

KARPINOS, O. M., et al, Problemy Prochnosti, No 5, May, 1970, pp 33-37

the volumetric content of such fibers is in excess of 20 percent. In such cases, the matrix is not completely reinforced by the fibers. However, such compositions possess increased plasticity, and in combination with sufficiently high strength can prove useful for a number of structural elements.

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KARPINSKAYA, R. S.

Filosofskiye Problemy Molekulyarnoy Biologii (Philosophical Problems of Molecular Biology), Moscow, "Mysl'," 1971, 232 pp

Translation: Annotation: This work is one of the first monographs in which current problems of molecular biology are considered philosophically. Using the dialectical concept of development, the author analyzes problems of the relationship of molecular biology to Darwinism, chemical evolution to organic evolution, and so on. Special attention is paid to the problem of the molecular principles of evolution.

The book is intended for scientific personnel in the fields of philosophy, biology, and chemistry, and for teachers, students, and graduate students as well.

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KARPINSKAYA, R. S., *Filosofskiye Problemy Molekulyarnoy Biologii* (Philosophical Problems of Molecular Biology), Moscow, "Mysl'," 1971, 232 pp

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USSR

UDC 678.742.3-137.452.2:613.632

SMUROVA, YE. V., ZURLOVA, O. M., SOSIN, S. L., ANTIPOVA, E. A., KOVIKOVA,
S. P., KARPINSKAYA, V. M.

"Interaction of Modified Polypropylene with Blood"

Moscow, *Plasticheskiye Massy*, No 4, 1972, pp 60-61

Abstract: The results of studying polymers with antithrombogenic properties are described. Data are presented on obtaining a sulfonated inoculated copolymer of polypropylene and polystyrene, and a study is made of the conditions permitting the polymer to be obtained which prevents the coagulation of blood on contact. With an increase in the active group content, the given copolymers cause significant hemolysis of the blood corpuscles. Iron ions must introduced into the copolymer to eliminate this phenomenon. The presence of iron ions in the sulfonated inoculated copolymer polypropylene+polystyrene+polyvinylferrocene promotes a noticeable reduction in the hemolysis of the red blood corpuscles on contact of the blood with copolymers without changing the antithrombogenic properties.

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Pharmacology and Toxicology

USSR

UDC 577.153

BOCOLYUBOVA, G. M., ~~KARPINSKAYA, Ye. V.~~ KULIKOVA, A. I., and ROZENGART, V. I.,
Chair of Biochemistry, First Leningrad Medical Institute imeni Academician
I. P. Pavlov

"The Protective Effect of Substrates During Inhibition of Various Cholinesterases by an Organophosphorus Inhibitor"

Moscow, Biokhimiya, Vol 36, No 5, 1971, pp 1,075-1,081

Abstract: The reaction between the organophosphorus inhibitor GD-7 O-ethyl S-ethylmercaptoethyl methylthiophosphonate and three different cholinesterases -- horse serum cholinesterase (HSC), bull erythrocyte acetylcholinesterase (BEA), and squid optical ganglion cholinesterase (OGC) -- was investigated in the presence of three substrates -- acetylcholine (AC), proprionylcholine (PC), and butyrylcholine (BC) -- in various concentrations. It was found that the rate constant of the reaction of the organophosphorus inhibitor with the enzymes is decreased in the presence of the substrates. A quantitative correlation was established between the reduction in the above rate constant and the concentration of the substrates. OGC is protected by AC more than by PC or BC, while HSC and BEA are protected equally by any one substrate. When BC is present in sufficiently high concentrations, 1/2

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BOGOLYUBOVA, G. M., et al., Biokhimiya, Vol 36, No 5, 1971, pp 1,075-1,081

the organophosphorus inhibitor becomes totally inert, because it cannot interact with butylated cholinesterase. It is believed that the hydrolysis of BC by OGC and HSC is inhibited by the formation of acylated enzymes, while the hydrolysis of AC and PC is inhibited by deacylation.

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Acc. Nr.: AP0042569Ref. Code: UR0293

JPRS 52162

Measurement of Low-Energy Ions

(Abstract: "Measurement of Low-Energy Ions," by Yu. I. Gal'perin, V. A. Gladyshev, I. D. Ivanov, I. N. Karpinskiy, T. M. Mulyarchik, B. V. Polenov, V. V. Temnyy, B. I. Khazanov, A. V. Shifrin and F. K. Shuyskaya; Moscow, Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 120-126)

[Note: This is part of a sectionalized article "Study of Geoaactive Cor-puscles and Photoelectrons on the Satellite 'Kosmos-261'," Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 104-136]

The RIP-801 low-energy ion spectrometer is described; it was used on the "Kosmos-261" satellite for measuring ions in the range 0.04-8 keV. It is a modulation trap with magnetic protection of the ring collector; this suppresses the currents of secondary electrons and photoelectrons from the collector. The ion flux is modulated by a voltage in the form of a rectangular wave with a frequency of 300 cps and voltage amplitudes of 0.5 and 2 kV over threshold voltages from 0.04 to 6 kV. The electric current of the central collector and the positive current of the ring collector are measured. This paper gives the first results of measurements on the "Kosmos-261" satellite. In regions close to the auroral zone it is common to register fluxes of ions with energies of several keV, at-

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taining 10^7 ions·cm⁻²·sec⁻¹·keV⁻¹. After midnight these particles are situated in the northern hemisphere near the southern boundary of the region of injection of electrons in the form of a "hydrogen arc." In addition, in the southern and northern polar caps in the region of invariant latitudes 70-80° ions were registered simultaneously with soft electrons in the so-called "second" or "soft" auroral zone. The ion energy spectra in the northern hemisphere (nighttime, altitude about 220 km) and in the southern hemisphere (daytime, altitude about 600 km) are different. In the northern auroral zone the spectrum has a pronounced maximum in the region 1.5-2 keV, whereas in the southern auroral zone and in the south pole cap the spectrum in the region 0.04-8 keV is rather flat (without taking into account the charge exchange of protons during passage through the atmosphere). The pitch-angle distribution usually has a maximum near 70°. The authors given an example of an ion intensity burst in the low latitudes over the USSR at $L \approx 2$.

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I.P. KARPINSKIY

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Acc. Nr.: AP0042567

Ref. Code: UR0293

JPRS 50162

Measurements of Intermediate- and High-Energy Particles

(Abstract: "Measurements of Charged Particles of Intermediate and High Energies," by A. D. Bolyunova, A. D. Verevkin, Yu. I. Gal'perin, L. S. Corn, L. S. Zhurina, I. D. Ivanov, R. N. Isayeva, I. P. Karpinskiy, M. A. Kovrazhkin, V. V. Temnyy, B. I. Khazanov, A. V. Shifrin and E. K. Shvyskaya; Moscow, Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 126-135) [Note: This is part of a sectionalized article "Study of Geosactive Cor-puscles and Photoelectrons on the Satellite 'Kosmos-261'," Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 104-136]

This article describes the RIE-205 scintillation spectrometer for electrons of intermediate energies, the RIP-802 scintillation spectrometer for protons and the RIG-III lead-shielded Geiger counter. The RIE-205 instrument measured electrons in the ranges 20-45, 45-85, 85-120 and 120-150 keV and the total intensity of electrons with an energy greater than 150 keV (geometry factor $2 \cdot 10^{-3} \text{cm}^2 \cdot \text{sterad}$). The RIP-802 instrument measured protons in the ranges 0.30-0.45, 0.45-0.70, 0.70-0.95 and 0.95-9 MeV with a geometry factor of $1.5 \cdot 10^{-2} \cdot \text{sterad}$. The RIG-111 instrument measured

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protons with $E > 50$ MeV and hard electrons. In the radiation belts and auroral zones the instruments measured the fluxes and energy spectra of electrons and protons, their distribution by pitch angles and spatial-temporal characteristics. It was possible to determine the latitude variation of the intensity of injected electrons, the pitch distribution of intensity for auroral zone electrons and the differential electron spectra. For example, the electron fluxes measured with the RIE-205 spectrometer can be assigned to the following groups: a) trapped electrons in the inner zone ($L \leq 2.5$) were registered for the most part in the region near the Brazilian anomaly; their flux for an energy $E > 150$ keV attained 10^8 particles/cm²·sec, and was highly dependent on pitch angle; a pronounced maximum was observed for pitch angles 90° ; b) trapped electrons in the outer zone $2.5 \leq L \leq 7$, also with a maximum intensity for pitch angles of 90° ; in many cases quasitrapped particles were registered in the region of invariant coordinates $h_{\min} \leq 100$ km with intensities up to $2 \cdot 10^9$ particles/cm²·sec·sterad; c) sporadic hard electrons injected into the atmosphere in the middle latitudes; in these cases the mean energy was usually ~ 130 keV and the particle flux attained 10^5 particles/cm²·sec; d) electrons of intermediate and high energies injected into the atmosphere in the high latitudes; they are frequently observed near the auroral zone.

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Acc. Nr.: 110042568

Ref. Code: 11R0293

JPRS 50162

Measurement of Low-Energy Electrons

(Abstract: "Measurement of Low-Energy Electrons," by Yu. I. Gal'perin, N. V. Dzhordzhio, I. D. Ivany, I. P. Karpinskiy, E. L. Lein, T. M. Mulyarchik, B. V. Polenov, V. V. Temnyy, N. I. Fedorova, B. I. Khazanov, A. V. Shifrin and F. K. Shuyskaya; Moscow, Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 108-119)

[Note: This is part of a sectionalized article "Study of Geoactive Corpuscles and Photoelectrons on the Satellite 'Kosmos-261'," Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 104-136]

A spectrometer for low-energy electrons, operating in the energy range 30 eV-15 keV, is described. Electrons undergo energy selection in a cylindrical capacitor and then are accelerated to 17 keV and are registered by a scintillation counter with two photomultipliers operating in a coincidence circuit. The instrument field of view is circular, the aperture angle is $+3.5^\circ$, the geometry factor is $2 \cdot 10^{-3}$ cm²-sterad and the energy resolution is $\Delta E/E = 0.19$. In the first range (30-150 eV) energy scanning is done smoothly by applying a sawtooth voltage; in the second analysis it is done smoothly at three fixed energies -- 1, 4.5 and 15 keV. The instrument can be switched from one regime to another by command from

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the earth. The paper gives the first results of measurements on the "Kosmos-261" satellite. The instruments measured the equilibrium energy spectrum of fresh photoelectrons at different latitudes for different pitch angles. Soft auroral electrons with energies from 30 eV to approximately 1 keV were registered both in the "second" zone of auroras and in the main zone of auroras in which electrons with energies 4.5 and 15 keV were also very intensive even during magnetically quiet times. On many revolutions of the satellite about the earth, passing approximately along the auroral oval, with transition from the midnight to the morning sectors there is a structureless "background" of electrons with an almost constant intensity and slowly changing angular distribution. The energy flux of these electrons is approximately 1 erg/cm²-sec. Near the midnight sector and with transition from the midnight to evening sector the fluxes of auroral electrons are far more irregular, with strong peaks, particularly at about 4.5 keV. No measurable electron intensities were discovered in the middle and low latitudes in the keV range. The upper limit of the energy flux in the quiet atmosphere is approximately $< 1.5 \cdot 10^{-2}$ erg/cm²-sec. An exception is the equatorial region of the ionospheric anomaly, where as earlier (on the "Kosmos-5" satellite) there was sporadic registry of soft electrons.

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Acc. Nr:

AP0048368

Abstracting Service:

INTERNAT. AEROSPACE ABST.

Ref. Code:

5-90 2180293

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A70-24315 # Study of the geosactive particles and photoelectrons by means of satellite 'Kosmos-261.' IV--Study of charged particles with a middle and high energy (Issledovanie geoaktivnykh korpuskul i fotoelektronov na sputnika 'Kosmos-261.' IV--Izmereniia zariazhennykh chastits srednikh i vysokikh energii). A. D. Bolunova, A. D. Verevkin, Iu. I. Gal'perin, L. S. Gorn, L. S. Zhurina, I. D. Ivarov, R. N. Isaeva, I. P. Karpinskii, R. A. Kovrakhin, V. V. Temnyi, B. I. Khazantov, A. V. Shifrin, and F. K. Shuiskala. *Kosmicheskie Issledovaniia*, vol. 8, Jan.-Feb. 1970, p. 125-135. 7 refs. In Russian.

Descriptions of the scintillation spectrometers for measuring the electrons with energy ranging from 20 to 150 keV and more, protons with energy ranging from 0.30 to 9 MeV. A lead-screened Geiger counter for measuring the protons with energy above 50 MeV and rigid electrons is also described. The latitude-dependent intensity distribution of the intrusive electrons is determined together with the pitch distribution of the electron intensity in the auroral zone, and differential electron spectra.

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USSR

UDC 533.9

KARPIYUK, K. S., KOLESNICHENKO, Ya. I., Institute of Physics, Academy of Sciences, Ukrainian SSR, Kiev

"The Interaction of Waves in Plasma Wave Guides. I"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, No 9, September 1970, pp 1459-1467

Abstract: The interaction of waves is considered in a bounded plasma described by equations of two-component hydrodynamics with the finiteness of the plasma temperature taken into account. It is shown that with a corresponding determination of the scalar product, the normal modes of the plasma wave guide form an orthogonal system. This permits effective calculation of the matrix elements which describe the processes of wave interaction in the plasma wave guide. Account is taken of the influence of nonlinearity of the boundary conditions upon wave interaction. Consideration is given to a number of specific interactions with the participation both of solid waves in the case in which a constant magnetic field is absent. 10 bibliographic entries.

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USSR

UDC 533.9

KARPIVUK, K. S., KOLESNICHENKO, Ya. I., Institute of Physics, Academy of Sciences,
Ukrainian SSR, Kiev

"The Interaction of Waves in Plasma Wave Guides. II"

Kiev, Ukrainskiy Fizicheskiy Zhurnal, No 9, September 1970, pp 1468-1476

Abstract: The nonlinear interaction of waves in magnetized plasma wave guides is investigated. Matrix elements describing the interaction of slow high-frequency waves are calculated. Some decay instabilities in a magnetized plasma wave guide are considered. 1 table. 2 bibliographic entries.

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1/2 030 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--SLOW, HIGH FREQUENCY WAVES IN A MAGNETIZED PLASMA WAVEGUIDE -U-
AUTHOR--(02)-KARPLYUK, K.S., KOLESNICHENKO, YA.I.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL TEKHNICHESKOI FIZIKI, VOL. 40, JAN. 1970, P. 54-61
DATE PUBLISHED----JAN70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--WAVEGUIDE, PLASMA WAVE, PLASMA OSCILLATION, MAGNETIC FIELD
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1979/1617 STEP NO--UR/0057/70/040/000/0054/0061
CIRC ACCESSION NO--AP0047939
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0047939

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE PROPAGATION OF SLOW, HF WAVES UNDER EFFECT OF A MAGNETIC FIELD IN CYLINDRICAL PLASMA WAVEGUIDE SURROUNDED BY A DIELECTRIC OR A METAL. DISPERSION EQUATIONS ARE OBTAINED WHICH DESCRIBE THE NATURAL OSCILLATIONS OF THE WAVEGUIDE FOR BOTH THESE CASES. AN ANALYSIS IS MADE OF THESE EQUATIONS AND DISPERSION CURVES ARE OBTAINED USING NUMERICAL CALCULATIONS. IT IS SHOWN THAT AN ALLOWANCE FOR TEMPERATURE RESULTS IN THE ARISING OF NEW OSCILLATION BRANCHES IN THE BOUNDED PLASMA SYSTEMS.

1/2 045 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--INTERACTION OF MAGNETOHYDRODYNAMIC WAVES IN A BOUNDED PLASMA -U-

AUTHOR--(03)-KARPLIUK, K.S., KOLESNICHENKO, I.I., DRAEVSKIY, V.N.

COUNTRY OF INFO--USSR

SOURCE--NUCLEAR FUSION, VOL. 10, MAR. 1970, P. 3-11

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MAGNETOHYDRODYNAMIC WAVE, WAVE EQUATION, PLASMA INSTABILITY,
STRONG MAGNETIC FIELD, SURFACE WAVE, ACOUSTIC WAVE, PLASMA INTERACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1985/1749

STEP NO--AU/0000/70/010/000/0003/0011

CIRC ACCESSION NO--AP0101802

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PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0101802

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DESCRIPTION IS GIVEN OF A GENERAL METHOD OF DERIVING DYNAMIC EQUATIONS FOR THE AMPLITUDES OF INTERACTING WAVES (BOTH VOLUME AND SURFACE WAVES) IN A BOUNDED PLASMA. THE TREATMENT IS BASED ON THE STUDY OF THE INTERACTION OF MAGNETOHYDRODYNAMIC WAVES IN A PLASMA CYLINDER CONFINED BY A STRONG MAGNETIC FIELD. DECAY INSTABILITIES WERE STUDIED IN ORDER TO FIND THE PROBABILITIES AND EVALUATE THE CHARACTERISTIC TIMES OF THE CORRESPONDING THREE PLASMON PROCESSES. IT IS SHOWN THAT THE NONLINEARITY OF THE BOUNDARY CONDITIONS CAN HAVE A SUBSTANTIAL EFFECT ON THREE PLASMON INTERACTIONS INVOLVING SURFACE WAVES. THE LINEAR PROBLEM WAS SOLVED IN ADVANCE. IT IS SHOWN, IN PARTICULAR, THAT IN ADDITION TO THE ALFVEN SURFACE WAVES, ACOUSTIC TYPE SURFACE WAVES WITH FREQUENCIES APPROXIMATELY EQUAL CAN PROPAGATE IN THE PLASMA CYLINDER.
FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, INSTITUT FIZIKI, KIEV, UKRAINIAN SSR.

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USSR

UDC 532.522.2

AVDUYEVSKIY, V. S., IVANOV, A. V., KARPMAN, I. M., TRASKOVSKIY, V. D., and YUDELOVICH, M. Ya.

"The Structure of Turbulent Underexpanded Jets Discharging Into a Flooded Space and a Concurrent Stream"

Moscow, Izvestiya Akademii Nauk, SSSR, Mekhanika Zhidkosti i Gaza, No 3, 1972, pp 15-29

Abstract: The results of an experimental investigation of the geometric structure of the initial sector of underexpanded jets are presented, and consideration is given to the principal features of flow in the mixing zone on the boundary of a greatly underexpanded jet during a turbulent flow regime along the entire length of the initial sector of the jet. A concurrent supersonic stream exerts an essential qualitative and quantitative influence upon the configuration of the initial sector of underexpanded jets. The most essential feature of a jet in the concurrent stream consists in "degeneration" of the central shock wave at Mach numbers of the concurrent stream $M_\infty > 2$. The transverse and longitudinal dimensions of the initial sector of an underexpanded jet in a concurrent stream with numbers $M_\infty > 1.5-2$ decrease with the increase of M_∞ . The established features of the structure of concurrent jets
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AVDUYEVSKIY, V. S., et al., Izvestiya Akademii Nauk, SSSR, Mekhanika Zhidkosti i Gaza, No 3, 1972, pp 15-29

make it impossible, in the general case, to substitute the concurrent jet by an equivalent flooded jet. Approximate relationships are presented, which make it possible to take into account the influence of a concurrent stream upon the basic characteristic dimensions of the initial sector of the jet. The characteristic regions of flow in the compressed viscous layer of an underexpanded jet are isolated. The self-similarity of fields of the gas-dynamic parameters is established. Data are presented on the position of the mixing zone in the space, the total-head profiles, the statistical pressure, and the dimensionless excess stagnation temperature in greatly underexpanded jets. 14 figures. 3 tables. 8 references.

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AVDUYEVSKIY, V. S., IVANOV, A. V., KARPMAN, I. M., TRASKOVSKIY, V. D.,
TUDELOVICH, M. Ya.

"The Flow in a Supersonic Viscous Underexpanded Jet"

Moscow, Mekhanika Zhidkosti i Gaza, No 3, 1970, pp 63-69

Abstract: An experimental investigation is made of the flow at the initial sector of an underexpanded supersonic jet flowing out into the immersed space and the concurrent stream at Mach numbers $M_\infty \leq 10$. The determining effect of viscosity upon the nature of flow in the jet is established. The basic rules governing the flow are defined. In addition, the results of investigation of the basic dimensions of the initial sector of a turbulent underexpanded jet flowing out into the immersed space are set forth in detail.

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Acc. Nr: **AP0047355**

Ref. Code: **UR0589**

PRIMARY SOURCE: Vestnik Khirurgii imeni I. I. Grekova, 1970,
Vol 104, Nr 1, pp **37-44**

**ON PATHOGENESIS OF HEMORRHAGE FROM ESOPHAGEAL AND GASTRIC
VEINS IN PORTAL HYPERTENSION**

By M. D. Patsiora, L. I. Aruin, L. M. Karpman and A. K. Yeramishantsev

The authors have investigated 123 patients with portal hypertension complicated by esophageal or gastric phlebectasis. In 88 patients there were gastroesophageal hemorrhages in the anamnesis. In 34 patients during surgical procedures on esophageal and gastric veins the biopsy mucosa specimens from the cardiac portion of the stomach and lower esophagus were studied. It is concluded, that a hemodynamic factor — high portal pressure is of primary importance in causing hemorrhage from esophageal or gastric varices. The starting mechanism of bleeding is hypertensive crisis in the portal system. Acid-peptic factor could contribute to hemorrhage, while disturbances in the blood coagulation system could stipulate its massive character and duration, but they do not play a leading part in the occurrence of bleeding.

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USSR

ISTOMIN, Ya. N., and KARPMAN, V. I., Institute of Terrestrial Magnetism, the Ionosphere, and Radiowave Propagation, Academy of Sciences USSR

"Nonlinear Modulation of Quasimonochromatic Whistler Packet in Magnetosphere"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 208-211

Abstract: Much research has been done in the last few years on the propagation of monochromatic whistlers along the geomagnetic field in the upper ionosphere and magnetosphere, including experiments in which waves are radiated by a transmitter on earth and recorded by a receiver located at a magnetoconjugate point. The transmitter usually radiates quasimonochromatic wave packets. The present article discusses some nonlinear effects due to the limited nature of a packet entering the active region of the magnetosphere.

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USSR

BUD'KO, N. I., KARPMAN, V. I., and SHKLYAR, D. R.

"Stability of a Plasma in the Field of a Longitudinal Monochromatic Wave"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 61, No 4(10),
October 1971, pp 1463-1476

Abstract: The evolution of disturbances in a plasma located in the field of a longitudinal monochromatic wave of high amplitude is investigated. Interest in this question was aroused by the work of Wharton, Malmberg, and O'Neil (Phys. Fl., 11, 1968, p 1761) in which it was found that such a wave generates satellites whose frequency differs from that of the fundamental wave by an amount of order $1/\tau$, where τ , the characteristic oscillation time of the particles captured by the field of the fundamental wave, is inversely proportional to the charge-to-mass ratio of the electron and to the amplitude and wave number of the fundamental wave. The approach to the problem of the mechanism behind this phenomenon used by the authors employs the distribution function obtained by O'Neil. It is found that the satellites can be generated only for a strong wave that can satisfy the condition $v_{\phi} v_r / v_T^2 > 1/2$: where v_{ϕ} is the phase velocity, v_r is the velocity of the captured particles, and v_T is the thermal velocity of the particles.
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BUD'KO, N. I., et al., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki,
Vol 61, No 4(10), October 1971, pp 1463-1476

Under experimental conditions, the value of the lefthand side of the inequality above was found to be of the order of unity. The authors express their gratitude to R. Z. Sagdeyev for his comments and to V. S. Knyazyuk for his assistance with the numerical computations. They are members of the Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation, Academy of Sciences, USSR.

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USSR

UDC: 533.951

VAS'KOV, V. V. and KARPMAN, V. I.

"Nonlinear Theory of Plasma Motion in a High-Frequency Electro-magnetic Field"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, vol. 41, No. 4, April 1971, pp 676-679

Abstract: This theoretical article considers the nonlinear flow of a nonisothermal plasma in a high-frequency electromagnetic field in which the amplitudes of the electric and magnetic fields are slowly varying functions of time. The assumption is made that the plasma is collisionless, and the hydrodynamic equations of the plasma are considered in combination with the Maxwell equations to yield an expression for the dielectric permeability of the plasma. From equations they derive, the authors find a solution describing the isolated electrosonic waves known as solitons, as well as periodic solutions, which are generalized. They conclude by expressing their thanks to M. L. Levin and K. V. Khodatayev for their comments.

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UDC:532.59

KADOMTSEV, B. D., ~~KARPMAN, V. I.~~

"Nonlinear Waves"

Moscow, Uspekhi Fizicheskikh Nauk, Vol 103, No 2, Feb 71, pp 193-232

Abstract: This article presents the primary results from the theory of nonlinear wave processes in continuous media in comparatively simple form, considering dispersion and dissipative effects. Primary attention is given to the unstable process of the formation of collision and combined waves, phenomena of self-constriction and self-focusing of wave packets, processes of dynamic and stochastic interaction of waves. The general regularities are illustrated with examples from the areas of hydrodynamics, plasma physics, nonlinear optics, etc.

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USSR

UDC 612.16+612.1

KAREPMAN, V. L., LYUBINA, B. G., and SINYAKOV, A. F., Laboratory of Cardiology and Chair of Sport Medicine, Central Institute of Physical Culture, Moscow

"Circulation During Controlled Tachycardia"

Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 2, 1973, pp 292-298

Abstract: On a bicycle ergometer, trained athletes performed work at several levels of assigned heart rate. This was achieved by means of feedback information from an instrument with a programmed heart rate. The experimental subject's actual heart rate was being continuously recorded and compared with the programmed rate. A discrepancy between the two rates released a sound signal of high or low frequency, and the subject immediately adjusted his pedaling speed until the sound disappeared. In this way, the actual heart rate was kept within 2% of the programmed rates of 120, 130, 150, and 170 beats/min. It was found that the work rate increases in linear proportion with the heart rate. The stroke volume increases at a rate of about 8 ml per 10 beats increase in the heart rate up to a heart rate of 120-130 b/min. Thereafter, the average increase becomes about 2 ml/10 beats. Correspondingly, the cardiac output increases rapidly at first (from 5 L/min at rest to 14 L/min at a heart 1/2

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KARPMAN, V. L., et al., Fiziologicheskii Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 2, 1973, pp 292-298

rate of 125 b/min) and slower subsequently (to a maximum of 20 L/min). With shortening duration of the cardiac cycle, not only the diastolic but also the systolic period becomes shorter. However, since the phase of isovolumetric contraction almost disappears, the ejection period is reduced to a smaller degree. On the average, the ejection rate increases approximately linearly from 360 ml/sec at rest to a maximum of 896 ml/min. Similarly, the ventilation perfusion ratio increases, to reach the value of 3.4 at the maximum work load. From the practical viewpoint, it appears important that the heart rate can be kept constant at any desired level by adjusting the work rate.

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USSR

UDC 612.766.1+613.72/.73

KARPMAN, Prof. V. L.; BELOTSEKOVSKIY, Z. B.; LYUBINA, B. G.;
Cardiology Laboratory, Central Institute of Physical Culture,
Moscow

"Study of Physical Work Capacity in Sports Medicine and Clinical
Practice"

Moscow, Sovetskaya Meditsina, Vol 34, No 2, Feb 71, pp 103-109

Abstract: Cumbersome graphic extrapolation in the determination of the physical working capacity at 170 heartbeats per minute (PWC₁₇₀) according to T. Sjostrand (Acta Med. Scand., Suppl. 196, p 687, 1947) can be avoided if the formula $PWC_{170} (kgm/min) = N_1 + (N_2 - N_1) \cdot \left(\frac{170 - f_1}{f_2 - f_1} \right)$ is used, where N_1 and N_2 are the respective outputs in kgm/min of two successive physical exertions on a bicycle ergometer, and f_1 and f_2 the pulse rates registered 5 min after the first and second exertions. Tests carried out on men athletes, women athletes, and men and women not engaged in athletics showed that a simple linear relation

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USSR

KARPMAN, Prof, et al, Sovetskaya Meditsina, Vol 34, No 2, Feb 71, pp 103-109

between f and N applied in the $f \leq 170$ range in each of the four groups except that of men athletes, for which the increase of f with N at $N > 1,500$ kgm/min became less pronounced. By using the values of PWC_{170} calculated for the test subjects on the basis of the formula, the maximum O_2 consumption $\text{max } V_{\text{O}_2}$ could be calculated from the formula $\text{max } V_{\text{O}_2} (\text{ml}/\text{min}) = 1.7 \times \text{PWC}_{170} + 1,240$. Use of this formula made it possible to determine $\text{max } V_{\text{O}_2}$ without subjecting the persons being tested to a muscular strain² of a trying nature. The values of PWC_{170} and $\text{max } V_{\text{O}_2}$ were found to be statistically valid and reliable indexes of physical performance.

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USSR

UDC 537.533.2+537.534

NEMCHENOK, R. L., IVANOV, A. V., KARPOV, A. A.

"Emission Properties of the Au-BaO System"

Tr. Leningr. politekhn. in-ta (Works of Leningrad Polytechnical Institute),
1970, No 311, pp 51-55 (from RZh-Fizika, No 12(1), Dec 70, Abstract No
12Zh631)

Translation: The properties of the Au-BaO system were studied by external photo-effect and thermoemission methods. The measurements were conducted in sealed devices in a high vacuum ($p < 5 \cdot 10^{-9}$ mmHg). It was shown that for surface concentrations $n_{\text{BaO}} > 1 \cdot 10^{15} \text{ cm}^{-2}$ the BaO film has photoelectric properties of thick oxide coatings and, in particular, sensitivity to ultraviolet radiation. The nature of the changes in emission properties of the Au-BaO system to $T = 1200^\circ\text{K}$ does not indicate chemical interaction of the BaO film with Au. Authors abstract.

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USSR

UDC 669.721.046.4

KARPOV, A. B., IL'ICHEV, A. A.

"Dependence of Dehydration and Hydrolysis of Magnesium Chloride Crystal Hydrates on Gas Flow Rate"

Tr. Vses. N-i. i Proyecktn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 63-68. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G188 by the authors).

Translation: The influence of the speed of the gas stream blown directly through the filter material layer on the rate of processes of dehydration and hydrolysis of $MgCl_2 \cdot 2H_2O$ and $MgCl_2 \cdot H_2O$ in the 200-400° temperature interval is studied. The rate of dehydration increases with increasing gas flow rate. The degree of hydrolysis of $MgCl_2$ is decreased with an equal degree of dehydration of its crystal hydrates. The data produced indicate that the rate of dehydration is significantly higher than the rate of hydrolysis. An increase in temperature causes an increase both in the rate of dehydration and in the rate of hydrolysis. However, the rate of hydrolysis increases more rapidly with increasing temperature. 3 figs; 1 table, 9 biblio refs.

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USSR

UDC 669.721.046.4

KARPOV, A. B., REZNIKOV, I. L.

"Kinetics of Dehydration and Hydrolysis of Magnesium Chloride During Dehydration"

Tr. Vses. N-i. i Projektn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 69-76. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G189 by the authors).

Translation: The kinetics of dehydration and hydrolysis of $MgCl_2 \cdot 4H_2O$, $MgCl_2 \cdot 2H_2O$, and $MgCl_2 \cdot H_2O$ are studied. Based on the experimental data produced, the dehydration rate constants of these crystal hydrates and the hydrolysis rate constants for $MgCl_2 \cdot 2H_2O$ and $MgCl_2 \cdot H_2O$ are calculated. The apparent activation energies are calculated. Certain considerations concerning the mechanism of the process of dehydration of crystal hydrates of $MgCl_2$ are stated. 5 figs; 2 tables; 11 biblio refs.

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Foundry

USSR

UDC 669.187.046

ROYTBURD, L. N., IVANOV, I. N., KARPOV, A. G., and GERGAUZ, G. V., Moscow Engineering-Economics Institute

"Important Reserve for Increasing the Economic Effectiveness of Electroslag Smelting"

Moscow, Izvestiya VUZ, Chernaya Metallurgiya, No 11, 1973, pp 186-188

Abstract: By now the high national economic effectiveness of one of the new procedures for improving the quality of alloyed steels and alloys, that is, the process of electroslag smelting, can be considered proven. However there is still room in the metallurgical enterprises for improving the effectiveness of this process and its technico-economic indicators.

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USSR

ROYTBURD, L. N., et al., Izvestiya VUZ, Chernaya Metallurgiya, No 11, 1973,
pp 186-188

The authors discuss some of the ways in which this can be done with respect to cost of using various alloys and fluxes.

They have compiled a table which illustrates the calculations of the cost of one ton of liquid flux employed in the process.

The article contains 1 table.

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USSR

UDC 669.14.018.23

KOZHIN, V. M., KARPOV, A. G., OPANASENKO, T. V., GRISHINA, N. A., and YEROFEYEV, V. I.

"EP378 High-Strength Automatic Stainless Steel"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1970, pp 25-27

Abstract: A new high-strength automatic stainless steel, type EP378 (0.35-0.45% C; 0.6-1.0% Mn; 1.7-2.2% Ni; 0.6-0.9% Mo; 16.5-18.5% Cr; 0.15-0.25% S; 0.08-0.15% P), is described. The new steel has superior physical and mechanical properties to types Kh14, 1Kh18N10Ye, and EI474. The steel is designed for parts of instruments working in friction which must have hardness HRC \geq 48. The critical points for EP378 steel, determined dilatometrically, are: $Ac_1 = 750^\circ\text{C}$; $Ac_3 = 820^\circ\text{C}$; $M_n = 220^\circ\text{C}$. The steel has maximum hardness when hardened from 1040-1060°C. The influence of tempering on mechanical properties is studied. The mechanical properties of the steel are: tensile strength 168-175 kg/mm², $\sigma_{0.2} = 140-145$ kg/mm², $\delta = 8-10\%$, $\psi = 15-17\%$, $a_n = 1.0-1.8$ kgm/cm², HRC = 48-52. Heat treatment modes are discussed.

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1/3 020 UNCLASSIFIED PROCESSING DATE--11SEP70
 TITLE--STRUCTURE AND PROPERTIES OF BERYLLIUM BRONZE MICROALLOYED WITH
 MAGNESIUM -U-
 AUTHDR--TKHAGAPSOYEV, KH.G., RAKHSHTADT, A.G., PASTUKHOVA, ZH.P., KARPOV,
 A.G.
 COUNTRY OF INFO--USSR
 SOURCE--METALLOYED. TERM. OBRAB. METAL. 1970, (2), 19-24
 DATE PUBLISHED-----70
 SUBJECT AREAS--MATERIALS
 TOPIC TAGS--BRONZE, BERYLLIUM CONTAINING ALLOY, MAGNESIUM CONTAINING
 ALLOY, ALLOY DESIGNATION, X RAY ANALYSIS, ELECTRIC RESISTANCE,
 MECHANICAL PROPERTY/(U)B2 BERYLLIUM BRONZE, (U)BNT19 BERYLLIUM BRONZE
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRA--1988/1297 STEP NO--UR/0129/70/000/002/0019/0024
 CIRC ACCESSION NO--AP0106077
 UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106077

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COLD ROLLED B2 AND BNT1.9 BE BRONZES CONTG. MG 0.05-0.10, AND P 0.02-0.1PERCENT (B2 BRONZE ONLY), AND THOSE WITHOUT MG AND P WERE QUENCHED FROM 780-820DEGREES AND AGED AT 280-360DEGREES FOR 0.5-10 HR. DISTRIBUTION OF TI, NI, AND MG WAS DETD. BY THE X RAY ANAL., AND THE AGING KINETICS WAS STUDIED BY DETG. CHANGES OF HARDNESS, ELASTIC LIMIT SIGMA SUB0.002, AND ELEC. RESISTANCE. THE RELAXATION STABILITY WAS DETD. BY THE LONGITUDINAL BEND TESTS AT 10 PRIME4 CYCLES, 65 AND 45 KG-MM PRIME2, AND UNDER STATIC LOAD OF 55 KG-MM PRIME2 AT 20 AND 100DEGREES, FOR 3500 AND 150 HR, RESP. ADDN. OF MG SMALLER THAN OR EQUAL TO 0.1PERCENT SIGNIFICANTLY IMPROVES MECH. PROPERTIES OF BRONZES. THE SIGMA SUB0.002 INCREASED FROM 58-63 FOR BRONZE WITHOUT MG TO 73-8 KG-MM PRIME2 FOR THE ONE CONTG. MG, THE FINAL DEFORMATION DEGREE AFTER 10 PRIME4 CYCLES DECREASED FROM (5-6.3) TIMES 10 PRIME NEGATIVE3 TO (2.5-2.6) TIMES 10 PRIME NEGATIVE3PERCENT AT 65 KG-MM PRIME2, AND FROM (1.72-2.9) TIMES 10 PRIME NEGATIVE3 TO (1.17-1.4) TIMES 10 PRIME NEGATIVE3PERCENT AT 45 KG-MM PRIME2, AND THAT UNDER THE STATIC STRESS OF 55 KG-MM PRIME2 DECREASED FROM (4.8-5.65) TIMES 10 PRIME NEGATIVE3 TO (2.34-2.42) TIMES 10 PRIME NEGATIVE3PERCENT AT 20DEGREES, 3500 HR, AND FROM 8 TIMES 10 PRIME NEGATIVE3 TO 4.2 TIMES 10 PRIME NEGATIVE3PERCENT AT 100DEGREES, 150 HR. MG INCREASES DISPERSITY AND HOMOGENEITY OF THE BRONZE STRUCTURE. THE MEAN ALPHA SOLID SOLN. GRAIN DIAM., MEASURED AFTER 15 MIN OF HEATING AT 720-820DEGREES AND QUENCHING, DECREASED FROM 0.03 TO 0.025 MM AT 720DEGREES AND FROM SIMILAR TO (0.08-0.09) TO SIMILAR TO (0.065-0.07) MM AT 820DEGREES.

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PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106077

ABSTRACT/EXTRACT--THESE EFFECTS ARE ATTRIBUTED TO THE ADSORPTION OF MG ON THE INTERPHASE SURFACES AND AT THE GRAIN BOUNDARIES. NO CHANGES OF ELEC. RESISTANCE AND NEGLIGIBLE ONES OF HARDNESS WERE OBSD. FURTHERMORE, IT WAS CALCD. THAT P INCREASES THE AGING ACTIVATION ENERGY OF THE B2 BRONZE AT 280-360DEGREES FROM 24-6 TO 32-5 KCAL-MOLE. P ATOMS FORM COMPLEXES WITH VACANCIES AND DIMINISH THEIR MOBILITY. THE QUENCHING FROM 770DEGREES AND AGING AT 320DEGREES FOR 6 HR IS RECOMMENDED AS THE OPTIMUM HEAT TREATMENT OF THE BNT1.9 AND B2 BRONZES - CONTG. MG. J. PIETKIEWICZ.

UNCLASSIFIED

KARPOV, A.V.

Hydrometeorology

Source: JPRS 456831
1972 Aug 72
Hydrometeorology
①

FROM RESULTS OF THE NUMERICAL EXPERIMENT WITH RESPECT TO REPRODUCTION OF THE TEMPERATURE PROFILE BY THE "NUMERICAL" IRRADIATION METHOD
Article by A.V. Karpov (Hydrometeorological Scientific Research Center, Moscow, USSR)
Hydrometeorology, Moscow, No. 6, 1972, submitted to February 1972, pp. 12-22

A study was made of the problem of reproducing the vertical temperature profile by spectral radiative measurements. The iteration algorithm for solving this problem is discussed. The calculation to the known formulas for downward and upward thermal probing problem is established. The efficiency of the proposed algorithm was checked in numerical experiments using real satellite measurements.

The solution of the problem of thermal sounding -- determination of the temperature profile of the atmosphere T(p) by measurements of the intensity of infrared radiation -- is being implemented by various mathematical methods which in one way or another reduce to the solution of a system of algebraic equations approximating the integral radiation transport equation briefly written in the form

$$J(x_i) = \delta T(x_i) T(p_i) + \int_{x_1}^{x_2} B(x_n, T(p)) \epsilon(x_n, T(p)) dx_n \quad (1)$$

where $J(x_i)$ is the intensity of the outgoing thermal emission at the upper boundary in the vertical direction,

$B(x_n, T(p)) = \int_{\Omega} \epsilon(x_n, T(p)) \epsilon(x_n, T(p)) d\Omega$ is the Planck function,

$\epsilon(x_i, T(p))$ is the spectral transmission function of the atmosphere,

δ is the emissivity of the underlying surface,

USSR

KARPOV, A. V., (Editor)

Khimicheskoye i Bakteriologicheskoye (Biologicheskoye) Oruzhiye i Posledstviya Yego Vozmozhnogo Primeneniya (Chemical and Bacteriological [Biological] Weapons and Consequences of Their Use), Moscow, "Mezhdunarodnyye Otnesheniya," 1970, 156 pp

Translation: Annotation: In 1969 UN General Secretary U Thant presented a report on the consequences of possible use of chemical and bacteriological weapons. U Thant said that the international community does not realize sufficiently the dangers connected with this new kind of mass-murder weapon. The report was prepared by prominent scientists of many nations and, in accordance with a decision of the UN General Assembly, it is being published in all member nations of this organization.

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KARPOV, A. V., Chemical and Bacteriological Weapons and Consequences of Their Use, Moscow, "Mezhdunarodnyye Otnosheniya," 1970, 156 pp

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KARPOV, A. V., Chemical and Bacteriological Weapons and Consequences of Their Use, Moscow, "Mezhdunarodnyye Otnosheniya," 1970, 156 pp

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USSR

UDC: 51

KARPOV, E. A., SUROVTSOV, L. K., NIGGOL', V. K.

"Concerning a Problem in the Dynamics of Forest Resources"

V sb. Primeneniye mat. v ekon. (Use of Mathematics in Economics--collection of works), vyp. 7, Leningrad, Leningrad University, 1972, pp 131-135 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6v484)

Translation: The paper presents a mathematical formulation of the problem of determining the extent of forest utilization for a planned period assuming a certain condition of dimensionality of utilization. The problem is treated from the standpoint of the mathematical theory of optimum processes. [From the introduction].

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USSR

UDC: 619:616.981.42-084.47

KOSILOV, I. A., KARPOV, EL GL, SYRTLANOV, R. M., and YAKOVLEV, I. A., Siberian Scientific Research Veterinary Institute

"Inagglutinogenic Brucellosis Vaccine From Strain B-1"

Moscow, Veterinariya, No 2, 1971, pp 46-48

Abstract: The reactivity of the newly developed brucellosis vaccine from inagglutinogenic Br. abortus strain B-1 was studied in 4,800 cattle, 3,200 of which had previously been inoculated with vaccine from strain 19. After vaccination some of the healthy animals (1 to 5%) responded in the agglutination and complement-fixation reactions with standard antigens in 3 to 5 months. After revaccination there was no increase in the number of animals reacting or in the length of time the antibodies remained. Complement-fixing antibodies with homologous antigen were found in 85% of the animals 20 to 30 days after inoculation. The vaccine produced the same degree of immunity in young cows subsequently inoculated with a virulent culture from the Br. abortus 54 strain as the widely used vaccine from strain 19. For example, Brucella were isolated from the regional lymph nodes of only 9 of 16 animals vaccinated with B-1 vaccine. The immunity conferred by the

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USSR

KOSILOV, I. A., et al, Veterinariya, No 2, 1971, pp 46-48

two vaccines diminished steadily and after 23 to 30 months most of the animals could not resist experimental infection. However, revaccination at this time with either vaccine restored immunity.

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USSR

AKIMOVA, A. A., KARPOV, I. K. and KASHIK, S. A.

"Recognition of Geological Objects Belonging to Several Classes on the Basis of a Single Function"

Mat. Modeli v Geol. i Geostatistika [Mathematical Models in Geology and Geostatics -- Collection of Works], Moscow, Nauka Press, 1973, pp 40-44 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V193)

Translation: A group of a a priori possible classes of geological objects v_1, v_2, \dots, v_a , are studied, characterized by p properties (for example, the content of chemical compounds, expressed in weight percent). Suppose of a certain set we extract the sample X_1, X_2, \dots, X_k , where $X_i = (X_{i1}, X_{i2}, \dots, X_{ip})$ is a p-dimensional vector. In order to classify the set in question (that is related to one of the classes v_1, v_2, \dots, v_a), it is suggested that we use the statistics

$$f = \theta_0 + \theta_1 \bar{X}_1 + \theta_2 \bar{X}_2 + \dots + \theta_p \bar{X}_p,$$

where $\bar{X}_j = \frac{1}{k} \sum_{i=1}^k X_{ij}$.

The coefficients $\theta_0, \theta_1, \dots, \theta_p$ are selected on

USSR.

AKIMOVA, A. A., KARPOV, I. K. and KASHIK, S. A., Mat. Modeli v Geol. i Geostatistika, Moscow, Nauka Press, 1973, pp 40-44

the basis of the results of independent observations

$$x^0_1, x^0_2, \dots, x^0_N \quad (1)$$

of geological objects belong to classes $v_1, v_2, \dots, v_\alpha$. The results of observations are p -dimensional vectors and are ordered in sequence (1) so that the results of observations of the geological objects belonging to class v_i precede the results of observations of geological objects belonging to class v_{i+1} .

Suppose n_i the number of observations of geological objects belonging to class v_i . Classes $v_1, v_2, \dots, v_\alpha$ can be assigned the weights $y_1, y_2, \dots, y_\alpha$ respectively.

Coefficients $\theta_0, \theta_1, \dots, \theta_p$ and weights $y_1, y_2, \dots, y_\alpha$ are selected so as to minimize the function

$$\sum_{m=1}^{\alpha} \sum_{l=s(m)+1}^{s(m)+n_m} \left[\theta_0 + \sum_{j=1}^p \theta_j X_{lj}^0 - y_m \right]^2$$

where $s(m) = \sum_{l < m} n_l$.

USSR

UDC 621.391:519.27

BLOK, A. S., KARPOV, L. P. *K*

"Problem of Multiplication of Images in Coherent Optical Information Processing Systems"

Materialy nauchnotekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi. Vyp. 2 (Materials of the Scientific and Engineering Conference. Leningrad Electrotechnical Communications Institute, Vyp 2), 1970, pp 136-142 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A31.)

Translation: This article contains an investigation of various methods of multiplication of input images by optical means. The latter is required when constructing optical-electronic recognition systems, when reducing integral microunits, and so on. A brief mathematical description of some methods of multiplication is presented. Results of the preliminary experiment are presented.

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UDC: 621.391.19

KRUPITSKIY, E. I., KARPOV, I. P., ZYUZIN, O. M., BLOK, A. S.

"Device for Formation of Characteristics During Recognition of Patterns"

USSR Author's Certificate Number 307411, filed 6/04/70, published 29/07/71, (translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 3, 1972, Abstract No 3 A379 P)

Translation: For formation of characteristics during recognition of patterns a device is suggested containing a source of coherent light, a collimator, a transparency with the pattern to be recognized, and a Fourier transform lens along the optical axis of the device. In order to increase the speed and reliability of recognition, an optical system to multiply the light flux-such as a matrix of a small-diameter lens and a converting lens-is placed between the collimator and transparency, while a matrix of masks and photoreceptors, based on the number of light fluxes multiplied, is placed in the output plane of the device. 1 figure.

1/1

USSR

UDC: 621.375.8

KRUPITSKIY, E. I., KARPOV, L. P., ZYUZIN, O. M., BLOK, A. S., Leningrad
Electrical Engineering Institute of Communications imeni Professor M. A.
Bonch-Bruyevich

"A Multichannel Optical Correlator"

Moscow, Otkrytiya, Izobreneniya, Promyshlennyye Obratzysy, Tovarnyye Znaki,
No 7, Mar 72, Author's Certificate No 329612, Division H, filed 29 May 70,
published 9 Feb 72, p 212

Translation: This Author's Certificate introduces: 1. A multichannel
optical correlator with two-dimensional channels. The device contains a
coherent light source, a collimator, a transparency carrying an image of
the pattern to be recognized, a Fourier-transform lens, and a photocell
matrix. As a distinguishing feature of the patent, in order to improve the
accuracy of registration of correlation functions, a reflecting diffraction
grating is placed in the rear focal plane of the lens, which performs
Fourier transformation of the light flux passing through the transparency
carrying a recording of the image to be processed, and a reference-mask
matrix is placed together with the photocell matrix in the forward focal

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USSR

KRUFITSKIY, E. I. et al., USSR Author's Certificate No 329612

plane of the lens. 2. A modification of this correlator distinguished by the fact that stray light beyond the photocell inputs is reduced by making the diffraction grating with an opening for filtering out the fixed component of the image being processed.

2/2

USSR

UDC: 681.325.65:621.383

KRUPITSKIY, E. I., KARPOV, L. P., ZYUZIN, O. M., Leningrad Electrical Engineering Institute of Communications imeni M. A. Bonch-Bruyevich

"An Electron-Optical Learning System"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 25, Soviet Patent No 278229, class 42, filed 31 Jan 69, published 5 Aug 70, p 135

Translation: This Author's Certificate introduces an electron-optical learning system for recognition of acoustic and radar signals. Two-dimensional moments of the "instantaneous amplitude spectrum" are taken as the input signal characteristics. The device contains an "instantaneous spectrum" shaper, a specialized electronic computer, and a control module. As a distinguishing feature of the patent, the system is simplified and operating effectiveness is improved by connecting to the output of the "instantaneous spectrum" shaper a device which generates light flux modulated by the "instantaneous spectrum" of the signal to be recognized. This light generator is coupled to a multiple-channel optical correlator with electrical outputs proportional to the two-dimensional moments of the instantaneous amplitude spectrum. These electrical outputs are connected to the electronic computer.

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USSR

UDC: 519.1

KARPOVA, N. A.

"Concerning the Possible Asymptotic Behavior of Shannon Functions in Realizing Functions of Logic Algebra by Formulas"

Moscow, Probl. kibernetiki--sbornik (Problems of Cybernetics--collection of works), vyp. 26, "Nauka", 1973, pp 37-51 (from RZh-Matematika, No 9, Sep 73, abstract No 9V447 by S. Marchenkov)

Translation: The paper deals with realizing the functions of logic algebra by formulas in arbitrary bases. A basis is defined, generally speaking, as an infinite, functionally complete system of functions, each of which is assigned a non-negative weight. The complexity of realization of the function is defined in the conventional way -- as the lower bound of the weights of formulas realizing the function, and the Shannon function $L(n)$ -- as the maximum of the complexities of realizations of all functions of n variables.

The numerical function $P(n)$ is called permissible if for any $\epsilon > 0$ there is an N such that for all n and t ($N < t \leq n$)

$$\frac{P(n) (t \log_2 n + 2t)}{2^{nP(t)}} < (1 + \epsilon).$$

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USSR

KARPOVA, N. A., Probl. kibernetiki, vyp. 26, "Nauka", 1973, pp 37-51

We say that the function is asymptotically monotonic if it is equivalent (asymptotically equal) to some monotonically nondecreasing function. The main result of the work consists in proof of the following theorem:

In order for the numerical function $P(n)$ to be equivalent to a Shannon function, it is necessary and sufficient that it satisfy the conditions:

- 1) $P(n)$ is asymptotically monotonic;
- 2) $P(n)$ is permissible.

Previously (RZhMat, 1971, 3V341) the author of the paper obtained a similar result for the case of realization of functions of logic algebra by circuits of functional elements.

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USSR

UDC: 519.1

KARPOVA, N. A.

"Minimum Circuits of Closing Contacts for Monotonic Functions of Five Variables"

Moscow, Probl. kibernetiki--sbornik (Problems of Cybernetics--collection of works), vyp. 26, "Nauka", 1973, pp 53-94 (from RZh-Matematika, No 9, Sep 73, abstract No 9V452 by V. Khrapchenko)

Translation: An article in RZhMat, 1960, abstract 6264, describes a catalog of minimum contact circuits for Boolean functions which depend on no more than four variables. It is impractical to compile such a catalog for a larger number of variables, since the number of types exceeds a million even for Boolean functions of five variables. Therefore it is necessary to restrict further examination to the most interesting classes. This paper gives a catalog for monotonic Boolean functions of five variables (it was found that there are 210 types). The given circuits contain only closing contacts and are the minimum circuits in their class. The main difficulty in compiling the catalog -- proving that the given circuits are indeed minimum -- is overcome in most instances by combined application of

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USSR

KARPOVA, N. A., Probl. kibernetiki, vyp. 26, "Nauka", 1973, pp 53-94

a number of known methods, although in about 30 cases the author was constrained to find nonstandard proofs. The catalog also lists certain other useful information including the catalog number of the dual function and the number of functions of the given type.

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USSR

KARLOV, N. V., KARPOV, N. A., et al. (Lebedev Physics Institute, USSR Academy of Sciences)

"Dissociation and Decrease of Light Absorption of a Multilevel Molecular Gas Due to Radiation From a Powerful CO₂ Laser"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, June 1973, pp 2008-2016

Abstract: The interaction between an intense infrared beam and resonantly absorbing gases is investigated. A cascade radiative-collision mechanism of vibrational excitation of a molecular resonance system is considered which leads to dissociation and decrease of the light absorption of the gas. Propagation of the radiation in the medium is accompanied by transparency, dissociation, and recombination waves. Experiments on absorption of 10.6- μ radiation in BCl₃ and SF₆ gases allow one to calculate the characteristic excitation transfer times in a cascade process in the gases and also to evaluate the distribution of the molecule populations with respect to vibrational levels as well as the degree of dissociation, which was 97-99% for an irradiation intensity of about 10 kw/cm². The dependence of the propagation velocity of the transparency wave on the irradiation intensity is found. A stationary decrease of the absorption coefficient should occur when practically all molecules are dissociated.

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USSR

UDC: 669.017--12:539.53

GLEBOVA, E. D., KURASOV, A. N., and KARPOV, N. A., Dnepropetrovsk Metallurgical Institute

"Structural Changes in Hyperplastic Cr-Ni-Fe Alloys With High-Temperature Stretching"

Moscow, Izvestiya VUZ--Chernaya Metallurgiya, No. 8, 1971, pp 133-136

Abstract: Although little attention has been given to the structural changes occurring in the stretching of two-phase (A+ δ) high-chromium Cr-Ni-Fe alloys, their study is important for determining the hyperplasticity mechanism and choosing the conditions of heat deformation. The alloys investigated had the following composition: 42% Cr, 30-40% Ni, 1% Ti, 0.02% C, and 0.06% N. The width of the sheet specimens was 40 microns, with a grain dimension of 5-10 microns. Specimens measuring 15 mm in length and 3 mm in diameter were stretched at a rate of 1.5 mm/min at a temperature of 600-1250^o C after a 15-minute preparatory maintenance at these temperatures. In this preliminary heating, the development of phase shifts was observed and confirmed through observation on a television microscope, and changes in the concentration of Cr and

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USSR

GLEBOVA, E.D., et al, Moscow, Izvestiya VUZ--Chernaya Metallurgiya, No 8, 1971, pp 133-136

Ni in specimens heated from 900-1250° C were observed with the MAR-1 x-ray microspectral device, Photomicrographs of Mn42Ni40Ti alloy specimens heated at 1100° C after various percentages of deformation are shown.

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USSR

UDC: 669.15-194:669.26:620.186

BARANOV, A. A., BLIZNYUKOVA, L. A., GLEBOVA, E. D., and KARPOV, N. A.

"Structural Changes Upon Deformation and Annealing of Iron-Chromium Alloys"

Izv. VUZ, Chernaya Metallurgiya, No 6, 1970, pp 120-124

Abstract: The changes in the structure of vacuum treated alloys of iron with chromium in quantities of 25, 37, and 50% were studied with cold deformations of 5, 20, and 45% and subsequent heating to 400-1200°C. Deformation was by slipping and twinning, with the twinning increasing with increasing chromium content. The development of recrystallization in the deformed alloys was noted at 700°C. In alloys containing chromium 35 [sic] and 50%, recrystallization was accompanied by formation of the σ -phase. The changes in the twinning structure, polygonization, and grain growth occurring during heating are described. Three illustrations; two tables; seven biblio. refs.

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USSR

UDC 621.357.7(088.8)

KARPOV, P. S., PYDAL'CHENKO, M. K., TYPITSYN, G. I., and YARKIN, V. V.,
Institute of Metallurgy imeni A. A. Baykov, Academy of Sciences USSR

"Electrolytic Deposition of Highly Porous Metal Layers"

USSR Author's Certificate No 324301, Filed 22 Sep 69, Published 6 Mar 72
(from Referativnyy Zhurnal -- Khimiya, Svodnyy Tom, No 23(II), 1972, Abstract
No 23L269)

Translation: The patented method uses an electrolyte containing suspended insoluble metal particles. The metal particles are of the same kind as those being deposited. The particles serve as cathode with high catalytic activity. For example, in order to obtain the Ni catalyst, a nickel carbonyl powder PNK-1 is added to the H_2SO_4 electrolyte. The electrolyte composition is (g/liter): $NiSO_4 \cdot 7H_2O$ 100-150, Na_2SO_4 40-60, H_3BO_3 20-30, NaCl 3-5, nickel carbonyl powder 75-150. The electrolytic deposition is carried out at pH 2-5, $50^\circ C$, D_c 4-12 a/dmf with intensive mechanical mixing of the electrolyte.

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USSR

UDC: 621.317.37

OSOKIN, V. I., DUBOVOY, N. D., CHIBRIKOV, S. I., KARPOV, R. G., GRUZDEV, S.V.

"A Microwave Pulse Power Meter"

Moscow, Otkrytiya, Izobreneniya, Promyshlennyye Obratzysy, Tovarnyye Znaki, No 9, Mar 72, Author's Certificate No 331325, Division G, filed 23 Mar 70, published 7 Mar 72, p 135

Translation: This Author's Certificate introduces a microwave pulse power meter which contains a bolometric bridge, a detector and an amplifier. As a distinguishing feature of the patent, measurement accuracy is improved by feeding the output signal simultaneously to the inputs of a slave multivibrator and a slave sawtooth voltage oscillator. The output of the sawtooth voltage oscillator is connected to the input of a memory unit. The output signal from the memory unit is sent to one of the inputs of a two-coil ratiometer, and the signal from the output of the bolometric bridge is sent to the second input of the two-coil ratiometer through a second memory unit. A signal is sent to the input of the bolometric bridge through a high-frequency switch from the output of a flip-flop. A signal from the output of the slave multivibrator is sent to one input of the flip-flop

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USSR

OSOKIN, V. I. et al., USSR Author's Certificate No 331325

through a pulse duration shaper, a frequency divider and a delay line. The second input of the flip-flop is connected to the output of the pulse duration shaper.

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USSR

UDC: 537.74

GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G., MATYUKHIN, Yu. D.,
OSOKIN, V. I., and YUDINA, V. P.

"UHF Power Meter With Automatic Selection of the Measurement
Limit"

Leningrad, Priborostroyeniye, No 1, 1972, pp 13-17

Abstract: Most UHF power meters of the self-balancing type, in which some of the measuring operations are automatic, have a manually operated method of setting the measurement limit. The authors, members of the Ryazan Radio Engineering Institute, have devised a method of automating that adjustment as well. Where the measurements are based on the method of replacing the UHF power by the varying frequency pulse power, and especially in digital readout instruments, this can be done fairly easily, as the authors demonstrate. A block diagram of the device is given together with an explanation of its operation. The essence of the system is a power-frequency converter for representing the output information in frequency form.

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USSR

UDC: 621.317.784.023(088.8)

OSOKIN, V. I., DUBOVOY, N. D., KARPOV, R. G., GRUZDEV, S. V., CHIBRIKOV,
S. I.

"An Automatic SHF Power Meter"

USSR Author's Certificate No 268519, filed 18 Nov 68, published 14 Aug 70
(from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6A275 P)

Translation: This Author's Certificate introduces an automatic SHF power meter with double comparison which contains an automatically balancing thermistor bridge, a microwave cutoff switch and a power indication circuit. The proposed meter differs from conventional units in the fact that the rectifier input is connected to the bridge output, and the rectifier output is connected to one of the comparator inputs; the other comparator input is connected to the output of an integrator, and the comparator output is connected to the inputs of flip-flops; the output of a sawtooth voltage generator is connected to a thermistor and to a meter, resulting in increased speed and accuracy of measurement over a wide temperature range. E. L.

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USSR

UDC: 621.317.784.023(088.8)

KARPOV, R. G., GRUZDEV, S. V., OSOKIN, V. I., DUBOVOY, N. D., KROTENKO, V. I.,
MAKSEMOV, Yu. N.

"An SHF Power Meter"

USSR Author's Certificate No 263006, filed 30 Apr 68, published 8 Jun 70
(from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6A277 P)

Translation: This Author's Certificate introduces an SHF power meter which contains a self-balancing thermistor bridge with a selective amplifier in the self-balancing circuit, and a heater for the thermistor. As a distinguishing feature of the patent, measurement precision is improved by using a high-frequency oscillator as the thermistor heating source.

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USSR

UDC 621.317.78(088.8)

GRUZLEV, S. G., DUBOVOY, N. D., KARPOV, R. G., OSOKIN, V. I.

"Super-High Frequency Power Meter"

USSR Author's Certificate No 275184, Filed 21 Jun 68, Published 14 Oct 70 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A276P)

Translation: A super-high frequency power meter containing a self-balancing bolometric bridge with an oscillator in the autobalancing circuit is proposed. A pulse oscillator with constant amplitude and regulatable length, the modulation characteristic of which depends on the peak amplitude of the control pulses was used as the oscillator to improve the measurement accuracy.

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USSR

UDC 621.317.784.023(088.8)

KARPOV, R. G., GRUZDEV, S. V., FROLIN, M. I., OSOKIN, V. I., DUBOVOY, N. D.

"Superhigh Frequency Power Meter"

USSR Author's Certificate No 272400, Filed 29 Apr 68, Published 22 Sep 70 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A283P)

Translation: A superhigh frequency power meter comprising a self-balancing bolometric bridge with an oscillator in the autobalancing circuit is proposed. The proposed meter is distinguished by the fact that in order to improve the meter sensitivity a pulse oscillator with constant amplitude and regulatable repetition rate is used as the oscillator. Its modulation characteristic depends on the peak value of the control pulse amplitude.

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USSR

UDC: 621.317.78

GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G., OSOKIN, V. I., CHIBRIKOV, S. I.

"An SHF Power Meter"

USSR Author's Certificate No 270888, filed 8 Dec 68, published 24 Aug 70
(from RZh-Radictekhnika, No 2, Feb 71, Abstract No 2A329)

Translation: An SHF power meter is proposed which contains a thermistor bridge, amplifier, variable-frequency oscillator and sensitivity control circuit. As a distinguishing feature of the patent, the proposed meter utilizes automatic sensitivity control which is effected by varying the frequency of the substituting voltage. This frequency is compared with that of the reference oscillations, and the difference between these frequencies is presented in digital form. The ultimate result is an increase in measurement precision. E. L.

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USSR

UDC: 621.317.78.023(088.8)

GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G., OSOKIN, V. I., CHIBRIKOV, S. I.

"An SHF Power Meter"

USSR Author's Certificate No 270886, filed 8 Dec 68, published 24 Aug 70
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A337 P)

Translation: An SHF power meter is proposed which contains a thermistor bridge, a selective amplifier and a power indication circuit. In order to improve measurement accuracy, provision is made in the proposed meter for automatic compensation of the error in comparison of the measured power with the substituting power increment. This is accomplished by using a storage integrator, a comparator and a sawtooth voltage generator to which a pointer indicator is connected at the instant when the sawtooth voltage reaches the balance level. E. L.

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USSR

UDC: 621.317.784.023(088.8)

GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G., OSOKIN, V. I., CHIBRIKOV, S. I.

"A Pulse-Frequency SHF Power Meter"

USSR Author's Certificate No 270887, filed 8 Dec 68, published 24 Aug 70
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A334 P)

Translation: This Author's Certificate introduces a meter which contains a bolometric bridge, pulse amplifier, amplitude detector, variable-frequency oscillator and a subtraction device. As a distinguishing feature of the patent, a prf divider for the VFO pulse output is connected in the feedback circuit of the bridge resulting in an increase in meter sensitivity proportional to the division coefficient of the divider. E. L.

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Acc. Nr.: AT0046539

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Ref. Code: UR0146

USSR

UDC 621.317.713

GRUZDEV, S.V., DUBOVY, N.D., KARPOV, R.G., OSOKIN, V.I.

"Digital SHF Power Meter"

Tsifrovoy izmeritel' SVCh moshchnosti (of. English above),
Leningrad, Izvestiya Vysshikh Uchebnykh Zavedeniy, Priboro-
stroeniye, 1970, No. 1, pp 30-33

Translation:

Considered is an SHF power meter with linear conversion of the measured quantity into pulse repetition frequency and automatic output of the measurement result in digital form. The basic analytic relations and experimental data are presented.

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USSR

UDC 621.317.328

GRUZDEV, S. V., DUBOVOY, N. D., ^KKARPOV, R. G., OSOKIN, V. I., CHIBRIKOV, S. I.

"Superhigh-Frequency Power Meter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,
No 17, 12 May 70, p 56, Patent No 270886, Filed 8 Dec 68

Translation: This Author's Certificate introduces a superhigh-frequency power meter containing a thermistor bridge, a selective amplifier and a power indicating circuit. In order to increase the measurement accuracy, in the power indicating circuit the output of the balancing oscillation rectifier is connected to a comparator and an integrator, the integrator output is connected to the second input of the comparator, and the output of the comparator is connected via the control circuit to the saw oscillator the output of which is connected to the thermistor.

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USSR

K UDC 621.317.325

GRUZDEV, S. V., DUBOVY, N. D., KARPOV, R. G., OSOKIN, V. I., CHEBRIKOV, S. I.

"Superhigh-Frequency Power Meter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzy, Tovarnyye Znaki, No 17
12 May 70, p 56, Patent No 270888, Filed 8 Dec 68

Translation: This Author's Certificate introduces a superhigh-frequency power meter containing a thermistor bridge, an amplifier, a controlled frequency generator and a measuring regulation circuit. In order to increase the measurement accuracy, the controlled frequency oscillation output and the reference oscillation output in the sensitivity regulating circuit are connected via dividers to the pulse sequencing switch, and the subtractor output is connected to the digital sensor for controlling the conversion voltage frequency and the division factor of the dividers.

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USSR

K
UDC: 621.317.784

KARPOV, R. G., GRUZDEV, S. V., FROLEN, M. I., OSOKIN, V. I., DUBOVOY, N. D.

"An SHF Power Meter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzny, Tovarnyye Znaki, No 19, 1970, Author's Certificate No 272400, p 50

Abstract: This author's certificate introduces an SHF power meter which contains a self-balancing bolometric bridge with an oscillator in the self-balancing circuit. As a distinguishing feature of the patent, the sensitivity of the meter is improved by using a pulse generator with constant amplitude and controllable prf as the oscillator. The modulation characteristic of this generator depends on the peak value of the amplitude of the controlling pulses.

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USSR

UDC 621.317.744

GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G., OSOKIN, V. I., CHIBRIKOV, S. I.

"Pulse-Frequency Superhigh-Frequency Power Meter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsy, Tovarnyye Znaki,
No 17, 12 May 70, p 56, Patent No 270887, Filed 8 Dec 68

Translation: This Author's Certificate introduces a pulse-frequency super-high-frequency power meter containing a bolometric bridge, a pulse amplifier, an amplitude detector, a generator with controlled frequency, an auxiliary generator and a subtracting circuit. In order to increase the sensitivity the output pulse repetition frequency divider of the controlled generator is connected to the feedback circuit of the bridge circuit.

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USSR

K UDC: 621.317.784

OSOKIN, V. I., DUBOVOY, N. D., KARPOV, R. G., GRUZDEV, S. V., CHIBRIKOV, S. I.

"An Automatic SHF Power Meter"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 14, 1970, Author's Certificate No 268519, filed 18 Nov 68, p 44

Abstract: This author's certificate introduces an automatic SHF power meter with double comparison. The unit contains an automatic-balance thermistor bridge, an SHF disconnect and a power indication circuit. As a distinguishing feature of the patent, measurement precision is improved by connecting the rectifier input to the bridge output and connecting the rectifier output to one of the comparator inputs, the other comparator input being connected to the output of an integrator. The comparator output is connected to flip-flop inputs. The output of the saw-tooth voltage generator is connected to a thermistor and a meter pointer.

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USSR

K UDC: 621.733

GUZDEV, S. V., KARPOV, R. G.

"Bridge Meters with Radio Impulse Feed"

Tr. Ryazansk. radiotekhn. in-ta (Works of the Ryazan Radio Engineering Institute),
1970, vyp. 23, pp 165-173 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7A215)

Translation: It is theoretically shown that radio pulse voltage may be used for supply to bridge circuits. Relationships are given which define the time of the transition process and the required frequency spacing of the radio pulses. A number of advantages of radio impulse feed are pointed out. E. L.

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USSR

K
UDC 621.317.78

OSOKIN, V. I., GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G.

"Automatic Device for Measuring Low Levels of Continuous Superhigh-Frequency Power"

Tr. Ryazansk. radiotekhn. in-ta (Works of Ryazan Radiotechnical Institute), 1970, vyp. 23, pp 188-196 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A369)

Translation: A significant deficiency of self-balancing bridges as applied to measuring superhigh-frequency power is the high initial signal level at their output before supplying the measured power as a result of which the relative variation of this signal on arrival of the measured power at the bolometer is insignificant. A functional diagram is presented and analyzed, the special structure of which permits elimination of the indicated deficiencies and, in addition to this, automation of the measurement process, an increase in speed and an increase in accuracy. The instrument constructed by the described scheme, insures automatic measurement of the power in the 30 microwatt to 3 milliwatt range with accuracy to 5%. The measurement time for maximum power is less than or equal to 3 seconds.

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USSR

UDC 621.317.78

K
GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G., OSOKIN, V. I.

"High-Speed Superhigh-Frequency Power Meter"

Tr. Ryazansk. radiotekhn. in-ta (Works of Ryazan Radiotechnical Institute), 1970, vyp. 23, pp 174-187 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8A376)

Translation: This article contains a description of an instrument which is an astatic tracking system constructed on the basis of a selective amplifier encompassed by positive feedback via a bolometric bridge. The block diagram of this meter and the time diagrams explaining its operation are presented. A short theory is presented. The possibility of applying the device on the indicated principle for stabilization of the generator power is noted. The bibliography has three entries.

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USSR

UDC 621.317.78

DUBOVOY, N. D., GRUZDEV, S. V., KARPOV, R. G. OSOKIN, V. I.

"Superhigh-Frequency Power Meter with Time-Pulse Conversion"

Obmen opytom v radioprom-sti (Exchange of Experience in the Radio Industry)
vyp. 2, Moscow, 1970, pp 47-48 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract
No 8A373)

Translation: This article contains a block diagram and a description of the operating principle of a high-speed tracking time-pulse superhigh-frequency power meter. The meter includes a power amplifier, a controlled multivibrator, a pulse amplifier, a shaping circuit, and a delay line. The multivibrator is executed according to the schematic permitting control of the generated constant voltage pulse length. Variation of the pulse length can serve as a measure of the superhigh-frequency power. The pulse feed of the bridge circuit greatly improves the sensitivity of the bridge by comparison with constant or variable voltage feed.

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USSR

UDC 576.858.25.083.2

YEROFEYEV, V. S., and KARPOV, S. P., Tomsk Scientific Research Institute of Vaccines and Sera and Chair of Microbiology at the Tomsk Medical Institute

"Utilization of Syrian Hamsters and Piglets for Evaluation of Attenuated Tick-borne Encephalitis Virus"

Moscow, Voprosy Virusologii, No 5, Sep/Oct 72, pp 591-594

Abstract: The responses of four different types of laboratory animals to attenuated variants (V-67 and VE-4) of tickborne encephalitis virus were investigated by clinical, virological, and neuromorphological methods. After subcutaneous injections of the attenuated variants, randombred and Balb mice developed the disease, but in a much milder form than after injections of virulent strains. In Syrian hamsters, piglets, and rhesus monkeys, intracerebrally administered attenuated variants caused no clinical manifestations of encephalitis, though temporary viremia was observed in several animals for up to 3 days. Immunofluorescent and pathomorphological investigations also yielded negative results. In control tests with virulent strains, all hamsters, piglets, and monkeys developed the disease with pronounced neurological signs, high viremia, fever, and lethal outcome. The attenuated variants were highly pathogenic to cell cultures. Thus, because the reaction of Syrian hamsters

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USSR

YEROFEYEV, V. S. and KARPOV, S. P., Voprosy Virusologii, No 5, Sep/Oct 72, pp 591-594

and piglets to attenuated strains is the same as that of rhesus monkeys, the first two species are recommended as test animals. To pass the test of safety, attenuated tickborne encephalitis strains must be completely pathogenic for Syrian hamsters and piglets.

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USSR

UDC 616.988.25-022.395.42-056.3

KARPOV, S. P., Tomsk Medical Institute and Tomsk Institute of Vaccines and Sera

"Allergy in Tickborne Encephalitis"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 12, 1971, pp 97-105

Abstract: Formaldehyde-killed tissue vaccine made from tickborne encephalitis virus cultured in chick embryo fibroblasts produced an allergic reaction in rabbits. The specificity of the reaction was demonstrated by a positive experiment involving anaphylaxis with desensitization. The course of a skin test and positive reaction of neutrophil injury in animals sensitized by the virus and vaccine as well as the allergy produced by an abdominal exudate from the animals indicated that the allergy was of the delayed type. The preparation was given as a diagnostic test to 675 patients with tickborne encephalitis at different stages of the disease and the result was positive in 75.4% of the cases. The appearance and course of the allergy varied with the form of the disease. Field studies showed the test to be useful in determining the immunologic structure of the population in foci of tickborne encephalitis. It was positive in 19.6 to 90.9% of the cases, depending on the intensity of circulation of the virus.

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USSR

UDC 616.988.25-022.395.42-056.3

KARPOV, S. P. and FEDOROV, Yu. V., Tomsk Medical Institute and Tomsk
Institute of Vaccines and Sera

"Recent Data on the Immunology of Tickborne Encephalitis (Review)"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 10, 1971,
pp 89-93

Abstract: This review of the literature (mostly Soviet) of the last 10 years touches on the following aspects of tickborne encephalitis: (a) antigenic structure of the agent; (b) allergenic properties of the virus; (c) serological tests developed for identifying the strains of viruses isolated and their antigenic properties, determining antibodies in serum preparations, diagnosing the disease, and detecting natural foci; (d) principal methods of diagnosing the disease; (e) immunological structure of foci of tickborne encephalitis; (f) physiological mechanisms of natural immunity; (g) development of live vaccine; (h) prophylactic and therapeutic uses of gamma globulin.

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USSR

UDC: 531.1

KARPOV, S. V. and SUBECTIN, V. M.

"Deviations of a Gyroscope on a Movable Base Caused by Friction Moments"

Sb. Nauchn. tr. Perm. politekhn. in-t (Scientific Transactions of the Perm Polytechnical Institute--collection of works) 1970, No. 57, pp 139-144 (from RZh-Mekhanika, No. 2, Feb 71, Abstract No. 2A79)

Translation: Equations are given for the precession movement of a three-degree astatic gyroscope with the moments of force of dry friction in the suspension axes taken into account. The base rotates with a constant angular velocity around the external frame axis, and makes progressive shifts (vibrations) with accelerations obeying the harmonic law. When this angular velocity substantially exceeds the azimuthal deviation of the gyroscope, the equations are markedly simplified, and only the azimuthal motion of the gyroscope axis is considered. An expression is given for the modulus of the friction moment in the inner frame suspension.

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USSR

KARPOV, S.V., et al, Sb. Nauchn. tr. Perm. politekhn. in-t, 1970, No 57, pp 139-144 (from RZh-Mekhanika, No 2, Feb 71, Abstract No 2A79)

axis, depending on the radial and axial projections of the reaction of the bearings of this axis and the friction coefficients, for which, on the basis of theoretical and experimental data, corresponding analytical dependences are obtained. A determination is made of the angular velocity of the gyroscope axis azimuthal deviation, averaged over the period of vibration, caused by radial and axial components of the bearing reactions in the inner frame axis of the gyroscope suspension for vibrations of the base.

S. S. Rivkin

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1/2 046 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--PECULIARITIES IN THE VIBRATIONAL SPECTRA OF CESIUM AND RUBIDIUM
NITRATE CRYSTALS IN ITS LOW TEMPERATURE PHASES -U-
AUTHOR--(02)-KARPOV, S.V., SHULTIN, A.A.
COUNTRY OF INFO--USSR *K*
SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 39, NR 1, PP 33-38
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--IR SPECTRUM, ABSORPTION SPECTRUM, X RAY ANALYSIS, CRYSTAL
STRUCTURE, VIBRATION SPECTRUM, CESIUM, RUBIDIUM, NITRATE, LOW
TEMPERATURE EFFECT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1989/1401 STEP NO--GE/0030/70/039/001/0033/0038
CIRC ACCESSION NO--AP0107874
UNCLASSIFIED

2/2 046

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0107874

ABSTRACT/EXTRACT--(U) CP-0- ABSTRACT. POLARIZED IR ABSORPTION SPECTRA OF CSNO SUB3 II AND RBN0 SUB3 IV CRYSTALS HAVE BEEN INVESTIGATED IN THE REGION OF THE FUNDAMENTAL VIBRATIONS OF THE NITRATE IONS AT 80 AND 300DEGREESK AS WELL AS THE RAMAN SPECTRA OF THESE CRYSTALS AT ROOM TEMPERATURE. APART FROM THE LOCAL FIELD EFFECTS AND THE DAVYDOV SPLITTING OF SOME VIBRATIONAL TERMS ALSO A SPLITTING DUE TO THE PRESENCE OF SEVERAL SETS OF MOLECULES NOT RELATED BY SYMMETRY IN A UNIT CELL WAS OBSERVED. THESE RESULTS AGREE WITH THE MORE ACCURATE DATA OF X RAY ANALYSIS OF THE CRYSTAL STRUCTURE OF THE LOW TEMPERATURE PHASES OF CESIUM AND RUBIDIUM NITRATE.

UNCLASSIFIED

Measuring, Testing, Calibrating

USSR

UDC: 535.34

BOFEYKO, V. M., KARPOV, V. I., FEDOROVA, T. N.

"Installation for Studying Gasses in the Vacuum Area of the Spectrum by Impulse Photolysis"

Leningrad, Optiko-mekhanicheskaya Promyshlennost', No 8, Aug 72, pp 36-39.

Abstract: An impulse photolysis device is described. Vacuum absorption spectra in the UV area are recorded using a transmission tube consisting of a capillary source producing a continuum to 120 m μ . The design peculiarities of the source are studied. Oscillograms and radiation spectra are presented. The device is made in two versions, with photographic and photoelectric recording. Power supply is through six high-voltage coaxial cables located concentrically around the quartz discharge capillary, in order to assure a short pulse. The device can measure the absorption spectra of particles with lifetimes of over 10 μ sec in the vacuum ultraviolet area.

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UDC 678.742.2-137.46.22:66.018.86

TERTERYAN, R. A., LESHCHENKO, S. S., LIVSHITS, S. D., GOLOSOV, A. P.,
ITSIKSON, L. B., MONASTYRSKIY, V. N., KARPOV, V. L., SOBOLEVA, N. S.,
MAL'TSEVA, A. P., and ISKHAKOV, L. I.

"Radiation Stability of Ethylene and Styrene Copolymers"

Moscow, Plasticheskiye Massy, 7, 1973, pp 3-5

Abstract: A study was made of the continuous statistical copolymerization of ethylene monomers (E) with styrene (S) under conditions similar to those under which low density polyethylene is produced and also of the behavior of E + S polymers in an ionizing radiation field. The results of copolymerization studied -- grams of copolymer/hr concentration of S in the polymer, density, and others -- are given as a function of styrene concentration and pressure at 200°C. An increase in the concentration of S in the reaction mixture leads to a decrease in the copolymer yield, in its characteristic viscosity, in its melting temperature, and its crystallinity, and to an increase in the density. The presence of S monomers in the polyethylene chains and the chemical bonds between them and the methylene groups significantly increases the resistance of the material to α -radiation damage. The gases evolved during the radiation of various types of polymers were determined.

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UDC 541.6+541.15

KARPOV, V. L., FINKEL', E. E., BERLYANT, S. M., and BRAGINSKIY, R. P.

"Radiation Modification of Polyolefines"

Moscow, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva imeni D. I. Mendeleev, Vol 18, No 3, 1973, pp 270-278

Abstract: A review with 87 references analyzing the effect of radiation on the changes in physico-mechanical and electric properties of polyethylene and other polyolefines as well as the thermal stabilization of the radiation modified polyolefines. The reported data suggest that radiation modification of polyethylene is one of the most promising radio-chemical processes. The polyethylene modified by radiation exhibits several novel qualities in comparison to the nonirradiated one, expanding considerably its applicability. The properties and areas of application of the products manufactured from radiation modified polyethylene have been noted.

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