

USSR

UDC 553.951

ALIYEV, Yu. M., SILIN, V. P., Physics Institute imeni P. N. Lebedev, Academy of Sciences of the USSR, Moscow

"Parametric Action on a Plasma by High-Power Emission Close to Electron Cyclotron Frequencies"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 42, No 11, Nov 72, pp 2249-2254

Abstract: Taking general principles of the theory of parametric resonance in a plasma as a basis, the authors present theoretical results which show a new possibility for anomalously strong action of emission on a plasma. It is found that parametric resonance arises in a magnetically active plasma under conditions in which the overtones of the external emission frequency are close to electron cyclotron harmonics. Emission field strength threshold values are found at which the plasma begins to be parametrically unstable. The maximum values of increments in small perturbations are calculated.

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SILIN, V. P., Physics Institute imeni P. N. Lebedev, Academy of Sciences of the USSR

"Concerning Relaxation Processes in a Parametrically Unstable Plasma"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 63, No 5(11), Nov 72, pp 1686-1697

Abstract: A theory of relaxation of particle distributions is developed for a plasma in the strong electric field of a high-frequency pumping wave under conditions of development of parametric instability relative to the buildup of potential perturbations. It is shown that the number of ions with energy  $(m_i/m_e)^{1/3}$  times the oscillation energy of the electrons in the field of the pumping wave can be increased. A relation is established between the increasing ion energy and the energy density of field perturbations under conditions of a rising fluctuation field. It is found that high-energy harmonics develop in the electron velocity distribution in which the energy scatter of electrons is determined by the plasma fluctuation energy density reduced to a single electron. Causes are established for anisotropy of particle velocity distribution which shows up in anisotropy of temperatures and in possible regions of resonance relaxation.

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SILIN, V. P., et al; Novosibirsk, Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki; November-December, 1970; pp 41-8

The study was conducted over a wide range of frequencies of an external electrical field  $\omega_0 > \nu_{ei}$  ( $\nu_{ei}$  is the frequency of electron-ion collisions, the expression for which is obtained in the paper). In the low-frequency region  $\omega_0 < \nu_{ei}$  the drift velocity of electrons along a magnetic field does not have a frequency  $\omega_0$  but the frequency of the electron-ion collisions; this leads to another expression for the conductivity along the magnetic field.

Finally, it is shown that the time of a collision occurring due to Coulomb interaction, obtained by Silin and Chernyy in the above-cited reference, remains valid for the case in which an external high-frequency electrical field is imposed on the plasma.

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USSR

SILIN, V. P.; TIKHONCHUK, V. T. (Moscow)

"A Relaxation Theory for the Temperature of an Electron-Ion Plasma Occurring in High-Frequency Electrical and Constant Magnetic Fields"

Novosibirsk, Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki; November-December, 1970; pp 41-8

ABSTRACT: The authors determined the effective electron-ion collision frequency leading to the equalization of temperatures in plasmas occurring in constant magnetic and weak, high-frequency electrical fields under conditions in which the gyroscopic radius of the electrons is found to be less than the Debye shielding radius. The corresponding values of the relaxation time for a wide range of ratios of the electron and ion temperatures and a wide range of values of the magnetic and electrical fields, as well as the frequency of the external electrical field, were determined.

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SILIN, V. P., et al, Novosibirsk, Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, November-December, 1970, pp 41-8

Equalization of the electron and ion temperatures of a plasma in a strong, constant magnetic field when the Debye shielding radius is found to be greater than the gyroscopic radius of the particles was studied by V. P. Silin and G. P. Chernyy ("Relaxation of Electron and Ion Temperatures of a Plasma Occurring in a Strong Magnetic Field", ZhETF, 1962, Vol. 43, No. 5; "A Theory for the Relaxation of Electron and Ion Temperatures of a Plasma Occurring in a Strong Magnetic Field", Zh. Tekh. Fiz., 1969, Vol. 39, No. 5). A kinetic equation with an integral of the collisions determining the effect of a magnetic field on the motion of the colliding particles (V. P. Silin, "Kinetic Equation for Rapidly Changing Processes", ZhETF, 1960, Vol. 38, No. 6) provided the basis of these works.

This paper concerns the problem of determining the effect of a high-frequency electrical field on the relaxation time of the temperature of a magnetized plasma. As Silin et al showed in their paper "Parametric Resonance in a Plasma Occurring in a Magnetic Field" (ZhETF, 1966, Vol. 50, No. 4), in a magnetized plasma a variation of the increasing oscillations in a strong, high-frequency electrical field is possible; therefore, electrical fields in which the drift velocity of the particles becomes greater than their thermal velocity are not considered in this paper.

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USSR

YELEONSKIY, V. M., and SILIN, V. P., Physics Institute imeni P. N. Lebedev,  
Academy of Sciences USSR

"Self-Focusing of a Vector Field"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 13,  
No 3, 5 Feb 71, pp 167-170

Abstract: Self-focused or self-channelling field distributions were first discussed in 1958 by Volkov, who showed in studying a plasma that there may exist magnetic field distributions localized in space due to the nonlinear action of the field on the medium. The nonlinear solution of the field equations found by Volkov were for the case of a scalar field. In this article it is shown that self-focused field distributions also exist for TM-waves when there are two components of the electrical field (the vector case). Such distributions were found to differ qualitatively from the scalar field case. The presence of a small parameter  $k_z$  in the field equations reduces the maximum value of the self-focused field by  $\sqrt{2}$ , as compared with the solution of scalar field theory. In the case of a spatially periodic solution, the regions of the transverse field alternate with regions in which a longitudinal field occurs. The electrical field vector then rotates.

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USSR

SILIN, V. P., and YELEONSKIY, V. M. (Lebedev Physics Institute, USSR Academy of Sciences)

"Nonlinear Theory of Penetration of a Conductor by p-Polarized Waves"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, May 1971, pp 1927-1937

Abstract: Solutions are obtained for the internal and external electro-dynamics problems which arise on analysis of the reflection of obliquely incident p-polarized waves (waves with the electrical vector in the plane of incidence) from a medium with nonlinear dielectric permeability. It is shown that in the absence of an energy flux into a nondissipative medium, reflection of p-polarized waves may occur not only under conditions of electromagnetic fields' vanishing within the medium but also under conditions of periodic fluxless field distributions. For almost normal wave incidence the medium becomes stratified into regions in which the electromagnetic field is transverse and, at the same time, regions in which a longitudinal field exists. The condition of nonlinear transparency with respect to longitudinal waves is satisfied in the latter regions, and spatial  
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USSR

SILIN, V. P., and YELEONSKIY, V. M., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, May 1971, pp 1927-1937

transformation of transverse and longitudinal electromagnetic fields occurs in them.

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1/2 037 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--SPATIAL DISPERSION EFFECTS IN THE OPTICS OF METALS -U-  
AUTHOR--(02)-SILIN, V.P., FETISOV, E.P.  
COUNTRY OF INFO--USSR  
SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 39, NR 1, PP 49-60  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--KINETIC EQUATION, PLASMA WAVE, METAL SURFACE PROPERTY, LIGHT RADIATION EFFECT, SURFACE ENERGY, ASYMPTOTIC PROPERTY, LIGHT DISPERSION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1992/0083 STEP NO--GE/0030/70/039/001/0049/0060  
CIRC ACCESSION NO--AP0111277  
UNCLASSIFIED

2/2 037

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0111277

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE OBLIQUE INCIDENCE OF A LIGHT WAVE ON A PLANE BOUNDARY IS CONSIDERED USING THE METHOD OF KINETIC EQUATION. THE MAIN ATTENTION IS PAID TO THE STUDY OF THE INFLUENCE OF LONGITUDINAL PLASMA WAVE EXCITATION IN METALS ON SURFACE ENERGY LOSSES OF LIGHT WAVES AND ON VOLUME LOSSES IN THE CASE OF P-POLARIZATION. THE SIGNIFICANCE OF FERMI LIQUID EFFECTS IS CONSIDERED IN DETAIL. AN ASYMPTOTIC BEHAVIOUR OF THE FIELD INSIDE THE METAL IS OBSERVED FOR LONG DISTANCES FROM THE BOUNDARY. FACILITY: P. N. LEBEDEV PHYSICAL INSTITUTE, MOSCOW.

UNCLASSIFIED

1/2 027 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--QUANTUM WAVES IN A DEGENERATE ELECTRON FLUID OF METALS -U-  
AUTHOR-(03)-ZYRYANDV, P.S., OKULOV, V.I., SILIN, V.P.  
COUNTRY OF INFO--USSR  
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,  
NR 4, PP 1295-1309  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRON OSCILLATION, ELECTRON GAS, QUANTUM OSCILLATION,  
ELECTRON MOTION, ELECTRON SPECTRUM, SPIN WAVE, CRYSTAL LATTICE  
VIBRATION, METAL ELECTRICAL CONDUCTIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1988/1570

STEP NO--UR/0056/70/058/004/1295/1309

CIRC ACCESSION NO--AP0106316

UNCLASSIFIED

272 027 UNCLASSIFIED PROCESSING DATE--23OCT70  
CIRC ACCESSION NO--AP0106316  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN EQUATION SET IS OBTAINED WHICH DESCRIBES THE OSCILLATIONS OF AN ISOTROPIC ELECTRON FLUID IN A QUANTIZED MAGNETIC FIELD. FERMI FLUID INTERACTION IS ASSUMED TO BE OF THE CONTACT TYPE AND IS DESCRIBED BY TWO CONSTANTS. BRANCHES OF THE PROPER FREQUENCY SPECTRUM WHOSE EXISTENCE IS COMPLETELY DUE TO QUANTIZATION OF THE ELECTRON ORBITAL MOTION (QUANTUM WAVES) ARE CONSIDERED IN THE CASE OF PROPAGATION ALONG THE DIRECTION OF THE MAGNETIC FIELD. IN CONTRAST TO SUCH WAVES IN AN ELECTRON GAS (PRIME4-8), QUANTUM WAVES IN A LIQUID, AS A RULE, ARE RELATED TO OSCILLATIONS OF THE SPIN DENSITY. UNDER CERTAIN CONDITIONS THE EXISTENCE OF QUANTIZED SPIN WAVES IS POSSIBLE. IT IS SHOWN THAT THE LONGITUDINAL QUANTUM WAVES STRONGLY INTERACT WITH OSCILLATIONS OF THE ION LATTICE OF THE METAL. LIMITS OF APPLICABILITY OF THE RESULTS ARE INDICATED WHICH ARE DUE TO THE EFFECT OF COLLISIONS AND OF TEMPERATURE SMEARING OUT OF THE FERMI DISTRIBUTION.  
FACILITY: INST. FIZIKI METALLOV, AN SSSR, FIZICHESKIY INST. IM. P. N. LEVEDEVA, AN SSSR.

UNCLASSIFIED

USSR

ALODZHANTS, G. P. and SILIN, V. P., Physics Institute imeni P. N. Lebedev,  
USSR Academy of Sciences

"Spin Waves in Nonferromagnetic Metals with Open Fermi Surfaces"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 14,  
No 5, 5 Sep 71, pp 351-354

Abstract: Spin waves in nonferromagnetic metals, as predicted by the theory of a degenerate electron liquid, have been experimentally detected in alkali metals whose Fermi surface is almost spherical. At the same time, such spin waves may also exist in metals with sharply anisotropic Fermi surfaces. In previous articles the major attention has been paid to spin waves in closed Fermi surfaces. In this article the authors are concerned with open surfaces which lead to the presence of open electron paths in the space of the impulses; they give the essential characteristics of spin waves in such metals. They note that when the frequency is zero in the limiting wave vector, this is an indication of the possibility that a spatially periodic paramagnetic structure exists which, unlike that studied by Silin in a previous issue of this Journal (11,419, 1970), is periodic in the direction across the constant magnetic field. The article contains 8 bibliographic entries.

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USSR

SILIN, V. S.

"Laboratory Simulation of the Seismic Effect of an Explosion when Loosening Seasonally Frozen Soil"

Sb. nauchn. tr. Chelyab. politekhn. in-ta (Collection of Scientific Works of the Chelyabinsk Polytechnical Institute), 1970, No 72, Part 2, pp 62-75 (from RZh-Mekhanika, No 11, Nov 70, Abstract No 11V724)

Translation: An experimental study was performed under laboratory conditions to estimate the seismic effect of an explosion in frozen ground. The experiments were performed on cement-sand slabs simulating ground. The layers with different sonic and strength characteristics simulating the natural layering were created by means of a different ratio of the cement and sand content. A detonating fuse initiated by lead azide was used as the exploded charge. The rate of displacement of the surface of the slab was estimated by the distance steel washers ground into the surface of the slab flew away. As a result of the experiments it was discovered that the physical-mechanical properties of the medium have a decisive effect on the parameters of the emitted

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SILIN, V. S., Sb. nauchn. tr. Chelyab. politekhn. in-ta, 1970,  
No 72, Part 2, pp 62-75

wave at a distance up to 10 times the radius of the charge. During propagation of compression waves through a layered medium, two sharply different cases are observed: if the sonic rigidity drops with distance from the charge, the damping of the mass velocity turns out to be weak; if, on the other hand, the sonic rigidity increases with distance from the charge, the damping of the mass velocity increases noticeably. On the basis of the experiments performed the conclusion was drawn that the placement of the charge in the layers of reduced sonic rigidity (for seasonally frozen ground, in the thawed ground), the seismic effect of the explosion drops significantly. Explosions at the freezing boundary are proposed as the optimal version (with respect to seismic effect and with respect to quality of crushing).

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Lasers & Masers

USSR

UDC 535

CHERNETS, A. N., TIMCHENKO, A. I., and SILIN, V. V., Institute of Radio-physics and Electronics, Academy of Sciences UkrSSR, Khar'kov

"Mandelstam-Brillouin Scattering of Coherent Light in Coherent Hypersound"

Kiev, Ukrainskiy Fizicheskij Zhurnal, Vol 16, No 4, Apr 71, pp 678-680

Abstract: The possibility of the practical use of the phenomenon of Mandelstam-Brillouin scattering for processing information applied to a modulated sound wave excited in an acoustic line of a radar signal, to produce delay lines for radio signals and lines for compression of radio pulses, etc., is discussed. It is noted that the intensity of the scattered light is an essential factor in such applications of this scattering. Ordinarily, gas lasers are used as the light source; but the intensity of a scattered light is small, and new materials characterized by a higher Q are being studied to raise this intensity; for example, lithium niobate. A further rise in the intensity of scattered light is still important, and one possible way suggested for solving this problem is to use a ruby laser as a light source. Since various nonlinear effects are known to arise in powerful light fluxes, a study was made of the range of powers in which the linearity of the Mandelstam-Brillouin effect is preserved under irradiation of a lithium

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CHERNETS, A. N., et al, Ukrainskiy Fizicheskiy Zhurnal, Vol 16, No 4, Apr 71, pp 678-680

niobate single crystal. The experimental setup is described. The ruby laser was modulated with a device consisting of a Pockels-effect cell and a KC-19 shutter. This made it possible to ensure time control of the pulses and a small spectral width of the radiation line, which was  $0.01 \text{ \AA}$ . The light flux had an intensity of  $3 \cdot 10^6 \text{ w}$  and the pulse length was  $10^{-7} \text{ sec}$ . The lithium niobate crystal had dimensions  $18 \times 6 \times 6 \text{ mm}$ , and longitudinal hypersonic waves were excited in it by the resonator method at a frequency of 900 MHz. The experiment showed that the linear dependence between the intensities of the scattered and incident light as maintained in the range of light energy densities from 1 to  $3 \cdot 10^6 \text{ w/cm}^2$  in the case of lithium niobate. The scattered light intensity achieved was 500 w. The sound intensity in the lithium niobate crystal was calculated to be  $10^{-3} \text{ w}$ .

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UDC 621.373:530.145.6

ANTROPOV, YE. T., SILIN-BEKCHURIN, I. A.

"Satisfaction of the Similarity Laws for CO<sub>2</sub> Laser Gas Discharge"

Elektron. tekhnika. Nauchno-tekhn. sb. Gazorazryadn. pribory (Electronic Engineering. Scientific and Technical Collection. Gas Discharge Devices), 1970, vyp. 4 (20), pp 16-19 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4D184)

Translation: Systematic measurements of the longitudinal electric discharge field were taken to check the proposed similarity relations for CO<sub>2</sub> (2) laser discharges. The data obtained indicate the degree of satisfaction of the similarity ratios with an accuracy of 8-12%.

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1/2 012 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--DYNAMICS OF DL,CIS,PINONIC ACID SORPTION ON ANION EXCHANGERS -U-

AUTHOR--(03)-KOROLKOV, N.M., AVOTINS, F., SILINA, A.

COUNTRY OF INFO--USSR

SOURCE--LATV. PSR ZINAT. AKAD. VESTIS, K(M: SER: 1970, (1), 38-46

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ANION EXCHANGE RESIN, FLUIDIZED BED, ISOTHERM, MASS TRANSFER,  
CALCULATION/(U)AV17 ION EXCHANGE RESIN, (U)EDELOP ION EXCHANGE RESIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1997/0678

STEP NO--UR/0464/70/000/001/0038/0046

CIRC ACCESSION NO--AP0119586

UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119586

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DYNAMICS WERE STUDIED ON ANION EXCHANGERS AV-17 AND EDE-10P IN FIXED AND FLUIDIZED BEDS. IN THE CASE OF CONVEX ISOTHERMS A STEADY STATE SORPTION FRONT IS FORMED. THE EQUATIONS FOR THE DYNAMICS OF SORPTION IN A FIXED BED ARE VALID ALSO FOR A FLUIDIZED BED. EQUATIONS ARE GIVEN FOR CALCG. THE MASS TRANSFER COEFF. FACILITY: RZH. POLITEKH. INST. RIGA, USSR.

UNCLASSIFIED

Industrial

USSR

UDC 531.787.087.92

SILINA, L. A.

"Study of the Operation of a Limiting Pressure-Sensitive Sensor"

Avtomatiz. proizvod. protsessov v mashinostr. i priborostr. -- V sb. (Automation of Production Processes in Machine Building and Instrument Making -- Collection of Works), No 10, L'vov, L'vov University, 1971, pp 101-104 (from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 10, Oct 71, Abstract No 10.32.837)

Translation: A structural design is presented for an electrocontact limiting pressure sensor with a flaccid diaphragm designed for automation of measuring the volume of solid states by the pneumatic method. The operating pressure is established in the sensor by preliminary forcing of the operating element by the tension of a cylindrical spring. Experimental studies of the sensor are described for operation of it with springs of different rigidity. The operating characteristics are constructed by the test results in order to discover the zone of augmented sensitivity of the sensor. The temperature error of the sensor is investigated. There are 3 illustrations and 1 table.

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1/2 021 UNCLASSIFIED PROCESSING DATE--04DEC70  
 TITLE--RHENIUM OXYCHLORIDE ALUMINUM CHLORIDE , FERRIC CHLORIDE, TANTALUM,V,  
 CHLORIDE, NIOBIUM,V, CHLORIDE, MOLYBDENUM OXYCHLORIDE, PHOSPHORYL  
 AUTHOR--(04)-DROBOT, D.V., KORSHUNOV, B.G., ALEKSANDROVA, V.A., SILINA,  
 T.A.  
 COUNTRY OF INFO--USSR  
 SOURCE--ZH. NEORG. KHIM. 1970, 15(6), 1707-8  
 DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHASE DIAGRAM, CHEMICAL BINARY SYSTEM, OXYGEN COMPOUND,  
 RHENIUM COMPOUND, CHLORIDE, IRON COMPOUND, MOLYBDENUM COMPOUND, TANTALUM  
 COMPOUND, NIOBIUM COMPOUND, ALUMINUM COMPOUND, PHOSPHOROUS COMPOUND,  
 EUTECTIC

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAE--3008/1186

STEP NO--UR/0078/70/D15/005/1707/1708

CIRC ACCESSION NO--AP0138201

UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--A0138201

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PHASE DIAGRAMS OF REOCL SUB4 A (A  
EQUALS FECL SUB3, RECL SUB5, TACL SUB5, NBCL SUB5, ALCL SUB3, MOOCL  
SUB4, AND POCL SUB3) ARE CONSTRUCTED. THE BINARY SYSTEM CONTG. POCL  
SUB3 FORMS REOCL SUB4 POCL SUB3, CONGRUENTLY M. 80DEGREES. THIS  
COMPOUND FORMS EUTECTICS CONTG. 3 AND 80 MOLE PERCENT REOCL SUB4, M.  
NEGATIVE 10 AND 16DEGREES, RESP. THE REMAINING SYSTEMS FORMED ONE  
EUTECTIC EACH CONTG. ALMOST PURE REOCL SUB4 AND ALL M. 29DEGREES.  
FACILITY: MOSK. INST. TONKOI KHIM. TEKHNOI IM. LOMONOSOVA, MOSCOW,  
USSR.

UNCLASSIFIED

Steels

USSR

UDC 669.15-194.56.018.2

GREKOV, N. A., SILINA, YE. P., and a SURKOVA, A. P., Leningrad

"Structure and Properties of Explosive-Hardened Austenitic Steels"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 1, Jan/Feb 74, pp 112-114

Abstract: The mechanical properties and fine structure changes were studied for two austenitic steels (60Kh3G8N8V and 4-Kh3G18) which had been plastically deformed by low-pressure shock waves. The first steel is very stable with a martensite transformation point below  $-196^{\circ}\text{C}$  while the other steel is less stable ( $M_s$  near  $-120^{\circ}\text{C}$ ) especially during plastic deformation. It was noted that the sequence of transformation stages ( $\gamma \rightarrow \epsilon$  and  $\epsilon \rightarrow \alpha$ ) is preserved during high-speed shock-wave deformation. In the steel with high austenite stability the  $\epsilon$ -martensite transformation and twinning start only after a high-density dislocation matrix is formed. The degree of improvement of a cellular dislocation structure is better the more stable the austenite. For a lower stability the tendency of steel toward deformation hardening from shock waves increases which can be associated with intensive occurrence of  $\gamma \rightarrow \epsilon$  transformation and twinning processes. Three figure, one table, one bibliographic references.

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USSR

SILING, M. M.

"A Device for Pattern Recognition"

Moscow, Otkrytiya izobreteniya promyshlennyye obraztsy tovarnyye znaki, No 18,  
17 Apr 73, p 129

Translation: (11) 377827 (21) 1655621/18-24 (22) 14.05.71 (51) G 06k 9/12 (53)  
621.391.19 (72)

(54) An apparatus for pattern recognition contains a transmitting television camera, a signal transmission channel connected to the input of a video scanning unit, and a decision unit. It is distinguished by the fact that the operating speed of the device is greater because it contains a second transmitting television camera optically connected to the screen of the video scanning unit; a commutator, one input of which is connected to the output of the first transmitting television tube, while the commutator output is connected to the signal transmission channel; and a pulse counter, the input of which is connected to the output of the second transmitting television camera, while one output is connected to the input of the decision unit and the other output is connected to the control input of the commutator.

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Electrochemistry

UDC 541.67:537.311.33

USSR

KORSHAK, V. V., KHRENKOVA, T. M., ~~SILING, S. A.~~, CHUBAROVA, M. A.,  
VINOGRADOVA, S. V., and KASATOCHKIN, V. I.

"Structure and Properties of Polymeric Semiconductors Based on Pyrromellitic  
Acid Tetranitrile and p-Phenylenediamine"

Moscow, Vysokomolekulyarnyye Soyedineniya, Vol 14, Series A, No 3, 1972,  
pp 701-705

Abstract: The heating of a polymer based on pyrromellitic acid tetranitrile  
and p-phenylenediamine (polyhexazocyclane PF) from 20 to 300, 400, 500, 600,  
700, 800, and 900° at  $5 \times 10^{-3}$  torr, yielded polymers with specific resistance  
 $\rho_{\text{spec}}$  from  $10^{13}$  to  $5 \times 10^{-1}$  ohm cm and activation energy of conductivity  $\Delta E$   
from 1.7 to 0.1 ev, depending on the heat treatment. The structure of the  
polymers was determined by X-ray diffraction analyses, nmr studies, and IR  
spectroscopy. At heat-treatment temperatures above 500°C the polymer under-  
goes degradation and cross-linking accompanied by the formation of bundles of  
aromatic layers consisting mainly of condensed aromatic compounds.

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1/3 038  
 TITLE--ELECTROPHYSICAL AND PHOTOELECTRIC PROPERTIES OF THIN FILM SYSTEMS  
 OF TETRATHIOTETRACENE -U-  
 AUTHOR-(02)-SILINS, E. TAURE, L.  
 COUNTRY OF INFO--USSR  
 SOURCE--LATV. PSR ZINAT. AKAD. VESTIS, FIZ. TEH. ZINAT. SER. 1970, (1),  
 18-27  
 DATE PUBLISHED-----70

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SUBJECT AREAS--CHEMISTRY, MATERIALS  
 TOPIC TAGS--POLYNUCLEAR HYDROCARBON, HETEROCYCLIC SULFUR COMPOUND,  
 PHOTOELECTRIC EFFECT, TIN OXIDE, LEAD, GOLD, SILVER, ALUMINUM, METAL  
 DEPOSITION, ELECTRODE, EXCITED STATE

CONTROL MARKING--NO RESTRICTIONS  
 DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAME--1997/0653  
 CIRC ACCESSION NO--AP0119563  
 STEP NO--UR/0371/70/000/001/0018/0027  
 UNCLASSIFIED

2/3 038

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119563

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LAYERED THIN FILM SYSTEMS OF TETRATHIOTETRACENE (I) INVESTIGATED WERE REPRESENTED BY THE FOLLOWING SPECIMENS: SNO SUB2 (I)PB, AU(I)AL, AU(I)AU, AND AL(I)AL. THE SPECIMENS WERE PREPD BY VACUUM DEPOSITION. TO PREP. THE SNO SUB2 (I)PB CELL, A LAYER OF I WAS DEPOSITED ON A LAYER OF SNO SUB2 ON A GLASS PLATE, FOLLOWED BY DEPOSITING THE TOP PB ELECTRODE. TO PREP. THE AU(I)AL CELL, A QUARTZ PLATE WAS FITTED SUCCESSIVELY WITH A SEMI TRANSPARENT AU FILM (SERVING AS THE BOTDOM ELECTRODE), 3 LAYERS OF DIFFERENT THICKNESSES (0.2-1.1 MU) OF I, AND TOP SEMI TRANSPARENT AL ELECTRODES (AREA 5-10 MM PRIME2). FOR BOTH AU(I)AL AND SNO SUB2 (I)PB SPECIMENS, NONSYM. NONLINEAR CURRENT APPLIED VOLTAGE (U SUBO) CHARACTERISTICS OF THE DARK COND. WERE OBTAINED. THE POS. DIRECTION OF CURRENT FLOW CORRESPONDED TO NEG. POLARITY OF THE TOP ELECTRODE IN BOTH CASES. THE POS. C.D. WAS 10 PRIME NEGATIVE4-10 PRIME NEGATIVE3 A-CM PRIME2 AT U SUBO EQUALS 3 V. A PHOTOCURRENT AND A PHOTOEMF. WERE ALSO OBSO.; THE PHOTOEMF. HAD ITS NEG. POLE ALWAYS AT THE TOP ELECTRODE INDEPENDENTLY OF THE DIRECTION OF ILLUMINATION (THROUGH THE BOTTOM OR TOP ELECTRODE). ALSO, THE SYM. METAL(I)METAL SPECIMENS EXHIBITED A LOW PHOTOEMF. THE RECTIFYING EFFECT AND THE PHOTOELEC. PROPERTIES WERE STUDIED USING MAINLY THE AU(I)AL SPECIMENS. THE POS. DIRECTION CURRENT (I SUBR)-U SUBO DEPENDENCE INDICATES BY ITS SHAPE THAT THE RECTIFYING EFFECT IS GOVERNED BY THE SO CALLED CONTACT BARRIER MECHANISM (FORMATION OF A NEG. LAYER ON THE METAL-ORG. COMPD. CONTACT).

UNCLASSIFIED

3/3 038

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119563

ABSTRACT/EXTRACT--THE ENERGY OF ACTIVATION FOR DARK COND. IN THE POS. DIRECTION (E SUBR) FO, THE AU(I)AL SPECIMENS DROPPED ON DECREASING U SUBO, WHEREAS THE ENERGY FOR THE NEG. DIRECTION REMAINED CONST. I SUBR FOLLOWS THE RELATION  $I \text{ SUBR} = A \exp(-E \text{ SUBR} - KT)$ , WHERE T IS THE ABS. TEMP., AND A AND K ARE CONSTS. IN THE NEG. DIRECTION, A SHARP INCREASE IN REVERSE CURRENT (RESEMBLING A NEG. LAYER BREAKDOWN OF ITS KIND) WAS OBSD. AT COMPARATIVELY LOW U SUBO VALUES (GREATER THAN 2V). THE PHOTOEMF. OF THE AU(I)AL SPECIMENS ON ILLUMINATION THROUGH THE TOP ELECTRODE PLOTTED VS. THE WAVELENGTH OF THE LIGHT APPLIED SHOWED A CORRELATION WITH THE ABSORPTION ELECTRON SPECTRUM OF SOLID STATE I IN THE LONG WAVELENGTH OF THE LGIHT APPLIED SHOWED A CORRELATION WITH THE ABSORPTION ELECTRON SPECTRUM OF SOLID STATE I IN THE LONG WAVELENGTH REGION AND DROPPED MONOTONICALLY IN THE LONG WAVELENGTH REGION, WHEREAS THE PHOTOEMF. OBTAINED ON ILLUMINATION THROUGH THE BOTTOM ELECTRODE SHOWED "ANTICORRELATION" SIGNS WHEN COMPARED WITH THE ABSORPTION SPECTRUM IN ITS SHORT WAVELENGTH REGION (THERE WERE MIN. OF PHOTOEMF. AT MAX. OF ABSORPTION). THE DEPENDENCES SHOW THAT THE POTENTIAL BARRIER APPEARS AT THE I TOP ELECTRODE INTERFACE. THE NATURE OF THE POTENTIAL BARRIER IS DISCUSSED. A BAND SCHEME OF A METAL(I)METAL SPECIMEN IN THE TOP ELECTRODE REGION, AN ENERGY SCHEME OF POLAR STATES OF A I CRYSTAL, AND A SCHEME REPRESENTING THE ENERGY LEVELS OF NEUTRAL EXCITED STATES OF A I MOL. ARE PRESENTED. FACILITY: FIZ. ENER. INST., RIGA, USSR.

UNCLASSIFIED

USSR

UDC 535.215.1

ALEKSANDROV, S.B., BALODE, D.R., BELKIND, A.I., NEYLAND, O.YA., RAYSHUMA, I.K.,  
SILIN'SH, E.A., TAURE, L.F.

"Photoelectronic Properties And Energy Structure Of Transbisbindonilen"

V sb. Poluprovodniki i ikh primeneniye v elektrotekh. (Semiconductors And Their  
Application To Electrical Engineering--Collection Of works), No 5, Riga,  
"Sinatne," 1971, pp 221-250 (from RZh:elektronika i yeye primeneniye, No 2, Feb  
72, Abstract No 2A20)

Translation: The results are discussed of a study by the method of photoconduct-  
ivity and photoelectronic emission of the properties of a thin film system of  
transbisbindonilen. Possible mechanisms are considered of photoproduction of  
charge carriers, and an energy scheme of a molecular crystal of transbisbindonilen  
is proposed. 8 ill. 10 ref.

1/1

USSR

UDC [537.226+537.311.33].01

SILIN'SH, E. A.

"On the Physical Nature of Traps in Molecular Crystals"

V sb. Poluprovedniki i ikh primeneniye v elektrotekhn. (Semiconductors and Their Use in Electrical Engineering -- Collection of Works), No 5, Riga, "Zinatne," 1971, pp 179-196 (from RZh-Fizika, No 1, Jan 72, Abstract No 1YE1053)

Translation: The author considers the possible physical nature of charge carrier traps of a quasicontinuous distribution in molecular crystals. It is shown that the formation of quasicontinuous traps can be due to dispersion of charge-carrier polarization energy. A calculation is made of polarization energy dispersion in anthracene single crystals. Hypotheses are stated regarding the mechanism for the formation of discrete traps and surface states as a result of polarization effects in molecular crystals. Bibliography with 33 titles.

1/1

USSR

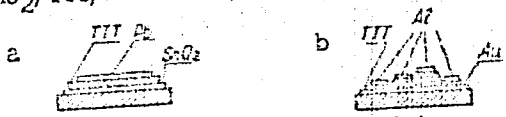
UDC: 535.215.4;535.215.6;541.97 .

STENSH, E. A. and TAURE, L. F., Physico-Energetic Institute of the Academy of Sciences of the Latvian SSR (Fiziko-energeticheskiy institut AN Latv. SSR)

"Studying Some of the Electrophysical and Photoelectric Properties of Tetrathio-tetracene Thin Layer Systems"

Riga, Izvestiya Akademii Nauk Latvyskoy SSR: Seriya Fizicheskikh i Tekhnicheskikh Nauk, No 1, 1970, pp 18-27

Abstract: The authors study the volt-ampere characteristic, bulk and contact conductivity activation energy, integral and spectral photoconductivity and photoelectromotive force, and the lux-ampere and lux-photoelectromotive force characteristics of tetrathiotetracene (TTT) thin-layer systems produced by the vacuum deposition method. The TTT preparation used by the authors was synthesized by Ya. F. Freymanis using C. Marschalk's and C. Sturm's method. The TTT was purified by multiple recrystallization and subsequent sublimation in a vacuum. Two types of units are studied: SnO2/TTT/Pb and Au/TTT/Al, Au/TTT/Au, or Al/TTT/Al (see figure).



All basic electrophysical parameters were measured in a p 10<sup>-5</sup> torr vacuum with  
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USSR

SELINSH, E. A. and TAURE, L. F., Izvestiya Akademii Nauk Latvyskoy SSR: Seriya Fizicheskikh i Tekhnicheskikh Nauk, No 1, 1970, pp 18-27

some compared to measurement results obtained in air. The SPM-1 monochromatic illuminator was used for measuring the photoelectric characteristic. The Au/TTT/Al and  $\text{SnO}_2$ /TTT/Pb thin layer systems exhibit nonsymmetric, nonlinear volt-ampere dark conductivity characteristics. The direction of easy flow corresponds to the positive polarity of the lower electrode ( $\text{SnO}_2$ ;Au) and negative polarity corresponds to the upper electrode (Pb;Al). The rectification factor for the given systems is  $k=10^2-10^4$ . Current density for the direction of easy flow at a voltage potential of  $U_0=3$ v approaches  $j_r=10^{-4}-10^{-3}$  amp/cm<sup>2</sup>. The given thin-layer systems exhibit both photocurrent and photo-emf. The photo-emf is always of negative polarity at the upper electrode independent of whether illumination is conducted through the upper or lower electrode of the specimen. Symmetric volt-ampere characteristics were observed only for the Au/TTT/Au systems. The results show that TTT is an excellent model material for studying the effects of contact and surface properties on the dark photoconductivity mechanism of thin-layer, low-molecular organic semiconductors because of its relatively low specific resistance. Type Me/TTT/Me and  $\text{SnO}_2$ /TTT/Me systems form a surface exhaustion layer under the upper electrode. The primary parameters of this layer are determined. The authors also consider a possible mechanism responsible for the formation of the surface exhaustion layer

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USSR

SILINSH, E. A. and TRURE, L. F., Izvestiya Akademii Nauk Latvyskoy SSI: Seriya Fizicheskikh i Tekhnicheskikh Nauk, No 1, 1970, pp 18-27

and its effect on the photogeneration of the charge carriers. The basic neutral and polar energy states of TTT are estimated. Mechanisms responsible for carrier charge photogeneration in TTT are considered. The authors express their thanks to Ya. F. Freymanis for synthesizing the TTT and D. F. Baloda for assisting during the experiment.

3/3

1/2 020 UNCLASSIFIED PROCESSING DATE--02OCT70  
 TITLE--REGIONAL ARTERIAL PRESSURE IN ARTERIAL OBSTRUCTION OF THE LOWER  
 EXTREMITIES -U-  
 AUTHOR-(03)-SILINSH, I.A., SKARDS, YA.V., PURINUA, B.A.  
 COUNTRY OF INFO--USSR  
 SOURCE--VESTNIK KHIRURGII IMENI I. I. GREKOVA, 1970, VOL 104, NR 4, P  
 94-97  
 DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
 TOPIC TAGS--ARTERY, BLOOD PRESSURE, BLOOD CIRCULATION, DIAGNOSTIC METHODS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAME--1988/1245

STEP NO--UR/0589/70/104/004/0094/0097

CIRC ACCESSION NO--AP0106026

UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0106026  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. MAXIMUM ARTERIAL PRESSURE (MAP) IN THE LEG, THAT COULD BE DETERMINED USING A VOLUMOMETRIC PRINCIPLE OF RECORDING, IS A VALUABLE DIAGNOSTIC INDEX OF THE REGIONAL BLOOD CIRCULATION IN ARTERIAL OBSTRUCTION OF THE EXTREMITY. MAP IN THE CRURAL PORTION OF THE AFFECTED EXTREMITY IS CONSIDERABLY REDUCED, THE DIFFERENCE BETWEEN BRACHIAL AND CRURAL MAP, AS A RULE, EXCEEDING 15-20 MMHG (ON THE AVERAGE 55.1). CRURAL MAP IN THE AFFECTED EXTREMITIES IS MARKEDLY AND SOMEWHAT CONTINUOUSLY REDUCED DURING THE REACTIVE HYPEREMIA, WHEREAS IT SHOWS GREATER INCREASE THAN IN SOUND PERSONS IN CHANGING THE POSITION FROM HORIZONTAL TO VERTICAL.

UNCLASSIFIED

Instruments and Measurements

USSR

UDC;621.396.69(088.8)

SILIN'SH, Ya. Y., KANAREYKIN, V. P.

"A Device for Checking Contact Between Electromagnetic Commutating Units"

USSR Author's Certificate No 264478, filed 29 Nov 67, published 20 Jun 70  
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V461 P)

Translation: This Author's Certificate introduces a device for checking contact between electromagnetic commutating units. The device contains an electromagnetic counter and two transistors. As a distinguishing feature of the patent, accuracy and reliability in determining contact are improved by connecting the base of the input transistor to the coil of the unit being tested, while the collector is connected to the electromagnetic counter. The second transistor is connected between the base of the first transistor and one terminal of the power supply, and its base is connected to the contact being checked.

1/1

USSR

UDC: 621.396.6:620.32:620.178.3(088.8)

SILIN"SH, Ya. Ya., YADCHENKO, K. I.

"A Method of Testing Radio Equipment"

USSR Author's Certificate No 286005, filed 19 Sep 68, published 12 Jan 71  
(from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V283 P)

Translation: This Author's Certificate introduces a radio equipment test method based on vibration or shock jarring of operating equipment under the maximum permissible electrical load. To shorten the production cycle in detecting latent flaws in the equipment during the tests, the moving elements of the equipment being tested (e. g. the band selector switch) are operated at a high speed.

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- 104 -

USSR

UDC: 535.215.5

GAYLIS, A. K., SILINYSH, E. A., Power Engineering Physics Institute, Academy of Sciences of the Latvian SSR

"Concerning the Shape of a Photocurrent Pulse in Thin-Film Organic Semiconductors"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, Seriya Fizichskikh i Tekhnicheskikh Nauk, No 5, 1972, pp 13-21

Abstract: The authors give a precise calculation of the shape of a photocurrent pulse when light is uniformly absorbed in a thin-film insulator under conditions of finite duration of the generation of charge carriers. It is shown that a previously determined semiempirical expression can be derived by approximate calculation. The current pulse shapes which are found are compared with experimental results of the study of pulse photocurrent in tetrathionaphthacene thin-film systems. It is shown that the photocurrent pulse shape can be qualitatively described by a simple semiempirical expression if a 100% overstatement of the generation time constant is taken into account. A procedure is outlined for determining the generation time constant, and the limits of applicability of the theoretical calculation are estimated.

1/1

- 117 -

USSR.

KRUTIKOV, V. F., ~~SILKIN, M. I.~~, and STEBANOV, V. G."EPR Spectra of Cd<sup>+</sup> Ions in the  $^2S_{1/2}$  State in K<sub>2</sub>SO<sub>4</sub> Crystals"Leningrad, Fizika Tverdogo Tela, vol. 13, No. 10, October 1971,  
pp 3100-3102

Abstract: This paper investigates the EPR spectra of Cd<sup>+</sup> ions stabilized by x-rays in the  $^2S_{1/2}$  state in K<sub>2</sub>SO<sub>4</sub> monocrystals. Observations were also made of Hg<sup>+</sup> EPR spectra in K<sub>2</sub>SO<sub>4</sub>. However, attempts to observe Zn<sup>+</sup> ion spectra in the K<sub>2</sub>SO<sub>4</sub> crystal proved unsuccessful. The crystals with the cadmium impurity were obtained from a water solution through slow evaporation. These specimens had Cd concentrations of 0.5 to 3%, and their crystals were irradiated by x-rays in a URS-70 equipment with a BSV-2 tube of 50 kv and 15 ma. The spectra measurements were made in the ranges of 3 cm and 8 mm at the temperature of liquid nitrogen. The EPR spectra were obtained at room temperature. It is noted that Cd<sup>+</sup> EPR spectra were not observed in specimens irradiated at 77° K. The spectra are reproduced in the article, and a table of spin

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USSR

KRUTIKOV, V. F., et al., Fizika Tverdogo Tela, vol. 13, No 10, October 1971,  
pp 3100-3102

Hamiltonian parameters for paramagnetic centers of  $Cd^{+}$  in  $K_2SO_4$  is given.  
Gratitude is expressed to T. B. Bogatova for growing the crystals and to  
R. Yu. Abdulsabirov and L. A. Trofanchuk for their assistance with the  
experiment. The authors are associated with the Kazan State University  
imeni V. I. Ul'yanov-Lenin.

2/2

- 64 -

I/2 018

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--APPLICATION OF THE METHOD OF STRAIGHT LINES TO THE SOLUTION OF  
NONLINEAR PROBLEMS OF SHALLOW SHELL DYNAMICS -U-

AUTHOR--(02)-VALISHVILI, N.V., SILKIN, V.B.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA MEKHANIKA TVERDOGO TELA, MAY-JUNE  
1970, P 140-143

DATE PUBLISHED-----70

S

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

TOPIC TAGS--STRUCTURE STABILITY, SPHERIC SHELL STRUCTURE, ALGORITHM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605020/D12 STEP NO--UR/0484/70/000/000/0140/0143

CIRC ACCESSION NO--AP0141028

UNCLASSIFIED

2/2 018  
CIRC ACCESSION NO--AP0141028  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--04DEC70

ABSTRACT. SOLUTION OF CERTAIN NONLINEAR PROBLEMS OF SHALLOW SHELL DYNAMICS WITH THE AID OF AN ALGORITHM PERMITTING THE USE OF THE METHOD OF STRAIGHT LINES. THE PROPOSED METHOD OF SOLUTION IS APPLIED TO THE CASE OF A SHALLOW SPHERICAL SHELL UNDER THE ACTION OF AN EXTERNAL DISTRIBUTED PRESSURE, A SHALLOW SPHERICAL SHELL WITH A CLAMPED BEARING EDGE UNDER THE ACTION OF A SUDDENLY APPLIED EXTERNAL PRESSURE WHICH THEN REMAINS CONSTANT, AND A SHALLOW SPHERICAL SHELL WITH A CLAMPED BEARING EDGE UNDER THE ACTION OF A TIME VARIABLE EXTERNAL PRESSURE. THE ACCURACY OF THE PROPOSED ALGORITHM IS CHECKED BY COMPARISON WITH EXACT SOLUTIONS OF CERTAIN NONLINEAR PROBLEMS.

UNCLASSIFIED

SILKO, P.P.

DISSOCIATING GASES AS COOLANTS AND WORKING SUBSTANCES AT ATOMIC POWER PLANTS

3

JPRS 60560  
16 November 1973

(16)

Translation of Russian-language materials presented at the Third All-Union Conference by A.K. Krasin, et al., *Dissolitsionnyye Gazy kak Tselennyye i Sberzhevyye Rele Energeticheskikh Ustanovok* 1973, Minsk, UDC: 621.311.627.957, signed to press 17 April 1973

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JRS  
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USSR

UDC 577:576.851.48+547.963.3

TROITSKIY, N. A., BATURO, V. A., ~~SILKOVA, T. A.~~, and KUDLOVICH, K. G.

"Use of Phosphorus<sup>32</sup> in the Investigation of the Reasons for the Increase in the Number of Recombinants Upon Irradiation of Escherichia coli With Neutrons"

Minsk, Voprosy Genetiki i Seleksii (Aspects of Genetics and Selection),  
"Nauka i Tekhnika," Minsk, 1970, p 302

Abstract: Data concerning the utilization of the radioactive phosphorus isotope for the investigation of the recombination process in Escherichia coli irradiated with intermediate neutrons, and also data on the isolation of DNA from radioactive zygotes, are cited. The assumption is advanced that increase in the frequency of recombinants induced by irradiation of the donor has no connection with the increase in the number of formed merozygotes and is probably the result of intensification of the integration process of the donor genotype in the recipient chromosome of Escherichia coli.

1/1

Health

SILLA, R.V.

REF: A11-22-0513

INCREASED MOTOR ACTIVITY AS A FACTOR IN STRENGTHENING THE HEALTH OF SCHOOL CHILDREN

Article by R.V. Silla, Tallin Institute of Pediatrics, Microbiology, and Hygiene; Yermik, Vladimir Vladimirovich, Tallin, USSR, Meditsina, No. 6, 1977, pp 81-88)

Human health is achieved through many conditions, both constitutional and genetic and environmental in nature. One of the most universal forms of strengthening it is believed to be regular physical training. According to the data of epistemics, as well as of many scientific investigations, it appears virtually to be a panacea, since it increases the adaptation resources of the organism and efficiency, it improves self-help, harmonizes and regulates developmental processes, and diminishes morbidity. Furthermore, scientific research has shown that health deterioration if there is not enough exercise when motor activity is significantly restricted, hypokinesia or stagnation, diverse pathological states develop which bear the general name of hypokinetic disease. Hence, motor activity is an essential and vital need of man. Thus, motor activity is not only one of the possible means of prophylaxis and treatment of many human diseases but is also an essential factor as a source of food for vital activity.

In hypokinetic present in the routine life of school children. Apparently, to us. First, according to the data of B.S. Volkov (1969), I.A. Rykova (1969), and others, when children start school there is a sharp decrease in overall motor activity (by at least 50%). Secondly, according to our observations, during summer vacation daily motor activity of 70-80 percent of the school children of middle and higher age groups is 2-3 times that is available to the school year. According to A.G. Susharev (1970), in Norilsk motor activity of school children is markedly diminished during polar night.

A comparison of the health status of physically inactive school children in summer and winter reveals significant differences. According to our data, there is a visibly higher incidence of colds during the winter, their condition is less favorable, height and weight indices fall, as well as those of lung to cold diseases, height and weight indices fall, as well as those of strength of spine, vital lung capacity, chest circumference diminishes, blood erythrocyte and hemoglobin drop, resting arterial pressure rises, while the

USSR

UDC 538.212

KATSNEL'SON, A. A., SILONOV, A. M., and SILONOV, V. M., Moscow State University  
imeni M. V. Lomonosov

"Effect of Short-Range Ordering on Electric Resistance and Magnetoresistance  
of Ni-Al Alloy Containing 6.3 at.% Al"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 33, No 6, Jun 72, pp 1267-  
1270

Abstract: An experimental investigation was made of the effect of atomic short-range ordering on the electric resistance ( $\rho$ ) and magnetoresistance of an Ni-Al alloy containing 6.3 at.% Al. The results are discussed by reference to diagrams of time-dependent changes of  $\rho$  in isothermal annealing at 400°C and in a transverse magnetic field ( $H=16$  kOe). A principally different dependence of  $\rho$  and  $\Delta\rho_M$  ( $\rho_M$ =the resistance part dependent on the scattering of electrons on magnetic heterogeneities) on the isothermal post-deformation annealing time was established. The character of magnetoresistance in annealing correlates with the change of most short-range neighboring Ni-Ni pairs. This effect can be coupled both with the change of the Curie point and the increase of magnetization. In the latter case, it cannot be explained by an increase in the number of neighboring Ni-Ni atoms. Three figures, four bibliographic references.

1/1



USSR

UDC 538.212

KATSNEL'SON, A. A., SILONOV, A. M., and SILONOV, V. M., Moscow State University  
imeni M. V. Lomonosov

"Effect of Short-Range Ordering on Electric Resistance and Magnetoresistance  
of Ni-Al Alloy Containing 6.3 at.% Al"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 33, No 6, Jun 72, pp 1267-  
1270

Abstract: An experimental investigation was made of the effect of atomic short-range ordering on the electric resistance ( $\rho$ ) and magnetoresistance of an Ni-Al alloy containing 6.3 at.% Al. The results are discussed by reference to diagrams of time-dependent changes of  $\rho$  in isothermal annealing at 400°C and in a transverse magnetic field ( $H=16$  kOe). A principally different dependence of  $\rho$  and  $\Delta\rho_M$  ( $\rho_M$ =the resistance part dependent on the scattering of electrons on magnetic heterogeneities) on the isothermal post-deformation annealing time was established. The character of magnetoresistance in annealing correlates with the change of most short-range neighboring Ni-Ni pairs. This effect can be coupled both with the change of the Curie point and the increase of magnetization. In the latter case, it cannot be explained by an increase in the number of neighboring Ni-Ni atoms. Three figures, four bibliographic references.

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1/2 006

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--STUDIES OF RABBIT MUSCLE PHOSPHORYLASE B ASSOCIATION BY KINETIC  
METHOD -U-

AUTHOR--(02)-SILONOVA, G.V., KURGANOV, B.I.

COUNTRY OF INFO--USSR

SOURCE--MOLEKULYARNAYA BIOLOGIYA, 1970, VOL 4, NR 3, PP 445-457

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--RABBIT, PHOSPHORYLASE, ENZYME ACTIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0188

STEP NO--UR/0463/70/004/003/0445/0457

CIRC ACCESSION NO--AP0120886

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PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0120886

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. QUANTITATIVE ANALYSIS WERE CARRIED OUT OF PHOSPHORYLASE B SPECIFIC ACTIVITY DEPENDENCE ON ENZYME, CONCENTRATION WHICH REFLECTS THE REVERSIBLE TRANSITION OF DIMERIC FORM OF PHOSPHORYLASE B INTO TETRAMERIC FORM IN THE PRESENCE OF AMP PLUS MG PRIME2 POSITIVE PLUS CYSTEINE. THE CONCLUSION HAS BEEN MADE THAT TETRAMERIC FORM IS INACTIVE. ASSOCIATION CONSTANTS FOR EQUILIBRIUM BETWEEN PHOSPHORYLASE B OLIGOMERIC FORMS SATURATED BY AMP VARIED MARKEDLY FROM ONE ENZYME PREPARATION TO THE OTHER AND WERE EQUAL TO 10 PRIMES MINUS 10 PRIME6 M NEGATIVE PRIME1 (10-25DEGREES, PH 6,8). ENTHALPY OF ASSOCIATION WAS ESTIMATED AS MINUS 26 KCAL-MOLE. DEPENDENCE OF PHOSPHORYLASE B ACTIVITY OF AMP CONCENTRATION IN PREINCUBATION MIXTURE IS SIGMOIDAL DUE TO COOPERATIVE INTERACTIONS OF AMP BINDING SITES. ALLOSTERIC INTERACTIONS ARE ANALYZED FOR A MODEL SYSTEM ACTIVE DIMER IN EQUILIBRIUM INACTIVE TETRAMERMMEDIATED BY THE DISPLACEMENT OF EQUILIBRIUM BETWEEN OLIGOMERIC ENZYME FORMS UNDER THE INFLUENCE OF SUBSTRATE. DIFFERENT TYPES OF ALLOSTERIC INTERACTIONS OF AMP BINDING SITES IN PHOSPHORYLASE B ARE DISCUSSED. FACILITY: INSTITUTE OF BIOCHEMISTRY, ACADEMY OF SCIENCES. FACILITY: INSTITUTE FOR VITAMINS RESEARCH, USSR, MOSCOW.

UNCLASSIFIED

SILVANOV, V. N.

MEDICINE

EXPERIMENTAL SURGICAL PRESSURE CHAMBER OF THE INSTITUTE OF  
CARDIOVASCULAR SURGERY IMBENT A. N. BURDULEV OF THE ACADEMY  
OF MEDICAL SCIENCES OF THE USSR

UDC 725.51.055:616.12-089

SPRS-54173  
01 OCT 71

DEWY  
COLEEN

Article by V. N. Silvanov, V. N. Burdulev, N. N. Berestov  
G. V. Volodarskiy, Ye. N. Shchegolev, V. N. Stetskiy and  
A. I. Babiley of the Institute of Cardiovascular Surgery and  
Meditsinskaya Tekhnika, Russian, No 3, 1971, pp 52-55

The article describes the experimental surgical pres-  
sure chamber of the Institute of Cardiovascular Surgery  
Imbent A. N. Burdulev of the USSR Academy of Medical Sciences.  
The surgical pressure chamber is located in a one-story  
building of the experimental branch of the institute. Be-  
sides the surgical pressure chamber, which occupies 45 square  
meters of floor space, the building also has premises for  
medical personnel and a postoperative recovery ward. Com-  
pressed air for the surgical pressure chamber is supplied  
from a compressed air plant located in an adjacent building  
30 meters from the pressure chamber. The compressed air  
plant is built in accordance with "Rules and Regulations for  
Safe Operation and Installation of Air Compressors and Air  
Pipes" and "Safety Rules and Regulations for Working in com-  
pressed air." For the safe and reliable operation of the  
pressure chamber, two independent systems of compressed air  
are provided.

The cubic content of the experimental surgical pres-  
sure chamber is 19.5 cubic meters. It has two compartmen-  
ts: a working compartment (14.5 cubic meters) and an air lock  
(5 cubic meters). The pressure chamber is designed for a  
pressure of 3 atmospheres. Compressed air is supplied to  
the chamber (Figure 1) by KSE-5 M air compressors delivering  
5 cubic meters of air per minute at a pressure of 8 atmos-  
pheres; the air compressors are driven by 40 kilowatt elec-  
tric motors. The compressors are air-cooled. The intake

VSER

UDC 669.168:621.746

SHARANOV, M. A., ~~SILUKOV, G. A.~~, KROLEV, A. A., KRYLOV, I. A., and  
VESELOVSKIY, A. Ya. (All-Union Scientific Research Institute of Heat  
Engineering in Metallurgy /VNIIMT/; Serov Plant of Ferroalloys)

"Study of the Granulation Process of Silicochrome"

Moscow, Stal', No 4, Apr 72, pp 321-323

Abstract: Described is a joint study by the All-Union Scientific Research Institute of Heat Engineering in Metallurgy and the Serov Plant of Ferroalloys involving plant-scale experiments on silicochrome granulation. The objective of the study was to determine the causes of explosions (during the process) and to develop preventive safety measures. The potential causes of explosions are theorized to include the clogging of nozzles and obstructing the metal stream, disintegration of the refraction control mesh constraining the feed of the liquid alloy to the granulation tank, fracture of the lining of the overflow trough snout, excessive distance between the trough snout and the nozzles, etc. The relationship between the granulometric composition of the granulated material and the water supply parameters has been established. Recommendations are made to exclude the limitation on water temperature in the granulation tank to 40°C from the standard technical

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SHARANOV, M. A., et al, Stal', No 4, Apr 72, pp 321-323

specifications as well as to introduce other relevant technological refinements. The study proposes a new explosion-free granulation technology. (3 illustrations).

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USSR

UDC 528.711.11.089.6

ZIMAN, YA. L., KRASIKOV, V. A., DUNAYEV, B. S., and SIL'VA-BEIGA, A. A.

"Photogrammetric Calibration of Photographic Systems by Means of a Progressively Movable Theodolite"

Moscow, Geodeziya i Kartografiya, No 5, May 1973, pp 54-60

Abstract: A procedure is described, by means of which compensation is provided for distortion introduced into the photographic image by the passage of rays through the porthole in the sealed bays of camera carriers conducting aerial and space photography. In this procedure, conducted when the cameras are being mounted in the carriers, the photographic system is calibrated with respect to the corresponding porthole by measuring, with a progressively movable theodolite, the directions to the points of a standardized grid situated in the focal plane of the calibrated camera. Measurements are conducted through the porthole of the carrier and the camera lens. The theodolite is placed in front of the lens of the calibrated camera, and by means of a special support is moved progressively from station to station, in parallel to the focal plane of the camera. A geometric diagram of the solution of the problem is presented, as well as practical data of calibration of the stellar camera of the "Salyut" orbital station. 2 tables. 4 figures. 5 references.

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Miscellaneous

USSR

UDC 523.51 .

VINOGRADOV, A. P., LAVRUKHINA, A. K., GANIYEV, A. G., SIL'VANOVICH, Yu. A., and RAKHIMOV, Kh. R., Institute of Geochemistry imeni V. I. Vernadskiy, Academy of Sciences USSR, Moscow, and Institute of Nuclear Physics, Academy of Sciences Uzbek SSR, Tashkent

"Distribution of Platinoids and Gold Between Various Phases of Meteorite Matter. I."

Moscow, Geokhimiya, No 12, Dec 72, pp 1461-1469

Abstract: The regularities of the distribution of platinoids and Au between the phases of Fe-poor chondrites of the L-group of various petrological types were studied. In the analysis of samples, neutron activation followed by the radiochemical separation of the platinoids and Au, which were identified from the gamma-emission of the radioisotopes, was applied. There was a gradual increase in the content of platinoids and Au in the Fe-Ni phase in the sequence L3 < L4 < L5 < L6. The content of Pd in the Fe-Ni phase decreased with an increasing absolute content of this element in chondrites; this relationship was not observed for the other elements. The content of platinoids and Au in the FeS of chondrites was higher as compared with that in the troilite of iron meteorites. The content of Pd, Os, Ir, Pt, and Au

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USSR

VINOGRADOV, A. P., et al., Geokhimiya, No 12, Dec 72, pp 1461-1469

in the silicate phase of chondrites decreased in the sequence indicated. One may assume that the recrystallization of chondrites in the protoplanetary nebula resulted in a substantial redistribution of platinumoids and Au between the phases of chondrites of the L-group; an enrichment in these metals of the Fe-Ni phase took place that was accompanied by a reduction of their content in the sulfide and silicate phases.

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Precision Mechanical and Optical

USSR

UDC: 537.533.335

VSEVOLOZHSKAYA, T. A. and SIL'VESTROV, G. I., Institute of Nuclear Physics, Novosibirsk

"Optical Characteristics of Convergent Parabolic Lenses"

Leningrad, Zhurnal tekhnicheskoy fiziki, No 1, 1973, pp 61-70

Abstract: The theory of focusing systems for converging the paths of secondary particles originating in a large solid angle, involving high illumination and small focal length, is discussed in this article. An example of such a focusing system is the parabolic lens system developed in the Institute of Nuclear Physics of the Siberian Division Academy of Sciences in 1962-1963, used for focusing positrons with an energy of 120 Mev in a solid angle of about 0.03 steradians, corresponding to a linear angle of about 0.1 radians. The basic idea of the parabolic lens is that, to achieve linear focusing with a magnetic field of the form  $H_{\phi} = k/r$ , where  $k$  is a proportionality constant, the particle covers a path proportional to  $r^2$  in the field along the axis of symmetry. The theories of point and non-point sources are developed, and the chromatic aberration in various types of lenses is computed and plotted in curves.

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SILVESTROV J.V.  
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Rev 10-16-66 / 5-11-72  
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critical point of a blunt body. Thus, for hypersonic flight velocities, the assumption of small width of the shock layer in comparison to a characteristic dimension of the body is valid. It becomes possible to describe the flow distribution near the critical point by systems of ordinary differential equations. Considerations are presented for disregarding the viscous structure of the shock wave so that the problem is solved without separating the shock layer into a nonviscous region and a boundary layer. It is noted that the final expression for the total heat flux at the critical point contains only values obtained from the solution to the "nonviscous" problem with allowance for gas radiation in the shock wave, as well as other values from the solution to the "viscous" problem, but with radiation ignored. An iteration method is used to solve the integro-differential system of equations. Graphical results are presented of computer-aided calculations of the relationships of the total heat flux and its convective and radiant components owing to variation of the flight velocities (to 20 km/sec) and the nose curvature radius at the critical point.

Silvestrov, Y. V., and V. P. Urushkin. Method for determining density of high speed gas jets. Dinamika sploshnoy sredy, Novosibirsk, no. 7, 1971, 125-129. (RZhMekh, 5/72, no. 5D477)

A method is proposed for determining the density of gas jets moving at a speed of 8-12 km/sec. The jets are formed from the detonation of an explosive in a channel. The method is based on an experimentally obtained law of the motion of a propelled body, using a steel ball. The successive positions of the ball in a chamber are recorded by x-ray pulse photography. The characteristics of the x-ray facility

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UDC 666.1:539.377

SIL'VESTROVICH, S. I., KAZAKOV, V. D., KATS, R. YA., Moscow  
Institute of Chemical Technology Imeni D. I. Mendeleev

"Features of Chemical Etching of the Surface of an Intensively  
Hardened Glass"

Moscow, Neorganicheskiye Materialy, Vol 6, No 5, May 70,  
pp 952-956

Abstract: The authors were interested in fine points of the chemical surface etching of glass with highly developed defects, such as occur on hardening when microcracks are formed. The selectivity of chemical surface etching of microlaminated glasses is determined by two phases of different resistance toward hydrofluoric acid action and by specific production conditions when they are subjected to various thermochemical actions. The glass strength, which is increased after chemical etching, is connected mainly with the presence of hazardous microcracks on its surface. When they are absent the strength is determined by the degree of microlamination and the quality of surface contour.

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1/2 009 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--APPROXIMATE METHOD OF CALCULATING THE TRANSIENT RESPONSE OF A CLASS  
OF SYSTEMS -U-  
AUTHOR-(02)-KOSTYUK, V.I., SILVESTROV, A.M. S  
COUNTRY OF INFO--USSR  
SOURCE--AVTOMATIKA, VOL. 15, MAR.-APR. 1970, P. 30-37  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--MATHEMATICAL SCIENCES  
TOPIC TAGS--DIFFERENTIAL EQUATION, SELF ADAPTIVE SYSTEM  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3003/0597 STEP NO--UR/0102/70/015/000/0030/0037  
CIRC ACCESSION NO--AP0129780  
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0129780

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEVELOPMENT OF AN APPROXIMATE METHOD OF CALCULATING THE DYNAMICS OF SELF ADAPTIVE SYSTEMS SUBJECTED TO THE EFFECT OF A DETERMINATE (OR RANDOM) SIGNAL MIXED WITH ADDITIVE NOISE. THE METHOD IS APPLICABLE TO SYSTEMS DESCRIBED BY A SYSTEM OF LINEAR DIFFERENTIAL EQUATIONS WITH VARIABLE COEFFICIENTS.

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USSR

UDC 539.4.1/624.011.1+624.0147

SIL'VESTROV, A. V., and SHAGIMARDANOV, R. M.

"The Influence of Low Temperatures on the Carrying Capacity of Standard Subassemblies of Steel Building Structures"

Irkutsk, Probl. Khladostoykosti Konstrukts. Staley -- Sbornik (Problems of the Cold Resistance of Structural Steels -- Collection of Works), 1971, pp 67-72 (from Referativnyy Zhurnal, Mekhanika, No 2, Feb 72, Abstract No 2V1176 by M. Kh. Leybur)

Translation: A study is made of the influence of low temperatures upon the strength and deformation of standard elements of steel structures for a number of objects of power and industrial construction. On the basis of the design criteria of structural incompleteness, the elements were divided into three categories: 1) concentrators in the basic metals, brought about by change in the geometrical shape of the part; 2) concentrators in the form of welded connections (joints) of the elements; 3) concentrators in the form of adjacencies of secondary parts to the main working elements. Used as the material for experimental large-size samples was rolled dead-melt VM St 3 steel; welding was performed by electrodes of the type E42 (OMM-5) in accordance with the material of the examined structures. It is noted that the decisive

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USSR

UDC: 519.2

MASOL, V. I., SIL'VESTROV, D. S.

"Record Values of Dwell Time of a Semi-Markov Process"

Visnyk Kiyiv. un-tu. Ser. mat. ta mekh. (Kiev University Herald. Mathematics and Mechanics Series), 1972, No 14, pp 81-89 (from RZh-Kibernetika, No 10, Oct 72, abstract No 10V76 [authors' abstract])

Translation: Let  $\eta(t)$ ,  $t \geq 0$  be a semi-Markov process with a finite number of states, and let  $\kappa(t)$  be the elapsed time since the last instant before  $t$  of a change in the state of the process  $\eta(t)$ ,  $t \geq 0$ . This paper investigates the limiting distributions for the time required for random process  $\kappa(t)$ ,  $t \geq 0$  to reach a receding level.

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UDC 519.2

USSR

SIL'VESTROV, D. S.

"Estimates of the Convergence Rate for Sums of Random Variables defined in a Denumerable Markov Chain with Absorption"

Dopovid AN URSR (Reports of the Ukrainian SSR Academy of Sciences), 1972, A, No 5, pp 436-438, 478 (from RZh-Kibernetika, No 9, Sep 72, Abstract 9V39)

Translation: Estimates of the convergence rate to possible limiting distributions are established for the sums of random variables defined in a denumerable regular Markov chain with absorption where the absorption probability approaches zero.

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UDC 519.2

USSR

SIL'VESTROV, D. S.

"Convergence of Weakly-Dependent Processes in Uniform Topology. 1"

Teoriya veroyatnostey i mat. stat. Mezhd. nauch. sb. (Probability Theory and Mathematical Statistics. Interdepartmental Scientific Collection), 1972, vyp. 6, pp 109-117 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V23)

Translation: Let for each  $\epsilon \geq 0$ ,  $\xi_\epsilon(t), t \geq 0$  and  $v_\epsilon(t), t \geq 0$  be random processes the trajectories of which belong with a probability of one to the space  $D_\infty$  ( $D_T$  is the space of the functions in  $[0, T]$  without discontinuities of the second type, continuous from the right) where  $v_\epsilon(t) \geq 0, t \geq 0$  with a probability of 1. A study was made of various generalizations of the following statement. If the conditions are satisfied:

a)  $(v_\epsilon(t), \xi_\epsilon(t), t \geq 0 \xrightarrow{\text{sum}} (v_0(t), \xi(t)), t \geq 0$  for  $\epsilon \rightarrow 0$ ,

where  $(v_0(t), \xi_0(t)), t \geq 0$  is a random process which is continuous with a probability of 1,

b)  $\lim_{c \rightarrow 0} \overline{\lim}_{\epsilon \rightarrow 0} P \{ \Delta_c(\xi_\epsilon(t), T') \geq \delta \} = 0, T' \delta > 0,$

c)  $\lim_{c \rightarrow 0} \overline{\lim}_{\epsilon \rightarrow 0} P \{ \Delta_c(v_\epsilon(t), T) \geq \delta \} = 0, \delta > 0,$

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SIL'VESTROV, D. S., Teoriya veroyatnostey i mat. stat. Mezhd. nauch. sb., 1972, vyp. 6, pp 109-117

where

$$\Delta_c(x(t), T) = \sup_{|t' - t| \leq c, t', t'' \in (0, T)} |x(t') - x(t'')|,$$

then for any measurable functional  $f(\cdot)$  in  $D_T$  which is continuous in uniform topology almost everywhere corresponding with respect to dimensions to the random process  $\xi_0(v_0(s)), s \in [0, T]$ :

$$f(\xi_\epsilon(v_\epsilon(t))) \xrightarrow{\text{sum}} f(\xi_0(v_0(t))) \text{ for } \epsilon \rightarrow 0.$$

UDC: 519.214.519.217

USSR

SIL'VESTROV, D. S.

"Uniform Estimates of the Rate of Convergence for Sums of Random Quantities Defined on a Uniform Markov Chain With Absorption"

Teoriya veroyatnostey i mat. stat. Mezhd. nauch. sb. (Probability Theory and Mathematical Statistics. Interdepartmental Scientific Collection), 1971, vyp. 5, pp 116-127 (from RZh-Kibernetika, No 11, Nov 71, Abstract No 11V54)

Translation: The author studies possible limiting distributions and estimates the rate of convergence to these distributions for sums of random quantities defined on a finite uniform Markov chain with absorption in a series scheme. Author's abstract.

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UDC 519.214,519.217

USSR

SIL'VESTROV, D. S.

"Limit Theorems for a Discrete Random Walk on a Half-line, Controlled by a Markov Chain. II."

Teoriya Veroyatnostey i Mat. Statist. Mezhd. Nauchn. Sb. [Theory of Probabilities and Mathematical Statistics, Interdepartmental Scientific Collection], No 2, 1970, pp 158-166 (Translated from Referativnyy Zhurnal Kibernetika, No 3, 1971, Abstract No 3 V25 by the author).

Translation: For part I see RZhMat, 1970, 9/V56. The rate of convergence of the distribution function of an integral functional of a discrete random walk on a half-line controlled by a Markov Chain with two states to its limiting value is estimated.

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UDC 519.214.519.217

USSR

SIL'VESTROV, D. S.

"Limit Theorems for Semi-Markovian Processes and Their Applications. I"

Teoriya veroyatnostey i mat. statis. Mezhd. nauch. sb. (Probability Theory and Mathematical Statistics: Interdepartmental Scientific Collection), No 3, 1970, pp 155-172 (from Referativnyy Zhurnal - Matematika, No 8, Aug 71, Abstract No 8V59 by D. Gusak)

Translation: Semi-Markovian processes dependent on the parameter  $\alpha \in [0, 1)$  and determined by the following are considered: 1) a homogeneous Markov chain  $T_1(\alpha) = \{T_1(\alpha, n), n = 0, 1, \dots$  with values in  $H = \{1, 2, \dots, m\}$ ; 2) a sequence of random vectors  $T_0(\alpha) = \{\tau(\alpha, n, i), \gamma(\alpha, n, i), n \neq 0, i \in H\}$  (with  $n$  independent distributions) whose first component defines the time of residence in a fixed state, and whose second component defines the value of the discontinuities, where this sequence is independent in the set; 3) a sequence  $T_3(\alpha) = \{\tau(\alpha, n, i), n \neq 0, i \in H$

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USSR

SIL'VESTROV, D. S., Teoriya veroyatnostey i mat. statis, Mezhd. nauch. sb., No 3, 1970, pp 155-172

random variables -- independent in the set -- defining the stopping moments

[sic] of semi-Markovian processes  $\zeta(\alpha, n, i) = \begin{cases} 0 & \text{with probability } p(\alpha, i) \\ 1 & \text{with probability } 1-p(\alpha, i) \end{cases}$

using the random variable  $v(\alpha, t) = \max \left\{ n: \sum_{k=1}^n \tau(\alpha, k-1, \eta_{\alpha}(k-1)) < t, \right.$

$$\left. \prod_{k=1}^n \zeta(\alpha, k-1, \eta_{\alpha}(k-1)) = 1 \right\}$$

(symbolically assuming  $\sum_{k=1}^{\infty} \tau(\alpha, k-1, \eta_{\alpha}(k-1)) = 0, \prod_{k=1}^{\infty} \zeta(\alpha, k-1, \eta_{\alpha}(k-1)) = 1$ ), the author defines the following random functional

$$\xi(\eta_{\alpha}, \alpha, t) = \sum_{k=1}^{v(\alpha, t)} \gamma(\alpha, k-1, \eta_{\alpha}(k-1)) \quad (\eta_{\alpha} = \eta_{\alpha}(0) \in H)$$

for whose distributions limit theorems are established as  $\alpha \rightarrow 1$  and  $t \rightarrow \infty$ .

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UDC 519.214.519.217

USSR

SIL'VESTROV, D. S.

"Limit Theorems for Semi-Markovian Processes and Their Applications. II"

Teoriya Veroyatnostey i mat. statis, Mezhd. nauch. sb. (Probability Theory and Mathematical Statistics: Interdepartmental Scientific Collection), No 3 1970, pp 173-194 (from Referativnyy Zhurnal -- Matematika, No 8, Aug 71, Abstract No 8V60 by D. Gusak)

Translation: Cf. Abstract No 8V59 for part I. Section 1 discusses semi-Markovian processes dependent on the parameter

$$S_1(\alpha) = \left\{ \zeta_\alpha(n) = \left( \sum_{k=0}^n \beta_\alpha(k), \bar{\beta}_\alpha(n) \right), n=0, 1, \dots \right\}$$

$\sqrt{0, 1}$  and defined by the following: 1) a homogeneous Markov chain with a

set of states  $Z = E \times \{ l_1 = +1, l_2 = -1 \}$  ( $E = \{ 0, \pm 1, \dots \}$ )

and with transition probabilities

$$P \{ \zeta_\alpha(n+1) = (x+y, l_j) | \zeta_\alpha(n) = (x, l_i) \} = \begin{cases} P_{ij}(\alpha, x) > 0, & \text{if } y=l_j, x \in E, i, j=1, 2 \\ 0 & , \text{if } y \neq l_j, x \in E, i, j=1, 2; \end{cases}$$

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SIL'VESTROV, D. S., Teoriya veroyatnostey i mat. statis, Mezhd. nauch. sb.,  
 No 3, 1970, pp 173-194

2) the sequence

$$S_n(\alpha) = \{(\tau(\alpha, n, (x, l_i)), \gamma(\alpha, n(x, l_i))), n > 0, (x, l_i) \in Z\}$$

of set-independent random vectors with values in  $\sqrt{0}, (\infty)$   $s(-\infty, \infty)$  and with  $n$ -independent distributions. By means of

$$v(\alpha, t) = \max \left( n : \sum_{k=1}^n \tau(\alpha, k-1, \zeta_{\alpha}(k-1)) \leq t \right)$$

the following random functional is defined:

$$\xi(x, \beta, \alpha, t) = \sum_{k=1}^{v(\alpha, t)} \gamma(\alpha, k-1, \zeta_{\alpha}(k-1)),$$

for whose distributions limit theorems are established as  $\nu \rightarrow 1, t \rightarrow \infty$ .

Sections 2 and 3 establish similar limit theorems for the distribution of functionals as a function of continuous random walks and diffusion processes.

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USSR

SIL'VESTROV, D. S.

"Convergence of Weakly Dependent Processes in an Even Topology. II."

Teoriya Veroyatiostey i mat. Stat. Mezhved. Nauch. sb. [Theory of Probabilities and Mathematical Statistics, Interdepartmental Scientific Collection], 1972, No 7, pp 132-145 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1973, Abstract No 1 V56 by the author).

Translation: For Part I, see RZhMat, 1972, 9V23. Conditions of convergence are studied for functionals, continuous in even topology of random processes such as  $\xi_\epsilon(st)$ ,  $s \geq 0$  (where  $t \rightarrow \infty$ ), where  $\xi_\epsilon(st)$ ,  $s \geq 0$  is a random functional of integral form of a diffusion process, the sum of random quantities, defined in a semiMarkov process, or a generalized process of restoration.

UDC 534.014

USSR

ANIKEYEV, G. I., ~~SIL'VESTROV, E. YE.~~ (Moscow)

"Nonlinear Oscillations of a Rotor With Account Taken of the Gyroscopic Effect of the Disk"

Moscow, Mashinovedeniye, No 1, 1971, pp 3-10

Abstract: The article deals with the self-oscillation of a flexible rotor, with account taken of the gyroscopic aspects on the basis of a weightless overhung shaft with an unbalanced disk on the free end. The oscillation of the system is described by four nonlinear differential equations. First-approximation equations are obtained for the amplitudes and phases in a case without resonance. It is shown that with the exception of purely forced oscillation, the system has only one almost-periodic regime. An investigation is made of the stability of the existing regimes. 3 illustrations, 3 bibliographic entries.

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UDC: 621.316.6

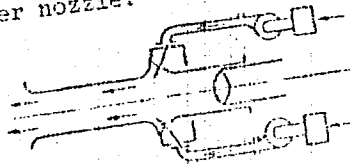
USSR

SIL'VESTROV, V. M., NOVODEREZHEKIN, V. P., TOMASHPOL'SKIY, N. F., DUBOVA,  
E. S., RISILEV, V. I.

"A Device for Protecting the Front Surface of Optical Systems"

Moscow, Otkrytiya, Izobreneniya, Promyshlennyye Obraztzy, *Tovarnyye Znaki*,  
No 6, Feb 72, Author's Certificate No 328411, Division G, filed 20 Aug 69,  
published 2 Feb 72, p 143

Translation: This Author's Certificate introduces a device for protect-  
ing the front of optical systems from atmospheric contaminants. The device  
contains a fitting which mates with the mount of the optical system and  
has a joint for feeding in compressed gas. As a distinguishing feature  
of the patent, in order to preserve image quality, the unit for feeding  
in gas is made in the form of a gas-collecting chamber with guide chan-  
nels which goes into a blender nozzle.



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UDC: 534.222.2

USSR

SIL'VESTROV, V. V., TITOV, V. M., URUSHKIN, V. P.

"Study of Gas Flow upon Dynamic Loading of Liquid Nitrogen and Hydrogen"

Dinamika Splosh. Sredy [Continuous Medium Dynamics -- Collection of Works], No 10, Novosibirsk, 1972, pp 233-238 (Translated from Referativnyy Zhurnal Mekhanika, No 12, 1972, Abstract No 12B202, by O. K. Rozanov)

Translation: The peculiarities of the flow of liquid nitrogen and hydrogen resulting from the action of dynamic loading of high intensity on the liquids are studied experimentally. Two methods of loading of deliquified gasses are used: planar loading of a layer by the impact of a plate accelerated to high velocity by detonation products, and cylindrical compression of an ampule containing the cryogenic liquid. The experimental installations are described in detail. The nature of flow of the liquids, differing significantly in molecular weight, compressibility and density, was analyzed in glass pipes 10-12 mm in diameter attached to the unloaded side of the liquid through a thin diaphragm. The air pressure in the pipe was 0.5-1 mm hg. In the case of hydrogen, a pipe of stainless steel 100 mm long was connected to the diaphragm, followed by the glass pipe. The waves propagating in the pipes were recorded by a streak camera.

With planar loading, it was found that the maximum shock wave velocities in

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USSR

Sil'vestrov, V. V., Titov, V. M., Urushkin, V. P., *Dinamika Splosh. Sredy*, No 10, Novosibirsk, 1972, pp 233-238.

the pipe occur for nitrogen when the working chamber, with a volume of 2-3 cm<sup>3</sup>, was shaped like a truncated cone with a peak angle of 90°. It is demonstrated that the influence of rear loading on velocity is slight, while variation of the cone angle has a significant influence on flow velocity, which is related to the effect of reflection from the side walls of the cone. It is noted that the exhaust velocity remains practically unchanged over the first 300 mm from the diaphragm. With planar loading of the hydrogen layer, the velocity in the initial sector reaches 35 km/sec, at a distance of 1 m it drops to 23 km/sec. The flow arising in this case is characteristically unstable. Cylindrical compression of the ampule of nitrogen formed a Mach configuration. In the case of hydrogen, pulsed x-ray studies showed complete closure of the ampule. It is emphasized that cylindrical loading produces no increase in flow velocity over flat loading for 150-300 mm. Six biblio. refs.

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1/2 036 UNCLASSIFIED PROCESSING DATE--16OCT70  
 TITLE--EFFECT OF TEMPERATURE, ELECTRIC FIELD, AND ILLUMINATION ON THE  
 ABSORPTION OF ULTRASOUND IN SBSI IN THE PHASE TRANSITION TEMPERATURE  
 AUTHOR--(05)-ZAPOROZHETS, O.I., LYAKHOVITSKAYA, V.A., PEKAR, S.I.,  
 POLOTSKIY, I.G., SILVESTROVA, I.M.  
 COUNTRY OF INFO--USSR

S

SOURCE--FIZ. TVERD. TELA 1970, 12(2), 671-2

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ULTRASONIC ABSORPTION, THERMAL EFFECT, ELECTRIC FIELD, PHASE  
 TRANSITION, TRANSITION TEMPERATURE, PYROELECTRIC MATERIAL, FERROELECTRIC  
 MATERIAL, ILLUMINATION, IODIDE, SULFUR COMPOUND, ANTIMONY COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAE--1988/0061

STEP NO--UR/0181/70/012/002/0671/0672

ARC ACCESSION NO--AP0105158

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--16OCT70

272 034

TRC ACCESSION NO--AP0105158  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE STUDY WAS MADE OF THE EFFECT OF TEMP., EXTERNAL STATIC ELEC. FIELD, AND ILLUMINATION ON ABSORPTION OF LONGITUDINAL ULTRASOUND VIBRATIONS IN SBSI CRYSTALS AT TEMPS. NEAR THE 1ST ORDER PHASE TRANSITION (SIMILAR TO 20DEGREES). THE DEPENDENCE IS GIVEN OF THE ABSORPTION COEFF. OF ULTRASOUND ON THE MAGNITUDE OF EXTERNAL ELEC. FIELD AT INITIAL TEMP. OF 17DEGREES AND AN ELEC. FIELD INCREASING AT 0.4 KV-MIN. THE ABSORPTION COEFF. INCREASES WITH INCREASING FIELD, PASSES THROUGH A MAX. AND STARTING WITH A FIELD OF 5 KV-CM, DECREASES. ILLUMINATION IN THE PRESENCE AND ABSENCE OF AN ELEC. FIELD DECREASES ABSORPTION BY LESS THAN 15PERCENT IN THE FERROELEC. PHASE AND HAS LITTLE EFFECT IN THE PARAELEC. PHASE. FACILITY:  
INST. METALLOFIZ., KIEV, USSR.

UNCLASSIFIED



1/2 023 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--EFFECT OF COMPOSITION ON THE GROWTH, DIELECTRIC AND PHOTOELECTRIC  
PROPERTIES OF SBSI CRYSTALS -U-  
AUTHOR-(03)-BELYAYEV, L.H., LYAKHOVITSKAYA, V.A., SILVESTROVA, I.M.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER. 1970, 6(3), 429-33  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, CHEMISTRY  
TOPIC TAGS--CRYSTAL GROWTH, PHOTOELECTRIC PROPERTY, ANTIMONY COMPOUND,  
SULFUR COMPOUND, IODIDE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED STEP NO--UR/0363/70/006/003/0429/0433  
PROXY REEL/FRAE--1996/0831  
CIRC ACCESSION NO--AP0118007  
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--16OCT70

2/2 023

CIRC ACCESSION NO--AP0118007

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE GROWTH FEATURES OF SBSI CRYSTALS IN THE PRESENCE OF SB1 SUB3, I SUB2, SB SUB2 S SUB3, AND S SUB2 IMPURITIES WERE STUDIED IN ORDER TO DET. THEIR EFFECT ON THE DIELEC. AND PHOTOELEC. PROPERTIES OF THESE CRYSTALS. THE SBSI CRYSTALS WERE GROWN FROM THE GAS PHASE AND THE MELT. THE FUNDAMENTAL PROCESS COMPLICATING THE CRYSTAL GROWTH IS THE DISSOCN. OF SBSI. THE TEMP. DEPENDENCE OF DIELEC. CONST. AND THE SPECTRAL DISTRIBUTION OF PHOTSENSITIVITY OF THE CRYSTALS WITH THE NAMED IMPURITIES PRESENT WERE STUDIED. THE ADDN. OF SB TO SBSI CRYSTALS RESULTS IN A SIGNIFICANT INCREASE IN THE COND. OF 10 PRIME NEGAVITE6 OHM PRIME NEGATIVE1-CM PRIME NEGATIVE1 AND A DECREASE IN THE PHOTSENSITIVITY OF THE CRYSTALS. THE ADDN. OF THE NAMED IMPURITIES INTO SBSI CRYSTALS IN CONCNS. OF LESS THAN 1 MOLE PERCENT DOES NOT CHANGE SIGNIFICANTLY THE ELEC. PROPERTIES OF THE CRYSTALS.

FACILITY: INST. KRISTALLOGR., MOSCOW, USSR.

UNCLASSIFIED

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UDC 576.851.48.095.38:576.851.315

USSR

POKROVSKAYA, M. P., EPSHTEYN-LITVAK, R. V., VIL'SHANSKAYA, F. L., RAKHIMOVA, N.G.,  
POSPELOVA, V. V., KUDRYAVTSEV, N. G., SIL'VESTOVA, T. N., KALININA, A. M., and  
SYADUK, V. F., Moscow Institute of Epidemiology and Moscow Municipal Sanitary  
Epidemiological Station

"In vitro Antagonistic Activity of E. coli (Strain M-17) and B. bifidum  
(Strain 1) Against El Tor Cholera Vibrios"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 10, 1972,  
pp 54-59

Abstract: The antagonistic activity of E. coli (strain M-17) and B. bifidum  
(strain 1) against 11 El Tor cholera vibrio strains (Inaba serotype 6 and Ogawa  
serotype 5) was studied in mixed cultures in vitro. During the first 6 hours  
of combined cultivation of E. coli and a cholera vibrio strain both microbial  
species grew, but the number of live vibrios began to decrease after 24 hours  
and after 48 hours almost all were dead. B bifidum had a similar inhibiting  
effect on vibrio growth. In the presence of both antagonistic strains, all  
the vibrios died within 48 hours without reproducing in the initial period of  
cultivation. It is suggested that the antagonistic activity of the two strains  
under study might be duplicated in an intestinal biocenosis and that a prepara-  
tion made from these microorganisms (a combination of colibacterin and  
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USSR

POKROVSKAYA, M. P., Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii,  
No 10, 1972, pp 54-59

bifidumbacterin) should, in principle, be an effective means of treating  
vibrio carriers and correcting the change in intestinal microflora observed in  
cholera.

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USSR

UDC 534

ANIKEYEV, G. I., SIL'VESTROV, E. YE.

"Nonstationary Almost Periodic Oscillations of a Gyroscopic Rotor"

V sb. Vibroizolyatsiya mashin i vibrozashchita cheloveka-operatora (Vibration Insulation of Machines and Vibration Protection of the Human Operator-- collection of works), Moscow, Nauka, 1973, pp 108-113 (from RZh--Mekhanika, No 6, Jun 73, Abstract No 6A136)

Translation: A study was made of nonstationary almost periodic oscillations of a gyroscopic rotor on transition of it through the autooscillation zone as a result of variation of the angular rotation rate. The presence of nonstationary almost periodic conditions of only one type is demonstrated in which along with the oscillations with variable frequency there are autooscillations with one of the natural frequencies also varying in time. A study was made of the effect of the initial conditions and the rate of passage through the zone of autooscillations with linear variation of the rotation rate of the rotor.

1/1

1/2 023

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--EFFECTIVENESS OF THE INFLUENCE OF CO PRIME2 POSTIVE ON SPIN WAVE LOSSES -U-

AUTHOR--(04)-~~BUNINA~~ M.P., LEBEDEVA, YE.V., PILSHCHIKOV, A.I., SILVESTROVICH, I.I.

COUNTRY OF INFO--USSR

S  
SOURCE--FIZ. TVERD TELA 1970, 12(2), 433-8 (RUSS)

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SPIN WAVE THEORY, COBALT, ZINC FERRITE, LITHIUM COMPOUND, TITANIUM COMPOUND, MAGNETIC PUMPING, METAL ION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1983/1896

STEP NO--UR/0181/70/012/002/0433/0438

CIRC ACCESSION NO--AP0054699

UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0054699

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ON SPECIMENS OF LI-TI-ZN FERITES WITH THE FORMULA  $LI_{1-2T}Fe_{1.5-T}Zn_x$  ( $LI_{0.5-T}Fe_{0.5+T}$ ), WHERE T EQUALS 0.4-0.8 AND X EQUALS 0-0.4, INVESTIGATIONS WAS CARRIED OUT OF THE DEPENDENCE OF THE PARAMETER OF SPIN WAVE LOSSES,  $\Delta H_K$ , ON THE CONTENT OF CO<sup>2+</sup>. MEASUREMENTS OF  $\Delta H_K$  WERE CARRIED OUT BY THE METHOD OF PARALLEL PUMPING ON CYLINDRICAL SPECIMENS AT ROOM TEMP. AT 9400 MHZ. THE EFFECT OF CO<sup>2+</sup> ON  $\Delta H_K$  FOR SPIN WAVES PARAMETRICALLY EXCITED AT THE MIN. OF THE THRESHOLD FIELD VARIES ON THE INTRODUCTION INTO LI FERITE OF ZN<sup>2+</sup> AND TI<sup>4+</sup>. THE CONTRIBUTION TO  $\Delta H_K$  DETERM. BY CO<sup>2+</sup> IS PROPORTIONAL TO THE QUANTITY  $(\frac{1}{2} \pi M-H_x)$  ONE HALF, CHARACTERISTIC FOR THE MECHANISM OF 2 MAGNON SCATTERING. THE INTRODUCTION OF NONMAGNETIC IONS INTO FERRITES CONTG. CO<sup>2+</sup> INCREASES  $\Delta H_K$  SHARPLY WITHOUT VARIATION OF THE CONTENT OF CO<sup>2+</sup>. FACILITY: MOSK. GOS. UNIV. IN. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--16OCT70  
 TITLE--EFFECT OF NONMAGNETIC IONS ON THE RELAXATION OF SPIN WAVES IN  
 YTTRIUM GARNETS CONTAINING RARE EARTH IONS -U-  
 AUTHOR--(04)-KRASNOVA, V.A., PILSHCHIKOV, A.I., SEDLITSKAYA, N.S.,  
 SILVESTROVICH, I.I.  
 COUNTRY OF INFO--USSR

S

SOURCE--FIZ. TVERD. TELA 1970, 12(3), 785-8

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--YTTRIUM, GARNET, RARE EARTH METAL, ION, SAMARIUM, SPIN WAVE,  
 SPIN RELAXATION, MAGNETISM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1995/1277

STEP NO--UR/0181/70/012/003/0785/0788

CIRC ACCESSION NO--AP0116739

UNCLASSIFIED



2/2 023

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0116739

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SPIN WAVE RELAXATION  
PARAMETER, DELTAETA SUBKAPPA, WAS INVESTIGATED IN POLYCRYST. Y AL AND Y  
IN GARNETS CONTG. SMALL CONCNS. OF SM ION. DELTAETA SUBKAPPA WAS  
MEASURED BY THE METHOD OF PARALLEL PUMPING AT 2850 MHZ. WITH INCREASED  
CONCN. OF NONMAGNETIC IONS, ESP. AL IONS, THE EFFICIENCY OF THE EFFECT  
OF SM IONS ON DELTAETA SUBKAPPA INCREASES. THE POSSIBILITY IS DISCUSSED  
OF AN EXPLANATION OF THE RESULTS WITH THE AID OF THE THEORY OF SLOW  
RELAXATION. FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW,  
USSR.

UNCLASSIFIED

1/2 009 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--FEATURES OF CHEMICAL ETCHING OF THE SURFACE OF AN INTENSIVELY  
HARDENED GLASS -U-  
AUTHOR--(04)-SILVESTROVICH, S.I., KAZAKOV, V.D., KATS, R.YA., MENDELEYEV,  
D.I.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. SSSR. MOSCOW, NEORGANICHESKIYE MATERIALY, VOL 6, NO 5, MAY  
70, PP 952-956  
DATE PUBLISHED----MAY70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--GLASS PROCESSING, HYDROFLUORIC ACID, GLASS STRENGTH  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3006/1042 STEP NO--UR/0363/70/006/005/0952/0956  
CIRC ACCESSION NO--AP0134745  
UNCLASSIFIED

2/2 009

CIRC ACCESSION NO--AP0134745  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--13NOV70

ABSTRACT. THE AUTHORS WERE INTERESTED IN FINE POINTS OF THE CHEMICAL SURFACE ETCHING OF GLASS WITH HIGHLY DEVELOPED DEFECTS, SUCH AS OCCUR ON HARDENING WHEN MICROCRACKS ARE FORMED. THE SELECTIVITY OF CHEMICAL SURFACE ETCHING OF MICROLAMINATED GLASSES IS DETERMINED BY TWO PHASES OF DIFFERENT RESISTANCE TOWARD HYDROFLUORIC ACID ACTION AND BY SPECIFIC PRODUCTION CONDITIONS WHEN THEY ARE SUBJECTED TO VARIOUS THERMOCHEMICAL ACTIONS. THE GLASS STRENGTH, WHICH IS INCREASED AFTER CHEMICAL ETCHING, IS CONNECTED MAINLY WITH THE PRESENCE OF HAZARDOUS MICROCRACKS ON ITS SURFACE. WHEN THEY ARE ABSENT THE STRENGTH IS DETERMINED BY THE DEGREE OF MICROLAMINATION AND THE QUALITY OF SURFACE CONTOUR. FACILITY: MOSCOW INSTITUTE OF CHEMICAL TECHNOLOGY IMEMI.

UNCLASSIFIED

USSR

UDC 666.1.056:678.84:678.643

SIL'VESTROVICH, S. I., STOLYAROV, M. I., GURIKOVA, L. M., STOLYAROVA, G. V.,  
SHCHEREDINA, Ye. A., KOSHELKINA, O. N.

"Protective Effect of Polymer Coatings on Glass Surfaces":

Moscow, Steklo i Keramika, No 11, 1972, pp 12-15.

Abstract: The authors performed studies to determine the influence of protective organosilicon and other organic polymer coatings on industrial glass: sheet glass 1.5 mm thick and electric vacuum type S-49-2 glass (rods 5 mm in diameter). Coatings 1-25  $\mu$  thick were applied with the polymers in solution in toluene, acetone, ethyl alcohol, styrene and in a mixture of solvents. Polymers of this type reduce transparency only slightly in thin coatings, although aging may cause additional reductions in transparency. The polymer coatings tested approximately doubled the strength of the sheet glass surface, producing maximum effect with a coating thickness of 5-10  $\mu$ . Strong polymers and polymers with good adhesion to the glass produce the best effect. The protective effect is retained when the glass is exposed to high humidities for extended periods of time.

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USSR

UDC 615.779.9:582.285.1.633.11

SIL'YANOVA, A. N., Chair of Lower Plants, Moscow State University imeni M. V. Lomonosov

"Effect of Antibiotics on Wheat Smut"

Moscow, Biologicheskiye Nauki, No 8, 1970, pp 102-104

Abstract: Artificially infected wheat seeds were soaked for 6 hours in a solution of trichotezin (produced by *Trichotezium roseum*), candicidin, actinomycin, griseofulvin, or nystatin. At the concentrations tested all of the antibiotics increased the germination rate. The field germination rate decreased somewhat with increasing antibiotic concentrations. The antibiotics reduced the damage done by the fungus but did not prevent the disease. The most effective of the antibiotics was trichotezin; when it was applied to seeds in a concentration of 100 micro g/ml, the disease rate among the plants was 7.9%, as compared to 13.8% for the controls. Treatment of seeds with trichotezin, actinomycin, and griseofulvin in low concentrations increased wheat yields, while the other antibiotics somewhat reduced them.

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Nuclear Science and Technology

USSR

UDC 621.039.52

13

KRASIN, A. K., KESTERENKO, V. B., KOLYKHAN, L. I., BUBNOV, Y. P., IL'IN, A. YA., SILZOV, V. P., and SHUFROV, YU. V.

"Experimental Power Installation With Gas-Cooled Fast-Neutron Reactor and Dissociating Heat-Transfer Medium (BRG-20)"

Dissotsiruyushch. Gazy kak Teplonositeli i Rab. Tela Energ. Ustanovok' (Dissociating Gases as Heat Transfer Media and Working Fluids of Power Installations -- collection of works), Minsk, Nauka i Tekhn. Press, 1970, pp 42-47 (from Referativnyy Zhurnal-Yadernyye Reaktory, No 4, 1971, Abstract No 4.50.134)

Translation: The possibility is studied of creating an experimental pilot scale atomic power plant with a gas-cooled fast-neutron reactor with dissociating coolant. The parameters of the installation and required volume of experimental study are discussed. 2 figures, 4 biblio. refs.

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USSR

UDC 681.332.6

GREZDOV, G. I., and SIMAK, L. A., Institute of Cybernetics, Academy of Sciences of the Ukrainian SSR

"A Quasi-Analog Device for Solving a System of Ordinary Differential Equations"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 22, Aug 71, Author's Certificate No 309375, Division G, filed 23 Mar 70, published 9 Jul 71, p 193

Translation: This Author's Certificate introduces a quasi-analog device for solving a system of ordinary differential equations. The device contains analog modules for a system of derivatives, an analog module for a system of functions, and a penalty function shaper. The first group of inputs of this shaper is connected through a quasi-analog inverter module to direct and inverted input signal sources and to the inputs of the analog modules for the system of derivatives and the system of functions. As a distinguishing feature of the patent, the functional capabilities of the device are extended by including a matching unit

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USSR

GREZDOV, G. I., and SIMAK, L. A., Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 22, Aug 71, Author's Certificate No 309375, Division G, filed 23 Mar 70, published 9 Jul 71, p 193

whose inputs are connected to the outputs of the analog modules for the system of derivatives and the system of functions, while the outputs of the matching unit are connected to the second group of inputs of the penalty function shaper.

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USSR

SIMAKHIN, V. A., FUKS, I. L.

"One Class of Rank Tests for the Problem of Dependence"

Tr. Sib. fiz.-tekhn. in-ta pri Tomsk. un-te [Works of Siberian Institute of Physics and Technology of Tomsk University], 1973, No 63, pp 196-208 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V170 by D. Chibisov)

Translation: With the sample  $X_1, \dots, X_n$ , hypothesis  $H_0$  and the hypothesis that  $X_i$  are independent and identically distributed against the alternative of dependence are tested. A class of criteria is studied, based on

$$S_N = \frac{1}{N-1} \sum_{2 \leq i < j \leq N} a_{i,N} \left( \frac{R_i}{N+1} \right) a_{j,N} \left( \frac{R_j}{N+1} \right)$$

where  $R_i$  is the rank of  $X_i$ ,  $a_{jN}(u)$  converge on the mean square to certain functions  $a_j(u)$ ,  $u \in [0, 1]$ ,  $j=1, 2$ . Asymptotic normality of  $S_N$  is proven in the case of an  $M$  dependent sequence and with continual alternatives of the Markov dependence. In the last case, asymptotically optimal criteria are constructed against the fixed alternative. The asymptotic effectiveness of the criteria is studied.

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USSR

UDC 519.2

SIMAKHIN, V. A.

"Nonparametric Rank Criteria for the Regression Problem of Checking Hypotheses"

Tr. Sib. fiz.-tekhn. in-ta pri Tomsk. un-te (Works of the Siberian Physico-Technical Institute under Tomsk University), 1971, vyp. 62, pp 209-219 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V138)

Translation: Let  $X_1, \dots, X_n$  be independent vectors,  $X_i = (X_{1i}, \dots, X_{pi})$ . The hypothesis  $H_0: \mathcal{L}\{X_i\} = F(x, 0)$  against  $H_1: \mathcal{L}\{X_i\} = F(x; S_i)$  where  $S_i = ((\theta_1/\sqrt{n})\phi_{1i}, \dots, (\theta_p/\sqrt{n})\phi_{pi})$ ;  $\phi_{ij}$  are unknowns which satisfy the Noether conditions,  $\theta_1, \dots, \theta_p$  are unknown parameters. The rank statistics of the type of  $Z = (Z_1, \dots, Z_p)$  are introduced,

$$Z_j = \sum_{i=1}^N \phi_{ij} \psi_N^{(j)}(R_{ji}/(N+1)),$$

where  $R_{ji}$  is the rank of the element  $X_{ji}$  in the series  $X_{j1}, \dots, X_{jN}$ ,  $j = 1, \dots, p$ ;  $\psi_N^{(j)}(u)$  is the "tag" function.

On the basis of  $Z$  it is possible to construct nonparametric (similar)

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USSR

SIMAKHIN, V. A., Tr. Sib. fiz.-tekhn. in-ta pri Tomsk. un-te, 1971, vyp. 62, pp 209-219

tests. In order to avoid the complexities of using the similarity method, it is proposed that the statistical test

$$L_N = (Z - \bar{Z})^T V^{-1} (Z - \bar{Z}),$$

be used to check  $H_0$  against  $H_1$  where  $\bar{Z} = (\bar{Z}_1, \dots, \bar{Z}_p)$ ,  $\bar{Z}_j$  is the mathematical expectation of  $Z_j$  under the assumption that the vectors  $(R_{j1}, \dots, R_{jN})$  have uniform distribution,  $V$  is the  $Z$  covariance matrix for the indicated assumption which depends on  $R_{ji}$ .

It is proved that asymptotically  $L_N$  has  $\chi^2$ -distribution for  $H_0$  with  $p$  degrees of freedom and for  $H_1$ , noncentral  $\chi^2$ -distribution with  $p$  degrees of freedom and the parameter of noncentralness which depends on  $\theta_j$ ,  $\phi_{ij}$  and  $\psi_N^j(u)$ . Thus,  $L_N$  asymptotically insures nonparametric checking of the hypothesis  $H_0$ . A study was made of the problems of optimal selection of  $\psi_N^j(u)$  and the problems of Pitman effectiveness of the proposed test.

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1/2 017  
UNCLASSIFIED  
PROCESSING DATE--04DEC70  
TITLE--COMBINED TREATMENT OF CANCER OF THE RECTUM -U-  
AUTHOR--(04)-PAVLOV, A.S., SIMAKINA, E.P., KHRUSCHOV, M.N., SMIRNOVA, E.S.  
COUNTRY OF INFO--USSR  
SOURCE--KHIRURGIYA, 1970, NR 5, PP 67-74  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--CANCER, COLON, SURGERY, RADIOTHERAPY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3003/0134  
STEP NO--UR/0531/70/000/005/0067/0074  
CIRC ACCESSION NO--AP0129390  
UNCLASSIFIED