"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARENKOV, A.P.

Fuel Abstracts
Vol. 14 No. 4
October 1953
Industrial Furnaces,
Kilns, Etc.;
Combustion

3722. OPERATION OF AUTOMATICALLY CONTROLLED DRYERS AT KRASNOGORKOVSKY PLANT. Larenkov, A.P. (Ogneupory (Fireproof Int., Moscow), 1952, vol. 17, 440). Three years' experience with tunnel dryers is summarized. Automatic temperature regulation reduces fuel consumption by 20-25%. Costs will be compensated by fuel saving in 1-1.5 year. R.H. can be regulated to within ±2-4%. Dryers with automatic regulation of R.H. should be planned with 2 drying zones: (1) in which shrinkage takes place, with R.H. 70-80%; (2) in which no more shrinkage takes place, and only the air temperature should be regulated.

L.Com.R.E.I.

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LARENKOV A.P.

Increase of capacity of driers for heavy ceramics. I. M. Keller, Z. A. Smolyakova, and A. P. Larenkov. Translated in *Silikattech.*, 4 (4) 162-67 (1953); cf. *Ceram. Abstr.*, 1951, Nov., p. 202h; 1954, April, p. 73d. M.Ha.

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LAHENKOV, A.P.

Use of gas throttles. Ogneupory 19 no.5:232-233 '54. (MIRA 11:8)

1.Krasnogorovskiy zavod im. Lenina.
(Gas governors)

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LARENKOV, A.P.

USSR/Chemical Technology. Chemical Products and Their Application -- Silicates. Glass. Ceramics. Binders, I-9

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5241

Author: ~~Larenkov, A. P.~~

Institution: None

Title: Drying of Shaped Articles with a Large Amount of Heat Transfer Medium

Original Publication: Ogneupory, 1956, No 1, 32-34

Abstract: On drying of heavy and intricate chamotte bricks, produced by plastic forming, in accordance with conditions specified in the manuals (moisture content of heat transfer medium >70% and temperature ~70-90°), a considerable amount of rejects are obtained due to cracks and flaws caused by drop in moisture over the cross-section of the article and uneven shrinkage. To prevent rejects drop in moisture content between surface and center of the article must be minimal, which requires decreasing of the external and an increase of the internal diffusion of the moisture. In addition, under the above

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LARENKOV, A.P.

TSIGLER, V.D.; KAMINSKIY, V.K.; KUSHNERIK, N.I.; PANKRATOV, D.I.; LARENKOV, A.P.; EYSMOND, M.V.

Redesigning certain elements of low tonnage gas chamber kilns for burning dinas bricks. Ogneupory 21 no.3:107-114 '56. (MLRA 9:8)

1. Khar'kovskiy institut ogneuporov (for TSigler). 2. Krasnogorovskiy ogneupornyy zavod (for Kaminskiy, Kushnerik, Pankratov, Larenkov, Eysmond).

(Firebricks) (Kilns)

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ALEKSEYEV, I.A., STAROKON', V.A.; LARENKOV, A.P.

Automatic temperature control in tunnel dryers. Ogneupory 26 no.8:379-381 '61. (MIRA 14:9)

1. Krasnogorovskiy ogneupornyy zavod im. Lenina.
(Temperature regulators) (Kilns)

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Larenkova, L.V.

KHABIBULLIN, Sh.T.; LARENKOVA, L.V.

Observations of Abell's comet (1953g) and Schwassmann-Wachmann's (1954g) at the Engel'gardt Observatory. Astron.tsir.no.160:2-3 Je'55. (MLRA 8:12)

1. Astronomicheskaya observatoriya imeni Engel'gardta (Comets)

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

USSR / Human and Animal Morphology (Normal and Pathological). Methods and Technique of Investigation. S

Abs Jour : Ref Zhur - Biologiya, No 4, 1959, No. 16872

Author : Larev, N. V.; Lyun'kov, N. Ya.
Inst : Irkutsk Agricultural Institute
Title : On the Problem of Preparation of a Contrast Mass for Blood Vessels

Orig Pub : Izv. Irkutskogo s.-kh. in-ta, 1958, vyp 8, 192-196

Abstract : No abstract given

Card 1/1

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARSEN, I. F.

LARSEN, I. F. -- "Investigation of the Action of Drugs on Surface-Type Peat Deposits." Sub 17 Jun 52, Moscow Peat Inst. (Dissertation for the Degree of Candidate in Technical Sciences).

SO: Vechernaya Moskva, January-December 1952

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARGIN, I. F.

(1)

133, STRENGTH AND WATER ABSORPTION OF WOOD IN PINE STUMPS AND TRUNKS ENCOUNTERED IN PEAT DEPOSITS. Largin, I.F. (Torf. Prom. (Peat. Ind., Moscow) Jan. 1954, vol. 31, 18-21). Research for the benefit of designers of peat winning machines showed that strength depends on the state of preservation and moisture content of the wood. Strength increases gradually with decrease of moisture from 200 to 25%, then rapidly as the air-dried moisture content of 8 to 15% is attained. Equations and graphs are derived. (L).

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LARGIN, I.F., kand.tekhn.nauk

Correlation between the diameter of the trunk part and the dimensions of paws of pine stumps buried in peat deposits. Torf. prom. 36 no.8:26-29 '59. (MIRA 13:3)

1. Kiyevskiy torfyanoy institut.
(Peat)

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARGINA, M. I.

"A Study of Food Digestion and Metabolism (Nitrogen, Calcium and Phosphorus) of Milch Cows on Rations Containing a High Portion of Succulent Feed." Cand Agr Sci, Khar'kov Veterinary Inst, Khar'kov, 1954. (RZhBiol, No 2, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (13)
SO: Sum. No. 598, 29 Jul 55

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

USSR / Cultivated Plants. Grains. Legumes. Tropical Cereals. M-1

Abs Jour : Ref Zhur - Biologiya, No 2, 1959, No. 6236

Author : Largskiy, Yu. N.
Inst : Voronezh Agricultural Institute
Title : Application of Fertilizers According to the Maltsev Method of Soil Cultivation for Corn and Winter Wheat

Orig Pub : Zap. Voronezhsk. s.-kh. in-ta, 1957, 27, No 2, 349-355

Abstract : Experiments comparing the effect of fertilization in conjunction with plowing without moldboard on 40 cm and with moldboard on 32 cm on leached out thick chernozem on Voronezh hybrid corn and Stepnaya 135 winter wheat were carried out at the field experimental station, Voronezh

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARCSKIY, Yu. N., Cand Agr Sci--(diss) "Effectiv~~ity~~ of fertiliz~~ation~~ for corn and winter wheat in d~~ump~~ and non-d~~ump~~ plowing on lixiviated chernozem." Voronezh, 1958. 19 pp (Min of Agr USSR. Voronezh Agr Inst), 150 copies (KL,30-58,129)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARGU, Gheorghe

On Iasi construction sites. Constr Buc 15 no.697:4 18 My '63.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARGU, Gh.

Again the Iasi scenery. Constr Buc 16 no.731:1 11 Ja '64.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARGU, Gheorghe

The trademark of the factory, the guaranty of good quality. Constr Buc 16 no.753:2 13 Je '64.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARGU, Gh.

Scrap iron for steel mills. Constr Buc 16 no.767:4 19 September '64.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

CHIRULESCU, M., ing.; PLOSTINARU, D.; LARGU, Gh., corespondent; CALIS, Reghina, corespondenta; BARBALATA, St.

News. Constr Buc 16 no.775:1 14 N '64.

1. Head of Construction Site No.601, Tirgu Jiu (for Chirulescu).
2. Galati Branch of the Voluntary Editorial Office of "Constructorul" (for Barbalata).

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

BARBALATA, Stanciu, economist; LARGU, Gheorghe; DORU, T., corespondent

New cadres for the 1965 tasks. Constr Buc 17 no.783:4
9 Ja '65.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARGU, Gheorghe, corespondent

Material stimulants. Constr Bue 17 no.784:1 16 Ja '65.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

SANDA, Constantin, coresp.; LARGU, Gheorghe, coresp.; IONASCU, Iulian, coresp.; PUSTAI, Aurel, coresp.; OROSZ, Andrei

Our leaders, our pride. Constr Buc 17 no.788:1,4 13 F '65.

1. Chairman of the Trade-Union Committee of Construction Site 501, Brasov, of Trust No.5. (for Orosz).

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARI, I.

Considerations on the concept of boring. Petrol si gaze 12 no.8: 354-358 Ag '62.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARI, I., ing.

Aspects of the development in drilling techniques. Petrol si gaze 14 no.1:10-15 Ja '63.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARI, I.

Considerations on the drilling ability. Petrol si gaze 12 no.8:354-358 Ag '61.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARI, I., ing.

Cybernetic interpretation of the work of drilling turbines.
Petrol si gaze 14 no.9:421-427 S'63.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARI, I.; STEFANESCU, D.

Aspects of mathematica logic in analyzing the information on geophysical properties of geologic formations. Petrol si gaze 15 no.2:49-53 F '64.

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

KUNIN, L.L.; IZMANOVA, T.A.; LARICHES, N.S.

Apparatus for determining the amount of hydrogen separated during the conservation of specimens. Sbor. trud. TSNIICHM no.31:110-113 '63. (MIRA 16:7)

(Metallurgical analysis--Equipment and supplies)
(Gases in metals--Analysis)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

29542
S/089/61/011/005/007/017
B102/B101

26.2246

AUTHOR: Larichev, A. V.

TITLE: Spectral and angular distributions of gamma rays from a plane monodirectional Co^{60} source, scattered in iron

PERIODICAL: Atomnaya energiya, v. 11, no. 5, 1961, 443-445

TEXT: Angular and energy distributions of gamma quanta scattered in a plane iron shield were measured by means of a total-absorption spectrometer with cylindrical NaI(Tl) 80 mm in height and diameter. The measuring method is described in Ref.4: Ye. L. Stolyarova et al. (Apparatuses and methods of radiation analysis), Sbornik nauchnykh rabot MIFI, no. 3, M., Gosatomizdat, 1961. The results are graphically presented. Fig. 1 shows the energy distribution of the Co^{60} gamma radiation scattered in a 15.6 cm thick iron sheet. This thickness corresponds to 6 mean free paths. Fig. 2 shows the angular distributions relative to the intensities of the nonscattered radiation for three barrier thicknesses. The intensity of scattered radiation depends exponentially from the scattering angle: $I(\theta) = I(0)\exp(-\theta/\theta_0)$. In a

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semilogarithmic coordinate system, the measured intensity values fit the theoretical straight lines rather well. Fig. 4 shows the angular dependence of the intensity of the scattered gamma radiation in a solid angle of $2\pi \sin\theta\Delta\theta$ for three barrier thicknesses. The energy build-up factors were found to be increasing linearly with increasing barrier thickness $\mu_o x$. The theoretical straight line calculated by the Monte-Carlo method lies somewhat above the experimental one but within the error limits, since the theoretical error amounts to ~8%. There are 5 figures and 7 references: 3 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: G. Whyte, Canad. J. Phys., 33, 96 (1955); J. Hubbell, E. Hayward, W. Titus. Phys. Rev. 108, 1361 (1957); H. Goldstein, J. Wilkins. Calculations of the penetration of gamma-rays. US. AEC, No.40/3075, 1954; M. Berger, J. Doggett. J. Res. Nat. Bur. Standards, 56, No. 2 (1956).

SUBMITTED: March 13, 1961

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

45445
S/892/62/000/001/007/022
B102/B186

26.2545

AUTHORS: Larichev, A. V., Mitin, V. I.

TITLE: Build-up factors of soft gamma-ray dose in aluminum

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 55-56

TEXT: The authors measured the energy dependence of the dose build-up factors for gamma point sources in the range 0.145-0.66 Mev. The measurements were made with the mono-energetic sources Ce^{141} (E_γ=0.145 Mev, 30 mc), Hg^{203}(E_γ = 0.279 Mev, 20 mc), and Cs^{137}(E_γ = 0.661 Mev, 5 mc). A compensated scintillation gamma dosimeter served as gamma-ray detector. The shields in which the build-up factors were measured were aluminum sheets 750·750 mm in size and with the optical thicknesses $\mu_0 r$=1,2,3,4; μ_0 is the gamma-ray absorption coefficient, and r the thickness. The build-up factor was determined from the ratio of the dosimeter indications, with ($P(\mu_0 r)$) and without (P_0) shield: $Br(\mu_0 r) = P(\mu_0 r)/P_0 e^{-\mu_0 r}$. The

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Build-up factors of soft ... S/892/62/000/001/007/022
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results obtained agree closely with the experimental data available.
There is 1 figure.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

45447
S/892/62/000/001/009/022
B102/B186

26.2246

AUTHORS: Larichev, A. V., Levchenko, V. P., Osanov, D. P.

TITLE: The effect of channels in the shield on the attenuation of the gamma radiation of extended sources

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dosimetrii i zashchity ot izlucheniy, no. 1, 1962, 66-73

TEXT: The effect of conical or cylindrical shield channels is calculated for γ-ray sources in the shape of a truncated cone or of a line. In the case of the truncated cone covered with a shield containing the conical channel, the dose rate at point A is calculated by

$$P(\alpha, \mu l) = \frac{2\pi k q}{\mu_0 H}(1 - \cos\alpha - \Phi(\mu_0 H) + \cos\alpha\{\Phi(\mu l \sec\alpha) - \Phi[(\mu l + \mu_0 H)\sec\alpha] + \Phi(\mu_0 H \sec\alpha)\} + \cos\phi\{\Phi[(\mu l + \mu_0 H)\sec\phi] - \Phi(\mu l \sec\phi)\}), \quad (1)$$

$\mu_0 H = 1, 3 \text{ и } 5;$
$\mu l = 0{,}5, 1, 2, 3 \text{ и } 5;$
$\phi = 30°, 45°, 60° \text{ и } 90°;$
$\alpha = 5°, 10°, 20° \text{ и } 30°.$

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The effect of channels in the ...

k is the gamma constant of the isotope, q the specific source activity and $\Phi(x)$ King's function. The μt-dependence of the reduced dose rate ε obtained for $\mu_0 H=1$ is shown in Fig.1; $P(\alpha=0,\mu t)$ denotes the dose rate at A without shield channel. $\varepsilon(\alpha)$ is also calculated. For a linear source and a cylindrical channel the reduced dose rates

$$\varepsilon = \frac{P}{P_0} = \frac{\int_a^\infty e^{-\mu t'(\alpha)} d\alpha}{\int_a^\infty e^{-\mu t(\alpha)} d\alpha}; \quad (2) \qquad \varepsilon' = \frac{P'}{P_0'} = \frac{\int_a^\infty B(t') e^{-\mu t'(\alpha)} d\alpha}{\int_a^\infty B(t) e^{-\mu t(\alpha)} d\alpha}. \quad (3)$$

are calculated, where P and P' are the dose rates at any point behind the shield, without and with γ-ray scattering taken into account; P_0, P_0' denote these dose rates if no channel exists; $t(\alpha)$ and $t'(\alpha)$ are the γ-ray path lengths without and with channel $t(\alpha)=t_0 \sec\alpha$, t_0 is the shield thickness; μ is the linear γ-ray attenuation factor; $B(t)$, $B(t')$ are the dose build-up factors. Numerical calculations were made for μt_0 = 1,3,5, μR = 0.2, 0.5, 0.7, 1.0, and 3.0 and θ = 30, 60 and 90°; θ is the angle

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between channel axis and shield plane. For lead, steel and water and Co^{60} γ-rays (1.25 Mev) the theoretical results were partly compared with experimental data. For $\theta=90^{\circ}$ agreement was close, for 60° a divergence was observed due to γ-ray reflections from the channel walls. There are 8 figures.

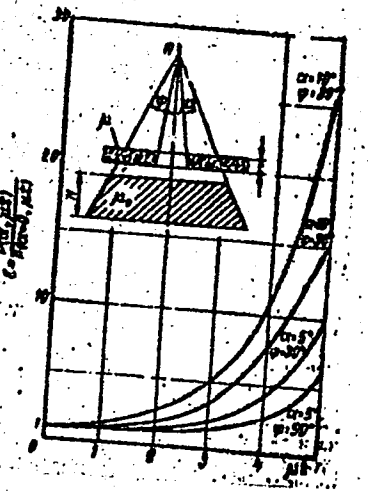

Fig. 1

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45449
S/892/62/000/001/012/022
B102/B186

AUTHORS: Larichev, A. V., Levchenko, V. P.

TITLE: Scintillation gamma dosimeter with compensation of the hardness dependence

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 81-85

TEXT: The authors have developed a scintillation dosimeter whose crystal (stilbene, 30·11 mm) is a standard one provided with KI(Tl) for compensating the energy dependence of the instrument's indication. The dosimeter consists of three blocks: (1) crystal plus ФЭУ-29(FEU-29) photomultiplier, (2) the measuring unit, and (3) the high-voltage power-supply unit ВС-16 (VS-16) for the multiplier. (2) consists of a cathode voltmeter with a 6Н1П (6N1P) tube with integrating RC-circuits at the input; a micro-ammeter (100μa) serves as indicator. With 1 kv on the FEU-29, the sensitive range is from 0-0.45 mou/sec, the coarse range from 0 - 450 mou/sec. The added KI(Tl) compensating plate has the dimensions 40 mm^2 x 0.3 mm, and is glued onto the upper face of the crystal. The

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Scintillation gamma dosimeter ... S/892/62/000/001/012/022
B102/B186

apparatus has been checked by comparing its indications with those of a reference dosimeter. There are 2 figures.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

45456

S/892/62/000/001/019/022
B102/B186

21.6000

AUTHORS: Cherevatenko, G. A., Larichev, A. V.

TITLE: A scintillation spectrometer for investigating the angular spectral distributions of electron bremsstrahlung

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 125-130

TEXT: A scintillation spectrometer, with a NaI(Tl) crystal of 80·80 mm, designed for investigating the electron bremsstrahlung spectrum, is described. It consists of four main units: the transmitter unit, the amplifier, the pulse height analyzer, and the electron supply for the photoelectronic multiplier. The transmitter unit, which was specially designed and is not of standard type, contains the spectrometer unit, the preamplifier, a lead casing with the collimator, and the adjusting dolly. The spectrometer unit contains the NaI(Tl) crystal, an ФЭУ-1Б (FEU-1B) multiplier, and a voltage divider for supplying the FEU electrodes with the necessary potentials. Everything is enclosed in a steel vessel of 2 mm wall thickness that shields the FEU against light, electromagnetic

Card 1/2

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A scintillation spectrometer for ...

fields and mechanical damage. A 40 mm wide window closed with thick black paper serves for gamma-ray transmission. The light flash, whose intensity is proportional to the energy absorbed, is converted into a voltage pulse which is fed directly from the FEU to the preamplifier. The latter consists of six tubes connected via four functional cascades, the first and the last being double-tube cathode followers. The second and third cascades serve for amplifying. The lead housing of the collimator serves as a shield against scattered radiation and has a wall thickness of at least 150 mm; its front part, directed against the source, is 300 mm thick. The housing consists of rings of 55 kg weight each; its total weight amounts to about two tons. The collimators used in the apparatus have aperture diameters of 10, 20, and 30 mm and can be selected according to the type of measurements being taken. The inner diameter of the housing is 160 mm; its length can be varied up to 700 mm, so that larger crystals and multipliers can also be used. The adjusting dolly serves for shifting the transmitter unit in all three directions. There are 3 figures.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

24.6500

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

AUTHORS: Larichev, A. V., Laricheva, V. V.

TITLE: Inversion of the matrix of the sensitivity function of a scintillation spectrometer

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 150-155

TEXT: The corrections for Compton distribution, photoefficiency, collimator solid angle, and low-energy γ-ray absorption, necessary in the transition from the apparatus pulse-height spectrum to the true γ-ray spectrum measured with a single-crystal scintillation spectrometer, have already been calculated by Yu. A. Kazanskiy (Pribory i tekhnika eksperimenta, no.4, 32, 1959). He obtained the correction formula by means of the original matrix of the Compton contributions. Since this method is cumbersome and not free from errors, the authors here use the inverse complete matrices of the sensitivity function (cf. Collection: Pribory i metody analiza izlucheniy, no.3, Gosatomizdat 1961) for calculating the correction for a spectrometer with an 80·80 mm NaI(Tl)

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Inversion of the matrix of the ..

crystal and a collimator 300 mm in length and 20 mm in diameter. The relation obtained for the normalization of the Compton distribution for one incident photon equals that given by J. Hubell (Rev.Sci.Instrum.,29, no.1,65,1958): $p_k = N_k/N_o = \varepsilon - \varepsilon p_{ph}$. If the multiplication of the photons (factor Ω_{eff}/Ω_o) due to transmission effects and their reduction in number (factor $e^{-\mu_1 d}$) due to absorption is taken into account, the correction function becomes $\varepsilon'' = p''_{ph}\varepsilon'' + p''_k = \varepsilon(\Omega_{eff}/\Omega_o)e^{-\mu_1 d}$, and therefore $p''_k = \varepsilon'' - \varepsilon'' p_{ph}$. The latter relation serves for normalising each element of the Compton distribution of the original matrix. As an example, the original and inverse total matrices are given for E_γ = 600 kev. The results agree closely with those obtained by E.Rawson and D.Cormak (Nucleonics,16,no.10,92,1958) and J.Kockum (Nucl.Instrum. 4,no.3,171, 1959). The inverse matrix is characterized by the following properties: (1) it is triangular; (2) each diagonal element is the inverse of the corresponding element of the original matrix; (3) all its diagonal elements are positive and most of its off-diagonal elements negative;

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

S/796/62/000/003/003/019

AUTHORS: Larichev, A. V., Klimanova, L. F.

TITLE: Angular and energy distributions of Co^{60} γ-rays scattered in a heterogeneous Al+Pb medium.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no.3. 1962, 37-46.

TEXT: An experiment pertinent to reactor shielding is described. In γ-rays having energies of 0.5 to 10 mev the most probable interactions with matter are the photoeffect, scattering, and pair formation. In low-atomic-number matter scattering predominates, i.e., the energy and direction of motion of the γ-rays is altered; hence, it is necessary to know the angular and energy distribution of γ-rays. The characteristic quantity used is the γ-ray quantum flux density N, which is the number of γ-quanta ithin a given energy interval which move in the direction of a prescribed vector within a prescribed solid-angle element and which intersect a unit area located at a given point in space normal to said vector in a unit time. This quantity is employed in the angular energy distribution (cf. Goldstein, H., et al., U.S.AEC Report no.3075, 1954 //Abstracter's Note: probably NYO-3075, 1954 //). The same quantity multiplied by the energy provides the so-called angular radiation-intensity distribution. From an integration of each of theses quantities one may arrive at the radiation-accumulation (storage) factors by dividing by the integration of the non-scattered radiation. The present experiment investigates the

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Angular and energy distributions of Co^{60} γ-rays... S/796/62/000/003/003/019

angular energy distributions of 1.17 and 1.33 -mev γ-rays from a plane single-directional Co^{60} source following transition through heterogeneous shielding barriers made of Pb and Al. A 470-mcurie Co^{60} source was placed at 2 m from the flat shielding barrier, which consisted of Pb and Al sheets 75x75 cm of various thicknesses (Pb 2 and 3 cm, Al 6.7 and 13.4 cm) and with Pb+Al and Al+Pb pairings. Measurements were made at 0, 10, 20, 40, and 60° by a scintillation spectrometer with a single NaI(Tl) crystal (70x50 mm). A collimator 300 mm long, with a 20-mm aperture, was used. It is shown that the heterogeneous shield retains the following characteristics of homogeneous shielding: (1) The position of the maximum of a γ-radiation scattered at a given angle θ corresponds to the value of the energy of a radiation scattered singly through an angle θ; (2) the exponential dependence of the intensity of the scattered radiation on the angle θ obtains regardless of the arrangements of the sheets. The arrangement of the sheet does affect substantially the magnitude of the intensity (which grows with increasing angle), which leads to different energy-accumulation factors for alternate sheet arrangements. A comparison is made between the subject experimental results and the theoretical calculations of Goldstein-Wilkins cited on Card 1/2. Good agreement obtains for pure Pb and the Al+Pb combination; for Pb+Al the experimental values exceed the theoretical. Additional experimental work is in progress to ascertain the validity of the assumptions made in Rockwell's, Price's et al., books on reactor shielding re the practical calculation of accumulation factors in heterogeneous media. 9 figures, 10 references
Card 2/2 (2 Russian-language Soviet and 8 English-language).

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

S/796/62/000/003/004/019

AUTHORS: Larichev, A.V., and Cherevatenko, G.A.

TITLE: Investigation of the sensitivity of the single-crystal scintillation γ-spectrometer with an 80x80-mm NaI(Tl) crystal.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izluchenly. no.3. 1962, 47-52.

TEXT: A difficulty encountered in the interpretation of the instrument spectra (amplitude distribution of the impulses) is attributed to the separate contributions of each spectral component (e.g., in a composite or continuous spectrum) at the spectrometer output, so that the observed amplitude distribution, N(E), is related to the true γray spectrum, f(E), by a Fredholm integral equation, the kernel of which is a function of the spectrometer sensitivity (cf. Berger, M., et al., NBS J. Res., v.56, no.6, 1956, 335). The individual basic characteristics of the spectrometer sensitivity are identified. In thick crystals (one or more free paths thick) the approximate calculation method (Maeder, D., et al., Helv. Phys. Acta, v.27, no.1, 1954) is not applicable and the Monte Carlo method requires laborious high-speed-computer work. Experimental investigation appears most practical. The work defined in the title employed a crystal and a photomultiplier housed in a Pb housing with a 300-mm long and 20-mm diam collimator. The impulses issuing from the photomultiplier, via a linear amplifier, passed into a 100-channel amplitude analyzer. Lead filters were used to minimize the effects of self-scattering within the

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source and other nearby objects. The γ-ray spectra of Hg^{203}, Au^{198}, Cs^{137}, Zn^{65}, and Na^{24} isotopes were measured. The energy resolution, as defined by the width of the peak at its midheight divided by the peak energy, was measured, and a linear variation of the resolution with the square root of the energy was found (cf. Koch, H., Foote, R., Nucleonics, v. 12, no. 3, 1954, 51). The photocontribution (ratio of the area underneath the total-absorption peak and the total area underneath the amplitude distribution) was measured; the test points lie slightly below the curve defined by Berger's semiempirical formula. A numerical matrix of the contribution due to Compton scattering of the γ-rays is computed by interpolation of the experimental spectra of 279, 411, 661, and 1120 kev γ-lines is shown (full page). Prior to interpolation all experimental continua were normalized for one impulse in the total-absorption peak and for a 1-kev energy interval. The validity of this matrix construction and the accuracy of an elaboration of spectra with the aid of this matrix remains to be verified by analyzing some real spectrum in the 40-to-1400 kev energy range. The results of one such analysis of the instrument spectrum of the γ-rays of a Co^{60} isotope (1170 and 1330 kev energies), in comparison with the summary continuum of both γ-lines as obtained according to the matrix, is graphically depicted, and the result is found to be favorable. There are 4 figures (counting the matrix) and 4 references (1 Russian-language Soviet, 2 English-language U.S., and 1 Swiss of undetermined language; probably English).

ASSOCIATION: None given.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

S/796/62/000/003/018/019

AUTHORS: Stolyarova, Ye. L., Chukhin, S.G., Larichev, A.V.

TITLE: Equipment for the measurement of complex low-intensity γ-spectra.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no.3. 1962, 181-185.

TEXT: A single-crystal scintillation γ-spectrometer was assembled for the experimental investigation of the passage of γ-rays through matter. A block diagram is shown. The remote portion of the spectrometer consists of a NaI(Tl) crystal, 80x80 mm, and a photoelectronic multiplier (PhM) ФЭУ-1Б (FEU-1B) with a 70-mm diam cathode, all enclosed in a Pb housing. The side shield of the housing, assembled of interlocking Pb bricks, is no less than 150 mm, that of the frontal wall (the collimator)no less than 300 mm thick. Collimators of 10, 20, 30, and 50-mm diam can be inserted for work with sources of various intensities (cross-section shown). The pulses pass from the anode load of the PhM to a zero-overload preamplifier and then onto the linear amplifier of the "Kashtan" equipment. A 100-channel analyzer is utilized. A special voltage divider serves to feed the electrode of the PhM with independent potential regulation on several electrodes (focusing system) to enhance the energy resolution. For example, for γ-rays of Cs^{137} (0.661 mev) a 9.5% energy resolution is attained, which is comparable to that

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reported by J. Kockum (Nucl. Instrum., v. 4, no. 3, 1959, 171). The use of a large NaI(Tl) crystal ensures an elevated registration effectiveness (80% for 1-mev γ-rays, no less than 50% for 10-mev γ-rays); the heavy shielding reduces the background to about 15 pulses/sec. The stability of the equipment is good: 1.5-2% variation per day on the energy scale. The energy peak is also highly load-stable; a change in integral count from 500 to 5,000 pulses/sec engenders a shift in the peak of less than 2%. The instrument thus offers good promise for the measurement of complex γ-spectra over a broad range of energies and intensities, the measurement of the spectra of scattered γ-rays, and the performance of quantitative and qualitative isotope analysis, etc. A comparison is made between the elaboration of the amplitude spectrum of the γ-rays of equilibrium radium for Compton distribution as measured on the present equipment and D. Peirson's measurements (Nature, v. 173, 1954, 990); the individual lines obtained with the present equipment are found to be defined more sharply. Spectra of the intensity of γ-rays from a Co^{60} source, scattered at angles of 20, 50, and 70° in a 16-cm thick Fe barrier, are also shown. There are 7 figures and the 2 above-cited English-language U.S. references.

ASSOCIATION: None given.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

S/796/62/000/003/019/019

AUTHORS: Larichev, A. V., Cherevatenko, G. A., Yakshin, V. V.

TITLE: On the sensitivity function of a scintillation spectrometer relative to γ-rays with a maximal energy of 5 mev.

SOURCE: Moscow. Inshenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no.3. 1962, 186-190.

TEXT: The experimental determination of the total sensitivity function of a Soviet-made scintillation spectrometer with an 80x80-mm NaI(Tl) crystal is described. The objective of the study is the quantitative determination of the energy dependence of the instrumental shape of the total-absorption peak and the continuous Compton distribution for a given energy interval. The crystal and the ФЭУ-1Б (FEU-1B) photoelectronic multiplier (PhM) were placed in a Pb housing with a 300-mm long and 20-mm diam collimator. The γ-ray source was placed on the collimator axis, at a distance of 75 cm from the crystal surface. Upon preamplification and linear amplification, the amplitude analysis was performed on a АИ-100-1 (AI-100-1) 100-channel amplitude analyzer. The sources employed were: Hg^{203} (0.279 mev); Au^{198} (0.411 mev); Cs^{137} (0.661 mev), Zn^{65} (1.14 mev); Na^{24} (2.76 mev) and a Po+Be source (4.45 mev). The energy dependence of the energy resolution (midheight width of total-absorption peak divided by the amplitude of the peak)

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On the sensitivity function of a scintillation spectrometer. S/796/62/000/003/019/019

is plotted; the curve concurs qualitatively with that of H.Koch et al. (Nucleonics, v. 12, 1954, 51) and is quantitatively comparable to foreign data on crystals of similar dimensions. The energy dependence of the photoeffectiveness and of the photocontribution (ratio of the area underneath the total-absorption peak to the total area underneath the amplitude distribution) is also plotted and compared to the values computed according to the semiempirical formula of M.Berger et al (NBS J.Res., v.56, 1955, 355). The Compton contribution for γ-rays with a maximal energy of 5 mev is shown in matrix form normalized to one impulse registered in the total-absorption peak for 5-mev γ-rays and a 1-kev energy interval. To verify the correctness of the matrix qualitatively, the amplitude spectrum of the γ-rays of equilibrium radium was taken and elaborated to obtain the total sensitivity function. The radium spectrum, elaborated by means of the inverse matrix, is shown in the form of a histogram. Agreement between histogram and the instrumental spectrum is reasonably good (strictly speaking, the matrix of the sensitivity function is intended for the processing of continuous spectra). Thus, all necessary elements of the total sensitivity function of a specrometer for the consideration of the equipment effects in the instrumental spectra are obtained for a maximum energy of 5 mev. There are 4 figures and 3 references (1 Russian-language Soviet - the authors' paper on pp. 47-52 of the present compendium, Abstract S/796/62/000/003/004/019 - and the 2 English-language references cited in the text of the present abstract.

Card 2/2 ASSOCIATION: None given.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, A.V.; OSANOV, D.P.; POPOV, V.I.

Spectral composition of γ-radiation from homogeneous cylindrical sources. Atom. energ. 13 no.2:145-151 Ag '62. (MIRA 15:8)
(Gamma rays—Spectra)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

S/2892/63/000/002/0040/0046

ACCESSION NR: AT4021249

AUTHOR: Larichev, A. V.

TITLE: On the question of the distribution of scattered γ radiation intensity behind protective screens

SOURCE: Vosprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 40-46

TOPIC TAGS: γ radiation, energy scattering, protective screen

ABSTRACT: The author acknowledges in literature that there are designs for protective screens for various installations, but he also notes that these are applied only to the so called standard geometries of radiation sources and protection media. His goal was to investigate the spatial distribution of γ rays from bounded parallel beams scattered in a protective barrier. Previously attained experimental data on the spectral and angular distribution of scattered γ rays was the starting point for this work. The dependence of the constant A on the thickness of the protective barrier can be defined by known factors of the inclination of B_E for a plane unidirected source from the following equation:

$$\frac{A}{I_0 0} = c\,(E_\gamma, Z)\,(B_E - 1), \qquad (4)$$

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where

$$c(E_\gamma, Z) = \frac{1 + \Theta_0^2}{2\pi\Theta_0[\Theta_0 - \exp(-\pi/2\Theta_0)]}$$

(A and Θ_0 are constant values). In addition to being able to estimate the factors of inclination for a bounded parallel beam of the above type, the author, through a series of mathematical arguments, is able to attain the change of factors with the distance from the barrier and estimate the intensity of the scattered radiation at those points of space where nonscattered radiation is absent. The author uses this case to express his thanks to O. I. Leypunskiy for valuable advice in the discussion of the results of the article. Orig. art. has: 9 formulas, 2 figures, and 1 table.

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

SUBMITTED: 00 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: PH, NS NO REF SOV: 005 OTHER: 000

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APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, A.V.; MITIN, V.I.

Energy dependence of the angular distribution constant of scattered γ-rays. Vop. dozs. i zashch. ot izluch. no.2:47-50 '63. (MIRA 17:3)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

ACCESSION NR: AT4019052 S/0000/63/000/000/0214/0217

AUTHOR: Larichev, A. V.

TITLE: Investigation of the spectral and angular distribution of Gamma rays after passage through a shield

SOURCE: Voprosy* fiziki zashchity* reaktorov; sbornik statey (Problems in physics of reactor shielding; collection of articles). Moscow, Gosatomizdat, 1963, 214-217

TOPIC TAGS: nuclear reactor, reactor shielding, Gamma ray, Gamma ray spectral disturbance, Gamma ray angular distribution, point source, isotropic source, homogeneous shielding, heterogeneous shielding, planar source

ABSTRACT: The angular distribution of γ radiation after penetrating through homogeneous and heterogeneous shielding was investigated as a function of the γ-ray energy using the experimental arrangement described in Ye. L. Stolyarova et al. (Pribory* i metody* analiza izlucheniy, No. 3, Moscow, Gosatomizdat, 1962). The γ-ray sources (Au^{198}, Co^{60} and Na^{24}) were either pointlike and isotropic or planar and unidirectional. Shielding barriers were made from lead, iron, aluminum and combinations of two of these materials. The angular distribution of the γ-rays as a function of energy for a homogeneous material (Pb, $\mu_0 x = 6$) can be

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represented by:

$$I(\theta) = Ae^{-\theta/\theta_0}, \quad (1)$$

where A and θ_0 are constants and θ does not depend on the thickness of the barrier. In the case of lead, the constant A is proportional to the energy storage factor given by

$$B_E - 1 = kA\frac{\theta_0^2}{1+\theta_0^2}\left[1 - \frac{1}{\theta_0}e^{-\pi/2\theta_0}\right] \quad (2)$$

The angular distribution of the γ radiation for two-layer barriers (Pb + Al and Al + Pb) for point and planar sources is given in Fig. 1 of the Enclosure. It can be seen that eq. (1) retains its validity for the case of a planar unidirectional source, although a change in the order of the layers influences the slope of the logarithmic lines. For a pointlike isotropic source, eq. (1) is not satisfied in the case of a two-layer barrier. Better agreement with experimental results is obtained from the relation:

$$2\pi \sin\theta d\theta\, I(\theta) = ae^{-\theta/\theta_0}. \quad (3)$$

The energy storage factor was also found to depend on the total thickness of the barrier. Orig. art. has: 5 figures and 3 formulas.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

ACCESSION NR: AT4019052

ASSOCIATION: none

SUBMITTED: 14Aug63 DATE ACQ: 27Feb64 ENCL: 01

SUB CODE: NP NO REF SOV: 006 OTHER: 002

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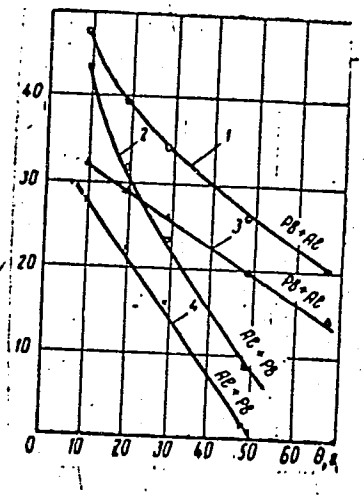
ACCESSION NR: AT4019052

ENCLOSURE: 01



Intensity of the radiation scattered in a 2-layer barrier for point (1, 2) and planar (3, 4) sources.
Abscissa = θ in degrees.

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ACCESSION NR: AT4021257 S/2892/63/000/002/0100/0108

AUTHOR: Kovalev, Ye. Ye.; Larichev, A. V.

TITLE: The problem of protection against electrons and bremsstrahlung from the outer radiation belt of the Earth

SOURCE: Moscow. Inzh.-fiz. institut. Voprosy* dozimetrii i zashchity* ot izlucheniy (Problems of dosimetry and radiation protection), no. 2, 1963, 100-108

TOPIC TAGS: radiation belt, cosmic radiation, radiation protection, beta ray, bremsstrahlung, space flight, electron stream

ABSTRACT: The authors note that in recent times information on full electron streams and spectrum in the Earth's outer radiation belt has undergone considerable modification. It has been found that previous estimates of the full electron streams in the outer radiation belt, based on radiation-counter tests, were approximately 1,000 times too high. The purpose of the present article is to review problems of protection against the electrons and bremsstrahlung of the outer radiation belt in the light of the new information available with respect to the streams and the spectrum of the electrons. The authors consider the radiation hazard to the astronaut (and, concomitantly, the shielding requirements of the capsule) in terms of the new data and analyze the contribution of the electrons

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and the bremsstrahlung, respectively, to the over-all dose past the shielding. A model is proposed for this purpose, based on several simplifying assumptions (an isotropic spherical source of bremsstrahlung), and an equation is written for the intensity of the dose in the center of the cabin. Tables are given, showing the relative contributions of various spectral components of the bremsstrahlung and other parameters as well. It is established that the greatest contributions to the dose intensity of outer belt electron bremsstrahlung are made by electrons with energies of 0.05-0.3 Mev. The data presented refer to a space-capsule wall constructed of a material with thickness $d = 0.1\text{-}10$ g/cm^2 and atomic number Z (in the particular case of carbon $Z = 6$, but the data may easily be extrapolated to other light substances by multiplying the values given by $Z_{eff}/6$). In the second section of the article, the estimates derived for the bremsstrahlung doses are supplemented by a calculation of the doses of penetrating electrons of the outer belt. The author establishes the fact that the intensity of the electron dose decays very rapidly as the thickness of the shielding increases. With a shielding thickness of $d \leq 1.0$ g/cm^2, by far the greatest part of the dose is due to electrons which penetrate through the shielding; at $d > 1 - 2$ g/cm^2, the dose is determined entirely by bremsstrahlung. In conclusion, the authors offer certain practical considerations with respect to radiation protection in the outer belt, emphasizing two fundamental requirements: 1) for reduced bremsstrahlung generation, the shielding must be manufactured of a material with a low atomic number;

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2) for increased bremsstrahlung absorption, the shielding must be manufactured of a material with a high atomic number. The authors note that these conditions are satisfied by a combined shielding, consisting, for example, of a layer of low-Z material (outer layer) and a layer of high-Z material (inner layer). Orig. art. has: 7 formulas and 7 tables.

ASSOCIATION: INZH.-FIZ. INSTITUT, MOSCOW (Engineering Physics Institute)

SUBMITTED: 00 DATE ACQ. 06Apr64 ENCL: 00

SUB CODE: SV, LS NO REF SOV: 009 OTHER: 003

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B108/B186

AUTHORS: Doroshenko, G. G., and Larichev, A. V.

TITLE: Counting efficiency method of studying continuous fast-neutron and gamma spectra

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 1, 1963, 141-146

TEXT: This paper deals with a new method of spectroscopy, which utilizes the high efficiency of a scintillation detector and by one order of magnitude reduces the time required to collect information by the usual method of measuring the differential spectrum of the charged particles. The new method is based on the known dependence of ε the absolute counting efficiency on E the energy of the fast neutrons of gammas and B the energy threshold of the counter. The integral count rate N_i is related to f(E) the differential spectrum sought by the equation $N_i = \int_{E_{min_i}}^{E_{max}} f(E)\varepsilon_i(E)dE$.

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Counting efficiency method of ...

The subscript i at N, E_{min}, and ε indicates the given form of counting efficiency. The best results were obtained when f(E) was represented in the form of a polygon: $f(E) = \sum_{k=1}^{n} f_k(\eta(E-E_k) - \eta(E-E_{k+1}))$ where $\eta(E) = 1$ for $E \geqslant 0$ and $\eta(E) = 0$ for $E < 0$. Results obtained with this method agree well with other experimental data. This paper was read at the 12. Annual Conference on Nuclear Spectroscopy, Leningrad, January 26 - February 2, 1962. There are 6 figures.

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ACC NR: AM6001040 Monograph UR/

Bobkov, V. G.; Demin, V. P.; Keirim-Markus, I. B.; Kovalev, YE. YE.; Larichev, A. V.; Sakovich, V. A.; Smirennyy, L. N.; Sychkov, M. S.

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Radiation safety during space flights (Radiatsionnaya bezopastnost' pri kosmicheskikh poletakh) Moscow, Atmizdat, 1964. 370 p. illus., biblio. 1700 copies printed. B+1

TOPIC TAGS: cosmic radiation, solar radiation, space radiation hazard, radiation safety, radiation belt, radiation dosimetry, radiation protection, solar corpuscular radiation, nuclear energy, nuclear propulsion engine

PURPOSE AND COVERAGE: This monograph may be of interest to persons concerned with problems of radiation safety in space flights. It is a compilation of articles written by various authors on cosmic radiation, its sources, levels, dosimetry techniques, and physical methods for protection against radiation. The authors' purpose was to present the problem of radiation safety in space flight as fully as possible. Peculiarities of cosmic radiation dosimetry are outlined; radiation conditions in space, basic interactions of cosmic radiation with the matter, and radiation protection are analyzed. Chapters 1 and 3 were written by Z. B. Keirim-Markus, Chapters 2 and 4 by M. A. Sychkov, Chapters 5 and 8 by A. V. Larychev, Chapter 6 by Ye. Ye. Kovalev, Chapter 7 by Ye. Ye. Kovalev and L. N. Smirennyy, Chapter 9 by V. G. Bobkov, and Chapter 10 by V. P. Demin and V. A. Sakovich.

TABLE OF CONTENTS [abridged]:

Card 1/3 UDC: 539.16+628.58+523

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

L 27302-66

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Appendices -- 354

SUB CODE: 18, 06/ SUBM DATE: 220ct64/ ORIG REF: 034/ OTH REF: 050/

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L 1298-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/HW

ACCESSION NR: AR5014384 UR/0058/65/000/004/V010/V011

SOURCE: Ref. zh. Fizika, Abs. 4V75

AUTHOR: Chistov, Ye. D.; Larichev, A. V. 55

TITLE: Investigation of reflected gamma-ray spectra in the labyrinths of large cobalt installations

CITED SOURCE: Nauchn. raboty in-tov okhrany truda VTsSPS, vyp. 3(29), 1964, 49-66

TOPIC TAGS: radiation shielding, cobalt, gamma radiation, gamma spectrum

TRANSLATION: The spectra of reflected γ-radiation were studied in the concrete labyrinths of large cobalt installations using a scintillation γ-spectrometer made up of standard components with a thallium-activated sodium iodide crystal 70×50 mm in size and an FEU-43 photomultiplier. It is shown that all spectral distributions have a maximum in the 70-90 kev energy region. The position of this region is shifted toward the lower energy side as the distance to the emitter is increased. Dosage spectra with average energies in the 90-150 kev range are plotted from the measured γ-ray spectra. A method is proposed and discussed for designing labyrinth

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ACCESSION NR: AR5014384

shields as structural elements of tanks and other shielding devices. It is pointed out that an average energy of 100 kev may be used in all points of the labyrinth in these calculations with sufficient accuracy for all practical purposes. When the safety factor is taken as equal to 2, and empirical coefficients m_i are used to account for scattering and the geometry of the labyrinth, the calculated values at all points are overestimated when compared with experimental data. A. Petushkov.

SUB CODE: NP ENCL: 00

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

L 28367-66 EPF(n)-2/EWA(h)/EWI(m)/ETC(f)/EWG(m)/EWP(t)/ETI IJP(c) JH/JD

ACC NR: AP5026452 SOURCE CODE: UR/0089/65/019/004/0395/0396

41
39
B

AUTHOR: Larichev, A. V.

ORG: None

TITLE: Angular distribution of gamma rays scattered in shielding materials from a point source

SOURCE: Atomnaya energiya, v. 19, no. 4, 1965, 395-396

TOPIC TAGS: gamma scattering, nuclear shielding, angular distribution, gamma ray

ABSTRACT: In reviewing some alternative methods used for the determination of gamma scattering in nuclear shielding, the author's attention was drawn to the empirical formula: $I_0 = I(0) 2\pi \sin\theta d\theta = a' e^{-\theta/\theta_0}$, presented by Yu. A. Kazanskiy (Atomnay Energiya, 8, 432, 1960). Here: I_0 is the scattering intensity in the space element, $I(0)$ the scattering intensity at an angle θ in the unit solid angle, a' and θ_0 the constants characterizing the medium and the incident-radiation energy. The author's aim was to measure the constant θ_0 for various materials. The measurements of angular energy distributions were made by means of a scintillation spectrometer. The measurements and calculations showed the accuracy of

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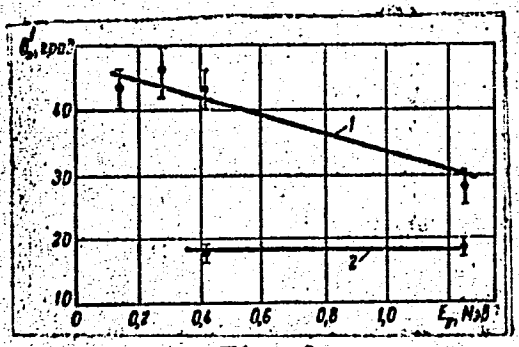
ACC NR: AP5026452

2

the above formula for angular distributions between 10 and 70 degrees The measurements were made for gamma rays from isotopes Co^{141} (0.145 Mev), Hg^{203} (0.28 Mev), Au^{198} (0.411 Mev) and Co^{60} (average 1.25 Mev) in aluminum and from Au^{198} and Co^{60} in lead. The θ_0 degrees calculated by using experimental data are shown below in Fig. 1. Orig. art. has: 1 graph and 2 formulas.



Curve 1 for aluminum

Curve 2 for lead

Fig. 1

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APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, K.K.

Device for measuring the beat of cylindrical parts and rings.
Izm. tekh. no.5:10 My '64 (MIRA 17:7)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, K.K.

Damping device for manometers. Izm. tekh. no.3:28 Mr '64
(MIRA 17:8)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, L.

We are extending the network of health combines. Okhr. truda i sots. strakh. 4 no.5:23-24 My '61. (MIRA 14:5)

1. Nachal'nik Ukrainskogo respublikanskogo kurortnogo upravleniya profsoyuzov.
(Ukraine--Health resorts, watering places, etc.)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, L.

Ukrai'ian resorts. Nauka i zhyttia 12 no.9:36-37 S '62.
(MIRA 16:1)

1. Predsedatel' Ukrainskogo respublikanskogo soveta po upravleniyu kurortami profesional'nykh soyuzov.
(Ukraine—Health resorts, watering places, etc.)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

KARAYEV, Roman Grigor'yevich; LARICHEV, Leonid Semenovich; PISAREV, B.P., red.; GITSHTEYN, A.D., tekhred.

[Health resorts of the Ukraine; an aid to selection of patients for health resorts] Kurorty Ukrainy; posobie po otboru bol'nykh na kurorty. Kiev, Gos.med.izd-vo USSR, 1959. 189 p.
(MIRA 12:9)

(UKRAINE--HEALTH RESORTS, WATERING PLACES, ETC.)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

BRANDENBURGSKIY, Galiley Lazarevich; LARICHEV, L.S., red.; HYKOV, N.M., tekhn. red.

[Systematic rules for sanatorium-health resort selection of patients with cardiovascular diseases] Metodicheskie ukazaniia po sanatorno-kurortnomu otboru bol'nykh serdechno-sosudistymi zabolevaniiami. Kiev, Gos. med. izd-vo USSR, 1961. 14 p. (MIRA 15:3)

(HEALTH RESORTS, WATERING-PLACES, ETC.)
(CARDIOVASCULAR SYSTEM--DISEASES)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, Leonid Semenovich; SOVETOV, Vasiliy Nikolayevich; CHERNYSHEV, V.P., red.; CHUCHUPAK, V.D., tekhred.

[Leaflet for patients and guests at the resorts of the Ukraine] Pamiatka dlia lechashchikhsia i otdykhaiushchikh na kurortakh Ukrainy. 2.dop.izd. Kiev, Gos.med.izd-vo USSR, 1961. 50 p. (MIRA 15:5)

(UKRAINE—HEALTH RESORTS, WATERING PLACES, ETC.)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

IL'ICHEVA, Ye.M., nauchn. sotr.; SHVAREVA, Yu.N., nauchn. sotr.; KURASHOV, S.V., red.; GOL'DFAYL', L.G., red.; POSPELOVA, G.N., red.; Prinimali uchastiye: BAKHMAN, V.I., kand. khim. nauk, red.; IVANOV, V.V., kand. med. nauk, red.; KARAYEV, R.G., kand. med. nauk, red.; LARICHEV, L.S., red.; NEVRAYEV, G.A., red.; OPPENGEYM, D.G., kand. med. nauk, red.; POLTORANOV, V.V., red.; CHUBUKOV, L.A., doktor geogr. nauk, red.; VUL'FSON, I.Z., red.; KUZ'MINA, N.S., tekhn. red.

[Health resorts of the U.S.S.R.]Kurorty SSSR. Moskva, Medgiz, 1962. 797 p. (MIRA 15:11)
(HEALTH RESORTS, WATERING PLACES, ETC.)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

KARAYEV, Roman Grigor'yevich; LARICHEV, Leonid Semenovich; CHISTYAKOV, V.A., red.

[Health resorts of the Ukraine; manual for medical selection of sanatorium and health resort treatment] Kurorty Ukrainy; posobie po meditsinskomu otboru na sanatorno-kurortnoe lechenie. Kiev, Zdorov'e, 1964. 224 p. (MIRA 17:8)

APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6"

"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, M.

PA 57T21

USSR/Engin
Water Heaters
Engines, Marine

Dec 1947

"Methods of Measuring Crust Inside Water-Heating Pipes of Boilers," M. Larichev, Engr, 1 p

"Morskoy Flot" No 12

Describes system to measure encrustation formed on inside surfaces of water-heating pipes. This is very important as crust of more than 0.5 mm will greatly reduce operating efficiency of boiler equipment. Editors request reports from operating personnel to be able to draw up standard for critical thicknesses of crusts for various-type boilers.

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

Larichev, N.S.

32-12-4/71

AUTHORS: Klyachko, Yu.A., Kunin, L.L., Chistyakova, Ye.M., Larichev, N.S.

TITLE: Analysis of Gases in Steel by the Method of Heating in the Vacuum (Analiz gasov v stali metodom vakuum-nagreva).

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 12, pp. 1410-1412 (USSR)

ABSTRACT: The existing sources of errors of the rapid methods as well as the apparatus belonging to them consist, according to the opinion of the authors, in the fact, that the gas which was eliminated during the course of experiments carried out, was supposed only to be hydrogen, but, in reality, also CO_2 water vapor and CO were existant. A new apparatus is suggested in this paper which, first of all, permits the elimination and capture of vapor and highly volatile gases from the sample. The vapor is condensed and the water obtained is frozen-in and weighed; the captured gases are determined in the same manner. Next, the products are determined which are eliminated within the course of time. In this way the content of H_2, H_2O and CO_2 can be determined separately in the sample. The apparatus consists of a system of quartz tubes, to one end of which a tubular furnace containing the sample is fitted. The vacuum pump with the correspond-

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Analysis of Gases in Steel by the Method of Heating in the Vacuum

ing measuring devices is located at the other end of the system. In the system itself the interception chambers (extensions) for the capture of vapors and gases including the corresponding measuring devices are located, as well as a connection with the spectrograph. When carrying out the experiment the fact that part of the condensed vapor goes over to hydrogen, has to be taken into acoount, which can be determined spectrographically. Here it was determined that, if the eliminated vapors and gases are not eliminated from the part in which the heated sample is located, a decrease of vapor elimination with a simultaneous increase of forming of hydrogen takes place. There are 1 figure, 2 tables, and 4 Slavic references.

ASSOCIATION: Central Scientific Research Institute for Ferrous Metallurgy (Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii).

AVAILABLE: Library of Congress

Card 2/2 1. Steel-Gas analysis 2. Instrumentation

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

LARICHEV, N.S.

PHASE I BOOK EXPLOITATION SOV/4617

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Analiz gazov v metallakh (Analysis of Gases in Metals) Moscow, 1960. 304 p. (Series: Its: Trudy, tom. 10) Errata slip inserted. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut geokhimii i analiticheskoy khimii imeni V.I. Vernadskogo. Komissiya po analiticheskoy khimii.

Resp. Ed.: A.P. Vinogradov, Academician; Ed. of Publishing House: A.L. Bankvitser; Tech. Ed.: V.V. Brusgul'.

PURPOSE: This book is intended for laboratory personnel concerned with gas analysis in metals.

COVERAGE: This collection of articles is based on materials of the Commission on Analytical Chemistry AS USSR on problems dealing with gas analysis in metals. The articles present data on: 1) The vacuum-fusion method, developed by European scientists and the Soviet scientists N.P. Chizhevskiy and Yu.A. Klyachko, for the analysis of gases in steel and aluminum, and now applicable to analysis of gases in other metals. 2) The research of Z.M. Turovtseva and coworkers at the Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy AS USSR, Moscow, making it possible to evaluate the practicability and fields of application of the different analytical methods. 3) The contributions of Yu.A. Klyachko and coworkers in their study of thermodynamic methods for the evaluation of suitable conditions for carrying out analysis. 4) The determination of gases in metals by the sulfurous method as developed by A.K. Babko. 5) The spectrum isotope method for the determination of hydrogen as developed by A.N. Zaydel' and coworkers. The authors of these articles systematize and review critically the various analytical methods, describe the apparatus used in analysis, and indicate the basic trends of research. References accompany most of the articles.

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S/024/61/000/005/001/009
E140/E135

16,8000 (1031, 1132, 1013)

AUTHORS: Kulebakin, V.S., and Larichev, O.I. (Moscow)

TITLE: Multi-invariance in automatic control systems

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, no.5, 1961, 7-12

TEXT: The authors consider the invariance principle as applied to multi-parameter systems with multiple disturbances. The study is conducted on the assumption that the processes in such systems can be described with sufficient precision by systems of linear inhomogeneous differential equations.

$$\|a_{ij}\|_n^1 X = F \qquad (1)$$

where $\|a_{ij}\|_n^1$ is a matrix of differential operators with constant coefficients; X is the column vector of coordinates x_{ij}; F is the column vector of the disturbances f_i. For this system it has been proved that the condition of invariance of the

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Multi-invariance in automatic control...

coordinate $X_1(t)$ with respect to the perturbation $f_1(t)$ is the identical vanishing of the adjunct A_{11} of the determinant $|a_{ij}|_n^1$. It is assumed that the system (1) is in the form where the number of equations is equal to the number of regulated coordinates. To obtain invariance of several coordinates with respect to a single disturbance or of a single coordinate with respect to several disturbances - termed multi-invariance - the adjuncts of several matrix elements must vanish identically, while preserving a nonvanishing value of the determinant of the matrix. The following particular problems arise. 1) How many adjuncts of elements in a single row or column of the determinant, $|a_{ij}|_n^1$ with $a_{ij} \neq 0$ can be identically equated to 0 with $|a_{ij}|_n^1 \neq 0$ In other words, how many coordinates $x_i(t)$ can be made simultaneously invariant with respect to a single disturbance $f_1(t)$? 2) Can the adjuncts of the diagonal elements of the determinant $|a_{ij}|_n^1$ be identically equated to 0 with $|a_{ij}|_n^1 \neq 0$, i.e. is it possible to make simultaneously invariant all coordinates $x_i(t)$ with respect to their corresponding disturbances $f_i(t)$?

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Multi-invariance in automatic ....

3) Find the greatest number of adjuncts of arbitrarily located determinant elements which can be equated identically to zero without vanishing of the determinant itself.
The authors prove a number of theorems which give necessary conditions for the invariance of a single coordinate with respect to $n - 2$ disturbances or $n - 2$ coordinates with respect to a single disturbance, since it is possible to equate to zero $n - 2$ adjuncts of elements in a single row or column of a nonvanishing determinant. The necessary conditions for the invariance of each of the system coordinates with respect to the corresponding perturbation have been found, since it is possible to equate to zero the n adjuncts of the diagonal elements of the determinant. It is possible to equate to zero $n - 1$ adjuncts of arbitrarily located determinant elements not all in a single column or row. A determinant with nonzero elements vanishes if $n - 1$ adjuncts of the elements of a single row or column, n adjuncts not lying on a diagonal or $n + 1$ adjuncts of elements, with n elements on the diagonal, are equated to zero. The practical application of these results lies in the determination of which system

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Multi-invariance in automatic control...

parameters must be manipulated to obtain the required type of invariance. To cause a given adjunct to vanish it is sufficient to adjust a single element entering into the adjunct. Therefore, to cause m adjuncts to vanish, it is necessary to have m adjustable elements in the corresponding adjuncts. The values to be assigned to the adjusted elements are found by the solution of a set of simultaneous equations.
There are 4 Soviet-bloc references.

SUBMITTED: May 30, 1961

Card 4/4

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"APPROVED FOR RELEASE: 08/31/2001 CIA-RDP86-00513R000928630007-6

ACCESSION NR: AP4011318 S/0103/64/025/001/0041/0053

AUTHOR: Larichev, O. I. (Moscow); Perel'man, I. I. (Moscow)

TITLE: Suboptimum control of multivariable systems with linked outputs

SOURCE: Avtomatika i telemekhanika, v. 25, no. 1, 1964, 41-53

TOPIC TAGS: automatic control, suboptimum automatic control, multivariable automatic control, linked outputs multivariable control, hot strip rolling mill, strip tension automatic stabilization

ABSTRACT: A multivariable N-loop automatic-control system is considered which can be described by this set of differential equations:

$$F_i[x_i(t)] = U_i(t) \quad (i = 1, 2, \ldots, N),$$

where $F_i[x_i(t)]$ is a differention operator of the output variable of the i-th loop and $x_i(t)$, $U_i(t)$ is the control signal in the i-th loop. The signals $U_i(t)$ form an N-variate control vector $\vec{U}(t)$. The control linking of the loops means that the

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L 34515-65 EWP(k)/EWT(d)/EWP(h)/EWP(1)/EWP(v) Pf-4/Pg-4 IJP(c) GS

ACCESSION NR: AT5004111 S/0000/64/000/000/0049/0055

AUTHOR: Kulebakin, V. S.(Academician); Larichev, O. I.

TITLE: Semi-invariance in automatic control systems

SOURCE: Vsesoyuznoye soveshchaniye po teorii invariantnosti i yeye primeneniyu v avtomaticheskikh sistemakh. 2d, Kiev, 1962. Teoriya invariantnosti v sistemakh avtomaticheskogo upravleniya (Theory of invariance in automatic control systems; trudy soveshchaniya. Moscow, Izd-vo Nauka, 1964, 49-55

TOPIC TAGS: differential equation, linear differential equation, invariance, control theory, automatic control system, invariant system

ABSTRACT: The paper considers control systems which can be described by systems of linear differential equations of the first order

$$\|a_{ij}\|_1^n X = F \qquad (1)$$

where F = (fi) is a vector of n perturbations acting on the system. It is shown that: a) If one coordinate is invariant with respect to n-2 perturbations or if n-2 coordinates are invariant with respect to one perturbation, then it is possible to set to zero n-2 adjoint elements of one row or column in the matrix

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ACCESSION NR: AT5004111

(a_{ij}); b) selective invariance, i.e. all coordinates invariant under a given perturbation, allow the diagonal of (a_{ij}) to be zero. For the determinant $|A_{ij}|$ to be zero it suffices that either n-1 adjoint elements of a row or column be zero, n adjoint elements not lying on the diagonal vanish, or n+1 elements vanish, for which n of these must lie on the diagonal. Orig. art. has: 25 formulas.

ASSOCIATION: None

SUBMITTED: 24Sep64 ENCL: 00 SUB CODE: MA, IE

NO REF SOV: 003 OTHER: 000

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L 19471-65 EWG(j)/EWT(d)/EWG(r)/EWT(l)/FS(v)-3/EWG(v)/EWG(a)/EWG(c)/
EWP(l) Po-4/Pe-5/Pq-4/Pg-4/Pk-4/Pl-4, IJP(c)/ASD(a)-5/ASD(s)/AFMD(p)/ESD(dp)
DD/BC
ACCESSION NR: AP4048824 S/0280/64/000/005/0072/0081

AUTHOR: Larichev, O.I. (Moscow) B

TITLE: Optimum control of a class of multiply connected systems

SOURCE: AN SSSR. Izv. Tekhnicheskaya kibernetika, no. 5, 1964, 72-81

TOPIC TAGS: automation, optimum control, multiply connected system, control function derivation

ABSTRACT: The following problem is investigated: A multiply connected system consisting of N identical loops is described by

$$F\,[x_i(t)] = U_i(t),\ i = 1, 2, \ldots, N \qquad (1)$$

where F is a linear differential operator of order n and the connection between the loops is expressed by the fact that the vector $\bar{U}(t)$, with components $U_i(t)$ belongs to some closed region of N-dimensional space of control functions, which includes the origin and is described by

$$\sum_{i=1}^{N} |U_i| \leq A = \text{const.} \qquad (2)$$

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If, in an Nn-dimensional phase plane, the point x_0 describes the state of the system at $t = 0$ and the point x_1 describes the desired state, then it is required to find such $\vec{U}_{opt}(t)$ which will bring the system from x_0 to x_1 in a minimum amount of time. It is shown that this can be accomplished by designing an equivalent system, providing that the characteristic equation of a system loop does not have imaginary roots. For this case the equivalent system is constructed as follows: For some given set of initial conditions, a non-optimum but realizable control function is found, and the equivalent system is specified at $t = t_k$ by the sum of the phase coordinates of all loops and by the sum of all control functions. When the initial conditions of the equivalent system are determined correctly, the minimum time T_{min}, required to bring the equivalent system from one point of the phase plane to the other is the same as the minimum time for the optimum control process in the actual system. The equivalent system is only of the nth order and its initial conditions can be evaluated from the fact that the real control function U (t) can always be replaced by n intervals $U_1, U_2, \ldots, U_n$ = const., which will also bring the system to the same point in the phase plane during some interval τ. The proposed method is actually an algorithm of a control computer and results in significant simplifications. A three-loop numerical

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example is given which illustrates a system for the creation of artificial gravity in a space platform, proposed by M. A. Athans, P. L. Faib and R. T. Lacoss (IEEE Trans. on Appl. and Industry, July 1963, No. 67). Orig. art. has: 35 equations and 2 figures.

ASSOCIATION: None

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