DOROSHENKO,A.; ZAYCHIK,M.

"UPT" television amplifying attachment. Radio no.10:26-27 O'55.
(Television--Apparatus and supplies) (MLRA 9:1)

15.2610
26.2532

25438 S/137/61/000/006/064/092
A006/A101

AUTHORS: Semenov, V.V., Doroshenko, A.G.

TITLE: The Peltier coefficient and thermo-emf of the Bi_2Te_3 alloy

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1961, 3-4, abstract 6Zh21 ("Tr. Odessk. tekhnol. in-ta i kholodil'n. prom-sti", 1959, v. 8, no. 2, 68 - 73)

TEXT: The thermo-emf α and Peltier heat of cylindrical Bi_2Te_3 alloy specimens were measured. Measurement of α were carried out on a conventional potentiometrical installation; the compensation method was employed to measure the Peltier heat, which excluded the effect of Lenz-Joule heat liberated in the specimen during the passage of current through it. It follows from data on the direct determination of α that $dE/dT = 2.18 \cdot 10^{-4}$ v/degree and from measurements of the Peltier heat that $\alpha = 2.07 \cdot 10^{-4}$ v/degree. It is concluded that the Thomson correlation $P = \pm T (dE/dT)$, where P is the Peltier coefficient, is well applicable to the Bi_2Te_3 alloy.

N. Chernoplekov

[Abstracter's note: Complete translation]

Card 1/1

FAN-YUNG, A.F.; DOROSHENKO, A.G.; GLOBIN, N.K.

Technology of the manufacture of carbonated tomato and apricot juices. Kons.i ov.prom. 17 no.7:11-15 Jl '62. (MIRA 15:6)

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

(Carbonated beverages)

DOROSHENKO, A.G.; SAVENKO, Yu.F.; DANILOV, A.A.

Scraper haulage of coal in the making of cross cuts and cross holes. Ugol' 40 no.4:56-58 Ap '65. (MIRA 18:5)

1. Shakhta "Zamkovskaya" No.2 tresta Kadiyevugol' (for Dorozhenko). 2. Kommunarskiy gornometallurgicheskiy institut (for Savenko, Danilov).

DOROSHENKO A.I.

6(4) PHASE I BOOK EXPLOITATION SOV/2774

Novaya apparatura radioveshchatel'nogo trakta; informatsionnyy sbornik (New Equipment of a Broadcasting System; Information Series) Moscow, Svyaz'izdat, 1959. 56 p. (Series: Tekhnika svyazi) 10,000 copies printed.

Resp. Ed.: V. A. Fursov; Ed. : V. I. Bashchuk; Tech. Ed.: S. F. Karabilova.

PURPOSE: This collection of articles may be useful to radio engineers.

COVERAGE: The authors discuss the following broadcast equipment: PRA-1 panel of a broadcast control room; PFA-1 panel of a speech-broadcast control room; PTU-3 and PTU-4 portable transmitters; and SDS-1 announcer's desk equipment. No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

Card 1/3

The author discusses the construction and operation of a PTU-3 transmitter for transmitting speech and outdoor music programs and describes transmitter components.

Lipkina, V. A. PTU-4 Portable Transmitter 41
The author discusses the circuit of a PTU-4 portable transmitter and its components, such as the microphone amplifier, pulse meter, control amplifier and the power-supply circuit.

Meter, Ch. M. SDS-1 Announcer's Desk 52
The author presents a brief description of the equipment of the announcer's desk and discusses its operation.

AVAILABLE: Library of Congress

DOROSHENKO, A.K.

USSR/Chemistry - Decomposition

Card 1/1 : Pub. 151 - 4/37

Authors : Belyaev, I. N., and Doroshenko, A. K.

Title : Double decomposition of sodium and silver sulfates and molybdates in fusions

Periodical : Zhur. ob. khim. 24/3, 427-432, Mar 1954

Abstract : Two binary systems (Na_2MoO_4 - Ag_2MoO_4 and Ag_2SO_4 - Ag_2MoO_4) were investigated for the first time by means of a visual-polythermal method. The formation of continuous solid solutions with a minimum of 21% Na_2MoO_4 was observed in the first systems at 546°; the second system yielded a eutectic with 33% Ag_2SO_4 at 497°. The crystallization surface of a ternary Na, Ag SO_4, MoO_4 system was investigated and it was established that this system belongs to the irreversibly-mutual systems with stable diagonal section and that the Ag-ion has a greater effect on the stability of solid $Na_2(MoO_4,SO_4)$ solutions than the Pb-ion. Data, regarding the equilibrium and double decomposition of above mentioned compounds, are included. Nine USSR references (1873-1952). Tables; graphs.

Institution : The V. M. Molotov State University, Rostov/Don

Submitted : November 2, 1953

BELYAYEV, I.N.; DOROSHENKO, A.K.

Interaction of potassium and silver sulfates and molybdates during crystallization from their melts. Uch.zap.RGU no.60: 217-223 '59. (MIRA 14:10)
(Systems (Chemistry)) (Salts)

L 8619-66 EWT(m) IJP
ACC NR: AP5027031 SOURCE CODE: UR/0120/65/000/005/0188/0190

29

AUTHOR: Voznyuk, A. S.; Doroshenko, A. N.; Cherepanov, V. N.

ORG: Physics-Engineering Institute GKAE, Sukhumi (Fiziko-tekhnicheskiy institut GKAE) B

TITLE: An ionization manometer for the measurement of steady and pulsed pressures

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1965, 188-190

TOPIC TAGS: manometer, gas pressure, pressure measuring instrument gm

ABSTRACT: An ionization manometer for the measurement of fast changes in pressure of neutral gases in vacuum chambers using quasi-stationary magnetic and HF fields has been developed using 2S3A ultraminiature triodes as sensors. The anode-cathode voltage difference is 150 v, anode-collector voltage is 10 v, and emission current is 100—500 μa. The anode voltage originates from a 26-I generator supplying at 5 kc voltage pulses 10 μsec long. The presence of external fields makes additional calibration necessary. The manometer has a range from 10^{-4} to 1 Torr. Using a low pressure wave generated by a pulsed electromagnetic valve, the time constant of the new device is found to be less than 100 μsec demonstrating the manometer capable of measuring time variations in pressure. Orig. art. has: 4 figures.

SUB CODE: IE,EC / SUBM DATE: 07Aug64 / ORIG REF: 003 / OTH REF: 002

UDC: 531.788.133.7

L 02278-67 EWT(1) IJP(c) AT

ACC NR: AP6025246 SOURCE CODE: UR/0057/66/036/007/1211/1214

74
72
B

AUTHOR: Besshaposhnikov,A.A.; Doroshenko,A.N.; Simonova,N.W.; Chelidze,T.Ye.

ORG: none

TITLE: Observation of "curved" spectrum lines in a pulsed high frequency plasma

21

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 7, 1211-1214

TOPIC TAGS: hydrogen plasma, rotating plasma, plasma velocity, ion concentration, ion temperature, magnetic mirror, optic spectrum

ABSTRACT: The authors have spectroscopically observed the rotational velocities and the radial distributions and temperatures of impurity O^{+} and Si^{++} ions in hydrogen plasma filaments. The plasmas were produced by a 1.5 MHz pulsed rotating dipole field in a 6.5 cm diameter 1 meter long glass tube containing hydrogen at from 0.02 to 0.25 mm Hg and were confined by a magnetic mirror system with a mirror ratio of 1.57 and a field strength in the uniform field region of 7.2 kOe. Additional stabilization was provided by an up to 216 cusped octupole field corresponding to a diameter of 2 cm. Two conditions of operation were distinguished: "direct rotation", in which the forces on the particles due to interaction of the high frequency currents in the plasma with the quasistatic field were directed toward the axis of the chamber, and "reverse rotation", in which those forces were directed toward the wall of the chamber. The OII 4649 Å and SiIII 4552 Å lines were observed with a spectrometer having a dispersion

Card 1/2 UDC: 533.9.07

L 02278-67
ACC NR: AP6025246

of 4 Å/mm and a resolution of 0.1 Å. The lines were very weak and were recorded with the aid of a multistage electron-optical in age converter. The radial distributions of the ion concentrations were determined (in arbitrary units) from the relative intensities of the portions of the lines arising from different parts of the plasma filament, the radial distribution of the rotational velocity was determined from the Doppler shifts of different parts of the lines, and the temperatures of the impurity ions were also determined, presumably from the Doppler broadening. In direct rotation the impurity ion concentration decreased more or less monotonically from the axis to the periphery of the plasma filament; in reverse rotation the ion concentration increased with increasing distance from the axis, passed through a maximum, and then decreased toward the periphery. The rotational velocity was also maximum at some distance from the axis. The rotational velocity was of the order of 10^6 cm/sec at about 1 cm from the axis. The direct rotational velocities decreased with increasing octupole field strength, and the reverse rotational velocities increased with increase of the octupole field strength up to about 144 Oe and decreased with further increase of the octupole field strength. With increasing octupole field strength, the ion temperature decreased in direct rotation and increased in reverse rotation. Ion temperatures up to 20 (units not stated) were observed. The authors thank R.A.Demirkhanov and T.I.Gutkin for suggesting the problem and for their interest in the work. Orig. art. has: 5 figures and 1 table.

SUB CODE: 20 SUBM DATE: 02Aug65 ORIG. REF: 002 OTH REF: 004

Card 2/2 vmb

18 1142 1530 1496 1482

33456
S/126/61/012/006/017/023
E073/E535

AUTHORS: Doroshenko, A.V., Klyushin, V.V., Loshmanov, A.A. and Goman'kov, V.I.

TITLE: Neutron diffraction investigations of MnTe

PERIODICAL: Fizika metallov i metallovedeniye, v.12, no.6, 1961, 911-912

TEXT: MnTe was produced by vacuum sintering at 800°C of a mixture of 99.8% purity Mn and 99.99% purity Te, the structure and the composition of which were checked by X-ray analysis. Then, after additional crushing, the powder was pressed into a thin-walled aluminium cylinder 27 mm high with an internal diameter of 9.6 mm. The table herewith gives the calculated and experimentally determined values of the Bragg angles and of the corresponding interplanar distances. The magnetic reflections from (001) under the angle of 4°40' corresponds to the constant c of the crystal lattice and, consequently, along the c-axis the parameter of the elementary cell coincides with the parameter of the crystallo-chemical lattice. Furthermore, the appearance of this reflection indicates that the magnetic moments of the Mn

Card 1/2

atoms are located in the basal planes or form a small angle with these planes. A simplified model of the magnetic structure corresponding to the magnetic reflection from (001) will be the structure formed by ferromagnetic layers in the basal planes with magnetic moments that are perpendicular to the c-axis and anti-parallel as regards the magnetic moments in the adjacent basal planes. The presence of a magnetic reflection from (101), together with a reflection from (001), is natural for such a model. However, in this case there should be no reflection from (002). To get more accurate information on the magnetic structure of MnTe, the investigations are to be continued. Acknowledgments are expressed to A. K. Kikoin, B. G. Lyashchenko, D. F. Litvin and N. P. Grazhdankina. There are 1 figure, 1 table and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The English-language references read as follows: Ref.3: Kelley K.K. J.Amer. Chem.Soc., 1939, 61, 1, 203; Ref.4: Greenwald S. Acta Cryst., 1953, 6,5,396.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals AS USSR)

SUBMITTED: June 3, 1961

DOROSHENKO, A.V.

Effect of ordering on the saturation magnetization of Ni_2Mn alloys. Fiz. met. i metalloved. 15 no.6:936-937 Je '63. (MIRA 16:7)

1. Institut fiziki metallov AN SSSR.
(Nickel-manganese alloys--Metallography)
(Magnetization)

SIDOROV, S.K.; DOROSHENKO, A.V.

Dependence of the mean magnetic moment of the alloy atom on the manganese content in disordered nickel manganese alloys. Fiz. met. i metalloved. 18 no.6:811-820 D '64.

(MIRA 18:3)

1. Institut fiziki metallov AN SSSR.

SIDOROV, S.K.; DOROSHENKO, A.V.

Dependence of the magnetization of nickel-manganese alloys on the composition and order in the distribution of atoms. Fiz. met. i metalloved 20 no.1:44-54 Jl '65. (MIRA 18:11)

1. Institut fiziki metallov AN SSSR.

SOV/86-58-10-35/40

AUTHOR: Doroshenko, D.F., Sen Engr Lt

TITLE: Instrument Storeroom (Instrumental'naya kladovaya)

PERIODICAL: Vestnik vozdushnogo flota, 1958, Nr 10, pp 84-85 (USSR)

ABSTRACT: The author recommends that a large number of different instruments used in routine maintenance work on aircraft should be kept in special storerooms. The instrument storerooms should be set up in the subunits of technical exploitation units (TECh) and a mechanic put in charge of such a storeroom. Two photos.

Card 1/1

COUNTRY : USSR
CATEGORY : Cultivated Plants. M
Grains. Legumes. Tropical Cereals.
ABS. JOUR. : RZhBiol., No. 3, 1959, No. 10943

AUTHOR : Dorosheako, E. Y.
INST. : -
TITLE : On Different Methods of Fall Cultivation of the Soil to Millet.

ORIG. PUB. : Byul. nauk. inform. po zemlerobstvu, 1958, No. 3, 7-10

ABSTRACT : No abstract.

CARD: 1/1

DOROSHENKO, F., sinoptik

When a living thing sacrifices to form... Grazhd. av. 19 no.5: 22-23 My '62. (MIRA 18:6)

1. Aviameteorologicheskaya stantsiya Sumskogo aeroporta.

DoROSHENKO, F. D.

2

9.4-235 551.596.5

Dorothenko, F. D. O rokatakh grema. [Thunder peal.] *Meteorologiia i Gidrologiia*, Moscow, No. 8:32, Aug. 1956 DWB, DLC — An attempt is made to explain more adequately the rolling of thunder following the first peal. Reflection of the sound from the clouds cannot explain why the rolls may be louder than the initial thunder clap. The author suggests that since the length of the lightning stroke may range from several hundred meters to several kilometers it is natural that the sound from the various parts of the stroke would reach the observer at the same time. This may explain the [illegible] sound. *Subject Headings*: 1. Audibility of thunder ; Thunder peals

DOROSHENKO, F.F.

Cleaning railroad cars in a mine with a hydraulic giant. Ugol' 39 no.10:34-35 O '64. (MIRA 17:12)

1. Urgal'skoye shakhtoupravleniye.

3.5000

AUTHOR: Doroshenko, F. T.

S/050/60/000/04/006/018
B007/B017

TITLE: On the Causes of the Development of Squalls

PERIODICAL: Meteorologiya i gidrologiya, 1960, Nr 4, pp 28-31 (USSR)

TEXT: Squalls usually develop under huge cumulus rain clouds. In this article the author gives a new explanation of the descending motion of air at the rear of the shifting rain- and cumulus rain clouds, of the jumplike pressure rise, and of the extraordinarily increasing wind velocity on the earth surface. A vertical air motion occurs during the development of a rain cloud followed by a cumulus rain cloud. The wind velocity is assumed to increase with height in the air surrounding this could. In this case, the ascending air motion (inside or outside the cloud) will penetrate one air layer after the other (which move with increasing horizontal velocity). This ascending air column may have a large diameter (of from some meters to several kilometers). It has a large mass and, therefore, a high energy, but will have a horizontal velocity at the respective level, which is smaller than the wind velocity. Thus, this air column retards the motion of the surrounding air considerably. This horizontal air current of the atmosphere hits the ascending current, its own velocity in

the rear is reduced, it accumulates there, and evades the hindrance partly from the side, from above and from below. Due to this retarding effect, the pressure in the rear of the ascending air current rises. Pressure drops, however, at the front of the ascending air current. This gives rise to a pressure gradient that warrants horizontal acceleration of the ascending air. Thus the velocity at which the ascending air is shifted in the horizontal direction, is nearly as high as the wind velocity at any new level. Next, the author performs an approximate calculation of the pressure gradient within the region of intense ascending motions. These calculations show, that great pressure gradients are produced (of the order of several dozen millibars per 100 km) due to the inertia of the ascending air (on which pressure is exerted by the wind) within the region of intense ascending currents when the wind velocity changes with the height. These gradients which are produced only on small surfaces, cannot be determined by the existing network of meteorological stations. Their existence is proved by the great pressure rise on the barogram and by the squally wind

4

the velocity of which exceeds that of the wind gradient according to the synoptic chart for the region concerned. The baric gradient found in the region of ascending currents is superposed by the additional pressure gradient which determines the wind conditions at the respective spot for a short time. Particularly favorable conditions for pressure rise and descending motions in the rear of ascending currents (of clouds) are found on cold fronts with large cumulus rain clouds. Though precipitations intensify the descending motion of air in the rear, underneath the cloud, squalls occur under the passing cumulus clouds even without precipitations. Formula (5) for the baric gradient is derived. Herefrom it may be seen that in the case of a squall the baric gradient and, consequently, also the wind velocity are proportional to the following quantities: the air density at the level with the highest velocity of the ascending motion, the velocity of the ascending motion, and the local variation in velocity with height at the level of highest velocity of the ascending motion. The gradient further depends on the horizontal and vertical

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On the Causes of the Development of Squalls

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B007/B017

extension of the zone with ascending motion, and on the stratification of the air and the specific air humidity.

4

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DOROSHENKO, G. A.

28431
S/185/61/006/002/003/020
D210/D304

21.6000

AUTHORS: Vatset, P.I., Vlasenko, V.N., Voloshchuk, V.Y., Doroshenko, G.A., Kolesnykov, L.Ya., Nikitin, V.O., and Tonapetyan, S.H.

TITLE: A diffusion cloud chamber

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 6, no. 2, 1961, 168 - 173

TEXT: The authors describe the construction and operation of methanol in an air diffusion chamber. This chamber was built as an experimental model for a larger chamber for use with a linear electron accelerator. The chamber (Fig. 1) has a working diameter of 26 cm and an effective height of 6 cm. It is made of stainless steel and consists of three sections: the lower cylinder 1, the cone 2, and the upper cylinder 3. The internal diameter of the lower cylinder is 30 cm and of the upper 22 cm, and the height of the chamber is 80 cm. At the base of the chamber there is a copper condensation disc 4, whose surface has been chemically blackened. This disc is

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D210/D304

A diffusion cloud chamber

cooled by passing liquid nitrogen through a coil (5) soldered onto the bottom of the disc. A glass cylinder (6), 26 cm diameter, 10 cm high, and 4 mm thick is held firmly against the copper disc with the copper cone, thus ensuring a good temperature contact. The temperature distribution in the conical section is effected by electrically heating the flanges of the cone, the lower flange temperature corresponding to the methanol temperature. The cone and the lower ring is separated by a heat insulator 7, the bolts (8) being similarly insulated. Thermocouple and electrode connections are made through the insulating ring, the screen 9 being connected by glass rods to the electrodes. Two windows (10) made from organic glass are situated diametrically opposite each other for illuminating the chamber space. The methanol is fed to the chamber through the lead 12, and it is held in the groove 11 of capacity 300 cm^3, the evaporation being enhanced by filter papers placed in the groove. The methanol temperature is controlled with a thermocouple which enters the chamber through 13. Two windows (14) are provided for photographing the working volume and one (15) for visual ob-

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D210/D304

A diffusion cloud chamber

servation. The upper part of the chamber is held at a higher temperature to prevent condensation of methanol on the windows which can cause a high background. The operation of the chamber is controlled by automatically varying the liquid nitrogen flow rate, the methanol temperature, and the temperature of the upper flange of the lower cylinder. The chamber was tested with an air and methanol filling at 1 and 3.5 at. It could be operated at a bottom temperature of -45 to -70°C and a methanol temperature of 10 to 30°C, however, the most satisfactory temperatures were found to be -50 and 20°C respectively, giving a temperature gradient in the working space of 7 deg/cm. At an alcohol temperature above 20°C the droplet background was high; when the temperature fell to 0 to 10°C the vapor flow was insufficient for satisfactory operation of the chamber. The authors have given in this paper a good description and diagrams of the supporting equipment for pumping the liquid nitrogen and feeding methanol to the diffusion chamber. The authors state that they are preparing at the moment a larger chamber with a diameter of 30 cm and a working pressure of 30 at.

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D210/D304

A diffusion cloud chamber

There are 6 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: A. Langsdorf, Rev. Sci. Instr., 10, 91, 1939; Shutt, Rev. Sci. Instr., 22, 730, 1951.

ASSOCIATION: Fizyko-tekhnichnyy instytut, AN URSR, m. Kharkiv
(Technical Physics Institute, AS UkrSSR, Khar'kov)

SUBMITTED: July 1, 1960

Card 4/5

STOLYAROVA, Ye.L.; DOROSHENKO, G.G.

Delayed-coincidence device for measuring time intervals from 10^{-10} to 10^{-7} sec. Sbor. nauch. rab. MIFI no.2:144-154 '60. (MIRA 14:3)

(Time measurements)

27699
S/120/61/000/003/009/041
E032/E314

26.2213

AUTHORS: Doroshenko, G.G. and Stolyarova, Ye.L.

TITLE: A Fast-neutron Scintillation Counter with a Low γ-ray Sensitivity

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No. 3, pp. 69 - 71

TEXT: This counter was demonstrated at the 1960 National Soviet Exhibition.
It has recently been reported (Ref. 1 - R.B. Owen, IRE Trans. Nucl. Sci., 1958, NS-5, No. 3, 198; Ref. 2 - F.D. Brooks - Nucl. Instrum. and Method., 1959, 4, 151) that the scintillation decay time for neutrons is greater than for γ-rays by a factor of approximately 2. In the present counter this time difference is transformed into an amplitude difference; the basic circuit of the device is shown in Fig. 1. The fast-neutron scintillation counter consists of a stilbene crystal (30 mm in diameter and 30 mm thick), an ФЭУ-33 (FEU-33) photomultiplier, a discriminator consisting of two germanium

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E032/E314

A Fast-neutron ....

diodes, and two cathode followers. Since the decay constant for the slow components is 0.3 μsec, the time constant of the output RC chain was chosen to be 3 μsec. The discrimination level is determined by the bias applied to the first diode. The key position 1 gives the integral count of fast neutrons and γ-rays with the photomultiplier noise cut off. With the key in position 3, the device records the intensity of fast neutrons with the γ-rays cut off. The time-to-amplitude transformation is achieved by operating the photomultiplier in such a way that the magnitude of the output voltage pulse is independent of the energy of the recoil protons and electrons where, in the first case, it is equal to about 100 V, and in the second, to 200 V. It is thus possible to avoid the use of an amplifier and to discriminate against the γ-field with the aid of the simple discriminator shown in Fig. 1. Fig. 4 shows the γ and neutron calibrations. The nunbers next to the experimental points denote the maximum energy of the recoil protons in MeV. The numbers on the

Card 2/5

γ-curve refer to the maximum energy of the Compton recoil electrons. Experiments led to the following results: lower neutron energy threshold 1.2 MeV; efficiency for fast neutrons (Po - Be source) ~ 7%; efficiency for γ-rays (Po - Be source) ~0.01%. Permissible load (integral count of fast neutrons and γ-rays) 10^4 p.p.s. In these experiments the recording device was the generally available [illegible] (PS-10000). However, the device can easily be made portable by the use of transistor techniques. There are 4 figures and 4 references: 1 Soviet and 3 non-Soviet. The three English-language references quoted are: Refs. 1, 2 (quoted in text); Ref. 4 - C.J. Taylor, W.K. Jentschke, M.E. Remby, F.S. Eby, P.G. Kruger - Phys. Rev., 1951, 84, 1034.

SUBMITTED: July 9, 1960

Card 3/5

89262

S/048/61/025/001/028/031
B029/B063

26.2244

AUTHORS: Doroshenko, G. G. and Stolyarova, Ye. L.

TITLE: A method of separating pulses caused by fast neutrons and gamma particles by using the space charge of a photoelectronic multiplier

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 1, 1961, 152-156

TEXT: The recording of fast neutrons in the presence of a gamma background is known to be very difficult. It has recently been found that the effective duration of neutron emission is about twice as long as that of gamma emitters. The present paper reports on two methods making practical use of this interesting property of some organic scintillators. Ordinary photomultipliers with a linear characteristic have been used in both methods. Two pulses were taken from the photomultiplier, one from the anode and the other from the last dinode. In the first method, the pulse taken from the anode is proportional to the scintillation amplitude, while the pulse taken from the dinode is proportional to the total light yield. The

pulses pass through amplifiers and stretchers, and then they are transmitted to the plates of the oscilloscope tube. One of the lines to be seen on the screen of the oscilloscope corresponds to the neutrons, while the other corresponds to the gamma rays. Though this result is very illustrative, it can hardly be used for measuring the fluxes and spectra of fast neutrons. A simpler electronic circuit is used in the second method. In this case, lines can be separated by a proper choice of the elements and operation of the circuit. For practical purposes, however, all elements of the circuit must be exactly adjusted. Besides, the signal is very weak and therefore needs considerable amplification. The method discussed here is based on the principle of an artificial space charge at the last cascades of the multiplier, which serves the purpose of separating the pulses caused by fast neutrons and gamma quanta. Fig. 2 shows the circuit used in the second method. Stilbene shows that with a short period of emission, the influence of a space charge is much stronger although the light yield is considerably lower. The time difference is probably changed into an amplitude difference by means of the space charge. The time constant of the RC circuit of the output must be sufficiently great. Fig. 4 shows the separator. Theemitted negative pulse is shown on the right side. The

separator has yielded good results so far. Fig. 6 shows the amplitude distribution of pulses emitted from a Po-Be source. The authors examined 25 stilbene crystals and 12 FEU-33 photomultipliers. All crystals yielded the same results. The separator makes it possible to construct a simple device for measuring the fluxes and spectra of fast neutrons and heavy ions in the presence of an appreciably strong gamma background. This is the reproduction of a lecture read at the Tenth All-Union Conference on Nuclear Spectroscopy, Moscow, January 19-27, 1960. There are 6 figures and 4 non-Soviet-bloc references.

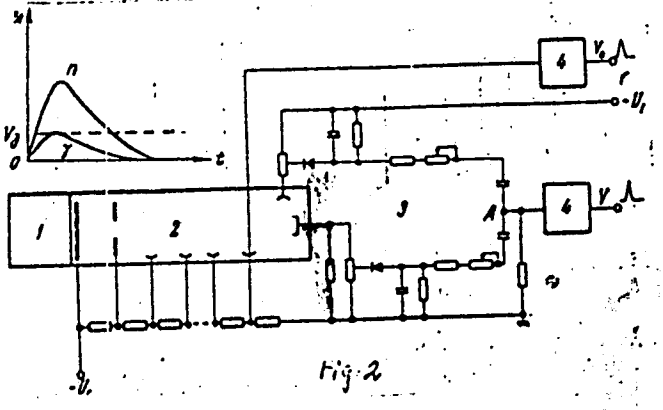

Fig. 2

Legend to Fig. 2:
Brooks circuit: 1) scintillator; 2) photoelectronic multiplier; 3) separator; 4) amplifier. In the upper left-hand corner one may see the shapes of pulses caused by neutrons and gamma rays at point A.
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B029/B063

Legend to Fig. 4:
1) scintillator; 2) photoelectronic multiplier of type ФЭУ-33 (FEU-33).

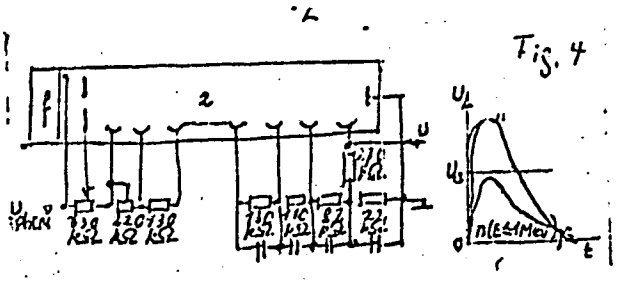

Fig. 4

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89262

A method of separating pulses caused ... S/048/61/025/001/028/031
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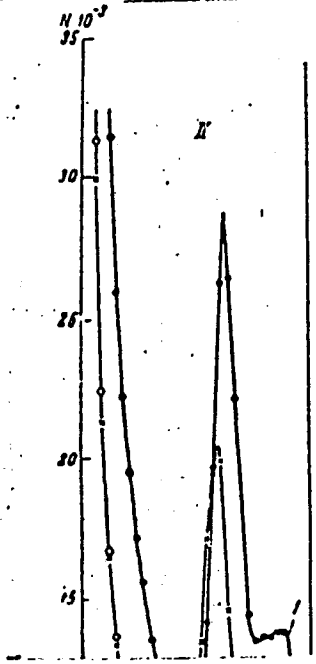

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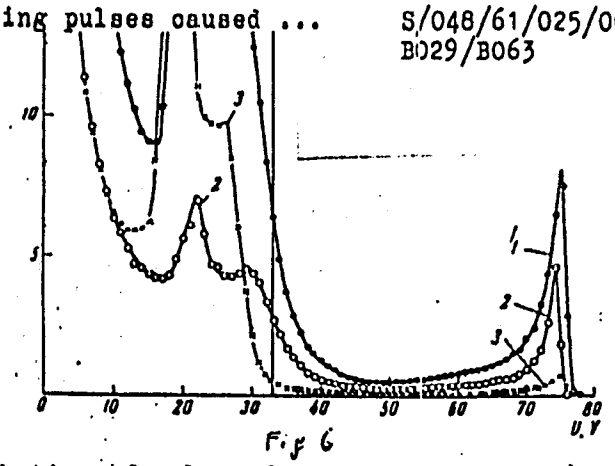

Fig 6

Legend to Fig. 6:
1) amplitude distribution of pulses from Po-Be source; 2) dto. with a lead layer (12.8 cm); 3) dto. with paraffin (15.8 cm); I - only from fast neutrons (~ 1 Mev); II - from gamma quanta and recoil protons of low energy.

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DOROSHENKO, G.G.

PHASE I BOOK EXPLOITATION SOV/5717

Moscow. Inzhenerno-fizicheskiy institut.

Pribory i metody analiza izlucheniy; sbornik nauchnykh rabot, vyp. 2. (Apparatus and Methods for the Analysis of Radiation; Collection of Scientific Papers, no. 2) Moscow, Atomizdat, 1960. 166 p. 4000 copies printed.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya RSFSR. Moskovskiy inzhenerno-fizicheskiy institut.

Ed. (Title page): Ye. L. Stolyarova, Candidate of Physics and Mathematics; Tech. Ed.: S. M. Popova.

PURPOSE: This collection of articles is intended for specialists in nuclear physics, dosimetry of nuclear radiations, and shielding.

COVERAGE: The articles were prepared by scientists of MIFI (Moscow Physics and Engineering Institute) and presented at the 1957 conference of the Institute. Brief annotations to the articles have been included in the Table of Contents. No personalities are mentioned. References follow each article.

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DOROSHENKO, G. G.

INTERNATIONAL ATOMIC ENERGY AGENCY, (IAEA)
Symposium on Neutron Detection, Dosimetry
and Standardization - Harwell, England,
10-14 December 1962

DOROSHENKO, G. G., GLAGOLEV, V. I., BARABANOV, I. R., and FILIPYOSHKIN, I. V. - "A new method for studying continuous fast neutron spectra - the counting efficacies method" (Section I.1.(4))

DOROSHENKO, G. G., and Ye. L. STOLYAROVA [STOLYAROVA in 1960 was a member of the Moscow Engineering Physics Institute] - "A new method for separating pulses from fast neutrons and Y quanta" (Section III)

IVANOV, V. I. - "A modified procedure for using the Hurst type proportional counter for dosimetry of mixed Y-neutron radiation" (Section III)

KASHKOVICH, Vadim Pavlovich - "The spectrometric method and the attenuation-curve analysis method for determining the activity of threshold indicators" (Section I.3.(2))

STOLYAROVA, Ye. L. [In 1960 was a member of the Moscow Engineering Physics Institute] - "Methods of fast-neutron spectrometry and the opportunities for their use in neutron dosimetry" (Section II.)

ZIELEZYNSKI, M. [ZIELEZYNSKI is listed in the program as a USSR author; he may, however, be Wieczyslaw ZIELINSKI who in 1958 was at Warsaw University, Poland] - "Recombination method of linear energy transfer (LET) determination of mixed radiation" (Section V)

ZOLOTUKHIN, V. G., DOROSHENKO, G. G., and YEFIMENKO, B. A. - "Calculation of pulse-height distributions and counting efficiencies of a fast-neutron scintillation detector" (Section I.2)

(5)

15451

S/892/62/000/001/014/022
B102/B186

21664

AUTHORS: Doroshenko, G. G., Glagolev, V. L., Pilyushkin, I. V., Afanas'yev, M. I.

TITLE: Calculation of the counting efficiency in fast-neutron recording for a detector with an organic crystal

SOURCE: Moscow. Inshenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 90-99

TEXT: The counting efficiency $\varepsilon(E,B)$ is calculated for a fast-neutron detector with a 30 mm-thick stilbene crystal as scintillator; E is the neutron energy and B the recording threshold, i.e. the lowest neutron energy recorded. In stilbene the neutrons are recorded via the recoil protons or via nuclear reactions with carbon or hydrogen. The carbon nuclei play an important part since their density is higher ($C_{14}H_{12}$), and in the high-energy range the total (n,C) interaction cross-section is of the order of that of (n,p) scattering. Multiple scattering effects are negligible for medium-size crystals. In first approximation (single scattering) ε_1 is calculated from the collision probability

Card 1/3

Calculation of the counting ...

$$P_1(E_0) = \int_0^l e^{-\bar{n}\bar{\sigma}(E_0)(l-x)} n\sigma(E_0)\,dx = \frac{\sigma(E_0)}{\bar{\sigma}(E_0)}\left(1 - e^{-\bar{n}\bar{\sigma}(E_0)l}\right). \quad (3)$$

for the distance l-x from the left window. Since $\varepsilon_1(E,B) = P_1(E_0)d\alpha = P_1(E_0)\alpha_B$ (where $\alpha = E/E_0$, the neutron energy fraction retained after the first collision, E being the energy of the scattered neutron) and $\alpha_B = (E_0 - B)/E_0$, one obtains

$$\varepsilon_1(E, B) = \frac{\sigma(E_0)}{\bar{\sigma}(E_0)}\left(1 - e^{-\bar{n}\bar{\sigma}(E_0)l}\right)\left(1 - \frac{B}{E_0}\right). \quad (5)$$

where

$$\left.\begin{aligned} n\bar{\sigma}(E) &= n\sigma(E) + n_C\sigma_C(E), \\ \bar{\sigma}(E) &= \sigma(E) + \frac{n_C}{n}\sigma_C(E), \end{aligned}\right\} \quad (1)$$

(n and n_C being the nuclear concentrations of H and C; $\sigma(E)$ the (n,p) scattering cross-section; $\sigma_C(E)$ the total (n,C) scattering cross-section)

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Calculation of the counting ... S/892/62/000/001/014/022
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In the case of double scattering,

$$\varepsilon_2(E_0, B) = \int_{E_0-B}^{E_0} P_1(E_0, E_1)\frac{dE_1}{E_1} - \int_{\beta_B}^{\beta_0} P_1(E_0, E_2)\,d\beta, \quad (11)$$

is obtained (where $\beta = E/E_0$ and $\beta_B = 1 - B/E_0$). From a comparison of the energy dependences of ε_1 and ε_2 it can be seen that at low energies the ε_2 curves lie higher than the ε_1 curves. The role of ε_2 is reduced with increasing neutron energy, and for ~11 Kev neutrons both curves coincide. The effect of double scattering increases with B. The peaks of the ε-curves are due to the resonance character of the (n,C) scattering cross-section. There are 5 figures.

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21.6000

AUTHORS: Doroshenko, G. G., Shatalov, G. A.

TITLE: Separation of the pulses from fast neutrons and gamma quanta in a fast-neutron time-of-flight spectrometer

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 1, 1962, 137-149

TEXT: If the neutron pulses are separated from the gamma pulses (cf. Izv. AN SSSR, ser.fiz.,25,no.1,152,1961) the construction of a fast-neutron time-of-flight spectrometer can be considerably simplified. Such an instrument is described. It operates with two transmitters which are ФЭУ-33 (FEU-33) photoelectronic multipliers with stilbene crystals (30 • 10 mm and 30 • 30 mm). The first is a usual transmitter (time operation); the second serves for pulse separation. The block diagram of the spectrometer and the circuit diagrams of the transmitters, the pulse-forming unit and the converter are given and discussed in detail. The characteristics of the mixer tube were investigated under various operational conditions. The spectrometer was calibrated using a

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Separation of the pulses from fast ...

Co^{60} source placed in the middle between the two transmitters; in γ-γ coincidence measurements the time resolution was $3.14 \cdot 10^{-9}$ sec. For checking the spectrometer the neutron spectrum of a Po-Be source arranged with L=1 m was determined. The neutrons of the Po-Be source were produced in the reaction $Be_4^9 + He_2^4 \rightarrow C_6^{13} \rightarrow C_6^{12} + n + (Q-E_i)$ where the reaction energy Q=5.75 Mev, and E_i is the excitation energy of the C_6^{12} nucleus. Since E_o=0, E_1=4.43 Mev and E_2=7.65 Mev, three neutron groups could be expected. However, as only the first level de-excites via gamma emission, E_2 in at least 99.97% via α-emission, only the 4.43-Mev group was recorded. The spectrum recorded was not discrete but continuous, which is attributed to changes of the α and neutron energies due to ionization losses or differences in the direction of emission. The results are shown in Fig. 8, compared with theoretical calculations and foreign results. There are 9 figures.

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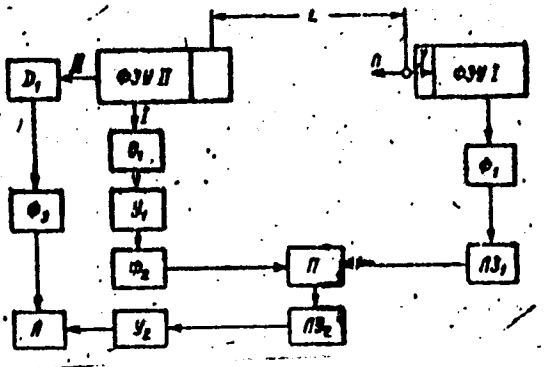

Fig. 1. Block diagram of the spectrometer.
$О_1$ - limiter; $Ф_{1,2,3}$ - pulse-forming circuits; $У_{1,2}$ - amplifiers; $ЛЗ_{1,2}$ - delay lines; $Д_1$ - discriminator; П - converter; А - multichannel analyzer.

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B102/B186

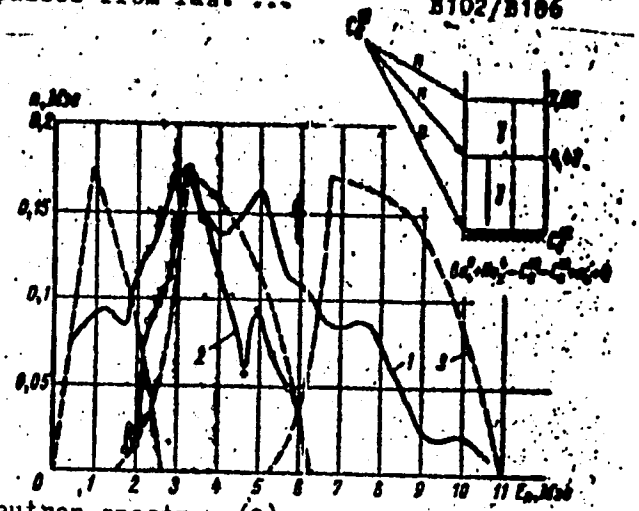

Fig. 8. The Po-Be neutron spectrum (2) compared with the theoretical spectrum (3) obtained in qualitative approximation, and with the spectrum (1) obtained from photoemulsion experiments (Phys. Rev. 78,799,1950).

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DOROSHENKO, G. G.

95

S/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inzhenerno-fizicheskogo instituta (Scientific Conference of the Moscow Engineering Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fivegskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect; M. I. Ryazanov, theory of ionization losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadze, h-f conductivity of subcritical plasma;

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S/089/62/013/006/019/027
B102/B186

Nauchnaya konferentsiya...

Ye. Ye. Lovetskiy, A. A. Rukhadze, electromagnetic waves in nonhomogeneous plasma; Yu. D. Kotov, I. L. Rozental', the origin of fast cosmic muons; Yu. M. Ivanov, muon depolarization in solids; V. G. Varlamov, Yu. M. Grashin, B. A. Dolgoshein, V. G. Kirillov-Ugryumov, V. S. Roganov, A. V. Samoylov, μ^- capture by various nuclei; V. S. Demidov, V. G. Kirillov-Ugryumov, A. K. Ponosov, V. P. Protasov, F. M. Sergeyev, scattering of π^- mesons at 5 - 15 Mev in a propane bubble chamber; S. Ya. Nikitin, M. S. Aynutdinov, Ya. M. Selektor, S. M. Zombkovskiy, A. F. Grashin, muon production in π^-p interactions; B. A. Dolgoshein, spark chambers; N. G. Volkov, V. K. Lyapidevskiy, I. M. Obodovskiy, study of operation of a convection chamber; K. G. Finogenov, production of square voltage pulses of high amplitudes; G. M. Alekseakov, problems of color vision; V. K. Lyapidevskiy, relation between number of receivers and number of independent colors; Ye. M. Kudryavtsev, N. N. Sobolev, F. I. Tisengausen, L. N. Tunitskiy, F. S. Fayzulov, determination of the moment of electron transition of oscillator forces and the widths of the Schuhman-Runge bands of molecular oxygen; B. Ye. Gavrilov, A. V. Zharikov, V. I. Rayko, decomposition of the volume charge of intense ion beams; Ya. A. Kramer-Agayev, V. S. Troshin, measurement of neutron spectra; G. N. Doroshenko, new methods of fast-neutron recording; V. I. Ivanov, dosimetry terminology; R. M. Voronkov,

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S/796/62/000/003/012/019

AUTHORS: Doroshenko, G.G., Stolyarova, Ye.L.

TITLE: Physical fundamentals of the design of high-effectiveness fast-neutron detectors.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no.3. 1962, 115-124.

TEXT: In fast-neutron flux measurement two difficulties are encountered: (1) Neutral particles can be registered only via secondary charged particles (recoil protons and nuclei, nuclear-reaction products); (2) fast-neutron fluxes, as a rule, are accompanied by gamma-radiation, so that the problem of the γ-background cut-off comes to the fore. Existing measuring methods are criticized for their low effectiveness of registration and relatively low counting rate (hundreds of pulses per second). Scintillation sensors with organic phosphors (stilbene, anthracene, liquid scintillators, etc.) with an elevated H content afford a 10-40% effectiveness in the registration of fast neutrons and a counting rate of the order of 10^3 and 10^4 pulses per second. Formerly their use was limited by their lower light output for protons than for electrons at identical particle energies. Recent discoveries of the interesting property of certain organic scintillators, in which the character of the

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scintillation depends on the type of the exciting particle (cf. Brooks, F., Nucl. Instrum., v.4, no.3, 1959, 151; Wright, G., Roy. Phys. Soc., Proc., v. B 69, no. 435, 1956, 358; Brooks, F., Progr. Nucl. Phys., no. 5, 1956, 252; Owen, R., IRE Trans. Nucl. Sci., v. 5, no. 3, 1958, 198) offer promise of a practical separation of fast-neutron and γ-quanta impulses in a high-effectiveness sensor. The Kallmann-Brucker work (Phys. Rev., v. 108, 1957, 1122) on the shape of the scintillational pulses of organic luminophores is reported, as is F. Harrison's discovery of slow components in the scintillations of stilbene and anthracene (Nucleonics, v. 12, no. 3, 1954, 24), Wright's findings (see above) of different fluorescent life time (FL) for α-particles (53 nsec) and electrons (31 nsec) in anthracene, and Owen's experiments (see above) on the difference in FL of the slow components of organic phosphors. The fluorescence in organic scintillators can be visualized as a sum of several exponential components, namely, one "fast" nsec component which produces 80% of the total light output and one or more "slow" components with FL from 0.1 to 100 μsec. Although the FL of the fast component is independent of the nature of the exciting particle, inclusion of the slow components in some organic scintillators affords a distinction between greater effective FL's for a proton and shorter FL's for an electron. The FL differentiation is attributed to the different duration of the processes initiated by ionized molecules (M+) and excited molecules (M*), namely, recombination and return-to-ground-state photon emission, respectively.

Physical fundamentals of the design of ... S/796/62/000/003/012/019

Divider arrangements, designed to achieve γ-background cutoff in high-effectiveness detectors for fast neutrons (cf. Owen, R., Nucleonics, v. 17, no. 9, 1959, 92; Doroshenko, G.G., et al., present compendium, pp. 125-135, Abstract S/796/62/000/003/013/019), are classified according to the principle and method of division (full-page table). There are 4 figures, 4 tables, and 15 references (2 Russian-language Soviet and 13 English-language).

ASSOCIATION: None given.

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S/796/62/000/003/013/019

AUTHORS: Doroshenko, G.G., Stolyarova, Ye.L.

TITLE: Cutoff of a γ-background in high-effectiveness fast-neutron detectors with the aid of a space charge in a photoelectronic multiplier.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no.3. 1962, 125-135.

TEXT: The paper describes the experimental steup for the cutoff of the γ-background according to the authors' method (cf. AN SSSR, Izv., v.25, no.1, 1961, 152) by differentiation in effective fluorescent (deactivation) lifetime (FL) of the scintillation of some organic phosphors depending on the density of the ionization determined by the type of exciting particle (Owen, R., IRE Trans. Nucl. Sci., v.5, no. 3, 1958, 198; Brooks, F., Nucl. Instrum. & Meth., v.4, 1959, 151). The difference in FL is transformed into a difference in pulse-voltage amplitude at the photoelectronic-multiplier (PhM) output. For that purpose the PhM is operated in a special state of deep space-charge saturation in which the magnitude of the saturation amplitude is determined solely by the FL. The characteristics of NaI(Tl) crystals, anthracene, stilbene, tolane, and naphthalene used for this purpose were determined experimentally. The equipment used is illustrated schematically. The characteristics of the same substances are also depicted as measured in deep space-charge

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saturation, also the dependence of the saturation amplitude on the FL. Agreement with literature data is termed good. Calibration curves for various PhM voltages are shown, manifesting a flat spot which spreads toward the lower-energy area with increasing voltage. The amplitude distributions for 1.5 and 2.5 kv are shown separately. A comparison of the amplitude distributions for pure γ-radiators on these graphs shows that for sufficiently high flux densities in the pulse the dependence of the maximal amplitude at the PhM output on the γ-quanta energy disappears (the above-mentioned flat spot). It can be proved experimentally that the high-energy ends of the amplitude distribution of the γ-radiation of a Po-Be source (max. energy 4.45 mev) deviates from the saturation amplitude of the pure γ-sources because of the presence of fast neutrons. Thus, a simple discrimination can provide a practically total cutoff of the γ-background. The principal advantage of this method over R. Owen's method (Nucleonics, v. 17, no. 9, 1959, 92) consists in its delivery of large-amplitude PhM-output pulses of very short duration (photo), thereby rendering unnecessary a pre-recorder amplifier. The short output-signal durations permit heavy sensor loads, up to $3 \cdot 10^4$ pulses per second. There are 10 figures and 8 references (1 Russian-language Soviet and 7 English-language, of which one is cited in Russian translation).

ASSOCIATION: None given.

S/796/62/000/003/014/019

AUTHORS: Doroshenko, G.G., Stolyarova, Ye.L.

TITLE: Use of space charge and gaseous enhancement in a photoelectronic multiplier for the separation of fast-neutron and γ-quantum impulses.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no.3. 1962, 136-142.

TEXT: An experimental investigation was made to increase the saturation-amplitude ratio for the recoil protons and recoil Compton electrons ($\rho = n/\gamma$) as set forth in the authors' preceding paper in the same compendium (Abstract S/796/62/000/003/013/019). For that purpose the effect on ρ of the operation of the three last photomultiplier (PhM) cascades with various values of the load resistance R_{13} in line with the 13th dynode is studied (circuit shown). It was discovered that with large values of R_{13}, at and above 200 kohm, and at certain fairly reduced voltage differences between the 12th and the 13th dynode ρ jumps abruptly from appx. 1.2 to appx. 1.6-2.0, an effect which leads to a clear separation of the fast-neutron impulses on the oscillograms (photorecordings shown). This interpretation was verified experimentally by means of impulse-amplitude distributions from a Po-Be source, shielded by various layers of paraffine and Pb. A 100-channel "Raduga" analyzer was employed. The plotted graph shows that a 406-mm thick paraffine layer weakens the fast-neutron flux to near-zero, whereas the number of γ-quanta pulses is approximately halved. The reverse result occurs with Pb. A γ-neutron calibra-

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tion (graph) shows a clearly defined saturation plateau for both γ-quanta and neutron impulses, with a saturation-amplitude ratio of the order of 2. The points on the gamma-calibration curve were obtained with an array of Cs^{137}, Zn^{65}, ThC^{11}, and Po-Be γ-sources; the points on the neutron curve were obtained with a Po-B source for 5.5 mev, Po-Be for 11 mev, a neutron-generator D(d,n) and T(d,n) reaction for monochromatic neutrons at 4 and 15.85 mev, respectively, and a Van-de-Graaf-equipment T(p,n) reaction for monochromatic neutrons at 0.76-3.11 mev. The potential-trap effect is interpreted with reference to Ivey, H., Adv. Electronics, v.4, 1954, 137. Strong focusing action occurs even with small numbers of positive ions in the interval between dynodes, primarily because they are practically immobile during the course of the impulse (Spivak, G.V., et al., Zh. tekhn. fiz., v.2, 1950, 15). An added effect is that of the partial compensation of the space charge of the electrons. As a result the electron charge passing onto the 13th dynode is enlarged, which in turn increases the amplitude of the output signal and, consequently, the contribution of the gaseous focusing effect. Hence, the jumplike increase in the fast-neutron impulse amplitude. This action of the residual gas (Ce) is termed "gaseous enhancement." Any PhM that operates well under space-charge saturation will also operate satisfactorily and stably under gaseous enhancement. The practical usefulness of this PhM operation for the registration of fast-neutron impulses is evident. There are 6 figures and the 3 references cited in the text (2 Russian-language Soviet, 1 English).

ASSOCIATION; None given.

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L 31835-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AR5005652 S/0058/64/000/012/A039/A040

SOURCE: Ref. zh. Fizika, Abs. 12A363

AUTHORS: Doroshenko, G. G.; Stolyarova, Yu. L.

TITLE: Method of estimating the effective scintillation de-excitation times

CITED SOURCE: Sb. Stsintillyatory i stsintillyats. materialy. Khar'kov, Khar'kovsk. un-t, 1963, 119-122

TOPIC TAGS: electron excitation, proton excitation, deexcitation time, tolane, anthracene, stilbene, naphthalene

TRANSLATION: A new simple method is proposed for estimating the effective de-excitation times by a relative method. The method is based on measuring the saturation amplitude at the output of a photomultiplier operating under a special mode of deep saturation with

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ACCESSION NR: AR5005652

3

space charge. In this mode, the amplitude of the saturation is determined only by the effective time of de-excitation of the scintillations. An estimate of the effective de-excitation times of the investigated scintillators is made against calibration curves obtained by the indicated method for scintillators with well known de-excitation time, namely tolane, anthracene (electron excitation) and NaI(Tl). The values of the effective de-excitation time, obtained as a result of measurements of the saturation of different scintillators excited with electrons and protons, turn out to be as follows: stilbene -- τ_e = 15 msec and τ_p = 33 msec, naphthalene -- τ = 126 msec, anthracene -- τ_p = 43 msec. The effective de-excitation times of stilbene for electron and proton excitation, and also the effective time of de-excitation of anthracene in the case of proton excitation, were measured for the first time. The data obtained are compared with data of other experiments.

SUB CODE: GP, OP ENCL: 00

Card 2/2

S/2892/63/000/002/0146/0151

ACCESSION NR: AT4021264

AUTHOR: Zolotukhin, V. G., Doroshenko, G. G., Yefimenko, B. A.

TITLE: The registration efficiency of a neutron scintillation detector

SOURCE: Voprosy* dozimetrii i zashchity* ot izluchaniy, no. 2, 1963, 146-151

TOPIC TAGS: scintillation detector, neutron detector, neutron absorption, Monte Carlo method, scintillation, carbon, Taylor series, hydrogen

ABSTRACT: Accurate data on detector characteristics, such as the shape of the spectral line and the registration efficiency of scintillation detectors with organic crystals is not as yet available. Only a number of approximate formulas for the calculation of registration efficiency of counters is available. These formulas take into consideration: 1) the single stage scattering in hydrogen, 2) the single stage scattering in hydrogen and carbon, and 3) the single stage scattering in carbon and the single and double stage scattering in hydrogen. The authors [Neutron Dosimetry (Proceedings of a Symposium on neutron detection, dosimetry and standardization, Harwell, 10-14 December, 1962), v. 1, 597, International Atomic Energy Agency, Vienna, 1963] have developed a semi-analytic Monte-Carlo method for calculating the amplitude distribution of pulses and the counter

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ACCESSION NR: AT4021264

effectiveness of a detector with an organic scintillator. This method proves to be highly effective and acquires high calculation precision with moderate machine time consumption. All interaction processes of neutrons with nuclei of the scintillation substance are taken into consideration, including the marginal effects on the walls of the scintillator. These are presented in a graph. The paper also includes a table of registration efficiency for a 30 X 30 mm crystal. Orig. art. has: 3 formulas, 3 figures, and 1 table.

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

SUBMITTED: 00 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: MF, PH NO REF SOV: 002 OTHER: 003

Card 2/2

S/2892/63/000/002/0152/0157

ACCESSION NR: AT4021265

AUTHOR: Doroshenko, G. G., Glagolev, V. I., Barabanov, K. R., Filyushkin, I. V.

TITLE: Application of the denumerable efficiency method for measuring the spectra of fast neutrons

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 152-157

TOPIC TAGS: denumerable efficiency, fast neutron, Monte Carlo method, neutron spectrum, photomultiplier, FEU-33, computer, BESM-2, trapezoidal rule, Simpson rule

ABSTRACT: In this paper, a new method for the study of neutron spectra -- the denumerable efficiency method -- is discussed. This method has the advantage that it is applicable to any shape of spectral line and the initial data used in this method are the integral count velocities, thereby decreasing a statistical error. The main principle of this method is contained in the use of the known dependence of the absolute denumerable efficiency in registering $\varepsilon(E,B)$ on the neutron energy E and the energy threshold B of the neutron counter. Of the possible methods studied, the trapezoidal rule and Simpson rule are the most suitable. The results are presented and verified in graphs. The authors find the development of a multi-

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ACCESSION NR: AT4021265

threshold analyzer to be most expedient because of its considerable simplicity, as compared with the multichannel analyzers now in use. The authors claim this method will simplify considerably the task of obtaining spectra. The authors express their gratitude to V. G. Zolotukhin for his interest in the article and for his valuable advice. Orig. art. has: 3 figures and 6 formulas.

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

SUBMITTED: 00 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: NS, PH NO REF SOV: 004 OTHER: 007

Card 2/2

ACCESSION NR: AT4021266 S/2892/63/000/002/0158/0161

AUTHOR: Doroshenko, G. G., Glagolev, V. I., Barabanov, L. R., Filyushkin, I. V.

TITLE: Application of the denumerable efficiency method for measurement of the spectra of γ quanta

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 158-161

TOPIC TAGS: denumerable efficiency, γ rays, γ quanta, shield, energy threshold, γ spectrometry, organic scintillators, cobalt 60

ABSTRACT: The authors use the denumerable efficiency method for measuring γ spectra. This new method is described by Doroshenko, G. G. and Larichev, A. V. (Izv. AN SSSR, Ser. fiz. 27, No. 1, 141, 1963). The continuous spectra of γ rays obtained in the scattering of γ quanta of cobalt 60 in shields of iron, lead and their combination, are studied. The measurement results of the γ spectra with eight thresholds are presented in graphs. Based on the data, the authors suggest the development of a simple portable γ spectrometer. The denumerable efficiency method makes it possible to use organic scintillators for γ spectrometry. The authors express their gratitude to A. V. Larichev for his contribution of experimental data. Orig. art. has: 4 figures and 3 formulas.

Card 1/1

MOSCOW ENGINEERING PHYSICS INST

S/2892/63/000/002/0179/0184

ACCESSION NR: AT4021269

AUTHOR: Doroshenko, G. G., Filyushkin, I. V., Fedorov, V. A.

TITLE: A separation device for a scintillation spectrometer of fast neutrons

SOURCE: Voprosy* dozimetrii i zashchity* ot izlucheniy, no. 2, 1963, 179-184

TOPIC TAGS: scintillation spectrometer, fast neutrons, γ quanta, time discrimination

ABSTRACT: The discovery of the fact that the form of a scintillation pulse in some organic phosphors depends on the type of exciting particle (Brooks, F. Nucl. Instrum., 4, no. 3, 151 (1959)) has made it possible to perform a separation of pulses from fast neutrons and γ quanta. This has enabled the authors to develop a highly efficient single crystal scintillation spectrometer, the schematic of which is presented in this paper. Oscillograms which explain the operation of the device are presented. The authors also present the results of measuring the threshold of separation and the spectrometric threshold of the separation device. The separation device operates normally until the "integral load" exceeds 4×10^3 pulses/sec. Within these limits, the efficiency of the separation device does not exceed 5×10^{-3}% in respect to γ radiation. Orig. art. has: 4 figures.

Card 1/2

ACCESSION NR: AT4021269

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

SUBMITTED: 00 DATE ACQ: 06Apr64 ENCL: 00

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

Card 2/2

ACCESSION NR: AP4006840 S/0120/63/000/006/0175/0175

AUTHOR: Fedorov, V. A.; Doroshenko, G. G.; Filyushkin, I. V.

TITLE: A sensitive threshold device

SOURCE: Pribory* i tekhnika eksperimenta, no. 6, 1963, 175

TOPIC TAGS: sensitive threshold device, sensitive threshold circuit, threshold circuit, stable threshold circuit, threshold pickup

ABSTRACT: A sensitive triggering device is briefly described. It consists of a two-tube single-shot multivibrator with an operating threshold of from 2 to 200 mv, depending on the bias voltage used. Selected tube operating conditions and the use of a double diode key in the positive-feedback circuit are responsible for its high sensitivity. Means for stabilizing the bias voltage are provided. Orig. art. has: 1 figure.

Card 1/2

ACCESSION NR: AP4006840

ASSOCIATION: none

SUBMITTED: 17Jan63	DATE ACQ: 24Jan64	ENCL: 00
SUB CODE: SD	NO REF SOV: 000	OTHER: 000

Card 2/2

ZOLOTUKHIN, V.G.; DOROSHENKO, G.G.; YEFIMENKO, B.A.

Calculation of pulse amplitude distributions and counting efficiencies for a fast neutron scintillation detector. Atom. energ. 15 no.3:194-200 S '63. (MIRA 16:10)

(Scintillation counters)

W.952

S/048/63/027/001/043/043
B108/B180

21.6700

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 $N_i = \int_{E_{min_i}}^{E_{max}} f(E)\varepsilon_i(E)dE.$

Card 1/2

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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L 17862-63 EWT(m)/BDS AFFTC/ASD S/0048/63/027/007/0949/0952

ACCESSION NR: AP3003704

54

AUTHOR: Doroshenko, G.G.; Filyushkin, I.V.; Fedorov, V.I. 19

TITLE: Amplitude-time discrimination of the gamma background in a scintillation spectrometer for fast neutrons /Report of the Thirteenth Annual Conference on Nuclear Spectroscopy held in Kiev from 25 January to 2 February 1963/

SOURCE: AN SSSR, Izv.Seriya fizicheskaya, v.27, no.7, 1963, 949-952

TOPIC TAGS: neutron detectors, organic scintillators, discrimination

ABSTRACT: The fact that the shape of the scintillation pulses in some organic phosphors depends on the nature of the exciting particle has made it feasible to discriminate the pulses due to background gamma-rays from pulses produced by fast neutrons thereby realizing a high-efficiency neutron detector. A good separating circuit must insure the lowest possible separation threshold and reliable cut-off of the gamma background, and allow of a high load (counting rate). Unfortunately, present separating circuits do not fully meet these requirements. Accordingly, a separating arrangement utilizing amplitude-time discrimination is proposed in the present paper. The arrangement is diagrammed in Fig.1 of the Enclosure; it con-

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L 17862-63
ACCESSION NR: AP3003704

sists of a separating circuit of the type designed by V.G.Brovchenko and G.V.Gorlov (Pribory i tekhnika eksperimenta, No.4, 49, 1961), a separating channel (I), a time-delay channel (II) and a coincidence circuit. Tests of the arrangement show that it operates satisfactorily up to an "internal load" of 4×10^3 pulses per sec; up to this point the detecting efficiency for gamma-radiation does not exceed 0.01%. Orig.art.has: 3 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 02Aug63 ENCL: 01

SUB CODE: SD, NS NO REF SOV: 003 OTHER: 004

Card 2/3

DOROSHENKO, G.G.; GLAGOLEV, V.I.; BARABANOV, I.R.; FILYUSHKIN, I.V.

Results of measurements of fast neutron spectra using the counting efficiency method. Izv. AN SSSR. Ser. fiz. 27 no.10:1308-1312 O '63. (MIRA 16:10)

DOROSHENKO, G. G.; YEFIMENKO, B. A.; ZOLOTUKHINA, V. G.

"A Method of Calculating Efficiencies for the Investigation of Continuous Spectra of Fast Neutrons."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

MIFI (Moscow Engineering Physics Inst)

DOROSHENKO, G. G.; FILYUSHKIN, I. V.

"Spectra of Fast Neutrons of a Po-Be Source After Water Shielding."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

MIFI (Moscow Engineering Physics Inst.)

ARSE[illegible], V. Ya.; VLADIMIROV, L. A.; DOROSHENKO, G. G.; DUMOVA, A. A.; TIKHONOV, A. N.

"Concerning the Question about Working up the Spectra of Gamma Rays and Fast Neutrons Measured with the Help of Single Crystal Scintillation Spectrometers."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

MIFI (Moscow Engineering Physics Inst)

L 24403-65 EWT(m) DIAAP

ACCESSION NR: AT5003280 S/2892/64/000/003/0030/0031

AUTHOR: Fedorov, V. A.; Doroshenko, G. G.

TITLE: Matrix method for determining the relative content of a given isotope within a sample

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izluchenly, no. 3, 1964, 30-31

TOPIC TAGS: isotope, isotope content, matrix method, activation analysis, fast neutron spectrum, gamma spectrum

ABSTRACT: It is often necessary to determine the relative abundance of a given isotope within an arbitrary sample consisting of several isotopes. A method is proposed based on the known total fast neutron or γ-quanta spectrum of the sample and the knowledge of the partial spectrum of each of the isotopes. The article presents the case of fast neutrons, but the resulting method can also be used in cases when the spectra are discrete rather than continuous. The new approach can be used in activation analysis. Orig. art. has: 7 formulas.

ASSOCIATION: None

Card 1/2

L 24403-65

ACCESSION NR: AT5003280

SUBMITTED: 00 ENCL: 00 SUB CODE: MA,NP

NO REF SOV: 000 OTHER: 001

Card 2/2

L 24402-65 EWT(m) DIAAP RM

ACCESSION NR: AT5003281 S/2892/64/000/003/0032/0044

AUTHOR: Doroshenko, G. G.; Filyushkin, I. V.; Fedorov, V. A.

TITLE: Fast neutron spectrometer

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 1964, 32-44

TOPIC TAGS: fast neutron, neutron spectrometer, scintillation spectrometer, stilbene crystal, radiation dosimetry

ABSTRACT: Fast neutron scintillation spectrometers are extremely efficient devices, but due to the almost rectangular line form and high γ-sensitivity, data from such spectrometers are difficult to process. The method of recording efficiencies published earlier by the authors (Izv. AN SSSR, Ser. fiz., 27, 10, 1308, 1963) yields very reliable fast neutron spectra, and the high efficiency of the scintillation spectrometers opens a real possibility for the measurement of the spectra of very weak neutron beams (e.g., 20 neutrons/cm^2·sec). The authors describe in detail a fast neutron spectrometer whose good linearity allows the attainment of an extremely low spectrometric resolution threshold (~80 kev on the emitted electron scale) at relatively high permissible loads (~5.10^3 c/sec). The

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L 24402-65

ACCESSION NR: AT5003281

30 x 30 mm cylindrical stilbene crystal is connected to an FEU-13 type photomultiplier. The article describes the electronic circuitry and gives the temporal diagram of the separation device pulses, the determination of the energy threshold, the shape of the Compton distribution, the ratio of the half-height energy to the maximum Compton electron energy as a function of the energy resolution (Cs 137 γ-quanta), the stilbene light yield as a function of emitted protons, and the inverse transposed stilbene crystal matrix. Test measurements of fast neutrons from Po-Be sources were in excellent agreement with the results of photoplate measurements and resonant cross section structure (neutron-oxygen interaction) data. Orig. art. has: 4 formulas, 9 figures, and 3 tables.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 004 OTHER: 006

Card 2/2

L 24400-65

ACCESSION NR: AT5003284 S/2892/64/000/003/0065/0071

B+1

AUTHOR: Fedorov, V. A.; Doroshenko, G. G.

TITLE: The use of Kotel'nikov's theorem in the sepctrometry of continuous energy spectra of radiation

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izluchenij, no. 3, 1964, 65-71

TOPIC TAGS: radiospectrometry, energy spectrum, radiation energy, Fredholm first order equation, integral equation, Kotel'nikov theorem, information theory

ABSTRACT: During the study of continuous radiation spectra, one frequently encounters the Fredholm first order integral equation

$$F(E') = \int f(E)K(E, E')\,dE, \qquad (1)$$

connecting the differential distribution of pulse amplitudes F(E') with the differential energy radiation spectrum f(E). The present paper discusses the feasibility of an analytic representation of f(E) free from the usual shortcomings of the polynomial representation. It is based on the theorem due to V. A. Kotel'nikov (O propusknoy sposobnosti efira i provoloki v elekrosvyazi. Materialy k I-omu Vsesoyuznomy s"yezdu, VEK, 1933), which is well known in information theory and

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L 24400-65

ACCESSION NR: AT5003284

which states that an arbitrary function can be represented exactly using frequencies between 0 and ω_{max} if the function is sampled at intervals π/ω_{max} seconds apart. The results show that by the use of the above-mentioned theorem one can indeed augment the accuracy of quadratures of approximate solutions of problems of spectrometry and obtain well defined systems of linear equations. Orig. art. has: 17 formulas and 1 figure.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: NP, DP

NO REF SOV: 008 OTHER: 000

Card 2/2

L 24398-65 EWT(m)/EWA(h)

ACCESSION NR: AT5003285 S/2892/64/000/003/0072/0076

AUTHOR: Fedorov, V. A.; Doroshenko, G. G. B+1

TITLE: Measuring device at the input of a nonlinear amplitude analyzer

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 1964, 72-76

TOPIC TAGS: nonlinear analyzer, amplitude analyzer, channel discriminator, channel specification, radiation dosimetry /4

ABSTRACT: During amplitude analysis, it is necessary to separate the boundaries of the analyzer channels according to some given law. Such is the case in fast neutron spectroscopy (G. G. Doroshenko, I. V. Filyushkin, V. A. Fedorov, Voprosy dozimetrii i zashchity izlucheniy, no. 3, 1965, p. 32), where the boundaries are separated according to the nonlinear law of scintillator light signals. In the present article, the authors describe in detail the circuitry and operation of an input device which differs from other known setups by the use of a threshold element whose triggering instant determines the address of the respective channel. This is achieved by an appropriate change in the discriminator threshold time (from longer to shorter) through a distributed delay line. The channel number is

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L 24398-65

ACCESSION NR: AT5003285

determined by the number of pulses from the generator. Orig. art. has: 2 figures and 1 formula.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: NP, DP

NO REF SOV: 002 OTHER: 000

Card 2/2

L 24399-65 EWT(m)/EWA(h)

ACCESSION NR: AT5003286 S/2892/64/000/003/0077/0081

AUTHOR: Fedorov, V. A.; Doroshenko, G. G.

TITLE: Sensitive stable amplitude discriminator

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 1964, 77-81

TOPIC TAGS: amplitude discriminator, monovibrator, nonlinear diode quadrupole, radiation dosimetry, radiospectrometer

ABSTRACT: The amplitude discriminator, one of the most important elements of a spectrometric device, is actually a nonlinear element generating a signal whenever the amplitude of the input signal exceeds the given discrimination threshold. A new amplitude discriminator has been designed around a highly sensitive monovibrator having a minimum clear operating threshold on the order of 1-2 mv. The discrimination threshold is controlled by the most stable discriminating element - the diode (provided it is thermally stabilized), while the tube circuitry of the monovibrator represents a special kind of zero-element whose possible drift practically does not affect the operation of the entire device. The especially high sensitivity of the monovibrator circuit is by a particular choice of tube operating points and by the

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L 24399-65

ACCESSION NR: AT5003286

use of the positive feed-back of the nonlinear diode quadrupole whose transfer coefficient is determined in an essential way by the magnitude of the input signal (V. A. Fedorov, G. G. Doroshenko, I. V. Filyushkin, Pribory i tekhnika eksperimenta, 6, 69, 1963). Orig. art. has: 7 formulas and 2 figures.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: NP, EC

NO REF SOV: 001 OTHER: 000

Card 2/2

L 23790-65 EWT(m)/EWA(h)

ACCESSION NR: AT5003290 S/2892/64/000/003/0101/0105

AUTHOR: Doroshenko, G.G.; Barabanov, I.R.; Fedorov, V.A. B+1

TITLE: The processing of spectra from monoenergetic neutrons behind water shielding using the method of counting efficiencies 19

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosy dozimetrii i zashchity ot izlucheniy, no. 3, 1964, 101-105

TOPIC TAGS: neutron spectrum, monoenergetic neutron scattering, water shielding, counting efficiency method, reactor shielding

ABSTRACT: The method of counting efficiencies (see, e.g., G.G. Doroshenko, et al., Neutron Dosimetry. Proc. of Symposium on neutron detection, dosimetry and standardization, Harwell, Dec. 10-14, 1962. International Atomic Energy Agency, Vienna, vol. 1, 1963, p. 337) in the single-scattering approximation was applied to the study of spectra of monoenergetic neutrons behind water shielding. Monoenergetic 15.1 Mev neutrons originated from the accelerator reaction

$$D_1^1 + T_1^3 \rightarrow n + He_2^4.$$

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L 23790-65

ACCESSION NR: AT5003290

Data from a target at the center of a water-filled tank (simulating infinite geometry) were collected by Yu. A. Kazanskiy and V.A. Dulin. The results are compared with theoretical data by R. Aronson et al. (USAEC, Report NYO-6269, 1954) and with the exact Monte Carlo calculation of counting efficiencies by V.G. Zolotukhin et al., (Atomnaya energiya, 15, no. 3 1964, 1963). The agreement is good, indicating that the approximation taking into account single hydrogen atom scattering can be utilized for the approximate evaluation of fast neutron spectra. Orig. art. has: 2 formulas, 2 figures, and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 004 OTHER: 002

Card 2/2

L 23782-65 EWG(j)/EWT(l)/EWT(m)/EPF(c)/EWP(j)/EEC(b)-2/EWA(h)/EWA(l)
Pc-4/Pr-4/Peb RH

ACCESSION NR: AT5003292 S/2802/64/000/003/0110/0124

AUTHOR: Doroshenko, G.G.; Fedorov, V.A.; Barabanov, I.R.; Grishin, Yu. L.

TITLE: Analysis of a photomultiplier operating in the nonlinear region

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Voprosydozimetrii i zashchity ot izlucheniy, no. 3, 1964, 110-124

TOPIC TAGS: photomultiplier, saturated photomultiplier, scintillation counter, photomultiplier theory, sodium iodide scintillator, radiation dosimeter

ABSTRACT: Photomultipliers operating in the nonlinear region may exhibit valuable properties (see, e.g., G.G. Doroshenko, Ye. L. Stolyarova, Neutron Dosimetry, Proc. of Symposium on neutron detection, dosimetry, and standardization, Harwell, 10-14 Dec, 1962. International Atomic Energy Agency, Vienna, vol. 2, 363, 1963). Since such operations may involve complicated processes, the authors carried out an analysis of photomultipliers working under high saturation conditions. On the one hand, the analysis was based on experimental data concerning the dependence of the output pulses from various electrodes of the system on the energy of secondary particles (for NaI(Tl), anthracene, stilbene, tolan, and naphthalene crystals), on the scintillation time of scintillators, and on the time constant of the RC load; on the other hand, the analysis

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L 23782-65
ACCESSION NR: AT5003292

utilized simple physical models of the observed events. The article also contains diagrams of the pulsed photomultiplier current for various scintillators at E=4.43 Mev, of the amplitude of the pulse voltage as a function of the saturation current for various scintillation times, of the current pulses for a scintillation time of 5 nsec. and various degrees of uncertainty in the time of flight (describable by a constant T), of the dependence of the current and voltage pulse amplitudes on T, of the saturation amplitude versus the scintillation constant, and of the current and voltage pulses across the loads as a function of time. The results of theoretical calculations are in good agreement with present and previously published experimental data (G.G. Doroshenko, Ye. L. Stolyarova, Sbornik rabot po nekotorym voprosam dozimetrii i radiometrii ioniziruyushchikh izlucheniy, no. 2, M., Gosatomizdat, 1961, p. 129). Orig. art. has: 9 formulas, 11 figures, and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 006 OTHER: 005

Card 2/2

ACCESSION NR: AP4015566 S/0089/64/016/002/0152/0153

AUTHORS: Doroshenko, G.G.; Filyushkin, I.V.

TITLE: The spectra of fast neutrons from a Po-Be-source passing through a water shielding

SOURCE: Atomnaya energiya, v. 16, no. 2, 1964, 152-153

TOPIC TAGS: Po-Be-source, stilbene crystal, gamma-background, discrimination, semi-infinite geometry, barrier geometry, fast neutron, neutron spectra, water shielding, oxygen nucleus, infinite medium, relaxation, isotropic source, fission spectrum

ABSTRACT: Experimental measurements and theoretical calculations have been made of fast neutron spectra from a Po-Be-source after they have passed through a water shielding. In view of the proximity of the energy spectra, the results obtained are applicable to Pu-Be- and Ra-Be-sources. The measurements have been made with a single-crystal spectrometer of fast neutrons and a stilbene crystal

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ACCESSION NR: AP4015566

measuring 30 x 30 mm. In the case of a 40 cm layer of water, the full neutron flux hitting the detector amounted to 7.7 neutr/cm^2·sec, and the measuring time was 3 hours. The spectrometric threshold of the spectrometer was determined by a matrix and amounted to 1 Mev. Attention is called to the congruence between the theoretical and experimental spectra in an infinite medium. On the other hand, the characteristic details of the real spectra, associated with the energy dependence of the oxygen cross-section, were not clearly manifested in the theoretical spectra. The attenuation theoretically calculated for an infinite medium was found to be congruent with the experimentally measured attenuation in a semi-infinite medium in the case of a 30 cm layer. "The authors express their gratitude to V.A. Chudayev for his assistance in calculating the theoretical spectra of a Po-Be-source, and to Yu. L. Grishnin for his assistance in the experimental data processing." Orig. art. has: 3 figures.

ASSOCIATION: None

Card 2/2

ACCESSION NR: AP4020327 S/0089/64/016/003/0218/0223

AUTHOR: Doroshenko, G. G.; Glagolev, V. I.; Barabanov, I. R.; Filyushkin, I. V.

TITLE: Analysis of reliability of methods of studying continuous spectra of fast neutrons and gamma quanta

SOURCE:- Atomnaya energiya, v. 16, no. 3, 1964, 218-223

TOPIC TAGS: continuous spectrum, fast neutron, gamma quantum, radiation spectrum, matrix method, neutron dosimetry

ABSTRACT: Various matrix methods for studying the continuous radiation spectra were analyzed from the viewpoint of reliability. The physical reliability of methods of studying the continuous spectra of fast neutrons and γ-quanta is evaluated on the basis of applying criteria of conditionality of linear equation systems. The matrix integral and differential methods of spectrometry with respect to the shape of the line are discussed and compared. In each of these methods, the relationship of conditionality to line shape, matrix rank and energy range is studied. An advantage is shown for the method of counting coincidences with poor line shapes. "The authors are grateful to V. G. Zolotukhin for his

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ACCESSION NR: AP4020327

interest in the work and his helpful discussions." Orig. art. has: 10 equations, 4 figures, 1 table.

ASSOCIATION: None

SUBMITTED: 14Aug63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: NP NO REF SOV: 006 OTHER: 005

Card 2/2

L 45579-65 EWG(j)/EWT(m)/EWP(j)/EWA(h)/EWA(1) Pc-4/Pob DM/RM

ACCESSION NR: AP5009116 S/0089/65/018/003/0287/0290

18
B

AUTHOR: Zolotukhin, V. G.; Doroshenko, G. G. 14

TITLE: Dependence of the calculated fast-neutron counting efficiency on the geometry of organic scintillators

SOURCE: Atomnaya energiya, v. 18, no. 3, 1965, 287-290

TOPIC TAGS: organic scintillator, stilbene, fast neutron counting, counting efficiency

ABSTRACT: In view of the contradictory published data on the subject, the authors present results of Monte-Carlo calculations of the counting efficiency for four geometries of a cylindrical stilbene crystal. The calculations for each geometry were made at 55 initial neutron energies in the range 0.5--18 MeV. The choice of the energies was governed by the resonance structure of the cross section for the interaction between the neutrons and the carbon nuclei. The calculation procedure was described elsewhere (Atomnaya energiya v. 15, 194, 1963). The statistical accuracy was 0.2--0.8%. The results show that the resonance structure of the carbon

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L 45579-65

ACCESSION NR: AP5009126

cross section comes into play in all geometries of the stilbene crystal, and becomes stronger with increasing scintillator dimensions. If scintillators of relatively small size are used and the required accuracy is not high, it is possible to use the formula for the counting efficiency at energies up to 10 MeV in the approximation of single n-p scattering. Plots which make it possible to improve the accuracy by interpolation are presented. Orig. art. has: 2 figures and 1 formula.

ASSOCIATION: None

SUBMITTED: 08Jun64 ENCL: 00 SUB CODE: NP

NR REF SOV: 002 OTHER: 004

Card 2/2