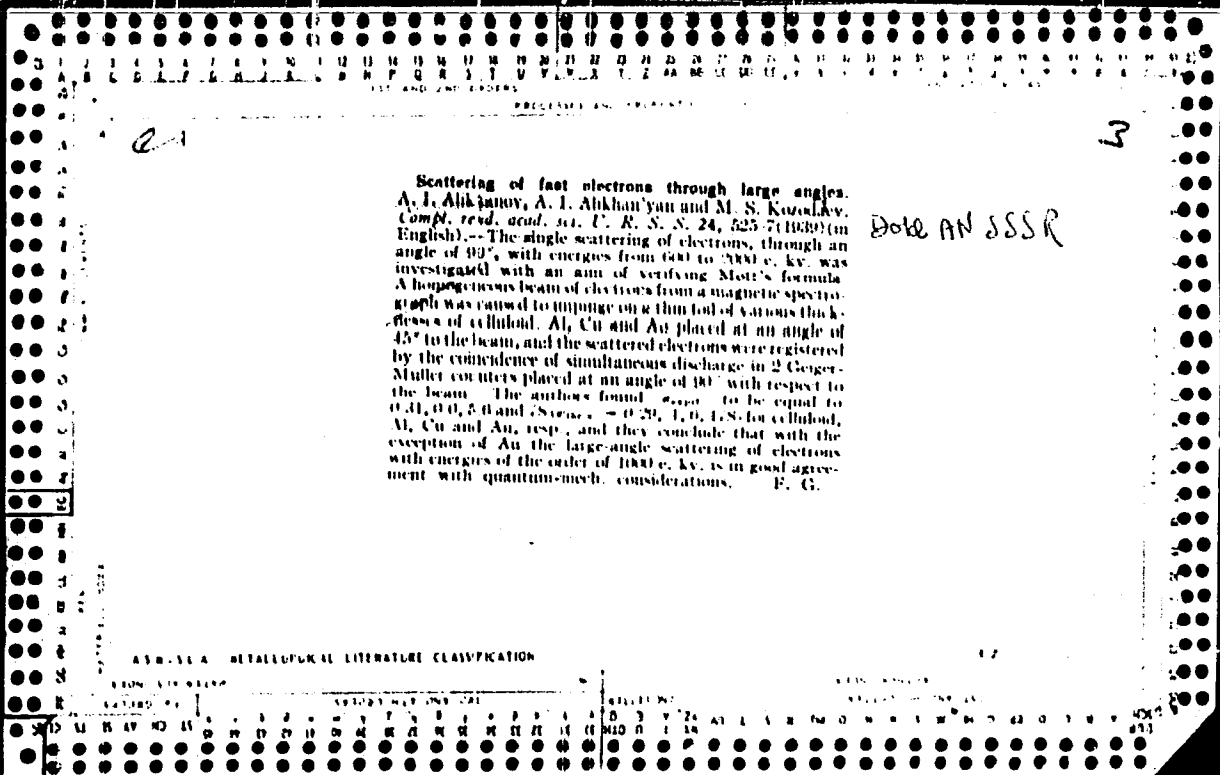


ALIKEANOV, A.I., ALICHANIAN, A.I., and DVELEPOV, B.S.

"On the Form of the β -Spectrum of Ra E in the Vicinity of the Upper Limit and the Mass of the Neutrino," The Physical Review, Vol. 53, pp. 766-767, 1938.

Physical-Technical Institute, Leningrad, U.S.S.R.



PROCESSED AND PROPERTY INDEX

3

Energy losses of fast electrons. A. I. Akhmanov and A. I. Akhman'yin. Compt. rend. acad. sci. U. R. S. S. R. 25, 102-4(1939)(in English).--Energy losses of fast electrons were investigated by the use of Pb and Al absorbers of various thicknesses and a method of uniform magnetic-field focusing. The results obtained (for normal energy losses) were found to be in fairly good agreement with those calcd. by the Bloch formula, and they are in conformity with the theory that when traversing a substance with a low at. no. the electrons experience greater energy losses than when passing through a heavy substance (which is in striking contradiction to the results of Laslett and Hurst (C. A. 32, 1554) and Rublig and Crane (C. A. 32, 442P)). The results do not allow for any conclusions concerning cases when the loss in energy experience by the electrons is very high. P. Gonet

Докл. АН СССР

Physical Tech/Inst. Leningrad

A S R - S L A METALLURGICAL LITERATURE CLASSIFICATION

SIGNATURE												NUMBER											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		

PROCESSED AND PROPERTIES INDEX

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LATYSHEV

Zhukov. Fiz

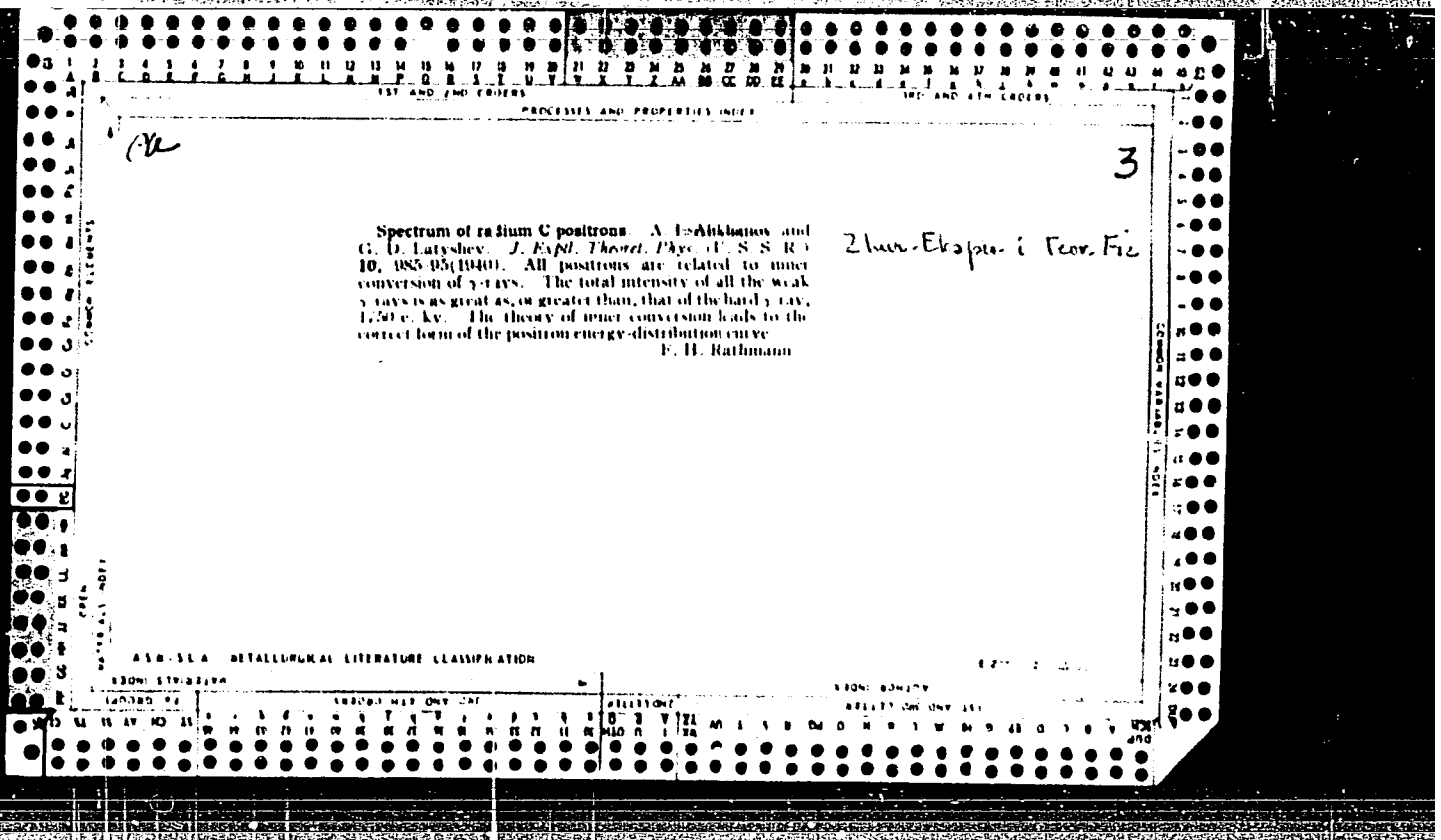
Positron spectrum of radium-C. A. I. Alchanov and G. D. Latichev (*J. Physics U.S.S.R.*, 1940, 8, 263-274).-- The positron spectrum of Ra-C has been investigated with improved apparatus. The curve of energy against no. of positions shows 11 sharp drops, each corresponding with a γ -line of which the energy can be calc. All the positrons from Ra-C arise from internal conversion of γ -rays. It is shown that the total intensity of a large no. of γ -lines of Ra-C is comparable with the intensity of the strongest γ -line of Ra-C. The theory of Jaeger and Hulme (*A.*, 1935, 557) is verified. No drop corresponding with energy of 1414 ke.v. of a nucleus level in Ra-C has been observed, in agreement with the fact that a transition from this level with emission of a γ -ray is forbidden.

A. J. M.

Physics - Inst., AS USSR

METALLURGICAL LITERATURE CLASSIFICATION

SEARCHED										SERIALIZED										INDEXED										FILED									
1940										1941										1942										1943									



ALISHANOV, A.I., ALISHANYAN, A.I., and MIKITIN, S.Ya.
Fiziko-Tekhnicheskii Institut AN SSSR, Leningrad

"Soft and Hard Components of the Cosmic Rays and the Neutron Spin," Journal of Physics, (U.S.S.R.) 1942, Vol. 6, No. 9, pp 230-232, Izvestia Akademii Nauk S.S.S.R., Seriya Fizicheskaya, 1942, Vol. 6, Nos. 1-3 pp 41-43.

ALIKHANOV, A.I., ALIKHANIAN, A.T., and MIRIANASHVILI, G.M.

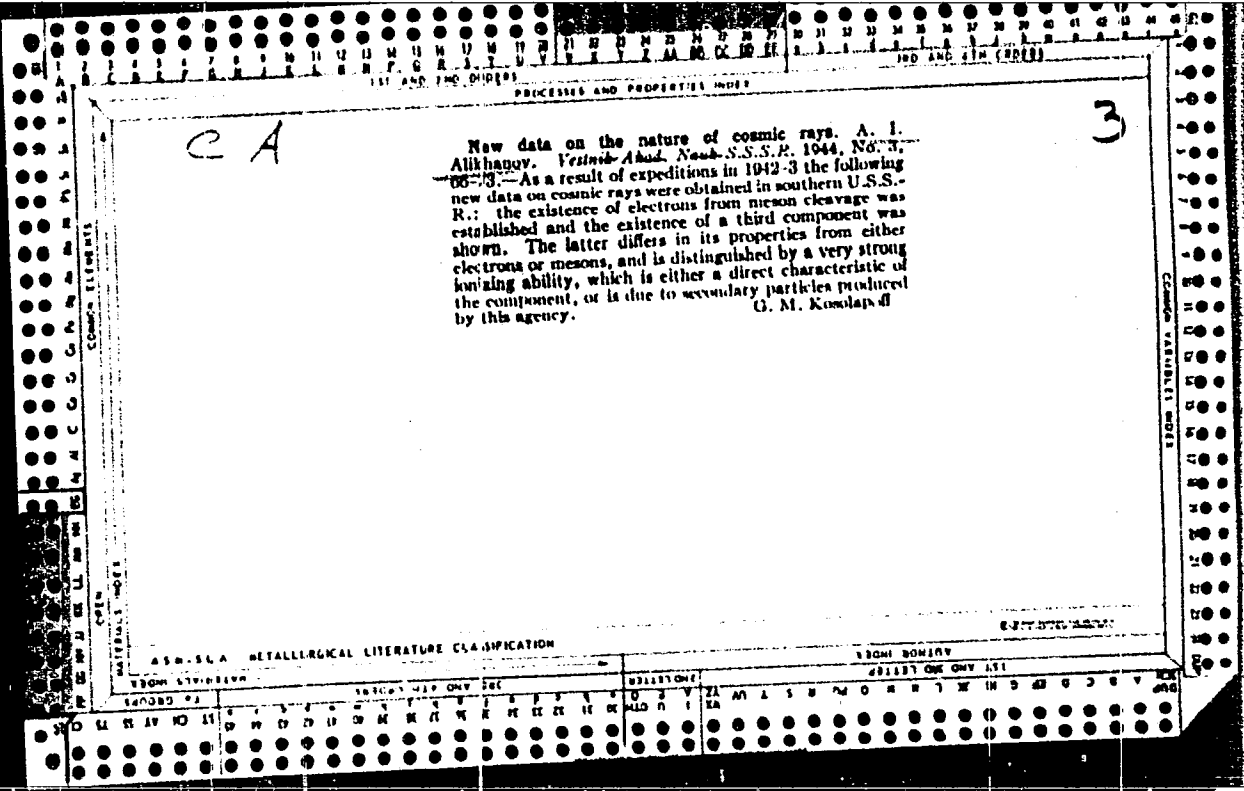
"Measurement of the Angle-Independent Intensity of the Soft and Hard Component of Cosmic Rays at 3250-Meter Altitude," Soobshchenia Akademii Nauk Gruzinskoi S.S.R., Vol. 4, No. 7, pp 637-640, 1943.

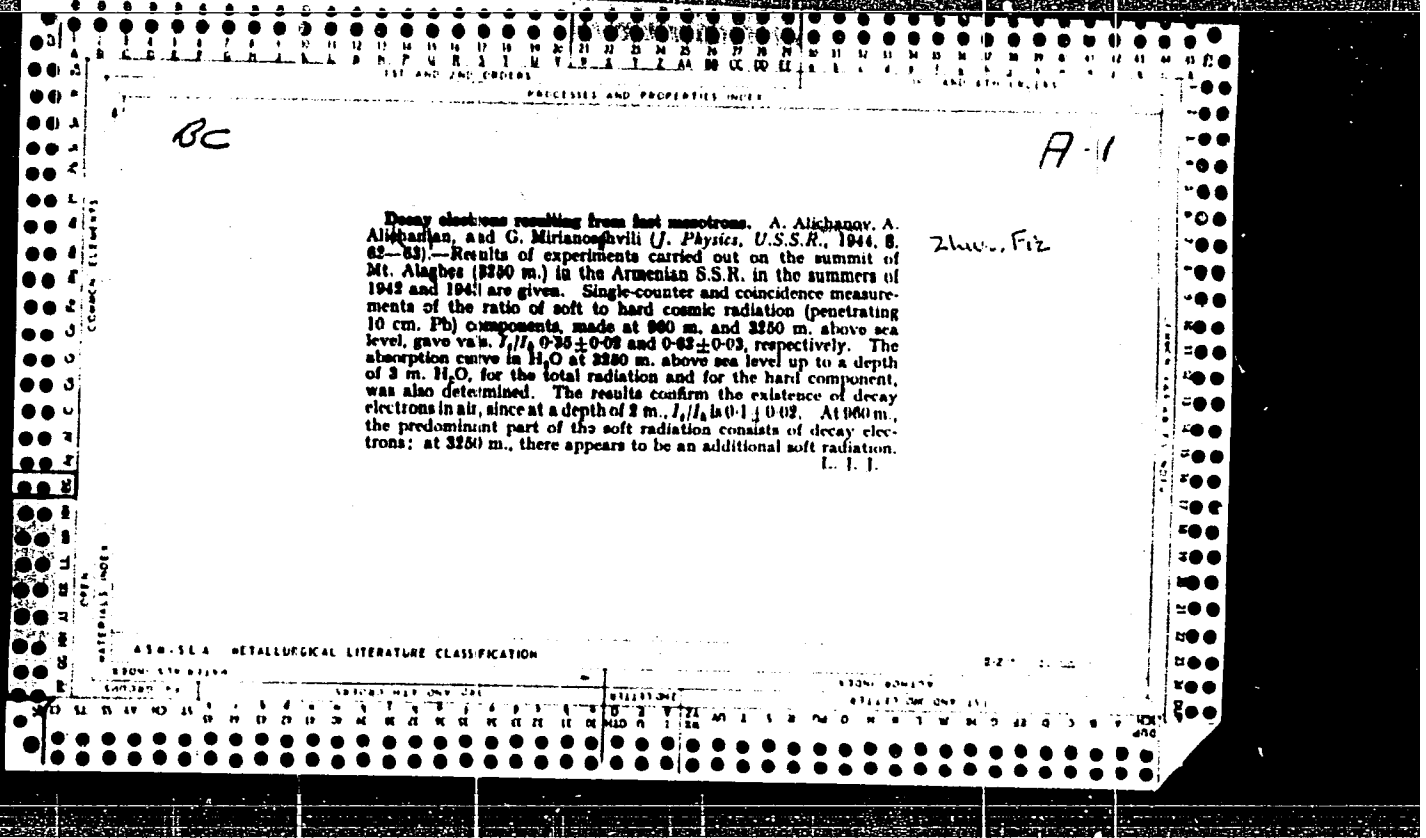
~~Akademiia Nauk Gruzinskoi S.S.R., Institut Fiziki i Geofiziki, Tbilisi;~~
~~Akademiia Nauk S.S.S.R. (Fiziko-Tekhnicheskii Institut, Leningrad.)~~

ALIKHANOV, A.I. and ALIKHANIAN, A.I.

"On the Results of the Cosmic Rays Expedition of 1942," Journal of Physics,
U.S.S.R. Vol. 7, No. 5, p. 246, 1943.

Physical-Technical Institute of the Academy of Sciences of the U.S.S.R.





А. И. АЛКХАНОВ, А. И.

PROCESSES AND PROPERTIES INDEX

C A

Soft component of cosmic rays at an altitude of 3280 m.
 A. I. Alkhanov, A. I. Alkhan'yan, L. Nomenov and N.
 Kozharyan. *J. Phys. (U.S.S.R.)* 8, 63 (1944) (in Eng-
 lish).—By 3 different methods it was found that the ex-
 perimentally detd. ratio of the soft component to the hard
 component of the cosmic rays varied with method and
 altitude from three distinct values of 1.1, 0.45 and 0.50 at
 3280 m. to a single value of 0.35 at 900 m. It is concluded
 that the soft component contains particles with an ionizing
 power greater than that of relativistic particles, probably
 protons with an energy below 100 m.e.v. P. H. R.

Zhur. Fiz.

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Phys. Sect. Inst., ASUSSR

ASUSSR METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND INDEXES PRICES AND PROPERTIES INDEX 1ST AND 2ND INDEXES

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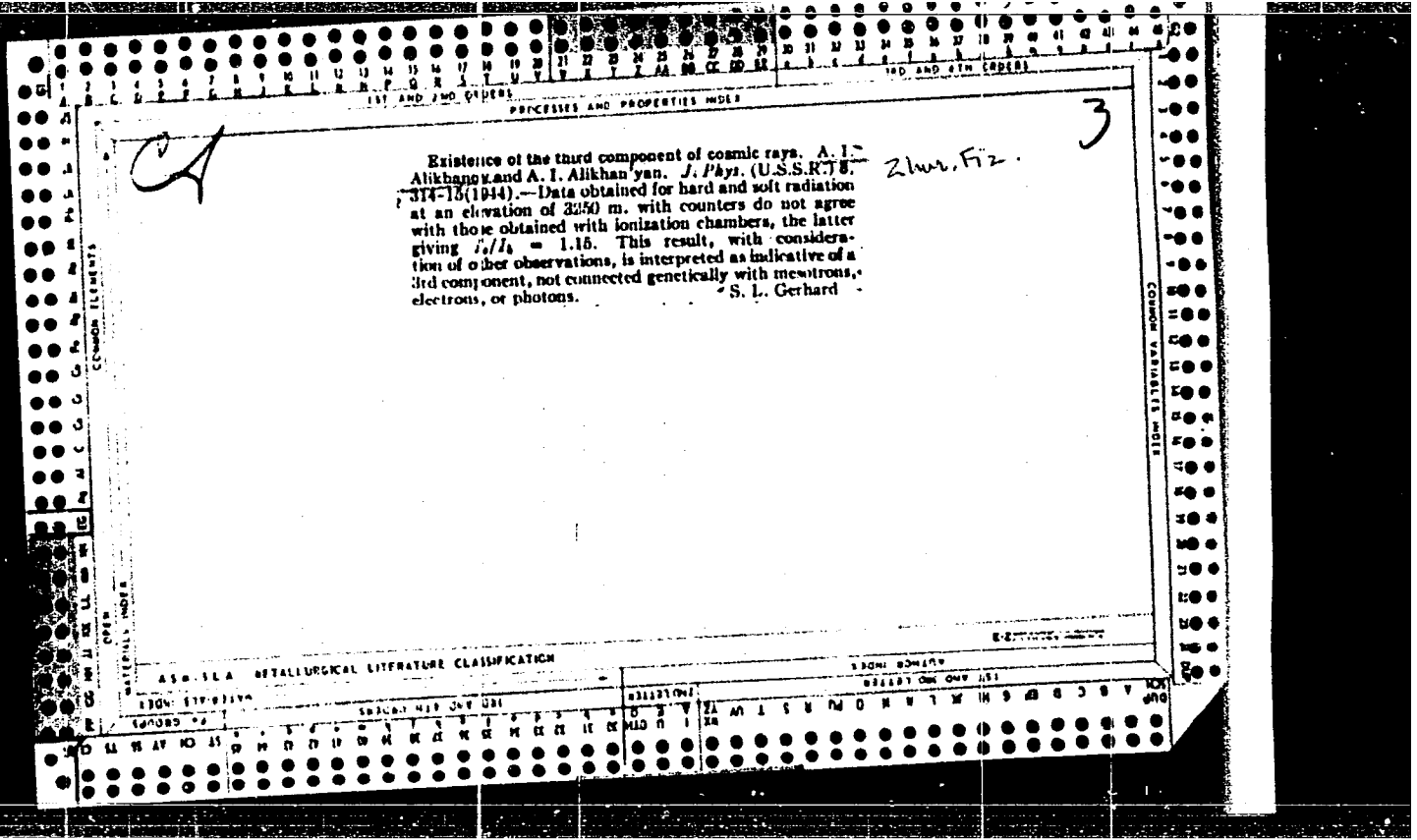
337.991.3 2343

The absorption of the soft component in water of an altitude of 3235 m. ALKHANOV, A., ALKHANOV, A., KOCHEVAN, N., KVAREZAVA, L., AND MERIAN-ZHUKOVA, L. G. J. Phys. USSR, 8, 2, pp. 127-128, 1944.—Results are recorded of the measurements of the ratio of the intensities of the soft and hard components of cosmic rays by means of an ionization chamber, counters and a coincidence method. L. S. G.

Zhur, Fiz.

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

SERIALS	NON-SERIALS	SERIALS	NON-SERIALS	SERIALS	NON-SERIALS



ALIKHANOV, A.I.

"Explosion of the Atom," Tekhnika-Molodezhi, Nos. 10-11, pp. 18-20, 1944.

ALIKHANOV, A.I.

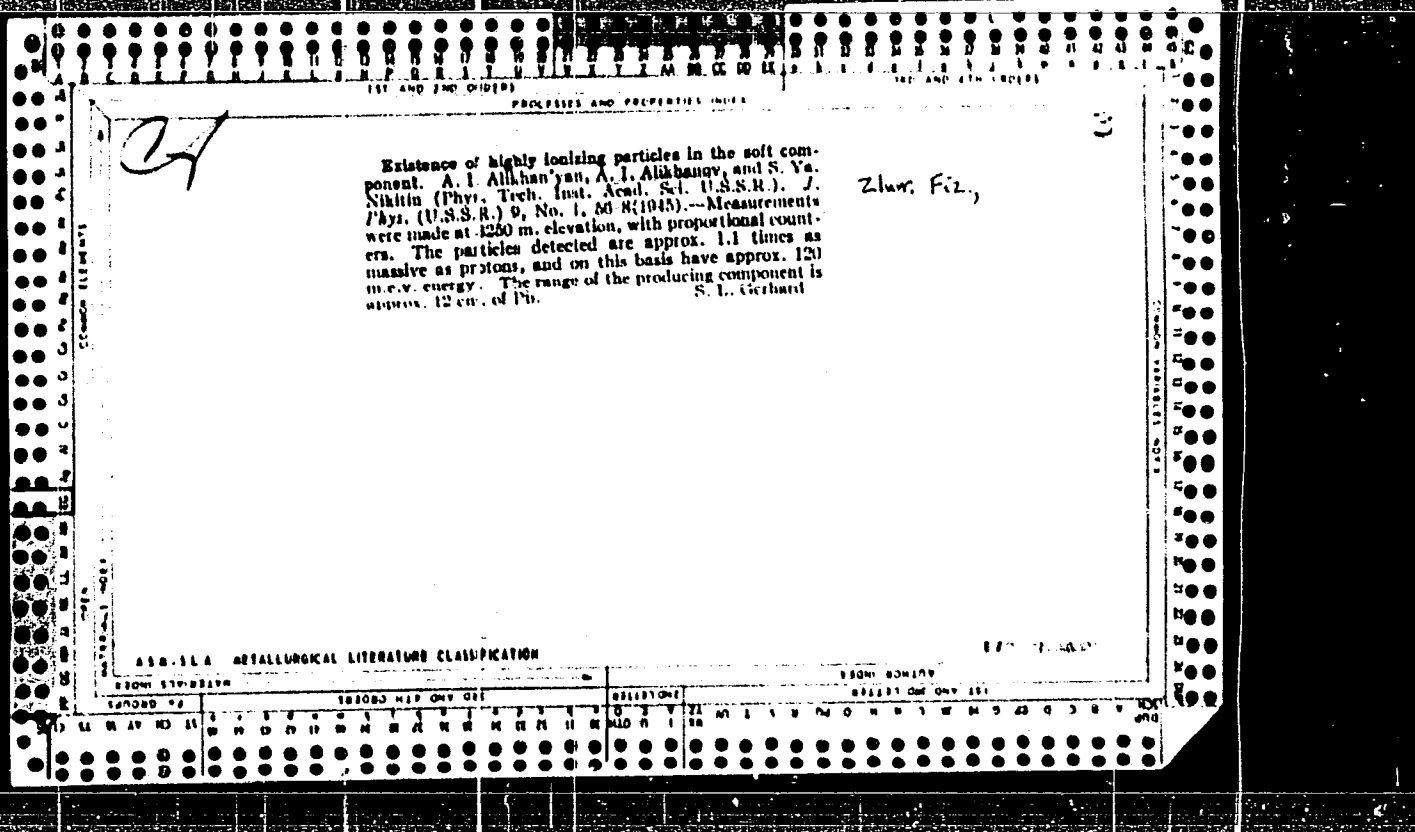
1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX										3RD AND 4TH ORDERS									
Transition effect of cosmic rays in lead. I. A. I. Alkhanov, I. Kravtsova, and S. Zucabkin (Phys. Tech. Inst. Acad. Sci. U.S.S.R.). <i>J. Phys. (U.S.S.R.)</i> 9, No. 1, 68-71 (1945).—Measurements were made at different depths in Lake Kara-Ogl, elevation 3225 m. The absorption in water of the shower-producing component is different from that of the soft component. Expts. with Al screens 0 to 8 mm. thick between the Pb screen and chamber wall showed that absorption reaches a max. at 5 to 12 mm. of Pb, depending on the thickness of the Al screen. S. L. Gerhard.																													

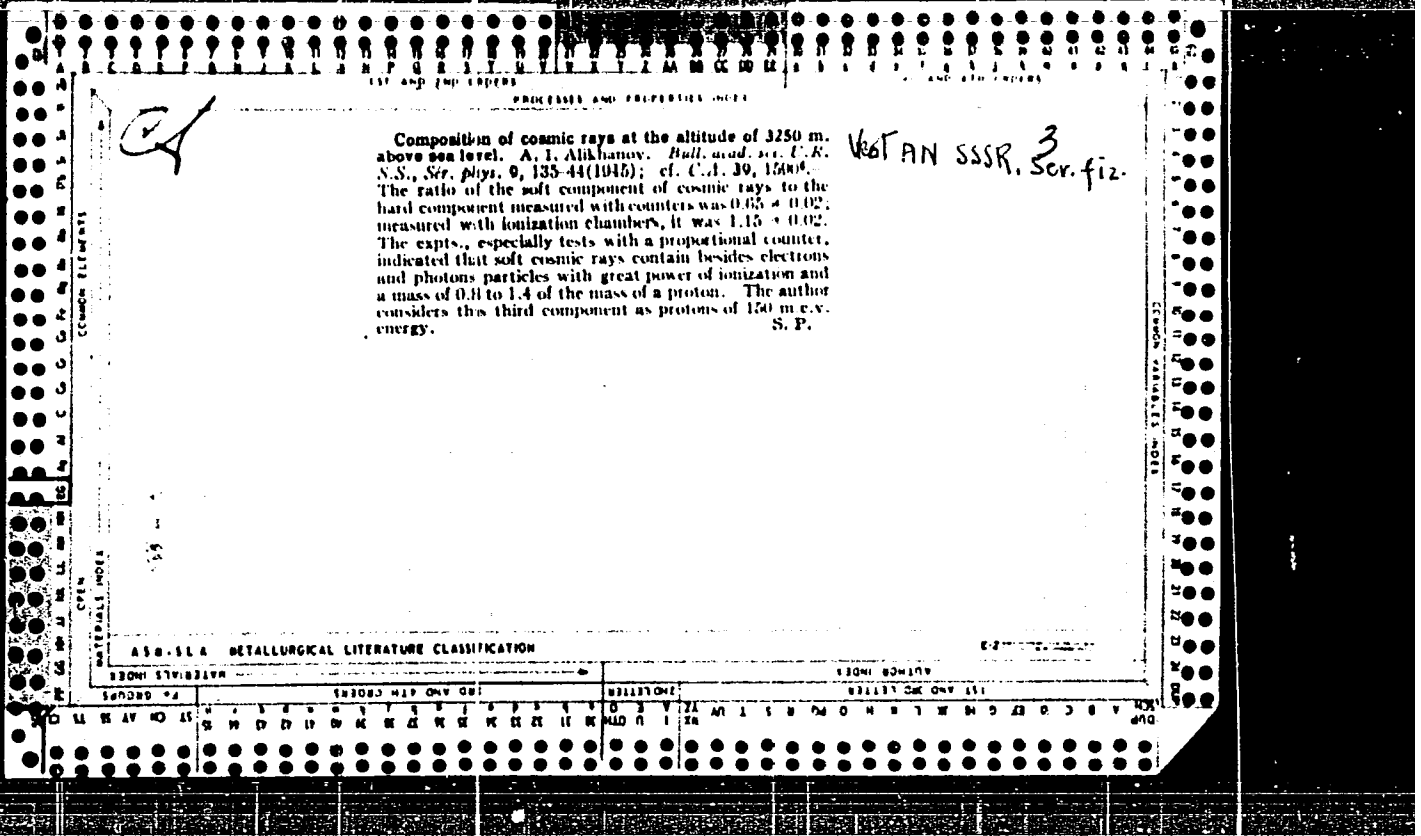
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MATERIALS INDEX A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	PROCESSES AND PROPERTIES INDEX A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	COMMON ELEMENTS A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
	<div style="position: relative;"> <div style="font-size: 2em; font-weight: bold; position: absolute; top: 10px; left: 10px;">CA</div> <div style="position: absolute; top: 10px; right: 10px; font-size: 1.5em; font-weight: bold;">3</div> <p>Highly ionizing particles in soft component of cosmic rays. A. I. Alikhan'yan, A. I. Alikhanov, and S. Nikitin. (Phys. Tech. Inst. Acad. Sci. U.S.S.R.). <i>J. Phys. (U.S.S.R.)</i> 9, 167-73(1945); cf. C.A. 40, 272. —An arrangement of proportional counters with linear amplifiers, tripped by coincidences between G.-M. counters, showed that about 30% of the soft component of cosmic radiation at 3250 m. altitude consists of highly ionizing particles. Rough estn. of the mass and range showed that the particles probably are protons of about 150 m.e.v. energy.</p> <p style="text-align: right;">A. O. Allen</p> <div style="text-align: right; font-style: italic; font-weight: bold; margin-top: 10px;">Zhur. Fiz.</div> </div>	
A S S - 3 1 4	METALLURGICAL LITERATURE CLASSIFICATION 230M BOWERY	150M BOWERY

ALIKHANYAN, A.I.

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Alkhanov, A. and Alkhanov, A. So
3250 m nad morskim urovnem
above sea level. Zhurnal Akademi
figs. 8 tables, 11 refs. English
composition of the soft component
Alagöz in Armenia (13,250 ft) in 1942, 194
were made with counters and an ionization
between data obtained by the two methods
particles having an ionization power 2.5 to
It is also shown that these particles amount
are not genetically connected with the ele
produced by an increasing component of
cosmic rays. 2. Mt. Alagöz. U.S.S.R. A.I.P.

komponenty kozmicheskikh luchei na vysoote
soft component of cosmic radiation at 3250 m
soft y. Fizicheskaya Fizika, 15(4/5):143-160, 1945. 10
January p. 160. D.C.—Results of investigations of the
radiation carried out during three expeditions on Mt.
and 1944 are presented and discussed. Measurements
camera and show that there is a systematic difference
This is due to the presence in the soft component of
larger than that of the relativistic particles.
to about 20% of the intensity of the mesotrons, and they
ons and quanta or the mesotrons, and that they are
and the "third" component. Subject Headings: 1. Soft

551.521.64:537.381.1

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9-202

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9-202

PROCESSES AND PROPERTIES INDEX

AN
Vest. Arm. SSR

Measurement of the soft and the hard components of cosmic rays by means of the ionization chamber. A. I. Alikhanov, A. I. Alikhanyan, and N. M. Kocharyan. *Proc. Acad. Sci. Armenian S.S.R.* 4, No. 3, 65-70(1940).
 ---Measurements of cosmic rays at an altitude of 3250 m. and 950 m. in Armenia by means of an ionization chamber showed the presence of a new component, which was named "the third component." The ionization effect of this component is 3 times that of the meson; it appears to be composed of protons of energy of 150-200 m.e.v.; this component is much more readily absorbed by Pb than by air or H₂O, and it is almost absent in the observations at lower altitude.
 G. M. Kosolapoff

METALLURGICAL LITERATURE CLASSIFICATION

E 2

CA

3A

Absorption of cosmic rays in a strong magnetic field at 3250 meters above sea level. A. I. Alikhanov, A. A. Alikhanov, S. Ya. Nikitin, and A. Valsenberg. *J. Phys. (U.S.S.R.)* 10, 294-5(1946); cf. preceding abstr.--Analysis of the soft component of cosmic rays by means of an intense magnetic field shows that the component having a range of 4-4.5 cm. in Pb is not deflected by the field, and confirms that the particles generated in Pb are protons.
H. A.

Zhur. Fiz.,

Abstr. for Phys. Problems of AS

1951

Scattering of relativistic electrons at a large angle. A. I. Alikhanov, A. I. Alikhanov, and A. V. Voznenko. *J. Exptl. Theoret. Phys.* (U.S.S.R.) 16, 389-78 (1946); *J. Phys.* (U.S.S.R.) 9, 290-8 (1945).—Fast electrons from (100-200)-millicurie radon sources (Ra C electrons, upper limit 3175 kv.) were monochromatized by a magnetic spectrograph and beams of energies from 60 to 2000 kv. were scattered on thin films placed at 45° to the beam. Scattering was observed with Geiger-Müller counters at an angle between 89° and 97°; γ -radiation from the source was eliminated. The scattering metal films were obtained by thermal vacuum evaporation and deposited on 2-4- μ celluloid foils, which contributed not over 10% to the total scattering. By the criterion of linearity of scattering intensity and film thickness, preliminary expts. on Al, Ni, Ag, and Au layers showed that singleness of scattering is approximated the better the faster the electrons, example: Al 3.0 and 6.0 mg./sq. cm., energy of electrons 850, 1000, 1200, 1330 kv., ratios of intensities scattered by the thicker and by the thinner film = 2.71, 2.55, 2.19, 2.00, resp. According to Wentzel's (C.A. 17, 923) criterion for single scattering at an angle ϕ , namely not more than two deflections on the av. by an angle $\phi/4$, scattering of (1000-kv. electrons in Al 100 mg./sq. cm. thick should still be single, whereas exptl. results show that multiple scattering occurs even in 6 mg./sq. cm. Al; consequently, Wentzel's criterion is not applicable. On the other hand, the exptl. ratios obtained check satisfactorily with Artimovich's formula $N = x + [(1.5) \times 10^{-3} x^2]/R^2$ where N = no. of electrons

Zhur. Eksper. i. Teor. Fiz.

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scattered by Al, E = energy of electrons in m.e.v., x = thickness of film in Al, and bear out his basic representation of the possibility of deflections by large angles through repeated deflections by smaller angles. Final detos. were made with x and E for which scattering is most nearly single, example Al 1.5, 3.0, 6.0 mg./sq. cm., E = 900-1050, 800-1200, 1100-1000 kv., resp. For celluloid (at. no. $Z = 7.1$), Al, Cu, Ni, Ag, Au ($Z = 79$), probability of scattering varies with E along the same curve, identical with Mott's theoretical quantum-mechanical curve (cf. with Mott's theoretical quantum-mechanical curve (cf. with Mott's theoretical quantum-mechanical curve on light C.A. 23, 5406). Abs. values of the scattering on light nuclei and their dependence on Z also check with Mott's theory (example, for Al 3 mg./sq. cm., 1000 kv., within 10-15%), with the exception of Au, for which the exptl. cross-section is about 2.5 times smaller than that predicted by the theory; for Ag ($Z = 47$), owing to the absence of a numerical formula, agreement cannot be asserted. The rapid increase of the effective cross section on scattering by higher angles, claimed by Skobel'tsyn and Stepanova (C.A. 30, 3317; 32, 2825), is not confirmed. N. Thon

AS USSR

ALIKHANOV, A. I.

USSR/Nuclear Physics - Cosmic Radiation
Nuclear Physics - Particles

May 47

"The Existence of a Particle With Mass, Between the Masses of a Mesotron and Proton,"
A. I. Alikhan'yan, Corr Mem, Acad Sci USSR; A. I. Alikhanov, A. O. Vaysenberg, Academician,
9 pp

"Vest Akad Nauk SSSR" No 5

During period 1942-1946 authors were stationed on Mount Alagez, at an altitude of 3,250 m above sea level. Discerned cosmic particles very different from mesotrons and protons. Series of tests revealed data which showed that these particles to be ionized gases, two to three times greater than either protons or mesotrons. Mass of this intermediate particle is 250 to 2,000 m_0 . They are either positive or negative. Authors express gratitude to V. M. Kharitonov, and M. I. Dayon.

PA 54T69

Enst. Phys. Problems, AS USSR

34

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Existence of particles with a mass intermediate between the mesotron and proton. A. I. Alikhanyan, A. I. Alikhanov, and A. Valenbergh. *Compt. rend. acad. sci. U.S.S.R.* 33, 701-4 (1947) (in English); *J. Phys. (U.S.S.R.)* 11, 97-9 (1947) (in English); cf. *C.A.* 40, 1080, 1387. --Cosmic rays were investigated at an altitude of 3250 m. above sea level by using a system of counters which permitted simultaneous measurement of both the curvature of a particle's path and its range. Analysis of the results obtained shows that cosmic rays contain pos. and neg. particles, called "barytrons," with a mass larger than that of the meson. More than 4,000 barytrons have been observed, and the no. of pos. barytrons appears to be 1.7 times larger than the no. of neg. barytrons. At an

altitude of 3250 m. above sea level, the no. of barytrons amount to 10% of the no. of mesons. Frank Gonet

Inst. Phys. Problems 45 USSR

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

ALIKHANOV, A.

USSR/Nuclear Physics - Cosmic Ray #
Nuclear Physics - Mesons

Dec 47

"Mass Spectra of Varitrons," A. Alikhanyan, Corr Mem, Acad Sci USSR; A. Alikhanov, Academician; V. Morozov, G. Muskhelishvili, A. Khrimyan. Phys Inst, Acad Sci, Armenian SSR, 8 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVIII, No 7

Authors reported in previous article that, as a result of magnetic analysis of composition of cosmic radiation at an altitude of 3,250 meters, new particles discovered which have a mass greater than the mass of the mesotron. Also presented data showing that, in cosmic radiation, there are particles with a positive and negative sign, the mass of which exceeds that of the proton. This new group of elementary particles named varitrons. Present article presents results of spectrum analysis of these new particles.

PA 60T80

*Inst. of Physical Problems
AS USSR*

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3A

Existence in cosmic rays of positive and negative particles with a mass greater than the mass of the meson. A. I. Alikhanyan, J. I. Alikhanov, and A. Vajenberg. *Zhur. Ekspil. Teoret. Fiz.* 18, 201-36(1948); cf. *C.A.* 43, 10122, 4106af. — The hard and soft components of cosmic rays at 3250 m. above sea level were analyzed in a magnetic field by an elaborate counter arrangement, and curves are given for the no. of trajectories vs. displacement of particles. Pos. and neg. particles are indicated with masses greater than the mass of a meson, some with a mass greater than the proton mass. P. H. Murray

Zhur. Ekspil. i. Teor. Fiz.

*Ensel) Phys) Problems, AS USSR
Phys) net, AS Armenian SSR*

PA (9/49T79

USSR/Nuclear Physics - Cosmic Radiation Aug 48
Nuclear Physics - Particles

"Spectrum of Variotron Beams," A. Alikhanov, A. Alikhanov, V. Morozov, E. Mikhelishvili, A. Kurjanyan, Phys Inst, Acad Sci Armenian SSR, 30 pp

"Zhur Eksp 1 Teoret Fiz" Vol XVIII, No 8
p. 673-702

Method for mass spectrometric analysis of particles in hard and soft components of cosmic rays.

Established that at altitude of 3,250 m above sea level, there are more than 12 varieties of variotrons with mass varying from 100 to 25,000 times mass of electrons and possessing positive or

9/49T79

USSR/Nuclear Physics - Cosmic Radiation Aug 48
(Contd)

negative charges. Shown that variotrons registered by spectrometer were result of disassociation of heavier particles caused by deceleration in earth's atmosphere. Presence of fast protons is confirmed and it is inferred they constitute not less than 7% of total intensity.

ALIKHANOV, A.

9/49T79

ALIKHANOV, A. I.

USSR/Nuclear Physics - Cosmic Radiation
Nuclear Physics - Particles, Charged - Trajectories

Jul 48

"Spectrum of Varitron Masses, II," A. I. Alikhanyan, Corr Mem, Acad Sci USSR, Acad
A. I. Alikhanov, V. M. Morozov, A. V. Khrinyan, Phys Inst, Acad Sci Armenian SSR, and
Inst Phys Problems, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXI, No 1

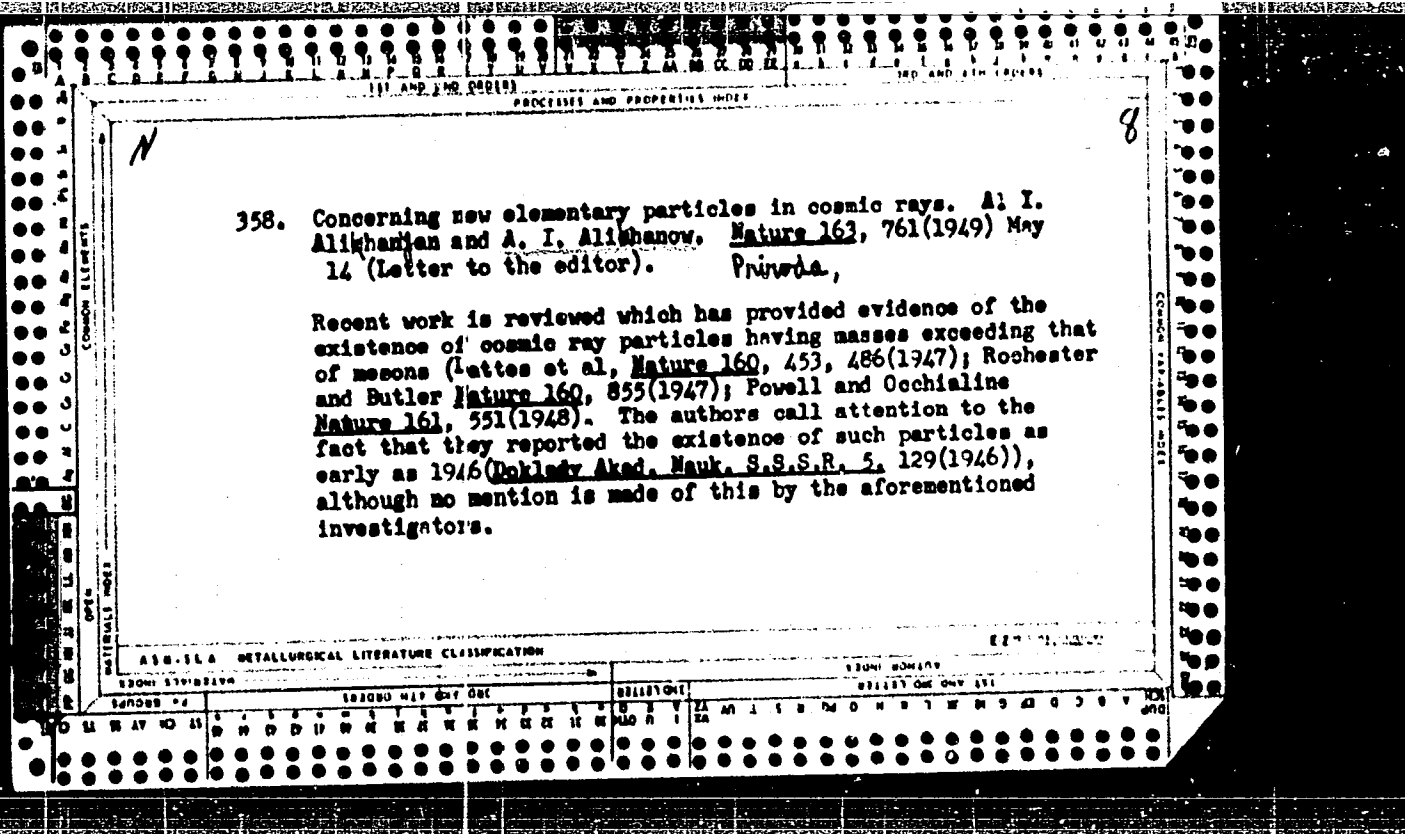
Part I appeared in "Dok Ak Nauk SSSR" Vol LXVIII, No 7. Present paper gives more
exact data obtained by processing supplementary series of readings, and by processing
the trajectory of particles with a penetration of over 5.6 cm Pb (of the "hard"
component). Submitted 18 May 1948.

PA 8/49 T104

ALIKHANOV, A. N.

~~Verbatim~~ Alikhanov, A. N. - "Cosmic rays," In the symposium: Sovr. problemy nauki i tekhniki, Moscow, 1949, p. 19-47

SO: U-4355, 14 August 53, (Letopis 'Zhurnal 'nykh Statey, No. 15, 1949.)



PA 193T91

ALIKHANOV, A. I.

USSR/Nuclear Physics - Cosmic Rays

Sep 51

"Investigation of Mass Spectrum of Cosmic Ray
Particles at Sea Level," A. I. Alikhanov, G. P.
Yeliseyev

"Zhur Eksper i Teoret Fiz" Vol ²¹XXI, No 9, pp
1009-1022

Describes a new much improved mass spectrometer
for cosmic rays, which increases reliability of
trajectory detn and mass measurement. It was
applied to measurements of mass spectra of cosmic
ray particles at sea level. Submitted 3 Mar 51.

193T91

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S.A.
Section A.

53.

Zhur.

539.18 : 537.391.1
0771. The varitron. A. I. ALIBERMAN AND
A. I. ALIBERMANOV. Zh. Eksp. Teor. Fiz., 24, 1023-41
(No. 9, 1951) in Russian.

First of a series on the latest discoveries relating to the fundamental particles. The authors analyze their experimental results, disclosed between 1947 and 1950, which led them to conclude that there exist various masses, different from the masses of the electron, proton, meson or μ -meson, and to which they gave a general name the "varitron." A considerable part of the paper is devoted to the answer to the criticism by J. Doudin [Abstr. 8230 (1950)] alleging that their results may be due to an error caused by the presence of electrons not cut off by the filters. The authors give a detailed analysis of all possible sources of errors, to demonstrate that these errors could not essentially affect their results even in their initial experiments and that they were reduced to an insignificant factor in their latest experiments where the methods were essentially perfected. The apparatus is described in some detail, especially their latest mass spectrometer, where the field used in the experiments was up to 10 500 oersteds, with 100 x 20 cm pole faces and 12 cm interpoles. In this field five double layers of mutually perpendicular counting tubes were installed, one at the entrance, one at the end and three in between. Apart from this, a number of absorbing screens, such as lead or graphite slabs, were installed at the end of the particle trajectories,

after passing the field with the layers of counting tubes between them and at their sides. In this way the trajectory of each particle before and after μ -absorption could be studied in detail. The weight of the spectrometer was about 76 tons. As a result of the statistical analysis of the spectra of the masses thus obtained, the authors succeeded, with the aid of their apparatus installed at 3250 m above sea level, in separating groups of particles with the mass 270 m , and in detecting particles with masses 300, 600 m , and 900-100 m .

N. S. JAPOLSKY

ALIKHANOV, A. I.

ON THE MASS SPECTRA OF COSMIC RAY PARTICLES AT
BRA LEV: L. A. I. Alkhanov and G. P. Eliseev. *Kbr.*
Eknol' 1, 1953, No. 2, 76-78 (1953). (In Russian)
A magnetic mass spectrometer is described. The particle
momentum is fixed by five successive trays of counters and
the particle is brought to rest by laminar absorbers. The
apparatus allows resolution of the π and μ spectra. Meas-
urements show masses intermediate between π and μ proton
masses and a few masses greater than the latter. (Science
Abstracts)

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ALIKHANOV, A. I.

Aug 53

USSR/Nuclear Physics - Mesons

"Heavy Mesons," A. I. Alikhanov

Usp Fiz Nauk, Vol 50, No 4, pp 481-538

Reviews foreign and author's cosmic-ray observations at sea level and at high altitudes. In particular, analyzes traces left by heavy mesons. Results are given in tables. Suspects the existence of excited protons.

Review B-81401, 16 Dec 54

263T99

KHARITONOV, V.; BARSKIY, A.; ALIKHANOV, A.I., akademik.

Ionization created in gas by fast particles. Dokl.AN SSSR 93 no.4:645-646
D '53. (MLRA 6:11)

1. Akademiya nauk SSSR (for Alikhanov). 2. Fizicheskiy institut Akademii
Armynskoy SSR (for Kharitov and Barskiy).
(Ionization of gases) (Mesons)

YELISHEV, G.P.; KOSMACHEVSKIY, V.K.; LYUBIMOV, V.A.; ALIKHANOV, A.I., akademik.

Relative primary and total ionization of μ -mesons as a function of energy.
Dokl. AN SSSR 90 no.6:995-998 Je '53. (MLRA 6:6)

1. Akademiya nauk SSSR (for Alikhanov). (Mesotrons) (Ionization)

BABAYAN, Kh.P.; ZINGER, I.I.; MARUTYAN, N.A.; ALIKHANOV, A.I., akademik.

Determination of the number of slow π and μ mesons in cosmic rays at various altitudes. Dokl.AN SSSR 92 no.2:263-264 S '53. (MLRA 6:9)

1. Akademiya nauk SSSR (for Alikhanov). (Mesons) (Cosmic rays)

ALIKHANOY, A. I.; ZAVOYSKIY, V. K.; SIRDYUK, R. L.; KRSHLER, B. V.; SUVOROV, L. Ya.

[Boiling homogeneous nuclear power reactor] Kipiashchii energeticheskiy gomogennyi iadernyi kotel; doklady, predstavlennye SSSR na Mezhdunarodnuu konferentsiu po mirnomu ispol'zovaniyu stolnoi energii. Moskva, 1955. 13 p. [Microfilm] (MIRA 9:3)
(Nuclear reactors)

ALIKHANOV, A. I., VLADIMIRSKIY, V. V., NIKITIN, S. Y., GALANIN, A. D., GAVRILOV, S. A.
AND BURGOV, N. A.

"A Heavy-Water Research-Reactor," a paper presented at the Atoms for Peace
Conference, Geneva, Switzerland, 1955

ALIKHANOV, A.I.; VLADIMIRSKII, V.V.; NIKITIN, S.Ya.

[Measuring the effective number of secondary neutrons in U^{233} , U^{235} , and Pu^{239} in the thermal energy region of neutrons] Izmerenie effektivnogo chisla vtorichnykh neutronov urana-233, urana-235 i plutoniia-239 v oblasti teplovykh energii neutronov. Moskva, 1955. 11 p. (Doklady predstavlennye SSSR na Mezhdunarodnuiu konferentsiiu po mirnomu ispol'zovaniiu atomnoi energii) (MIRA 14:7)
(Neutrons—Capture) (Uranium—Isotopes) (Plutonium—Isotopes)

ALIKHANOV, A.I.; VLADIMIRSKII, V.V.; NIKITIN, S.Ya.; GALANIN, A.D.;
GAVRILOV, S.A.; BUNGOV, N.A.

[Heavy water experimental reactor for physical research] Opytnyi
fizicheskii reaktor s tiazhelei vodoi. Moskva, 1955. 15 p.

(Deuterium oxide)

(Nuclear reactors)

(MIRA 14:7)

ALIKHANOV, A.), AND OTHERS.

Homogenous evaporation nuclear reactor for power production. Tr. from the Russian. p. 707.

Vol. 3, no. 6, 1955
SOVETSKA VEDA: ENERGETIKA

So: Eastern European Accession Vol. 5 No. 4 April 1956

ALIKHANOV, A.I.; YELISEYEV, G.P.

Anomalous scattering of μ -mesons in graphite. Izv. AN SSSR Ser. fiz.
19 no.6:732-736 N-D '55. (MLRA 9:4)

1. Akademiya nauk SSSR.
(Cosmic rays) (Nuclear physics)

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1601
AUTHOR ALIKHANOV, A.I., VLADIMIRSKY, V.V., PETROV, P.A., KHRISTENKO, P.I.
TITLE A Heavy-Water Power Reactor with Gas Cooling.
PERIODICAL Atomnaja Energija, 1, fasc.1, 5-9 (1956)
Issued: 3 / 1956

The authors at first discuss the advantages offered by heavy-water reactors for atomic power stations, namely the high neutron multiplication factor, because neutron capture in D_2O is low, so that natural uranium can be burned and a high burn-up of U^{235} is attained.

The high reactivity allows a large surface of the fuel element. Because of the high costs of D_2O quantities used should be as small as possible. In the first construction D_2O was used as moderator and as coolant. This proved to be insufficient.

As at a given maximum temperature of the fuel elements heat transfer increases at a low coolant temperature whereas the thermal efficiency of the power production is increased, the result is an optimum which at $230^\circ C$ results in only 2,5 atm wet steam excess pressure for aluminium fuel cans and 14% efficiency for the vapor power works. As this is considered to be inadequate from an economic point of view, a second construction was provided with gas cooling at $T_{max} = 400^\circ C$ and 29 atm steam excess pressure and with aluminium alloys which would theoretically permit $470^\circ C$ and 90 atm excess pressure.

Number of fission neutrons per captured thermal neutron
 in uranium-233, uranium-235, and plutonium-239. A. I.
 Alkhanov, V. V. Vladimirov, and S. I. Nikitin (Acad. Sci.
 USSR). *Proc. Intern. Conf. Peaceful Use Atomic Energy,
 Geneva, 1955 4*; 301-4 (1956); cf. preceding and following
 abstrs. --By using a heavy-water reactor, implantation
 method for U^{233} , U^{235} , and Pu^{239} the respective ν_{th} values
 were 2.31, 2.12, and 2.03 in the complete lattice and 2.44,
 2.12, and 2.05 (uncor. for Pu^{239}) when a 35-cm. radius "ther-
 mal pit" free of U rods was left around the exptl. channel.

Jack J. Bulloff

ALIKHANOV, A.I., ERSHLER, B.V., LYUBIMOV, V.A., YELISEYEV, G.P.

(Acad. Sci. USSR)

"Measurement of Longitudinal Polarization of β Electrons."

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

ALIKHANOV, A.I., LUBIMOV, V.A., YELISE'YEV, G.P.

"High Precision Measurement of the Ionizing Power of Fast Charged
Particles with the help of Multi-Layer Proportional Counters," paper
presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1,
ppp. 21-30, 1957

AUTHOR

ALIKHANOV, A.I., YELISEYEV, G.P., LYUBIMOV, V.A.
ERSHLEIN, B.V.

56-6-12/56

TITLE

The Polarization of Electrons on the Occasion of β -Decay.
(Polarizatsiya elektronov pri β -raspade- Russian)

PERIODICAL

Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, pp 1344-1349
(U.S.S. R.)

ABSTRACT

In connection with the checking of the law of conservation of parity, the authors carried out experiments concerning the discovery of a longitudinal polarization of electrons on the occasion of β -decay. For the determination of this polarization the effect of the azimuthal asymmetry was used; it occurs on the occasion of the simple scattering of electrons polarized vertical to the direction of motions through a large angle on a thin foil of a heavy element. The longitudinally polarized β -electrons were sent through an electric field crossed by a magnetic field. In these crossed fields a transversal polarization occurred in the electrons. The reasons why this method should be favored are given. The numerical parameters of the measuring device used here are given. Measurements were carried out in the energy domains of 300 keV. At an electric field strength of 18,3 keV/cm and a magnetic field strength of $H = 79$ Oe the spins were turned by the angle of $\varphi \sim 50^\circ$. The expected amount of the azimuthal asymmetry can be determined from the data given in a table. For the expected effect of azimuthal asymmetry in the plane which is vertical to the direction of spin the value $\delta_{\text{exp}} = 27,7\%$ is found.

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56-6-12/56

The Polarization of Electrons on the Occasion of β -Decay. ~~SECRET~~
 Measuring results are given in a further table. They show that there is no asymmetry in the plane of the turn of the spin by $0 = 180^\circ$. An asymmetry is observed in the plane $90-270^\circ$, where the sign changes if the direction of the field is reversed. The sign of asymmetry is determined by the fact that on the occasion of β -decay the electrons are emitted with a spin directed against the motion of the electrons. For the degree of the polarization of the electrons on the occasion of β -decay the expression $B(17,4 \pm 2,6) / 27,7 = (0,63 \pm 0,09)B$ is found. The experiments concerning the measuring of the polarization of electrons in the case of β -decay tend to show that parity is not conserved in the case of weak interaction and that the theory of the two-component neutrino suggested by Landau agrees with the experiment. (4 tables).

ASSOCIATION Not Given.
 PRESENTED BY
 SUBMITTED 30.3.1957
 AVAILABLE Library of Congress.
 Card 2/2

ALIKHANOV, A. I., YELISEYEV, G. P., LYUBIMOV, V. A. and ERSHLER, B. V.

"Polarization of Electrons Emitted in β -Decay,"
Nuclear Physics, Vol. 5, No. 4, 1958. (No. Holland Publ. Co., Amsterdam)

USSR Acad. Sci. , Moscow

Abst: In connection with a reconsideration of the law of conservation of parity some experiments have been performed with the purpose of detecting longitudinal polarization of electrons emitted in β -decay. It was found that the spin of the emerging β -electrons is opposite to the direction of electron motion. The magnitude of the longitudinal polarization agrees with the theoretical value, v/c , v being the electron velocity.

AUTHORS: ~~Alikhanov, A.I., Yeliseyev, G.P.,~~ 56-34-4-1/60
Lyubimov, V.A., Ershler, B.V.

TITLE: Electron Polarization in β -Decay (Polarizatsiya elektronov pri β -raspade)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 785 - 799 (USSR)

ABSTRACT: The authors reported already in a short communication (reference 1) on experiments in which a longitudinal polarization of the β -electrons was found. This work now describes more exactly these experiments and control measurements. The experimental arrangement consisted of a device for measuring the turning of the spin and of a device for the measurement of the intensity of the electrons, which were scattered through a wide angle, at various azimuthal angles between 0 and 360°. The apparatus for the turning of the spin consisted of an oblong electric capacitor which was in a metal vacuum tube. Then the authors shortly report on the accuracy of the measurement of the electric and of the magnetic

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Electron Polarization in β -Decay

56-34-4-1/60

field. The source of the β -electrons was laid upon a 10 μ thick aluminium support as an even spot with a diameter of 1 cm. The source consisted of segregations from fraction solutions (oskolochnyy rastvor) of Sr^{90} with an admixture of Sr^{89} . The spectrum of the electron energies of such a source is plotted in a diagram. The thickness of the source plays an essential role in such measurements. That part of the device in which there were the scatterer of the electrons and the counters was separated from the capacitor by a thin colloidal film. For the computation of the expected effect of the azimuthal asymmetry the angle of rotation of the electron spin in crossed fields and the dependence of the azimuthal asymmetry on the scattering angle and on the energy of the polarized electrons must be known. A quite complicated term for $\sin \varphi$ is obtained, where φ means the angle of rotation of the spin. The amount of $\sin \varphi$ depends to quite a degree on the energy of the electron and this especially in the case of high energies. 3 tables illustrate the experimental results for 3 series of measurements at energies of ~ 300 keV and a fourth table

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Electron Polarization in β -Decay

56-34-4-1/60

gives the results for energies of ~ 750 ke V. Various details are discussed. An asymmetry in the direction $0 - 180^\circ$ exists that changes its sign in the case of a change of the signs of the fields. Their mean value is $(14,5 \pm 8,5)\%$. In the direction $90 - 270^\circ$ the asymmetry is $(42,8 \pm 4,8)\%$. The data obtained on the polarization need a correction because of the multiple scattering at the scattering foils. The degree of polarization has at a mean energy of 300 keV resp. 750 keV with an accuracy of 15% resp. 40% the value $-v/c$. Finally the authors thank K.A. Ter-Martirosyan for the derivation of the formula of the spin rotation in the crossed fields; L. Ya. Suvorov, M. P. Anikina, and V. D. Laptev for the production of the strontium source; A. S. Kronrod for the computation of the light intensity of the device and M. Ye. Vishnevskiy for his useful data on the role of multiple scattering. There are 4 figures, 7 tables, and 12 references, 6 of which are Soviet.

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Electron Polarization in β -Decay

56-34-4-1/60

ASSOCIATION: Akademiya nauk SSSR (AS USSR)

SUBMITTED: February 3, 1958

1. Electrons--Polarization
2. Beta particles--Decay

Card 4/4

AUTHORS:

Alikhanov, A. I., Yeliseyev, G. P., Lyubimov, V. A. SOV/56-34-5-1/61

TITLE:

The Measurement of the Longitudinal Polarization of the Electrons Emitted in β -Decay of Tm^{170} , Lu^{177} , Au^{198} , Sm^{153} , Re^{186} , Sr^{90} and Y^{90} . II (Izmereniye prodol'n y polarizatsii elektronov, ispuskayemykh pri β -raspade Tm^{170} , Lu^{177} , Au^{198} , Sm^{153} , Re^{186} , Sr^{90} i Y^{90} . II)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1045-1057 (USSR)

ABSTRACT:

The authors try to measure, as precisely as possible, the longitudinal polarization of electrons with various energies for elements with Coulomb (Kulon) transitions, such as Tm^{170} ($J = 1; \text{yes}$), Re^{186} ($J = 1; \text{yes}$), Sm^{153} ($J = 1, 0; \text{yes}$), Au^{198} ($J = 0; \text{yes}$) and Lu^{177} ($J = 1; \text{yes}$) or ($J = 0; \text{yes}$). These elements contain a mixture of Gamow (Gamov) - Teller interactions and Fermi interactions. For the purpose of comparison, the authors also carried out measurements at Sr^{90} and Y^{90} , which have "unical" transitions and a pure Gamow (Gamov)-Teller interaction. The longitudinal polariza-

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The Measurement of the Longitudinal Polarization of the Electrons Emitted
in β -Decay of Tm¹⁷⁰, Lu¹⁷⁷, Au¹⁹⁸, Sm¹⁵³, Re¹⁸⁶, Sr⁹⁰ and Y⁹⁰. II

SOV/56-34-5-1/81

tion was measured according to the method of Mott-scattering, i.e. by determination of the azimuthal asymmetry in the single scattering of transversely polarized electrons by a scatterer with great Z into a great angle. The measuring device and the measuring method are discussed. The authors then discuss the calculation of the extrapolated value of the azimuthal asymmetry of single scattering and the calculation of the expected value of the azimuthal asymmetry of scattering. The results of the measurements discussed in this paper lead to the following conclusions:

- 1) The longitudinal polarizations of the electrons of all the investigated elements are equal, with an accuracy of 2 to 11 %.
- 2) For the average value with respect to all elements the longitudinal polarization of the electrons is equal to v/c with an accuracy of 3 %.
- 3) Within the range of from 100 to 600 keV the longitudinal polarization of the electrons of the Coulomb transitions does not depend on the energy (with an accuracy of $(4 + 7) \%$). A formula is given for the Coulomb transitions which are forbidden in the first order.

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The Measurement of the Longitudinal Polarization of the Electrons Emitted
in β -Decay of Tm¹⁷⁰, Lu¹⁷⁷, Au¹⁹⁸, Sm¹⁵³, Re¹⁸⁶, Sr⁹⁰ and Y⁹⁰. II

SOV/56-34-5-1/61

There are 6 figures, 2 tables, and 9 references, 5 of which
are Soviet.

ASSOCIATION: Akademiya nauk SSSR (AS USSR)

SUBMITTED: December 12, 1957

1. Electrons--Polarization measurement
2. Electrons--Sources
3. Beta decay
4. Chemical elements--Properties
5. Mathematics--Applications

Card 3/3

21(8)

AUTHORS:

Alikhanov, A. I., Yeliseyev, G. P., Lyubimov, V. A. SOV/56-35-4-50/52

TITLE:

The Polarization of the Electrons of RaE and Time-Parity
(Polyarizatsiya elektronov RaE i vremennaya chetnost')

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
Vol 55, Nr 4, pp 1061-1062 (USSR)

ABSTRACT:

In an earlier paper (Ref 1) the authors showed that the longitudinal electron polarization in β -decay acts of heavy nuclei (which corresponds to transitions forbidden in the first order, i.e. the so-called Coulomb (Kulon) transitions ($\Delta J \neq 2$) and the unical transitions ($\Delta J = 2, ja$)) is equal to v/c with 5% accuracy and is independent of electron energy. However, in one case (RaE) an anomaly in the shape of the β -spectrum is observed in spite of the Coulomb transition ($1^- \rightarrow 0^+$). By employing a method already described (Ref 1) the authors determined the longitudinal electron polarization at the medium energies $E = 125$ and 390 keV. The Ra(D+E)-source with an intensity of 5 m Cu had a thickness of about 0.8 mg/cm². With $E = 125$ and 390 keV the longitudinal polarization $-\langle \sigma \rangle c/v$

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The Polarization of the Electron of RaE and Time-Parity

of the electrons amounted to 0.733 ± 0.06 and 0.725 ± 0.06 (mean value 0.73 ± 0.04). B. B. Geshkenbeyn, S. A. Nemirovskaya and A. P. Rudik calculated the longitudinal electron polarization of RaE for the VA- and ST-variants in consideration of the non-conservation of spatial parity, but with conservation of parity with respect to time (but also for the case of the non-conservation of time-parity). The disturbance of time-parity is less than 7.5%. This is the most accurate estimate of the conservation of parity with respect to time that has hitherto been made. Possibilities of a further improvement of this estimation are pointed out in short. There are 8 references, 2 of which are Soviet.

SUBMITTED: August 20, 1958

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ALIKHANOV, A. I.

RESEARCH INTO THE NATURE AND SPECTRA
OF PARTICLES PRODUCED BY HIGH ENERGY
NUCLEONS

A. I. Alikhanov, A. V. Khrimyan, V. K. Kosmachevsky,
V. L. Avakyan, K. S. Egiyan, Yu. P. Kerotkov, N. A.
Nalbandyan

The nature and the momentum spectra of secondary particles produced in lead by fast cosmic nucleons were studied at an altitude of 3,250 m. above sea level by means of a magnetic mass-spectrometer, five-layer proportional counter and five-layer scintillation counter.

The momentum spectra of π^- -mesons, K-mesons, protons, and neutrons, generated by the charged and neutral components of cosmic radiation, are presented.

The spectra of π^+ -mesons produced by neutrons do not differ from the spectra of π^+ -mesons produced by fast charged particles. The N^+/N^- ratio for π^- -mesons generated by protons differs from that for π^- -mesons generated by neutrons.

Among the products of stars with momenta up to 720 Mev/c, the number of K-mesons is of the order of 10% of the π^- -mesons. In the 720 - 1,000 Mev/c range, $N_K/N_p > 0.2$.

In the momentum range up 1,000 Mev/c, an increase in the number of K-mesons is observed with increase in momentum. An evaluation of n/p ratio was undertaken where n , p are the cross sections of K-mesons production by neutrons and protons.

Data are presented on the number of neutrons and protons of different energies in cosmic radiation flux at an altitude of 3,250 metres above sea level.

Report presented at the International Cosmic Ray Conference, Moscow, 6-11 July 1959.

ALIKHANOV, A.I., akademik, obshchiiy red.; VEKSLER, V.I., akademik, obshchiiy red.; VLASOV, N.A., kand.fiz.-mat.nauk, obshchiiy red.; DROZDOV, S.I., kand.fiz.-mat.nauk, red.toma; ZARETSKIY, D.F., kand.fiz.-mat.nauk, red.toma; SMOLYAN, G.L., red.; MAZEL', Ye.I., tekhn.red.

[Nuclear physics; proceedings of the Second International Conference on the Peaceful Uses of Atomic Energy, Geneva, 1958] IAdernaiia fizika; trudy Vtoroi mezhdunarodnoi konferentsii po mirnomu ispol'zovaniyu atomnoi energii, Zheneva, 1958. Pod obshchei red. A.I.Alikhanova, V.I.Vekslera i N.A.Vlasova. Moskva, Izd-vo Glav. upr. po ispol'zovaniyu atomnoi energii pri Sovete Ministrov. Vol.1. 1959. 552 p. (Geneva--Atomic energy--Congresses) (MIRA 12:5)

ALIKHANOV, A.I., akademik, red.; VLASOV, N.A., kand. fiz.-mat.nauk, red.;
IL'ICHEV, B.I., red.; LABAZNOV, V.I., red.; MAZEL', Ye.I., tekhn. red.

[Transactions. Selected reports by foreign scientists] Trudy. [Izbrannye doklady inostrannykh uchennykh] Moskva, Izd-vo Glav. uprav. po ispol'zovaniyu atomnoi energ. pri Sovete Ministrov SSSR. Vol. 2. [Neutron physics] Neitronnaia fizika. Pod obshchei red. A.I.Alikhanova i N.A. Vlasova. 1959. 755 p.
(MIRA 14:7)

1. Vtoraya mezhdunarodnaya konferentsiya po mirnomu ispol'zovaniyu atomnoy energii, Zheneva, 1958.
(Neutrons)

24(7)

AUTHORS:

Alikhanov, A. I., Yeliseyev, G. P., SOV/56-36-2-9/63
Kamalyan, V. Sh., Lyubimov, V. A., Moiseyev, B. N., Khrimyan, A.V.

TITLE:

Investigation of the Nature and the Spectra of Particles
Produced by High Energy Nucleons (Issledovaniye prirody i
spektrov chastits, generirovannykh nuklonami vysokoy energii)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 36, Nr 2, pp 404-410 (USSR)

ABSTRACT:

In the present paper the authors publish the results obtained by the investigation of particles which were produced by high-energy nucleons of cosmic radiation at an altitude of 3200 m above sea level. Investigations were carried out on Mount Aragats in Armenia. The experimental device used is shown by figure 1 in form of 2 sections which are vertical to each other. The device, in principle, consists of a mass spectrometer (6850 Oe), an additional hodoscope arrangement, and a five-layer thin-walled proportionality counter. Two series of measurements were carried out: with generators (10 and 25 cm lead) and control tests "without generators" (0.3 - 2 cm lead total substance thickness). Measuring results can be divided into 2 groups:
a) particles produced in the generators by neutral radiation,

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Investigation of the Nature
and the Spectra of Particles Produced by High Energy Nucleons

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b) particles of stars produced by charged particles and single charged particles. Muons were excluded by means of the momentum-range method. Figures 1a,b show the results of momentum- and ionization measurements of secondary particles under 25 cm of lead of groups a) and b). Sufficient data could be obtained from the experimental material concerning secondary protons and partly also concerning deuterons. In 2 series of measurements carried out in the momentum range of 400-900 Mev/c 35 deuterons were observed, 10 of which had been produced by protons. Thus, cosmic radiation in an altitude of 3250 m had 3.5 times as many neutrons as protons. The momentum spectrum of deuterons in the "generatorless" tests with momenta >800 Mev/c had the form $N(p) \sim p^{-\gamma}$, ($\gamma \approx 2$). Figure 3 shows the differential momentum spectrum of π^- -mesons which had been produced by neutrons, viz. measurements of shower-mesons and of single mesons (momenta: 400 - 7000 Mev/c); the course corresponds to $N(p) \sim p^{-\gamma}$, where γ for the shower 1.7 for single π^- -mesons is equal to 2.4. Khrimyan and Asatiani (Ref 4) found $\gamma = 1.5$ for the π^- -meson spectrum (shower), but they investigated the π^- -meson production by protons.

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In the momentum range of 125-700 Mev/c the mean value $89/45$ was obtained for N_{π^-}/N_{π^+} as a result of neutron action, and for stars produced by protons $N_{\pi^-}/N_{\pi^+} = 45/54$ was obtained. In figure 2 the mass distribution of the recorded particles is represented in the momentum range of 125-720 Mev/c (ionization $1.3 - 7I_{\min}$) separately for single particles produced by neutrons and for multiple stars produced by neutrons. Particles with a mass $700-1300 m_e$ were determined as amounting to 10% (measured according to the proton number). As regards the K-mesons determined, it may be seen from table 1, which gives a detailed account of all measuring results, that $N_{K^+}/N_{K^-} = 16/3$, and that in consideration of the producing particles, it holds that $N_{K^+}(p)/N_{K^+}(n) = 14/5$. Finally, a large number of investigation results concerning π^- and K-mesons in the momentum range of 720-900 Mev/c is given. The authors in conclusion thank Professor A. I. Alikhanyan for his interest and discussions,

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Investigation of the Nature
and the Spectra of Particles Produced by High Energy Nucleons

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and they express their gratitude to V. K. Kosmachevskiy,
I. P. Karabekyan, V. P. Kanavets and V. V. Avakyan for their
great help in organizing and carrying out the work.
There are 4 figures, 2 tables, and 6 references, 4 of which are
Soviet.

SUBMITTED: August 20, 1958

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1(1)

SOV/56-36-4-69/70

AUTHORS: Alikhanov, A. I., Lyubimov, V. A.

TITLE: On the Possibility of Determining Muon Spirality by Means of δ -Electron Showers From Magnetized Iron (O vozmozhnosti opredeleniya spiral'nosti myuona po δ -elektronnym livnyam iz namagnichennogo zheleza)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 4, pp 1334-1335 (USSR)

ABSTRACT: The nonconservation of spatial parity in the case of weak interaction causes muons formed in pion- (or $K_{\mu 2}$ -meson) -decay to have polarization. The direction of this muon polarization has hitherto not been experimentally determined. The authors suggest a theoretically justified method of measuring the direction and the amount of polarization, and investigate the possibility of carrying out such experiments with accelerators and in cosmic radiation. This is done on the basis of a formula given by Berestetskiy for the scattering cross section of polarized muons on polarized electrons. This formula shows that the cross section is independent on polarization and that, if the energy transfer of electrons in collisions with high-energy polarized

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SOV/56-36-4-69/70

On the Possibility of Determining Muon Spirality by Means of δ -Electron Showers From Magnetized Iron

muons is great, it may assume considerable values. This may be the case with a δ -shower having a certain number of particles, which is caused by muons in magnetized iron. According to the avalanche theory for the probability $f(\xi, n)$ of the occurrence of a shower caused by polarized muons in magnetized iron with an electron number $> n$ the formula

$$b(E, n) = \int_0^{\xi_m(E)} f(\xi, n) (E, \xi) d\xi = b_0(E, n) + \vec{P}_e \vec{P}_\mu b_1(E, n) \text{ is given.}$$

(ξ = energy of δ -electrons, b_0 denotes the polarization-independent and b_1 the polarization-dependent probability for the occurrence of such a shower. For $P_e = 8\%$ a number of numerical values is given.) Measurements of muon chirality by means of the method described can be carried out also on muons of cosmic radiation. A similar equation is written down for the probability of a shower formation with particle number $> n$ by a cosmic muon,

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SOV/56-36-4-69/70
On the Possibility of Determining Muon Spirality by Means of δ -Electron Showers
From Magnetized Iron

and again numerical data are given for $P_e = 8\%$. The authors
thank V. B. Berestetskiy for discussions. There is 1 Soviet
reference.

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

SUBMITTED: February 21, 1959

Card 3/3

24(0)

AUTHOR:

Alikhanov, A. I.

SOV/53-67-2-6/7

TITLE:

Lev Andreyevich Artsimovich. On His Fiftieth Birthday
(K pyatidesyatiletuyu so dnya rozhdeniya)

PERIODICAL:

Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 2, pp 367-369 (USSR)

ABSTRACT:

The Soviet physicist, Academician L. A. Artsimovich, celebrated his 50th birthday on February 25, 1959. He was born as the son of a professor of statistics in Moscow. He studied at the Belorusskiy gosudarstvennyy universitet (Belorussian State University) and at the Leningradskiy fiziko-tehnicheskii institut (Leningrad Physico-Technical Institute). He carried out his first scientific work in cooperation with the author of this paper on X-ray optics. During the following years (1934/35) Artsimovich together with I. V. Kurchatov and others, worked in the field of neutron physics and investigated the laws of conservation in electron-positron annihilation and in the Compton effect. He further investigated the interaction of fast electrons with matter, theoretical and experimental problems of electron optics, especially of the chromatic aberration of electron-optical systems. In 1945 he carried out a theoretical investigation, together with I. Ya. Pomeranchuk, of radiation

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Lev Andreyevich Artsimovich
On His Fiftieth Birthday

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losses in a betatron. He further occupied himself with problems of isotope separation and the aberrationless focusing of wide-angle ion beams in axially symmetric magnetic fields. Together with a group of physicists under his supervision, he investigated high-intensity pulse discharges in rarefied deuterium (plasma heated to several millions of degrees); in 1952 this group of research scientists discovered a new phenomenon: this plasma was found to be a source of neutrons and hard X-ray radiation. Since that time, Artsimovich has been busy investigating thermonuclear reactions. He attended the second Geneva Conference for the Peaceful Uses of Atomic Energy in 1958. He taught at the Leningradskiy politekhnicheskii institut (Leningrad Polytechnic Institute), at Leningrad University, at the Moskovskiy inzhenerno-fizicheskii institut (Moscow Engineer. Physics Inst.) and lately at Moscow University. In 1946 he was appointed Corresponding Member and in 1954 Regular Member of the Academy of Sciences, USSR. In 1953 he was awarded the Stalin Prize and in 1958 the Lenin Prize. There are 1 figure and 15 Soviet references.

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PHASE I BOOK EXPLOITATION

SOV/4317

Alikhanov, Abram Isaakovich

Slabye vzaimodeystviya; noveyskiye issledovaniya β -raspada (Weak Interactions; Recent Investigations of β -Decay) Moscow, Fizmatgiz, 1960. 143 p. (Series: Sovremennyye problemy fiziki) 10,000 copies printed.

Ed.: Ye. Ye. Zhabotinskiy; Tech. Ed.: Ye.A. Yermakova.

PURPOSE: This book is intended for students, aspirants and scientific workers interested in problems of modern physics.

COVERAGE: The book reports on experimental research in the field of β -decay carried out from 1957 to 1959 which the author claims helped confirm the existence of non-conservation of parity during weak interactions, and made possible its use in further study of the atomic nucleus and elementary particles. Problems of β -decay of special interest to the author, and which have been intensively studied by researchers of the Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR (Institute of Theoretical and Experimental Physics of the Academy of Sciences USSR)

Card 1/3

ALIKHANOV, A. I.

"Measurement of Muon Spirality."

report submitted for the 10th International Conference on High Energy Physics.
Rochester, N. Y., 25 Aug - 1 Sep 1960

report to be presented by Lyubimov, V. A.

LYUBIMOV, V.A.; ALIKHANOV, A.I.

Effect of a magnetic field on resonance absorption of γ rays.
Izv.AN SSSR.Ser.fiz. 24 no.9:1076-1078 S '60. (MIRA 13:9)

1. Institut teoreticheskoy i eksperimental'noy fiziki Akademii
nauk SSSR.

(Gamma rays)

(Magnetic fields)

85702

S/056/60/038/006/045/049/XX
B006/B070

24.6210

AUTHORS:

Lyubimov, V. A., Alikhanov, A. I.

TITLE:

Effect of a Magnetic Field on the Resonance Absorption of Gamma Rays 14

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 6, pp. 1912 - 1914

TEXT: The emission and resonance absorption of gamma rays without loss of energy during nuclear recoil, discovered by Mössbauer, permits an immediate observation of the Zeeman splitting of excited nuclear levels and measurement of their magnetic moments. The gamma transition in Sn^{119m} (23.8 keV; lifetime, $2.67 \cdot 10^{-8}$ sec; level width, $2.5 \cdot 10^{-8}$ eV) was selected for the observation of the Zeeman effect, and some results pertaining thereto are reported in this "Letter to the Editor". It was necessary to use a sample enriched to 96% in Sn¹¹⁸ in which the fraction of Sn¹¹² was less than 0.05%, as the In¹¹³ produced from Sn¹¹² is a strong source of ~24-keV X-rays. A magnet with pyramid-shaped pole pieces (6 mm gap) and capable of

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Effect of a Magnetic Field on the Resonance Absorption of Gamma Rays S/056/60/038/006/045/049/XX
B006/B070

giving fields of up to 20,000 gauss was used for the determination of the field dependence of the resonance absorption. The size of the gamma source was 20×4 mm (5 mg/cm^2). The absorption length of the 23.8-keV gamma rays in tin (on account of the photoeffect) was 70 mg/cm^2 , and thus essentially larger than the resonance absorption length in the source and absorber. Source and absorber were cooled with liquid nitrogen. The measurements are described. Three different thicknesses of the absorber (natural white tin) were used for the measurements: 36, 11, and 5 mg/cm^2 . The measured H dependence of the relative intensity changes is shown in a diagram. During measurement, the source temperature was 90°K and the absorber temperature, 293°K (with the thin absorber). The theoretically calculated curves for $\mu = 1.5 \mu_0$ and $\mu = 2.0 \mu_0$ are also shown in the diagram. The magnetic moment of the excited level of $\text{Sn}^{119\text{m}}$ was determined from the data obtained. The values found are: $\mu = -(1.1 \pm 0.1) \mu_0$ or $\mu = (1.72 \pm 0.06) \mu_0$ for a Debye temperature $\theta = 170^\circ\text{K}$. μ_0 is the magnetic moment of the ground state

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Effect of a Magnetic Field on the Resonance Absorption of Gamma Rays S/056/60/038/006/045/049/XX
B006/B070

of Sn¹¹⁹ and equal to -1.046 nuclear magnetons. L. A. Artsimovich is thanked for preparing the enriched sample, G. M. Kukavadze for mass spectrographic analysis of the samples, and V. I. Anan'yev for help in the measurements. There are 1 figure and 2 references: 1 Soviet and 1 German.

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

SUBMITTED: April 25, 1960

Card 3/3

85706

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

24.6900 (1138, 1191, 1559)

AUTHORS: Alikhanov, A. I., Galaktionov, Yu. V., Gorodkov, Yu. V.,
Yeliseyev, G. I., Lyubimov, V. A.

TITLE: Measurement of the Chirality of the μ -Meson ¹⁹

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 6, pp. 1918 - 1920

TEXT: The muon chirality was measured by the authors of the present "Letter to the Editor" by a method described in Ref.1. The method is based on the measurement of the scattering cross sections of polarized muons from polarized electrons. This cross section depends on the mutual orientation of the spins of the colliding particles. An independent measurement of the number of δ showers was made, the showers being released by cosmic muons in magnetized iron and consisting of two or more particles. The experimental arrangement is shown in a Fig. and described in the text. About 500 muons pass through the apparatus every minute, one or two of these produce showers with $m \geq 3$. Up to now 116,000 showers with $m \geq 3$ have been recorded. The energies of the shower-producing muons were

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Measurement of the Chirality of the μ -Meson S/056/60/038/006/049/049/XX
B006/B070

between 5 and 6.5 Bev. The following results were obtained from the experiments: For μ^+ mesons, the difference in the number of showers for two different directions of the current in the winding of the triangle (Fig.) gives the effect $s_+ = -0.37 \pm 0.41$; ($s = (N_+ - N_-)/(N_+ + N_-)$); for μ^- mesons, $s_- = +0.82 \pm 0.42$. For both signs of the charges of the muon the effect is given by $s_{\pm} = 0.58 \pm 0.29$. The theoretical value for a 50% polarization of the muon is 0.6. The sign of the effect corresponds to weak V-A interaction (according to which the spin of the muon is directed opposite to its momentum), that is, to a left-hand chirality of the μ^+ meson. The probability for the effect to be zero or negative is $2 \cdot 10^{-2}$. The experiments are being continued to improve the statistical accuracy. There are 1 figure and 2 Soviet references. ✓

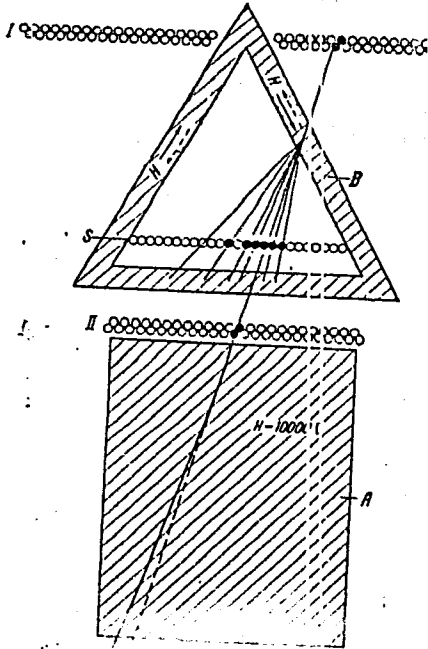
ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Akademii nauk SSSR (Institute of Theoretical and Experimental Physics of the Academy of Sciences USSR)

SUBMITTED: April 25, 1960

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B006/B070



Legend to the Fig.:

I, II, III - hodoscope counters for the determination of the muon trajectories; S - counter series for shower recording; A - iron yoke of the permanent magnet for the determination of the sign of the muons from their deviation in the magnetic field; B - iron core of the electromagnet with triangular cross section in which the muons produce showers; the field induced in B attains 14,400 gauss.

✓

Card 3/3

S/056/60/039/003/008/045
B004/B069

AUTHORS: Alikhanov, A. I., Yeliseyev, G. P., Lyubimov, V. A.

TITLE: Longitudinal Polarization of Beta Electrons From Au¹⁹⁸ /7

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 39, No. 3 (9), pp. 587-588

TEXT: The authors measured the polarization of Au¹⁹⁸ electrons by means of an apparatus resembling the one described in Ref. 4, but improved in order to work with a beta source exhibiting a strong gamma background. The measurements were made in the ranges of 145 kev and 390 kev. Equal Au¹⁹⁸ and Tm¹⁷⁰ samples served as sources. The corrections for the two samples were mutually compensating. At 145 kev, the longitudinal polarization of Au¹⁹⁸ beta electrons was $P_{Au}/P_{Tm} = 0.80 \pm 0.05$ relative to Tm¹⁷⁰, and was thus smaller than $-v/c$. Comparable values were obtained by P. Ye. Spivak and L. A. Mikaelyan (Ref. 7). At 390 kev, $P_{Au}/P_{Tm} = 1.07 \pm 0.08$. A paper by B. V. Geshkenbeyn and A. P. Rudik is referred to as containing an explanation of the deviation from $-v/c$ at low energies.

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Longitudinal Polarization of Beta
Electrons From Au¹⁹⁸

S/056/60/039/003/008/045
B004/B060

In the case of heavy nuclei, polarization for first forbidden transitions is to be expected to deviate from $-v/c$ in that region of the beta spectrum where there is a deviation from the Fermi shape. There are 9 references: 6 Soviet, 5 US, and 1 Dutch.

SUBMITTED: April 30, 1960

Card 2/2

ALIKHANOV, A. I. [Alikhanov, A. I.]

Weak interactions. I. Tr. from the Russian. Analele mat 15 no.4:
105-168 O-D '61.

(Nuclear reactions) (Beta rays--Decay)

ALIKHANOV, A.I., BABYEV, A.I., HAJATS, M. Ya., KAFTANOV, V.S., LANDSBERG, L.G.,
LYUBIMOV, V.A., OBUKHOV, Yu. V. (6)

"Search for $\mu \rightarrow e \gamma$ Decays"

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

Institute of Theoretical and Experimental Physics, Moscow, USSR

ALIKHANOV, II. I.

ALIHANOV, A.I. [Alikhanov, A.I.]

Weak interactions. II. Experimental determination of the types
of interactions β . Analel mat 16 no.1:95-129 Ja-Mr '62.

S/056/62/042/002/048/055
B108/B138

AUTHORS: Alikhanov, A. I., Babayev, A. I., Balats, M. Ya., et al.

TITLE: Further investigation of $\mu \rightarrow e + \gamma$ decay

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,
no. 2, 1962, 630 - 631

TEXT: The upper limit of a $\mu \rightarrow e + \gamma$ process is $1.6 - 2.0 \cdot 10^{-6}$ of all muon decay events. This is probably the reason why such a process has not yet been observed. Searching for this process the authors devised a technique in which they operate with a spark chamber with high-speed operation electronics. A 70-Mev π^+ beam obtained from the 680-Mev proton synchrotron of the LYAP OIYA I is separated out by the coincidence monitors I, II, O. The fast coincidences O, 4, 5, 7, 8, $\bar{6}$, $\bar{9}$, \bar{A} and O, 1, 2, 10, 11, $\bar{3}$, $\bar{12}$, \bar{A} with a time resolution of about 10^{-8} sec actuate a master signal which starts up the pulse generator for the chamber. The traces in the chamber were photographed from two sides. A third camera recorded the oscillograph, from which was measured the time between signals of the coincidences I, II, O and O, 4, 5, 7, 8, $\bar{6}$, $\bar{9}$, \bar{A} or O, 1, 2, 10, 11, $\bar{3}$.
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2

Further investigation of

S/056/62/042/002/C48/055
B108/B138

12, A. The six-layer cylindrical chamber B was to record the electrons and gamma quanta. The error in the determination of the collinearity of events was 4.8° across and 20° along the chamber. The efficiencies of 53-Mev electron and gamma recording, were 40 and 15 %, respectively. However, the general efficiency for $\mu \rightarrow e + \gamma$ events was only 0.8 %. The results of the authors' measurement showed that unlike earlier estimates the upper limit of $\mu \rightarrow e + \gamma$ decay processes is $5 \cdot 10^{-7}$. Measurements are being continued. V. P. Dzhelepov, A. A. Tyapkin, A. S. Kronrod, Yu. A. Simonov, and M. V. Terent'yev are thanked for assistance. There are 1 figure and 3 references: 1 Soviet and 2 non-Soviet. The 2 references to English-language publications read as follows: D. Perley, J. Lee, M. Bardon, Phys. Rev. Lett., 2, 357, 1959; S. Frankel et al. Phys. Rev., 118, 589, 1960. ✓

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki
(Institute of Theoretical and Experimental Physics)

SUBMITTED: December 9, 1961

Card 2/2

SHCHELKIN, K. I.; ALIKHANOV, A. I., akademik

Outstanding physicist of our times; the sixtieth birthday anniversary of I. V. Kurchatov. Priroda 52 no.1:25-34 '63.
(MIRA 16:1)

1. Chlen-korrespondent; AN SSSR (for Shchelkin).

(Kurchatov, Igor' Vasil'evich, 1903-1960)

ACCESSION NR: AP4041142

S/0020/64/156/004/0778/0780

AUTHOR: Kosman, M. S.; Sozina, A. N.; Alikhanov, A. I.

TITLE: Relaxation oscillations in dielectrics

SOURCE: AN SSSR. Doklady*, v. 156, no. 4, 1964, 778-780

TOPIC TAGS: dielectric relaxation oscillation, resistance variation, volume charge, barium titanate

ABSTRACT: The authors have found in a previous work (Fiz. tverd. tela 3, 2504, 1961) that current oscillations are produced in silicon upon application of a sufficiently high voltage. They find now a similar phenomenon in dielectrics such as polycrystalline barium titanate, and in many others. The oscillations are observed with an oscilloscope on a 1 mm thick sample, with one flat and one pointed electrode; the applied voltage is about 700 v. The current pulses are not strictly periodical. Higher "frequency" corresponds to a lower amplitude. The circuit resistance greatly influences the pattern. With 10^6 ohms, the current reaches the maximum in about 10^{-6} sec, the decrease is somewhat longer. It appears that while in the semiconductors the resistance changes during the oscillations only in the

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ACCESSION NR: AP4041142

layer near the surface, in the dielectric the resistance of the whole specimen is periodically changing. Orig. art. has: 3 figures.

ASSOCIATION: Leningradskiy gosudarstveniy pedagogicheskiy institut im. A. I. Gertsena (Leningrad State Pedagogical Institute)

SUBMITTED: 11Jan64

ENCL: 00

SUB CODE: EM

NO REF SOV: 003

OTHER: 002

Card 2/2

..ALIKHANDV, A.I., akademik; FEINBERG, Ye.L., prof.; SHIMAK, V. [Sizak, V.];
doktor [Chekhoslovakiya]; FISHER, Ya. [Fiser, J.], doktor (Chekhoslova-
kiya); PERNEGR, Ya., doktor (Chekhoslovakiya); MARKS, G., prof.
(Vengriya); SHAPIRO, I.S., doktor fiz.-matemat. nauk

Comments by experimenters and theoreticians. Priroda 54 no.1:
57-65 Ja '65. (MIRA 18:2)

L 30993-66 EWT(m)/T

ACC NR: AT6002498

SOURCE CODE: UR/3138/65/000/350/001/0012

AUTHOR: Alikhanov, A. I.; Bayatyan, G. L.; Brakhman, E. V.; Eliseev, G. P.; Galaktionov, Yu. V.; Landsberg, L. G.; Lyubimov, V. A.; Sidorov, L. V.; Zeldovich, O. Ya.; Yetch, F. A.

ORG: none

48
Br 1

TITLE: π^- - meson-neutron elastic backward scattering at 1.4-4.0 bev/c

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 350, 1965. Pi sup minus-meson-neutron elastic backward scattering at 1.4-4.0 Bev/c, 1-12

TOPIC TAGS: pion scattering, neutron scattering, elastic scattering, scattering cross section, angular distribution, spark chamber

ABSTRACT: The authors study the elastic backward scattering reaction



in the 1.38-4.05 bev/c range. A spark chamber was used with photographic and neutron counter registration. The experimental installation was highly efficient in

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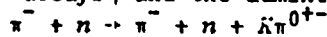
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I 30993-66

ACC NR: AT6002498

0

recording γ -quantum from π^0 -decays, and the admixture of inelastic events



in the 1700 cases of the elastic backward scattering reactions which were selected for study was no more than 2%. The solid angles for these cases were measured and the absolute cross sections were determined. Tables are given showing the cross section $\bar{\sigma}_n = \bar{\sigma}_{D^2O} - \bar{\sigma}_{H_2O}$ and $R = \bar{\sigma}_{H_2O}/\bar{\sigma}_{D_2O}$ as functions of energy. The total error

in calculation of these cross sections due to necessary corrections for pion-pion and pion-neutron scattering in the ambient medium, electronic efficiency, beam composition and the shielding effect of nucleons in the deuterium was 25%. Data for $\bar{\sigma}_n$ and $\langle \sigma_n \rangle$ as functions of energy show some irregularity in the 2-3 beV region

which may be due to resonance. Measurements of angular distribution for pion-neutron scattering show a minimum in the 162-180° region. The momentum transfer function is used as a basis for calculating the width of this minimum. A comparison of the experimental data obtained in this paper with those in the literature shows that the cross section $d\sigma/d\Omega$ is approximately inversely proportional to energy when the momentum transfer is constant. Orig. art. has: 4 figures, 2 tables.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 000/ OTH REF: 009

Card 2/2 *LC*

I. 65207-65 ENT(m)/T/EWA(m)-2

ACCESSION NR: APS021735

UR/0386/65/062/002/0090/0094

AUTHOR: Alikhanov, A. I.; Bayatyan, G. L.; Brakhman, E. V.; Galaktionov, Yu. V.; Yeliseyev, G. P.; Yech, P. A.; Zeldovich, O. Ya.; Landsberg, L. G.; Lyubimov, V. A.; Sidorov, I. V.

TITLE: Elastic backward scattering of π -mesons by neutrons in the 1.4-4.0 Bev/s pulse range

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 2, 1965, 90-94

TOPIC TAGS: pi meson, particle scatter, neutron scattering

ABSTRACT: The elastic backward scattering reaction $\pi^+ + n \rightarrow \pi^+ + n$ is studied in the 1.38-4.05 Bev/s pulse range. 1700 events of this reaction were selected with a pion scattering angle of $>90^\circ$. The solid angles for these events were measured (accuracy of measurement in the horizontal plane was 1° and in the vertical plane $\sim 5^\circ$). The results are given in graphic and tabular form. Orig. art. has: 3 figures, 1 table.

ASSOCIATION: none

Card 1/2

I. 65207-65

ACCESSION NR: AP5021735

SUBMITTED: 02Jun65

NO REF SOV: 000

ENCL: 00

SUB CODE: NP

OTHER: 000

dm
Card 2/2

ALIKHANOV, A.N., glav. red.; AZIZBEKOV, Sh.A., otv. red.;
SULTANOV, A.D., otv. red.; ABRAMOVICH, M.V., red.;
ALIZADE, A.A., red.; ALIZADE, K.A., red.; KASHKAY,
M.A., red.; KHALILOV, A.G., red.

[Outline of the geology of Azerbaijan (dedicated to the
22nd Session of the International Geological Congress in
India)] Ocherki po geologii Azerbaidzhana (posviashchaetsia
XXII sessii Mezhdunarodnogo geologicheskogo kongressa v
Indii). Baku, 1964. 386 p. (MIRA 17:12)

1. Akademiya nauk Azerbaidzhanskoy SSR, Baku.

ALIKHANOV, D.S.

ALIKHANOV, D.S., inzh.

Installing drain pipes for railroad switches in the case of a
flooded station area. Transp.stroi. 7 no.5:21-22 My '57.

(MIRA 10:11)

(Drainage) (Railroads--Stations)

ALIKHANOV, E.N.; GROBSHTEYN, S.R.

Effectiveness of using appropriate drive methods in the
Neftyanne Kamni oil fields. Azerb.neft.khoz. 35 no.4:5-9
Ap '56. (MLRA 9:10)

(Neftyanne Kamni--Petroleum engineering)