ACCESSION NR: AP4017401 S/0185/64/009/002/0214/0215

AUTHOR: Krugly*kh, A. A.; Pavlov, V. S.; Ty*khins'ky*y, G. P.

TITLE: Vapor pressure of solid yttrium

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no. 2, 1964, 214-215

TOPIC TAGS: yttrium, yttrium vapor pressure, yttrium vapor, clausing coefficient, evaporation rate, yttrium sublimation, high temperature evaporation

ABSTRACT: Values for the vapor pressure of yttrium obtained by Nesmeyanov et. al. on two different occasions (Vestnik MGU, No. 2, 40, 1962; Izv. A. N. USSR, Metallurgiya i Toplivo, 5, 117, 1962) differed by an order of magnitude. Ackerman and Rauch obtained yet another set of values mass-spectrometrically [J. Chem. Phys. 36 (2), 448, 1962] . The authors measured the vapor pressure of yttrium over the solid phase between 1100 and 1480C by observing vaporization rates at each value of temperature in a vacuum. A cylindrical tantalum

Card 1/2

ACCESSION NR: AP4017401

crucible held the material, and temperatures were measured with an optical pyrometer. The results coincided with those of Ackerman and Rauch, and are expressed by the relation:

$$\log P_{mm} = -\frac{18500}{T} + 7.580.$$

"The authors thank M.S. Rudenko and M. M. Matyushenko for their discussion of the results." Orig. art. has one table, one graph and one formula.

ASSOCIATION: Fizy*ko-Tekhnichny*y Insty*tut AN URSR, Kharkov
(Physico-Technical Institute, AN URSR)

SUBMITTED: 25Jul63 DATE ACQ: 19Mar64 ENCL: 00

SUB CODE: CH, EL NO REF SOV: 003 OTHER: 001

Card 2/2

L 34508-65 EWP(e)/EWI(m)/EPF(c)/EPF(n)-2/EWG(m)/EPR/I/EWP(t)/EWP(b)/EWA(c)
ACCESSION NR: AP5002806 S/0078/65/010/001/0285/0287
Pr-4/Ps-4/Pu-4 IJP(c) JD/JW/JG/AT/WH

AUTHOR: Kruglykh, A. A.; Matyushenko, N. N.; Pavlov, V. S.; Tikhinskiy, G. F.

TITLE: Certain properties of gadolinium beryllide

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 1, 1965, 285-287

TOPIC TAGS: gadolinium beryllide, physical property, lattice structure, density, microhardness, dissociation, sublimation heat, vapor pressure

ABSTRACT: The following properties of $GdBe_{13}$ were determined: lattice structure--cubic, with parameter a = 10.27 ± 0.005Å; density = 3.363 gm/cm^3; microhardness = ~1400 kg/mm^2. This intermetallic compound dissociated appreciably above 1050C; the rate of Be evaporation was measured and the following equation was calculated for the vapor pressure of Be over $GdBe_{13}$ at 1055-1250C: lg p (mm Hg) = 10.0 - 19180/T. The heat of sublimation in this temperature range was 87.8 kcal/mol. Orig. art. has: 1 equation, 1 figure and 2 tables.

Card 1/2

L 34508-65
ACCESSION NR: AP5002806

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physical-technical Institute, Academy of Sciences Ukrainian SSR)

SUBMITTED: 12Feb64 ENCL: 00 SUB CODE: IC

NR REF SOV: 005 OTHER: 001

Card 2/2

L 9608-66 EWT(m)/EPF(n)-2/EWP(t)/EWP(b) IJP(c) JD/WW/JW/JG
ACCESSION NR: AP5024132 UR/0185/65/010/009/1029/1032

AUTHOR: Kruhlyakh, A.A. (Kruglykh, A.A.); Pavlov, V.S. 44,55

TITLE: Pressure of saturated vapor of liquid cerium 51 B

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 9, 1965, 1029-1032

TOPIC TAGS: vapor pressure, cerium

ABSTRACT: The pressure of cerium vapor was determined in the temperature range of 1295-1570°C. Cerium, 99.7% pure, purified by the zonal recrystallization method was used for the measurements, which were carried out by two independent methods: by effusion, and the rate of evaporation from a cylindrical crucible. The change in the weight of the container with the substance was recorded continuously. The results show good agreement and are described by the equation

$$\log P_{mm} = 8.81 - \frac{19020}{T}$$

The heat of evaporation of cerium was determined as 87.0 k cal/mol; the boiling point, as 2930°C.

Card 1/2

L 44305-66 EWT(m)/T/EWP(t)/ETI LJP(c) JD/JG

ACC NR: AP6019841 SOURCE CODE: UR/0370/66/000/001/0190/0192

AUTHOR: Amonenko, V. M. (Khar'kov); Kruglykh, A. A. (Khar'kov); Pavlov, V. S. (Khar'kov); Tikhinskiy, G. F. (Khar'kov)

ORG: none

TITLE: Evaporation rate of beryllium during dissociation of cerium beryllide

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1966, 190-192

TOPIC TAGS: beryllium, vacuum sublimation, cerium compound, vapor pressure

ABSTRACT: The article presents the results of an investigation of the evaporation rate of Be during the thermal dissociation of the intermetallic compound $CeBe_{13}$, as well as of the effect of the addition of a small amount (0.4 wt.%) of Ce on the evaporability of Be. $CeBe_{13}$ was obtained by the vacuum heating of a stoichiometric mixture of the powders of Ce and Be at 1150°C for 3 hr, while the Be-0.4% Ce alloy was obtained by direct vacuum melting of the metals. The sublimation rates of the Be-0.4% Ce alloy and of the products of dissociation of $CeBe_{13}$ were determined by the method of evaporation from a cylindrical tantalum crucible with a residual gas pressure of $\leq 2 \cdot 10^{-6}$ mm Hg in the vacuum chamber. The temperature was measured with

Card 1/3

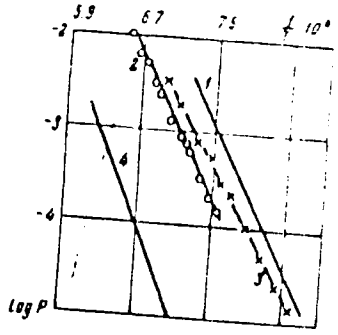
UDC: 669.725.4

the aid of an optical pyrometer correct to ± 5%. Weighing of the crucibles was carried out correct to ±0.0001 g by the continuous method on scales without violating the vacuum. The sublimation rate of Be with 0.4% Ce was measured in the temperature range 920-1160°C; for this temperature range the saturated vapor pressure of Be over the Be-0.4% Ce alloy is described by the equation: log P = 9.35-17,000/T. As for the sublimation rates of the components of the intermetallic compound $CeBe_{13}$, during its thermal dissociation in the temperature range 1050-1250°C, the roentgenograms of the condensates gathered following evaporation of the compound at 1100 and 1250°C lack the lines of Ce and $CeBe_{13}$; therefore, appreciable dissociation occurs above 1050°C and the entire sublimated matter may be referred to Be. The saturated vapor pressure of Be over the $CeBe_{13}$ compound during the latter's thermal dissociation may be described by the equation: log P = 10.475-18,990/T. The findings were utilized to plot curves of the saturated vapor pressure of the compounds and their components (Fig. 1). Orig. art. has: 1 figures, 2 tables, 2 formulas.

ACC NR: AP6019841

Fig. 1. Vapor pressure (P, mm Hg) of Be as a function of temperature for:

1 - pure Be; 2 - over the compound $CeBe_{13}$ during its thermal dissociation; 3 - over the alloy Be-0.4% Ce; 4 - pure Ce



SUB CODE: 11, 13 SUBM DATE: 25Jul64/ ORIG REF: 006/ OTH REF: 001

Card 3/3

L 27468-66 EWT(m)/EWA(d)/EWP(t) IJP(c) JD
ACC NR: AP6007844 SOURCE CODE: UR/0120/66/000/001/0211/0212

AUTHORS: Kovtun, G. P.; Kruglykh, A. A.; Pavlov, V. S. 10 B

ORG: Physicotechnical Institute AN UkrSSR, Khar'kov (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: Apparatus for zone refining of refractory metals 19 19

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1966, 211-212

TOPIC TAGS: refractory metal, electron beam melting, metal zone refining, molybdenum, metal ceramic material

ABSTRACT: The authors describe an electron-beam instrument with electrostatic beam focusing, intended for zone refining of refractory metals. The device employs three plane-parallel beams of electrons with radial cathodes and focusing electrodes (Fig. 1). The use of plane cathodes instead of annular cathodes eliminates contamination of the cathodes, prevents electric discharges, and prevents contamination of the refined sample. The focusing system for each electron beam consists of plane anode and cathode electrodes bent at 135°. Tests with metal-ceramic molybdenum rods up to 10 mm in diameter have shown that the rods could

Card 1/2 UDC: 58.553.6

L 27468-66

ACC NR: AP6007844

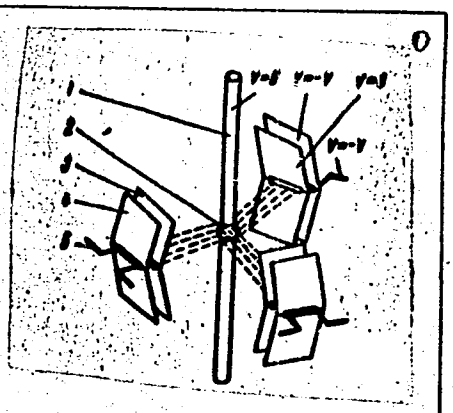


Fig. 1. Operating principle of electron-beam gun. 1 -- Sample, 2 -- melting zone, 3 -- focusing anode, 4 -- focusing cathode, 5 -- electron source.

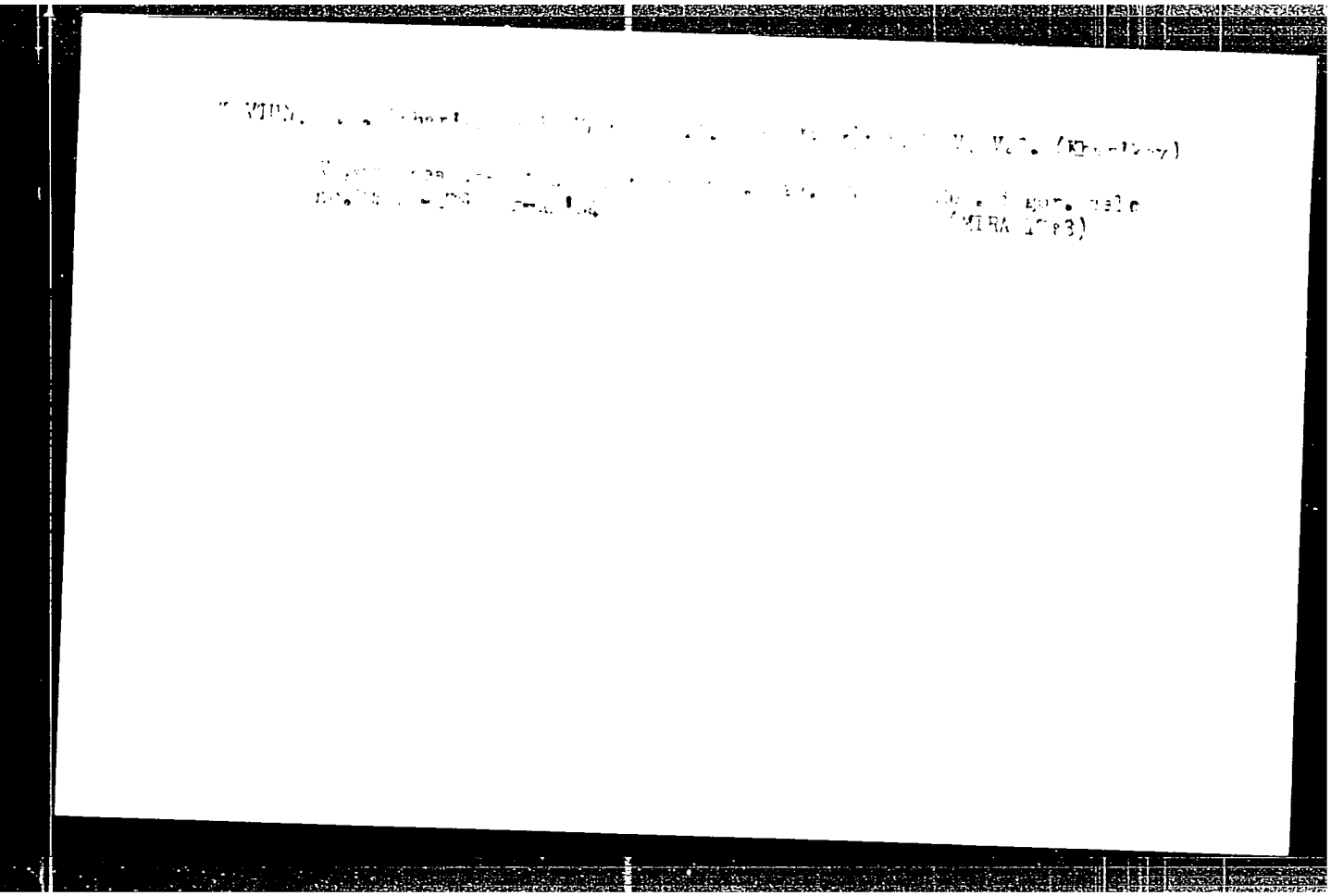
be subjected to zone refining without preliminary heating and, in spite of the considerable gas release, melting began without prior outgassing. Orig. art. has: 2 figures

SUB CODE: 13, 11/ SUBM DATE: 24Jan65/ ORIG REF: 002/ OTH REF: 003

Card 2/2 BLG

PAVLOV, V. S., kapitan 2-go ranga

Communication security in the control of naval forces. Mor. sbor. 47 no.1, 19-25 Ja '64. (MIRA 18:7)



AMONENKO, V.M. (Khar'kov); [illegible]

Rate of vaporization [illegible] tion of yttrium and [illegible] BeO. Zhur. fiz. khim. [illegible]

L 16367-65 EWT(m)/EPF(c)/EWP(b) Pr-4 ESD(gs)/SSD/AFWL/AFTC(p) JD/
ACCESSION NR: AP4048866 JW/JG S/0185/64/009/010/1089/1091

AUTHOR: Kovtun, G. P.; Krugly*kh, A. A.; Pavlov, V. S.

TITLE: Vapor pressure of gadolinium and dysprosium

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no. 10, 1964, 1089-1091

TOPIC TAGS: gadolinium, dysprosium, vapor pressure, heat of sublimation, entropy of sublimation

ABSTRACT: The pressure of gadolinium and dysprosium vapor was determined over the temperature intervals of 1120-1310C and 850-1075C respectively, using Knudsen's effusion method, by the difference of the weight of the tantalum effusion cell before and after the experiment. The following equations describe the results obtained for Gd and Dy, respectively: $\log P_{mm\ Hg} = 12.03 - 23705/T$, and $\log P_{mm\ Hg} = 0.79 - 15825/T$. The heats of sublimation were calculated: 108.5 and 72.4 kcal/mole for Gd and Dy, respectively. The respective entropies of sublimation equal 42.0 and 31.6 cal/mole. degree. Orig. art. has: 2 tables, 1

Card 1/2

L 16367-65
ACCESSION NR: AP4048866

figure and 5 equations

ASSOCIATION: Fizy*ko-tekhnichny*y insty*tut AN URSR m. Kharkov (Physical Technical Institute AN URSR)

SUBMITTED: 20Jan64 ENCL: 00

SUB CODE: GC, IC NO REF SOV: 001 OTHER: 003

Card 2/2

PAVLOV, V.S.

Snail boring tools. Mashinostroitel' no.6:21 Je '60.
(MIRA 13:8)
(Metal cutting tools)

TSITSIASHVILI, Mikhail Yur'yevich; PAVLOV, Vladimir Semenovich; SOKOLOV, L.G., red.; LAPINA, Z.D., red. izd-va; LAVRENOVA, N.B., tekhn. red.

[Modern methods for the loading and unloading of unrefined sugar in harbors]Sovremennye sposoby peregruzki sakhara-syrtsa v portakh. Moskva, Izd-vo "Morskoi transport," 1962. 89 p. (MIRA 16:2)

(Sugar--Transportation) (Cargo handling)

ACC NR: AP6025592 (N) SOURCE CODE: UR/0413/66/000/013/0024/0024

INVENTOR: Pavlov, V. V.; Levin, I. A.; Birnbaum, O. E.

ORG: None

TITLE: A unit for testing aircraft parts under conditions of artificial icing and rain. Class 17, No. 183222

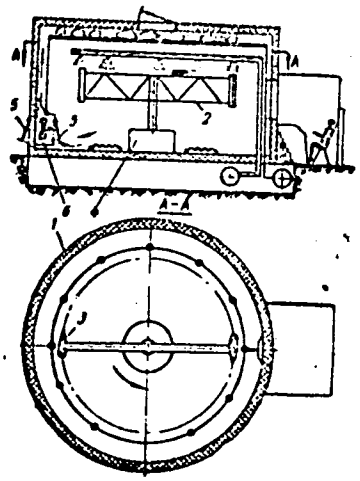
SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 13, 1966, 24

TOPIC TAGS: flight simulation, simulation test, test chamber, ice, rain

ABSTRACT: This Author's Certificate introduces a unit for testing aircraft parts under conditions of artificial icing and rain. The unit contains a closed chamber with a refrigeration assembly, a water distributing unit, heaters and a control panel with measuring and recording instruments. The chamber of this unit is equipped with a horizontal frame for mounting test parts. This frame is rotated by an electric motor mounted in the center of the chamber to simplify design and set up flight simulation by rotary motion.

Card 1/2 UDC: 621.58

ACC NR: AP6025992



1—chamber; 2—frame; 3—parts to be tested; 4—electric motor; 5—damper; 6—blower

SUB CODE: 13/ SUBM DATE: 05Jun64

Card 2/2

16.8000 (1031,1132,2302)

31926
S/102/61/000/006/003/004
D299/D305

AUTHOR: Pavlov, V. V. (Kyyiv)

TITLE: Finding approximate solutions to nonlinear differential equations of transient processes

PERIODICAL: Avtomatyka, no. 6, 1961, 52-59

TEXT: The solution is considered of a second-order differential equation having a nonlinear term which is not proportional to a small parameter. A fomula is obtained which is a generalization of the results obtained (by other authors) for the linearized expressions

$$f\left(x, \frac{dx}{dt}\right) = -\left[-q(a)x + \frac{q'(a)}{\omega} \cdot \frac{dx}{dt}\right] \qquad (2)$$

and

$$f\left(x, \frac{dx}{dt}\right) = -\left\{\frac{q'(a)}{\omega} \cdot \frac{dx}{dt} + \left[-q(a) + \frac{\lambda q'(a)}{\omega}\right] x\right\} \qquad (4)$$

Card 1/

31926
S/102/61/000/006/003/004
D299/D305

Finding approximate solutions ...

The nonlinear second-order equation

$$\frac{d^2x}{dt^2} + 2\lambda \frac{dx}{dt} + k^2 x = F\left(x, \frac{dx}{dt}\right) \qquad (5)$$

is considered, where F is a nonlinear function. The coefficients in the left-hand side of Eq. (5) satisfy the inequality

$$\lambda^2 - k^2 < 0 \qquad (6)$$

the linear part of the control system has filter property; hence the solution of the nonlinear equation can be approximated by the solution to the linear equation. The solution of the nonlinear equation is expressed in the form of trigonometric series. By setting in Eq. (5) $F \equiv 0$, one obtains the linear equation whose solution is

Card 2/7

Finding approximate solutions ...

$$x = a \cos \psi \tag{7}$$

$$\frac{dx}{dt} = -\lambda a \cos\psi - \omega a \sin\psi \tag{8}$$

where

$$a = a_0 e^{-\lambda t},\ \psi = \omega t + \varphi,\ \omega = \sqrt{k^2 - \lambda^2},\ a_0 = \text{const},\ \varphi = \text{const}$$

After transformations, one obtains the solution of Eq. (5) in the form

$$x = \sum_{i=1}^{n} x_i \tag{12}$$

Card 3/4

Finding approximate solutions ...

and the approximate solution

$$x = \sum_{i=1}^{n} v_{1i}(\bar{a}_i)\cos\psi(\bar{a}_i) \text{ for } \psi(a_i) = \omega t + \varphi_{1i}(\bar{a}_i) \qquad (13)$$

where v and φ are determined from Eqs. (7) and (8) and expressions for the Fourier coefficients. After introducing the amplitude functions, one obtains

$$x = \sum_{i=1}^{n} a_{o(i-1)} e^{-\lambda(\bar{a}_i)t} \cos(\omega(\bar{a}_i)t + \varphi_i) \Big|_{t_{i-1}}^{t_i} \qquad (16)$$

Card 4/4

(where λ and ω are given by expressions). The obtained formula (16) permits constructing the transient process determined by Eq. (5). The difference is noted between expression (16) and analogous expressions for differential equations with a nonlinear term, proportional to a small parameter. Formula (16) yields an expression for equivalent linearization of the nonlinear term, viz.

$$F\left(x, \frac{dx}{dt}\right) = -\left\{\frac{q'(a)}{\omega} \cdot \frac{dx}{dt} + \left[-q(a) + \frac{\lambda q'(a)}{\omega} + \left(\frac{q(a)}{2\omega}\right)^2 + \left(\frac{q'(a)}{2\omega}\right)^2\right] x\right\} \qquad (21)$$

Formula (21) is a generalization of the equivalent-linearization formulas (2) and (4), obtained for a nonlinear term proportional to a small parameter. Hence formulas (16) and (21) are general formulas which permit an approximate analysis of nonlinear control

Card 5/7

Finding approximate solutions ...

systems with both "large" and "small" nonlinearities. As an example, the determination of the transient process in the system shown in Fig. 2, is considered. A comparison of the accuracy of results obtained by using formula(2') instead of formula (4), shows a considerable gain in accuracy, hence the conclusion that formulas (16) and (21) yield greater accuracy in the study of nonlinear systems. There are 5 figures, 1 table and 4 Soviet-bloc references.

SUBMITTED: July 8, 1960

Card 6/7

S/024/61/000/006/009/019
E140/E335

AUTHOR: Pavlov, V.V. (Kiyev)

TITLE: Improved form of equivalent linearization of essentially nonlinear circuits

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i avtomatika no. 6, 1961, 67 - 73

TEXT: The asymptotic method of N.M. Krylov and N.N. Bogolyubov previously applied to the approximate solution of nonlinear differential equations has been applied under the assumption of slowly varying amplitude and phase. This has permitted the examination of systems with weak nonlinearities In order to consider systems with strong nonlinearities, the present author proposes to apply the method where the decrement and frequency, and not the amplitude and phase, are slowly varying functions, while the amplitude can vary at a finite rate in dependence on the numerical value of the decrement. This method is applied to obtain expressions for the equivalent linearization of an essentially nonlinear element in a total

13 4000
16.8000 (4103, 4302)

S/024/62/000/001/006/013
E140/E435

AUTHOR: Pavlov, V.V. (Kiyev)

TITLE: Symmetrical single-frequency forced oscillations in nonlinear automatic control systems

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Energetika i avtomatika. no.1, 1962, 133-137

TEXT: The article concerns an application of the author's previous work (Ref.5: Izv. AN SSSR. OTN, Energetika i avtomatika, no.6, 1961). The essence of the method is to give a second-order approximation, improving on the Krylov-Bogolyubov formula, when the nonlinearity cannot be given by a function proportional to the small parameter ε. An assumption of the method, both in the classical Krylov-Bogolyubov work and the present, is that the linear portion of the system has filter properties. Then the method given in Ref.5 can be applied to the type of problem described by the title. The defects of the Krylov-Bogolyubov method in essentially nonlinear systems appear most strongly at the low-frequency end of the frequency characteristics of the

Card 1/2

Symmetrical single-frequency ...

investigated system. An example is calculated showing that in this region the improved method gives results muchcloser to the exact solution (independently obtained) than the classical approximation. There are 6 figures.

SUBMITTED: May 5, 1961

Card 2/2

S/102/62/000/002/004/004
D201/D302

16.8000

AUTHOR: Pavlov, V.V. (Kiyev)

TITLE: Symmetrical single-frequency forced oscillations in non-linear automatic control systems

PERIODICAL: Avtomatika, no. 2, 1962, 73 - 75

TEXT: The author considers the problem of using (1)

$$F(x,px) = -\left\{\frac{q'(a)}{\omega}\,px + \left[-q(a) + \frac{\lambda}{\omega}q'(a) + \left(\frac{q(a)}{2\omega}\right)^2 + \left(\frac{q'(a)}{2\omega}\right)^2\right]x\right\},$$

as given by him earlier for analysis of forced single-frequency oscillations in a system having a really non-linear element. Let the system be described by

$$Q(p)x + F(x, px) = S(p)\,f(t), \qquad \left(p \equiv \frac{d}{dt}\right), \qquad (2)$$

Card 1/2

Symmetrical single-frequency ...

where $\varphi(p)$ and $S(p)$ - polynomials of any degree with real constant coefficients, the degree of $\varphi(p)$ being higher than that of $S(p)$; $f(t) = B \sin \Omega t$. Since the linear part of such automatic control systems has the properties of a filter, then in the first approximation the solution for the steady state forced oscillations may be sought in the form of $X = A \sin (\Omega t + \psi)$. By considering the complementary function of Eq.(2) and by several subsequent transformations of Eq. (2) it is shown that the difference between the exact expression for equivalent linearization of the resulting equation and the approximate expression as given by N.M. Krylov and N.N. Bogolyubov for the linearization of the nonlinear element, consists of a single correcting term Δq, which is a function of Ω and A. An example of linearization shows that this correcting factor lies in the region of low frequencies and its magnitude depends on the magnitude of linearization factors. There are 1 figure and 5 Soviet-bloc references.

SUBMITTED: March 3, 1961

Card 2/2

PAVLOV, V.V. (Kiyev)

Refined form of equivalent linearization of essentially nonlinear asymmetrical links. Avtomatyka 7 no.6:52-54 '62. (MIRA 16:1)
(Automatic control)

PAVLOV, V.V.

Nonlinear differential equations and dynamic programming.
Avtomatyka 8 no.3:76-77 '63. (MIRA 16:7)
(Differential equations) (Programming (Electronic computers))
(Automatic control)

PAVLOV, V.V. (Kiyev)

Sufficient conditions for the invariancy of nonlinear systems.
Avtomatyka 8 no.4:65-67 '63. (MIRA 16:10)

PAVLOV, V.V. (Kiyev)

Realization of invariance conditions in nonlinear automatic control systems. Avtomatyka 8 no.5:75-77 '63. (MIRA 17:1)

PAVLOV, V.V. (Kiyev)

Invariance and [illegible] systems [illegible]
box." Avtomatyka [illegible]

PAVLOV, V.V. (Kiyev); BABCHUK, V.S. [Babchuk, V.S.] (K...)

Invariance to ... conditions in nonlinear ... systems. Avtomat. i ...
9 no.5:70-72 '64 (MIRA ...)

L 20984-65 ESD(dp)/ESD(gs)

ACCESSION NR: AP5003858 S/0102/64/000/004/0087/0088

AUTHOR: Pavlov, V.V. (Kiev) B

TITLE: Polyinvariance in combined nonlinear automatic systems

SOURCE: Avtomatyka, no. 4, 1964, 87-88

TOPIC TAGS: nonlinear control system

ABSTRACT: This is a follow-up to two articles by the same author (Avtomatika, No. 4, 1963 and No. 5, 1963) concerning invariance in nonlinear automatic systems. Two theorems are presented relative to polyinvariance in combined nonlinear automatic systems. The theorems are numbered "3" and "4," numbers "1" and "2" having been presented in the cited earlier works. The abbreviated symbolism is taken from the earlier papers, and it is completely obscure without these for introduction. Orig.art. has 6 formulas.

ASSOCIATION: none

SUBMITTED: 11Mar64 ENCL: 00 SUB CODE: IE

NO REF SOV: 003 OTHER: 000 JPRS

Card 1/1

L 9611-66 EWT(d)/EPF(n)-2/EWP(v)/EWP(k)/EWP(h)/EWP(l) IJP(c) WW/GS/BC
ACC NR: AT5028937 SOURCE CODE: UR/0000/65/000/000/0113/0124

39
B+1

AUTHOR: Pavlov, V.V.

ORG: None

TITLE: Some problems in realization of invariance conditions in multi-dimensional nonlinear automatic control systems

SOURCE: AN UkrSSR. Slozhnyye sistemy upravleniya (Complex control systems). Kiev, Naukova dumka, 1965, 113-124

TOPIC TAGS: nonlinear automatic control system, automatic control theory, circuit design

ABSTRACT: The author considers the following problem which frequently arises in connection with the design of automatic control systems. The system shown in Fig. 1 has an unalterable section based on a multi-dimensional controlled element. A controller must be synthesized for maintaining invariance in some set of coordinates of the controlled element either with respect to some class of disturbances or with respect to all other variables in the system. It is further required that the invariance resulting from synthesis of this control system must belong to the class of physically realizable invariance. The author shows that this problem may be solved by increasing the number of degrees-of-freedom of the entire system made up of object and controller. A class of automatic control systems is considered which operate on the divergence principle with behavior which can be described by a system of ordered equations. Formulas are derived proving the requirement for a controller which assures

Card 1/2

L 9611-66
ACC NR: AT5028937

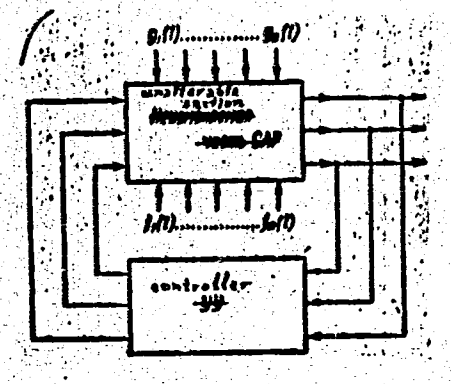
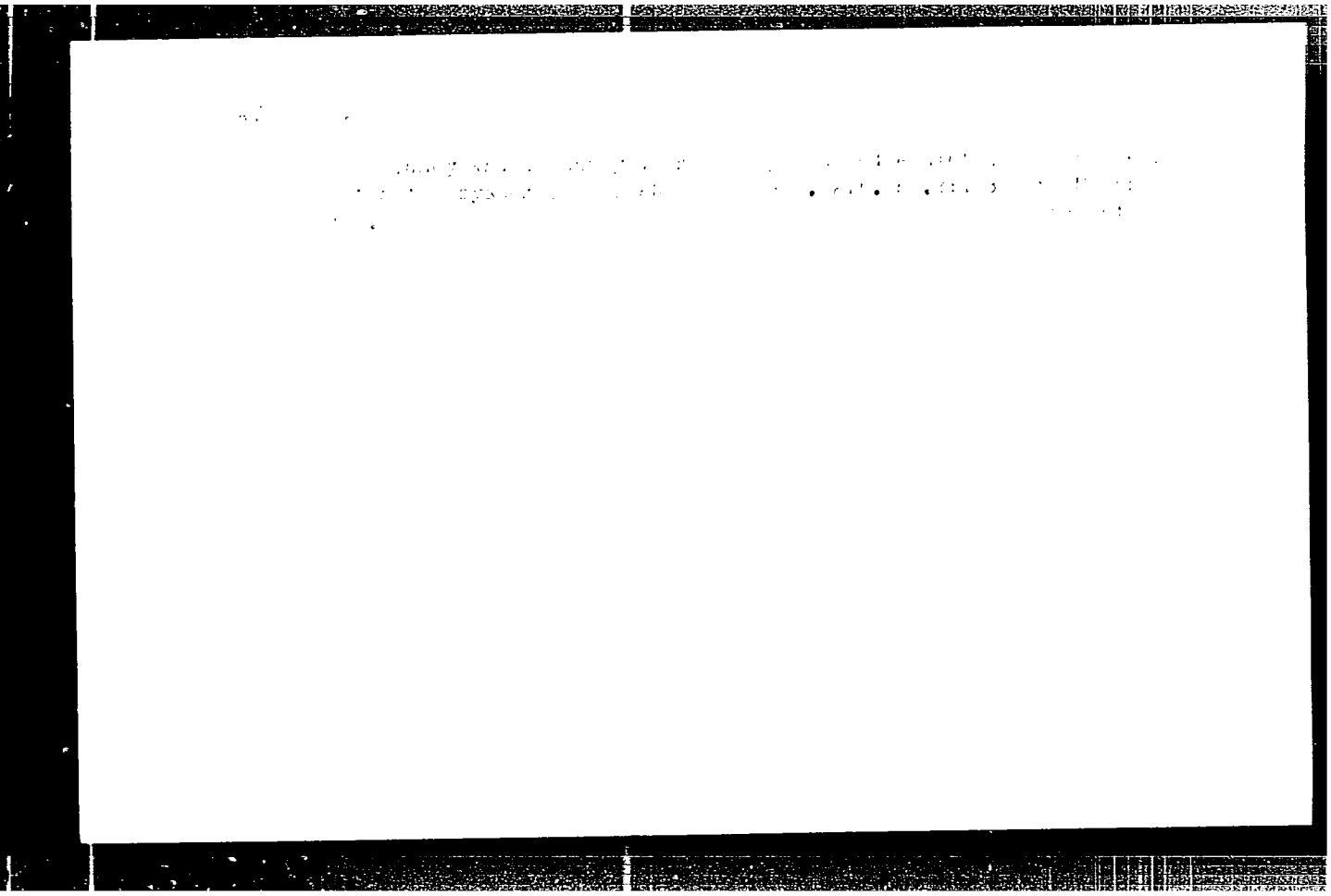


Fig. 1. System with unalterable section based on a multi-dimensional controlled element.

invariance of a definite set of coordinates of the controlled element with respect to the remaining parameters of the system, and recommendations are given for realization of the invariance conditions. A class of conditions for invariance in multi-dimensional nonlinear automatic control systems is considered. Equations are derived for invariance of a set of coordinates of the controlled element with respect to a group of disturbances. Examples are given showing application of these compensation methods. Orig. art. has: 4 figures and 35 formulas.

SUB CODE: 09 / SUBM DATE: 03Aug65 / ORIG REF: 002
13

Card 2/2



[illegible], Ya.Z. (Moscow)

On the problems of invariance and autonomy in essentially nonlinear automatic systems. Avtomatyka 10 no.2:79-88 '65.
(MIRA 18:6)

L 9613-66 EWT(d)/EPF(n)-2/EWP(v)/EWP(k)/EWP(h)/EWP(l) IJP(c) WW/GS/DC
ACC NR: AT5028938 SOURCE CODE: UR/0000/65/000/000/0125/0134

43
B+1

AUTHOR: Pavlov, V.V.

ORG: None

TITLE: Conditions for absolute invariance and autonomy in multidimensional automatic control systems which are described by differential equations with discontinuity in the second member

SOURCE: AN UkrSSR. Slozhnyye sistemy upravleniya (Complex control systems). Kiev, Naukova dumka, 1965, 125-134

TOPIC TAGS: nonlinear automatic control system, automatic control theory, differential equation

14 9

ABSTRACT: The author considers problems associated with derivation and proof of necessary and sufficient conditions for invariance and autonomy in automatic control systems with a considerable degree of nonlinearity. Considerably nonlinear automatic control systems are defined as those with differential equations of the form

$$\frac{dx_i}{dt} = F_i(t, x_1, \ldots, x_n, f_1(t), \ldots, f_n(t)) \quad (i = 1, 2, \ldots, n; \; n > 1),$$

where

$$F_i,\ f_i,\ \frac{\partial F_i}{\partial x_i},\ \frac{\partial F_i}{\partial f_i},\ \frac{\partial^2 F_i}{\partial x_i \partial x_n},\ \frac{\partial^2 F_i}{\partial f_i \partial x_n} \text{ and } \frac{\partial^2 F_i}{\partial t}$$

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2

L 9613-66

ACC NR: AT5028938

(at all α; i, j $\in$ N; N=[1, 2,..., n]) are restricted piecewise linear functions. Theorems are proposed and proved, and the results are illustrated by application to an automatic control system described by a system of ordered equations. Orig. art. has: 4 figures and 29 formulas.

SUB CODE: 09, 13 / SUBM DATE: 03Aug65 / ORIG REF: 004

Card 2/2

L 20974-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACCESSION NR: AP5012886 UR/0280/65/000/002/0153/0156

AUTHOR: Pavlov, V. V. (Kiev)

TITLE: Invariancy and autonomy in multivariable essentially-nonlinear automatic systems

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 2, 1965, 153-156

TOPIC TAGS: multivariable control system, automatic control, automatic control design, automatic control system, automatic control theory

ABSTRACT: The necessary and sufficient conditions of absolute invariance are given by:

$$N_j' \subseteq (N \setminus N_1) \quad \text{for all } j \in N_1,$$

$$N_{s'} \subseteq (N_1 \cup S_{n_s^{n-1}}) \quad \text{for all } j \in N_1.$$

They are valid for automatic-control systems describable by the canonic sets of equations:

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L 20974-66

ACCESSION NR: AP5012886

$$x_j^{(m_j)} = F_j(t, x_1, \ldots, x_n, f_1(t), \ldots, f_n(t)) \text{ for all } j \in N,$$

where $N = (1, 2, \ldots, n)$, F_j denotes the nonlinear functions connecting the independent variable t, functions $x_1, x_2, \ldots, x_n$ and their derivatives up to $(m_1 - 1)$, $(m_2 - 1)$ orders, and the disturbing forces $f_1(t), \ldots, f_n(t)$. A method for singling out various types of autonomous subsets is given. Applications to automatic systems measuring the disturbances and operating on the deviation principle are indicated. Orig. art. has: 4 figures and 15 formulas.

ASSOCIATION: none

SUBMITTED: 05Jul63 ENCL: 00 SUB CODE: DP, IE

NO REF SOV: 003 OTHER: 000

Card 2/2 MJS

L 02465-67 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)
ACC NR: AP6018017 SOURCE CODE: UR/0102/66/000/003/0015/0023

58
B

AUTHOR: Pavlov, V. V. (Kiev); Melyeshev, A. M. -- Meleshev, A. M. (Kiev)

ORG: None

TITLE: Compensation of perturbations and autonomy of infinite-dimensional systems

SOURCE: Avtomatyka, no. 3, 1966, 15-23

TOPIC TAGS: automatic control theory, computer simulation, analog computer, automatic control system

14

ABSTRACT: The authors study the problem of synthesizing control systems which would insure autonomy and invariance of a finite number of degress of freedom for infinite-dimensional objects. An ordered system of equations is given for an infinite-dimensional object treated as a finite-dimensional controller. Expressions are given for the control organs of an invariant system. The system was simulated on an analog computer. It is shown that invariance may be produced with the aid of a finite-dimensional object if certain conditions are maintained. An example is given of the control system of an elastic object consisting of a uniform beam with a tracking force at its end. It is further shown that the coordinates characterizing the motion of the center of mass of the object do not depend on the coordinates

Card 1/2

Card 2/2 pm

PAVLOV, V.V.

AID P - 715

Subject : USSR/Electronics

Card 1/1 Pub. 29 - 8/26

Authors : Pavlov, V. V., Foreman and Golovin, A. K., Technician

Title : Electronic time relay

Periodical : Energetik, 9, 15-16, S 1954

Abstract : The authors describe briefly the relay of their own design. The editors in a note warn against using this type of relay in protective circuits. 2 drawings.

Institution : None

Submitted : No date

PAVLOV, V.V., inzhener.

Semiconductor parts for telephone systems. Vest.sviazi 16 no.9:34 S '56. (MLRA 9:11)
(United States--Semiconductors)

PAVLOV, V. V.

1627
621.373.5+621.373.4]: 621.314.7: 621.311
Application of Germanium Triodes in Equipment for the Protection, Telemechanics and Communication Channels of Power Systems.—G. F. Martynov & V. V. Pavlov. (*Avtomatika i Telemekhanika*, June 1955, Vol. 17, No. 6, pp. 570–580.) Characteristics and circuit diagrams are given of a multistage a.f. amplifier, oscillator and multivibrator. The characteristics of 12 Russian junction-type and nine point-contact transistors are tabulated.

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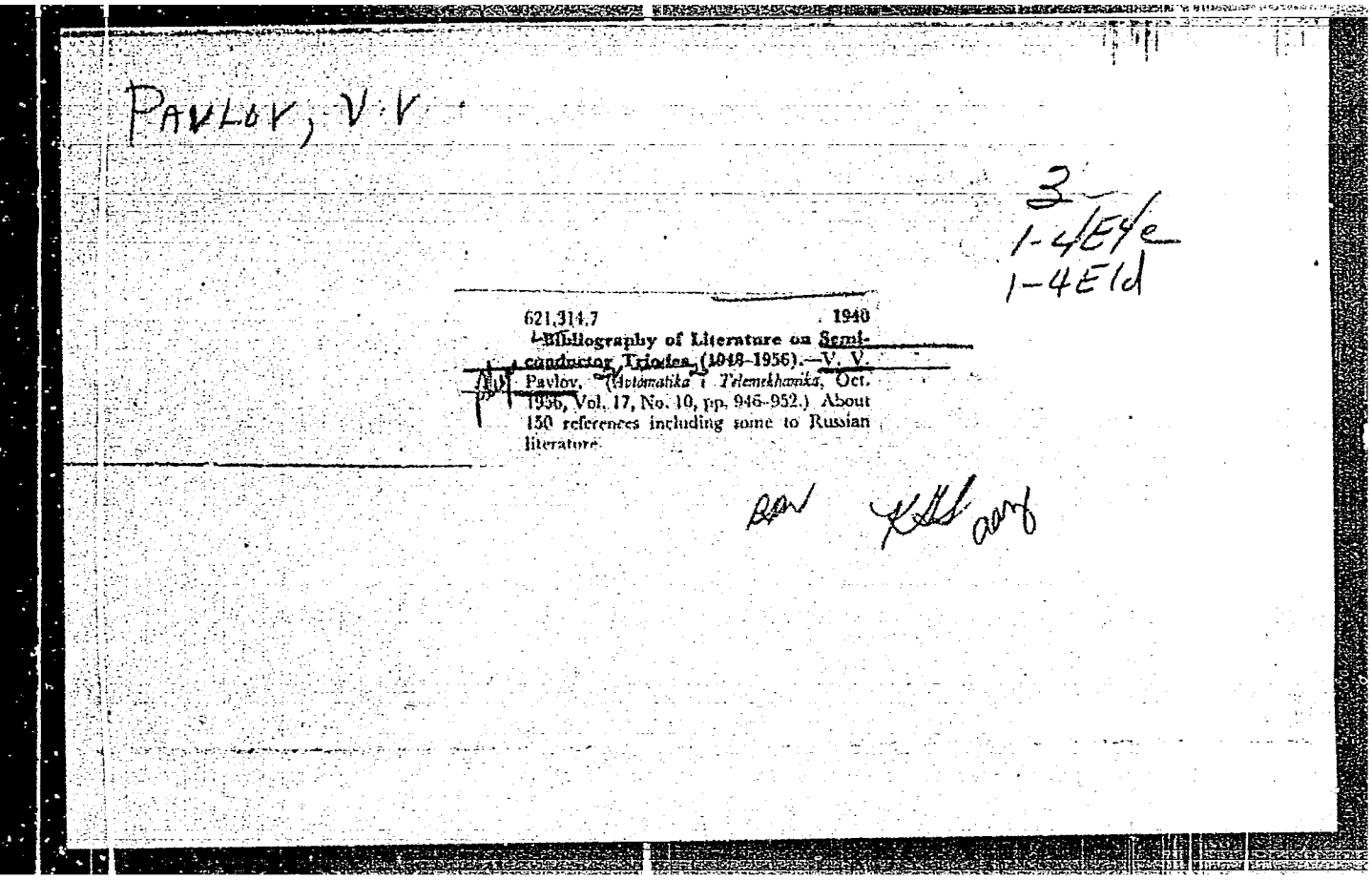

PAVLOV, V.V.

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1-4E1d

621.314.7 1940

Bibliography of Literature on Semiconductor Triodes (1948-1956).—V. V. Pavlov. (*Avtomatika i Telemekhanika*, Oct. 1956, Vol. 17, No. 10, pp. 946-952.) About 150 references including some to Russian literature.

PAVLOV, V. V.

REGULATION & REMOTE CONTROL

"Use of Germanium Transistors in High Frequency Apparatus for Telemechanics Communication, and Protection" by Engineer V.V. Pavlov, Elektricheskiye Stantsii, No. 5, May 1957, Pages

A brief survey article, describing the operation of a transistor and indicating possible application for use in power system protection and telemetering, to replace ordinary vacuum tubes.

Card 1/1 - 41 -

PAVLOV, V.V.

PAVLOV, V.V., master; GOLOVIN, A.K., tekhnik.

New method of connecting KGA switchboards. Energetik 5 no.12:19-20 D '57. (MIRA 10:12)

(Electric power plants--Equipment and supplies)

PAVLOV, V.V., inzhener.

[redacted] system using guided light beams. Vest. sviazi 17 no.7: 35 Jl '57. (MLRA 10:8)

(Telephone)

PAVLOV, V.V., inzhener.

Using germanium triodes in high-frequency telemechanics, communication and relay apparatus. Elek. sta. 28 no.5:59-61 My '57. (MLRA 10:6)

(Transistors)

PAVLOV, V.V., red. [translator]; KODKIND, I.I., red.; LARIONOV, G.Ye., tekhn. red.

[Use of transistors in relay-type protective equipment, measuring apparatus, and telemechanics equipment for power systems] [Translations from the English] Poluprovodnikovye triody v apparature releinoi zashchity, izmerenii i telemekhaniki dlia energosistem. Moskva, Gos. energ. izd-vo, 1958. 63 p. (MIRA 11:10)

1. Gosudarstvennyy trest po organizatsii i ratsionalizatsii rayonnykh elektricheskikh stantsiy i setey, Moscow.
(Transistors) (Electric power distribution)

PAVLOV, V.V.

Practical calculation of internal noise in radio receivers equpped with junction triodes. Poluprov.prib. i ikh prim. no.3: 162-174 '58. (MIRA 12:4)

(Radio amplifiers--Noise)
(Transistors)

AUTHOR: [illegible]

TITLE: Semiconductor Triode Noise Factor in Radio Receiver Sets (O raschete shumov poluprovodnikovykh triodov v radiopriyemnykh ustroystv na poluprovodnikovykh triodakh)

PERIODICAL: Radiotekhnika, 1958, Vol. 13, No. 9, pp. [illegible]

ABSTRACT: A method of computing and measuring the noise factor of semiconductor triodes in radio equipment with semiconductor triodes is presented. The noise factor F specifies the ratio of the actual noise level at the triode output and that noise level occurring in an ideal quadripole which gives the same amplification as the triode [illegible] (1). This way of designating the set noise is very convenient as it is applicable to all radio receiver equipment [illegible] represented by fourpoles. Moreover it permits to compare the tube noise with the noise produced in semiconductor triodes. Under otherwise equal conditions F is practically independent of the circuit diagram incorporating the triode. It varies considerably, however, with the mode of operation of the circuit, that is to say with the collector potential U_K, the emitter current I_e, and the operational frequency f. The function

Card [illegible]

Semiconductor Triode Radio Receiver Sets

[illegible] exhibits three characteristic [illegible]: [illegible], the [illegible] medium, and that of high frequencies. In electron semiconductors four basic components of set noise can be distinguished (Refs 1,-). The semiconductor noise is caused by a number of specific processes. The two hypotheses by Bess and Beraznes are explained. Various types of noise are investigated. The noise caused by current division in the triodes, the Schrott effect, caused by the discrete microstructure of the current in the semiconductor, the thermal noise caused by the thermal oscillations of the crystal lattice and by the carriers of elementary charges. These three types of noise together produce the white noise. Formulae (14) and (15), specifying F for a circuit with common emitter or with a common basis, respectively, are derived. According to these formulae it is possible to compute F for a cascade with an accuracy sufficient for computations on an engineering level. The noise factor of amplifiers with semiconductor triodes can also be measured immediately. Here the usual tube method can be used. There are [illegible] figures and 5 references, 3 of which are Soviet.

[illegible] 5

SOV/108-13-9-5/26

On the Computation of the Set Noise in Semiconductor Triode Radio Receiver Sets

SUBMITTED: December 18, 1956 (initially) and August 14, 1957 (after revision)

Card 3/3

8(2)
AUTHOR: Pavlov, V. V., Engineer SOV/119-59-1-17/20

TITLE: Modern Foreign Semiconductor Diodes and Triodes (Sovremennyye zarubezhnyye poluprovodnikovyye diody i triody)

PERIODICAL: Priborostroyeniye, 1959, Nr 1, pp 30-31 (USSR)

ABSTRACT: This paper deals with a report on two papers published in English and one paper published in German, i.e.,
Proceedings of the IRE, Nr 6, 1958, pp 12A-13A, 955-968;
Electronic Industries, Nr 6, 1958, pp 73-101, 111-139, 365;
Electronik Nr 7, pp 221-227.
There are 2 tables.

Card 1/1

9(6)
AUTHOR: Pavlov, V. V., Engineer

SOV/119-60-1-7/14

TITLE: The Calculation of the Set Noise in Amplifier- and Measuring Apparatus With Semiconductor Surface Triodes

PERIODICAL: Priborostroyeniye, 1960, Nr 1, pp 18 - 20 (USSR)

ABSTRACT: As semiconductor triodes produced in series have a relatively high noise-level, methods for the reduction of this noise and of calculating the set noise must be developed. Problems of practical calculation methods for set noise in the construction of measurement apparatus are here dealt with, it being assumed that set noise is produced only by internal effects in the semiconductor triodes, the author confining himself to problems of calculation. Four components of set noise are given: 1) Semiconductor noise in the collector circuit. 2) Noise of the Schottky effect in electron-hole transitions in the emitter and collector. 3) The noise of the division of the emitter current into collector and basic current. 4) The thermal noise of the basis. In practical calculations only the semiconductor noise in the collector is taken into account, and the author

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gives formula (1) for the average voltage of this noise. The decrease of semiconductor noise depends on the progress made in semiconductor production methods. For the mean voltage of noise produced by the Schottky-effect formulas (2) and (3) are given. A decrease of this noise may be attained by reduction of the emitter- and collector current as well as of the working temperature. Further, the equations (4) and (5) are given for the mean voltages of emitter-current division noise and thermal noise. A formula for the probability of the occurrence of white noise pulses with a certain minimum magnitude is then given. The author next investigates the internal noise on the basis of figure 1. Five noise-sources are given, which are arranged in two groups for practical calculation, corresponding to the in- and output of the triode. By means of formulas (6) and (7) the coefficients of internal noise for emitter- and collector basic circuits (skhemy s obshchim emitterom) are calculated. Formula(9) is given for the purpose of calculating this coefficient of a cascade

circuit. In the case of the practical calculations, the correlation between the mean voltages of emitter, and collector-noise need not be taken into account. The internal noise depends on the triode parameter, the mode of operation of the scheme, and on the internal resistance of the signal source. Selecting the mode of operation with the least internal noise is discussed on the basis of the diagram in figure 3, in which the inner noise coefficient has a minimum in the frequency range II. For the reduction of set noise, the triodes must be used in a circuit, in which a low emitter current, low collector voltage, and small temperature fluctuations occur. There are 3 figures and 4 references, 1 of which is Soviet.

20445
S/115/61/000/003/009/013
B124/B204

9.2520 (2902, 1139, 1159, 1161)

AUTHOR: Pavlov, V. V.

TITLE: d.c. measurement amplifier with semiconductor triodes

PERIODICAL: Izmeritel'naya tekhnika, no. 3, 1961, 35-40

TEXT: Examination of the operation of d.c.-to-a.c. transformers with Ge and Si semiconductor triodes of various types (Д2 (D-2), Д7 (D7), Д20 (D20)) showed that the sensitivity threshold is at 3-5 mv. The transformation coefficient, i.e. the ratio of the d.c. voltage drop over the output to the d.c. voltage, has a value of 0.5 to 0.7. A sinusoidal voltage as well as rectangular pulses may be used in transforming. Transformers with germanium diodes have unsatisfactory temperature characteristics; their voltage drift amounts to an average of 0.8 mv in the case of eight-hour operation, also on fluctuations at room temperature. Transformers with silicon diodes operate, even on temperature fluctuations by up to 45°C, with a voltage drift of around 0.1 mv and a current drift of 10^{-10} a (after 8 hr). Low d.c. voltages may be transformed on the basis of the Hall effect with the sensitivity threshold at

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d.c. measurement amplifier...

50μv. However, the transformation coefficient of such transformers is small and the latter are not stable on temperature variation. An interesting type are transformers of small d.c. signals to a.c. signals by means of semiconductor triodes. A sinusoidal or rectangular transformation voltage is applied across base and emitter or collector of the triode, while the measured d.c. signal is led over a resistor to the electrodes of the emitter. The triode base current varies according to the effect of the transformation voltage between 0 and $i_{b\ max}$. When the input d.c. voltage is zero, then the output voltage is zero, too. On the action of a d.c. voltage, the triode soon closes the circuit and becomes saturated, which leads to the result that at the output of the triode an alternating voltage appears, with a rectangle-like shape and an amplitude proportional to the measured direct voltage. The lower limit of direct voltage that can be transformed by such transformers is determined by the residual voltage u_{res} and the residual current i_{res} of the triode. In the case of inverse connection of the triode, the residual parameters are smaller than in the case of the usual connection with common emitter; for this reason, in measurement transformation of weak

Card 2/8

d.c. measurement amplifier...

d.c. signals just the inverse triode connection has to be employed. The schematic diagram of a parallel and of a successive-type transformer with inversely connected semiconductor triodes is shown in Fig.1 (a,b), and the equivalent scheme is analyzed in Fig.1 (v). The voltage across the output of the transformer during the half period of contact breaking is $U_{cb} \approx E_c + i_{res}(R_c+R)$ (4), where $R_{res} \ll R_c+R \ll R_3$; R_3 denoting the triode impedance. The voltage drop across the triode output is

$$U_{out} = U_{cb}-U_{cl} = E_c+i_{res}(R_c+R) - \frac{E_c}{(R_c+R)/R_{res}+1} + \frac{u_{res}}{R_{res}/(R_c+R)+1} \quad (5),$$

the transformation coefficient of the circuit amounts to

$$K_{tr} = \frac{U_{out}}{E_c} = \frac{1}{R_{res}/(R_c+R)+1} + \frac{1}{E_c}\left[\frac{u_{res}}{R_{res}/(R_c+R)+1} + i_{res}(R_c+R)\right] \quad (6)$$

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d.c. measurement amplifier...

which by omission of the second term is reduced to the form $K_{tr} = 1/(R_{res}/R_c+R) + 1$ (7) or, in the case of very small R_c, to $K_{tr} = 1/(R_{res}/R) + 1$ (8). From these interrelations, the most important properties of the discussed transformers may be deduced. The residual voltage over the output of the transformer with shunted resistor decreases to $[(R_c+R)i_{res}R_{sh}]/(R_c+R+R_{sh})$ (9). During the half-period of contact in the triode, the voltage amounts to

$$U'_{cl} = \frac{E_c}{(R_c+R)/R_{sh}+(R_c+R)/R_{res}+1} - \frac{u_{res}}{R_{res}/R_{sh}+R_{res}/(R_c+R)+1} \quad (10),$$

in the half-period of contact breaking to

$$U'_{ob} = \frac{R_{sh}}{R_c+R+R_{sh}}\left[E_c+(R_c+R)i_{res}\right] = \frac{R_{sh}}{R_c+R+R_{sh}}U_{ob} \quad (11),$$

Card 4/8

d.c. measurement amplifier...

the voltage drop across the transformer output is

$$U'_{out} = \left\{ \frac{R_{sh}}{R_c+R+R_{sh}} \frac{E_c+u_{res}\left[(R_c+R)/R_{sh}+1\right]}{R_{res}/R_{sh}+R_{res}/(R_c+R)+1} + (R_c+R)i_{res} \right\} \qquad (12),$$

and the transformation coefficient under consideration of R_{sh} is

$$K'_{tr} = \frac{R_{sh}}{R_c+R+R_{sh}} \left\{ \frac{1}{R_{res}/(R_c+R)+1} + \frac{1}{E_c} \left[\frac{u_{res}\left(\frac{R_c+R}{R_{sh}}+1\right)}{R_{res}/(R_c+R)+1} + (R_c+R)i_{res} \right] \right\} \qquad (13)$$

$$\text{and/or } K'_{tr} = \frac{R_{sh}}{R_c+R+R_{sh}} \frac{1}{R_{res}/(R_c+R)+1} = \frac{1}{\frac{R_c+R}{R_{sh}}+1} K_{tr} \qquad (14)$$

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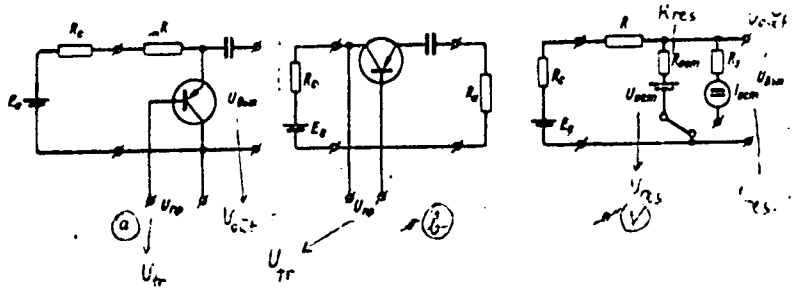
d.c. measurement amplifier...

for the case of small $(i,u,R)_{res}$. Fig. 5 illustrates the scheme of a d.c. amplifier in the range of from 0 to 50 mv with symmetric parallel transformer with the triodes П13 (P13), (ПТ1 (PT1) and ПТ2 (PT2)), having a basic error of about 1%, on Si diodes. The feedback coefficient is 0.2, the output voltage 0.3 - 5 v. Fig. 6 shows the schematic diagram of an amplifier for slowly varying d.c. signals in the range of 0 - 15 mv. The input transformer is of the parallel type on the П16 (P16) (ПТ1 (PT1))-type triode; its feedback coefficient is 0.05, its total drift in 8 hr 0.1 mv at maximum. There are 6 figures and 1 Soviet-bloc reference.

Fig. 1



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B124/B204

d.c. measurement amplifier...

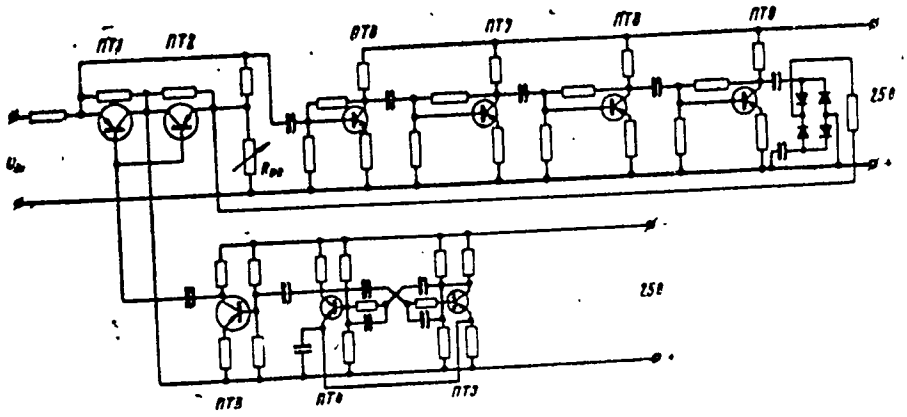

Fig. 5

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d.c. measurement amplifier...

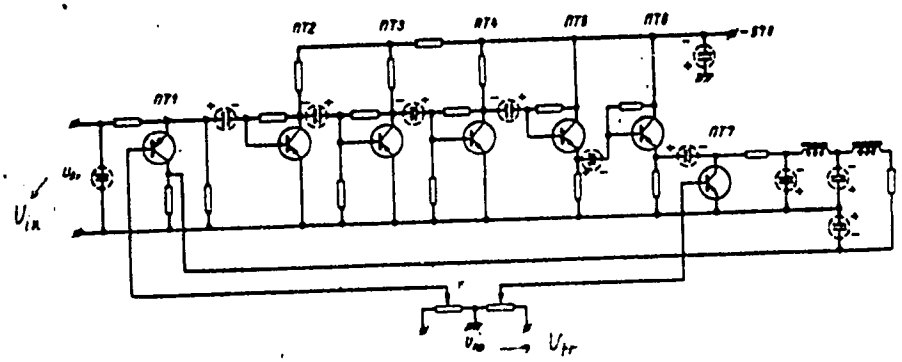

Fig. 6

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PHASE I BOOK EXPLOITATION SOV/6264

Pavlov, Viktor Vasil'yevich

Poluprovodnikovyye izmeritel'nyye i upravlyayushchiye ustroystva dlya yadernoy energetiki (Semiconductor Measurement and Control Devices for Nuclear Power Engineering). Moscow, Gosatomizdat, 1962. 200 p. 7000 copies printed.

Ed.: G. M. Pchelintseva; Tech. Ed.: N. A. Vlasova.

PURPOSE: This book is intended for engineers and technicians concerned with the development, designing, and operation of electronic equipment in nuclear power engineering and in other fields connected with the use of radioactive substances, as well as for students in higher schools of education and technicians who are taking correspondence courses.

COVERAGE: Engineering methods for the design and construction of semiconductor equipment employed in reactors and in various physical experiments are discussed with emphasis on units and assemblies using semiconductor elements. The aim of the author is to convince

Card 1/5

his readers of the excellency of semiconductor equipment and its advantage over vacuum tubes, contact relays, and magnetic amplifiers.

TABLE OF CONTENTS:

S/892/62/000/001/011/022
B102/B186

AUTHOR: Pavlov, V. V.

TITLE: Use of a Sakharov counter in a strongly varying γ-ray field

SOURCE: Moscow. Inshenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 78-80

TEXT: If a Sakharov counter (cf. Atomnaya energiya, III, no. 7, 1957) is used in a spatially varying field, it indicates the gamma energy flux not for the measuring point but for a certain region around it. The flux at a definite point can be found if this is corrected. This correction was calculated by the author and found to be

$$E = \frac{\Phi_1}{\Phi_2} = \frac{B(\mu r)e^{-\mu r}}{\int_{-\Theta_{max}}^{+\Theta_{max}} B(\mu r \sec\Theta)\, e^{-\mu r \sec\Theta}\, d\Theta} \quad (3)$$

where

q is the source activity; B the energy build-up factor; d_{eff} is the

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ACCESSION NR: AT4021252 S/2892/63/000/002/0066/0077

AUTHOR: Pavlov, V. V.

TITLE: On the spectral angular distribution of γ radiation from the surface of a semi-infinite medium with uniformly distributed isotropic sources

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 66-77

TOPIC TAGS: γ radiation, spectral angular distribution, isotropic sources, infinite medium, Compton effect, Klein-Nishina formula, photo effect, Lambert law, semi-infinite medium

ABSTRACT: The Monte Carlo method (based on statistical tests) for calculating the spectral angular distribution of radiation from a surface of a semi-infinite medium is not acceptable in many cases because of its numeric and therefore cumbersome character. By means of an extensive mathematical argument, the author makes an attempt to construct a formula for a solution to the above mentioned problem, and he proves the validity of the Lambert law for nonscattered radiation which intersects the element of the area ds. This radiation is described by the formula

$$\delta_0(E_0)d\Omega ds = \frac{q\cos\theta}{4\pi\mu(E_0)} d\Omega\, ds \qquad (11)$$

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ACCESSION NR: AT4021252

$\delta_0(E_0)\, d\Omega\, ds$ is the amount of unscattered γ quanta intersecting the area ds in the direction which is characterized by the angle Θ in the solid angle $d\Omega$ in one second. All formulas are derived in the assumption that the source emits γ quanta of an E_0 energy only. In case the source emits additional γ quanta of another energy, these can be easily calculated if the spectral composition and the "yield" of the separate spectral lines are known. The above formula is also valid for an infinite medium. In conclusion, the author claims that a drop in γ quanta energy will increase the deviation from the Lambert law. Thus, the author arrives at the final formula

$$\delta_{\text{semi-infinite}}(E_0,E,\Theta) = f_{\text{semi-infinite}}(E_0,E,\Theta) \cdot \cos\Theta \qquad (19)$$

In many important calculations it may be assumed, without allowing great error, that the spectral angular distribution of an infinite medium pertains to semi-infinite medium. In those cases when this is not permissible, in the presence of precise formulas of spectral angular distribution in an infinite medium, a comparison can give useful evaluations. Orig. art. has: 19 formulas and 4 figures.

Card 2/3

ACCESSION NR: AT4021252

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physics and Engineering Institute)

SUBMITTED: 00	DATE ACQ: 06Apr64	ENCL: 00
SUB CODE: PH, NS	NO REF SOV: 001	OTHER: 001

Card 3/3

ACCESSION NR: AT4021253 S/2892/63/000/002/0078/0080

AUTHOR: Pavlov, V. V.

TITLE: On the radiation energy from a surface of a semi-infinite medium with uniformly distributed isotropic sources

SOURCE: Voprosy* dozimetrii i zashchity* ot izluchenіy, no. 2, 1963, 78-80

TOPIC TAGS: energy scattering, γ radiation, semi-infinite medium, isotropic source

ABSTRACT: The function which characterizes the energy of γ radiation exiting from the surface of a semi-infinite medium with uniformly distributed isotropic sources has not as yet been defined. A knowledge of this function is important for a number of practical calculations of the γ radiation dose. However, the function which characterizes the energy of radiation passing through an element of a surface with a cross section of ds in an infinite medium with uniformly distributed isotropic sources can be easily found. This function is a good substitute for the missing function because of its proximity to it. By means of mathematical arguments, the author attains the following expression for the function of angular distribution of radiation energy in an infinite medium:

$$\delta_{energy}\, d\omega\, \frac{q}{4\pi\mu}\left(\frac{A_1}{1+\alpha_1}+\frac{A_2}{1+\alpha_2}\right)\cos\theta\, d\omega \qquad (5)$$

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ACCESSION NR: AT4021253

The largest discrepancy will be approximately 25% in the direction of an increase in the case of the angles $\theta \approx \pi/2$. Orig. art. has: 1 figure and 5 formulas.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physics and Engineering Institute)

SUBMITTED: 00 DATE ACQ: 06Apr63 ENCL: 00

SUB CODE: PH, NS NO REF SOV: 001 OTHER: 001

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L 41854-65 EWT(m)/EPF(n)-2/T/EPA(bb)-2 Pu-4
ACCESSION NR AM5004503 BOOK EXPLOITATION S/ 30 B+1

Pavlov, Viktor Vasil'yevich

Semiconductor control devices for ships' atomic power plants (Poluprovodnikovyye upravlyayushchiye ustroystva dlya sudovykh atomnykh ustanovok), Leningrad, Izd-vo "Sudostroyeniye", 1964, 166 p. illus., biblio. 2,600 copies printed.

TOPIC TAGS: marine nuclear power plant, semiconductor instrument, automatic control system, radiation effect

PURPOSE AND COVERAGE: This book presents the principles of calculation and design of elements and components of electronic equipment of the control system and protection of marine nuclear power plants using semiconductor instruments. The features of semiconductor instruments used in the control system and protection of a nuclear reactor and the reliability of semiconductor equipment under radioactive irradiation are examined. The book is intended for engineers and technicians concerned with the development, design, and use of control systems and protection systems of marine nuclear power plants and for students of higher educational institutions.

TABLE OF CONTENTS [abridged]:

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L 41854-65
ACCESSION NR AM5004503

SUBMITTED: 28May64 SUB CODE: PR, SS, EC, NP

NO REF SOV: 047 OTHER: 032

Card 2/2

L 23793-65 EWT(m) DIAAP

ACCESSION NR: AT5003287 S/2892/64/000/003/0082/0088

AUTHOR: Pavlov, V.V. B+1

TITLE: Some problems of radiation within an infinite medium containing uniformly distributed isotropic sources

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 1964, 82-88

TOPIC TAGS: gamma radiation, gamma ray absorption, infinite medium, uniformly distributed source, absorbed energy, primary ray absorption, isotropic source, radiation shielding

ABSTRACT: The present article is a more comprehensive study of radiation within an infinite medium containing uniformly distributed isotropic sources, a problem which was discussed earlier by several authors (see, e.g., W.K. Fanst, M.H. Johnson, Phys. Rev., 75, 467, 1949). The interest in the problem was triggered by the following quotation from a book by G.V. Gorshkov (Gamma-izlucheniye radioaktivnykh tel i elementy raschota zashchity ot izlucheniya. M.-L., AN SSSR, 1959, p. 96): "Calcula-tions and experiments show that in the case of extended sources acting from all sides

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towards the observer, the radiation intensity (aqueous medium, Co^{60} source) is approximately twice the one calculated without taking into account secondary rays while carrying out measurements with conventional devices.... It is highly probable that the coefficient taking care of secondary rays must be directly proportional to the coefficient of true γ-ray absorption within the medium under consideration." Consequently, the author investigated the magnitude of the fraction of energy (and of the related quantities) absorbed from the unscattered radiation, and discusses the errors introduced by calculating the absorbed energy on the basis of the accumulation factor of a point isotropic source within an infinite medium given in the form of a sum of two exponentials. The errors in the calculation of the dose and absorbed radiation are tabulated. Orig. art. has: 17 formulas, 1 figure, and 2 tables.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 003 OTHER: 000

Card 2/2

L 23792-65 EWT(m) DIAAP

ACCESSION NR: AT5003288 S/2892/64/000/003/0089/0094

AUTHOR: Pavlov, V.V. 19 71

TITLE: The calculation of the flow of gamma radiation energy at the exit from a stepwise cylindrical channel

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 89-94

TOPIC TAGS: shielding, radiation barrier, barrier channel radiation, gamma ray protection, gamma radiation flow

ABSTRACT: If the section "d" of a stepwise cylindrical channel is sufficiently large (see Fig. 1a of the Enclosure), the calculation of the energy outflow at the exit of the channel may be reduced to the calculation of a flow at the exit from a "pit" (Fig. 1b of the Enclosure). The calculation assumes that a. the γ-ray source is monochromatic and the radiation is incident perpendicularly to the barrier; and b. the pit's walls are absolutely black, i.e., they do not reflect radiation. The necessary values of the semiempirical constants are taken from the work of A.B. Larichev (Voprosy dozimetrii i zashchity izlucheniy, V.I. Ivanov, Editor. no. 2, M., Gosatomizdat, 1963). The results show that for pit radii between 5 and 10 cm, penetrating half the thickness of 1.5-2 m

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ACCESSION NR: AT5003288

thick concrete barriers, the energy flow depends on the square of the pit's radius. The results are plotted in the form of graphs. Orig. art. has: 9 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 01 SUB CODE: NP

NO REF SOV: 003 OTHER: 000

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L 23791-65 EWT(m) DIAAP

ACCESSION NR: AT5003289 S/2892/64/000/003/0095/0100

B+1

AUTHOR: Pavlov, V.V.

TITLE: Currents, energy flows, and doses from the surface of a semi-infinite medium containing uniformly distributed isotropic sources of gamma radiation /9

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 1964, 95-100

TOPIC TAGS: gamma radiation, radiation current, radiation flow, semi-infinite medium, uniformly distributed source, isotropic radiation source

ABSTRACT: If one considers an infinite medium with uniformly distributed isotropic sources as the sum of two semi-infinite planes, one can relate the energy current within the infinite medium to the energy current at the surface of the semi-infinite medium by the formula $j_{inf} = j_{semi\text{-}inf} + A_j j_{semi\text{-}inf}$ Here, the component $A_j j_{semi\text{-}inf}$ is the energy emitted by the unit surface of one semi-infinite region and reflected by the other. Multiple reflections are neglected and the single-reflection calculations yield $A_j = 0.13$ at 1 Mev and 0.09 at 2 Mev. Analogous equations for energy flow lead to a semi-infinite plane A_j (albedo) = 0.19 at 1 Mev and 0.12 at 2 Mev. The calculations utilize the

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ACCESSION NR: AT5003289

Isotropic source albedo data from a paper by M.J. Berger and D.J. Raso (Radiation Res., 12, 20, 1960). The equations for the semi-infinite medium doses are also derived. Orig. art. has: 17 formulas and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 001

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PAVLOV, V.V.

Some problems concerning radiation in an infinite medium with uniformly distributed isotropic sources. Vop.doz. i zasnch. ot izluch. no.3:82-88 '64.

Calculating the gamma-ray energy flux at the output of a stepped cylindrical channel. Ibid.:89-94

Current, energy flux, and dose from the surface of a semi-infin'te medium with uniformly distributed isotropic gamma-ray sources. Ibid.:95-100 (MIRA 18:2)

L 1168-66 EWT(m) DIAAP

ACCESSION NR: AT5023154 UR/2892/65/000/004/0092/0094

27
B+1

AUTHOR: Pavlov, V. V.

19

TITLE: Determination of the flux energy of gamma radiation coming out of an aqueous radioactive semi-infinite medium and reflected by an air medium

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 4, 1965, 92-94

TOPIC TAGS: gamma radiation, radioactive source, gamma ray absorption, gamma flux, radiation dosimetry

ABSTRACT: The article is a theoretical treatment which results in the derivation of the following equations:

$$I_{отр} = \frac{qA_I}{4\mu'(E_0)(1+A_I)}; \quad (7)$$

$$\varphi_{отр} = \frac{qA_\varphi}{2\mu'(E_0)(1+A_\varphi)}. \quad (8)$$

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ACCESSION NR: AT5023154

where A_i and A_φ are the current and flux albedos, averaged with respect to the angle and the spectrum respectively; i_{ref} and φ_{ref} are the reflected current and flux, respectively; q is the specific activity energy of the water; and, $\mu'(E_0)$ is the coefficient of absorption of the energy of the gamma radiation in water. These equations are not considered exact, since they are based on two assumptions. The first assumption is that in calculating the albedo, the spectral distribution of the semi-infinite medium changes due to the distribution of the infinite aqueous medium. The second is that the formula for the flux energy of an unbounded aqueous radioactive medium is obtained on the assumption that the absorption coefficient for the energy of the gamma rays is equal to its value for the energy of the gamma quanta of the source and that, for water, it does not depend on their energies. Theoretical considerations lead to the conclusion that the maximum error of the second assumption is less than ±12%. Orig. art. has: 8 formulas and 1 table

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NR REF SOV: 004 OTHER: 001

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L 1307-66 EWT(m) DIAAP

ACCESSION NR: AT5023155 UR/2892/65/000/004/0095/0097

AUTHOR: Pavlov, V. V.

TITLE: Angular dependence of the energy of gamma radiation coming from the surface of a semi-infinite medium with uniformly distributed isotropic sources

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 4, 1965, 95-97

TOPIC TAGS: gamma radiation, radioactive source, water, gamma flux, radiation dosimetry

ABSTRACT: The following approximate formula has been proposed for the angular distribution of the energy of gamma radiation coming from the surface of a semi-infinite medium:

$$\delta\, ds d\Omega = \frac{q\cos\theta}{4\pi\mu}\left(\frac{A_1}{1+\alpha_1}+\frac{A_2}{1+\alpha_2}\right) ds d\Omega, \qquad (1)$$

where q is the specific activity of the medium in Mev/cm^3; μ is the coefficient of attenuation of the gamma rays; A_1, A_2, α_1, α_2 are constants of the accumulation

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factor for an isotropic point source in a homogeneous infinite medium, in the form of the sum of two exponents. One of the reasons for the inaccuracy of this formula is the fact that the flux energy in an inorganic radioactive medium is calculated on the basis of an approximate representation of the accumulation factor in the form of the sum of two exponents according to the formula

$$\varphi = \frac{q}{\mu}\left(\frac{A_1}{1+\alpha_1} + \frac{A_2}{1+\alpha_2}\right). \qquad (2)$$

However, for an aqueous medium, there is another method of determining flux energy. By this method, the formula for flux energy can be easily found in the form of a conversion from the energy of absorption, if the following three factors are considered: 1) the absorption coefficient for radiation energy in water varies only slightly in the interval of the energy of gamma quanta from 0.1-3 Mev; 2) most of the energy in the spectrum is carried by the unscattered quanta; and 3) the absorption of energy, according to the law of the conservation of energy, is equal to the specific activation energy of the medium q in Mev/cm^3. The article derives the following formula:

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$$\vartheta\, ds d\Omega = \frac{q}{4\pi}\,\frac{\cos\theta}{\mu'}\, ds d\Omega_0 \qquad (4)$$

which is claimed to be simpler than the original equation, but not less accurate. Orig. art. has: 6 formulas

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NR REF SOV: 003 OTHER: 001

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L 64368-65 EWT(m)/EPF(n)-2/ENP(t)/ENP(b)/EWA(h) IJP(c) JD/WW/JG/DM

ACCESSION NR: AP5014534 UR/0089/65/018/005/0456/0459 38 B

539.172.13 + 539.17.015

AUTHOR: Nemilov, Yu. A.; Pavlov, V. V.; Selitskiy, Yu. A.; Solov'yev, S. M.; Eysmont, V. P.

TITLE: Total and differential cross sections for the fission of uranium and thorium by low-energy deuterons

SOURCE: Atomnaya energiya, v. 18, no. 5, 1965, 456-459

TOPIC TAGS: uranium, thorium, fission cross section, subbarrier deuteron, total cross section, differential cross section, fission fragment detection

ABSTRACT: By registering the fission fragments with glass plates, the authors were able to determine the total and differential cross sections for the fission of Th^{232}, U^{236}, U^{235}, and U^{238} by deuterons of energy much lower than the Coulomb barrier (6.6 MeV and below). Ordinary photographic plates were used, the emulsion serving as a protection for the surface. The targets were made by evaporating fluorides of uranium and thorium on thin silver substrates. The deuterons were accelerated in a cyclotron and their energy was determined accurate to 0.1 MeV. The experimental set-up is illustrated in Fig. 1 of the Enclosure. The results are compared with published data in which the cross sections have been obtained with

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semiconductor detectors at larger deuteron energies. The differential cross sections of all nuclei varied smoothly within a narrow range at the investigated deuteron energies. The anisotropy of the angular distribution was quite smooth in all cases, except that for U^{235} the angle distribution of the fragments had a maximum not at 0° but at 90° to the beam. Although the results did not differ greatly from those obtained by others, it is indicated that the reactions preceding fission of nuclei having different neutron fission thresholds and bombarded by subbarrier deuterons may differ noticeably from those at higher energies. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 23Jun64 ENCL: 01 SUB CODE: NP

NR REF SOV: 005 OTHER: 006

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L 64368-65
ACCESSION NR: AP5014534

ENCLOSURE: 01

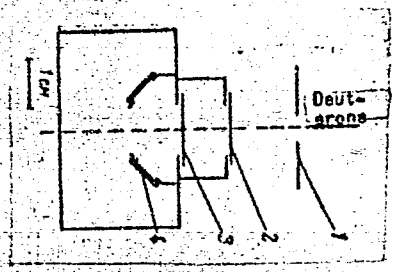

Fig. 1. Setup for the measurement of fission cross sections:

1 - Diaphragm, 2 - foils for the measurement of deuteron energy, 3 - target, 4 - glass plate to register the fission fragments.

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L 00748-67 EWT(d)/EWP(c)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACC NR: AP6022866 SOURCE CODE: UR/0145/66/000/002/0123/0127

AUTHOR: Pavlov, V. V. (Candidate of technical sciences, Docent)

24
23
B

ORG: None

TITLE: Locating structural elements during assembly 14

SOURCE: IVUZ. Mashinostroyeniye, no. 2, 1966, 123-127

TOPIC TAGS: structural engineering, construction, PRODUCTION ENGINEERING, MECHANICAL ENGINEERING

ABSTRACT: The author proposes a method for structural design where continuous contact is maintained between the adjacent surfaces of components by locking forces to keep them properly located. The spatial interrelationship between components is described with regard to the form and direction of motion in the presence or absence of a given degree of freedom. A component which cannot move in some single direction with respect to a base component is said to have a unit base which prevents the given displacement. A component devoid of all six degrees of freedom has six unit bases: three pairs preventing translational motion and three pairs preventing rotation. It is assumed that the unit base is equal to 1 if the component cannot move in a given direction and that the base is equal to 0 if the component is free to move in a given direction. This concept of the unit base is used for describing the interrelationship of adjacent components. A simple method is proposed for determining the effectiveness

UDC: 621.81.002.72

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PAVLOV, V.V.

Surface treatment of glass fiber as a method for a radical improvement of the properties of glass reinforced plastics (from reports of the 1959 Düsseldorf Plastics Fair). Plast.massy no.10:69-72
(Glass reinforced plastics)

PAVLOV V V

PHASE I BOOK EXPLOITATION SOV/4207

Penoplastmassy; sbornik statey (Foam Plastics; Collection of Articles) Moscow, Oborongiz, 1960. 182 p. Errata slip inserted. 5,050 copies printed.

Ed.: A.A. Moiseyev, Candidate of Technical Sciences, V.V. Pavlov, and M.Ya. Borodin; Managing Ed.: A.S. Zaymovskaya, Engineer; Ed. of Publishing House: I.A. Suvorova; Tech. Ed.: V.I. Oreshkina.

PURPOSE: This book is intended for engineers and technicians planning and manufacturing products and structures using lightweight fillers, and for workers of the foam plastic industry.

COVERAGE: The volume contains 13 studies on foam plastics and foaming agents. Some of the studies provide data on the technology of producing foam plastics from polystyrene and polyvinyl chloride, and data on thermosetting polymers (phenol rubber compositions, polyurethane foam, polyepoxy foam, and foam plastic sheets based on organic silicon resins). Other studies contain data on the composition of foam plastics, the effect of technological factors and volumetric weight on the physical, mechanical, and dielectric properties of foam plastics,

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successfully applied to the production of foam plastics but that the following are preferable: 1) N, N'-dimethyl-N, N'-dinitrosoterephthalamide 2) N, N'-dinitrosopentamethylentetramine 3) n, n'-oxy-bis (benzosulfonylhydrazide) and 4) azodicarbonamide.

Moiseyev, A.A., and T.F. Durasova. Foam Plastic Sheets Based on Polystyrene and Polyvinyl Chloride 19

Production of foam plastic sheets by the press and autoclave methods are described along with production from individual granules, as well as by mixing the composition on rollers. The technological process for the production of polystyrene and polyvinyl chloride foams is described giving the physical and mechanical properties of the foams. Soviet foam products are compared with those of Britain, the United States, East Germany and West Germany.

Rogov, L.V., and V.V. Pavlov. Production of Polystyrene Foam Based on Different Foaming Agents 45

This study presents experimental data on the physical and mechanical properties of polystyrene foam produced using four different foaming

agents. It describes the properties of the foaming agents, the composition of the foam plastic sheets, and pressing conditions for different compositions.

Foam Plastics; Collection of Articles SOV/4207

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