CHAYKOVSKIY, G.N.

Experience in the surgical treatment of cholecystitis and its late results. Vest. khir. 93 no.12:24-29 D '64. (MIRA 18:5)

1. Iz khirurgicheskogo otdeleniya (zav. - kand.med.nauk T.A. Grasmik) 3-y gorodskoy bol'nitsy goroda Nizhnego Tagila (glavnyy vrach - M.M.Fomin).

L 16694-65 ESD(t)/SSD/AFWL/ASD(a)-5/AS(mp)-2/AFETR
ACCESSION NR: AR5000798 S/0058/64/000/010/E047/E047

SOURCE: Ref. zh. Fizika, Abs. 10E366

AUTHORS: Chaykovskiy, I. A.; Kovarskiy, V. A.

TITLE: Single quantum capture as a mechanism of impurity scattering

CITED SOURCE: Izv. AN MoldSSR. Ser. yestestv. i tekhn. n., no. 7, 1963, 92-97

TOPIC TAGS: electron capture, electric conductivity, Green function, electron mobility

TRANSLATION: The authors calculate the electric conductivity tensor with account of capture of an electron by a single donor level with the aid of the Konstantinov and Perel' diagram technique and of the Green function method. As $T \to 0$, the mobility due to scattering via capture (U_{rec}) is inversely proportional to the concentration N of the charge centers, whereas the usual mobility, calculated by the Conwell-Weisskopf formula (U_{C-W}), is inversely proportional to $N^{1/3}$ in this temperature region. Con-

Card 1/2

L 16694-65
ACCESSION NR: AR5000798

D

sequently at sufficiently large values of N it is possible to have $U_{rec} \geq U_{C-W}$.

I Korenblit.

SUB CODE: NP, SS, EM

ENCL:00

Card 2/2

ACCESSION NR: AP4041720 S/0181/64/006/007/2131/2145

AUTHORS: Kovarskiy, V. A.; Chaykovskiy, I. A.; Sinyavskiy, E. P.

TITLE: Quantum-kinetic equations for processes with nonradiative recombination

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 2131-2145

TOPIC TAGS: recombination coefficient, quantum statistics, kinetic theory, phonon, polaron, nonradiative recombination

ABSTRACT: Several reasons for the inadequacy of the standard kinetic-equation formalism to non-optical transitions between discrete spectrum states are pointed out. The authors then propose to describe the processes accompanying multi-phonon nonradiative combination by means of a system of integral quantum-kinetic equations based on the formalism of the quantum density matrix, a formalism in which the quantum-mechanical and statistical calculation stages

Card 1/3

ACCESSION NR: AP4041720

are combined. The method used is essentially that of Kubo (J. Phys. Soc. Japan, v. 12, 570, 1957). A graph representation is obtained for the recombination coefficients with the aid of the technique of Konstantinov and Perel' (ZhETF v. 39, 197, 1960), modified by Lang and Firsov (ZhETF v. 43, 1843, 1962) to cover multi-phonon jumps in the case of low polaron mobility. The free relaxation of the band carriers, which are in quasi-equilibrium with the crystal lattice at the initial instant of time, is considered. A criterion is considered for the applicability of perturbation theory to the theory of multiphonon nonradiative transitions. "The authors thank Yu. A. Firsov and I. G. Lang for valuable information in connection with the computation procedure, and also A. I. Ansel'm and Yu. Ye. Perlin for a discussion of the calculation of the recombination coefficients." Orig. art. has: 5 figures and 76 formulas.

ASSOCIATION: Institut fiziki i matematiki AN MolSSR, Kishinev (Insti-

Card 2/3

ACCESSION NR: AP4041720

tute of Physics and Mathematics, AN MolSSR)

SUBMITTED: 27Dec63 ENCL: 00

SUB CODE: GP NR REF SOV: 009 OTHER: 002

Card 3/3

KOVARSKIY, V.A.; CHAYKOVSKIY, I.A.

Generation-recombination noises in a magnetic field. Fiz. tver. tela 7 no.8:2499-2504 Ag '65.

Recombination relaxation in a quantized magnetic field. Ibid.:2505-2512 (MIRA 18:9)

1. Institut prikladnoy fiziki AN Moldavskoy SSR, Kishinev.

L 6329-66 EWT(1)/EPA(m)-2 IJP(c) AT

ACCESSION NR: AP5019871 UR/0181/65/007/008/2499/2504

AUTHOR: Kovarskiy, V. A.; Chaykovskiy, I. A.

TITLE: Generation-recombination noise in a magnetic field

SOURCE: Fizika tverdogo tela, v. 7, no. 8, 1965, 2499-2504

TOPIC TAGS: electron recombination, correlated noise, quantum oscillation, spectral distribution, autocorrelation function, strong magnetic field

ABSTRACT: This is a continuation of earlier work (Tez. dokl. VI coveshchaniya po teorii poluprovodnikov. Izd. "Kartya Moldovenyaske," Kishinev, 1964) dealing with singularities of carrier recombination in a quantized electric field. In the present article, the theory of quantum fluctuations developed by one of the authors (Kovarskiy, with Ye. V. Vitin, ibid; Izv. AN MSSR, ser. fiz. No. 12, 111, 1964) is applied to an investigation of the influence of the magnetic field on the frequency spectrum and the relative magnitude of the noise connected with carrier recombination and generation processes. By introducing an autocorrelation function for the quantum fluctuations and employing a diagram technique, the authors obtain an expression for the spectral density of the noise intensity. An analysis of the results shows that the noise level depends on the magnetic field. It is pointed out that there are still not enough data to determine the numerical parameters in the

Card 1/2

L 6329-66

ACCESSION NR: AP5019871

6

fluctuation spectrum. "The authors thank V. L. Gurevich for interest in the work and valuable discussions." Orig. art. has: 35 formulas.

ASSOCIATION: Institut prikladnoy fiziki AN MSSR, Kishinev (Institute of Applied Physics AN MSSR)

SUBMITTED: 18Jan65 ENCL: 00 SUB CODE: EM

NR REF SOV: 005 OTHER: 002

nw

Card 2/2

L 6330-66 EWT(1)/EPA(w)-2/EWA(m)-2 IJP(c) AT

ACCESSION NR: AP5019872 UR/0181/65/007/008/2505/2512

44,55 44,55

AUTHOR: Kovarskiy, V. A.; Chaykovskiy, I. A.

TITLE: Recombination relaxation in a quantizing magnetic field

SOURCE: Fizika tverdogo tela, v. 7, no. 8, 1965, 2505-2512

21,44,55

TOPIC TAGS: strong magnetic field, carrier density, matrix function, electron recombination, relaxation process, phonon interaction, carrier lifetime

ABSTRACT: The density matrix method is used to investigate the recombination relaxation of carriers which are initially in a state of quasi-equilibrium with the crystal lattice. The calculation is based on the Fermi quasi-level method. The recombination mechanism is assumed to be a single-phonon (or single-photon) capture by local levels. It is established that the time constant depends on the magnetic field. An example in which the lifetime of the carriers is delayed by the quantizing magnetic field is presented. "The authors thank A. I. Ansel'm who called their attention to the possible signularities of recombination kinetics in a quantizing magnetic field, and V. L. Bonch-Bruyevich for a valuable discussion of the results." Orig. art. has: 1 figure and 43 formulas. 44,55

ASSOCIATION: Institut prikladnoy fiziki AN MSSR, Kishinev (Institute of Applied Physics AN MSSR) 44,55

Card 1/2

0902 0024

L 6330-66

ACCESSION NR: AP5019872

SUBMITTED: 18Jan65 ENCL: 00 SUB CODE: NP

NR REF SOV: 005 OTHER: 004

nw

Card 2/2

ACC NR: AT6024010 SOURCE CODE: UR/0000/65/000/000/0033/0040

AUTHOR: Chaykovskiy, I. A.

ORG: none

TITLE: Derivation of quantum kinetic equations for processes with single-phonon recombination

SOURCE: AN MoldSSR. Institut prikladnoy fiziki. Teoreticheskiye i eksperimental'nyye issledovaniya fizicheskikh svoystv poluprovodnikovykh materialov i drugikh kristallov (Theoretical and experimental studies on physical properties of semiconductor materials and other crystals). Kishinev, Izd-vo Kartya Moldovenyaske, 1965, 33-40

TOPIC TAGS: quantum statistics, Boltzmann equation, integral equation, electron scattering, electron recombination, electron capture, electron emission, phonon interaction

ABSTRACT: In view of the fact that Boltzmann's kinetic equation, which is customarily used for the description of recombination in impurity semiconductors has a limited region of application, especially in the presence of a quantizing magnetic field, the author derives a set of quantum kinetic equations, in which the quantum and statistical approaches are combined, using for the derivation the method of O. V. Konstantinov and V. I. Perel' (ZhETF v. 39, 197, 1960). The system treated is a crystal containing impurity levels at a single depth that does not exceed the magnitude of the Debye phonon. He then introduces the Konstantinov-Perel' single-particle matrices and es-

Card 1/2

ACC NR: AT6024010

tablishes for them a system of differential equations of the Dyson type. The diagram technique and the correspondence rules are the same as established by Konstantinov and Perel'. These integral equations describe the kinetic phenomena of scattering, capture, and emission of electrons for the crystal with impurity centers. A distinguishing feature of this system of equations is that the explicit form of all the coefficients contained in them is known. The equations for the diagonal matrix elements are used to estimate the contribution of the recombination mechanism of the impurity scattering. While a general solution of the resultant inhomogeneous integral equation is difficult to obtain, some simplification can be obtained by making use of the fact that scattering by oscillations (or by impurities) and recombination scattering are physically independent. The final expression for the current shows that the main contribution to the recombination scattering mechanism is made by a term inversely proportional to the quantum-statistical probability of carrier capture by the impurity center. The author plans to use the derived equations to investigate the kinetics of the acousto-electrical effect in crystals. The author thanks V. A. Kovarskiy for continuous interest in the work. Orig. art. has: 9 figures and 29 formulas.

SUB CODE: 20/ SUBM DATE: 25Jul65/ ORIG REF: 004/ OTH REF: 002

Card 2/2

CHAYKOVSKIY, I.Ye.; YATSENKO, N.P.

Manufacture of glued bent frames for chairs. Der.prom. 9 no.10:8-9 O '60. (MIRA 13:10)
(Woodworking machinery)

MOROZOV, N.A., kand.tekhn.nauk; USHERENKO, Z.I., inzh.; CHAYKOVSKIY, I.Ye., inzh.

Semiautomatic line for machining bent and glued parts in the manufacture of furniture. Mekh.i avtom.proizv. 16 no.8:10-14 Ag '62. (MIRA 15:9)

(Furniture industry)

MOROZOV, N.A., kand. tekhn. nauk; USHERENKO, Z.I., inzh.; CHAYKOVSKIY, I.Ye., inzh.

New machines for manufacturing bent and glued furniture parts. Mekh. i avtom. proizv. 18 no.1:18-23 Ja '64. (MIRA 17:8)

CHAYKOVSKIY, K.A., inzhener; VERNIK, A.B., inzhener.

Devices for hoisting in installing hydroelectric power station equipment. Mekh.trud.rab.10 no.4:28-29 Ap '56. (MLRA 9:7)
(Hoisting machinery)

CHAYKOVSKIY, K.A.

CHAYKOVSKIY, K.A., inzhener.

Insert knockout grating. Lit.proizv. no.4:15-17 Ap '57.
(MLRA 10:5)
(Foundry machinery and supplies)

SOV/5158

PHASE I BOOK EXPLOITATION

Vanin, V.P., L.F. Chaykovskiy, and Yu.K. Cherevychnik

Modernizatsiya magnitnogo zapominayushchego ustroystva na mashine "Strela-3" (Modernization of the Magnetic Memory Device in the "Strela-3" Computer) Moscow, Vychislitel'nyy tsentr AN SSSR, 1960. 54 p. 750 copies printed.

Sponsoring Agency: Vychislitel'nyy tsentr AN SSSR.

Resp. Ed.: L.F. Chaykovskiy; Ed.: M.V. Yakovkin; Tech. Ed.: N.S. Popova.

PURPOSE: This booklet is intended for technical personnel concerned with the development of computers.

COVERAGE: The booklet describes alterations introduced in the magnetic storage system of the electronic computer "Strela" to improve the reliability and some other parameters of the device and facilitate its operation. These alterations were introduced without interrupting the operation of the device. In

Modernization of the Magnetic Memory Device (Cont.) SOV/5158

AVAILABLE: Library of Congress (TK7889.S7V3)

Card 3/3

JP/dwm/gmp
5-18-61

GOLYSHEV, Leonid Konstantinovich, inzh.; CHAYKOVSKIY, L.F., inzh., retsenzent; KOVAL'CHUK, L.Ya., inzh., red.izd-va; MATUSEVICH, S.M., tekhn. red.

[Electronic calculating machines] Elektronnye vychislitel'nye mashiny. Kiev, Gostekhizdat USSR, 1963. 425 p. (MIRA 17:1)

(Electronic computers)

GOLYSHEV, Leonid Konstantinovich; CHAYKOVSKIY, L.F., inzh., retsenzent

[Electronic digital computers] Elektronnye tsifrovye vychislitel'nye mashiny. Izd.2., ispr. i dop. Kiev, Tekhnika, 1965. 447 p. (MIRA 18:5)

L 61884-65 EWT(1)/EWA(h) Peb

ACCESSION NR: AP5018218 UR/0119/65/000/007/0024/0025
621.314:621.382.3

10
B

AUTHOR: Chaykovskiy, L. P. (Engineer)

TITLE: Regulated d-c to d-c converter 15

SOURCE: Priborostroyeniye, no. 7, 1965, 24-25

TOPIC TAGS: converter, d c to d c converter, voltage regulator

ABSTRACT: Eight transformer-coupled d-c to d-c converter voltage outputs are regulated by a voltage regulator tube placed in one of the eight secondary windings of the transformer. This stabilizes the output voltage to within ±1% for a ±15% input voltage variation from the nominal. If the power source used is 12 v, the best regulation is obtained by establishing a 1.2-amp nominal current through the tube. This is accomplished by appropriate selection of the series-dropping resistor placed between the full-wave diode rectifying bridge and the SG1P voltage regulator tube. The d-c regulator output voltages range from 3 v to 390 v, delivering 130 or 0.2 mamp, respectively. The converter efficiency is 60%. The converter ambient temperature limits are -40C to +50C, which when approached cause a ±3% maximum change in the output voltage. Orig. art. has: 3 figures. [BD]

Card 1/2

L 61884-65

ACCESSION NR: AP5018218 0

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: EC

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4061

dm

Card 2/2

CHAYKOVSKIY, L.F., inzh.

Regulated d.c. voltage converter. Priborostroenie no.7:24-25 Jl '65.
(MIRA 18:7)

CHAYKOVSKAYA, M.A. [Chaikovs'ka, M.A.]

Effect of various preservatives on microorganisms. Farmatsev. zhur. 19 no.4:34-38 '64. (MIRA 17:11)

1. Kafedra tekhnologii lekarstvennykh form i galenovykh preparatov Kiyevskogo instituta usovershenstvovaniya vrachey (zaveduyushchiy kafedroy prof. G.A. Vaysman [Vaisman, H.A.]).

CHAYKOVSKIY, P.I.

Improving the construction of pulpefangers. Sakh.prom. 30 no.9:58-59 S '56. (MLRA 10:3)

1. Maydanetskiy sakharnyy zavod.
(Sugar industry--Equipment and supplies)

CHAYKOVSKIY, S. [Chaikovs'kyi, S.]; ROMANENKO, I., inzh.-mekhanik

Speed up the production of tiles. Sil'. bud. 11 no. 2:16 F '61.
(MIRA 14:2)

1. Nachal'nik Kirovogradskogo oblmezhkolkhozproyekta (for Chaykovskiy). 2. Upravleniye stroitel'stva Kirovogradskogo oblsel'khozupravleniya (for Romanenko).
(Kirovograd Province--Tiles)

NARUSOV, Yu.B., inzh.; CHAYKOVSKIY, S.A., inzh.; KAMENTSEV, V.P., kand. tekhn. nauk

Sectional vibration tray for manufacturing blocks of spans for bridges. Transp. stroi. 15 no.7:25-27 Jl '65. (MIRA 18:7)

1. Dmitrovskiy zavod zheleznodorozhnykh konstruktsiy (for Narusov, Chaykovskiy). 2. Vsesoyuznyy nauchno-issledovatel'skiy institut transportnogo stroitel'stva (for Kamentsev).

CHAYKOVSKIY, S.I.

OVRUTSKIY, M.Sh.; CHAYKOVSKIY, S.I.

Tanning of heat-stable youfts. Legkaya Prom. 12, No.5, 23-4 '52.
(CA 47 no.19:10257 '53) (MLRA 5:5)

Chaykovskiy, V

USSR/General Problems. Methodology. History. Scientific Institutions and Conferences. Instruction. Questions Concerning Bibliography and Scientific Documentation A

Abs Jour : Ref Zhur-Khimiya, No 3, 1958, 6837

Author : A. Mal'skiy, V. Chaykovskiy, L. Mel'tser, S. Chuklin

Inst : Odessa Technological Institute of Food and Refrigeration Industries

Title : Odessa Technological Institute of Food and Refrigeration Industries

Orig Pub : Kholodil'naya tekhnika, 1957, No 3, 32-33

Abstract : To the 40th anniversary of the Great October Socialist Revolution. A general review of tuition and scientific activities.

Card 1/1

25(2)

SOV/66-59-5-4/35

AUTHORS: Chaykovskiy, V., Candidate of Technical Sciences, Shmyglya, A., Engineer, Savkov, K., Engineer

TITLE: Comparative Tests of Valves of Various Designs

PERIODICAL: Kholodil'naya tekhnika, 1959, Nr 5, pp 17-21 (USSR)

ABSTRACT: In order to evaluate the serviceableness of valves of various makes and designs, as used in Freon machines, a series of comparative tests have been conducted in the laboratory of the Odessa Refrigeration Machine Building Plant im.Stalin. The valves were divided in 4 groups: The 1st and 2nd groups comprised various types of the suction and discharge valves. The 3rd group contained valves manufactured by the Austrian firm Hörbiger and the 4th group valves designed by Engineer A. Shmyglya. The characteristics of the 4 types of valves are shown in Table 1. The tests were conducted with compressor 2FV-10 at certain fixed initial and final temperatures, -15°C and 30°C. A timing device recorded the time necessary for bringing the pressure in the receiver from 0 to 5 atmospheres. The best time - 22.5 seconds - was made by group 4 valves. Table 2 shows the results of comparative tests obtained by the 4 groups at temperatures indicated. The highest volumetric and energy coefficients of the compressor 2FV-10 were obtained with valves

Card 1/2

Comparative Tests of Valves of Various Designs

of group 4 with reduced dead space. The discharge coefficient of the Freon compressor falls sharply with the increase of dead space starting from 3.5% for example. The reduction of dead space in Freon compressors of average output to below 2% holds practically no advantage. There are 4 photos, 2 tables and 1 graph.

ASSOCIATION: Odesskiy tekhnologicheskiy institut pishchevoy i kholodil'noy promyshlennosti (Odessa Technological Institute of the Food and Refrigeration Industries) (Chaykovskiy, V.), Odesskiy zavod kholodil'nogo mashinostroyeniya imeni Stalina (Odessa Refrigeration Machine Building Plant im. Stalin) (Shmyglya, A. and Savkov, K.)

MARTYNOVSKIY, V.; CHAYKOVSKIY, V.; SHMYGLYA, A.

Methods of testing piston-type refrigeration compressors. Khol.tekh. 37 no.3:61-63 My-Je '60. (MIRA 13:7)
(Air compressors)

CHAYKOVSKIY, V. D.

Improvement of pulp troughs. V. D. Chaikovskii (Sakhar. Prom., 1952, No. 4, 28–29; Sug. Ind. Abstr., 1952, 24, 397).—An improved knot-pulp drainer comprises an adjustable sloping sieve (larger and wider than usual) on to which the pulp falls at right-angles from a wide delivery nozzle, an arrangement which prevents the pulp from sticking in the sieve, and gives improved drainage. Water is collected beneath the lower part of the sieve by a funnel of welded steel, which also receives the water from the upper part by way of a gutter. The width of the holes may be increased from one end to the other.

P. S. Arup.

CHAYKOVSKIY, V. D. and MORGUSHKO, P. G.

"Refinery of Superior Quality Production," Sakh. prom., 26, No 3, 1952

1. CHAYKOVSKIY, V. D.

2. USSR (600)

4. Efficiency, Industrial

7. For more accurate work and economy of material. Sakh.prom. 26 no. 11, 1952.

9. Monthly Lists of Russian Accessions, Library of Congress, March 1953, Unclassified.

CHAYKOVSKIY, V. D.

CHAYKOVSKIY, V. D.: "Methods of teaching surface areas and volumes in secondary schools", Kiev, 1955. Kiev ~~State~~ Pedagogical Inst imeni A. M. Gor'kiy, Chair of Methodology in Mathematics. (Dissertation for the Degree of Candidate of Science of Pedagogical Sciences)

SO: Knizhnaya Letopis', No. 41, 8 Oct 55

LYUDMILOV, D.S.(Vinnitsa);CHAYKOVSKIY, V.D.(Berdyansk);KUMINOV, G.I.(Shadrinsk)

Problems with practical contents. Mat. v shkole no.6:90 N-D '59
(Mathematics--Problems, exercises, etc.) (MIRA 13:3)

~~MEL'TSER, LEONID ?INOVIYEVICH.~~
CHAYKOVSKIY, V. F.

Epp.
.R92385

Kholodil'nyye mashiny i ustanovki dlya sel'skogo khozyaystva by L. Z. Mel'tser i V. F. Chaykovskiy. Kiyev, Mashgiz, 1956.
103 P. diagrs., tables.

CHAYKOVSKIY, V.F., kand.tekhn.nauk, dotsent

Designing apparatus for testing refrigerating compressors.
Trudy OTIP i KHP 8 no.1:37-42 '57. (MIRA 12:8)

1. Kafedra kholodil'nykh mashin Odesskogo tekhnologicheskogo instituta pishchevoy i kholodil'noy promyshlennosti.
(Compressors—Testing)

~~CHAKOVSKY, V. F.~~ CHAYKOVSKIY, V. F.

"The Volumetric Efficiencies of Refrigerating Compressors having a Varying Capacity."

Report submitted for the 10th Intl. Refrigeration Congress, Copenhagen, 19 August - 2 September 1959.

CHUKLIN, S.G., prof.; CHAYKOVSKIY, V.F., dotsent

"Refrigeration engineering. Vol. 1. Techniques of the production of artificial cold." Reviewed by S.G. Chuklin, V.F.Chaikovskii. Khol. tekh. 38 no.5:66-67 S-O '61. (MIRA 15:1)

1. Zaveduyushchiy kafedroy kholodil'nykh ustanovok Odesskogo tekhnologicheskogo instituta pishchevoy i kholodil'noy promyshlennosti (for Chuklin). 2. Zaveduyushchiy kafedroy kholodil'nykh mashin Odesskogo tekhnologicheskogo instituta pishchevoy i kholodil'noy promyshlennosti (for Chaykovskiy).
(Refrigeration and refrigerating machinery)

CHAYKOVSKIY, V.F., kand.tekhn.nauk, dotsent; SHMYGLYA, A.A., inzh.; VODYANITSKAYA, N.I., inzh.

Values of the mean temperature of the walls of a Freon uniflow compressor. Trudy OTIPiKhP 12:33-36 '62. (MIRA 17:1)

1. Kafedra kholodil'nykh mashin Odesskogo tekhnologicheskogo instituta pishchevoy i kholodil'noy promyshlennosti.

CHAYKOVSKIY, V.F., kand.tekhn.nauk, dotsent; KUZNETSOV, A.P., inzh.; LOS', V.I., inzh.; CHERTOK, V.D., inzh.

Enthalpy-concentration diagram for the Freon 12 - Freon 22 mixture. Trudy OTIPiKhP 12:37-47 '62. (MIRA 17:1)

1. Kafedra kholodil'nykh mashin Odesskogo tekhnologicheskogo instituta pishchevoy i kholodil'noy promyshlennosti.

CHAYKOVSKIY, V.F., kand.tekhn.nauk, dotsent; KUZNETSOV, A.P., inzh.

Low-temperature generators of cold. Trudy OTIPiKhP 12:22-32 '62.
(MIRA 17:1)

1. Kafedra kholodil'nykh mashin Odesskogo tekhnologicheskogo instituta pishchevoy i kholodil'noy promyshlennosti.

CHAYKOVSKIY, V. F. and KUZNETSOV, A. R.

Utilization of Refrigerant Mixtures in Refrigerating Compression Machines.

report presented at the 11th Intl. Congress of Refrigeration, Munich, Germany, 27 Aug - 4 Sept 1963.

CHAYKOVSKIY, V.F., kand.tekhn.nauk; KUZNETSOV, A.P., inzh.

Utilization of refrigerant mixtures in compression refrigerating systems. Khol.tekh. 40 no.1:9-11 Ja-F '63. (MIRA 16:3)

1. Odesskiy tekhnologicheskiy institut pishchevoy i kholodil'noy promyshlennosti.

(Refrigerants)

SAVKOV, K.I., inzh.; CHAYKOVSKIY, V.F., kand. tekhn. nauk

Determining the angular velocity of the shaft of refrigerator compressors. Khol. tekh. i tekh. no.1:43-47 '65. (MIRA 18:9)

ACC NR: AP6009832 (A) SOURCE CODE: UR/0413/66/000/004/0024/0024

AUTHOR: Chaykovskiy, V. F.; Kuznetsov, A. P.; Dankovskiy, V. B.

ORG: none

TITLE: A refrigeration unit which uses a two-component coolant. Class 17, No 178831

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 4, 1966, 24

TOPIC TAGS: refrigeration equipment, coolant, vapor condensation, gas compression, refrigerant gas

ABSTRACT: This Author's Certificate introduces a refrigeration unit which uses a two-component coolant. The device contains a compressor for the two-component vapor, a water- or air-cooled condenser where the high-boiling component is liquified, a vaporizing condenser for liquefaction of the low-boiling element by vaporization of the high-boiling component, a vaporizer for cold production and regenerated heat exchangers in which both components are recooled. The overall dimensions are reduced and the power indices are improved by using a booster at the input of the compressor for compressing the vapor of the low-boiling component.

UDC: 621.574.9-146.2

Card 1/2

Card 2/2

CHAYKOVSKIY, V.G.

Eliminate shortcomings in the system of loading arches. Transp. stroi. 14 no.4:59-60 Ap '64. (MIRA 17:9)

Chaykovskiy, V.G.

120-6-11/36

AUTHORS: Eyg, L.S., and Chaykovskiy, V.G.

TITLE: On the Working Life of Argon-$CH_2(OCH_3)_2$ Filled Counters of Radioactive Radiation (O sroke sluzh'y schetchikov radioaktivnogo izlucheniya s argon-metilalevym napolneniyem)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.6, pp. 49 - 54 (USSR).

ABSTRACT: The working characteristics of self-quenching counters deteriorate with age. A number of workers (Refs. 1 and 2) have noted that these changes are: increase in the threshold voltage, increase in the plateau slope, etc. Such changes are usually observed after 10^7 to 10^8 pulses and determine the working life of a counter. High-voltage self-quenching GM-counters are usually filled with an inert gas such as argon plus a small proportion of some organic vapour such as ethyl alcohol, isopentane and others. At the moment of recording of an ionising particle, dissociation of the organic molecules takes place. As a result of the irreversible breakdown (in the discharge) of the organic molecules the working characteristics of the counter change. According to the existing ideas in each discharge 10^9 to 10^{10} organic molecules are broken down. In

Card 1/4

On the Working Life of Argon-$CH_2(OCH_3)_2$ Filled Counters of Radioactive Radiation.

counters of normal dimensions there are 10^{20} molecules of the quenching material and therefore all these molecules ought to dissociate after 10^{10} counts. However, normal working of the counter is disturbed much earlier. In the present paper the authors give results of a mass-spectrometric analysis of the gas mixture during the working of the counter. The counters which were used for this experiment were of the usual co-axial form. The tungsten anode was 0.1 mm in diameter and had a working length of 80 mm. The cathode was in the form of a layer of copper deposited on the inner wall of the glass envelope. This system is shown in Fig.1. Counters were filled with 15% (by pressure) chemically pure $CH_2(OCH_3)_2$ and the pressure was brought up to 100 mm Hg by the addition of argon. Two groups of counters were used. The first group consisted of 60 counters and was used to study changes in the chemical composition of the filling and the characteristics of the counter as functions of the number of counts. The second group, consisting of 70 counters, was used for both the above purposes

On the Working Life of Argon-$CH_2(OCH_3)_2$ Filled Counters of Radioactive Radiation.

and the study of changes in the amplitude and the count rate as functions of the number of recorded counts. Results of these measurements are summarised in Figs. 2, 3, 4, 5 and 6. Fig.2 shows the change in the characteristics of counters as a function of the number of recorded counts. It can be seen that the threshold voltage increases by 50 to 60 volts, the length of plateau decreases by about 260 V and the plateau slope increases from 2 - 3 to 18 - 20% after 2×10^8 counts. Mass spectrometric analysis has led to the conclusion that the amount of dissociating organic molecules is proportional to the number of recorded counts. In the gas mixture of the counter, substances with mass numbers 16 and 28 appear, and these worsen the counter characteristics. There are reasons to suppose that the mass number 16 corresponds to oxygen which has a strong influence on counter characteristics. The ageing of the counter is connected not only with the dissociation of the organic component but also with changes in the surface of the cathode. The present experiments have shown that, with the right exploitation of argon-$CH_2(OCH_3)_2$ filled counters, they can be used for recording up to (1 to 2) $\times 10^8$ counts.

120-6-11/36

On the Working Life of Argon-$CH_2(OCH_3)_2$ Filled Counters of Radioactive Radiation.

S.A. Vekshinskiy and M.I. Men'shikov collaborated in this work.

There are 6 figures, 2 tables and 6 references, 2 of which are Slavic.

SUBMITTED: May 3, 1957.

AVAILABLE: Library of Congress

Card 4/4

SOV/120-59-1-15/50

AUTHOR: Chaykovskiy, V. G.

TITLE: Thermal Stability of Halogen Counters (Termostoykost' galogennykh schetchikov)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 65-66 (USSR)

ABSTRACT: Three groups of counters were investigated:
Group I. In this group the counters had nickel cathodes, 10 mm in diameter, kovar anodes 0.5 mm in diameter, the working length of the anode being 50 mm. They were outgassed and subsequently heated to 250° in chlorine. In order to remove volatile products, additional heating at 140-150°C was carried out before the final filling at a pressure not exceeding 10^{-4} mm Hg. The counters were filled with a mixture of Ne, Ar (0.1%) and Br_2 (0.03%) at a total pressure of 600-650 mm Hg.
Group II. Counters of identical construction. The additional heating to 150°C not carried out.
Group III. Counters of Type STS-1 with the geometrical dimensions as the above but having stainless steel cathodes.
Figs 1-3 show the results obtained. Fig 1 shows the dependence of the threshold voltage on temperature for the CTC-1

Card 1/3

Thermal Stability of Halogen Counters

counter (2) and the Group I counter (1). Fig 2 shows the dependence of counter characteristics on temperature of the surrounding medium. Curve 1 shows the dependence of the beginning of the plateau on temperature for a STS-1 counter and a Group I counter, and Curve 2 shows the dependence of the end of the plateau on temperature for a similar pair of counters. Curve 3 shows the dependence of the efficiency of Group I counters on the temperature of the surrounding medium. It is concluded that changes in the characteristics of halogen counters as the temperature increases are due to the evaporation into the working volume of the products of interaction of the halogen with the material of which the counter is made and desorption of excess chlorine. Preliminary removal of these products by heating, extends the thermal

Thermal Stability of Halogen Counters

stability of the counters up to 170-200°C. There are 3 figures and 2 Soviet references.

SUBMITTED: November 21, 1957.

Card 3/3

05435
SOV/120-59-3-6/46

AUTHORS: Dmitriyev, A. B., Tolchenov, Yu. M., Filatov, A. I., and Chaykovskiy, V. G

TITLE: Corona Counters of Strongly ionising particles (Koronnyye schetchiki sil'noioniziruyushchikh chastits)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 3, pp 35-40 (USSR)

ABSTRACT: A description is given of a number of corona counters designed on the basis of the work reported in Refs 3 and 4. The SAT-7 α - particle counter is shown in Fig 3. It consists of a glass envelope with a ferrochrome ring. A 10÷11 μ thick mica plate is attached to this ring and forms the end-window of the counter. The ring serves as the output contact for the metallic cathode which is evaporated onto the glass and the mica. The anode is in the form of a hemisphere 1 mm in diameter (in Fig 3, 1 is the glass envelope, 3 is the anode, 4 is the cathode, 5 is the ferrochrome ring, and 6 is the mica window). The SAT-8 counter is designed to measure the intensity of beams of strongly ionising particles. Its

Card 1/4

Corona Counters of Strongly Ionising Particles

cathode is in the form of a metallic cap made from ferrochrome which carries a mica window 3 ÷ 4 μ thick and 4 mm in diameter. The anode is similar to that in the SAT-7. The slow neutron counter SNM-9 has the usual cylindrical geometry. Its cathode has a diameter of 18 mm and is made of stainless steel. The element sensitive to slow neutrons is a layer of amorphous boron deposited on the inner surface of the cathode. The thickness of this layer is greater than the range of the products of the reaction B^{10} (nα) Li^{7}. All the three counters are filled with a mixture of neon with a small admixture of argon (not greater than 2%). The corona noise usually does not exceed 5 mV in SAT-7 15 mV in SNM-9 and 25 mV in SAT-8 counters and can be easily cut off with a suitable discriminator. The maximum amplitude of the working pulses is 100 ÷ 300 mV which corresponds to a gas amplification coefficient of about 1000 ÷ 3000. Fig 5 shows the dependence of the

Corona Counters of Strongly Ionising Particles

α - particle pulses and noise on the supply voltage in the case of the SAT-7 counter. Best results are obtained with a load of 5 x 10^8 ÷ 10^9 ohm. With such load resistances, the voltage ranges are 450÷1000 and 700 ÷ 2500 volts for the SAT-8 and the SNM-9 counters respectively. The plateau slope is practically zero. In the case of the SAT-7 counter a 1 Meg resistance is sufficient and the length of the plateau is 300 ÷ 450 volts. The counters have a resolving time of about 1 μ sec. The efficiencies are as follows:-
SAT-7, 25 ÷ 30% (uncollimated 5 Mev alpha particles),
SAT-8, 100% (uncollimated 2 Mev alpha particles),
SNM-9, 0.25% (thermal neutrons).
L. S. Eyg, L. K. Pyatibokov, V. I. Vinogradov, V. I. Popov, V. T. Fedoseyev, V. N. Korneyev and L. A. Fomina are thanked for their assistance.

Card 3/4

05435
SOV/120-59-3-6/45

Corona Counters of Strongly Ionising Particles

There are 7 figures and 8 references, 5 of which are Soviet (1 a translation from English), and 3 English.

SUBMITTED: April 25, 1958

Card 4/4

05438
SOV/120-59-3-9/46

AUTHORS: Dmitriyev, A. B., Peskov, D. I., Kheyfets, A.B. and Chaykovskiy, V. G.

TITLE: Dose Characteristics of Low Voltage Halogen Counters (Dozovyye kharakteristiki nizkovol'tnykh galogennykh schetchikov)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 3, pp 47-49 (USSR)

ABSTRACT: The dose characteristics of the low voltage halogen counters STS-1, STS-2, STS-5, STS-6, STS-8, SGS-5, SGS-6, SBT-10 and SGS-7 have been measured and are now reported. The parameters of the first six counters were given by Dmitriyev (Ref 2, a review paper). The SGS-6 counter is similar to the SGS-5 but its cathode has a longer working length. The SBT-10 is designed to detect soft β-radiation and has a 30 cm^2 mica window. It consists of ten sections placed in a common envelope. The cathode of each section is in the form of a half-cylinder, 5 mm in radius. The anode of each section is 55 mm long and has a separate output terminal. In the SGS-7 counter the cathode and the anode are in the form of discs 10 mm and 0.5 mm in diameter, respectively. The gap between the discs is 1 mm. The electrical

Card 1/4

Dose Characteristics of Low Voltage Halogen Counters

parameters (threshold, length and slope of the plateau) of SBT-10, SGS-6 and SGS-7 are analogous to the parameters of all the low voltage halogen counters described in Ref 2. Table 1 gives the main parameters of the counters. The first column gives the type of the counter, the second column the cathode diameter in mm and the third column the working length of the anode in mm. The counting rate was measured using the PS-10000 meter, the input sensitivity being 0.1 V and the resolving time 1 μsec. The irradiation was carried out using Co^{60} sources whose activity was 0.01-5 Ra g equiv. The dose was determined to within ± 10%. In the experiments the SBT-10 counter was connected as shown in Fig 1, while all the remaining counters were connected as shown in Fig 2. The dose characteristics and the plateau slope were determined using R = 10^6 Ohm. Figs 3 and 4 show the dose characteristics of the above counters measured at the working voltage. It is clear that in the majority of the counters there is a maximum counting rate on the dose characteristic. This is explained by the considerable reduction in the

Dose Characteristics of Low Voltage Halogen Counters

pulse height at large counting rate. Under these conditions the potential difference across the counter is not fully established. Since halogen counters give pulses with unequal amplitudes (Ref 3) it follows that some of the pulses may fall below the threshold of the detecting device. Table 2 gives the dose characteristics of the counters, where column 1 gives the type of the counter, column 2 the dose range in μr/sec, column 3 gives the counting rate at the appropriate dose in pulses/sec and column 4 the maximum counting rate in pulses/sec. Table 3 gives the dependence of the plateau slope on the dose, in which the first column gives the dose in μr/sec and the second and third columns give the plateau slope in percent/Volt for the STS-5 and SGS-5 counters, respectively (the headings of columns 4, 5 and 6 are the same as those of 1, 2 and 3). Table 4 gives the resolving time of the counters. Column 1 of this table gives the type of the counter, columns 2 and 3 the resolving time in μsec at 100 pulses/sec and at maximum counting rate, respectively (columns 4, 5 and 6 have the same headings as 1, 2 and 3). The load resistance has a

Card 3/4

Dose Characteristics of Low Voltage Halogen Counters

great effect on the dose characteristics (Figs 5 and 6, in which the curves are plotted in ascending values of the load resistance). In the detection of large doses, the anode voltage must be well stabilized because in this case the plateau slope is considerably increased. It is noted that the plateau slope and the character of its change with increasing counting rate differs from counter to counter since it largely depends on the technology of manufacture and the conditions under which the counter is used. However, it follows from Table 3 that the plateau slope increases with increasing dose (i.e. increasing counting rate).
There are 6 figures, 4 tables and 4 Soviet references, one of which is a translation from English.

SUBMITTED: April 4, 1958

Card 4/4

20680

S/120/61/000/001/014/062
E032/E114

26.2246

AUTHORS: Tolchenov, Yu.M., and Chaykovskiy, V.G.

TITLE: A Gas Discharge Gamma-Ray Detector With a Logarithmic Sensitivity

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No.1, pp.51-52

TEXT: The detector (counter) is in the form of a two-electrode gas discharge system with a strongly nonuniform electric field. The counter can be filled with any of the non-self-quenching gases normally used in Geiger counters. Fig.1 shows the arrangement for the recording of γ-rays by the corona counter. A voltmeter which measures the potential difference between the electrodes is connected in parallel with the counter. In the simplest case, an electrostatic voltmeter can be employed. If the applied voltage exceeds the voltage necessary to initiate the corona discharge, and the load resistance R is greater than or equal to 10^9 ohm, then in the absence of ionizing radiation the voltmeter will indicate a constant voltage V_s. The introduction of a γ-radiation leads to an increase in the current through the counter, and consequently the voltage indicated by the voltmeter

Card 1/ 6

S/120/61/000/001/014/062
E032/E114

A Gas Discharge Gamma-Ray Detector With a Logarithmic Sensitivity

changes by, say, ΔV. ΔV depends logarithmically on the intensity of the γ-radiation, and its magnitude reaches 100 volts or more when the intensity changes by an order of magnitude. Qualitatively, the operation of the counter can be described as follows. When the applied voltage is less than V_s, the counter operates as a proportional counter. Under these conditions the volt-ampere characteristics are as shown schematically in Fig.3. In the absence of γ-radiation the volt-ampere characteristic has the form of a rapidly rising curve which for $V > V_s$ goes over into the usual characteristic of a corona discharge, which is not very dependent on the γ-ray intensity. The dotted lines in Fig.3 show the dynamic characteristics of the counter for various applied voltages and loads ($R_1 > R_2$). The introduction of γ-radiation leads to the displacemet of the working point from A to B (or from A' to B', etc.) and the current passing through the circuit changes from i_i to some value i which is determined by the γ-ray intensity. At the same time, the anode potential decreases by $\Delta V = V - V_s$. The new position of the working

20680
S/120/61/000/001/014/062
E032/E114

A Gas Discharge Gamma-Ray Detector With a Logarithmic Sensitivity

point (B') corresponds to the proportional region. Two factors influence the change in the current, namely, an increase in the γ-ray intensity gives rise to an increase in the current, but on the other hand this increase in the current in the proportional region reduces the gas amplification coefficient (Tolchenov, Ref.2). As a result, the dependence of ΔV on the γ-ray intensity is logarithmic. As can be seen from Fig.3, the higher the supply voltage the lower the load resistance R and the higher the upper working limit of the instrument. Fig.2 shows the change in the anode voltage ΔV as a function of the γ-ray intensity (r/hr) for different values of R (ohms) as shown. These results were obtained with a cylindrical counter, 26 mm in diameter and 130 mm long, filled with a mixture consisting of Ne + 2% Ar at 500 mm Hg. The value of V_s was 700 volts and the applied voltage was 750 volts. The lower working limit under these conditions was about 0.1 r/hr. Fig.4 shows the change in the anode voltages ΔV as a function of the γ-ray intensity (r/hr) for a counter 26 mm in diameter and filled with helium,

20680

S/120/61/000/001/014/062
E032/E114

A Gas Discharge Gamma-Ray Detector With a Logarithmic Sensitivity

argon and krypton respectively (pressure = 300 mm Hg). With a suitable design, a range of 0.01 to 10^6 r/hr may be covered.
Acknowledgements are expressed to Yu.N. Sachkov for discussing the method of measurement, and to V.N. Korneyeva for assistance in the experiments. V.G. Khrushchev, K.A. Trukhanov and A.D. Turkin are thanked for laboratory facilities provided.
There are 4 figures and 2 Soviet references.

SUBMITTED: February 1, 1960

Card 4/6

20680

S/120/61/000/001/014/062
E032/E114

A Gas Discharge Gamma-Ray Detector With a Logarithmic Sensitivity

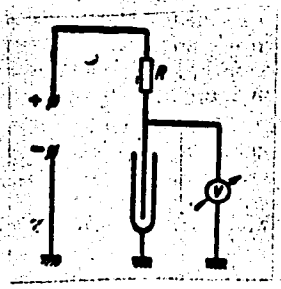

Fig. 1

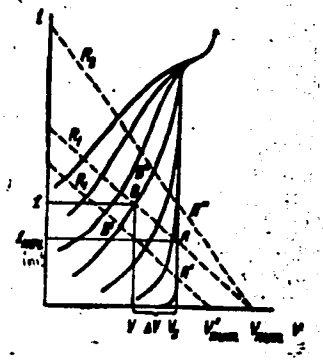

Fig. 3

Card 5/6

S/120/61/000/001/014/062
E032/E114

A Gas Discharge Gamma-Ray Detector With a Logarithmic Sensitivity

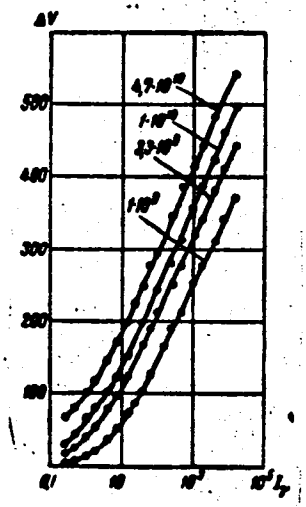

Fig. 2

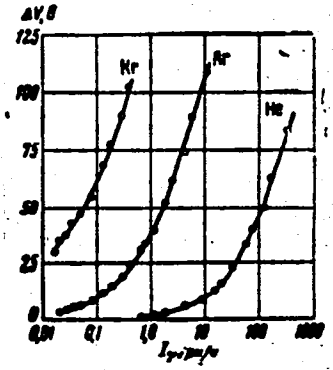

Fig. 4

Card 6/6

ACCESSION NR: AP4006812 S/0120/63/000/006/0005/0012

AUTHOR: Tolchenov, Yu. M.; Chaykovskiy, V. G.

TITLE: Corona counters for slow neutrons

SOURCE: Pribory* i tekhnika eksperimenta, no. 6, 1963, 5-12

TOPIC TAGS: corona counter, neutron detector, slow neutron, radiation measurement, neutron counter, neutron detection, slow neutron counter

ABSTRACT: A short description of Soviet-make corona counters is offered. Their advantages over proportional counters are seen as: (1) High gas-amplification factor not much affected by variations in the supply voltage; (2) Stable operation in the presence of a strong gamma-radiation background; (3) High thermal stability. Table 1 in Enclosure 1 gives the fundamental characteristics of the counters; Table 2 presents schematic data for the circuit diagram shown in Enclosure 2. The high gas-amplification factor of the corona

Card 1/2

ACCESSION NR: AP4006812

counters permits using low-sensitivity (30-50 mv) recording devices. It is claimed that corona counters can replace proportional counters in most applications. Orig. art. has: 12 figures, 3 formulas, and 2 tables.

ASSOCIATION: none

SUBMITTED: 29Jan63 DATE ACQ: 24Jan64 ENCL: 02

SUB CODE: NS NO REF SOV: 004 OTHER: 002

Card 2/2

L 4968-66 EWT(m)/T LJP(c)
ACC NR: AP5027009 SOURCE CODE: UR/0120/65/000/005/0071/0073

AUTHOR: Klyukvina, Ye. F.; Chaykovskiy, V. G.; Nikol'skiy, A. P.; Yevlanov, I. Ya. 21 B

ORG: none

TITLE: Construction and technical characteristics of a proportional counter 19

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1965, 71-73

TOPIC TAGS: gas discharge counter, proportional counter

ABSTRACT: A proportional counter designed for detection of 1—10-kev x-radiation is described. To meet the requirement of a large-area input aperture of minimum thickness, the design contains a cathode equipped with two 10-μ Al film apertures 25 x 16 mm each. To reduce attenuation of fluorescent radiation by the surrounding air, the counter itself is placed in a vacuum while the remainder of the unit is subjected to normal atmospheric pressure. Provisions are made for connecting the output of the counter to a scintillation counter. The active elements of the counter are a stainless steel cylindrical cathode 25 mm in diameter, a tungsten wire anode 0.05 mm in diameter, and a gas mixture of 90% Ar and 10% CH_4 which is passed through the counter interior at a rate of 5—20 cm^3/min. Fig. 1 shows the output pulse height as a function of the applied potential. The linear region corresponds to a gas avalanche factor range of (1.3—1.6) x 10^4. The efficiency of the counter as a function of wavelength is shown in Fig. 2. The effectiveness of the counter in detecting hard radia-

Card 1/2 UDC: 539.1.074.822.3:621.386

L 4968-66
ACC NR: AP5027009

tion is limited by the inadequate attenuating properties of the argon gas; for soft

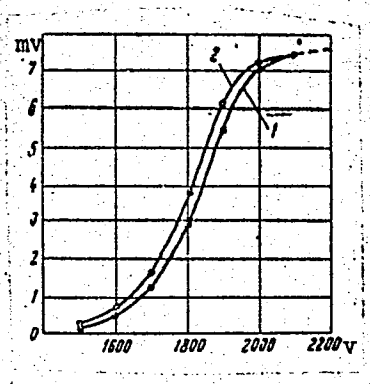

Fig. 1. Pulse height as a function of applied potential

1 - FeK_α; 2 - ZnK_α.

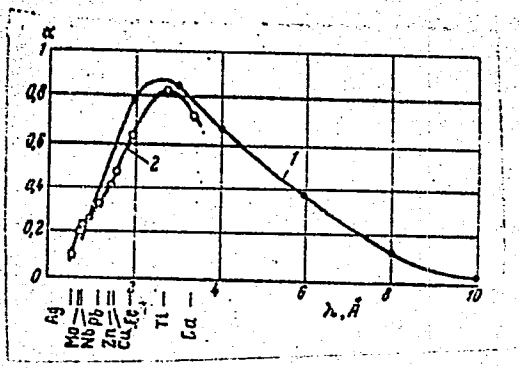

Fig. 2. Counter efficiency as a function of wavelength

1 - Calculated; 2 - experimental.

radiation, it is limited by the thickness of the cathode aperture. Most effective radiation range is 3—4 kev. Orig. art. has: 2 figures and 4 formulas. [BD]

SUB CODE: NP/ SUBM DATE: 20Jul64/ ORIG REF: 001/ ATD PRESS: 4137

Card 2/2 mer

CHAYKOVSKIY, V.G.

Repair of bridge spans. Put' i put.khoz. 7 no.1:23 '63. (MIRA 16:3)

1. Nachal'nik proizvodstvenno-tekhnicheskogo otdela mostopoyezda, stantsiya Brest, Belorusskoy dorogi.
(Railroad bridges--Maintenance and repair)

CHAYKOVSKIY, V. I.

CHAYKOVSKIY, V. I.: "An analysis of the interference-resistance of the autocorrelation method of receiving impulse signals". Kiev, 1955. Min Higher Education Ukrainian SSR. Kiev Order of Lenin Polytechnic Inst, Chair of Radio Receiving Equipment. (Dissertation for the Degree of Candidate of TECHNICAL Sciences)

SO: Knizhnaya Letopis' No. 51, 10 December 1955

CHAYKOVSKIY, V. I.

USSR/Electronics - Information Theory FD-2494

Card 1/1 Pub. 90-2/9

Author : Chaykovskiy, V. I., Active Member, VNORiE

Title : Reception of pulse signals by the mutual correlation method

Periodical : Radiotekhnika, 10, 16-20, Jun 55

Abstract : Determination of the ratio of signal to fluctuating noise during the reception of pulse signal, applying the mutual correlation method is discussed. The aim of this research was to analyze the noise rejection of pulse signal reception with the aid of the mutual correlation method. The values for the signal-to-noise ratio thus obtained are compared to the corresponding values of the output of an ideal band-pass filter. An expression is derived which shows that the signal-to-noise ratio at the output of a correlation receiver under certain conditions is more favorable than that of an ideal filter. Graphs. Five references: 2 USSR

Institution : All-Union Scientific and Technical Society of Radio Engineering and Electric Communications imeni A. S. Popov (VNORiE)

Submitted : November 16, 1954

CHAYKOVSKIY, V. I.

Category : USSR/Radiophysics - Statistical phenomena in radiophysics I-3

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1808

Author : Chaykovskiy, V.I.
Title : Noise Rejection of a Filter Auto-Correlation Receiver for Pulse Signals

Orig Pub : Radiotekhnika, 1956, 11, No 4, 20-30

Abstract : The signal-to-noise ratio is determined at the output of a simple correlation receiver, which has an averaging element consisting of a low-pass filter. By signal-to-noise ratio is meant the ratio A of the square of the maximum increment in the dc component at the output of the receiver in the presence of a useful signal to the average square of the fluctuations at the output in the absence of a useful signal. Assuming that the fluctuation noise has a uniform spectral density, and assuming the input (band) filter of the receiver and the averaging element to be ideal filters, the author derives an expression for the dispersion of the fluctuations and for the maximum value of the increment of the dc component at the output of the system under investigation. These values make it possible to determine A. It turns out that the optimum value of the time delay τ at which $A = A_{max}$, depends on the bandwidth of the input filter. If the input filter has an optimum bandwidth, the above system has no advantages over a receiving set with a square-law detector. Increasing the bandwidth of the input filter

Card : 1/2

Category : USSR/Radiophysics - Statistical phenomena in radiophysics I-3

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1808

($\Delta\omega a \geq 43$, where a is the duration of the useful-signal pulse), one can obtain a certain improvement in the noise rejection (up to a factor of 2) over a receiver with a square-law detector.

Card : 2/2

Chaykovskiy, V.I.

PA - 2293

AUTHOR: KARNOVSKIY, M.I., CHAYKOVSKIY, V.I., Regular Members of the Society for Radiotechnology.

TITLE: The Method of Increasing the Immunity from Disturbance of the Autocorrelation Reception of Impulse Signals. (Metod povysheniya pomekhoustoychivosti avtokorrelyatsionnogo priyema impul'snykh signalov, Russian).

PERIODICAL: Radiotekhnika, 1957, Vol 12, Nr 2, pp 22-27 (U.S.S.R.)

Received: 4 / 1957 Reviewed: 4 / 1957

ABSTRACT: It is shown that, with the aid of a somewhat complicated construction of the correlation reception system, it is possible to eliminate the usual faults and to increase the immunity from disturbance of the system. (Usual faults: if time of delay is greater than the optimum time, the immunity from disturbance of autocorrelation reception decreases to zero if the time of delay becomes equal to the duration of the useful signal). This is attained by switching on a synchronous key-device into one of the channels of the system. The range of application is, however, limited by the class of the synchronous pulse systems. At first it is shown merely by approximation that the dispersion of the noise integral is diminished in the case of regenerative reception, and that therefore the immunity from disturbance increases in the case of the method suggested. This is proved with accuracy in the course of the second part of the paper. From the attached diagram it may be seen that a regenerative autocorrela-

Card 1/2

The Method of Increasing the Immunity from Disturbance of the Autocorrelation Reception of Impulse Signals.

tion system warrants an additional improvement of immunity from disturbance amounting to = 30% in the case of the optimum value of the transparency band of the input filter and a proper selection of the time of delay, whereas the latter is somewhat less than the immunity from disturbance of an integral system in the case of the ordinary autocorrelation system. From the diagram it may further be seen that in the case of a broadening of the transparency band the aforementioned improvement increases still further and becomes equal to two in the case of a band of infinite breadth. (5 illustrations).

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED: 1. 10. 1956
AVAILABLE: Library of Congress

SOV/142-58-5-5/23

9(9)

AUTHOR: Chaykovskiy, V.I.

TITLE: Noise-killing Feature of an Integral Self-Correlated Reception System

PERIODICAL: Izvestiy vyssikh uchebnykh zavedeniy, radiotekhnika, 1958, Nr 5, pp 551-554 (USSR)

ABSTRACT: The article presents one of the possible variants of a correlated reception system , an integral self-correlation system with detecting of the impulse signal and black-out of the fluctuating disturbance. Following the principal scheme of the elementary self-correlating reception system (Fig.1), the last apparatus has to register the short-time self-correlation factor miscellany of the signal and the disturbance y (t). The presence of a synchronization channel allows the realization of the coincidence of the neutralization interval T with the interval of active transmission. The advantage of the signal disturbance relation at the output of this receiving system in comparison with the corresponding relation, at the output of a normal integral receiving system has its place only at the transparency band of the input filter,

Card 1/2

Noise-killing Feature of an Integral Self-Correlated Reception System

pushed to an optimum by Siforov (ΔW d >8.6). The maximum advantage appears as a consequence of weakening the disturbances at the installation output, combined with a barely existing reduction of the useful signal. The disadvantage of the system is, that in case of absent synchronism between the intervals of useful transmission and the intervals of neutralization, not all the advantages of the method appear. The article is recommended by the Kafedra radiopriemnykh ustroystv Kiyevskogo ordena Lenina politekhnicheskogo instituta (Chair of Radio Receiving Devices at the Kiyev Polytechnical Institute of the Order of Lenin). There are 1 block diagram, 1 graph, 15 equations and 6 references, 4 of which are Soviet and 2 English.

SUBMITTED: February 21, 1958

Card 2/2

9(2) SOV/142-58-6-4/20

AUTHOR: Chaykovskiy, V.I.

TITLE: Determination of the Minimum Detectable Ratio of Signal to Noise at the Input of a Radiometer (Opredeleniye minimal'no razlichimogo otnosheniya signala k pomekhe na vkhode radiometra)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Radiotekhnika, 1958, Nr 6, pp 659-664 (USSR)

ABSTRACT: The purpose of the article is to determine the correlation between the intensity of a treshold signal of random nature, acting on the input of a radiometer with a square-law detector, and the probability of detecting this signal at the output of a registering instrument during a given time of analysis, and with a known intensity of noise in the radiometer channel. The probability of correctly determining the fact of the absence or presence of the desired signal is a function of signal intensity, noise intensity, and the time of analysis. Determination of this functional relationship is one

Card 1/4

Determination of the Minimum Detectable Ratio of Signal to Noise at the Input of a Radiometer

purpose of the article. A block diagram of the radiometer circuit (Figure 1), consisting of input filter, detector, averaging device, and registering instrument, is very briefly discussed by the author. Readings of the registering instrument are proportional to the output voltage of the averager, and as both signal and noise are of a random nature, these readings will also have a random nature over a finite time of analysis. Readings will fluctuate about a certain average value, equivalent to the value of the average power of the mixture of desired signal and noise. Presence or absence of the desired signal can be determined from the magnitude of a particular value of reading; a reading higher than a certain control value corresponds to the presence of the signal, and vice versa. Taking the probabilities of correctly determining the presence or absence of

Determination of the Minimum Detectable Ratio of Signal to Noise at the Input of a Radiometer

the desired signal as equal, the author derives expressions for the minimum detectable ratio of signal to noise for a radiometer with the averaging device, and a radiometer with a low-pass filter in its place (eq. 10,11). It is concluded that as small a signal as desired may be detected providing sufficient averaging time or a sufficiently narrow pass-band in the averaging filter; at a given signal/noise ratio, an increase in the probability of detecting the desired signal demands a corresponding increase in the duration of the analysis; improvement of the signal/noise ratio at the output of the radiometer in comparison with the corresponding ratio at the input is greater; the greater the relative analysis time, or in the case of the radiometer with a low-pass filter, the less is the ratio of the band of the averaging filter to that of the input filter; with appropri-

Determination of the Minimum Detectable Ratio of Signal to Noise at the Input of a Radiometer

ate choice of averaging interval (time) and pass band of the averaging filter the maximum sensitivities of a radiometer ideal integrating device and a radiometer with low-pass filter do not practically speaking differ from each other. This article was recommended by the Kafedra radiopriyëmnykh ustroystv Kiyevskogo ordena Lenina politekhnicheskogo instituta (Chair of Radio Receiving Equipment of the Kiyev Order of Lenin Polytechnical Institute). There is 1 block diagram, and 4 references, 2 of which are Soviet and 2 English.

SUBMITTED: February 21, 1958

24374
S/142/60/003/005/001/015
E192/E382

6,9200

AUTHOR: Chaykovskiy, V.I.

TITLE: Methods of Experimental Determination of Correlation Functions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1960, Vol. 3, No. 5, pp. 425 - 434

TEXT: The mixed moment of the second-order $M(\tau)$, which represents the average value of the product of two random functions $f_1(t)$ and $f_2(t)$, shifted in time by an amount τ, is of importance in the statistical theory of communications. For the stationary processes this moment can be obtained as a result of the time-averaging of the product of these two functions, shifted in time by τ, in the following form

$$F_{12}(\tau) = \lim_{T\to\infty} \frac{1}{2T} \int_{-T}^{+T} f_1(t) f_2(t+\tau)\, dt \quad . \qquad (1)$$

Card 1/10

The ergodic theorem shows that $M(\tau)$ and $F(\tau)$ are equivalent. In the case when $f_1(t) = f_2(t)$, Eq. (1) represents the so-called autocorrelation function $F_{11}(\tau)$.

It is known from the Wiener-Khinchin (Ref. 3 - A.M. Yaglom, UMN, 1952, 7, No. 5(51), 3; Ref. 4 - U.R. Bennet, Basic Concepts and Methods of Theory of Noise in Radio-engineering, Sov.Radio, 1957) that the autocorrelation function of a random process can also be represented as

$$F_{11}(\tau) = \int_{-\infty}^{+\infty} P(\omega) \cos \omega\tau \, d\omega \qquad (2)$$

where $P(\omega)$ is the energy spectrum of the function. The equipment employed in the evaluation of correlation functions can be divided into three groups, depending on the underlying principle of their operation:

a) the devices based on the principle of the two-dimensional

Card 2/10

probability density;
b) the devices employing the principle of the spectral function, and
c) instruments based on the multiplication principle.
As regards the devices of the first group, their basic element is a system for determining the two-dimensional probability density $W_2(f_1 f_2 \tau)$ in each point of the three-dimensional space f_1, f_2, τ. This usually consists of a device determining the conditional probability density of the signal f_1 (or f_2) for a fixed τ and an instrument determining the unidimensional probability density of the signal f_1 (or f_2). In this type of equipment the signal f_1 and signal f_2, delayed by an amount τ, are applied to the device which determines the conditional probability density $W(f_1/f_2)$ which, together with a multiplier M_1, integrator I_1,

S/142/60/003/005/001/015
E192/E382

a generator of linearly changing voltage LG_1 forms a system evaluating the conditional average value of f_1 in the interval of f_1, which comprises the region of the most probable values of the process and its vicinity. A second channel of this type of correlator consists of a device determining the probability density of the quantity $f_2W(f_2)$, a multiplier M_2 and another generator of linearly changing voltage LG_2. The signal at the output of the second channel is proportional to the quantity $f_2W(f_2)$. The voltage of LG_2 changes within the same limits as the voltage of LG_1 but the rate of its change is much slower, so that the voltage of LG_2 can be regarded as constant during one period of LG_1. The generators LG_1, LG_2 and integrators I_1 and I_2

Methods of ....

are synchronised by a signal provided from a synchronising circuit. The output signals of the two channels are multiplied by a multiplier M_3 and are integrated with respect to f_2 in order to determine the average value of $f_1(t)f_2(t + \tau)$, which is equal to the correlation function for a fixed τ:

$$M(\tau) = \int_{-\infty}^{+\infty} f_2 W(f_2) df_2 \int_{-\infty}^{+\infty} f_1 W(f_1/f_2) df_1 \quad .$$

If the delay time τ is varied, the signal at the output of the device represents, therefore, the cross correlation function for f_1 and f_2. The principle of a correlator can be based on Eq. (2). In this case, the equipment consists of an automatic spectrum analyser which produces the amplitude spectrum of the input signal; this is followed by a squaring

Card 5/10

circuit where the power spectrum is obtained; the amplitude spectrum of the latter is then produced by another automatic spectrum analyser which is equivalent to the autocorrelation function of the investigated process. The correlators based on the multiplication principle can be of two types: those operating sequentially and those performing instantaneous analysis. In the second case, it is necessary to employ a set of fixed delay elements for $N\Delta\tau$ with a monotonically increasing delay. As regards the correlators of the first type, these simply consist of a delay circuit, a multiplier and an integrator (with an indication circuit). This correlator is much simpler than that based on the instantaneous - analysis principle. However, the sequential-analysis correlator has the disadvantage that the time taken by it for determining the value of the correlation function is n times longer than that of the more complex correlator. Multiplier correlators can also be designed differently. Thus, for example, the correlator can be constructed as follows. The investigated signal f_1 and a portion of the signal f_2

Methods of ....

(with suitable polarity) are applied to a subtraction circuit $\triangle$; the amplitude and polarity control of f_2 is performed by means of a calibrated symmetrical potentiometer and a phase-inverter circuit. The difference produced at the output of $\triangle$ is:

$$A(t) = f_1(t) - \alpha f_2(t)$$

and this is applied to a squaring circuit, an integrator and, finally, the indicating device. It can be shown that the minimum of the mean square value of $A^2(t)$ corresponds to the case when the multiplier α is equal to the correlation coefficient R_{12}. Consequently, the measurement of the correlation coefficient is equivalent to the setting of the above instrument in such a way that its indicator gives a minimum; the coefficient α is then read on the calibrated scale of the potentiometer. The above multiplier correlators are not suitable for the measurements of the autocorrelation functions of slowly changing processes.

Card 7/10

S/142/60/003/005/001/015
E192/E582

Methods of ....

In this case, it is possible to base the correlator on the following formula:

$$F_{11}(\tau) = \sum_{n=0}^{N} a_n h_n(t) \quad .$$

The resulting correlator consists of N channels; the investigated signal f_1 is applied to the input of these channels and their outputs produce expansion coefficients a_o, a_1, ..., a_n. Each channel consists, therefore, of a filter having a suitable impulse response $h_n(t)$, a multiplier M_n and an integrator I_n. The correlator also comprises another set of filters having impulse response h_o, h_1, h_2 whose input is excited by a short pulse $\delta(t)$.

Card 8/10

Consequently, periodic signals corresponding to h_o, h_1, h_2, ... are formed at the output of each filter. Another set of multipliers M'_n perform the multiplication of the expansion coefficients a_n and impulse responses h_n. The products of the multipliers are then added in a summation circuit. The resulting signal is equivalent to the auto-correlation function of f_1. The determination of a correlation function can also be performed by digital devices. In this case, each point of the correlation function is evaluated by averaging a sufficiently large number of the pairs of products of the values of the investigated process f(t); the correlation function is given by

$$F(\tau) = \frac{1}{N} \sum_{n=1}^{N} a_n b_n(\tau)$$

Card 9/10

S/142/60/003/005/001/015
E192/E382

Methods of ....

where a_n and b_n are discrete values of $f(t)$, shifted in time by τ with respect to each other. Instruments of this type can have a very high accuracy (error of less than 1%). There are 9 figures and 19 references: 9 Soviet and 10 non-Soviet. The four latest English-language references are : Ref. 6 - T.M. Burford and V.C. Rideont, J. Brit. Instn. Radio Engrs., May, 1955, 15, No. 5; Ref. 7 - T.M. Burford, J. Appl. Phys. Jan., 1955, 26, No. 1; Ref. 13 - T.P. Goodman, J. Appl. Phys. July, 1956, 27, No. 7; Ref. 14 - D.G. Lampard, PIRE, PC, 1955, 102, No. 1.

ASSOCIATION: Kafedra radiopriyemnykh ustroystv Kiyevskogo ordena Lenina politekhnicheskogo instituta (Chair of Radio-receiving Devices of the "Order of Lenin" Kiyev Polytechnical Institute)

SUBMITTED: December 21, 1959

Card 10/10

CHAYKOVSKIY, V.I., red.; POLYANSKAYA, L.O., red.; STARODUB, T.A., tekhn. red.

[Determination of the parameters of random processes]Opredelenie parametrov sluchainykh protsessov; sbornik statei. Kiev, Gostekhizdat USSR, 1962. Translated from the English. (MIRA 15:9)

(Random processes)