USSR

UDC 616.921.5-084

PRIYMYAGI, L. S., Candidate of Biological Sciences; GRINSHPUN, L. Ye., Lt Col Med Serv

"Experience in Using Interferon-Stimulating Vaccines to Prevent Influenza During Epidemics"

Moscow, Voyenno-Meditsinskiy Zhurnal, No 7, 1971, p 80

Abstract: Inoculation of homogeneous groups of people 19 to 23 years of age with attenuated virus vaccines (measles, strain USSR-58; poliomyelitis types I and II, Sabin strains; live enterovirus ZhEV-4, M. K. Voroshilova strain) decreased the incidence of influenza almost five-fold compared with controls (not vaccinated) in the 1967, 1969, and 1970 epidemics. Interferon titers decreased with the third injection of a particular vaccine, but they remained at a high level for 4 to 5 weeks if a different vaccine was used after the second injection of the first vaccine. Since the decreased incidence of the disease among the vaccinated was consistent with the results of studies on the circulation of interferon in the blood of these individuals, it was concluded

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PRIYMYAGI, L. S., et al, Voyenno-Meditsinskiy Zhurnal, No 7, 1971, p 80

that the protective effect produced by vaccines of differing antigenic structure from that of influenza was due to the stimulation of endogenous interferon.

USSR

UDC 576.858.095.38.095.18:[615.373.6:457.962

KUL'BERG, A. Ya., PRIYMYAGI, L. S., BARTOVA, L. M., SHELEVA, N. Ye., and FADEYEVA, L. L., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences USSR, Tallin Institute of Epidemiology, Microbiology, and Hygiene, Ministry of Health, Estonian SSR, and Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR

"Study of the Interferon-Inducing Activity of Gamma Globulin and Its Fab[7] Fragment"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 11, 1972, pp 63-66

Abstract: Human gamma globulin in aggregated form is capable of inducing interferon in mice. Its interferonogenic activity is higher than that of the fraction free of aggregates or that of the original gamma globulin. The difference is even more pronounced when it is heated to 63°C. The aggregate-free fraction has virtually no interferonogenic activity, whereas that of the aggregated fraction fraction is 3 to 4 orders higher than that of crude gamma globulin. To evaluate the species specificity of the proteins, the interferonogenic activity of highly purified preparations of lapine and bovine gamma globulins was investigated in experiments on rabbits. Both induced interferon but heterologous gamma globulin was more active than homologous globulin. The Fab[7] fragment of gamma globulin, which constitutes only one-third of the molecule,

USSR

KUL'BERG, A. YA., Byulleten' Eksperimental'noy Biologii i Meditsiny, No 11, 1972, pp 63-66

induced as much interferon as the unsplit molecule. The authors conclude that the interferon-inducing activity is caused by the gamma globulin proper and not by any admixtures that it may contain such as viruses or polysaccharides.

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PROBOTOVA, N.A.

medicine/oncology

SO: JPRS 54304
29 OCT 71

UDC: 616.71-006-098.9-092.18

CYTOCHEMICAL STUDY OF SKELETAL TUMORS

[Article by A.S. Petrova, N.A. Probotova (Moscow); Moscow, Vestnik Akademii Meditsinskikh Nauk SSSR, Russian, No 8, 1971, pp 15-20]

In modern oncology, the cytological method permits not only determination of the presence of tumor cells but also to obtain an idea about the nature of the structure and tissue classification of the neoplasm. Cytochemical analysis is of considerable aid in differential diagnosis of tumors.

In spite of the fact that tumors are more homogeneous than normal tissues with respect to enzymatic characteristics (Grinshteyn), there is reason to believe that a neoplasm consisting of "highly specialized" tissues retains some of the traits of the "maternal" tissue.

We are still at the early phase of using cyto- and histochemical methods in human pathology, nevertheless, the data obtained as the result of a number of investigations of recent years (Brandes and Bourne; Monis et al., 1957, 1959, 1960; Mori et al.; Willighagen et al., N.T. Raykhlin; Elizalde and Hillers; Elizalde and Korman; Cohen et al.) indicate that some human tumors differ in their set of enzymes. This could serve, on the one hand, as an important aid to differential diagnostics and, on the other hand, it could allow us to construct a more objective idea about the analogue of cellular elements of a neoplasm in the tissue from which the tumor originated by virtue of the identity of enzyme set. We have data [on a cytochemical investigation of nonspecific hydrolases (alkaline and acid phosphatase) and SHIK [Schiff's periodic acid] positive substances in the cells of osteogenic sarcoma (20 cases), of osteoblastoclasstoma (9), Ewing's sarcoma (4), and reticulosarcoma (two cases).

We thought it promising to investigate these enzymes in bone tumors, since the presence of phosphatase is an important characteristic of bone tissue, and a mandatory element at specific stages of osteogenesis. The latter suggested that we would encounter different quantities of these enzymes in different bone tumors.

We used the nitrogen coupling [azo combination] method with α-naphthyl phosphate sodium salt as a substrate (Pearce) to determine the activity of acid and alkaline phosphatase.

USSR

UDC 616.988.6-097

GURTSEVICH, V. E., MAZURENKO, N. P., ZHAROVA, Ye. I., PROBATOVA, N. A., and STEPANOVA, G. N., Laboratory of the Virology of Leucoses, Laboratory of Systemic Blood Diseases, and Division of Pathological Anatomy of Human Tumors, Institute of Experimental and Clinical Oncology, Academy of Sciences USSR, Moscow

"Specific Surface Leukosis Antigen and Cellular Malignancy in Mice of the CC57BR Line Infected with Mazurenko Virus"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 3, 1970, pp 100-104

Abstract: Mice of the CC57RB line were injected with Mazurenko virus. The time needed for appearance of specific antigen in cells of various organs and tissues was compared with the appearance of malignant cell transformation, detected morphologically and by transplantation. Using the immunofluorescence method, specific surface antigen was detected before the histological diagnosis of leukemia was made and before the cells became transplantable. This antigen was found in spleen, thymus, lymph nodes, and bone marrow at about the same time. A direct relationship was detected between the quantity of fluorescent cells and the degree of morphological change.

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Acc. Nr: AP0051972 Ref. Code: UR0219

PRIMARY SOURCE: Byulleten' Eksperimental'noy Biologii i Meditsiny, 1970, Vol 69, Nr 3, pp 108-109

SPECIFIC SURFACE LEUKEMIC ANTIGEN AND CELLULAR MALIGNIZATION IN MICE OF THE CC57BR LINE INFECTED WITH MAZURENKO'S VIRUS

V. E. Gurtsevich, N. P. Mazurenko, Ye. I. Zharova, N. A. Probatova, G. N. Stepanova

Institute of Experimental and Clinical Oncology of the Academy of Medical Sciences, of the USSR, Moscow

A specific surface antigen, detected by means of immunofluorescence in mice of the CC57BR line infected with Mazurenko's virus, was revealed before establishing the cytohistological diagnosis of leukemia and before the cells acquired the capacity to transplantation. The referred to antigen was determined in infected mice approximately at the same periods in the spleen, thymus, lymph nodes and bone marrow, this may be interpreted in favor of the autochthonous origin of the leukemia studied. There was established a direct relation between increase of the quantity of fluorescent cells in the organ investigated and intensification therein of morphological changes accompanied by the development of leukemia.

USSR

UDC: 51:801

ARAPOV, M. V., KARAPET'YANTS, A. M., MALINOVSKAYA, Z. M., PROBST, M. A.

"Some Problems in Deciphering K'itan Writing"

V sb. Issled. po mat. lingvist., mat. logike i inform. yazykam (Research on Mathematical Linguistics, Mathematical Logic and Information Languages--collection of works), Moscow, "Nauka", 1972, pp 79-95 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V626)

Translation: Some of the work on studying K'itan texts is presented -- specifically, finding and classifying morphemes of K'itan word forms. K'itan texts in digital transcription werved as the initial material.

The described work was made up of three main stages:

1. Division of blocks into fixed (the stem and possibly some word--forming suffixes) and variable (affixes) parts, establishing identities between a number of symbols, finding stable symbol combinations, and classification of post-fixal morphemes on the basis of their co-occurrence range.

2. Carrying out a formal procedure for dividing the variable parts into classes based on the division of blocks into variable and fixed parts, using the material of the first stage.

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USSR

ARAPOV, M. V. et al., Issled. po mat. lingvist., mat. logike i inform. yazykam, Moscow, "Nauka", 1972, pp 79-95

3. Classification of the variable and fixed parts of blocks in accordance with membership in a nominal or verbal paradigm on the basis of materials of the first stage, utilization of "parallel" passages in the texts, and by comparison with the Mongolian language. In this stage another division of blocks is used (based on the first, but differently constructed). Nearly all stages of the work, particularly the first, were characterized by iterative processes: new governing principles were used to refine those previously found. From the introduction.

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PROCHUKHAN, V.D.

JPRS 59203
6-73

3

XI-16. METHODS OF OBTAINING AND SOME ELECTRICAL PROPERTIES OF $ZnGeP_2$ SEMICONDUCTOR

[Article by V. S. Grigor'yeva, V. D. Prochukhan, A. A. Yakovenko, Leningrad; Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 162]

A study was made of the effect of the growth conditions by the Bridgeman and gas transport reaction method on the quality and habit of crystals of the semiconductor compound $ZnGeP_2$.

A procedure was developed for the manufacture of ohmic contacts with $ZnGeP_2$. Some electrophysical properties of single crystals with orientation of the single crystals obtained by the Bridgeman method were defined. The studies were carried out for the optical studies.

A study was made of the effect of thermal annealing in Zn and P vapor and also the introduction of admixtures of the I, III and VI group elements on the electrical properties of $ZnGeP_2$. It was demonstrated that depending on the chemical nature of the volatile component, the annealing conditions or the introduction of alloying elements, the specific resistance and concentration of the charge carriers can be varied within broad limits.

USSR

UDC: 621.315.592

VUL', S. P., PROCHUKHAN, V. D., SHMARTSEV, Yu. V., Physicotechnical Institute imeni A. F. Ioffe, Academy of Sciences of the USSR, Leningrad

"Thermodefects in $CdSnAs_2$"

Moscow, Doklady Akademii Nauk SSSR, Vol 204, No 5, Jun 72, pp 1094-1096

Abstract: A standard method of research which consists in "freezing" the high-temperature equilibrium state of the class of $A^{II}B^{IV}C_2^V$ semiconductor compounds was used to study point defects in $CdSnAs_2$. Single crystals grown by the method of zone crystallization were used with electron concentration of $4.5 \cdot 10^{17}$-$6.9 \cdot 10^{18}$/cc at room temperature. Carrier concentration and mobility of charges before and after heat treatment were calculated from measurements of the Hall coefficient and resistivity. The coefficient of diffusion of point defects was found to be of the order of $2 \cdot 10^{-7}$ cm^2/s, which is typical of the vacancy mechanism of diffusion. It was found that as annealing time increases, the electron concentration first falls to a certain minimum and then increases. The ratio of the annealing time for minimum concentration to the logarithm of the initial electron concentration is a constant. This behavior of electron concentration is attributed to the effect of two competing processes. In the first stage the arsenic va-

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VUL', S. P. et al., Doklady Akademii Nauk SSSR, Vol 204, No 5, Jun 72, pp 1094-1096

cancies formed during crystal growth are healed, and in the second stage tin replaces the vacant sites of cadmium. States produced by quenching after annealing from a temperature of 300°C in arsenic vapor are stable at room temperature. The authors thank I. I. Kozhina for performing the x-ray structural analysis of the crystals.

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USSR

UDC [537.226+537.311.33]:[537+535]

KRADINOVA, L. V., PROCHUKHAN, V. D., RADUL, V. A.

"On the Effect of Deviations From Stoichiometry on the Properties of the $ZnSnP_2$ Semiconductor"

V sb. Nekotor vopr. khimii i fiz. poluprovodnikov slozhn. sostava (Certain Problems of the Chemistry and Physics of Semiconductors of Complex Composition -- Collection of Works), Uzhgorod, 1970, pp 114-117 (from RZh Fizika, No 12, Dec 71, Abstract No 12Ye1317)

Translation: The effect of an excess of one or another elements forming the crystalline lattice of $ZnSnP_2$ on charge carrier concentration and mobility is investigated. An excess of Zn or P can be produced both in the process of growing the crystals and in annealing the latter in vapors of volatile components. The results of the study are given in a table. It is shown that displacement processes and vacancy formation in the crystal lattice, which must be taken into account in the alloying of this compound, have a considerable effect on the semiconducting properties of $ZnSnP_2$. A. Ya. O.

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1/2 036 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--INFRARED ABSORPTION IN CDSIAS SUB2 -U-

AUTHOR-(04)-AVERKYEVA, G.K., KARYMSHAKOV, R.K., PROCHUKHAN, V.D., SERGINOV, M.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(3), 591-3

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--IR ABSORPTION, CADMIUM COMPOUND, SILICON COMPOUND, ARSENIDE, FORBIDDEN ZONE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/0893 STEP NO--UR/0449/70/004/003/0591/0593

CIRC ACCESSION NO--AP0115403

UNCLASSIFIED

2/2 036 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0116403

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ABSORPTION SPECTRUM OF CDSIAS SUB2 WITH CHALCOPYRITE STRUCTURE, GROWN FROM A SOLN. OF CDAS, WAS OBTAINED AT ROOM TEMP. AND 0.7-15 MU. THE TRANSMISSION COEFF. EXHIBITED A SHARP INCREASE AT SIMILAR TO 0.8 MU, CORRESPONDING TO THE OPTICAL WIDTH OF THE FORBIDDEN ZONE. THEREAFTER, THE TRANSMISSION COEFF. INCREASED LESS RAPIDLY, REACHING A MAX. OF 48PERCENT AT SIMILAR TO 12 MU. AT 12.8 MU ABSORPTION WAS OBSD. WHICH CAN BE RELATED TO LATTICE VIBRATIONS OR COMPLEXES. MEASUREMENTS OF ABSORPTION COEFFS. IN THE PHOTON RANGE 1.45-1.65 EV WERE MADE TO OBTAIN A MORE ACCURATE DETN. OF THE FORBIDDEN ZONE WIDTH; THE OPTICAL WIDTH OF THE FORBIDDEN ZONE IN THE LARGE ABSORPTION REGION CORRESPONDED TO AN ABSORPTION COEFF. OF 6 TIMES 10 PRIME2 CM PRIME NEGATIVE1. DOUBLE REFRACTION WAS NOTED BUT NOT MEASURED QUANT. FACILITY: FIZ. TEKH. INST. IM. IOFFE, LENINGRAD, USSR.

UNCLASSIFIED

Acc. Nr: AT0048318 Abstracting Service: CHEMICAL ABST. 5-70 Ref. Code: UR0020

103334c Preparation of $CdSiAs_3$ in the vitreous state. Boltovets, N. S.; Goryunova, N. A.; Prochukhan, V. D.; Serginov, M. (Fiz.-Tekh. Inst. im. Ioffe, Leningrad, USSR). *Dokl. Akad. Nauk SSSR* 1970, 190(3), 619–20 [Phys Chem] (Russ). A vitreous form of $CdSiAs_2$ is produced by hardening a melt contg. stoichiometric amts. of the elements and also $CdSiAs_2$ which is prepd. according to a method described by G. K. Averkieva, *et al.* (1969). This semiconductor possesses a softening temp. around 500°, which significantly exceeds the softening temp. of other glasses of this type. C. J. Steinberg

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REEL/FRAME
19800020

18

USSR

UDC: 533.6.011.8

ZUYEV, N.D., KALUGIN, V.M. and PROCHUKHAYEV, M.V.

"Investigation of Rarefied Gas Flow Around Flat Plate With Sharp Leading Edge"

Novosibirsk, Sb. Eksperim. Issled. i Vopr. Modelir. Techeniy Razrezhennogo Gaza (Symposium on Experimental Investigation and Modeling Problems of Rarefied Gas Flow), 1971, pp 3-9 (from Referativnyy Zhurnal-Mekhanika, 1973, Abstract No 2B267 by V.S. Galkin)

Translation: Results of investigation on the effect of the temperature factor $T_w \approx 0.11 \div 1$ on the flow field parameters around a flat model at $M_\infty \approx 4,5$ and 8, designed for $R_\infty \approx 40$ and 400 respectively at 1 cm in a vacuum wind tunnel, are presented. The model is a flat plate with a sharp leading edge (thickness $\delta \approx 0.05$ cm, $\delta/\lambda_\infty < 0.25$, λ -length), the half-opening angle of the wedge at the leading edge $\varphi \approx 10^\circ$, liquid nitrogen circulating through internal channels maintains a temperature of $T_w \approx 78^\circ$K at the basic part of the surface, $T_w \approx 140^\circ$K near the leading edge. Measurements were made by means of total pressure probes, free-molecule thermoprobe made of 10 micromm diameter wire and by the glow discharge method (see Kalugin, V.M.,

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USSR

ZUYEV, N. D., et al., Sb. Eksperim. Issled. i Vopr. Modelir Techeniy Razrezhennogo Gaza, 1971, pp 3-9

Zh. Prikl. Mekh. i Tekhn. Fiz (Journal of Applied Mechanics and Technical Physics), 1969, No 2, pp 106-109, Referativnyy Zhurnal-Mekhanika, 1969, Abs. No 11B 383).

Data on the shape and thickness of the compression jump and profiles of temperature, density and pressure are presented. Reduction of $\bar{T}_w$ from 1 to 0.11 results in appreciable reduction of shock layer thickness. The use of similarity parameter proposed by Probstin

$$M_\infty \left(\bar{T}_w^{1/2} C_\infty / R_\infty \right)^{1/2}$$

where C_∞ is the Chapman-Rubezin constant, makes it possible to correlate the effects of M_∞ and $\bar{T}_w$ on the shape of the compression jump. With $\bar{T}_w = 1$ at the surface of the model a strong temperature jump is observed. There is a considerable transversal pressure gradient in the nonviscous layer. 8 references.

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USSR

UDC 533.6.011.8

VARTANOVA, S. V., POPOV, I. V., PROCHUKHAYEV, M. V., Moscow

"Study of the Effect of the Angle of Opening of Conical Nozzles on the Flow Parameters of a Rarefied Gas"

Moscow, Mekhanika zhidkosti i gaza, No. 5, Sep/Oct 72, pp 175-178

Abstract: A study of gas flow in conical nozzles with half-opening angles $\alpha = 15\text{-}35°$ in the range of Mach numbers from 4-11 at static pressures at the cutoff section $p = 0.2\text{-}100$ n/m^2 is described. It is noted that there are many difficulties both in principle and of an engineering nature in producing a hypersonic flow of a low density gas in nozzles of wind tunnels. The growth of the boundary layer at the walls of the supersonic nozzle essentially limits the possibility of producing flows with large Mach numbers and sufficient isentropic cores. It is also observed that one of the methods of improving flow characteristics is cooling the nozzle walls so that the thickness of the boundary layer decreases and the effective angle of opening of the nozzle increases with a decrease in the temperature factor $t_w = T_w/T_0$. The

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VARTANOVA, S. V., et al, Mekhanika zhidkosti i gaza, No. 5, Sep/Oct 72, pp 175-178

effect of deep cooling (t_w = 0.135) on the flow parameters was investigated for a nozzle with an angle of opening $\alpha = 20°$. The calculations provide an empirical relationship for calculating conical nozzles in the range of angles of half-opening from 15 to 35° and values of t_w from 0.135 to 1. Photographs are given showing that a shock wave of low intensity was formed in a nozzle with $\alpha = 15°$, which is attributed to the interaction of the boundary layer with the nonviscous flow. A decrease in the thickness of the boundary layer in the region of the output cross section at the nozzle with deep cooling led to a decrease in the curvature of the outer boundary of the boundary layer and to a weakening of its interaction with the flow. An increase in the angle of the half-opening led to an increase in the interaction of the boundary layer with the flow and hence to an increase in the intensity of the shock wave. The photograph of the flow for $\alpha = 35°$ shows that at high angles of opening of the nozzle ($\alpha \geq 30°$), the flow formation approximates in character the flow formation in free jets.

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USSR

UDC: 532.57:533.5

PROCHUKHAYEV, M. V.

"Use of Pitot and Flow-Rate Tubes for Determining the Density and Rate of Flow of a Rarefied Gas"

Minsk, Inzhenerno-fizicheskoy zhurnal, Vol 19, No 6, Dec 70, pp 998-1001

Abstract: The density and rate of flow of a rarefied gas are experimentally determined in a vacuum shock tube using a Pitot tube and a flow-rate tube with sharp edges and a divergent inner channel (half-aperture angle $\varphi = 25^\circ$) at Mach numbers M_∞ from 3.1 to 9.0, and Reynolds numbers $Re_{\infty l\,cm}$ from 45 to 1500. It is shown that a flow-rate tube can be used not only for determining density and flow rate in an isentropic flow, but also for studying the flow in a fairly thick boundary layer at Mach numbers $M_\infty > 1$.

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Acc. Nr. AP0105540 Abstracting Service: CHEMICAL ABST. Ref. Code UR0419

125458y Effect of water vapor on the dehydration of $NiNa_3P_3O_{10}.12H_2O$. Pavlyuchenko, M. M.; Pysyak, Ya. S. Zonov, Yu. G.; Prodan, E. A. (Inst. Obshch. Neorg. Khim., Minsk, USSR). *Vesti Akad. Navuk Belarus. SSR, Ser. Khim. Navuk* 1970, (1), 29–37 (Russ). The kinetics were studied of low-temp. dehydration of $NiNa_3P_3O_{10}.12H_2O$ in an atm. of water vapor at pressures of 2.6, 4.6, 7.4, and 13.9 mm Hg. The process is studied by means of paper chromatographic, x-ray, and ir anal. Preliminary thermogravimetric expts. show that within the limits of the pressures studied an inhibiting action of water vapor predominates. The kinetic parameter, as also in the case of dehydration in vacuum, has 2 aspects; the beginning section of relatively rapid dehydration and the final section of slow loss of wt. Increase in vapor pressure leads to a broadening of the first section at the expense of a redn. of the final section. An increase in the pressure of the water vapor in the limits studied leads to a decrease in the rate of dehydration of $NiNa_3P_3O_{10}.12H_2O$.

C. J. Steinberg

REEL/FRAME
19880555

1/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--OPTIMALITY CONDITIONS IN PROBLEMS OF LINEAR SYNTHESIS IN PRESENCE OF MEASUREMENT ERRORS -U-

AUTHOR--PRODAN, N.V.

COUNTRY OF INFO--USSR

SOURCE--AVTOMATIKA I TELEMEKHANIKA, 1970, NR 3, PP 38-41

DATE PUBLISHED--------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--OPTIMAL AUTOMATIC CONTROL, ERROR, MEASUREMENT, NEGATIVE FEEDBACK, POSITIVE FEEDBACK

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1484 STEP NO--UR/0103/70/000/003/0038/0041

CIRC ACCESSION NO--AP0106240

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0106240
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS, OBTAINED IN (1), ARE GENERALIZED IN THE PRESENCE OF MEASUREMENT ERRORS IN THE FEEDBACK CIRCUIT.

UNCLASSIFIED

1/2 025 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--FREQUENCY MODULATED TRANSISTORIZED RC OSCILLATOR -U-

AUTHOR-(03)-MARINOV, YU.P., ANGELOV, A.I., PRODANOV, I.F.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, RADIOTEKHNIKA, VOL 25, NO 2, 1970, PP 69-74

DATE PUBLISHED-------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--ELECTRONIC OSCILLATOR, TRANSISTORIZED CIRCUIT, VOLT AMPERE CHARACTERISTIC, ELECTRIC INVERTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0188 STEP NO--UR/0108/70/025/002/0069/0074

CIRC ACCESSION NO--AP0134002

UNCLASSIFIED

2/2 025 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0134002

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN EXPERIMENTAL CHECKING OF THE THEORETICAL EXPRESSIONS FOR THE AMPLITUDE AND PHASE FREQUENCY CHARACTERISTICS OF A LOADED PHASE INVERTING BRIDGE WAS CARRIED OUT. THE INVESTIGATED TRANSISTORIZED RC OSCILLATOR INCORPORATES TWO BRIDGE TYPE RC PHASE INVERTERS. THE FUNCTIONS OF THE FOUR TRANSISTORS ARE AS FOLLOWS: THE FIRST TRANSISTOR WITH COMMON EMITTER AND CONTROLLED NEGATIVE FEEDBACK FUNCTIONS AS AN AMPLIFIER, THE SECOND AND THE THIRD TRANSISTORS FUNCTION AS BRIDGE TYPE PHASE INVERTERS, AND THE FOURTH TRANSISTOR FUNCTIONS AS AN EMITTER FOLLOWER: THE LATTER HELPS TO REDUCE INTERACTION BETWEEN STAGES OF TRANSISTORS ONE AND THREE. THIS OSCILLATOR WAS BUILT WITHOUT A NONLINEAR INERTIA ELEMENT, SO AS TO PROVE THE POSSIBILITY OF AMPLITUDE COMPENSATION IN AN OSCILLATOR WITH LOADED BRIDGES. THE OSCILLATOR FREQUENCY CAN BE CONTROLLED WITH EITHER A RESISTANCE TYPE OR CAPATIVE TYPE TRANSDUCER. THE FUNDAMENTAL ADVANTAGES OF THIS FM RC OSCILLATOR ARE: 1. FREQUENCY DEVIATION IS MORE THAN 100PERCENT. 2. FREQUENCY CONTROL IS ACHIEVED BY A SINGLE ELEMENT. 3. FREQUENCY DRIFT DEPENDS ON IMPERFECTION OF RESISTORS AND CAPACITORS OF THE PHASE INVERTERS AND IS RATHER SMALL. 4. THE PARASITIC AM DOES NOT EXCEED 1.5PERCENT FOR FREQUENCY DEVIATION OF 100PERCENT. 5. THE POSSIBILITY OF USING THERMAL NONLINEAR ELEMENTS WITH SHORT TIME CONSTANT TO STABILIZE THE OUTPUT VOLTAGE.

UNCLASSIFIED

USSR

UDC: 621.373.421.15

MARINOV, YU. P., ANGELOV, A. I., PRODANOV, I. F.

"Frequency-Modulated Transistorized RC-Oscillator"

Moscow, Radiotekhnika, Vol 25, No 2, 1970, pp 69-74

Abstract: An experimental checking of the theoretical expressions for the amplitude and phase-frequency characteristics of a loaded phase-inverting bridge was carried out. The investigated transistorized RC-oscillator incorporates two bridge-type RC-phase inverters. The functions of the four transistors are as follows: the first transistor with common emitter and controlled negative feedback functions as an amplifier, the second and the third transistors function as bridge-type phase inverters, and the fourth transistor functions as an emitter follower; the latter helps to reduce interaction between stages of transistors one and three. This oscillator was built without a nonlinear inertia element, so as to prove the possibility of amplitude compensation in an oscillator

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USSR

MARINOV, YU. P., et al, Radiotekhnika, Vol 25, No 2, 1970, pp 69-74

with loaded bridges. The oscillator frequency can be controlled with either a resistance-type or capacitive-type transducer.

The fundamental advantages of this FM RC-oscillator are: 1. Frequency deviation is more than 100 percent. 2. Frequency control is achieved by a single element. 3. Frequency drift depends on imperfection of resistors and capacitors of the phase inverters and is rather small. 4. The parasitic AM does not exceed 1.5 percent for frequency deviation of 100 percent. 5. The possibility of using thermal-nonlinear elements with short time constant to stabilize the output voltage.

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USSR

UDC 519.24

GERANIN, V. A., GONCHAROVA, A. Ya., MIRONOV, N. A., PRODEUS, A. N..

"Influence of Errors in Quantization of a Random Process on Accuracy of Measurement of Correlation Function"

Metody Predstavleniya i Apparaturn' Analiz Sluchayn. Protsessov i Poley, 3-y vses Simpozium. Sekts. 3, [Methods of Representation and Hardware Analysis of Random Processes and Fields. Third All-Union Symposium, Section 3--Collection of Works], Leningrad, 1970, pp 71-76, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V196 by A. Dorogovtsev).

Translation: The dispersion of the estimate of a correlation function of a stable process is studied, constructed on the basis of discrete observations of the process, distorted either by additive random addition or produced at random moments in time, differing slightly from fixed nonrandom moments.

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USSR

UDC: 51

Prodius, M. M., Volkolupova, R. T.

"Mathematical Description of Flow Distribution in a Grid System"

Pribory i Sistemy Avtomatiki. Resp. Mezhved. Temat. Nauch.-tekhn. Sb. [Automation Devices and Systems. Republic Interdepartmental Thematic Scientific and Technical Collection], 1972, No 24, pp 165-170 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V498, by the authors)

Translation: A mathematical description and model of processes of gas distribution in a complex gas collecting network are studied. A system of nonlinear algebraic equations is produced, reflecting the interaction of variable factors in the process in question.

1/1

USSR

Theoretical Automation

UDC 62.5.681.3.007

MASLOV, A. A., PROFIMOVA, R. P.

"Problem of Calculation of Linearly Approximated Functions with Even Distribution of Error on Low-Power Computer"

Tr. Mosk. Aviats. In-ta [Works of Moscow Aviation Institute], No. 194, 1970, pp 101-105 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No. 4, 1971, Abstract No. 4B67 by BG).

Translation: A method is presented for calculating linearly approximated functions (LAF) for exponential functions and functions described by exponential series by iteration. The method allows LAF to be produced with evenly distributed error throughout their entire intervals with the required degree of accuracy and calculated on low-power computers. The essence of the method is as follows: for an analytically fixed function $y=f(x)$ with established limiting values with respect to X and Y and number of intervals N, the initial data accepted are the equal division intervals along the X-axis. During iteration calculation, displacement of the boundaries of intervals occurs (with the exception of the limiting values of the functions) to the right (or the left) along the X-axis; the monotonic approximation to the desired values provides convergence of the iteration process. The error in the approximation is equalized by displacing the common boundary ($\Delta x_{m,i}$) of the mth and (m-1)th intervals on the iteration

1/2

USSR

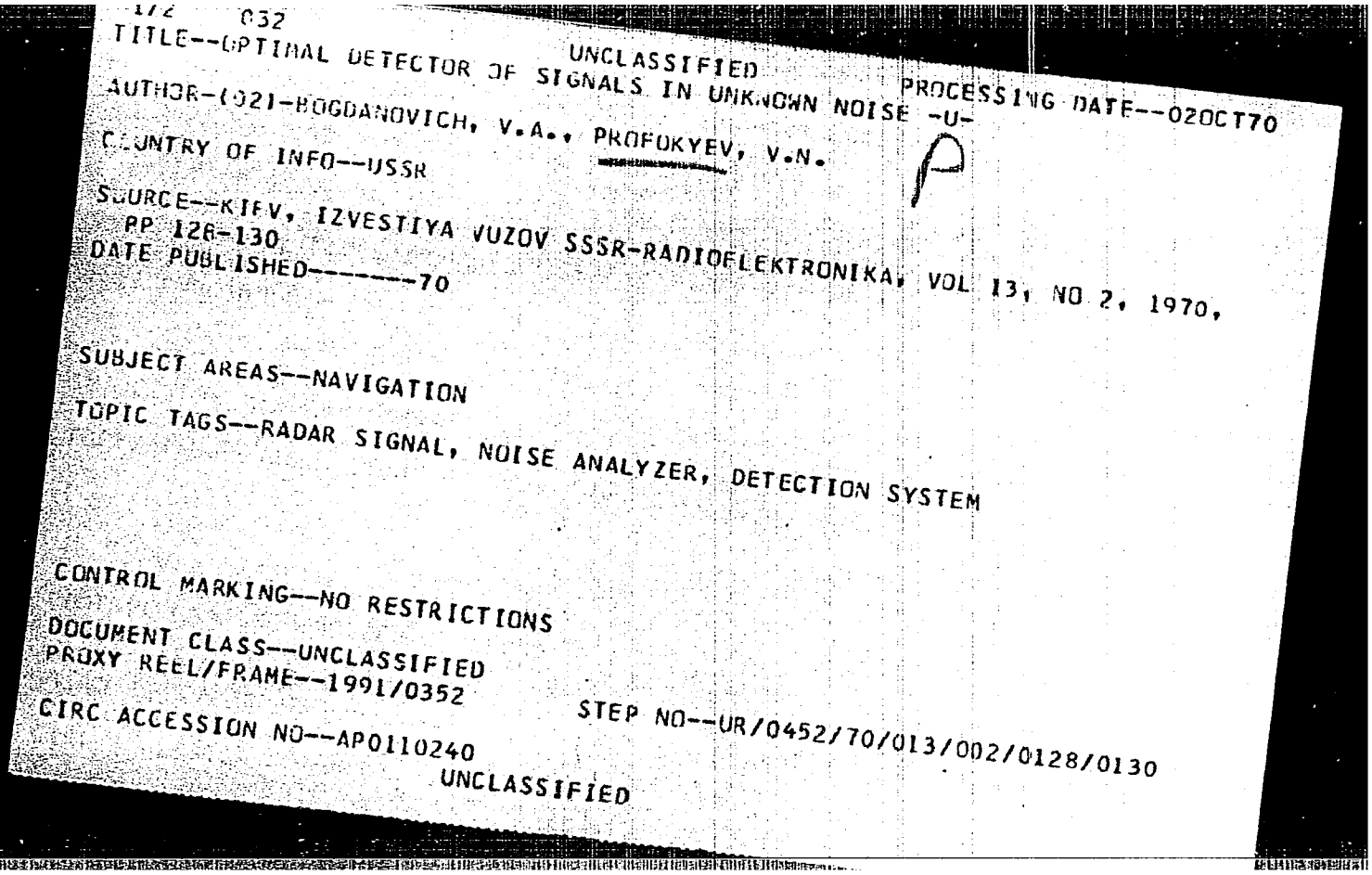
UDC 62.5.681.3.007

MASLOV, A. A., PROFIMOVA, R. P., Tr. Mosk. Aviats. In-ta, No. 194, 1970, pp 101-105.

step in accordance with the formula $\Delta x_{m,i}=\frac{\varepsilon_{m,i}-\varepsilon_{(m-1)i}}{\Delta k_{m-i}}$:

where $\varepsilon_{m,i}$ and $\varepsilon_{(m-1),i}$ are the errors in approximation in intervals m and (m-1), $\Delta k_{m,i}$ is the increment in the slope of the LAF upon transition from interval (m-1) to interval m. A flow chart is presented for a program for calculation of LAF intervals and described for the "NAIRI" computer. 2 figs, 1 table, 2 biblio refs.

2/2



172 032
UNCLASSIFIED
TITLE--OPTIMAL DETECTOR OF SIGNALS IN UNKNOWN NOISE -U-
PROCESSING DATE--02OCT70
AUTHOR-(02)-BOGDANOVICH, V.A., PROFOKYEV, V.N.
COUNTRY OF INFO--USSR
SOURCE--KIEV, IZVESTIYA VUZOV SSSR-RADIOELEKTRONIKA, VOL 13, NO 2, 1970, PP 126-130
DATE PUBLISHED-------70
SUBJECT AREAS--NAVIGATION
TOPIC TAGS--RADAR SIGNAL, NOISE ANALYZER, DETECTION SYSTEM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1991/0352
STEP NO--UR/0452/70/013/002/0128/0130
CIRC ACCESSION NO--AP0110240
UNCLASSIFIED

2/2 032 UNCLASSIFIED

CIRC ACCESSION NO--AP0110240 PROCESSING DATE--02OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS SHORT ARTICLE OFFERS THE FUNCTIONAL SYSTEM FOR A COHERENT DETECTOR OF RADAR SIGNALS OF UNKNOWN AMPLITUDE IN ADDITIVE NORMAL NOISE OF UNKNOWN POWER. THE DETECTOR OPERATES IN ACCORDANCE WITH THE UNIFORMLY MAXIMUM POWER UNDISPLACED DETECTION RULSE AND DOES NOT REQUIRE A PRIORI INFORMATION CONCERNING THE NOISE LEVEL OR THE SIGNAL AMPLITUDE. THE FOLLOWING ASSUMPTIONS ARE MADE: THE SIGNAL REFLECTED FROM THE TARGET IS A PERIODIC SEQUENCE OF PULSES WITH UNKNOWN AMPLITUDES; THE NOISE IS ADDITIVE AND NORMAL, WITH UNKNOWN DISPERSION; THE RECEIVED OSCILLATIONS ARE GIVEN COHERENT PROCESSING. THE OPTIMUM DETECTOR HAS THE FOLLOWING IMPORTANT CHARACTERISTICS: IT IS INDEPENDENT OF THE PRIORI UNKNOWN PARAMETERS OF THE AMPLITUDE AND DISPERSION; IT GUARANTEES THAT THE FALSE ALARM PROBABILITY WILL BE NO HIGHER THAN A SPECIFIED VALUE; IT IS MOST EFFICIENT FOR ANY ACTUAL AMPLITUDE AND DISPERSION. A BLOCK DIAGRAM OF THE DETECTOR SYSTEM IS GIVEN.

UNCLASSIFIED

USSR

UDC 669.046.5

MAKSIMOV, Yu. M., AKINFIYEV, V. I., DUNETS, A. M., and PROGONOV, V. V.

"Intensification of Metal Desulfuration by Blowing With Dust-Like Lime in an Oxygen Stream"

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 130-132

Translation of Abstract: Data on test heats with separation of limestone from the charge are given, during which the metal desulfuration process ran successfully in the case of a high rate of lime feeding into the bath. Data are presented on determining the relation between the rates of metal desulfuration and CaO feeding by the method of correlation analysis. Test results on the possibility of controlling the correlation of desulfuration and decarburization rates by varying the CaO concentration in the oxygen stream are presented. 1 figure, 2 references.

1/1

1/2 041 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--FEATURES OF THE K STATE IN ALLOYS OF THE TYPE NI3CR ALLOYED WITH ALUMINUM -U-

AUTHOR--PROGRUSHCHENKO, A.V.

COUNTRY OF INFO--USSR

SOURCE--IZV. VUZ. FIZIKA, VOL 13, NO. 1, 1970, P. 14-18

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--HIGH TEMPERATURE METAL, ALUMINUM ALLOY, NICKEL ALLOY, CHROMIUM ALLOY, CRYSTAL LATTICE STRUCTURE, ALPHA IRRADIATION/(U)NI3CR ALLOY

CONTROL MARKING--NO RESTRICTIONS

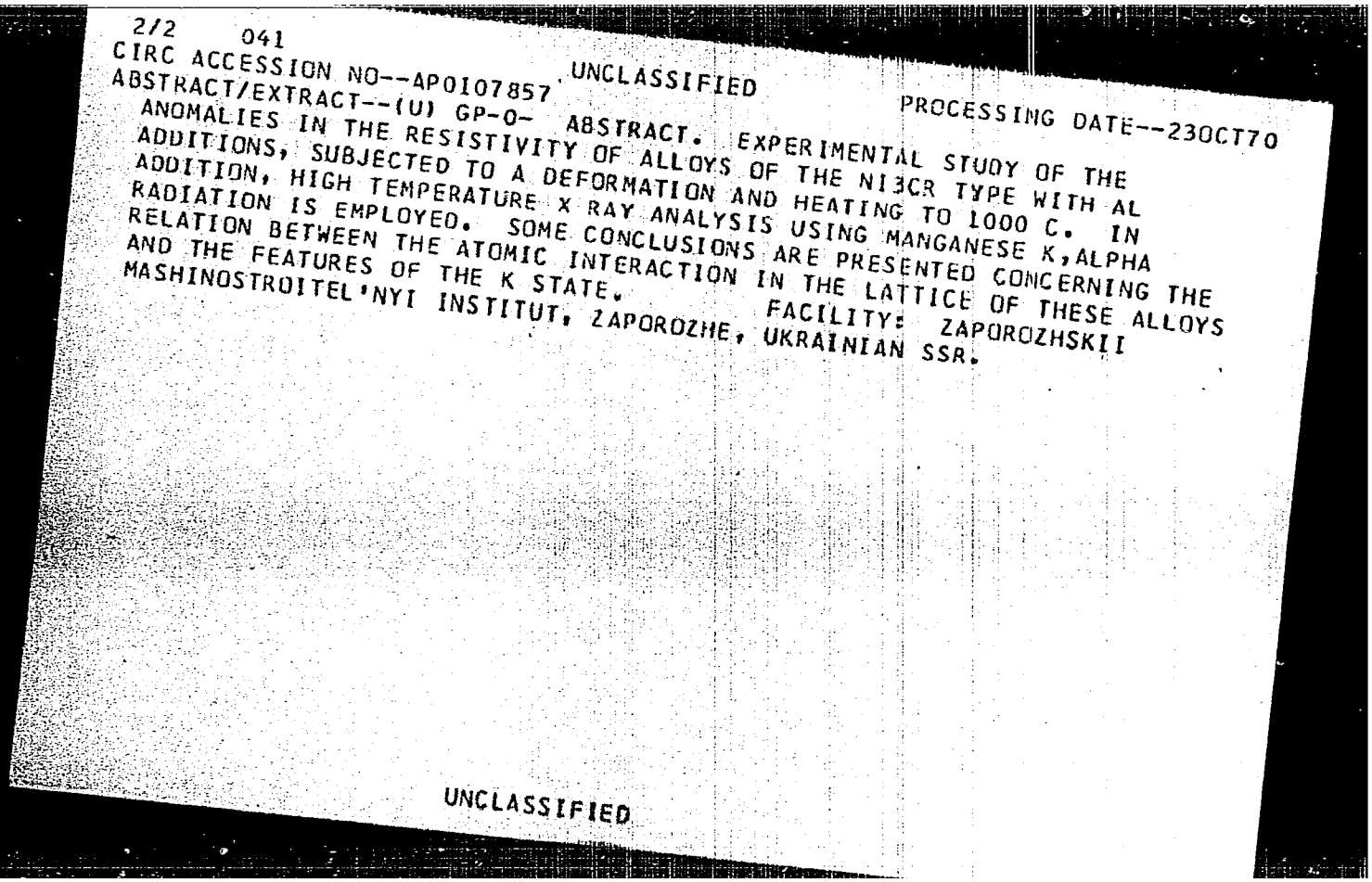
DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/1384

STEP NO--UR/0139/70/013/001/0014/0018

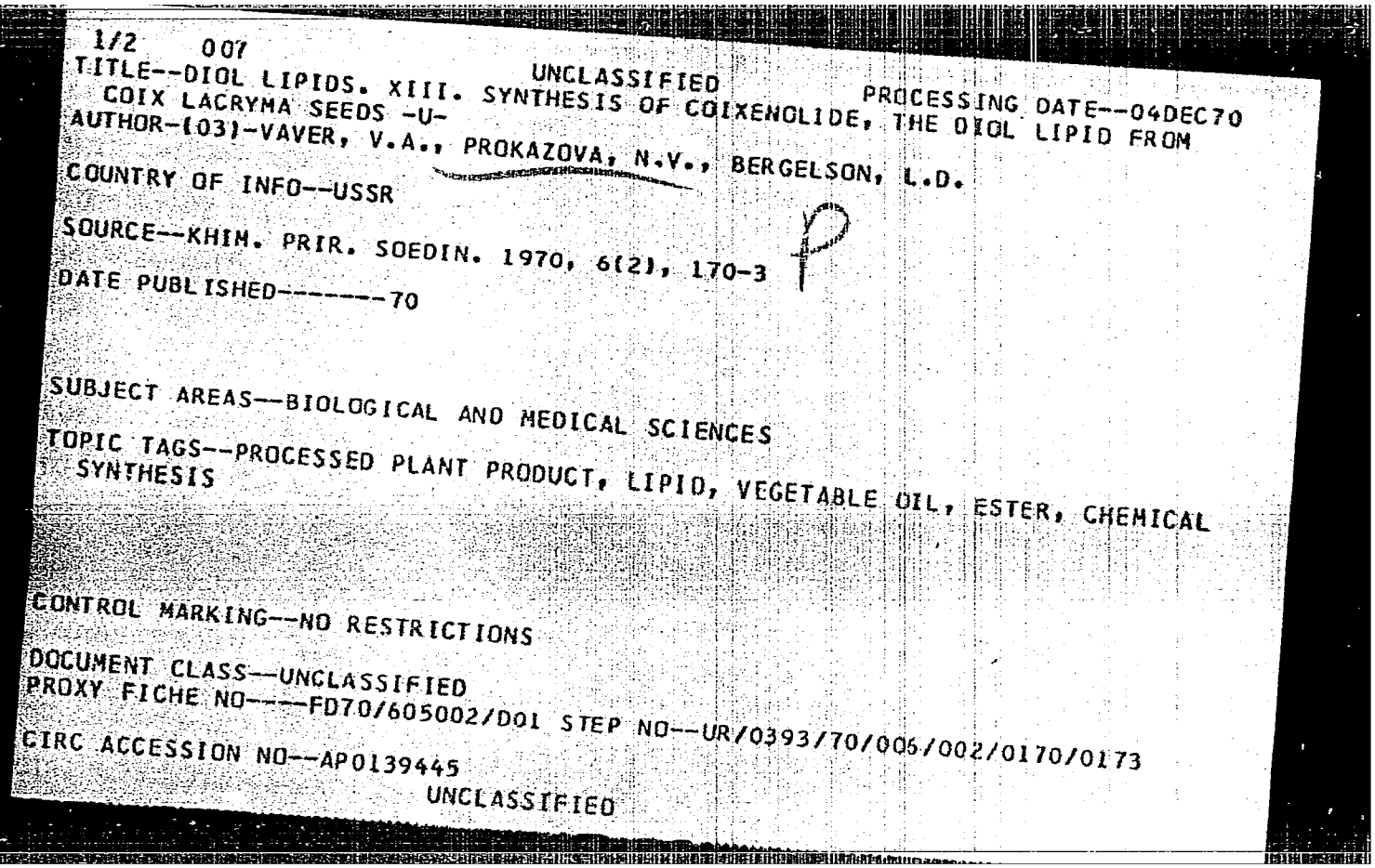
CIRC ACCESSION NO--AP0107857

UNCLASSIFIED



2/2 041 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0107857
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL STUDY OF THE ANOMALIES IN THE RESISTIVITY OF ALLOYS OF THE NI3CR TYPE WITH AL ADDITIONS, SUBJECTED TO A DEFORMATION AND HEATING TO 1000 C. IN ADDITION, HIGH TEMPERATURE X RAY ANALYSIS USING MANGANESE K,ALPHA RADIATION IS EMPLOYED. SOME CONCLUSIONS ARE PRESENTED CONCERNING THE RELATION BETWEEN THE ATOMIC INTERACTION IN THE LATTICE OF THESE ALLOYS AND THE FEATURES OF THE K STATE. FACILITY: ZAPOROZHSKII MASHINOSTROITEL'NYI INSTITUT, ZAPOROZHE, UKRAINIAN SSR.

UNCLASSIFIED



1/2 007 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--DIOL LIPIDS. XIII. SYNTHESIS OF COIXENOLIDE, THE DIOL LIPID FROM COIX LACRYMA SEEDS -U-

AUTHOR-(03)-VAVER, V.A., PROKAZOVA, N.Y., BERGELSON, L.D.

COUNTRY OF INFO--USSR

SOURCE--KHIM. PRIR. SOEDIN. 1970, 6(2), 170-3

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PROCESSED PLANT PRODUCT, LIPID, VEGETABLE OIL, ESTER, CHEMICAL SYNTHESIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605002/D01 STEP NO--UR/0393/70/006/002/0170/0173

CIRC ACCESSION NO--AP0139445

UNCLASSIFIED

2/2 007 UNCLASSIFIED

CIRC ACCESSION NO--AP0139445 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COIXENOLIDE (I), A MIXED ESTER OF CIS,9,HEXADECENOIC (PALMITOLEINIC) ACID (II) AND TRANS,11,OCTADECENOIC (VACCENIC) ACID (III) WITH 2,3,BUTANE,DIOL, ISOLATED BEFORE FROM C. LACRYMA-JOBI SEEDS, WAS SYNTHESIZED. THE ISOMERIZATION OF 1.5 G CIS,ME(CH SUB2) SUB5 CH:CH(CH SUB2) SUB9 CO SUB2 ME WAS CARRIED OUT BY HEATING 2 HR AT 200DEGREES WITH 0.1 G SE UNDER N, TO GIVE 0.45 G ME ESTER OF III, SAPOND. TO GIVE 0.4 G III, M. 40-20EGREES. THE ACID CHLORIDE OF II (PREPD. FROM II AND OXALYL CHLORIDE) WAS TREATED WITH 2,3,BUTANEDIOL IN ETHER IN THE PRESENCE OF PYRIDINE AT 0DEGREES TO GIVE 405.PERCENT 2,(CIS,9,HEXADECENOYLOXY),3,BUTANEDIOL (IV), N PRIME20 SUBD 1.4650, D PRIME20 0.9049. SIMILARLY, IV AND THE ACID CHLORIDE OF III GAVE 48.4PERCENT I, N PRIME20 SUBD 1.4594, D PRIME20 0.8945. OVER ADAMS CATALYST IN N HEPTANE, I WAS HYDROGENATED TO TETRAHYDROXOIXENOLIDE, M. 54-5.5DEGREES. FACILITY: INST. KHIM. PRIR. SOEDIN., MOSCOW, USSR.

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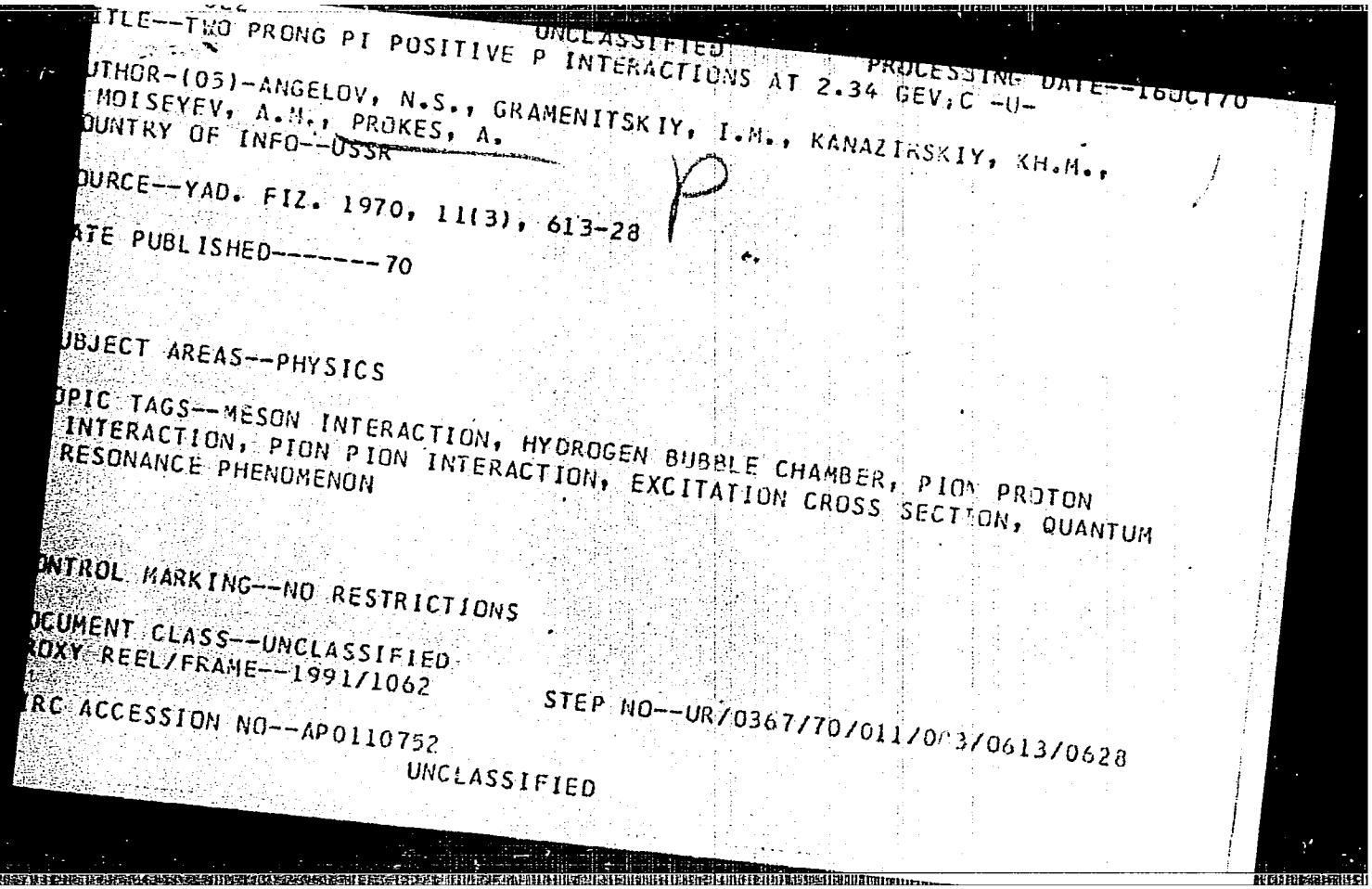


UNCLASSIFIED

TLE--TWO PRONG PI POSITIVE P INTERACTIONS AT 2.34 GEV/C -U-

UTHOR-(05)-ANGELOV, N.S., GRAMENITSKIY, I.M., KANAZIRSKIY, KH.M., MOISEYEV, A.M., PROKES, A.

OUNTRY OF INFO--USSR

OURCE--YAD. FIZ. 1970, 11(3), 613-28

ATE PUBLISHED-------70

UBJECT AREAS--PHYSICS

OPIC TAGS--MESON INTERACTION, HYDROGEN BUBBLE CHAMBER, PION PROTON INTERACTION, PION PION INTERACTION, EXCITATION CROSS SECTION, QUANTUM RESONANCE PHENOMENON

ONTROL MARKING--NO RESTRICTIONS

OCUMENT CLASS--UNCLASSIFIED

ROXY REEL/FRAME--1991/1062

RC ACCESSION NO--AP0110752

STEP NO--UR/0367/70/011/003/0613/0628

UNCLASSIFIED

2/2 022 UNCLASSIFIED

IRC ACCESSION NO--AP0110752 PROCESSING DATE--16OCT70

BSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS ARE PRESENTED OBTAINED IN THE ANAL. OF 17,000 2-PRONG PI POSITIVE P INTERACTION EVENTS SELECTED FROM 150,000 STEREOPHOTOGRAPHS TAKEN IN A 40-CM LIQ. H CHAMBER IRRADIATED BY A SEPD. BEAM OF 2.34-GEV-C PI POSITIVE MESONS. THE PRODUCTION CROSS SECTIONS AND PARAMETERS ARE DETD. FOR THE P POSITIVE, N POSITIVE POSITIVE SUB1238, AND N POSITIVE 1688 RESONANCES. THE MECHANISM OF THE PRODUCTION OF THESE RESONANCES IS STUDIED IN DETAIL. THE CROSS SECTION OF THE PI POSITIVE PI POSITIVE INTERACTION IS INFERRED FROM THE PI POSITIVE P YIELDS PI POSITIVE PI POSITIVE N REACTION BY THE CHEW. LOW METHOD. FACILITY: OB'EDIN. INST. YAD. ISSLED., DUBNA, USSR.

UNCLASSIFIED

1/3 010 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--HYDROMETEOROLOGICAL SERVICE OF UKRAINA IN THE 50 YEARS OF SOVIET POWER -U-

AUTHOR-(02)-MATUSHEVSKIY, B.F., PROKH, L.Z.

COUNTRY OF INFO--USSR

SOURCE--TRUDY NR 81. HYDROMETEOROLOGICAL SERVICE OF UKRAINA IN THE 50 YEARS OF SOVIET POWER (GIDROMETEOROLOGICHESKAYA SLUZHBA UKRAINY ZA 50

DATE PUBLISHED--------70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--HYDROMETEOROLOGY, MONOGRAPH

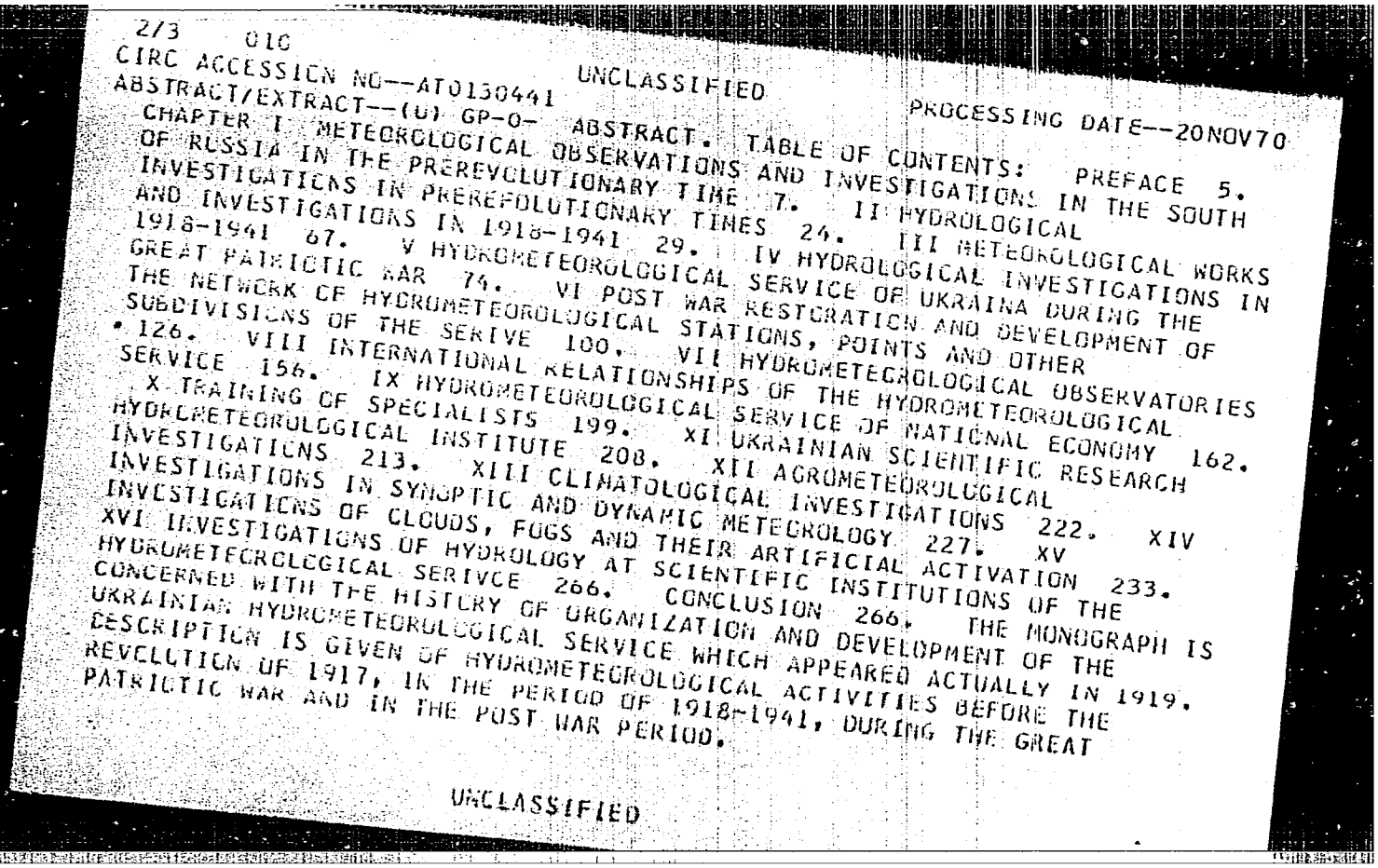
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1512 STEP NO--UR/0000/70/000/000/0001/0270

CIRC ACCESSION NO--AT0130441

UNCLASSIFIED



2/3 010 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AT0130441

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: PREFACE 5. CHAPTER I METEOROLOGICAL OBSERVATIONS AND INVESTIGATIONS IN THE SOUTH OF RUSSIA IN THE PREREVOLUTIONARY TIME 7. II HYDROLOGICAL INVESTIGATIONS IN PREREFOLUTIONARY TIMES 24. III METEOROLOGICAL WORKS AND INVESTIGATIONS IN 1918-1941 29. IV HYDROLOGICAL INVESTIGATIONS IN 1918-1941 67. V HYDROMETEOROLOGICAL SERVICE OF UKRAINA DURING THE GREAT PATRIOTIC WAR 74. VI POST WAR RESTORATION AND DEVELOPMENT OF THE NETWORK OF HYDROMETEOROLOGICAL STATIONS, POINTS AND OTHER SUBDIVISIONS OF THE SERIVE 100. VII HYDROMETEOROLOGICAL OBSERVATORIES • 126. VIII INTERNATIONAL RELATIONSHIPS OF THE HYDROMETEOROLOGICAL SERVICE 156. IX HYDROMETEOROLOGICAL SERVICE OF NATIONAL ECONOMY 162. X TRAINING OF SPECIALISTS 199. XI UKRAINIAN SCIENTIFIC RESEARCH HYDROMETEOROLOGICAL INSTITUTE 208. XII AGROMETEOROLOGICAL INVESTIGATIONS 213. XIII CLIMATOLOGICAL INVESTIGATIONS 222. XIV INVESTIGATIONS IN SYNOPTIC AND DYNAMIC METEOROLOGY 227. XV INVESTIGATIONS OF CLOUDS, FOGS AND THEIR ARTIFICIAL ACTIVATION 233. XVI INVESTIGATIONS OF HYDROLOGY AT SCIENTIFIC INSTITUTIONS OF THE HYDROMETEOROLOGICAL SERIVCE 266. CONCLUSION 266. THE MONOGRAPH IS CONCERNED WITH THE HISTORY OF ORGANIZATION AND DEVELOPMENT OF THE UKRAINIAN HYDROMETEOROLOGICAL SERVICE WHICH APPEARED ACTUALLY IN 1919. DESCRIPTION IS GIVEN OF HYDROMETEOROLOGICAL ACTIVITIES BEFORE THE REVOLUTION OF 1917, IN THE PERIOD OF 1918-1941, DURING THE GREAT PATRIOTIC WAR AND IN THE POST WAR PERIOD.

UNCLASSIFIED

3/3 010 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AT0130441

ABSTRACT/EXTRACT--THE LATEST ADVANCES IN THE NETWORK OF HYDROMETEOROLOGICAL STATIONS AND POSTS, OBSERVATORIES, THE UKRAINIAN HYDROMETEOROLOGICAL RESEARCH INSTITUTE AND SOME OTHER INSTITUTIONS ARE GIVEN. THE UP TO DATE SYSTEM IS PRESENTED OF PROVIDING THE NATIONAL ECONOMY OF THE UKRAINE WITH HYDROMETEOROLOGICAL INFORMATION. THE SUMMARY IS GIVEN OF STUDIES IN AGRICULTURAL METEOROLOGY, HYDROLOGY, CLIMATOLOGY, DYNAMIC AND SYNOPTICMETEOROLOGY, MODIFICATION OF CLOUDS AND FOGS. THE BOOK WILL BE VALUABLE TO ANY READER WHO STUDIES NATURAL HISTORY OF THE REGION AND TAKES INTEREST IN WEATHER FORECAST, CLIMATE, WATER BODIES, METEOROLOGICAL CONDITIONS OF PLANT GROWTH, ETC. IT WILL BE OF USE TO SPECIALISTS IN HYDROMETEOROLOGY, IN AGRICULTURE, IN AIR, HIGHWAY, RAILWAY AND SEA TRANSPORTATION. TEACHERS, STUDENTS AND PUPILS WILL FIND IT INTERESTING TOO.

UNCLASSIFIED

USSR

UDC 612.172+612/76

PROKHAZKA, I., KHAVKINA, I. V., and BARBASHOVA, Z. I., Physiological Institute, Czechoslovakian SSR, Prague and Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, Academy of Sciences USSR, Leningrad

"The Effect of Prolonged Hypokinesia on the Heart Muscle of Rats"

Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 8, Aug 73, pp 1237-1241

Abstract: The effects of 30- to 4-day hypokinesia on the heart muscle of ten white rats was investigated. Sharp weight losses were observed for the whole organism, the heart and particularly its right ventricle. A weakening of the contractile ability of the myocardium in response to rhythmic electrical impulses was seen, as well as a further weakening after 20-minute anoxia, said to indicate a loss of resistance to stress. Additionally a small deceleration of anerobic energy exchange in the ventricles was found, on the basis of lactic acid accumulation. The right ventricle showed a slowing of glycolysis and glycogenolysis, the left only slower glycogenolysis. Glycogen content in the heart muscle was unchanged. While not decisive, the disturbance of energy exchange is said to play an important role in the loss of the heat is stress resistance from prolonged limiting of movement.

1/1

PROKHAZKA, Y.

Trade

CEMA MACHINE BUILDING COOPERATION DISCUSSED

[Article by Y. Prokhazka, CEMA Secretariat Machine Building Section chief: "Economic Integration and Machine Building"] Moscow, Ekonomicheskaya Gazeta, Russian, No 50, December 1971, p 20]

Accelerated scientific and technical progress is exerting increasing influence on the development of social production and on increasing its efficiency in the socialist countries. The scientific and technical revolution has revealed an opportunity for the radical transformation of production and for the creation of fundamentally new machines and progressive materials. An important role in the technical reequipping of the national economy is played by machine building, which provides it with highly productive machines and equipment.

Machine building is an industrial sector which is developing at rapid rates in all the CEMA member countries. Machine-building output occupies first place among other commodity groups in the CEMA member countries' trading exchange. At present more than 70 percent of the fraternal countries' import requirements for machines and equipment are covered by reciprocal deliveries of this output. The great significance of machine building in the socialist countries' national economic development has determined the particular urgency of further deepening and expanding cooperation and specialization. This document developing progressive forms for the international socialist distribution of labor in this sector, and this was reflected in the Comprehensive Program adopted by the 25th CEMA session. This document devotes a great deal of attention to questions of developing socialist economic integration in machine building.

At the present time the main trends in the development of cooperation between the CEMA member countries in this sector are:

coordination of machine-building development plans;

international production specialization and cooperation;

coordination of scientific and technical research and planning and design work;

unification of national standards, and typification and unification of sectorial parameters and normatives;

prognostic and analytical work on the development of individual machine-building sectors and kinds of [illegible].

The above work trends are interconnected, and this insures a comprehensive approach to the solution of problems of cooperation in machine building.

Coordination of the CEMA member countries' plans for the development of the machine-building industry is carried out on both a bilateral and a multilateral basis. A characteristic particularity of work on the coordination of the CEMA countries' national economic plans in machine building for 1971-1975 is its tendency toward elaboration of problems which are of decisive significance for the formation of a modern highly efficient machine-building structure in the individual countries, its utilization of the latest technical and technological achievements, and its insuring of the national economy's requirements for modern technological production lines, machines, equipment and instruments. This work is of a comprehensive nature, that is, it includes questions of production specialization and cooperation, utilization of production capacities, scientific and technical cooperation, reciprocal deliveries of goods, and also improvement of the technical standard and quality of machine building output.

The main form of cooperation, which to the greatest extent promotes the development of socialist economic integration in the field of the fraternal countries' machine building, is international machine-building production specialization and cooperation. This is a continuous technical and economic process, which has an active influence on rational change in the structure of machine building. Depending on the extent of the countries' interest, specialization and cooperation in machine building are carried out according to the main groups of products, according to technological flow lines, power units and installations for enterprises producing complete sets of equipment; according to individual kinds and type sizes of machines, equipment and instruments; according to individual assemblies and components; and according to production technology. Until now specialization according to individual kinds and type sizes of machine building output was most widespread.

The following fact is evidence of the extent of the work on specialization carried out by the CEMA organs: recommendations and proposals have been adopted for 70 groups of machine building articles, and this includes approximately 3,000 descriptions of kinds and type sizes of machine building articles. Production specialization embraces the main groups and kinds of articles of almost all machine building sectors, including engineering, oil-extraction and oil-refining equipment, metal-cutting machine tools and

PROHAZKA Y.

Trade

COOPERATION IN MACHINE BUILDING DESCRIBED

[Article by Y. Prochazka, Head, Machine Building Department, CEMA Secretariat: "Foundations of Technological Retooling"; Moscow, Sotsialisticheskaya Industriya, Russian, 11 January 1972, p 3]

Machine building is an industrial branch developing at a high pace in all CEMA-member countries. The machine building output is first among the other commodity groups in the reciprocal trade among these countries. Over 70 percent of the import requirements of the fraternal countries for machines and equipment are covered by reciprocal procurements.

The main trends in the further expansion of cooperation in this sector are the following: plan coordination, international production specialization and cooperation; coordination of scientific research and design, international standardization and unification of sectorial parameters and norms, and forecast-analytical work on the development of the individual machine building branches.

The socialist countries are coordinating their plans for the development of machine building on a bilateral and multilateral basis. A characteristic feature of the work is the development of problems of decisive significance to the development of a modern highly effective branch structure of machine building in the individual countries, and the utilization of the latest scientific and technological achievements.

International production specialization and cooperation became the basic form of cooperation contributing to the most effective development of socialist economic integration in machine building. Depending on the extent of the interest displayed by the individual countries, specialization and cooperation in machine building are based on the essential groups of commodities, technological lines, aggregates, equipment for entire enterprises, individual types and dimensions of machines, equipment and instruments, individual assemblies and parts, and production technologies.

UDC 547.816'759.5'787.37

USSR

ZAYTSEVA, Ye. L., PROHODA, A. L., KURKOVSKAYA, L. N., SHIFFINA, R. R., KARDASH, N. S., DRAPKINA, D. A., KRONGAUZ, V. A., Institute of Physical Chemistry Scientific Research imeni L. Ya. Karpova, USSR Institute of Chemical Reagents and Study of Very Pure Substances, Moscow

"Preparation of N-Methacryloyloxyethyl Derivatives of Spiropyrans of the Indoline Series"

Riga, Akademiya Nauk Latviiskoy SSR, Himiya Geterotsiklicheskih Soedinenii, No 10, Oct 73, pp 1362-1369

Abstract: The synthesis of 3a,4,4-trimethyloxyazolidino(3,2-a) indoline (III) from 2,3,3-trimethylindoline and 1-bromo-2-ethanol is described. Reacting III with 5-nitro and 3-methoxy-5-nitrosalicylic aldehyde gives 1-(β-hydroxyethyl)-3,3-dimethyl-6'-nitrospiro(indoline-2,2'-(2H-1)benzopyran), V, and 1-(β-hydroxyethyl)-3,3-dimethyl-6'-nitro-8'-methoxysprio(indoline-2,2'-(2H-1) benzopyran), VI, while reacting III with 3-nitrosalicylic aldehyde gives 4,4-dimethyl-3a-(2-hydroxy-3-nitrostyril)oxazolidino (3,2-a)indoline, VII. V and VII react with methacrylic acid chloride in pyridine to give 1-(β-methacryloyloxyethyl)-3,3-dimethyl-6'-nitrospiro-(indoline-2,2'-(2H-1)benzopyran) and 4,4-dimethyl-3a-(2-methacryloyloxy-3-nitrostyril)oxazolidino (3,2-a)indoline, respectively. If V is reacted

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USSR

ZAYTSEVA, Ye. L., et al., Akademiya Nauk Latviiskoy SSR, Himiya Getero-tsiklicheskikh Soedinenii, No 10, Oct 73, pp 1362-1369

with methacrylic acid chloride in acetone, 4,4-dimethyl-3a-(2-methacryloyl-oxy-5-nitrostyril)oxazolidino(3,2-a)indoline results. A discussion of the NMR, IR and electronic spectroscopic structure determinations as well as a discussion of the photochromic behavior of these compounds in various organic solvents is given.

2/2

1/3 022 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--PHOTOCHROMISM OF ORGANIC COMPOUNDS. IV. BEHAVIOR OF A 2, 2 PRIME,4,4 PRIME,5,5 PRIME, HEXAPHENYL,1,2

AUTHOR-(02)-KRONGAUZ, V.A., PROKHODA, A.L.

COUNTRY OF INFO--USSR

SOURCE--KHIM. VYS. ENERG. 1970, 4(2), 176

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SPECTROPHOTOMETRIC ANALYSIS, EPR SPECTRUM, IMIDAZOLE, FREE RADICAL, COMPLEX COMPOUND, UV RADIATION, PHOTO EFFECT, BENZENE DERIVATIVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1155 STEP NO--UR/0456/70/004/002/0176/0176

CIRC ACCESSION NO--AP0120005

UNCLASSIFIED

2/3 022 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0120005

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SPECTROPHOTOMETRIC AND EPR METHODS SHOWED THAT RECOMBINATION IN THE DARK OF THE FREE TRIPHENYLIMIDAZYL RADICALS (I) IN C SUB6 H SUB6 IN THE PRESENCE OF THE TITLE BIIMIDAZOLYL DERIV. (II) IS A 2ND ORDER REACTION AT THE II CONCN. OF SIMILAR TO 10 PRIME NEGATIVE5 M AND A 1.5TH ORDER REACTION OF THE II CONCN. SIMILAR TO 10 PRIME NEGATIVE4 M. THIS IS EXPLAINED BY AN INTERMEDIATE COMPLEX FORMATION BETWEEN I AND II; THE COMPLEX REACTS WITH I IN FORMING 2 MOLS. OF II AND ITS CONCN. (AS DETD. BY THE II CONCN.) AFFECTS THE REACTION ORDER. THE SPLITTING OF H FROM THE ETOH MOL. BY I HAS THE RATE CONST. OF SIMILAR TO 1.6 TIMES 10 PRIME NEGATIVE4 IN THE DARK AT 23DEGREES AND LARGER THAN OR EQUAL TO 3.5 TIMES 10 PRIME3 L.-MOLE-SEC IN IRRADIATING THE SYSTEM (2M ETOH IN C SUB6 H SUB6 CONTG. I AND II) BY THE LIGHT WITH LAMBDA 546 NM. EXCITED I ARE ASSUMED TO PARTICIPATE IN THE H SPLITTING, THE QUANTUM YIELD BEING SIMILAR TO 0.007 MOLE=EINSTEIN. THE FORMATION OF TRIPHENYLIMIDAZOLE WAS STUDIED IN DEPENDENCE ON THE TIME OF THE IRRADN. WITH UV RADIATION OF SOLNS. OF II. BOTH EXCITED AND GROUND STATE MOLS. OF II TAKE PART IN THE REACTION, THE QUANTUM YIELDS OF WHICH ARE 0.2-0.3 AND 0.3-0.4 MOLE-EINSTEIN AT LAMBDA 303-313 AND 365 NM, RESP. THE PHOTODECOMPN. OF II TO RADICALS BY LAMBDA 253.7 AND 365 NM RADIATION WAS STUDIED WITH C SUB6 H SUB6 AND BENZOPHENONE AS THE SENSITIZERS, RESP. THE QUANTUM YIELDS DEPEND ON THE STARTING II CONCN. AND REACH THE SATD. VALUES OF SIMILAR TO 1 AND 0.01 MOLE-EINSTEIN AT THE II CONCNS. OF SIMILAR TO 10 PRIME NETATIVE2 AND SIMILAR TO 10 PRIME NEGATIVE4 M IN THE 1ST AND 2ND CASES, RESP.

UNCLASSIFIED

3/3 022 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0120005

ABSTRACT/EXTRACT--FACILITY: FIZ.-KHIM. INST. IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR UDC: 669.295:620.1

PROKHODTSEVA, L. V., DROZDOVSKIY, B. A. and YURUSHKINA, N. V.

"Anisotropy of Failure Characteristics of Sheets From OT4 and OT4-1 Alloys"

Moscow, Tsvetnyye metally, No 3, Mar 72, pp 72-73

Abstract: This study concerns the presence of considerable "reverse" anisotropy in sheets from OT4 and OT4-1 titanium alloys on the basis of mechanical properties and failure characteristics. All failure characteristics of lateral specimens from the experimental alloys appear to be much higher than those of longitudinal specimens. Lateral specimens of steel, Al alloys, and a number of Ti (α+β)- and β-alloys generally have lower failure characteristics than those exhibited by longitudinal specimens. This regularity, termed "reverse" anisotropy, for OT4 and OT4-1 alloys, was also found to be typical of other Ti alloys (VT5-1, VT20, VT14, VT3-1) as annealed. Annealing OT4-1 alloy above polymorphous transformation temperatures to obtain a large uniaxial grain eliminates the "reverse" anisotropy. The anisotropy of OT4 and OT4-1 alloy sheets on the basis of failure (impact bending) is to a large extent related to the substantial difference in deformation values between longitudinal and transverse

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USSR

PROKHODTSEVA, L. V., et al., Tsvetnyye metally, No 3, Mar 72, pp 72-73

specimens during failure (in the presence of a crack). (4 illustrations, 1 table, 6 bibliographic references).

2/2

1/2 031 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--EFFECT OF IONIZING RADIATION ON THE INCORPORATION OF PHOSPHORUS,32 INTO PROTEINS OF CALCIFIED TISSUES OF AUGUST RATS -U-

AUTHOR--PROKHONCHUKOV, A.A.

COUNTRY OF INFO--USSR

SOURCE--RADIOBIOLOGIYA 1970, 10(1), 108-11

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--X RAY RADIATION BIOLOGIC EFFECT, PHOSPHORUS ISOTOPE, CHEMICAL LABELLING, CALCIUM, METABOLISM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/1847 STEP NO--UR/0205/70/010/001/0108/0111

CIRC ACCESSION NO--AP0127257

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--30OCT70

2/2 031
CIRC ACCESSION NO--AP0127257
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RATS OF THE AUGUST STRAIN WERE X IRRADIATED WITH 500 R AT 0.6 R-SEC., INJECTED WITH TRACER LEVELS OF H PRIME32 PO SUB4 PRIME NEGATIVE AND DECAPITATED 1-20 DAYS LATER. IONIZING RADIATION DECREASED INCORPORATION OF PRIME32 P INTO THE PROTEINS OF THE CALCIFIED TISSUES, ESP. OF THE FEMURS. THIS INDICATED DISRUPTION OF THE CHEM. BONDS BETWEEN THE COLLAGEN OF THE PROTEIN MATRIX, AND CRYST. HYDROXYLAPATITE OF THE CALCIFIED TISSUES.
FACILITY: TSENT. NAUCH.-ISSLED. INST. STOMATOL., MOSCOW, USSR.

UNCLASSIFIED

8

UDC: 612.766.2

USSR

KOVALENKO, Ye. A., POPKOV, V. L., KONDRAT'YEV, Yu. I., MAILYAN, E. S., GALUSHKO, Yu. S., PROKHONCHUKOV, A. A., KAZARYAN, V. A., MOROZOVA, R. S., SEROVA, L. V., POTAPOV, A. N., ROMANOV, V. S., and PISHCHIK, V. B.

"Shifts in the Functions of the Organism During Prolonged Hypolinesia"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, Vol 14, No 6, Nov/Dec 70, pp 3-9

Abstract: Rats kept immobilized for up to 170 days in special cages showed an increase in general gas exchange and rate of oxygen utilization in the muscles, and a slowing of the rate of tissue metabolism in the liver and myocardium. The level of phosphotylation in the myocardium and, to some extent, in the skeletal muscles and liver dropped. Prolonged hypokinesia also stunted the animals' growth, pervented them from gaining weight, and in some cases caused them to lose weight. Besides disturbing mineral and protein metabolism, immobilization resulted in exhaustion of the hypothalamus - pituitary - adrenal cortex system.

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4

UDC 621.318.13:621.372.85

USSR

BEZMATERNYKH, L. N., SHVARTSMAN, G. I., MASHCHENKO, V. G., AFANAS'YEV, A. P., BOKOV, L. A., PROKHOROV, A. R., ZAYTSEV, V. A., KUZHELEV, S. M.

"Controllable Delay Lines Based on Yttrium-Garnet Ferrite Rods"

V sb. Tonkiye magnitn. plenki, vychisl. tekhn. i radiotekhn. T. 2 (Thin Magnetic Films, Computer Technology and Radio Engineering--collection of works. Vol 2), Krasnoyarsk, 1971, pp 142-146 (from RZh-Radiotekhnika, No 11, Nov 71, Abstract No 11B190)

Translation: The paper presents the results of an experimental study on excitation and propagation of magnetoelastic and magnetostatic waves in yttrium-garnet ferrite rods as applied to their use in controllable delay lines. An analysis is made of relationships for delay time as a function of the external magnetic field when frequency is held constant, delay time as a function of frequency when the magnetic field is held constant, and total insertion losses as a function of delay time. The measurements were made in the frequency range of 560-3 800 MHz. Two illustrations, bibliography of eight titles. A. K.

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UDC 639.954

USSR

PASHTAKOV, S. M., (DECEASED), DEYEVA, V. P., VOLYNETS, A. P., PROTHORCHIK, R. A., SHCHERBAKOV, V. A., and KUDRYAVTSEV, G. P., Fiziologicheskoye Deystviye Nekotorykh Gerbitsidov na Rasteniya (The Physiological Effect of Certain Herbicides on Plants), Minsk, "Nauka i Tekhnika," 1971, 252 pp

Translation: Annotation: The book presents results from research on the effect of certain herbicides, gibberallic acid, and chlorchlorinechloride (?) on the biochemical activity of mitochondria and chloroplasts and the exchange of phenol compounds of plants. The physiological activity of a number of free and linked polyphenols is described. The relationship between the effect of herbicides on plants and the content of native phenol compounds and the level of energy potential of the plants being tested is discussed.

The book is intended for scientific associates, graduate students, teachers, and students at universities and agricultural and pedagogical higher educational institutions.

Table of Contents:

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USSR

MASHTAKOV, S. M. (DECEASED), et al., Fiziologicheskoye Deystviye Nekotorykh Gerbitsidov na Rasteniya, Minsk, "Nauka i Tekhnika," 1971, 252 pp

(2)

USSR

MASHTAKOV, S. M., (DECEASED), et al., Fiziologicheskoye Deystviye Nekotorykh Gerbitsidov na Rasteniya, Minsk, "Nauka i "Tekhnika," 1971, 252 pp

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(2)

USSR

MASHTAKOV, S. M., (DECEASED), et al., Fiziologicheskiye Deystviya Nekotorykh Gerbitsidov na Rasteniya, Minsk i Tekhnika," 1971, 252 pp

4/5

USSR
MASHTAKOV, S. M., (DECEASED), et al., Fiziologicheskiye Deystviye Nekotorykh Gerbitsidov na Rasteniya, Minsk i Tekhnika," 1971, 252 pp

(2)

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USSR UDC 621.373.531.3(088.8)

IVAKHNENKO, M. M., PANCHENKO, V. A., SAYENKO, V. M., PROKHORCHUK, YE. F.

"Controlled Trapezoidal Oscillator with an Exponential Decay"

USSR Author's Certificate No 275111, Filed 10 Jul 68, Published 15 Oct 70 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4G234P)

Translation: An oscillator made of magneto-transistor elements is proposed. It contains two transistors and two magnetic toroidal cores included in a balanced circuit. In order to reproduce the proper shape of the exponential decay and keep the pulse amplitude invariant during the period of variation of the coefficient of the exponent and during the process of variation of the output signal frequency, a saturation choke with binary control is connected to the common collector circuit of the transistor in series with the power supply and the secondary information sensor. The first control winding is connected to the first information circuit and forms an auxiliary electrical and magnetic coupling, and the second winding is connected to the second information circuit opposite, and it forms only a magnetic coupling together with the collector circuit.

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USSR

UDC: 550.388.2

BORISOGLEBSKIY, V. S., VASIL'YEV, G. V., KOZLOV, B. F., PROKHORENKO, E. A., PROKHORENKO, V. P., Special Design Office of Physical Instrument Making of the Institute of Terrestrial Magnetism of the Ionosphere and Propagation of Radio Waves of the Academy of Sciences of the USSR

"An Ionospheric Probe"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 9, Mar 72, Author's Certificate No 331354, Division G, filed 25 Nov 70, published 7 Mar 72, p 143

Translation: This Author's Certificate introduces an ionospheric probe which contains an antenna with switch, a transmitter, a superhet receiver, a frequency synthesizer, a quartz-crystal oscillator module, a high--frequency amplifier module with electronic commutator, and a registration unit. As a distinguishing feature of the patent, the probe is designed for improved accuracy of measurements, acceleration of the process of recording a nomogram, and simultaneous printing of auxiliary symbols for operational analysis of the nomograms. A multiple-electrode registration unit is used with a paper-chart recording and with recording shapers on each electrode.

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USSR

BORISOGLEBSKIY, V. S. et al., USSR Author's Certificate No 331354

The registration unit is connected to the superhet receiver through a coding module. Connected to one input of the coding module is a matching unit which is connected to the quartz-crystal oscillator module through an electronic commutator. Connected to the other input of the coding module are the outputs of mosaic storage and electronic calendar modules which are connected directly to some of the recording shapers.

Electrochemistry

USSR

GREBENYUK, V. D., and PROKHORENKO, N. I.

"Influence of the Concentration of Electrolyte Solutions on the Consumption of Electricity in Electrochemical Regeneration of the Mixed Ionites Layer in the Desalting Cell"

Moscow, Elektrokhimiya, Vol 9, No 1, Jan 73, p 141

Abstract: When the concentration of solutions in electrode cells is less than 0.5 N, the amount of the material transmitted by diffusion and the quantity of transferred co-ions is less than 10% of the total stream of ions passing through the membranes. This serves as the basis for the use of an equation describing the kinetics of electrochemical regeneration of the ionite in the desalting cell, to calculate such a concentration of electrode solutions at which the losses of electrical energy for this process would be minimal. The function obtained agrees well with experimental data.

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USSR

UDC: 629.78.017.2

LEBEDEV, V. G., PROKHORENKO, V. I., SIDOROV, I. M.

"Determining the Orientation of a Rotation-Stabilized Artificial Satellite From Telemetric Data Sent by Magnetometers"

Moscow, Upr. dvizhushchimisya ob"yektami. Tr. IV Vses. soveshch. po avtomat. upr. Tbilisi, 1968--sbornik (Control of Moving Objects. Works of the Fourth All-Union Conference on Automatic Control. Tbilisi, 1968--collection of papers), 1972, pp 311-312 (from RZh-Raketostroyeniye, No 10, Oct 72, abstract No 10.41.63)

Translation: The authors consider the problem of determining the angular position of an artificial satellite stabilized by rotation with an angular velocity of more than 3 deg/s from data of magnetometric measurements sent over a telemetric channel. The method of determining the angular position of the rotating satellite is based on harmonic analysis of signals sent from the magnetometers. The parameters of orientation of the artificial satellite relative to an absolute coordinate system are determined on the basis of a comparison of the laws of variation in the average values of the amplitudes, frequencies and phases of the components of the vector of inten-

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USSR

LEBEDEV, V. G. et al., Upr. dvizhushchimisya ob"yektov. Tr. IV Vses. soveshch. po avtomat. upr. Tbilisi, 1968--sbornik, 1972, pp 311-312

sity of the earth's magnetic field in projection on the associated axes of the artificial satellite with the corresponding characteristics of the isolated harmonic components of the signals. The proposed method enables determination of the angular position of a rotating satellite both in the mode of rotation and in the mode of "tumbling". Methods are presented for evaluating the systematic and total error in determining the angular position of a rotation-balanced satellite by the given method. Bibliography of 4 titles. Résumé.

2/2

USSR

UDC 061.3:621.791

PROKHORENKO, V. M., Candidate of Technical Sciences

"Scientific Conference of Higher Learning Institutions, Devoted to the Memory of Ye. O. Paton"

Moscow, Svarochnoye Proizvodstvo, No 7, Jul 70, pp 58-59

Abstract: The Scientific Conference of Higher Learning Institutions, devoted to the 100th anniversary of the birthday of Hero of Socialist Labor Academician Ye. O. Paton, was held at the Kiev Polytechnic Institute on 5-7 March 1970. The conference was organized by the Ministry of Higher and Secondary Special Education of the Ukrainian SSR. More than 300 representatives of scientific research institutes, enterprises, and other organizations participated. D. A. Dudko, Corresponding Member of the Academy of Sciences Ukrainian SSR, discussed "The state and prospects for the development of welding science and technology in the USSR." A report, "Training of engineers and scientific personnel in the welding industry of the USSR," was presented by G. A. Nikolayev, Doctor of Technical Sciences. Yu. D. Livshits discussed "Training of engineers and scientific personnel in bridge building." The work of the conference was divided between two sections: "Welding Engineering" and "Welded constructions and Bridges." Of

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202530002-5"

USSR

PROKHORENKO, V. M., et al, Svarochnoye Proizvodstvo, No 7, Jul 70, pp 58-59

particular interest were the reports of the training of personnel and basic trends in research work on welding at the Kiev and Leningrad polytechnic institutes. Other reports were concerned with recent investigations in the field of welding equipment and the technology of welding processes; improvement of design and production methods for welded constructions; the diffusion joining of metals, alloys, and nonmetals; the development of Soviet and non-Soviet bridge building; and the durability of welded joints and the effect of stress concentrators.

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USSR

UDC: 550.388.2

BORISOGLEBSKIY, V. S., VASIL'YEV, G. V., KOZLOV, B. F., PROKHORENKO, E. A., PROKHORENKO, V. P., Special Design Office of Physical Instrument Making of the Institute of Terrestrial Magnetism of the Ionosphere and Propagation of Radio Waves of the Academy of Sciences of the USSR

"An Ionospheric Probe"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 9, Mar 72, Author's Certificate No 331354, Division G, filed 25 Nov 70, published 7 Mar 72, p 143

Translation: This Author's Certificate introduces an ionospheric probe which contains an antenna with switch, a transmitter, a superhet receiver, a frequency synthesizer, a quartz-crystal oscillator module, a high-frequency amplifier module with electronic commutator, and a registration unit. As a distinguishing feature of the patent, the probe is designed for improved accuracy of measurements, acceleration of the process of recording a nomogram, and simultaneous printing of auxiliary symbols for operational analysis of the nomograms. A multiple-electrode registration unit is used with a paper-chart recording and with recording shapers on each electrode.
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A

GRISOGLEBSKIY, V. S. et al., USSR Author's Certificate No 331354

The registration unit is connected to the superhet receiver through a coding module. Connected to one input of the coding module is a matching unit which is connected to the quartz-crystal oscillator module through an electronic commutator. Connected to the other input of the coding module are the outputs of mosaic storage and electronic calendar modules which are connected directly to some of the recording shapers.

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USSR

UDC: 532

PROKHORENKO, V. Ya., HAPCHYN, B. M.

"Concerning the Relation Between Thermal Effects, Structure, and Thermoelectric Coefficients"

Visnyk L'viv. un-tu. Ser. fiz. (L'vov University Herald. Physics Series), 1971, vyp. 6(14), pp 63-70, 110 (from RZh-Fizika, No 6, Jun 72, Abstract No 6Ye156)

Translation: An empirical relation is found between entropy and the change in resistance, thermoelectromotive force, and coordination number as metals are melted. Verifications for Pb, Zn, Bi, Ga, Cu, Ag, Au, and In were satisfactory. The thermoelectromotive force is sensitive to the structural effect of microstratification. It is shown that the method of thermoelectromotive force is suitable for plotting phase diagrams for systems with segregation in the molten state. Bibliography of 13 titles. Authors' abstract.

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1/4 046 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--NEW GENERATOR BREAKTHROUGH IN RADIATION OPTICS -U-

AUTHOR--PRGKHOROV, A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW IZVESTIYA 10 MAR 70 MORNING EDITION P 3 L

DATE PUBLISHED--10MAR70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--LASER RADIATION, LASER OPTICS, LASER POWER OUTPUT, LASER UNDERWATER PROPAGATION, LASER FREQUENCY CONVERSION, LASER SPECTROSCOPY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1981/1416 STEP NO--UR/9003/70/000/000/0003/0003

CIRC ACCESSION NO--AN0051324
UNCLASSIFIED

2/4 046 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0051324

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ONE OF THE MOST PROMISING DIRECTIONS OF RESEARCH EMERGING AFTER THE CREATION OF LASERS IS POWERFUL RADIATION OPTICS. THE POINT IS THAT IN TRANSFERRING TO RADIATION CAPACITIES ON THE ORDER OF MILLIONS AND HUNDREDS OF MILLIONS OF WATTS, VIRTUALLY ALL FUNDAMENTAL LAWS DESCRIBING THE DISPERSION OF LIGHT BEAMS IN SOLID BODIES, FLUIDS, AND GASES ARE SUBSTANTIALLY CHANGED. IN POWERFUL LASER RADIATION THE DEVELOPMENT OF OPTICAL PHENOMENA BEGINS TO DEPEND ON THE INTENSITY OF THE LIGHT, OR, AS IT IS CUSTOMARY TO SAY, THEY ACQUIRE A NONLINEAR NATURE. THE WORK BY R. V. KHOKHLOV, S. A. AKHMANOV, AND OTHERS, "RESEARCH INTO NONLINEAR COHERENT INTERACTIONS IN OPTICS..." ("ISSLEDOVANIYA NELINEYNYKH KOGERENTNYKH VZAIMODEY-STVIY V OPTIKE..."), WHICH HAS BEEN NOMINATED FOR THE 1970 LENIN PRIZE AND WHICH WAS CARRED OUT AT MOSCOW STATE UNIVERSITY, REPRESENTS A FUNDAMENTAL CONTRIBUTION TO POWERFUL RADIATION OPTICS. THE MAIN TASK WHICH CAN BE RESOLVED WITH THE HELP OF NONLINEAR COHERENT INTERACTIONS IS TO ALTER THE FREQUENCY OF THE LASER RADIATION. ALTHOUGH BY NOW OVER 100 TYPES OF LASERS HAVE BEEN DISCOVERED WHICH EMIT RAYS IN THE VISIBLE, ULTRAVIOLET, AND INFRARED BANDS, THE NUMBER OF POWERFUL LASERS CAN BE COUNTED IN ONES. ALL THESE LASERS EMIT RAYS ON THEIR OWN FIXED FREQUENCIES. FOR THIS REASON, ON THE ONE HAND WE ARE FACED WITH CREATING POWERFUL LASERS FOR NEW WAVELENGTH BANDS, AND ON THE OTHER WE MUST LEARN TO CHANGE THEIR FREQUENCY IF THE NEED ARISES. ONE WAY OF DOING THIS IS THE METHOD OF FREQUENCY CONVERSION PROPOSED BY SCIENTISTS AT MOSCOW STATE UNIVERSITY.

UNCLASSIFIED

3/4 046 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AN0051324

ABSTRACT/EXTRACT--FOR EXAMPLE, FOR UNDERWATER VISION SYSTEMS POWERFUL LASERS GIVING A DARK BLUE GREEN EMANATION ARE NECESSARY, INASMUCH AS WATER IS TRANSPARENT TO THEM. USING FREQUENCY MULTIPLIERS BASED ON COHERENT LIGHT INTERACTIONS, ONE CAN OBTAIN A POWERFUL INFRARED LASER RADIATION LYING IN THE GREEN BAND AND USE IT FOR UNDERWATER VISION SYSTEMS. ON THE BASIS OF THIS METHOD MOSCOW UNIVERSITY SCIENTISTS HAVE CREATED POWERFUL GENERATORS EMITTING RADIATION IN THE VISIBLE AND ULTRAVIOLET BANDS. THESE GENERATORS MAKE IT POSSIBLE TO RESOLVE A NUMBER OF IMPORTANT SCIENTIFIC TASKS. BY MULTIPLYING THE FREQUENCY, MANY SECTORS OF THE OPTICAL BAND HAVE BECOME ACCESSIBLE. HOWEVER, IN ORDER TO ASSIMILATE IT FULLY WE MUST HAVE COHERENT RADIATION GENERATORS WITH SMOOTHLY CHANGEABLE FREQUENCIES. THE THEORY OF THESE GENERATORS WAS FORMULATED AT MOSCOW STATE UNIVERSITY IN 1962. THREE YEARS LATER THE GENERATORS THEMSELVES WERE CREATED. THEY OPEN UP COMPLETELY NEW POSSIBILITIES IN OPTICS WHICH EVEN NOW ARE HARD TO IMAGINE. IMAGINE HOW LIMITED THE POSSIBILITIES OF RADIOTECHNOLOGY WOULD BE IF GENERATORS WITH SMOOTHLY CHANGEABLE FREQUENCIES WERE TAKEN AWAY FROM IT. THIS LIMITATION HAS HAD AN EVER GREATER INFLUENCE ON OPTICS. NOW THE WIDE CIRCLE OF PROBLEMS CONNECTED WITH THE INTERACTION OF RADIATION WITH MATTER IS BEING ADDED TO THE PROBLEMS OF COMMUNICATIONS, LOCATION, CONTROL, AND COMPUTER TECHNOLOGY WHICH OPTICS IS SOLVING. I MEAN THE CEHMISTRY OF EXCITED MOLECULES, A COMPLETELY NEW FIELD OF SCIENCE WITH NEW POSSIBILITIES FOR SYNTHESIZING SUBSTANCES.

UNCLASSIFIED

4/4 046 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AN0051324
ABSTRACT/EXTRACT--GENERATORS WITH SMOOTHLY CHANGEABLE FREQUENCIES ARE RADICALLY ALTERING SUCH A CLASSIC SECTION OF OPTICS AS SPECTROSCOPY. THE NORMAL TYPE OF SPECTRAL INSTRUMENT WITH HIGH RESOLVING POWER HAS BECOME VERY CUMBERSOME, THEREBY SERIOUSLY HOLDING BACK THE DEVELOPMENT OF TECHNICAL SPECTROSCOPY. BUT INSTRUMENTS BASED ON GENERATORS WITH CHANGEABLE FREQUENCIES ARE FREE OF THIS SHORTCOMING. THIS PROMISES QUALITATIVELY NEW POSSIBILITIES IN SPECTROSCOPY. NEW PROSPECTS ARE ALSO OPENING IN THE FIELD OF MEASURING EQUIPMENT. ONE CAN CITE AS AN EXAMPLE THE CONTACTLESS (BESKONTAKTNOYE) MEASURING OF THE ATMOSPHERE'S COMPOSITION ACCORDING TO ALTITUDE, WHICH IS EXTREMELY IMPORTANT TO METEROLOGY. BY SOUNDING THE ATMOSPHERE WITH AN IMPULSE OF SUITABLE FREQUENCY AND BY USING RADIATION WITH MOLECULES DISPERSED AT A DIFFERENT ALTITUDE, ONE CAN JUDGE THE PRESENCE OF ONE OR OTHER COMPONENTS IN THE ATMOSPHERE'S COMPOSITION. ONE CAN SAY WITHOUT EXAGGERATION THAT IF IN THEIR TIME LASERS HAVE BROUGHT ABOUT A REVOLUTION IN OPTICS, THEN GENERATORS WITH SMOOTHLY CHANGEABLE FREQUENCIES ARE NOW ACCOMPLISHING A SECOND REVOLUTION. I AM CERTAIN THAT THE NOMINATION OF THE WORK BY THE MOSCOW STATE UNIVERSITY'S COLLECTIVE OF SCIENTISTS' "RESEARCH INTO NONLINEAR COHERENT INTERACTIONS IN OPTICS..." HAS BEEN RECEIVED BY ALL PHYSICISTS WITH DEEP SATISFACTION.

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202530002-5"

AN0 026089

UR 9003

AUTHOR-- PROKHOROV, A., ACADEMICIAN

TITLE-- THE LIGHT OF LASERS

NEWSPAPER-- IZVESTIYA, MARCH 10, 1970, P 3, COLS 1-2

ABSTRACT-- IN SUPPORTING THE NOMINATION OF "THE INVESTIGATION OF NONLINEAR COHERENT INTERACTIONS IN OPTICS" BY R. V. KHOKHLOV AND S. A. AKHMANOV, ET AL, FOR THE LENIN PRIZE, PROKHOROV MAKES A CLAIM THAT THIS METHOD CAN BE USED FOR DEVELOPING UNDERWATER VIDEO SYSTEMS.

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P Crystals & Semiconductors

USSR

GALKIN, A. A., PROKHOROV, A. D., TSINTSADZE, G. A., Donets Physico-technical Institute, Academy of Sciences, Ukrainian SSR

"Co^{2+} Spin-Lattice Relaxation in Monoclinic Tungstenites"

Leningrad, Fizika Tverdogo Tela, Vol 12, No 6, June 1970, pp 1784-1787

Abstract: Measurements of the spin-lattice relaxation of the Co^{2+} ion in $ZnWO_4$ and $CdWO_4$ crystals are carried out in a wide technical range. The temperature relationships of the relaxation times are determined. It is shown that on sectors of the temperature interval the relaxation is described by the mechanisms. An analysis of the results on the basis of a homologic series of monoclinic tungstenites is carried out. The results indicate that in the temperature range characteristic of single-phonon relaxation the environment of the

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USSR

GALKIN, A. A., et al, Fizika Tverdogo Tela, Vol 12, No 6, June 1970, pp 1784-1787

magnetic center and its symmetry have little effect upon the process of spin-lattice relaxation, although in this range a substantial part may be played by the presence of defects in the crystals. In the range of higher temperatures the influence of the lattice type and lattice symmetry is explicitly manifested; this can be seen from a comparison of the coefficients for the respective times.

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USSR

ZLENKO, A. A., PROKHOROV, A. M., SYCHUGOV, V. A.

"A Thin-Film Laser With Magnitude-Modulated, Distributed Feedback"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 18, No 3, 5 Aug 73, pp 156-160

Abstract: A method is proposed for tuning the emission frequency of a thin-film laser with distributed feedback by using spatial modulation of the amount of feedback in the film. The amount of distributive feedback is determined by the amplitude of the periodic variations in the effective index of refraction or amplification factor. If these amplitudes are spatially modulated with period $\Lambda' \gg \Lambda$, then lattices with periods $\Lambda_n = \Lambda(1 \pm n\Lambda/\Lambda')$ will be formed in the film along with the lattice of period Λ, where $n = 1, 2, 3...$ If the wavelength of the emission determined by these lattices falls into the amplification band of the film, then emission should be stimulated on this wavelength with the corresponding pumping. Thus the emission frequency could be tuned by varying the period Λ'. This principle of modulation is experimentally demonstrated by a setup with a rotatable wire grid.

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DONCHENKO, V. A., ZUYEV, V. YE., KRASYUK, I. K., PAL'YANOV, P. A., PASHININ, P. P., PROKHOROV, A. M., KABANOV, M. V.

"Energy Attenuation of Supershort Pulses of Optical Emission by Dispersive Media"

Moscow, Pis'ma v ZhETF, Vol 18, No 4, 1973, pp 230-232

Abstract: Preliminary results are presented from direct measurements of one of the basic characteristics of a dispersive medium -- the attenuation coefficient -- on its interaction with a supershort pulse of optical emission. A decrease in attenuation of the supershort pulse by comparison with the case of emission which is continuous in time was detected experimentally. The results of measurements of the optical thickness of suspensions of polystyrene latexes and lycopodium spores are tabulated for continuous and pulsed emission. The observed "transparency" of the medium which is three times as great in the case of a laser pulse by comparison with continuous radiation is not connected with such effects as the thermal effect on the properties of the medium, the spectroscopic effect of saturation and self-focussing.

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PROKHOROV, A. M.

"Portrait of Radio Waves"

Moscow, Izvestiya, 8 April 73, p 4

Abstract: A group of workers of the Physical Institute of the USSR Academy of Sciences headed by Candidate of Physical-Mathematical Sciences N. A. Irisova and Candidate of Technical Sciences S. A. Fridman created a "radioviewer" [radiovizor]. This instrument permits a direct look at electromagnetic radiation in the band from several microns to several centimeters. The screen of the "radioviewer" is made of lavsan film with a very thin layer of aluminum coating, and this "microsandwich" is covered on top by a layer of luminophore. In the process of operation, the screen is continuously irradiated by ultraviolet bulbs to creat background lighting.

The layer of luminophore is transparent to waves of the band for which the instrument is designed. But the very thin aluminum backing heats up under the influence of radio waves. Where the intensity of radiation is greater, so is the heating effect. A different degree of heating has a different influence on the behavior or the luminophore. It is sufficient to raise its temperature just one degree to have the brightness of luminescence

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PROKHOROV, A. M., Izvestiya, 8 April 73, p 4

decrease by 28%. If a beam of radio waves is directed onto the screen of the "radioviewer," its portrait will appear on the evenly lighted background: points of greatest intensity of the electromagnetic field will be seen as dark spots, and those points where waves are superposed and cancel each other will be brighter. In short, it is possible to obtain a full impression of the structure of the beam of radiation, which means an impression of how the emitting device operates.

The main field of application of this instrument is in working with infrared, or, more simply, with thermal radiation. The "radioviewer," has proven useful to tune lasers which give off infrared radiation in order to study the structure of the beam which they emit. This especially involves lasers operating on carbon dioxide.

The characteristics of the new instrument are extremely favorable for researching the emission of lasers operating in the pulse mode. The flash of radiation itself is very transient -- it lasts millionths of a second, but its autograph imprinted on the "radioviewer" screen shines for a sufficiently long time. Therefore, it can be photographed on an ordinary photographic film.

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PROKHOROV, A. M., Izvestiya, 8 April 73, p 4

"Radioviewers" allow extending the methods of holography to obtain images in the invisible beams. With their help it is possible to study material opaque to visible light, but which pass infrared radiation. Some plastics possess this combination of properties.

It is already being produced serially by a production association of electrovacuum plants. After it was demonstrated at a session of the presidium of the USSR Academy of Sciences, a group of plant engineers under the leadership of Candidate of Technical Sciences V. Sasorov actively began creation of an industrial model of the instrument, although the production of the "radioviewer" was not noted in any plans of the association.

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USSR

UDC 535.3

LUGUVOY, V. N., and PROKhOROV, A. M., Physical Institute imeni P. N. Lebedev, Academy of Sciences of the USSR

"Theory of the Propagation of Powerful Laser Radiation in a Nonlinear Medium"

Moscow, Uspekhi Fizicheskikh Nauk, Vol 111, No 2, Oct 73, pp 203-247

Abstract: Only conditions of Kerr nonlinearity are considered. The authors have previously reported on the multi-focus concept of laser beam propagation above the critical point in a nonlinear medium. Since the distance to a focus is determined by the power of the incident beam and this power is constantly changing in short-duration laser pulses, the foci travel at a speed dependent on the time characteristics of the pulse. Mathematical analysis of this relationship shows good correlation with experimental observation of the "lifetime" of the bright filaments which are actually the tracks of moving foci.

Considering the time characteristics of the various types of Kerr nonlinearities and the durations of the laser pulses involved, a parabolic equation for the complex amplitude of the electric field under the conditions of greatest practical interest is derived from Maxwell's equation. The parabolic equation may require significant correction under conditions of substantial saturation of the Kerr nonlinearity.

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LUGUVOY, V. N. and PROKhOROV, A. M., Uspekhi Fizicheskikh Nauk, Vol 111, No 2, Oct 73, pp 203-247

For an axially symmetric beam, it can be demonstrated that the original gaussian distribution will be modified in a nonlinear medium if the beam power is greater than the critical value, a factor which has been ignored in several publications, including E. L. Kerr, Physical Review, A 4, page 1195, 1971.

The occurrence of a multi-focus structure is demonstrated by the numerical solution of the equilibrium state problem for laser pulses with a typical duration of 10^{-8} seconds or less. These calculations yield the action locations of the foci. Three-photon absorption, 2-photon absorption, and induced Raman emission in the forward direction are considered. The authors note that the use of an approximation of geometric objects, as by A. V. Gurevich, is not valid past the first focus.

The motion of foci generated by brief laser pulses leads to local effect, particularly at "turning" points. Depending on the speed of focus movement, local heating effects can lead to a breakdown of the focus structure.

Under certain conditions, ultra-short pulses of induced Raman emission in the reverse direction can be generated; these have been observed experimentally.

The spectra of pulses in a nonlinear medium are subject to several effects which widen them, including phase modulation proportional to the path length

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LUGUVOY, V. N., and PROKhOROV, A. M., Uspekhi Fizicheskikh Nauk, Vol 111, No 2, Oct 73, pp 203-247

traveled by the pulse and the rate of change of the index of refraction of the medium, a resulting amplitude modulation which can occur if the dispersion of the linear part of the index of refraction becomes significant, and expansion of the spectrum of the field of moving foci.

Although the calculations in this article involve pulses of a limited class, they can be extended to cover a broader range. Consideration of inertia in the Kerr effect for picosecond pulses would lead to experimental results that have not yet been observed. If the nonlinearity of absorption were very slight, Maxwell's equation would have to be used, leading to a very difficult calculation. However, a rough approximation indicates that the multi-focus structure would still be developed.

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UDC 539.89

ALEKSANDROV, V. I., KAMINSKIY, A. A., MAKSIMOVA, G. V., PROKHOROV, A. M. (Academician), SARKISOV, S. E., SOBOL', A. A., TATARINTsEV, V. M., Physical Institute imeni P. N. Lebedev, and Institute of Crystallography imeni A. V. SHUBNIKOV, Academy of Sciences of the USSR, Moscow

"A Study of Stimulated Emission by Nd^{3+} Ions in Crystals at the $^4F_{3/2} \rightarrow {}^4I_{13/2}$ Transition"

Moscow, Doklady Akademii Nauk SSSR, Vol 211, No 3, 21 Jul 73, pp 567 - 570

Abstract: The prevailing transition for neodymium is $^4F_{3/2} \rightarrow {}^4I_{11/2}$ (about 60%), but the transition to $^4I_{13/2}$ is of both practical and theoretical interest. The authors studied doped crystals of CaF_2-YF_3, $Ca_2Y_5F_{19}$, $Ca_5(PO_4)_3F$, ZrO_2-Y_2O_3, and HfO_2-Y_2O_3. Samples were tested at 77°K and 300°K. Laser action was observed at three frequencies near 1.35 microns in yttrofluorite, at two points in tysonite, and at several locations in fluorapatite with a 90° angle between the optical and geometric axes. Analysis of the low-temperature spectra showed that in all observations their lines were insensitive to concentration.

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ALEKSANDROV, V. I., et al., Moscow, Doklady Akademii Nauk SSSR, Vol 211, No 3, 21 Jul 73, pp 567 - 570

similar properties, and a spectrum is given for only the first of these. It shows lasing at both the transitions.

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UDC: 535-373.2

USSR

OSIKO, V. V., PROKHOROV, A. M., and SHCHERBAKOV, I. A.

"Transmission of Excitation Energy Among Three-Valent Ions of Rare Earth Elements in Ion Crystals"

Moscow, Izvestiya Akademii Nauk SSSR--Seriya Fizicheskaya, No 4, 1973, pp 768-771

Abstract: Results are given of an investigation into the interaction effectiveness of Nd^{3+} ions as a function of the temperature. While there are various ideas in the literature regarding the temperature effect on energy transmissions among TR^{3+} ions in crystals and glasses, the authors of the present paper have chosen as the subjects of their investigation CaF_2 with the paired M-centers of Nd^{3+}-Nd^{3+}, $YAlO_3$-Nd^{3+}, and LaF_3-Nd^{3+}. In the investigation of the first pair, involving a single ion system, the migration process of donor ions was excluded and the act of cross relaxation was directly observed. For the second crystal, the dependence of the interaction probability on temperature is determined by the increase in probability of multiphonon transitions with acoustical excitation and by the difference in probability of electron-phonon interaction transitions from basic and excitation Stark components. The third crystal is treated in somewhat the same way as the CaF_2. It is

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OSIKO, V. V., et al., Izvestiya Akademii Nauk SSSR--Seriya Fizicheskaya, No 4, 1973, pp 768-771

concluded that the dependence of the cross relaxation on temperature is the result of the population in the basic and excitation Stark component levels, the inclusion of new interacting transitions, and the thermal stimulation of electron-phonon transitions.

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UDC: 535.343+535.371

VORON'KO, Yu. K., OSIKO, V. V., PROKHOROV, A. M., SHCHERBAKOV, I. A.

"Some Questions of Spectroscopy of Laser Crystals With Ionic Structure"

Moscow, Trudy Ordena Lenina Fizicheskogo Instituta imeni P. N. Lebedev Akademii Nauk SSSR. Spektroskopiya Lazernykh Kristallov s Ionnoy Strukturoy, Vol 60, 1972, pp 3-30

Abstract: The paper analyzes the basic spectroscopic characteristics of ionic laser crystals (structure of absorption and luminescence spectra, quantum yield, kinetics of intracenter relaxation, processes of excitation energy transfer) which have a direct influence on emission parameters. The authors discuss the effect which the distribution of impurity ions of rare-earth elements with respect to centers of different structure has on these characteristics. Methods are outlined for analyzing the complex Stark structure of the absorption and luminescence spectra of trivalent rare-earth ions.

USSR UDC 548.55 : 612.373.8

BUBNOV, M. M., BUZHINSKIY, I. M., DIANOV, Ye. M., MAMONOV, S. K., MIKHAYLOVA, L. I., and PROKHOROV, A. M., Academician, Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR, Moscow

"Change in the Sign of the Thermal Lens of Glass Laser Rods With a Change in the Glass Thermooptical Constant"

Moscow, Doklady Akademii Nauk SSSR, Vol 205, No 3, 1972, pp 556-559

Abstract: The article describes results of a study of glasses with both positive and negative, constant thermooptical values. The focal distances of the thermal lens which forms during periodical laser rod pumping were measured by the autocollimation method. It was found that the thermal lens power decreases, as the thermooptical constant decreases, and changes sign at some constant thermooptical values. This correlation between lens power and the thermooptical constant of the glass occurs for glasses of various compositions (silicate, boron phosphate, phosphate). The mechanisms leading to lens formation are considered in order to explain this relation.

The authors thank S. I. KURGACHEV for his aid in the experiments.

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USSR

LUGOVOY, V. N., PROKHOROV, A. M., Physics Institute imeni P. N. Lebedev, Academy of Sciences of the USSR

"Heating and Containment of a Plasma in Crossed Light Beams"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 17, No 1, 5 Jan 73, pp 52-55

Abstract: A number of theoretical papers have dealt with the problem of pulsed laser heating of a plasma to produce a thermonuclear reaction. These previous papers have considered conditions in which the heating time does not exceed the time of hydrodynamic dispersion of the plasma. In this article the authors propose another method of pulsed laser plasma heating whereby the heating time may be determined by the duration of the laser pulse and thus may be considerably longer than the corresponding time of hydrodynamic dissipation. In addition, in contrast to previous theories, the area of the skin layer in the suggested model (where direct conversion of energy takes place) may be much greater than the area of the surface which bounds the entire volume of the heated plasma. This type of heating requires placing the material in the region of intersection of two laser beams at some angle.

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LUGOVOY, V. M., PROKHOROV, A. M., Pis'ma v ZhETF, No 1, Jan 73, pp 52-55

The authors consider focused beams with given focal diameters intersecting in the vicinity of these focal regions. The kinetics of plasma heating in the simplest model are analyzed. A numerical example is given. Conditions of plasma containment are discussed, and it is shown that plasma density in microregions may increase with time due to compression by the electromagnetic field. The authors thank A. A. Samokhin and M. V. Fedorov for useful discussion of the work.

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