source of limited capacity with a group of thyratron relaxation oscillators with an MTKH-90 cold cathode. The conditions under which the group of oscillators generates stable, periodically repeated ensembles of oscillatory processes are investigated.

On the basis of a hypothesis on the effect which the energy state of the neurons of the respiratory center has on the way their activity within the functional respiratory system is organized, the relaxation oscillators are viewed as dynamic analogies of the neurons.

The experiments show that an inadequate supply of energy to the set of oscillators, caused by a change in the magnitude of the feed voltage, leads to the

USSR

SHIROKIY, V. V., Kiberneticheskiye Aspekty v Izuchenii Raboty Mozga, Nauka Publishing House, 1970, pp 236-244

establishment of stable, periodically repeated phase shifts in the waves generated by these oscillators. And vice versa, an excess supply of energy leads to the disrupution of these relationships. In this way, an inadequate supply of energy is considered one of the possible factors conditioning the dynamic elements in the system and leading to the establishment of an intermittent organization of the oscillatory activity of these elements.

USSR

SHIROKORAD, B. V.

UDC: 51

"Methods of Representing the Duration of a Job on a Probabilistic CPM Graph"

Tr. Mosk. n.-i. i proyekt. in-ta sistem setevogo planir. i upr. v prom-sti (Works of the Moscow Scientific Research and Design Institute of Critical Path Systems in Industry), 1971, vyp. 3, ch. 2, pp 38-39 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V474)

Translation: The article is written chiefly for purposes of review and classification. Bibliography of 18 titles.

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Acc. Nr: AP0052081 Ref. Code: UR0475

PRIMARY SOURCE: Vrachebnoye Delo, 1970, Nr 2, pp 113-114

ON THE ETIOLOGICAL RELATIONS OF CHICKENPOX AND HERPES ZOSTER

K. Rashkov and *T. Shirokorad* (Tyrnovo, Bulgaria)

Results are presented of a five-year study of the epidemiological relationship of chickenpox and herpes zoster in Velikotyrnovo Region. Chickenpox affects mainly children whereas herpes zoster is a disease of adult and elderly persons.

It is suggested that children which have been in contact with herpes zoster patients may later be affected by chickenpox.

The course of the disease was typical, is transmitted by the air-drip route. The diseases have a seasonal character: chickenpox is an autumn-winter disease, herpes zoster a summer disease.

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REEL/FRAME
19820619

Optics & Spectroscopy

USSR

UDC 535.34-15 : 548.0

BROUDE, V. L., and SHIROKOV, A. A.

"Anomalous Exciton Splitting in Vibrational Spectrum of Naphthalene Crystal in 3000 cm^{-1} Region"

Leningrad, Optika i Spektroskopiya, Vol 34, vyp 2, Feb 73, pp 408-410

Abstract: The article considers the vibrational spectrum of naphthalene single crystal in the region of the band doublet 3055 and 3069 cm^{-1}. Absorption curves are shown for two polarizations of incident light at 90° K. The doublet is transformed into a quadruple of sharply polarized absorption bands (3050 and 3070 cm^{-1} at // b and 3056 and 3065 cm^{-1} at ⊥ b). Such polarization indicates the occurrence of Davydov exciton splittings in the spectrum of the crystal. The naphthalene crystal has two translationally nonequivalent molecules in the unit cell. Therefore, there has to be a comparison of each nondegenerate molecular term and the exciton band doublet in the spectrum of the crystal. Since both absorption bands of the molecule (3055 and 3069 cm^{-1}) are related to the same symmetry and have almost the

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USSR

BROUDE, V. L., and SHIROKOV, A. A., Optika i Spektroskopiya, Vol 34, vyp 2, Feb 73, pp 408-410

same intensity, the character and the form of the exciton doublets corresponding to them should be identical in the absence of mutual perturbations. Actually, the polarization of the bands indicates different splitting signs in both doublets (3050/3056 and 3070/3065 cm^{-1}). This apparently indicates that we are dealing with the case $\Delta_D \sim \Delta$, in which mutual perturbation of the two adjacent exciton bands is especially significant.

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1/2 015 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--LONG RANGE FORECASTING OF BROWN RUST AND SMUT -U-

AUTHOR-(02)-SHIROKOV, A.I., BALASHONOK, T.G.

COUNTRY OF INFO--USSR

SOURCE--ZASHCHITA RASTENIY, 1970, NR 1, PP 41-42

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--FUNGUS DISEASE, PLANT DISEASE, SEASONAL VARIATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/1347 STEP NO--UR/0433/70/000/001/0041/0042

CIRC ACCESSION NO--AP0136717

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136717

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN EXPERIMENTAL CHECK OF THE METHOD OF LONG RANGE FORECASTING ON THE BASIS OF DATA FOR THE CHELYABINSK REGION IN 1951-1961 SHOWED THAT THE DEVELOPMENT OF BROWN RUST IS DETERMINED BY THE DAILY MEAN TEMPERATURE IN MARCH AND MAY OF THE YEAR BEING PREDICTED. MATHEMATICAL TREATMENT OF DATA FOR 1958-1968 SHOWED THAT IN THESE YEARS THE DECISIVE FACTOR WAS THE MEAN MONTHLY TEMPERATURE IN DECEMBER OF THE PRECEDING YEAR AND FEBRUARY OF THE YEAR UNDER CONSIDERATION. THE AIR TEMPERATURE IN JANUARY AND PRECIPITATION IN MARCH WERE ALSO IMPORTANT. IN THE TROITSKIY REGION CORRELATION WAS OBTAINED BETWEEN RUST DEVELOPMENT AND THE MEAN MONTHLY AND MINIMUM TEMPERATURES IN THE PRECEDING DECEMBER. CORRELATIONS BETWEEN WEATHER OF THE PRECEDING YEAR AND RUST DEVELOPMENT MAY BE ACCIDENTAL, HOWEVER. EXPERIENCE HAS SHOWN THAT THE AMOUNT OF PRECIPITATION IN THE VEGETATION PERIOD (ESPECIALLY JULY) IS MOST IMPORTANT. IMPROVEMENT OF THE SUCCESS OF LONG RANGE FORECASTING WILL REQUIRE FURTHER STUDY OF THE BIOLOGY OF RUST FUNGUS, POSSIBLE MIGRATION ROUTES, AIR CURRENTS, AND EPIPHYTOTICS IN NEIGHBORING AREAS. FORECASTING OF SMUT IS SIMPLE AND DEPENDS ON THE AMOUNT AND TYPE OF PRECIPITATION IN THE BLOSSOMING PERIOD OF WHEAT IN THE PRECEDING YEAR. FACILITY: OTDEL ZASHCHITY RASTENIY, CHELYABINSKOY SEL'SKOKHOZYAYSTVENNOY OPYTNOY STANTSII, SEKTOR SIGNALIZATSII I PROGNOZOV OBLASTNOY STAZRA.

UNCLASSIFIED

USSR

UDC 632.914:682.285.1/.2

SHIROKOV, A. I., Candidate of Biological Sciences, Head of the Plant Protection Department, Chelyabinsk Agricultural Experimental Station, and BALASHONOK, T. G., Head of the Signaling and Forecasting Section, Oblast Plant Protection Station

"Long-Range Forecasting of Brown Rust and Loose Smut"

Moscow, Zashchita Rasteniy, No 1, 1970, pp 41-42

Abstract: Long-range forecasting of brown rust and loose smut in Chelyabinskaya Oblast is discussed. The late occurrence of these diseases, in late July and early August, indicates that local infectious material does not play the main role in infecting crops in this area. Examination of data for two rayons shows a high correlation coefficient between environmental factors in the preceding period (fall and winter) and the intensity of the disease. This coefficient can sometimes have a random nature, but is regular when the weather in the preceding period affects the accumulation, dormancy and germination of fungus spores. The forecast must be given for the phase of plant development when the disease is at a maximum. In the area under investigation this is the milky ripeness stage.
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USSR

SHIROKOV, A. I., et al., Moscow, Zashchita Rasteniy, No 1, 1970, pp 41-42

It was concluded that in order to compile a long-range forecast with high validity, it is necessary to study the biology of the agent of brown rust, and the possible paths of its migration, which depend on relief, direction of air currents, intensity of development of the disease, and passage through vegetative phases in an adjacent natural climatic zone, and so on. Long-range forecasting of the development of loose smut is quite simple and accurate. Analysis of weather conditions and infection of seedlings showed that the incidence of the disease is determined to a great extent by the amount and nature of precipitation during the flowering of wheat in the preceding year. Thus, the more rain that falls during the flowering period, the more loose smut there will be in the following year.

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USSR

UDC: 621.373.(72.6(088.8)

ROTSHTEYN, L. I., SHIROKOV, A. V.

"A Device for Automatically Stabilizing the Frequency of a Harmonic Oscillator With Discrete Frequency Control"

USSR Author's Certificate No 259174, filed 27 Feb 68, published 28 Apr 70 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12D377 P)

Translation: This Author's Certificate introduces a device for automatically stabilizing the frequency of a harmonic oscillator with discrete frequency control. The device contains a stabilized wide-band harmonic oscillator with discrete frequency grid, a mixer, an IF amplifier, an automatic phase and frequency control system, and an actuating element for frequency control of the wide-band oscillator. To extend the band coverage of automatic frequency control, an additional electronic switch is connected between the discrete switch and the system for automatic phase and frequency control. This additional switch is used for discrete changeover of the automatic control system from the frequency to the phase mode of operation. V. P.

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USSR

UDC 536.46

SHIROKOV, B. F., and BAKHMAN, N. N. (Moscow)

"Burning Rate of a Fuel Plate in Contact With a Solid Oxidizer Layer"

Novosibirsk, Fizika Goreniya i Vzryva, Vol 8, No 2, Jun 72, pp 247-252

Abstract: The article measures the shape of the recess in polymethyl methacrylate and polystyrene plates burning in contact with $KClO_4$ at elevated pressures ($p = 5 \div 30$ atm). Besides the pressure, the oxidizer layer density was also varied. The charge was a steel cuvette in which only the front wall was made of polymethyl methacrylate or polystyrene. The experiments were staged in a constant-pressure bomb in a nitrogen atmosphere. After a given time interval the pressure in the bomb was sharply reduced (at the rate of $\sim 4 \cdot 10^3 \div 10^4$ atm/sec) and the charge extinguished. The charge quenching device was analogous to the one developed by V. N. MARSHAKOV, except that the diameter of the channel in the relief valve was considerably increased (to 48 mm). The recess profile, burning angle, rate of burning (gasification) of a fuel

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USSR

SHIROKOV, B. F., and BAKHMAN, N. N., Fizika Goreniya i Vzryva, Vol 8, No 2, Jun 72, pp 247-252

plate in the stream of a gaseous oxidizer, and the structure of the recess surface are considered. Kinetic factors play the determining role near the flame "nose," while at rather a great distance from the "nose" the combustion apparently is purely diffusion.

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AA0052384 Shirokov, D.V. UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 2-70

243505 FABRIC HEAT TREATMENT DEVICE comprising nozzle with heating elements and perforated tube inside it to supply the treatment agent. The heating elements are placed between the outlet aperture of the nozzle and the perforated tube. This improves the quality of the fabric. The device consists of metal body 1 with slit nozzle 2. It is covered in insulation 3. Within is distributor tube 4 with apertures getting larger towards the middle. In the nozzle part, divided by ribs 5, is heating element 6. The tube is connected to air pressure hoses 7, with cocks 8. The body is held by two clips pivoted to brackets. Handle 11 may be set in two positions - with the slit of nozzle 12 close to fabric 13 (working position) and away from it (non-working position). The body is fixed in the working position by bolts and

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19820978

AA0052384

Gordeyev, V. A.; Shirokov, D. V.; Nayda, M. A.; Sechin, N. A.
Leningradskiy Institut Tekstil'noy i Logkoy Promyshlennosti im. S. M. Kirova

fabric movement upwards is limited by a pressure plate. The air output temperature is measured by thermo-couples 16 and maintained by a thermal generator. Cold air from the compressor enters the distributor tube and the air chamber is mixed, passes through the electric heater and meets the surface of the fabric at identical parameters all along the nozzle slit. 13.1.67. as 1125940/28-12. GORDEEV, V.A. et al. Kirov Leningrad Textiles and Light Industry Inst. (22.9.69.) Bul.16/5.5.69. Class 86a. 8b. Int.Cl. D02h, D06c.

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19820979

AA0030266

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Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 10/69

UR 0482

234939 SYNTHETIC CLOTH HEAT TREATMENT during weaving is ensured with a jet of hot air directed to the beat-up end, so that warp and weft yarns are softened and yarn tension is equalised. 27.4.66 as 1072525/28-12 V.A. GORDEEV et al. Leningrad Inst. of Textile Industry (30.5.69) Bul. 4/10.1.69. Class 86a, Int. Cl. D 02h.

Authors: V. A. Gordeyev, D. V. Shirokov, S. I. Mozzherova, F. M. Shteyn

Fac: Leningradskiy Institut Tekstil'noy i Legkoy Promyshlennosti Im. S. M. Kirova

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19690158 LM 1

USSR

SHIROKOV, F. V. and SIGNAYEVSKIY, V. A.

"Minimal Coverings of a Finite Set. Connected Coverings. II"

Diskretn. Analiz. [Discrete Analysis -- Collection of Works], No 22, Novosibirsk, 1973, pp 57-78 (Translated from Referativnyy Zhurnal Kibernetika, No 10, 1973, Abstract No 10V353)

Translation: Minimum covering α of set X is called connected if we can go over from any subset to any other by means of a chain of pairwise intersecting subsets. An arbitrary covering breaks down into connected components which are connected minimum coverings of their carriers. The system of all minimum coverings is subjected to further decomposition and analysis. The numbers $D(n|q, r)$, the numbers of minimum coverings with q elements and r connectedness components, are introduced. This work produces many direct and recurrent relationships for the numbers $D(n|q, r)$. The concept of the generalized generating function is introduced, as a function for which the center of the expansion of the corresponding Taylor series can be placed on the boundary of the analytical area. It is shown that certain generating functions arising in this problem have exactly this nature. This work also produces a general exponential formula relating the generating functions of a certain class of systems to the generating functions of the corresponding connected subsystems. Applications of this formula to the determination of the number of topologies in a finite set are indicated. Auther's view

II. Combinatory Analysis and Graph Theory
A. General Combinatory Analysis Theory

USSR

SHIROKOV, F. V., SIGNAYEVSKIY, V. A.

"Minimal Coverage of a Finite Set. 1."

Diskretn. Analiz [Discrete Analysis -- Collection of Works], No 21, Novosibirsk, 1972, pp 72-94 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V318, by the authors).

Translation: A combinatorial denumeration problem is stated and solved. The minimum coverage of a finite set refers to a class of its subsets which is a coverage, but stops being coverage if any one of the subsets included is discarded. The problem is stated of determining the number of all minimum coverages of a set with n points. The system $\Delta = \Delta(X)$ of all minimum coverages of set X breaks down into subsystems Δ_q, $q = 1, 2, \ldots, n$, with the number of elements of the coverage. This work produced direct and recurrent relationships for the corresonding numbers $D(n/q)$. Two formulas are produced, expressing $D(n/q)$ through Stirling numbers of the second kind. The computations are accompanied by direct combinatorial analysis of the objects studied.

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USSR

UDC 389.0(083.76):001.4

SHIROKOV, K. P.

"New State Standard -- Metrology. Terms and Definitions (GOST 16263-70)"

Moscow, Izmeritel'naya Tekhnika, No 10, 1971, pp 3-8

Abstract: The concepts included in GOST [All-Union State Standard] 16263-70, "Metrology. Terms and Definitions," and the principles on the basis of which the standard was developed are discussed. Explanations of some of the terms and definitions and reasons for changes in individual terms are presented. The new standard contains a total of 203 terms in 11 divisions: metrology and its divisions, physical variables, units of physical variables, measurements, forms of measurement media, general structural elements of measurement media, the parameters and properties of measurement media, measurement errors, measurement media errors, standards and sample measurement media, and concepts pertaining to the metrologic service. The standard encompasses the most important general concepts of metrology and is expected to promote order in the terminology both with respect to general problems of metrology and with respect to individual branches of it.

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USSR

SHIROKOV, L. YE.

from which then an equation is produced for $\pi_j(t) = P(J(t) = j \mid \eta_0^t,)$ as well as an equation for the conditional moments $M(\theta_i(t) \mid \eta_0^t, j(t) = j)$, $j = 1,\ldots, n$ and the equation for the conditional covariation matrix, when η_0^t and $j(t)$ are fixed. Thus the equation for $M(\theta_i(t) \mid \eta_0^t, j(t) = j)$, $i = 1,\ldots, n$, fix optimal estimates of random quantities $\theta_i(t)$, $i = 1,\ldots, n$, and $\pi_j(t)$ allow us to find an estimate for $j(t)$. However, the system of equations produced is not closed, since it includes the a posteriori moments of higher order. Therefore it is suggested for an approximate solution of the process that we limit ourselves to the first two semiinvariants of the distribution $P\left\{\bigcap_{k=1}^{n}(\theta_k(t) - \theta_k) \mid \eta_0^t, j(t) = j\right\}$, placing all remaining semiinvariants equal to zero. In other words, it is suggested that we consider approximately that the distributions are Gaussian. In this case the estimates, already approximately optimal, are found from a finite system of differential equations.

USSR

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KONYUKHOV, V. K., MATROSOV, I. V., PROKHOROV, A. M., SHALUNOV, D. T., and SHIROKOV, N. N., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Continuous Gasdynamic Laser With a Mixture of Carbon Dioxide, Nitrogen, and Water"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 12, No 10, 20 Nov 70, pp 461-464

Abstract: This article reports that in a supersonic wind tunnel to which a heated mixture of carbon dioxide and nitrogen with a small quantity of water was blown there was observed an amplification of infrared radiation, and after installation of an optical resonator in the working portion of the tunnel a generation effect was obtained. Studies of the amplification coefficient of a supersonic flow (M = 4-5) were made in a wind tunnel described previously by the authors, with the difference that the gas expanded in a wedge-shaped nozzle with an angle of opening of 13° and a length of the supersonic portion of 5 cm. The stagnation temperature was 1000°K, the stagnation pressure was 5 atm, and the dimensions of the critical cross section were 1.5 x 100 mm. The probing ray of a single-mode, single-frequency CO_2 laser was directed parallel to the greater dimension of the

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USSR

KONYUKHOV, V. K., et al, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 12, No 10, 20 Nov 70, pp 461-464

critical cross section and intersected the gas flow at the point of emission from the nozzle. A study of the change in the absorption coefficient and the amplification of the signal of the CO_2 laser with time showed that absorption in the gas flow decreases to zero and then amplification appears. Introduction of water molecules causes accelerated relaxation of the CO_2 molecules from the lower laser level as the gas flows in the supersonic portion of the nozzle. The amplification coefficient was measured as a function of water content in the mixture. Measurement of the amplification coefficient in this gas mixture was made at a frequency of 947.73 cm^{-1} and showed that inversion in the supersonic flow exists for the pair of levels (00°1)-(10°0) but the amplification coefficient amounts to $6 \cdot 10^{-4}$ cm^{-1} for a water concentration of 2.1%.

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USSR

UDC: 681.355:519.24

VASIL'YEV, P. V., SOLODYANNIKOV, Yu. V., SHIROKOV, S. M., Kuybyshev Electrical Engineering Institute of Communications

"A Computer Device"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 9, Mar 72, Author's Certificate No 331407, filed 22 Jun 70, published 7 Mar 72, p 158

Translation: This Author's Certificate introduces a computer device which contains an adder module, matching devices, memory units, switches, an input device, a registration device, and a control module. As a distinguishing feature of the device the functional possibilities of the unit are extended by connecting one input of each switch through the corresponding matching device to one of the outputs of the adder module and the input of the registration device. The other input and one of the outputs of each switch are connected to the corresponding memory unit, and the other output of each switch is connected to the corresponding output of the input device and through another corresponding matching device to one of the inputs of the adder module. This input of the adder module is also connected to the input device.

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USSR

UDC 681.3:51

KATYS, G. P., ZDOR, S. YE., and SHIROKOV, V. B.

"Optimal Structures of Optoelectronic Retrieval and Recognition Systems"

Moscow, Tsifrovaya Vychislitel'naya Tekhnika i Programmirovaniye, No 7, 1972, pp 172-181

Abstract: The article considers the question of the optimal synthesis of optoelectronic retrieval and recognition systems from the standpoint of the construction of rational structures optimized according to certain information criteria. Information on radiation fields can be obtained by parallel and serial methods. Both methods can be combined into one, in which the field scanning over many parallel channels is accompanied by the simultaneous scanning by these channels, thus permitting a significant expansion of retrieval system capabilities. If there is a priori information, a possible approach to optimization of radiation field scanning involves the compilation of some optimal program. The lack of such data on the field being scanned makes it necessary to introduce self-tuning or learning, consisting in the use of the intermediate scan results to correct the search or recognition procedure. The article discusses questions in the development of scanning programs and self-tuning algorithms in retrieval and recognition systems.

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USSR

UDC: 621.396.69:621.319.4

BYTIN, L. L., KOSHTAKOV, V. I., SHIROKOV, V. I.

"Investigation of Ceramic Disc Capacitors With Plates Made From Base Metals by Using a Low-Temperature Plasma Jet"

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 67-76 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V365)

Translation: The authors present the results of studies of ceramic disc capacitors made on the basis of ceramics grades T-150, T-80, T-40, Ts-70, ST-33, ST-47, ST-75 and UF-53 with plates made by plasma sintering of copper powder with the addition of titanium. The conditions are given for plasma forming of the plates. It is shown that plasma metallizing gives a tearing adhesion strength for the plates to the ceramic of more than 350 g/cm^2, and a loss tangent for the capacitors of less than $12 \cdot 10^{-4}$. It is shown that the mechanical strength, moisture resistance, capacitance and other characteristics of the capacitors meet State Standards 7159-64 and State Standards 2519-67. Resumé.

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1/2 018 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--EFFECT OF WATER AND OXYGEN IN NONPOLAR SOLVENTS ON THE LUMINESCENCE PROPERTIES OF PHTHALIMIDE DERIVATIVES -U-

AUTHOR-(04)-VESELOVA, T.V., REZNIKOVA, I.I., CHERKASOV, A.S., SHIROKOV, V.I.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(3), 649-53

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--PHTHALIC ACID, IMIDE, FLUORESCENCE SPECTRUM, AMINE, SOLVENT ACTION, FLUORESCENCE QUENCHING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0949 STEP NO--UR/0048/70/034/003/0649/0653

CIRC ACCESSION NO--AP0134669

UNCLASSIFIED

2/2 018 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0134669

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SIMILARLY TO PREVIOUS EXPTS. USING DEAERATED SOLNS. (V., R., C., AND S., 1968), ADDN. OF THE MAX. SOL. AMTS. OF WATER TO AIR CONTG. HEXANE AND PHME SOLNS. OF 4,AMINOPHTHALIMIDES RESULTED IN A SHIFT OF THE FLUORESCENCE SPECTRUM TOWARDS LONGER WAVELENGTHS AND AN INCREASED AMT. OF FLUOROMETRIC PHASE (CHARACTERIZING THE DURATION OF LUMINESCENCE) ACROSS THE SPECTRUM. THE SPECTRAL AND PHASE CHARACTERISTICS OF ANHYD., DEAERATED NEUTRAL SOLNS. OF 4,AMINO,N,METHYLPHTHALIMIDE (I), 4,AMINO,N,CYCLOHEXYLPHTHALIMIDE (II), 4,ANILINO,N,METHYLPHTHALIMIDE, 3,AMINO;N,METHYLPHTHALIMIDE, AND 3,(DIPHENYLAMINO),N,METHYLPHTHALIMIDE IN SEVERAL NON POLAR SOLVENTS ARE TABULATED. THE REMOVAL OF WATER AND O SUB2 FROM THE SOLNS. RESULTED IN A REVERSE SHIFT OF THE FLUORESCENCE SPCTRA TOWARDS SHORTER WAVELENGTHS; THUS, IN PHME AND ME SUB2 CO SOLNS. OF I, LTHE SHIFT WAS 700 AND 500 CM PRIME NEGATIVE1, RESP. THE BAS. QUANTUM YIELD AND FLUORESCENCE LIFETIME OF COMPLETELY ANHYD., DEAERATED SOLNS. FO I AND II WERE CONST. IN A GAMMA SUBMAX. RANGE OF 21,000-24,500 CM PRIME NEGATIVE1. THE QUENCHING EFFECT OF O SUB2 DROPPED IN THE ORDER HEXANE GREATER THAN DECALIN GREATER THAN TOLUENE GREATER THAN DIOXANE, AND WAS ALMOST ABSENT IN BUOH AND ETOH. WATER IN THE CONCNS. THAT ARE USUALLY PRESENT IN PREVIOUSLY DRIED SOLVENTS WITH ACCESS OF AIR (E.G., 0.001-0.002 AND 0.01-0.015 VOL PERCNET IN HEXANE AND PHME, RESP.) CAUSED SIGNIFICANT ALTERATION IN THE FLUORESCENCE SPECTRA AND FLUOROMETRIC BEHAVIOR OF THE N SUBSTITUTED AMINOPHTHALIMIDES.

UNCLASSIFIED

USSR

UDC 627.81.034(47+57)

BEYROM, S. G., KASKEVICH, L. N., RYBKA, V. G., SAVKIN, V. M., SHIROKOV, V. M.

"Dynamics of Revision of the Banks of the Novosibirsk Hydroelectric Power Plant Reservoir in 1966"

Izuch. i ispol'z. vodn. resursov SSSR. 1966-1967 V sb. (Study and Use of USSR Water Resources. 1966-1967 -- Collection of Works), Moscow, Nauka Press, 1970, pp 134-135 (from RZh-Elektrotekhnika i Energetika, No 2, Feb 71, Abstract No 2 D45)

Translatnon: A brief description of the level and wind-wave conditions of the reservoir, data on the nature of revision of the reservoir banks and the dynamics of the bottom layer of the layers of water involved in the wave action in the shore zone and data on the alluvial displacements along the shore are presented.

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USSR

UDC 627.81(47+57)

MILUSHKINA, R. YE., SHIROKOV, V. M.

"Natural and Technical-Economic Characteristics of Large Reservoirs of Siberia"

Tr. koordinats. soveshchaniy po gidrotekhn. (Works of Coordinating Meetings on Hydroengineering), No 59, 1970, pp 172-178 (from RZh-Elektrotekhnika i Energetika, No 2, Feb 71, Abstract No 2 D53)

Translation: Data are presented which characterize the structure of agricultural lands flooded by reservoirs; the distribution of expenditures with respect to hydroengineering complexes and reservoirs with respect to different branches (hydroelectric power engineering, water transportation, the fishing industry, water supply, and so on); data on the water conservancy balance (comparison of planned values with actual values); data connected with hydrological changes caused by reservoirs with respect to six large reservoirs being operated in Siberia (Bartsk, Vil'nyus, Irkutsk, Krasnoyarsk, Mamakanskiy Novosibirsk) and 3 large reservoirs being constructed (Sayan, Ust'-Ili and Khantayskiy). A tendency toward reducing the areas of agricultural lands subject to flooding at the reservoirs being newly built is noted. This tendency

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USSR

MILUSHKINA, R, YE., et al., Tr. koordinats. soveshchaniy po gidrotekhn., No 59, 1970, pp 172-178

is connected with the factor of uninhabitability of the areas of their construction. The total volume of water coming into the reservoirs of Siberia is 484.14 km^3 of which 165.95 km^3 gets into the reservoirs in the construction stage. A definite change in times of establishment of the ice cover and clearing of ice in the reservoirs by comparison with natural conditions and also weak utilization of them in transportation and fishing respects are noted. The bibliography has 4 entries.

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USSR

TROITSKIY, V. Ye., TRUBNIKOV, S. V., SHIROKOV, Yu. M.

"The Connection Between Deuteron Form Factors and the Physical S Matrix, Part 2"

Moscow, Teoreticheskaya i Matematicheskaya Fizika, Vol 10, No 2, Feb 72, pp 209-214

Abstract: An expression is obtained in this theoretical paper for the electromagnetic form factors of the matrix element $\langle pn|j_\mu(x)|p'n'\rangle$ through the Jost relativistic matrix for neutron-proton dispersion and through the single-particle form factors of neutron and proton. The relationships obtained relate the values of the form factors for the two-particle matrix element outside the mass surface with the Jost relativistic matrix. The first part of the article, published in the same journal named above (10, 45, 1972) yielded the relativistic parametrization of the matrix element for the electromagnetic current of the neutron-proton system and the two-particle form factors of the free current expressed through the single-particle factors. The present section of the article sets up the equations for finding the interaction form 1/2

USSR

TROITSKIY, V. Ye. et al, Teoreticheskaya i Matematicheskaya Fizika, Vol 10, No 2, Feb 72, pp 209-214

factors, in which the S matrix, in the form of the ratio of the two matrices, is principally used in a sense similar to the Jost matrices. The form factors are found by solving these equations and are expressed through integrals over the physical n-p dispersion region as obtained in the first part of the article. The results obtained by the article as a whole are also discussed. The authors are connected with the Moscow State University and the V. A. Steklov Mathematical Institute of the USSR Academy of Sciences.

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1/2 015 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--JOST FUNCTION FOR THE TWO CHANNEL SCATTERING PROBLEM -U-

AUTHOR-(02)-KHARAKHAN, M.L., SHIROKOV, YU.M.

COUNTRY OF INFO--USSR

SOURCE--TEORETICHESKAYA I MATEMATICHESKAYA FIZIKA, 1970, VOL 3, NR 1, PP 100-105

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--S MATRIX, MATRIX ELEMENT, PARTICLE SCATTER, HAMILTONIAN, INTEGRAL EQUATION, PARTICLE INTERACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1029 STEP NO--UR/0646/70/003/001/0100/0105

CIRC ACCESSION NO--AP0130064

UNCLASSIFIED

2/2 015 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0130064

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GENERALIZATION OF THE JOST FUNCTION IS INTRODUCED FOR THE CASE OF THE TWO CHANNEL SCATTERING OF THE NONRELATIVISTIC SPINLESS PARTICLES INTERACTING THROUGH THE ARBITRARY (NOT NECESSARY LOCAL) INTERACTION HAMILTONIAN. THE PROBLEM OF DERIVING OF THE TWO CHANNEL JOST MATRIX IN TERMS OF THE PHYSICAL S MATRIX IS REDUCED TO THE NONSINGULAR INTEGRAL EQUATION FOR A SINGLE FUNCTION. IT IS DEMONSTRATED THAT THE EXPLICIT FORM FOR THE JOST MATRIX IS OBTAINABLE IF THE USUAL ASSUMPTIONS HOLD ABOUT THE ANALYTICAL PROPERTIES OF THE S MATRIX ELEMENTS.

FACILITY: MOSKOVSKIY GORNYY INSTITUT.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--ALUMINUM NITRATE COMPLEXES -U-

AUTHOR-(04)-RESOLOVSKIY, V.YA., SHIROKOVA, G.N., KARELIN, A.I., KRIVTSOV, N.V.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(3), 622-4

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ALUMINUM NITRATE, ALUMINUM COMPLEX, CESIUM COMPOUND, CHEMICAL DECOMPOSITION, HEAT OF SOLUTION, HEAT OF FORMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/0225 STEP NO--UR/0020/70/191/003/0622/0624

CIRC ACCESSION NO--AT0132497

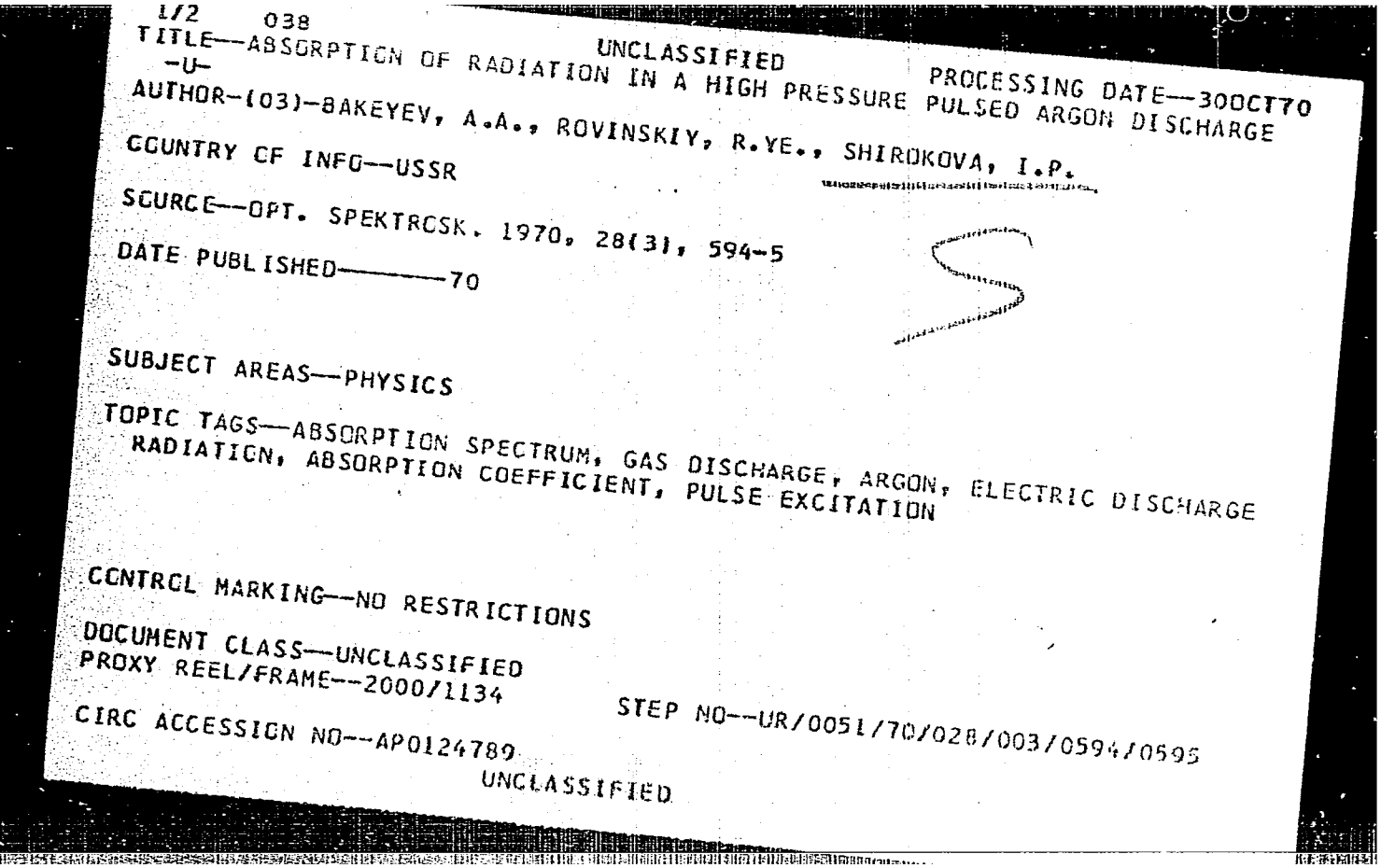
UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AT0132497

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ADDING A 4-8 FOLD EXCESS OF N SUB2 O SUB5, CONTG. HNO SUB3 IMPURITIES, TO AN EQUIMOLAR MIXT. OF CSNO SUB3 AND ALBR SUB3 AT MINUS 196DEGREES GAVE, ON WARMING UP SLOWLY AND REMOVAL OF VOLATILES IN VACUO, CS(AL(NO SUB3) SUB4). MIXING ALBR SUB3 WITH AN EXCESS OF DRY N SUB2 O SUB5 AT MOLAR RATIOS FROM 1:20 TO 1:30, REMOVING VOLATILES IN VACUO AFTER 12 HR AT 0DEGREES, ADDING A NEW PORTION OF N SUB2 O SUB5, AND STIRRING AT 0DEGREES GAVE NO SUB2 (AL(NO SUB3) SUB4), BOTH COMPDS. ARE CRYST., HYGROSCOPIC, SOL. IN H SUB2 O DECOMPG. INTO CS PRIME POSITIVE, AL PRIME3POSITIVE, AND NO SUB3 PRIME NEGATIVE. CS(AL(NO SUB3) SUB4) AT 100DEGREES FORMED NO SUB2 AND O. IT DECOMPD. COMPLETELY AT 300DEGREES GIVING CSNO SUB3 AND AL SUB2 O SUB3. NO SUB2 (AL(NO SUB3) SUB4), M. 85DEGREES, DECOMPD. AT 110-35DEGREES INTO AL SUB2 O SUB3, NO SUB2, AND O; ITS HEAT OF SOLN. IN H SUB2 O AT 25DEGREES IS MINUS 69.0 PLUS OR MINUS 0.1 KCAL.-MOLE AND ENTHALPY OF FORMATION H SUB298 EQUALS MINUS 238.4 PLUS OR MINUS 1.0 KCAL-MOLE. FACILITY: INST. NOVYKH KHIM. PROBL., CHERNOGOLOVKA, USSR.

UNCLASSIFIED



1/2 038 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--ABSORPTION OF RADIATION IN A HIGH PRESSURE PULSED ARGON DISCHARGE -U-

AUTHOR-(03)-BAKEYEV, A.A., ROVINSKIY, R.YE., SHIROKOVA, I.P.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(3), 594-5

DATE PUBLISHED----------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ABSORPTION SPECTRUM, GAS DISCHARGE, ARGON, ELECTRIC DISCHARGE RADIATION, ABSORPTION COEFFICIENT, PULSE EXCITATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1134 STEP NO--UR/0051/70/028/003/0594/0595

CIRC ACCESSION NO--AP0124789

UNCLASSIFIED

2/2 038 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124789

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TEMP. AND WAVELENGTH DEPENDENCE WAS MEASURED OF THE CONTINUOUS ABSORPTION OF RADIATION IN THE PULSED AR DISCHARGE. THEORETICAL AND EXPT. VALUES OF THE WAVELENGTH DEPENDENCE OF THE ABSORPTION COEFF. AT 16,000DEGREESK AGREE WELL IN THE REGION FROM 6000 A TOWARDS LONGER WAVELENGTHS.

UNCLASSIFIED

USSR

Probability Theory and Mathematical Statistics
A. Probability Theory

USSR

PETROV, V. V. and SHIROKOVA, I. V.

"Exponential Rate of Convergence in the Law of Large Numbers"

Vestn. Leningr. Un-ta [Herald of Leningrad University], 1973, No 7, pp 155-157 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V8)

Translation: The purpose of this article is to prove the following two theorems. Theorem 1. Let $\{X_n;\ n = 1, 2, \ldots\}$ be a sequence of independent, identically distributed random quantities, $S_n = \sum_{k=1}^{n} X_k$. Then the following conditions are equivalent: (A) there are positive constants $\rho<1$, ε and C such that $P(S_n \leq n\varepsilon) \leq C\rho^n$ for all sufficiently large n, (B) there is a number $T > 0$ such that $Ee^{tX_1} < \infty$ for $0 \leq t < T$.

Theorem 2. Let $\{X_n;\ n = 1, 2, \ldots\}$ be a sequence of independent

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PETROV, V. V. and SHIROKOVA, I. V., Vestn. Leningr. Un-ta, 1973, No 7, pp 155-157

random quantities, $S_n = \sum_{k=1}^{n} X_k$, and suppose $\frac{S_n}{n} \xrightarrow{P} 0$. If condition (A) is fulfilled, then $Ee^{tx_j} < \infty (j = 1, 2, \ldots)$ for $0 \leq t \leq \frac{1}{2\varepsilon} \log \frac{1}{\rho}$.

Author's view

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USSR

VIKULINA, L. F., GONYAYEV, G. S., LYUZE, L. L., FEDOROV, Ye. V., SHIROKOVA, L. S.

UDC: 621.382.029.6

"Investigation of the 'Second Threshold' Effect in Gallium Arsenide Cavity Oscillators"

Moscow, Radiotekhnika i Elektronika, Vol 16, No 1, Jan 71, pp 131-133

Abstract: An attempt is made to explain the "second threshold" effect reported by Gunn in 1966. The essence of this phenomenon is that an abrupt change in the frequency of oscillations takes place with an accompanying reduction in the average current through some gallium arsenide specimens when the bias voltage exceeds a certain value. The following mechanism is proposed as an explanation of the effect. At bias voltages between the threshold value and the "second" threshold, the specimen is operating in a "resonance-drift" mode. The overall voltage during the negative part of the cycle of the variable component falls below the threshold value, which delays the time for generation of a new domain. Above a certain bias voltage, which differs for different specimens, the amplitude of the variable component may be too small, so that the overall voltage does not fall below the threshold value. Thus there

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VIKULINA, L. F., et al, Radiotekhnika i Elektronika, Vol 16, No 1, Jan 71, pp 131-133

is a jump to the drift mode of operation. The lower amplitude of the oscillations in this mode is due to the reduction in current pulse duration. Frequency jumps do not take place when the specimens are connected in higher-Q oscillator sections, or when the elements of the section are adjusted with a change in voltage.

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USSR

SHIROKOVA, N. I. UDC 669.295+669.017.11

"The Effect of Aluminum on the Structure and Properties of Titanium (Review)

Moscow, Metallurgiya i Khimiya Titana (Institut Titana), Metallurgiya Publishing House, Vol 6, 1970, pp 123-124

Translation: A review is made of literature on the study of the phase diagram of the dual system titanium-aluminum and on the effect of aluminum on certain physical (parameters of the crystalline lattice, specific electrical resistance, Hall effect), mechanical (moduli of elasticity, hardness, strength and plasticity at room temperature, thermal stability, strength at increased temperatures), chemical (corrosion resistance and oxidation resistance), and technological (capacity for plastic deformation and weldability) properties of titanium. Nine illustrations and 56 bibliographic entries.

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1/2 033 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--PHASE EQUILIBRIUM AND HEAT RESISTANCE OF TI RZ AL ALLOYS -U-

AUTHOR-(02)-NARTOVA, T.T., SHIROKOVA, N.I.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, METALLY, MAY-JUNE 1970, P. 194-198

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--TITANIUM ALLOY, ZIRCONIUM CONTAINING ALLOY, ALUMINUM CONTAINING ALLOY, HEAT RESISTANCE, SOLID SOLUTION, BIBLIOGRAPHY, METAL CREEP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605008/C10 STEP NO--UR/0370/70/000/000/0194/0198

CIRC ACCESSION NO--AP0139963

UNCLASSIFIED

2/2 033 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0139963

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL INVESTIGATION OF THE PHASE EQUILIBRIUM AND HEAT RESISTANCE OF THE PROTION OF THE TI-ZR-AL SYSTEM ADJACENT TO THE TITANIUM RICH CORNER. A POLYTHERMAL CROSS SECTION PARALLEL TO THE TI-TI3AL-ZR EDGE IS CONSTRUCTED THERMAL DIFFERENTIAL, MICROSTRUCTURAL, AND X RAY ANALYSIS. THIS CROSS SECTION IS FOUND TO HAVE THE SAME INTERACTION CHARACTERISTICS AS THE TI-AL SYSTEM. AN ISOTHERMAL CROSS SECTION OF THE TI-TI3AL-ZR SYSTEM OBTAINED AT 500 DEG C REVEALS THE PRESENCE OF A LARGE SINGLE PHASE REGION OF A TITANIUM, ZIRCONIUM, AND ALUMINUM SOLID SOLUTION IN A NARROW TWO PHASE ALPHA PLUS ALPHA 2 REGION ADJACENT TO THE TI-TI3AL EDGE. CREEP TESTS AT 700 DEG C AND STRESSES OF 20 KG-SQ MM SHOWED AN ALLOY CONTAINING 86PERCENT, TI 9PERCENT AL, AND 5PERCENT ZR EXHIBITS THE HIGHEST CREEP RESISTANCE. SHORT TIME TENSILE TESTS OF THIS ALLOY SHOWED THAT ITS TENSILE STRENGTH AT ROOM TEMPERATURE IS ROUGHLY 100 KG-SQ MM, AND 80 AND 50 KG-SQ MM AT TEMPERATURES OF 700 AND 800 DEG C, RESPECTIVELY.

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