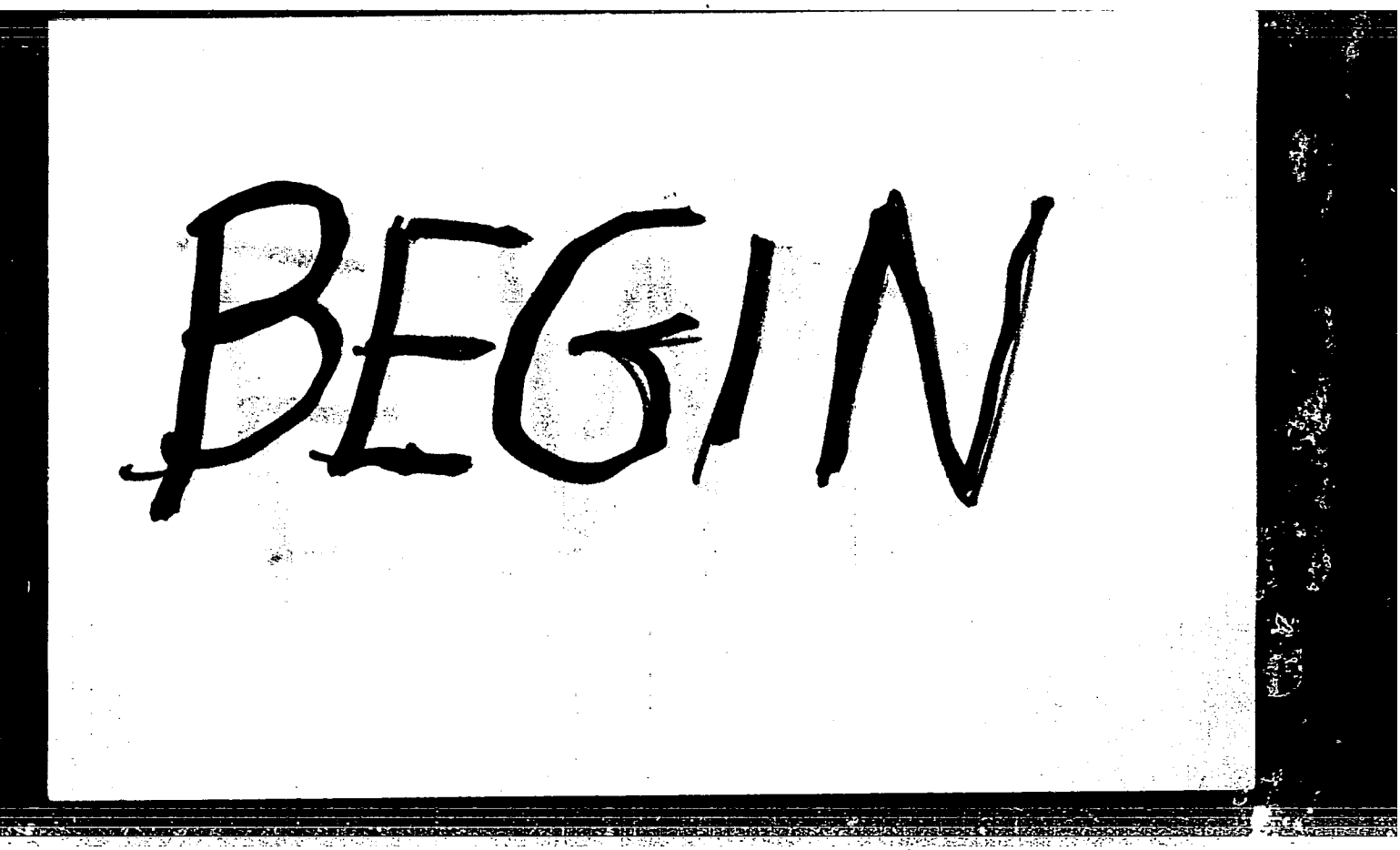

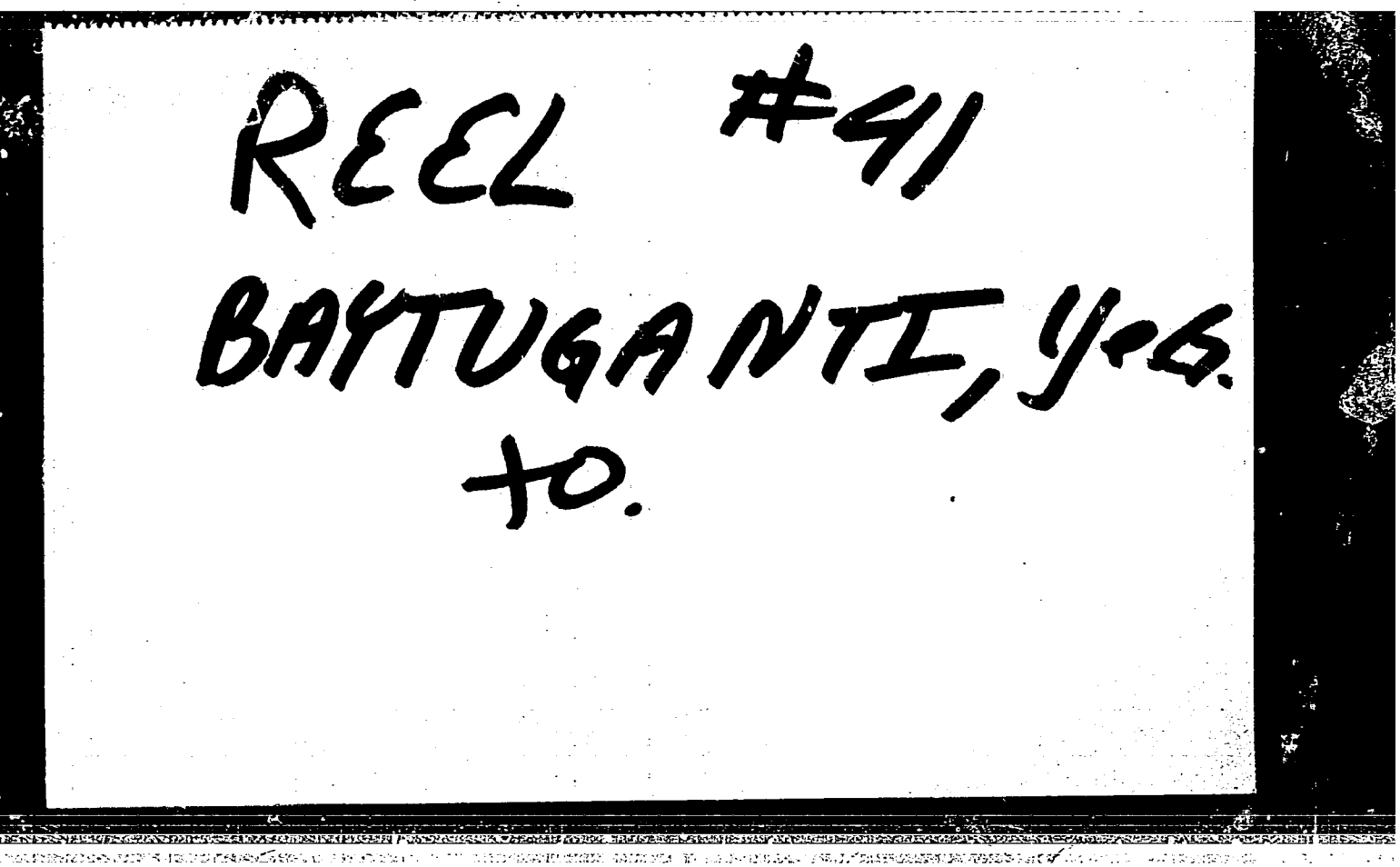

SULTANOV, M.Kh.; SKORNYAKOV, M.V.; MUSAELYANTS, R.N.; BAYTUGANTI, Ye.G.

Safety problems in using casing lines. Trudy VNIITB no.11:3-12 '59. (MIRA 15:5)
(Oil wells--Equipment and supplies)

MANVELYAN, E.G.; BAYTUGANTI, Ye.G.

Choice of efficient and safe design of pipe elevators for underground oil well repairs. Trudy VNIITB no.13:21-29 '60. (MIRA 14:12)
(Oil wells--Equipment and supplies)

KABANOV, V.I., inzh.; YERMAKOVA, A.S., inzh.; BAYTUGANTI, Ye.D., inzh.; BERTUL'SON, Ye.A., inzh.

Attachments to pumping jacks. Bezop.truda v prom. 4 no.4:24-25 Ap. '60. (MIRA 13:9)

(Oil wells—Equipment and supplies)

MANVELYAN, E.G., inzh.; BAYTUGANTI, Ye.G., inzh.

Tube elevators for underground repairing of wells. Bezop.truda v prom. 4 no.10:24-25 O '60. (MIRA 13:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po tekhnike bezopasnosti v neftyanoy promyshlennosti, Baku.
(Oil wells--Equipment and supplies)

MANVELYAN. E.G., inzh.; BAYTUGANTI, [illegible].G., inzh.

Fastening cables of an electric subsurface pumping unit. Bezop.truda v prom. 6 no.7:24 Jl '62. (MIRA 15:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy neftyanoy institut po tekhnike bezopasnosti.
(Oil well pumps)

ASHIMBAYEV, Tuymebay Ashimbayevich, nauchn. sotr.; BAYTULESHEV, Tursunbek Baytuleshevich, nauchn. sotr.; KOVALENKO, Tamara Ivanovna, nauchn. sotr.; SHIM, P.S., kand. ekon. nauk, otv. red.; LEVIN, M.L., red.

[Labor productivity of Kazakhstan's machinery industry and the factors of its growth] Proizvoditel'nost' truda v mashinostroenii Kazakhstana i faktory ee rosta. Alma-Ata, Nauka, 1965. 209 p. (MIRA 18:6)

1. Institut ekonomiki AN Kazakhskoy SSR (for Ashimbayev, Baytuleshev, Kovalenko).

USSR/Cultivated Plants - Fodders. M

Abs Jour : Ref Zhur Biol., No 12, 1958, 53687

Author : Baytulin, I.O.

Inst : AS Kazakh SSR

Inst : Peculiarities in the Development of the Root System of Perennial Cereal Grasses in Grass Mixtures.

Orig Pub : Vestn. AN KazSSR, 1957, No 9, 105-115

Abstract : At the agrobiological station of Kazakh University, the perennial cereals, tall rye grass and dewgrass, develop better and produce a large yield of seeds and hay when mixed with alfalfa, but have a less developed and shallower root system than when sown in pure form. The depth of the root penetration in the case of the tall rye grass in grass mixture is 100-110 cm, and 140-150 cm when sown in pure form. In the case of dewgrass the depth as

Card 1/2

BAYTULIN, I.O.

Effect of alfalfa on the nitrogen nutrition of grasses when growing together. Vest.AN Kazakh.SSR 17 no.1:53-59 Ja '61. (MIRA 14:1)

(Alfalfa) (Grasses)

BAYTULIN, I.O.

Root system spread of some field crops in the Dshurum desert steppes. Izv. AN Kazakh. SSR. Ser. biol. nauk 3 no.1:79-85 Ja-F '65. (MIRA 18:5)

BAYTULIN, I.O.

Root systems of some dominant plants of Emba Plateau desert associations. Bot. zhur. 50 no.8:1135-1143 Ag '65.
(MIRA 18:10)

1. Antyubinskaya opytnaya stantsiya kormov i pastbishch.

KECHEKEZYAN, A.N.; BYTURIN, M.K.

Possibility of lightening and simplifying the standard design of wells on the Zhetybay oil field on Mangyshlak Peninsula. Burenie no.9:19-21 '64. (MIRA 18:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut burovoy tekhniki.

BAYTURINA, O. SH.

Bayturina, O. Sh.

"Problems of the Etiology and Comparative Evaluation of the Effectiveness of Certain Therapeutic Substances in Bronchopneumonia of Calves." Min Higher Education. Alma-Ata Zooveterinary Inst. Alma-Ata, 1955 (Dissertation for the degree of Candidate in Veterinary Sciences)

SO: Knizhnaya letopis' No. 27, 2 July 1955

BAYTURIN, M. A.

Bayturin, M. A. "Pasture regime of the camel," Trudy Alma-At. vet.-zootekhn. in-ta, Vol. V 1948, p. 266-77

So: U-3566, 15 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 13, 1949)

BAYTURIN, M. A.

"The Safety Level in Feeding Vitamin A to Cattle and How to Obtain It." Cand Agr Sci, Alma-Ata Zooveterinary Inst, Alma-Ata, 1953. (RZhBiol, No 4, Oct 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (10)

So: Sum. No.481, 5 May 55

ROSLYAKOV, A.K.; BAYTURIN, N.A.; TSERULIK, P.N.; KRIKAYTSOV, V.T.

Measures for improving the vitamin nutrition of farm animals.
Izv.AN Kazakh.SSR.Ser.biol.no.10:163-168 '55. (MLRA 9:4)

1.Alma-atinskiy zooveterinarnyy institut.
(VITAMINS) (FEEDING AND FEEDING STUFFS)

USSR/Diseases of Farm Animals. Diseases of Unknown Etiology. R-3

Abs Jour : Ref Zhur-Biol., No 20, 1958, 92745

Author : Bayturina, O. Sh.
Inst : Institute of Veterinary Science of the Kazakh Branch of the All-Union Academy of Agricultural Sciences imeni Lenin.
Title : The Combined Treatment of Bronchopneumonia in Calves.

Orig Pub : Tr. in-ta vet. Kazakhsk. fil. VASKhNIL, 1957, 8, 125-131

Abstract : On one farm in the Alma-Ata region up to 65 percent of newborn calves used to be stricken with bronchopneumonia. With the background of improved feeding, 60 sick calves

Card : 1/2

Country : USSR
Category : Diseases of Farm Animals. R
Diseases Caused by Bacteria and Fungi.
Abs. Jour : Ref Zhur-Biol., No 21, 1958, 96962

Author : Bayturina, O. Sh.
Institut. : Kazakh Scientific Research Veterinary Institute
Title : The Treatment of Bronchopneumonia in Calves with Intratracheal Injections of Penicillin and Ecmolin.
Orig Pub. : Tr. Kazakhsk. n.-i. vet. in-ta, 1957, 9, 229-235
Abstract : Forty-five calves were treated. After their keeping and feeding conditions were improved, the calves were intratracheally injected with 350-400 thousand units of novocaine salt of penicillin diluted in 5 ml of an ecmolin suspension once daily for 5 consecutive days. In order to inhibit the cough reflex, 5 ml of a 5 percent suspension of novocaine were introduced 1-2 minutes before the penicillin injection. The treatment resulted in curing 75.5

Card: 1/2

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BAYTURINA, O. Sh., PODLINOV, I. S., AUSEN, E. A., KLEYNBOCK, Ya. I. and PETROV, V. M.

"Bronchial pneumonia in lambs."

Veterinariya, Vol. 37, No. 8, 1960, p. 51

Bayturina - Cand. Vet. Sci- Vet. Inst., Kazakh Acad. Agric. Sci-

KLEYNBOK, Ya.I.; PETROV, V.M., kand.veterinarnykh nauk; BAYTURINA, O.Sh. kand.veterinarnykh nauk; PODLINOV, I.S., nauchnyy sotrudnik; AYSEN, Ye.A., nauchnyy sotrudnik

Bronchopneumonia rate in lambs. Veterinariia 37 no.8:51-55 Ag '60. (MIRA 15:4)

1. Institut veterinarii Kazakhskoy akademii sel'skokhozyaystvennykh nauk. 2. Chlen-korrespondent AN KazSSR (for Kleynbok).
(Kazakhstan—Lambs—Diseases and pests) (Pneumonia)

BAYTURSUNOV, M.

Tryout of creative forces. Sov.foto 21 no.4:21-22 Ap '61.
(MIRA 14:3)

1. Otvetstvennyy sekretar' pravleniya Soyuza zhurnalistov Kazakhoskoy SSR.
(Kazakhstan—Photography—Exhibitions)

VOLAROVICH, M.P.; BAYUK, Ye.I.; SALEKHLI, T.M.; PAVLOGRADSKIY, V.A.

Longitudinal wave velocities in specimens of sedimentary rocks, saturated with kerosene and water, at high pressures. Izv. AN SSSR. Fiz. zem. no.3:71-75 '65. (MIRA 18:7)

1. Institut fiziki Zemli AN SSSR i Institut geologii AN AzerbSSR.

L 2844-66 EWT(1)/EWA(h) GW

ACCESSION NR: AP5021277 UR/0020/65/163/005/1131/1133

AUTHORS: Volarovich, M. P.; Bayuk, Ye. I.; Salakhli, T. M.

TITLE: The velocity of ultrasonic longitudinal waves at high pressures in oil and gas reservoir rocks of Azerbaidzhan

SOURCE: AN SSSR. Doklady, v. 163, no. 5, 1965, 1131-1133

TOPIC TAGS: ultrasonic wave, seismic wave, rock, high pressure/ IKL 5 radioelectric device

ABSTRACT: Studies on wave velocities were made on rocks in the Caspian lowland and the Baku Archipelago. The rocks were tested at pressures up to 4000 kg/cm^2. An IKL-5 radioelectric device was used for measuring wave velocities, and a lead zirconate and tantalate unit with natural frequency of 500 kilocycles was used in both transmitter and receiver. The sedimentary rocks were cylindrical cores, 3 cm in diameter and 3-15 cm long, taken from depths ranging from 100 to 3500 m. Tests were made on clay, siltstone, sandstone, and limestone. All pertinent properties of the rocks were measured. Experiments showed a sharp increase in velocity with pressure, with the greatest increase (up to 200%) being observed in very porous sand and clay. Change in limestone proved to be less, generally 15-45%.

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L 2844-66
ACCESSION NR: AP5021277

Saturation with kerosene increased velocity. Because of lower penetration, water did not increase velocity as much as kerosene. Where moisture caused swelling of the rock, the velocity decreased rather than increased. It is concluded that if the density and other reservoir properties of a rock have been measured, wave velocities may be predicted for various depths and water contents. The work of the authors confirms the fact that the velocity of less dense rocks changes more strongly with pressure than the velocity in denser rocks. Orig. art. has: 2 figures.

ASSOCIATION: Institut fiziki Zemli, Akademii nauk SSSR (Institute of Physics of the Earth), Academy of Sciences SSSR); Institut geologii, Akademii nauk AzerbSSR (Institute of Geology, Academy of Sciences AzerbSSR)

SUBMITTED: 25Nov64 ENCL: 00 SUB CODE: ES

NO REF SOV: 007 OTHER: 001

BVK
Card 2/2

SOV/49-59-6-13/21

AUTHOR: Bayuk, Ye. I.

TITLE: A Method of Determination of the Elastic Parameters of Rock Samples.

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geofizicheskaya, 1959, Nr 6, pp 895-897 (USSR)

ABSTRACT: A method is described where the measurement of the velocity of transverse waves is not required. It is based on the laboratory conditions of measuring the propagation of the longitudinal waves calculated from the formula $V_{P_M} = [E(1 - \sigma)/\rho(1 + \sigma)(1 - 2\sigma)] 1/2$.

The samples of rock used in the investigations were syenite, sandstone, and an alloy of aluminium for checking. The measurement consisted of determining the ratio a/λ_{P_M} (a - radius of a sample, λ_{P_M} - wavelength of P_M wave). It was established that the velocity of V_{P_M} did not vary with

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A Method of Determination of the Elastic Parameters of Rock Samples

the frequency. The latter was measured with the gauges of 50, 125 and 250 kh. The range of the ratio a/λ_{P_M} was 0.1 to 2.0. The results are shown in Fig 1, where the ordinate represents the velocity of the longitudinal wave and the abscissa - the ratio a/λ_{P_M}. The following elastic parameters were determined (table on p 896): density ρ, Poisson coefficient σ, Young's modulus E, shear modulus G, velocity of transverse waves V_S, volume compressibility β. The ratio of V_{P_M}/V_S was found to be 1.60 - 1.68 which agrees with the results found for real conditions.

SOV/49-59-6-13/21

A Method of Determination of the Elastic Parameters of Rock Samples

Thanks are given to M. P. Volarovich and O. I. Silayeve for valuable advice. There is 1 figure, 1 table and there are 7 references, of which 5 are Soviet and 2 English.

ASSOCIATION: Akademiya nauk SSSR, Institut fiziki zemli (Academy of Sciences, USSR, Institute of Physics of the Earth)

SUBMITTED: April 26, 1958.

Card 3/3

PHASE I BOOK EXPLOITATION SOV/5207

Vsesoyuznaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov.

Primeneniye ul'traakustiki k issledovaniyu veshchestva (Utilization of Ultrasonics for the Investigation of Matter) Moscow, Izd. MOPI, 1960. 267 p. 1,000 copies printed. (Series: Its Trudy, vyp. 11)

Ed. (Title page): V.F. Nozdrev, Professor and B.B. Kudryavtsev, Professor.

PURPOSE: This collection of articles is intended for physicists specializing in the physics of ultrasound.

COVERAGE: The collection of articles constitutes the transactions of the VII Conference on the Applications of Ultrasonics to the Study of Materials, which was held at the Moscow Oblast Pedagogical Institute imeni N.K. Krupskaya. Individual articles of the collection discuss various problems in the wave mechanics of ultrasound, the absorption and the propagation mechanics of ultrasonic waves in various media, the operating principle and design of generators and receivers of ultrasonic waves, the speed of sound and methods for its determination. Other articles deal with the applications of ultrasonics to investigations of the properties of materials. No personalities are mentioned. References accompany

Card 4/7

(17)

BAYUK, Ye.I.

Studying the elastic properties of rock samples from a deep borehole at high pressures. Izv. AN SSSR. Ser. geofiz. no.12:1756-1761 D '60. (MIRA 13:12)

1. Institut fiziki Zemli AN SSSR.
(Rocks—Testing) (Elastic waves)

84664

S/020/60/135/001/017/030
B006/B056

3.9300

AUTHORS: Volarovich, M. P. and Bayuk, Ye. I.

TITLE: The Influence Exerted by a Uniform Pressure of up to 4000 kg/cm^2 Upon the Elastic Properties of Rock Samples

PERIODICAL: Doklady Akademii Nauk SSSR, 1960, Vol. 135, No. 1, pp. 65-68

TEXT: The authors investigated the elastic properties of rock samples under high universal pressure by measuring the propagation rates of longitudinal waves: $V_{p\,b} = (E/\varrho)^{1/2}$ - the propagation rate in a thin bar and $V_{p\,m} = \left[E(1-\sigma)/\varrho(1+\sigma)(1-2\sigma)\right]^{1/2}$ - the propagation rate in an infinite medium (E - Young's modulus, ϱ - density, σ - Poisson coefficient); the experiments took place in a high-pressure chamber, in which the pressure could be varied from normal to 4000 kg/cm^2. The ultrasonic velocity was measured by means of a pulse method, where a modified ИКЛ-5 (IKL-5) type device was used. As transmitter and receiver ammonium dihydrophosphate

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The Influence Exerted by a Uniform Pressure of up to 4000 kg/cm^2 Upon the Elastic Properties of Rock Samples

S/020/60/135/001/017/030
B006/B056

crystals were used; for the purpose of measuring $V_{p\,b}$, the authors operated with 100, and for measuring $V_{p\,m}$ with 600 kc/sec. The samples investigated had the shape of circular cylinders with 3 cm diameter and 16-20 cm length. The various ore samples are numbered (cf. Table 2). The results of measurements are shown in form of diagrams, the assignment of the curves to the samples takes place according to the same numbers. Fig. 1 shows the propagation rate of longitudinal and transversal waves as functions of the pressure brought to bear upon the sample. In general, the curves within the range below 1000 kg/cm^2 showed a steeper rise; in the further course, the pressure dependence of V is insignificant or V is entirely independent of pressure. Fig. 2 shows the Young's modulus and the modulus of shearing as a function of pressure. The course taken by the curves is similar to that in Fig. 1. The results of the measurements of the Poisson coefficient at various pressures are given in Table 2:

84664

The Influence Exerted by a Uniform Pressure of up to 4000 kg/cm^2 Upon the Elastic Properties of Rock Samples

S/020/60/135/001/017/030
B006/B056

Rock	Pressure kg/cm^2 1	500	1000	2000	4000
Gabbro 82	0.31	0.30	0.29	0.29	0.29
Gabbro-diorite 38	0.29	0.28	0.28	0.28	0.28
Granite 247	0.24	0.22	0.22	0.21	0.21
Granite 248	0.12	0.21	0.19		
Granite 249	0.12	0.16	0.19	0.19	0.19
Quartzite 22	0.19	0.19	0.19	0.18	
Sandstone 213	0.18	0.18	0.17	0.15	0.15
Sandstone 105	0.19	0.19	0.19	0.16	0.16
Sandstone 94	0.11	0.12	0.15	0.16	0.17
Marl 206	0.19	0.19	-	0.19	0.19
Marl 207	0.21	0.19	0.19	0.19	-

There are 2 figures, 2 tables, and 6 Soviet references.

ASSOCIATION: Institut fiziki Zemli im. O. Yu. Shmidta Akademii nauk SSSR (Institute of the Physics of the Earth imeni O. Yu. Shmidt of the Academy of Sciences USSR)

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84664

The Influence Exerted by a Uniform Pressure of up to 4000 kg/cm^2 Upon the Elastic Properties of Rock Samples

S/020/60/135/001/017/030
B006/B056

PRESENTED: May 18, 1960, by P. A. Rebinder, Academician

SUBMITTED: May 17, 1960

Card 4/4

VOLAROVICH, M.P.; BAYUK, Ye.I.; LEVYKIN, A.I.

Elastic properties of rocks and the absorption of elastic waves by them at high all-round pressures. Prim. ul'traakust. k issl. veshch. no.13:55-61 '61. (MIRA 16:6)

(Rocks—Elastic properties)
(Elastic waves)

VOLAROVICH, M.P.; BAYUK, Ye.I.; ZHDANOV, A.A.; TOMASHEVSKAYA, I.S.

Study of the elastic properties of rocks of the Kola Peninsula under hydrostatic pressure up to 7000 kg./cm^2. Izv. AN SSSR . Ser. geofiz. no.8:1178-1184 Ag '64 (MIRA 17:8)

1. Institut fiziki Zemli AN SSSR.

AFANAS'YEV, G.D.; BAYUK, Ye.I.; BELIKOV, B.P.; VOLAROVICH, M.P.; ZALESSKIY, B.V.

Physical properties and the absolute age of certain rocks in India and Ceylon. Izv. AN SSSR Ser. geol. 29 no.3:22-42 Mr '64 (MIRA 17:3)

1. Institut geologii rudnykh mestorozhdeniy, petrografii, mineralogii i geokhimii AN SSSR i Institut fiziki Zemli AN SSSR, Moskva.

ACCESSION NR: AP4034538 S/0020/64/155/005/1058/1061

AUTHOR: Afanas'yev, G. D. (Corresponding member); Volarovich, M. P.; Bayuk, Ye. I.; Galdin, N. Ye.

TITLE: Investigation of velocities of elastic waves in ultrabasic rocks of the Monchegorsk pluton under high (allsi'vd) pressure

SOURCE: AN SSSR. Doklady*, v. 155, no. 5, 1964, 1058-1061

TOPIC TAGS: elastic wave velocity, seismic research, transversal wave velocity, longitudinal wave velocity, rock age, geology, geophysics, high pressure, pluton, Monchegorsk pluton, tectonics

ABSTRACT: In preparation for the coming geological-geophysical (deep seismic probing) of the Baltic shield, the authors have investigated the velocity of elastic waves in ultrabasic rocks of the Monchegorsk pluton located in the central part of the Kola Peninsula. The age of this rock (by the radioactive A-K method) is about 3×10^9 years. The velocity of both longitudinal and transverse waves was determined under pressures up to 4,000 kgm/cm^2. The velocity of the longitudinal waves averaged from 7000 to 8000 m/sec, and that of the transverse waves

Card 1/2

VOLAROVICH, M.P.; BAYUK, Ye.I.; GALDIN, N.Ye.

Effect of high pressure on the elastic properties of rock samples collected along the outline of the area of deep seismic sounding in northern Karelia. Izv. AN SSSR. Fiz. zem. no.1:109-115 '65.
(MIRA 18:5)

1. Institut fiziki Zemli AN SSSR.

VOLAROVICH, M.P.; BAYUK, Ye.I.; GAILEKHLI, T.M.

Velocities of ultrasonic longitudinal waves in oil and gas reservoirs of Azerbaijan at high pressures. Dokl. AN SSSR 163 no.5:1131-1133 Ag '65. (MIRA 18:8)

1. Institut fiziki Zemli AN SSSR i Institut geologii AN AzerbSSR. Submitted December 10, 1964.

ACC NR: AT6034505 SOURCE CODE: UR/0000/66/000/000/0064/0075

AUTHOR: Afans'yev, G. D.; Bayuk, Ye. I.; Belikov, B. P.; Borsuk, A. M.; Volarovich, M. P.; Zalesskiy, B. V.; Pavlogradskiy, V. A.; Sinyanov, I. Z.

ORG: none

TITLE: Preliminary data obtained by correlating physical properties of rocks from Northern Caucasus with geological and geophysical data

SOURCE: AN SSSR. Otdeleniye nauk o Zemle. Nauchnyy sovet po kompleksnym issledovaniyam zemnoy kory i verkhney mantii. Glubinnoye stroyeniye Kavkaza (Abyssal structure of the Caucasus). Moscow, Izd-vo Nauka, 1966, 64-75

TOPIC TAGS: geophysics, seismic prospecting, petrology, stratigraphy, /Caucasus

ABSTRACT: The most important of the different age associations of igneous rocks in some of the structural zones of Northern Caucasus (the piedmont region, the foothills, the transverse depression zone, the granitoid zone and the axial zone of the Major Caucasus ridge) are described. The post-Selurian, post-Lower Carbonaceous, pre-Triassic, post-Lower Jurassic, pre-Middle Cretaceous and Cenozoic formations are described. The magmatic geology of Northern Caucasus is compared with geophysical data. A new scheme is suggested for the deep structure of the territory. The ancient basement is shown to consist of Hercynian and older formations. In

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ACC NR: AT6034505

particular, a substage of lower Middle Paleozoic formations is differentiated. It differs greatly in respect to its physical properties from younger rocks of Upper Paleozoic and Mesozoic ages. In the region of the Major Caucasus this substratum has been completely reworked by upper Paleozoic granitic intrusions. The ancient rocks outcrop in a few areas; however, to the East the Caledonian basement is covered by Mesozoic and possibly Upper Paleozoic formations. It is believed that the deep seismic sounding conducted near El'kholovo has located the buried extension of the Caledonia structure of the Western Caucasian foothills. Orig. art. has: 6 figures and 1 table.

SUB CODE: 08/ SUBM DATE: 26Feb66/ ORIG REF: 020/ OTH REF: 001

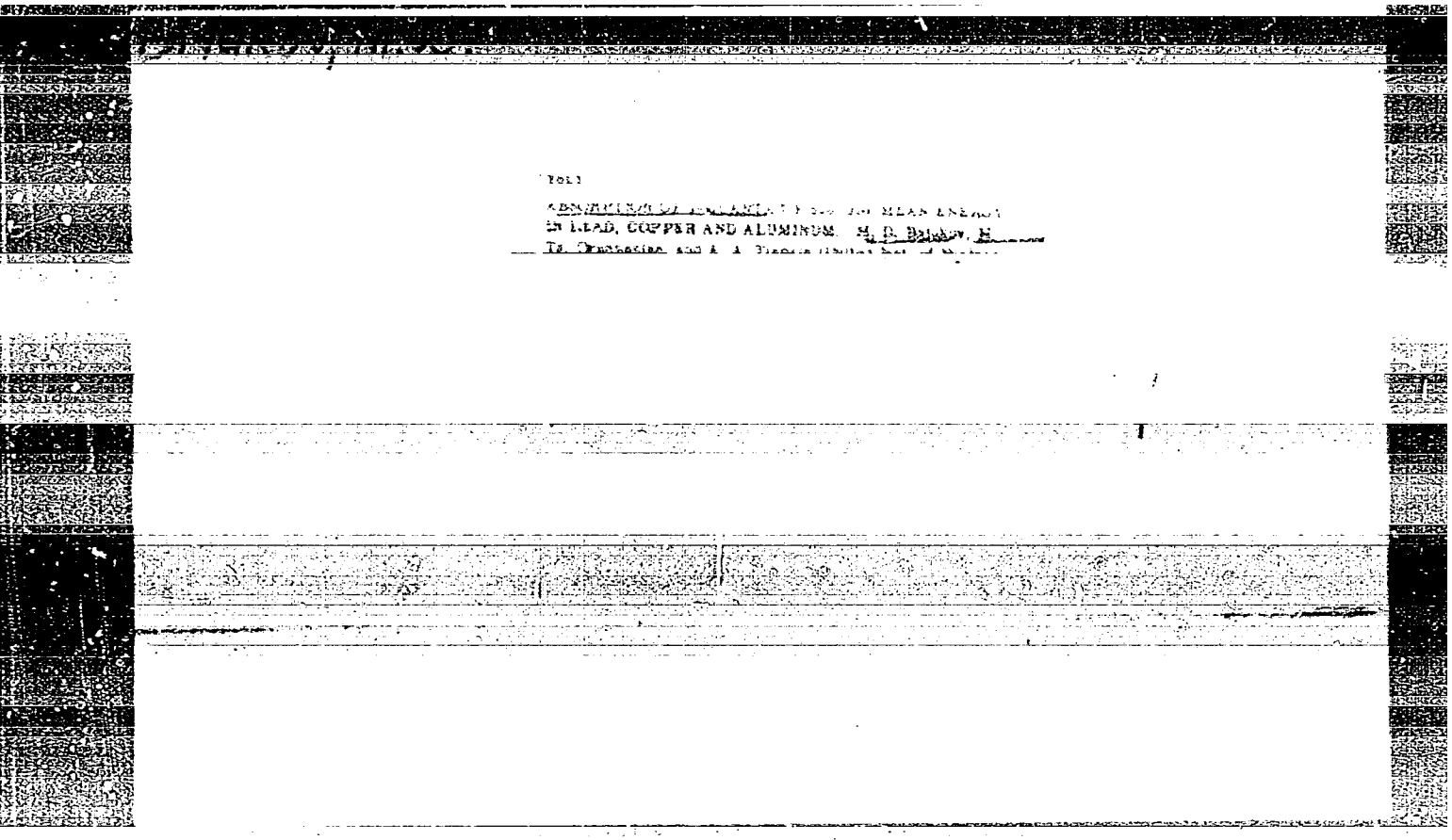
Card 2/2

BAYUKOV, I.

Factory Management

Efforts of the supply division of a plant to economize materials. Za ekon.mat. No. 2, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.



L 8603-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD

ACCESSION NR: AP5021171 UR/0139/65/000/004/0076/0081

44,55 44,55

AUTHOR: Stel'mashenko, M. A.; Bayukov, O. A.

TITLE: Determination of the temperature dependence of the first constant of the magnetic crystallographic anisotropy on polycrystalline lithium-aluminum ferrites

SOURCE: IVUZ. Fizika, no. 4, 1965, 76-81

TOPIC TAGS: temperature dependence, magnetic anisotropy, ferrite, lithium containing alloy, aluminum containing alloy, magnetic saturation, magnetic susceptibility

ABSTRACT: Experimental results are presented of measurements of the temperature dependence of the first constant of magnetic crystallographic anisotropy (k_1) in a series of polycrystalline ferrites $Li_{0.5}Fe_{2.5-a}Al_aO_4$, where a = 0, 0.2, 0.4, 0.5, and 0.6. The measurements were made by the method of approach to saturation in the temperature interval from 170 to 530K, in a pulsating magnetic field. The tests were made in a combined dc and ac (1500 cps) field. The results show that in fields 1000--2000 oe the differential susceptibility can be described by the expression $\kappa = A/H^2 + B/H^3 + C/H^4$ (A, B, C - constants, H magnetic field intensity) and that the temperature dependence of k_1 is in satisfactory quantitative agreement

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ACCESSION NR: AP5021171

3

with the experimental data obtained with single crystals of the same type. Plots are presented of different terms of the susceptibility and of the constant k_1 vs. the temperature and the magnetic field. Orig. art. has: 5 figures and 2 formulas.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut imeni V. D. Kuznetsova (Siberian Physicotechnical Institute)

SUBMITTED: 29Dec63 44,55 ENCL: 00 SUB CODE: SS, EE

NR REF SOV: 009 OTHER: 005

Card 2/2 pw

L 17410-66 EWT(m)/EWA(d)/EWP(e)/EWP(t) IJP(c) JD/EW/JG

ACC NR: AP6004469 SOURCE CODE: UR/0048/66/030/001/0064/0067

82
75
B

AUTHOR: Chistyakov, N.S.; Rusov, G.I.; Bayukov, O.A.; Rusova, S.G.

ORG: Physics Institute of the Siberian Section of the SSSR Academy of Sciences (Institut fiziki Sibirskogo otdeleniya, Akademii nauk SSSR)

TITLE: Ferromagnetic resonance in multilayer film systems (Transactions of the Second All-Union Symposium on the Physics of Thin Ferromagnetic Films held at Irkutsk 10 July to 15 July 1964)

SOURCE: AN SSSR, Izvestiya, Seriya fizicheskaya, v. 30, no. 1, 1966, 64-67

TOPIC TAGS: ferromagnetic film, magnetic thin film, iron nickel alloy, cobalt, molybdenum, quartz, laminated material, ferromagnetic resonance, superhigh frequency

ABSTRACT: The authors have investigated the ferromagnetic resonance at 9 kMHz of thin ferromagnetic films and multilayer film systems consisting of alternate layers of ferromagnetic alloy and quartz. The films were vacuum evaporated at 10^{-5} mm Hg in a 100 Oe magnetic field at the rate of 60 Å/sec onto glass substrates heated to 200C. The ferromagnetic resonance absorption was measured in a rectangular cavity resonator excited in the TE_{104} mode and having a Q factor of approximately 1000. The 7-mm-diameter circular films, fastened to the end of a brass rod, were introduced into the resonator through a 7 mm diameter hole in the end wall. The resonator was tuned with a teflon rod inserted through a hole in the side wall. The magnetic field was modulated at

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ACC NR: AP6004469 7

435 Hz with a special winding and was given a saw-tooth form by varying the current in the main winding. The resonance curves were displayed on an oscilloscope or recorded with a recording millivoltmeter. Single-layer films of composition 18Fe-79Ni-3Mo and 17Fe-80Ni-3Co and thickness from 400 to 2000 Å were investigated. For the Mo-containing films the resonant magnetic field decreased with increasing thickness from 1214 Oe for a 400 Å film to 818 Oe for a 2000 Å film and the width of the resonance ranged between 33 and 47 Oe. This small width of the resonance absorption line is favorable for practical applications. Data are reported on only three Co-containing films. Of these, the thickest (2000 Å) showed two absorption peaks separated by 60-80 Oe. No explanation for this is offered. A 600 Å film had a 34 Oe wide absorption line at 886 Oe and a film of unspecified thickness between 1000 and 2000 Å had a 38-Oe-wide absorption line at 861 Oe. Multilayer film systems having up to 10 layers were investigated. In these systems the metal films were approximately 1000 Å thick and the intervening quartz films were from 1500 to 2000 Å thick. As the number of layers was increased the absorption line became deeper and wider and began to evince complex structure. A ten-layer system clearly showed four resonance peaks separated by 60-80 Oe. This behavior is ascribed partly to dipole-dipole interaction between neighboring layers, as suggested by D.Chen and A.H.Morrish (J. Appl. Phys., Suppl., 33 N 3 (1962)), and partly to the influence of the conditions of deposition. It was found that if the vacuum was broken between deposition of metal and deposition of quartz the structure of the absorption curve of the resulting multilayer system was considerably different from that of a system which was deposited without breaking the vacuum. Auxiliary experiments with single-layer 20Fe-80Ni and 30Fe-45Ni-25Co films with and without quartz coverings

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showed that the presence of the quartz considerably reduced the strength of the resonant field and increased the width of the resonance. The resonance lines of two-layer systems with quartz between the layers occurred at approximately the same field strength and were of approximately the same width as those of the corresponding single films with quartz coverings.

SUB CODE: 20/ SUBM DATE: none/ ORIG. REF: 003/
ATD PRESS: 4260

OTH REF: 003

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Card 3/3

L 24788-66 EWT(1)/EWT(m)/T/EWP(t) IJP(c) JD/GG

ACC NR: AP6014256 SOURCE CODE: UR/0109/66/011/005/0950/0951

AUTHOR: Chistyakov, N. S.; Ignatchenko, V. A.; Bayukov, O. A.; Rusova, S. G.

ORG: none

TITLE: Certain UHF properties of multilayer films

SOURCE: Radiotekhnika i elektronika, v. 11, no. 5, 1966, 950-951

TOPIC TAGS: magnetic thin film

ABSTRACT: Transmission and reflection factors of single-layer and multilayer magnetic films were measured in a waveguide system operating at $\lambda = 3$ cm. Individual films were made by sputtering 17Fe80Ni3Mo alloy on a glass substrate heated to 200C in a vacuum of 10^{-5} mm Hg and in a magnetic field of $\sim$ 100 oe. Multilayer films were made by insulating each film layer by a layer of SiO 1000 Å thick. Experimental data (see Fig. 1) shows that the transmission factors for multilayer films (point 1—10 layers, 1000 Å each; point 2—40 layers, 500 Å each) substantially exceeds the same factor for a single layer 10^4 Å film (solid line). By breaking the film into layers, but keeping the same total thickness, skin depth is increased. This fact was substantiated by switching the films in a cavity resonator and

Card 1/2 UDC: 539.216.22:621.318.

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ACC NR: AP6014256

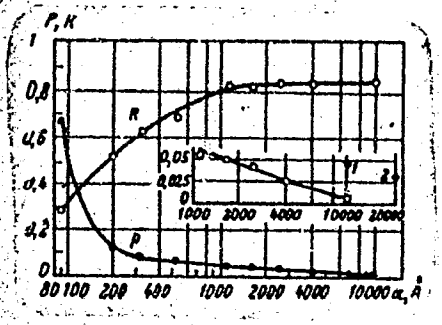


Fig. 1. Transmission (P) and reflection (R) factors as functions of film thickness d.

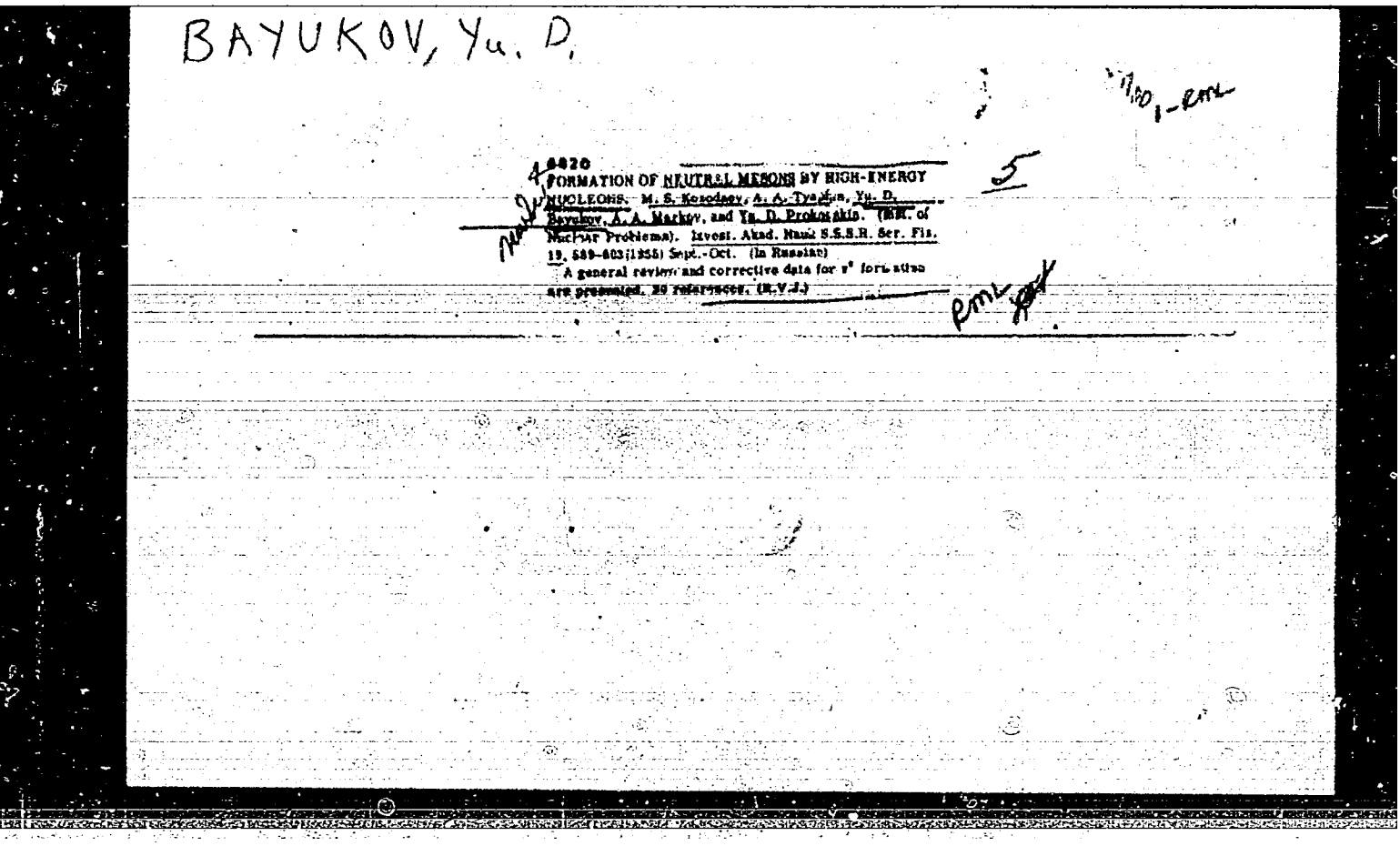
noting the resonator frequency shift. The shift for multilayer films is greater than that for equivalent single-layer film and shift linearity is preserved up to total film thickness of 3×10^4 Å (30 layers 1000 Å each). Orig. art. has: 2 figures. [BD]

SUB CODE: 09/ SUBM DATE: 17Apr65/ ORIG REF: 005/ ATD PRESS: 4250

Card 2/2

Bayukov, Yu. D.

Formation of neutral [illegible] by high-energy nucleons. M. S. Kozodaev, A. A. Tyapkin, Yu. D. [illegible], A. A. Markov, and Yu. D. [illegible] 5



BAYUKOV, Yu. D.

4820
FORMATION OF NEUTRAL MESONS BY HIGH-ENERGY NUCLEONS. M. S. Kozodaev, A. A. Tyapkin, Yu. D. Bayukov, A. A. Markov, and Ya. D. Prokoshkin. (Inst. of Nuclear Problems). Izvest. Akad. Nauk S.S.S.R. Ser. Fiz. 19, 589-603(1955) Sept.-Oct. (In Russian)
A general review and corrective data for π^0 formation are presented. 29 references. (R.V.J.)

BAZUKOV, M.D., KOZODAYEV, I.S., TYAPKIN, A.A.

Investigation of energy and angular distributions of π^0-mesons produced by protons with energies of 470 and 660 MeV (II/50)

CERN-Symposium on High Energy Accelerators and Pion Physics.

Geneva 11-23 June 56
In. Branch #5

Nuclear Instruments, No.1, p. 21-30, 1957

BAYUKOV, YU. D.

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PRODUCTION OF NEUTRAL π-MESONS BY HIGH ENERGY PROTONS. Yu. D. Bayukov, M. S. Kozodayev, Yu. D. [illegible]

Neutral π mesons are created by [illegible] of incident proton with separate nucleons in the [illegible] and not with the nucleus as a whole. At a proton energy of 470 Mev the π^0 mesons produced on a complex nucleus are mainly emitted at small angles with respect to [illegible] ... a significant role in the angular distribution of π^0 mesons. No difference in the energy spectra of γ quanta created on light and heavy elements was found. Identity of the spectra can be considered established only for high-energy γ quanta. With the [illegible] proton energy to 660 Mev the increase of the cross section for π^0 meson production in collisions of two protons substantially [illegible] in comparison with the [illegible] ... observed in the energy [illegible] ... Mev π^0 mesons are mostly [illegible]

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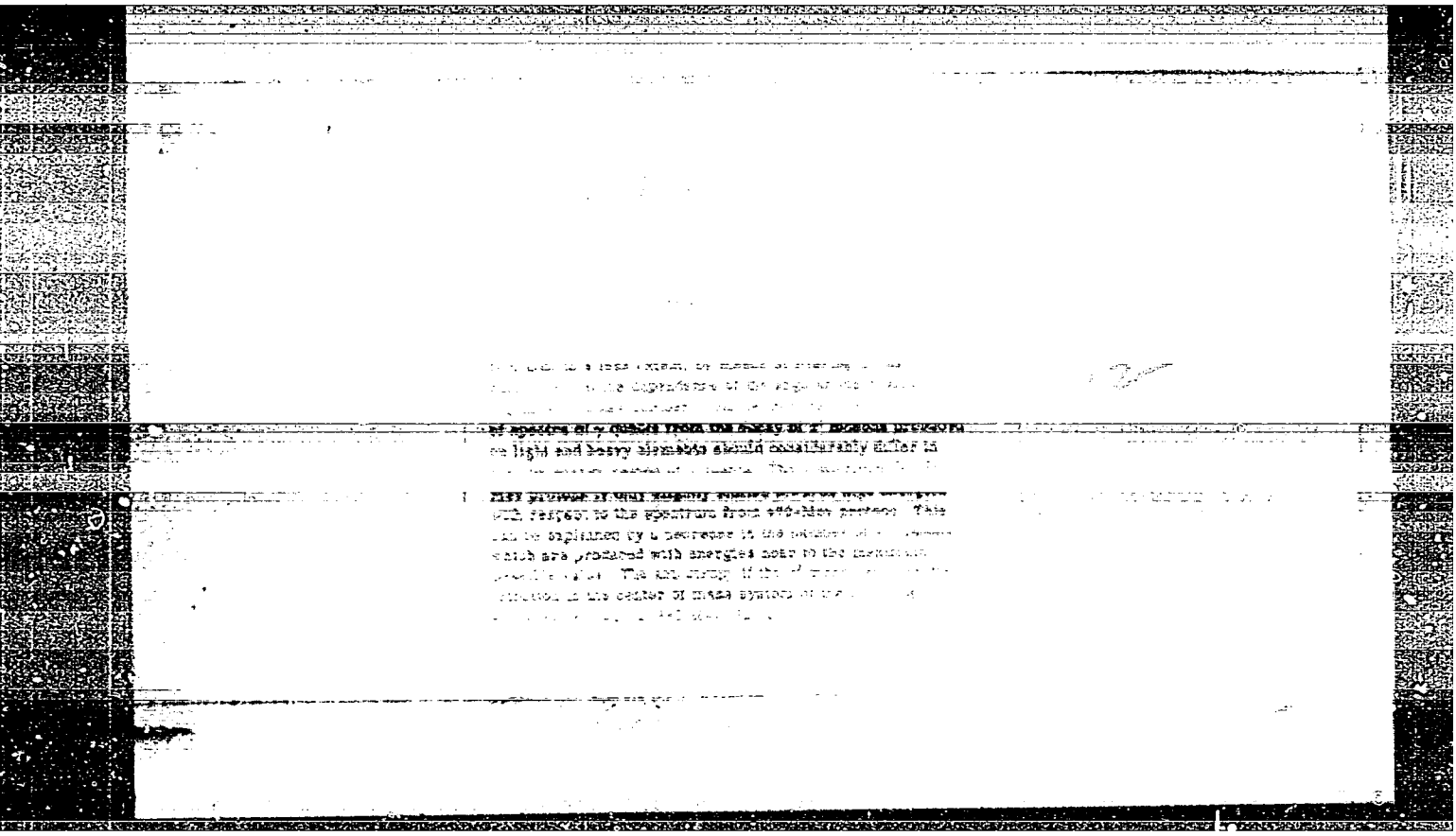

BAYUKOV, Y.D.

AUTHOR BAJUKOV, J.D., OGANESJAN, J.C., TJAPKIN, A.A. PA - 2038

TITLE The Absorption of γ-Quanta with the Average Energy of 500 MeV in Lead, Copper, and Aluminium. (Russian)

PERIODICAL Zhurnal Eksperimental'noi i Teoret. Fiziki, 1957, Vol 32, Nr 1 pp 183-183 (U.S.S.R.)

Received 3/1957 Reviewed 3/1957

ABSTRACT γ-quanta originate from the decay of neutral pions which were produced in the inner target of a phasotron by 660 MeV protons. These γ-quanta were recorded by a pair-like γ-spectrometer with 12 channels, on which occasion the spectrometer was at a distance of 23 m from the target. Before the collimator, which was fitted behind a protective wall of 4 m thickness, a device was arranged, by which the bundle of γ-quanta was periodically interrupted by means of a lead absorber. The γ-quanta recorded by the spectrometer in the case of fully covered and not fully opened bundles were counted separately.

For the determination of the coefficients of the absorption of the γ-quanta in Cu and Al the semicircular lead disk in the rotating device was replaced by absorbers of copper and aluminium. The frequent change of absorbers made it possible to carry out measurements without a monitor and to diminish the number of measuring errors. The bundle of γ-quanta passing through the collimator was purified from electrons and positrons by means of a special magnet. The authors obtained the following values (in cm^2/g) for the coefficients of the absorption of γ-quanta with the energy of $\varepsilon_\gamma = 500 \pm 50$ MeV:

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The Absorption of γ-Quanta with the Average Energy of 500 MeV in Lead, Copper, and Aluminium.

Pb 0,1115 ± 0,0025, Cu 0,0510 ± 0,0025, Al 0,0295 ± 0,0017.
The absorption of the γ-quanta at E_γ = 500 MeV takes place essentially by the production of electron-positron pairs. As shown by computation results, absorption by photo effect and Compton effect amounts to ~ 1,2 °/o in the case of Cu, and to ~ 2 °/o of the total absorption cross section in the case of Al. The cross sections for the absorption of γ-quanta found here agree well with the computed results obtained by H. DAVIES, H.BETHE, L.MAXIMON, Phys.Rev., 93, 788 (1954).
It remains to be added that the data for 500 MeV γ-quanta which agree with computations were obtained in the case of permanent presence of a lead absorber of 5,55 g/cm² thickness in the bundle. If such a lead absorber, by which the bundle is filtered, is lacking, cross sections which are larger by 10 °/o are obtained. When measuring the absorption cross section of 280 MeV γ-quanta, no influence was found to be exercised by the additional absorber by which the bundle is permanently covered. The cross section of the absorption of 280 MeV γ-quanta obtained here agrees with the results obtained by J.W.DE-WIRE, A.ASKIN, L.A.BACH, Phys.Rev., 83, 505 (1951). The reason for the increase of the absorption cross section of 500 MeV γ-quanta when an additional lead filter was lacking could not be explained.

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PA - 2038

The Absorption of γ-Quanta with the Average Energy of 500 MeV in Lead, Copper, and Aluminium.

ASSOCIATION United Institute for Nuclear Research, Laboratory for Nuclear Problems.

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PA - 2699

AUTHOR BAYUKOV, YU. D., SINAYEV A.N., TYAPKIN A.A.

TITLE Experimental Comparison of the Energy Spectra of γ-Quanta resulting from the Decay of Neutral Piens (which were created by 660 MeV-Protons on Carbon- and Lead-Nuclei).
(Eksperimental'noye sravneniye energeticheskikh spektrov kvantov ot raspada π^0- mezonov, obrazovannykh na yadrakh ugleroda i svintsa protonami s energiyey 660 MeV, Russian.)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 2, pp 385 - 386 (USSR).

Received: 5/1957 Reviewed: 6/1957

ABSTRACT For a more exact comparison of γ-quanta created on light and heavy nuclei the authors carried out relative measurements of the fluxes of γ-quanta within the various demains of the spectra mentioned above.
The angle of observation in the direction of motion of the protons amounted to 0°. Measurements were carried out by means of a magnetic double spectrometer with 12 channels. The targets consisting of lead and graphite fitted into the vacuum chamber of the accelerator were exchanged every minute.
At low energies of γ-quanta ($\varepsilon_\gamma < 70$ MeV) a difference is noticed on the γ-quanta created on carbon and lead. This difference is connected apparently with the modification of the angular distribution of the neutral piens.

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Experimental Comparison of the Energy Spectra of γ-Quanta resulting from the Decay of Neutral Piens (which were created by 660 MeV-Pretons on Carbon- and Lead-Nuclei).

This modification is due to the interaction of the bombarding pretons with the nucleons of the nucleus on the occasion of strong absorption of mesons. The hard γ-quanta with the angle of observation 0° are essentially created on the occasion of the decay of these neutral piens which are created on that side of the nucleus which is averted from the bombarding pretons and is heavely screened off by the remaining nucleons of the nucleus. The soft γ-quanta, however, are essentially created on the surface of the nucleus which is exposed to the pretons. Therefore, a relative increase of soft γ-quanta in the spectrum is observed on the occasion of the creation of neutral piens on heavy nuclei.
Considerable differences are to be expected also in the energy distributions of the mesons created on light and heavy nuclei. The energy distributions of the neutral piens created under an angle of 0° on carbon- and lead-nuclei do not differ noticeably. Possibilities for a more close study of these pion spectra are shown. (1 table)

ASSOCIATION: United Institute for Nuclear Research
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AUTHOR BAYUKOV, Yu.D., KOZODAYEV, M.S., TYAPKIN, A.A. 56-4-5/52

TITLE The Investigation of the Energetic and Angular Distribution of π^0-Mesons Formed On Carbon Nuclei by Protons With An Energy of 470 and 660 MeV. (Issledovaniye energeticheskikh i uglovykh raspredeleniy π^0-mezonov, obrazovannykh na yadrakh ugleroda protonami s energiyey 470 i 660 MeV. -Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiziki, 1957, Vol 32, Nr 4, pp 667-677 (U.S.S.R.)

Received 7/1957 Reviewed 8/1957

ABSTRACT The results obtained by the investigation of energetic spectra on the occasion of the decay of π^0-mesons produced on carbon nuclei by protons with the energy of 660 MeV is discussed. The method of spectral analysis was used. The neutral mesons have a very short life ($5,10^{-15}$ sec.). The experimental scheme is shown in form of an illustration. The carbon target is inside the vacuum chamber of the accelerator and was irradiated with protons of the average enrgy of 660 MeV. The γ-quanta formed in the target penetrated through an opening into a concrete wall of 4 m thickness and collimated through a diaphragm into a lead block. The collimated bundle of γ-quanta, which was purified from charged particles by the magnetic field of a special electromagnet, penetrated into the converter of the 12-channelled pair-spectrometer. The spectrometer was set up at a distance of 23 m from the target in the direction of the tangent to the orbit of the protons. The author haere gives a detailed description of the pair spectrometer used. The differential cross section for the production of γ-quanta on the carbon nuclei by protons with an energy of 660 MeV for $18L^0$ in the laboratory system amounts to $d\sigma_C^{\gamma}/a\omega(18o^0)=(1.5\pm 0,2).10^{-27}$ cm^2/sterad. The ratio of

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the flux of γ-quanta under the angles 0 and 180° is equal to $5,1 \pm 0,3$. The energy spectra of the γ-quanta is then analyzed.

1. Dependence of the spectrum on the angular- and energetic distribution of the π^0-mesons. It follows that with the isotropic distribution of the π^0-mesons, independent of their energy distribution, the spectrum of the γ-quanta is of symmetric shape with respect to the energy $1/2\,\varepsilon_0$.

2. Comparison of the energy spectra of γ-quanta on the occasion of the decay of π^0-mesons produced by protons with the energy of 470 MeV on the nuclei of beryllium. Illustration 5 shows that the energy spectrum of the γ-quanta of the decay of mesons produced by photons with the energy of 470 MeV (center of mass system) on the nuclei of carbon. At a proton energy of 470 MeV energies are produced, which are an a proximation to the maximum possible energy attainable by the meson in the reaction. With an energy of 660 MeV of the protons, mesons with considerably lower energies are formed than is possible as a maximum.

3. Energy spectra of π^0-mesons produced by protons with the energy of 770 and 660 MeV. Illustration 7 shows the energy distribution of π^0-mesons in the center of mass system for carbons by protons with the energy of 470 MeV. On the same illustration it shows the spectrum of π^0-mesons. The energy- and angular distribution of π^0- mesons which had been measured at a proton energy of 470 MeV shows that the mesons produced in this case which are neutral on the occasion of the collision of nucleons, absorb the greatest part of the free energy of the collision, as well as also the greatest an-

The Investigation of the Energetic and Angular Distribution of π^0-Mesons Formed On Carbon Nuclei by Protons With An Energy of 470 and 660 MeV. 5644-5/52

gular momentum.The same phenomenon is observed in the case of lower proton energies.At proton energies of 470 MeV the spectra of π^0-mesons produced on composed nuclei differ only slightly from spectra computed on the assumption that mesons are produced only with maximum energies, so that at a proton energy of 660 MeV a considerable difference between the spectra obtained and those computed at the same conditions is observed.
At a proton energy of 660 MeV π^0-mesons with an energy that is considerably lower than that which is possible as a maximum are mostly produced.Consequently it follows that in the case of the production of mesons by the proton energy of 660 MeV the nucleons in the final state acquire a high kinetic energy and,therefore,also high momenta.With an increase of proton energy from 470 to 660 MeV the angular distribution of the π^0-mesons changes considerably.

ASSOCIATION United Institute for Nuclear Research
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SUBMITTED 28.10.1956
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56-5-1/55

AUTHOR: BAYUKOV, Yu.D., TYAPKIN, A.A.,

TITLE: The Energy Spectrum of γ-quanta of the Decaying π^0-Meson Created by the Interaction of 660 MeV protons with Hydrogen Nuclei (Energeticheskiy spektr γ-kvantov ot raspada π^0-mezonov, obrazovannykh protonami s energiyey 660 MeV na yadrakh vodoroda. Russian).

PERIODICAL: Zhurn. Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 5, pp 953 - 956 (U.S.S.R.)

ABSTRACT: The γ-quanta were measured with the help of a scintillation telescope, on which occasion the production of π^0-mesons took place in such a manner that two targets one of polyten and one of carbon, were one after the other exposed to the inner of the phasotron. Besides, a number of double targets was alterningly irradiated in such a manner that, simultaneously with the change of target, also the γ-counting device could be adjusted to this pair of targets.

The angular distribution of the π^0-mesons created by the collision of 660 Mev protons with H-nuclei has the form

$$1 + (0,3 \pm 0,1) \cos^2 \theta$$

The π^0-mesons spectrum has a marked maximum at $\approx$ 75 MeV.

Furthermore it was established experimentally that the angular distribution of the π^0-mesons created by p-p interaction is isotropic.

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56-5-1/55

The Energy Spectrum of γ-quanta of the Decaying π^0-Meson Created by the Interaction of 660 MeV protons with Hydrogen Nuclei

ASSOCIATION United Institute for Nuclear Research

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SOV/120-58-6-4/32

AUTHORS: Baynkov, Yu. D., Kozodayev, M. S., Markov, A. A., Sinayev, A. N., Tyapkin, A. A.

TITLE: A Multichannel Pair γ-Spectrometer. I. Calculation of the Main Characteristics of the γ-Spectrometer (Mnogokanal'nyy parnyy gamma-spektrometr. I. Raschet osnovnykh kharakteristik-gamma-spektrometra)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6, pp 23-29 (USSR)

ABSTRACT: In a pair γ-spectrometer the energy of the quanta is determined by measuring the total energy of the components of the electron-positron pair formed in a thin converter. The first 2-channel pair spectrometer was built by Dzhelepov (Ref 1). Later spectrometers built on this principle were widely used in measuring the spectra of hard γ-rays (Refs.2 to 8). The electron and the positron leaving the converter were deflected by a magnetic field in different directions and for certain values of their energy they enter ionisation counters connected in coincidence. For a given intensity of the magnetic field and a fixed position of the counters, such a spectrometer will record a fraction of the pairs produced by γ-rays in a given energy range. In a simple 2-channel spectrometer in which one channel records the electrons and

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A Multichannel Pair γ-spectrometer. I. Calculation of the Main Characteristics of the γ-spectrometer

the other the positrons, an increase in the accuracy of measurement is associated with a marked decrease in the efficiency. Good energy resolution and high efficiency can only be simultaneously achieved in a multichannel spectrometer. In such a spectrometer the efficiency may be increased by a factor $n_1 n_2$ without loss of resolution, where n_1 and n_2 are the numbers of electron and positron counters. In such a spectrometer several energy intervals may be examined at the same time. A number of such multichannel spectrometers have been described (Refs.5, 6 and 8). The quality of a γ-spectrometer as a measuring instrument is determined by its efficiency and spectral sensitivity. In designing a multichannel system it is necessary to take into account these characteristics for the various pairs of channels of the spectrum. In this connection, a discussion is given in the present paper of the dependence of the efficiency and spectral sensitivity of the separate pairs of channels on various

A Multichannel Pair γ-spectrometer. I. Calculation of the Main Characteristics of the γ-spectrometer

parameters of the spectrometer:
1) Spectral sensitivity: the basic diagram of a γ-spectrometer considered in this paper is shown in Fig.1, in which the meanings of the symbols employed are indicated. In view of the finite width of the counters, the spectrometer records γ-quanta in a certain energy interval from $E_{\gamma\ min}$ to $E_{\gamma\ max}$. The corresponding spectral sensitivity curve is then shown in Fig.2a and is of triangular form with a dispersion given by

$$\sigma_{1a} = 1/6\ l_c^2/(r_1 + r_2)^2$$ where l_c is the width of a counter and r_1 and r_2 are the distances from the converter to the centres of the counters, respectively. The effect of the width of the converter upon the spectral sensitivity is examined and it is shown that a converter of a finite width introduces a spread into the spectral line in the high energy region of γ-quanta. As the angle φ between the direction of motion of the γ-quanta and the straight line connecting the centre of the converter with

A Multichannel Pair γ-spectrometer. I. Calculation of the Main Characteristics of the γ-spectrometer

the counter increases, the spread of the spectral line decreases. At $\varphi = 90^0$ the width of the spectral sensitivity curve is independent of the converter width. The effect of the converter width gives a distribution of the form shown in Fig.2b, which has a dispersion given by:

$$\sigma_2^2 = \frac{l_k^4 \operatorname{ctg}^4 \varphi}{180 r_1^2 . r_2^2}$$

. The effect of multiple scattering in the converter is estimated and expressions are derived for this effect also. Finally, an estimate is given for the radiation loss experienced by the electron-positron pair on traversing the converter.

2) Efficiency: in this section the Bethe-Heitler expression for the probability of formation of a pair by a γ-quantum of

A Multichannel Pair γ-spectrometer. I. Calculation of the Main Characteristics of the γ-spectrometer

energy E_γ is used (Ref.13) with a modification described by Bethe et al in Ref.22.

3) Multichannel system: in a multichannel spectrometer the electrons and positrons formed by γ-quanta of a given energy are recorded by a number of combinations of pairs of counters. The electronic circuit of such a spectrometer should record coincidences between pulses from each electron counter with pulses from any positron counter. Thus, any combination of one electron counter and one positron counter is, in fact, a 2-channel spectrometer. For a given geometry a spectrometer containing n channels records γ-quanta in n-1 energy intervals of different mean energy. In practice, one seeks to find the form of the spectrum and the absolute intensity in one of the energy intervals. To find the form of the spectrum it is sufficient to know the relative efficiency of recording for the different energy intervals, and this is given by Eq.(10). In order to obtain the absolute intensity in one of the energy intervals it is necessary to know the total absolute efficiency of recording of γ-quanta in one of the energy intervals. This problem is not treated.

SOV/120-58-6-4/32

A Multichannel Pair γ-spectrometer. I. Calculation of the Main Characteristics of the γ-spectrometer

V. V. Mel'nikov is thanked for carrying out a number of calculations. There are 2 figures and 22 references, of which 4 are Soviet, 1 German, 1 Soviet translated from English and the rest are English.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute for Nuclear Studies)

SUBMITTED: December 27, 1957.

Card 6/6

SOV/120-58-6-5/32

AUTHORS: Bayukov, Yu. D., Kozodayev, M. S., Markov, A. A. Sinayev, A.N., Tyapkin, A. A.

TITLE: A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer (Mnogokanal'nyy parnyy gamma-spektrometr. II. Opisaniye dvenadtsatikanal'nogo spektrometra)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6, pp 30-40 (USSR)

ABSTRACT: Application of a multichannel pair spectrometer in synchro-cyclotron work presents a number of specific requirements as far as counters of the ionising particles and the electronic system of the spectrometer are concerned. Since the beam intensity is high and consists of short pulses of 200 to 300 μs each at a repetition frequency of 40 to 80 pulses per sec, it follows that the apparatus must be very fast. It is desirable that the input blocks should have resolving times not greater than 1 μs. The large background intensity in synchro-cyclotron work means that it is always necessary to use a special selection system which records only electron-positron pairs. For this reason, in the spectrometer each component of a pair should be recorded by a number of counters in coincidence with sufficiently low resolving time. The present paper describes a 12-channel γ-spectrometer which has

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A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer

been used over a number of years in studying the spectra of hard γ-rays and neutral π-meson decays (Refs.2-6). The first variant of the spectrometer was built in 1949. In 1951 and 1954 the spectrometer was modified to improve its characteristics. The spectrometer described here satisfies completely the above requirements and is based on the design calculations given in the previous paper (Ref.1) in this issue.

1) Magnetic system and geometry of the instrument.
The magnetic field is produced by an SP-56 electromagnet. Fig.1 shows the disposition of the counters for two types of demountable pole pieces. The gap between the poles is 5 cm and the maximum field in the gap is 18 000 oersted. The electromagnet current is stabilised to 0.1%. In studies of γ-ray spectra in the energy region 20 to 200 MeV, $2\varphi = 180^{\circ}$ (Fig.1b) and in the energy region 100 to 450 MeV, $2\varphi = 90^{\circ}$ (Fig.1a). In the former case semi-circular focussing of

A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer

electrons and positrons was used, and this led to increased efficiency (Ref.1) because it was possible to use wider and thicker converters. For γ-quqnta in the energy range 450-600 MeV, $2\varphi = 90^{\circ}$ but the counters were at a larger distance from the converter. Copper converters were used (0.1, 0.3 and 0.5 mm, depending on the energy).

2) Resolving power and efficiency.

Fig.2 shows curves of the total spectral sensitivity for the 7th energy interval for various values of $E_{\gamma 0}$ and thicknesses T_k of the copper converters. These curves are based on the theoretical data given in the previous paper and are obtained by a statistical combination of the partial distributions due to a) width of the counters, b) width of the converter, c) multiple scattering and d) radiation. As can be seen, the form of the total spectral sensitivity curve is very nearly triangular, which means that the total spectral sensitivity is governed mainly by the width of the channels l_c (see Fig.1 of previous paper, p 24, this issue).

A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer

3) Counters and selection system. The counters used were proportional counters having a cylindrical stainless steel cathode, 10 mm in diameter and a molybdenum filament 0.1 mm in diameter. They were filled with $(CH_2(OCH_3)_2)$ at a pressure of 160 to 200 mm. The working voltage was 1600 to 2000 V. The counters have an effective dead time not exceeding 10^{-7} sec. The efficiency of the counters for particles with relativistic ionisation reaches 98% in a coincidence scheme with a resolving time of 5×10^{-7} sec. The delay of the pulses due to drift of electrons through the counter gas is less than 10^{-7}. The counters give electrical pulses with amplitudes between 10^{-4} and 1 V. The large difference in the amplitudes requires the use of amplifiers having a wide dynamic range and an amplification of a few thousands. 6-fold coincidences were used and the number of random coincidences in each 6-fold channel was 0.02 pulses per sec. The number of electron-positron pairs recorded per

A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer

sec depended on the efficiency of the spectrometer with respect to the γ-quanta in the measured energy interval and the form of the spectrum and was in the range 0.1 to 10 pairs per sec.

4) Electronic scheme.

A block diagram of the electronic part of the spectrometer is shown in Fig.3. The left-hand portion of this diagrem shows 6 co-ordinate counters of the electron series (a_1 - a_6), 6 co-ordinate counters of the positron series ($\bar{b}_1$ - $\bar{b}_6$) and 4 selection counters (A', A", $\bar{b}$' and $\bar{b}$"). Each of these counters in practice consists of a group of counters whose filaments are connected. A recorded electron or positron should pass through 3 counters (1 co-ordinate and 2 selection counters). A pair is recorded if a 6-fold coincidence takes place. Negative-going pulses from each counter are amplified by a corresponding amplifier-converter (Fig.4). These amplifiers have a rise time of 2×10^{-4} sec. Pulses from all the 16 amplifier-converters are applied to the main block which is at a distance of 1.5 m from the amplifier-converters (Fig.5). Pulses from the selection counters are applied to a

A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer

4-fold coincidence scheme while pulses from the co-ordinate counters are applied to mixers and in addition through delay lines to a hodoscopic system consisting of 2-fold coincidence circuits and output univibrators. The pulse at the output of a mixer appears in the presence of a pulse in at least one of the co-ordinate counters of a given series. Pulses from both the mixers and also from the 4-fold coincidence scheme are applied to a 3-fold coincidence scheme which produces the final output pulse. It follows that the latter pulse appears when a 6-fold coincidence takes place, i.e. when a particle passes through at least one of the co-ordinate counters in the electron series, through one of the co-ordinate counters of the positron series, and all the counters of the selection system. The resolving time of the above coincidence schemes is 5×10^{-7}.

5) Method of measurement and treatment of results. Fig. 7 shows the experimental arrangement. In this figure 1 is the proton trajectory, 2 is the target, 3 is the synchro-cyclotron chamber, 4 is a concrete wall, 5 is a collimator,

A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer

6 is a diaphragm, 7 is a clearing magnet which removes electrons and positrons from the beam, 8 is an additional screen, 9 is the convertor and 10 is the spectrometer electro magnet. Fig.8 shows a typical result obtained for the energy spectrum of γ-quanta from neutral π-meson decays. The mesons were produced by 660 MeV protons at a carbon target. The spectra are measured at an angle of 180-0° to the direction of motion of the protons. G.P.Zorin, B.A.Krasnovidov, L. A.Fadeyev and G.N.Stepanow are thanked for their assistance. There are 8 figures, 4 tables and 7 Soviet references.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute for Nuclear Studies)

SUBMITTED: December 27, 1957.

85699

S/056/60/038/006/042/049/XX
B006/B070

24.6900 (1138, 1191, 1559)

AUTHORS: Bayukov, Yu. D., Leksin, G. A.

TITLE: The Possibility of Using Nuclear Reactions to Obtain Data on ππ Interaction 19

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 6, pp. 1907 - 1908

TEXT: Nuclear processes are considered in which transferred momenta are small also for large energies, and from whose theoretical interpretation it is possible to obtain data on ππ, πK, and KK interactions, as is shown here. This is shown for the process where a pion is produced by a pion. Use is made of the formula of Chew and Low which gives the relationship between the cross section for this process and the ππ interaction cross section for the case of small transferred momenta (Ref.1). It is shown that this formula can be applied without much error for the production of a meson by a meson on a nucleus, and that it is thus possible to obtain data on ππ interaction from the total cross section for a nuclear reaction of the type $\pi + A \rightarrow \pi + \pi + B$. This is true especially for the

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The Possibility of Using Nuclear Reactions to Obtain Data on ππ Interaction

S/056/60/038/006/042/049/XX
B006/B070

reaction $\pi^- + C^{12} \rightarrow \pi^- + \pi^- + N^{12}$. Moreover, in momentum approximation, the formula of Chew and Low must be multiplied by $S^2 = \left\{ \int_0^\infty \psi^*(r) e^{ipr} \psi(r) dr \right\}^2$ before integration. This function gives the probability that the nucleus whose ground state is described by the wave function $\psi(r)$ continues to remain in the ground state even when a momentum p is transferred to it. As is shown in a diagram, S^2 falls rapidly with p. Only for p larger than 3 is this function greater than zero (for the case of the C^{12} nucleus considered here). K.A.Ter-Martirosyan is thanked for advice and help. There are 1 figure and 2 references: 1 Soviet and 1 US.

SUBMITTED: February 23, 1960

Card 2/2

27698
S/120/61/000/003/008/041
E032/E314

24.6800

AUTHORS: Bayukov, Yu.D., Leksin, G.A. and Suchkov, D.A.

TITLE: Characteristics of Spark Counters Operated with Pulsed Supplies

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No. 3, pp. 66 - 68

TEXT: The authors have investigated the characteristics of various spark counters operated with pulsed supplies. The principle of the experiments is illustrated in Fig. 1. The plane-parallel electrodes forming the spark gap were placed in a glass container which was evacuated and then filled with air, nitrogen, carbon dioxide, helium, neon and argon at various pressures, p, respectively. The polished brass electrodes were 55 x 55 mm^2 in size. In addition, a further counter having disc electrodes, 30 mm in diameter and made from aluminium foil 7 μ thick, was tested in open air. The distance between the electrodes was varied between 2 and 6 mm and the

Characteristics of ....

high-voltage pulse was derived from a TGI-1 400/16 (TGI-1 400/16) thyratron controlled by a telescope consisting of two scintillation counters C_1 and C_2. The thyratron pulse was delayed by 0.5 μsec relative to the passage of the particle through the counter. All the experiments were carried out with cosmic-ray particles. In some cases, a constant clearing voltage V_o (0 to 2 kV) was applied to the counters. The limiting resistor R_2 could be varied between fractions of an ohm and 1.4 kΩ. The remaining parameters are indicated in Fig. 1. The spark discharges of the counter were recorded continuously, by ear, or by counting electrical pulses induced in the antenna of a scaling unit. Fig. 2 shows the results obtained for the efficiency η defined as the ratio of the recorded particles to the total number of particles passing through the counter ($R_2 = 0$, $V_o = 0$, $\tau = 0.5$ μsec).

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Characteristics of ....

Fig. 3 shows typical efficiency curves for various clearing voltages and high-voltage pulse delays, τ. The efficiency of a spark counter can be approximately calculated from the formula

$$\eta = 1 - \exp\left[-n(d - v\tau)\right] \qquad (1)$$

where n is the number of ion pairs produced in the discharge gap,
$v = K\varepsilon$ is the charge drift velocity which depends on the clearing field $\varepsilon = V_o/d$ and the mobility K.
By comparing this formula with the results shown in Fig. 3, one can estimate the mobilities of the charges in the spark gap. For air at STP it is found that $K_2 \approx 3$ cm^2/sec, while for argon at p = 400 mm Hg $K \approx 3 \times 10^3$ cm^2/sec.
Fig. 4 shows the efficiency as a function of the delay τ, in μsec, for $R_2 = 0$, $V_o = 0$ and d = 6 mm. Acknowledgments to M.S. Kozodayev for discussions and interest in the work.

Card 3/7

27698
S/120/61/000/003/008/041
E032/E314

Characteristics of ....

There are 4 figures, 3 tables and 1 non-Soviet reference.

SUBMITTED: July 4, 1960

Fig. 1:

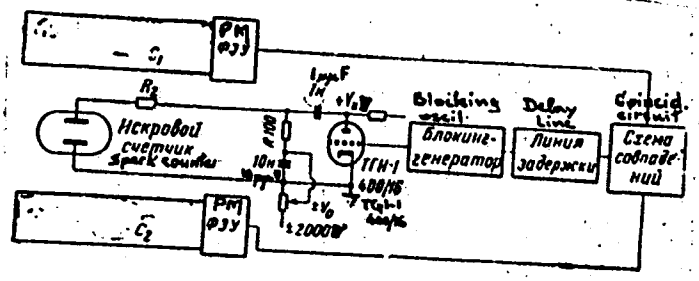

Рис. 1. Схема опытов

Card 4/7

BAYUKOV, Yu.D.; LEKSIN, G.A.; SUCHKOV, D.A.; SHALAMOV, Ya.Ya.; SHEBANOV, V.A.

Backward elastic scattering of 2.8 bev/c π^--mesons on neutrons.
Zhur.eksp.i teor.fiz. 41 no.1:52-55 Jl '61. (MIRA 14:7)

1. Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR.
(Mesons—Scattering) (Neutrons)

BAYUKOV, Yu.D.; LEKSIN, G.A.; SHALAMOV, Ya.Ya.

Elastic scattering of π^- -mesons by 2.8 Bev./c neutrons.
Zhur.eksp.i teor.fiz. 41 no.4:1025-1030 O '61. (MIRA 14:10)

1. Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR.
(Mesons—Scattering) (Neutrons)

S/056/61/041/006/019/054
B102/B138

AUTHORS: Bayukov, Yu. D., Leksin, G. A., Shalamov, Ya. Ya.

TITLE: Investigation of the reaction $\pi^- + n \to \pi^- + n + m\pi^0$ with a beam of π^- mesons with a momentum of 2.8 Bev/c

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6(12), 1961, 1787-1792

TEXT: The reaction $\pi^- + n \to \pi^- + n + m\pi^0$, m=1,2, was studied by means of a 50 cm long, 17-liter freon bubble chamber without magnetic field. The bombarding pions had a momentum of 2.8 ± 0.3 Bev/c. The gamma quanta arising in π^0 decay were recorded with quite high efficiency. From the stereophotographs taken 221 single-pronged stars were selected, representing pion interactions with quasi-free neutrons. Only in two cases was K^0 formation recorded, so strange particle formation could be neglected in evaluating the results. The gamma and pion angular distributions were measured and the multiplicity of the reaction was determined. Results: In the πN c. m. s. the angular gamma quantum distribution was anisotropic and

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Investigation of the reaction ...

asymmetric, the forward-to-backward ratio was 1.76 ± 0.30. In the laboratory system the angular γ and π^- distributions coincided within the limits of statistical error. The anisotropy in π^- angular distribution increased with the energy of the π^- meson. The anisotropy in gamma distributions tended to decrease with increasing number of gamma quanta: 1.7±0.4 for stars with one quantum, 1.7±0.5 with two and 1.5±0.7 for stars with 3 - 5 γ-quanta. In the lab-system it was also greater for stars with $>41^\circ$ π^- emission angles than for $<41^\circ$. The mean efficiency of gamma recording was not dependent on the π^- emission angles, and was to 0.34 ± 0.02. From the contributions of the reactions with m = 1,2,3 the mean multiplicity of π^0 production was found to be 1.47±0.15. The multiplicity tends to increase with the π^- departure angle, and depends on the π^- momentum: 1.33±0.15 for $p_{\pi^-} > 300$ Mev/c and 1.71±0.12 for $p_{\pi^-} < 300$ Mev/c. The results are in good agreement with V. M. Maksimenko's statistical theory (Dissertatsiya, FIAN 1960). The anisotropy can be explained by assuming peripheral $\pi\pi$ interactions. Among others, V. S. Barashenko and V. A. Belyakov et al. (ZHETF, 39, 937, 1960) have indicated

this possibility and Ya. Ya. Shalamov and V. A. Shebanov (ZhETF, 39, 1232, 1960) have used it to explain the anisotropy observed in $\pi^- + p \rightarrow n + m\pi^0$ reactions at 2.8 Bev. The authors thank Yu. S. Krestnikov, V. A. Shebanov, N. S. Khropov, M. U. Khodakova, V. A. Krutilina, Z. I. Pal'mina and Yu. S. Petrykin for assistance and N. G. Birger for discussion. There are 5 figures, 2 tables, and 11 references: 7 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: W. D. Wolker. Phys. Rev., 108, 852, 1957; L. C. Grote et al. Nucl. Phys.24, 300, 1960; G. Maenchen, W. Fowler et al. Phys. Rev. 108, 850, 1957; R. C. Whitten, M. M. Block. Phys. Rev. 111, 1676, 1958.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Akademii nauk SSSR (Institute of Theoretical and Experimental Physics of the Academy of Sciences, USSR)

SUBMITTED: July 18, 1961

BAYUKOV, Yu.D.; LEKSIN, G.A.; SHALAMOV, Ya.Ya.

Large-angle scattering of high-energy π-mesons. Zhur. eksp. i teor. fiz. 41 no.6:2016-2018 D '61. (MIRA 15:1)
(Mesons--Scattering)

24.6700

31799
S/056/61/041/006/053/054
B111/B104

AUTHORS: Bayukov, Yu. D., Leksin, G. A., Shalamov, Ya. Ya.

TITLE: Wide-angle scattering of high-energy π-mesons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6, 1961, 2016 - 2018

TEXT: Results obtained by Ya. Ya. Shalamov and V. A. Shebanov (Ref.5: ZhETF, 39, 1232, 1960) from measurements of the total cross section of $\pi^- + p \rightarrow \pi^0 + n$ reactions were worked out anew. The cross section of π^0-mesons back-scattered into the angular space of 1 steradian is indicated as < 0.01 millibarn/sterad. The cross section of elastic charge exchange with a π^0-meson departing at an angle > 90° in the c.m.s. was found to be $\lesssim$ 0.002 millibarn/sterad. The scattering cross sections of π^--mesons back-scattered by protons according to $\pi^- + p \rightarrow \pi^- + p$ reactions are also indicated. The momentum of π^--mesons was 2.8 Bev/c. For angles >90° in the c.m.s., $\sigma' < 0.03$ millibarn/sterad was measured. I. Ya. Pomeranchuk and V. A. Shebanov are thanked for discussions. There are 1 figure and 6 references: 4 Soviet and 2 non-Soviet. The two

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31799
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B111/B104

Wide-angle scattering of high-energy...

references to English-language publications read as follows: M. Gell-Mann, F. Zachariasen, Preprint, 1961; C. D. Wood et al., Phys. Rev. Lett., 6, 481, 1961.

SUBMITTED: October 16, 1961

Card 2/2

BAYUKOV, Yu. D.

ARZFYEV, A. V., BAYUKOV, Yu. D., ZAYTSEV, Yu. M., KIZODAYEV, M. S., SUZCHKOV, D. A., OGIYENKOV, V. T., TELEMADV, V. V. FEDOROV, V. B.

"π-π Intorgation at Low Energies"

Institute of Theoretical and Experimental Physics, Moscow, USSR

report presented at the Intl. Conference on High Energy Physics, Geneva, 4-11 July 1962

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000204110001-2"

39677
S/056/62/043/001/049/056
B102/B104

24.6600

AUTHORS: Bayukov, Yu. D., Birger, N. G., Leksin, G. A., Suchkov, D. A.

TITLE: The nature of elastic πN and pp scattering in the region of large transferred momenta

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 339-341

TEXT: The results of experimental and theoretical papers concerning elastic πN and pp-scattering with transferred momenta >0.5 Bev/c are reviewed, discussing mainly the energy course of the differential elastic scattering cross section. Investigations of the asymptotic behavior of the scattering amplitude point to a relation $d\sigma_{el}/dt = f(t)s^{2[l(t)-1]}$ where t is the square of the transferred four-momentum and s is that of the total particle energy in the c. m. s. Numerical results from several papers are used to study the $|t|$ - dependence of $l(t)$ at t-values of from 0.5 to 2.4 $(Bev/c)^2$ and s up to 52 $(Bev)^2$. It is found that $l(t)$ drops

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with increasing $|t|$ and changes its sign at $|t| \approx 1$ (Bev/c)^2. Within the (large) error limits no contradiction is found between the data on pp and πN scattering. There are 2 figures. The English-language references are: Cocconi et al. Phys. Rev. Lett. 7, 450, 1961; R. E. Thomas, Phys. Rev. 120, 1015, 1960; Cork et al. Phys. Rev. 107, 859, 1957.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Akademii nauk SSSR (Institute of Theoretical and Experimental Physics of the Academy of Sciences USSR)

SUBMITTED: May 8, 1962

BAYUKOV, Yu.D.; LEKSIN, G.A.; SUCHKOV, D.A.; TELENKOV, V.V.

Some characteristics of spark chambers. Prib. i tekh. eksp. 8 no.1:26-28 J[illegible]F '63. (MIRA 16:5)

1. Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR.
(Counting devices)

PERIODICAL: Pribory i tekhnika eksperimenta, no. 1, 1963, 36 - 38

TEXT: The apparatus shown in Fig. 1 was used to investigate the efficiency of a single-layer spark chamber as a function of the length of the high-voltage pulse and its rise time. The apparatus and the method employed were described in detail in a previous paper (PTE, 1961, no. 3, 66). In the present work the distance between the electrodes was 6 mm and the chamber was filled with argon at 600 mm Hg; there was no clearing field. All the measurements were carried out with cosmic-ray particles. The length of the high-voltage pulse was taken to be equal to $R_p C_p$, which was varied between 4.2×10^{-8} and 1.8×10^{-6} sec. The form of the efficiency-versus-thyratron anode-voltage curves was found to be similar for different values of R_p and C_p. It was found that as the pulse length was increased the efficiency-versus-

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anode-voltage curves shifted towards lower potentials. A study was also made of the effect of the chamber capacitance on the efficiency. It was found that the results were in satisfactory agreement with the formula:

$$\eta = 1 - \exp\left[-n\left(d - \int_0^{\tau} v(t)\,dt\right)\right] \qquad (1)$$

where η is the efficiency, n is the ionization density, d is the interelectrode distance, $v(t)$ is the velocity of electrons which depends on the field strength at a particular instant, i.e. on the form of the high-voltage pulse, and τ is the time taken by the potential to reach the critical value. Next, a study was made of the ability of the single chamber to record simultaneously a number of particles. This was carried out with a four-layer chamber filled with neon at atmospheric pressure, having an interelectrode distance of 1 cm. The chamber was placed in a 310 meV π-meson beam and operated when at least two particles passed through it (a detailed description of this apparatus will be given in a future paper). Numerical data on the efficiency of the

Some characteristics of ....

recording of two and three particles simultaneously are reproduced. It was found that argon-filled chambers had a lower efficiency for the simultaneous recording of particles than neon-filled chambers. Finally, the effect of impurities of spark chambers was investigated with the apparatus described in a previous paper. It was found that the presence of saturated water vapour reduced the potential for spurious pulses so that the plateau was practically absent. Small amounts of alcohol, acetone and dichloroethane could give rise to a reduction in efficiency at constant voltage, increase the spurious spark potential and suppress spurious pulses due to the propagation of photons through the chamber. Traces of carbon tetrachloride will reduce to zero the efficiency of recording of events occurring in a time interval of 1 μs prior to the application of the high-voltage pulses. There are 4 figures and 1 table.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR (Institute of Theoretical and Experimental Physics of the AS USSR)