

ALIKHANYAN, A.I.; KAMALYAN, V.Sh.
~~ALIKHANYAN, A.I.; KAMALYAN, V.Sh.~~

π -meson spectra at an altitude of 3200 m. above sea level. Izv.AN SSSR
Ser.fiz.19 no.6:707-710 N-D '55. (MIRA 9:4)

1.Fizicheskiy institut Akademii nauk Arm.SSR.
(Cosmic rays) (Nuclear physics)

ALIKHANYAN, A.I.; KIRILLOV-UGRYUMOV, V.G.

Slow μ -meson scattering in copper. Izv.AN SSSR.Ser.fiz.19 no.6:
737-746 N-D '55. (MLRA 9:4)

1.Fizicheskiy institut imeni P.N.Lebedeva Akademii nauk SSSR.
(Cosmic rays) (Nuclear physics)

ALIKHANIAN, A.I.,; VAYSENBERG, A.O., kandidat fiziko-matematicheskikh nauk

Elementary particles. Tekh. mol. 23 no.5:10-14 My '55. (MIRA 8:6)

1. Chlen-korrespondent Akademii nauk SSSR (for Alikhanian).
(Particles, Elementary) (Nuclear forces)

ALIKHANYAN, A.I., inzhener; KHODZHAMIRYAN, Yu.Ye., inzhener.

Automatic control of banks of static capacitors. Prom.energ.11
no.12:25-27 D '56. (MIRA 10:1)

1. Armenenergo.
(Condensers (Electricity)) (Automatic control)

АЛИЧАНЖАН, А. И.
AUTHOR: ALICHANJAN, A. I., SOSTAKOVIC, N. V., LADAJAN, A. T., PA - 2004
FEDOROV, V. M., DEBJAGIN, B. N.
TITLE: On the Spectrum of the Masses of the Charged Particles of Cosmic
Radiation.
PERIODICAL: Zhurnal Eksperimental'noi i Teoret. Fiziki, 1956, Vol 31, Nr 6,
pp 955-970 (U.S.S.R.)
Received: 1 / 1957 Reviewed: 3 / 1957

ABSTRACT: The present work deals with the results of the measurements of this mass spectrum which were carried out in an altitude of 3200 m. These measurements were carried out with a magnetic spectrometer in connection with two WILSON chambers. In the stars which were produced above the measuring device protons, deuterons, pions, and K-particles were observed. Work is arranged as follows: Determination of the mass spectrum of the particles from momentum and range, measurements of the masses of cosmic particles in a magnetic spectrometer with a many-plate WILSON chamber, selection of trajectories, accuracy of the measurements of the masses of particles, light intensity, the mass spectrum, the determination of particle mass from scattering and range.

Summary: Two groups of particles are observed in the mass spectrum between pion and proton: K-particles with $\sim 1000 m_e$ and a group of particles with $m_e \sim 550 m_e$. If only those particles are selected which were produced in the matter above the device, the group of particles with the mass $\sim 550 m_e$ vanishes completely and the mass spectrum then consists of pions, K-particles, protons and deuterons. In

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On the Spectrum of the Masses of the Charged
Particles of Cosmic Radiation.

PA - 2004

this connection the ratio of the abundance of K-particles and pions in the same interval of the ranges is 0,08. In the mass spectrum the authors observed a group of 11 particles the mass of which, determined from the range (as well as from range and scattering) amounts to 500 - 600 m_e . This is in contradiction to all measurements of the masses of cosmic particles hitherto carried out by means of a WILSON chamber and photoplates. The particles which belong to this anomalous group incide into the recording system from the outside just like myons. The fact that hitherto particles with $\sim 500 m_e$ have been lacking may be connected with the conditions for the selection of particles. As further data concerning 500 m_e particles have hitherto been lacking, a very careful interpretation of the aforementioned 11 traces is necessary. - According to the authors' opinion it is necessary, besides from determining mass from momentum, range, and scattering, to determine also the ionizing capacity of individual particles with great accuracy. It is then possible to determine the mass of particles by means of methods that are independent of one another, namely from momentum and ionization. It is only by such measurements that a definite decision concerning the existence of such 500 m_e particles is possible. The authors already started a new series of experiments in the course of which the ionizing capacity of the particle is determined before incidence into the WILSON chamber by means of multi-layer proportionality counters.

ASSOCIATION: Physical Institute "P.N.LEBEDEV" of the Acad.of Sciences, USSR
Physical Institute of the Acad.of Sciences of the Armenian SSR

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

CARD 2 / 2

ALIKHANYAN, A.I., KAMAYAN, V.S.

"The Spectra of π Mesons Generated by Fast Cosmic Ray Neutrons in thin Layers of Matter," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

ALUKHAYAN, A. I.

1973
 ON THE MASS SPECTRUM OF CHARGED COSMIC RAY PARTICLES
 Authors: A. I. Alukhayan, N. V. Shustakovikh, A. T. V. N. Fedorov, and B. N. Derjagin (Academy of Sciences USSR and Academy of Sciences, Armenian SSR)
 Soviet Phys. JETP 37: 817-89 (1987) July

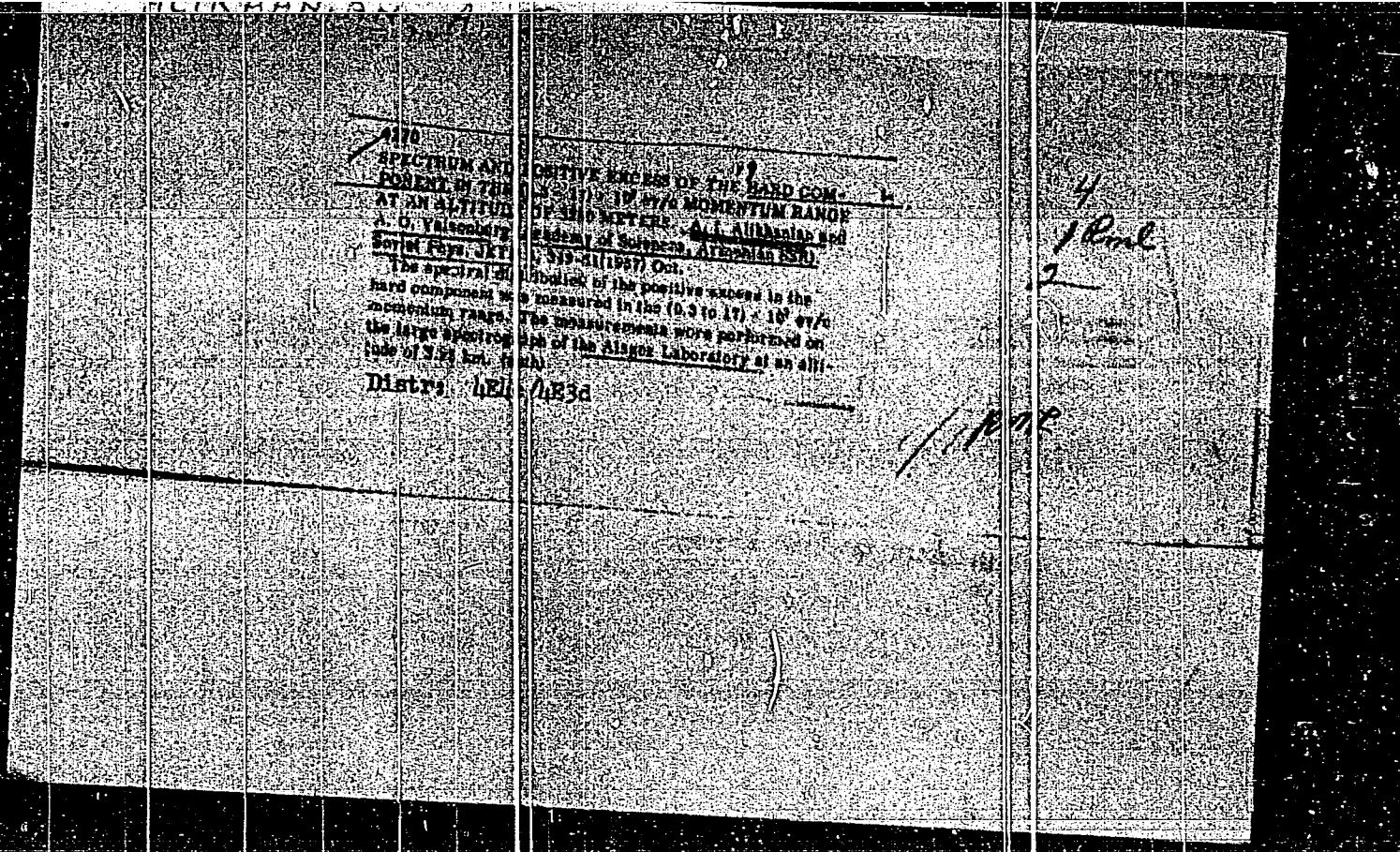
An investigation of the cosmic ray particles mass spectrum at 2100 m are reported. The measurements were carried out by means of a magnetic spectrometer used in conjunction with two cloud chambers. Protons, neutrons, mesons, and K particles were observed among the particles locally generated in mass above the experimental arrangement. The cases of 11 particles with masses of about 500 to 600 m, stopping in the lower chamber are discussed. In all these events, neither a star nor a shower was observed in the upper chamber. It was found that some of these particles entered the apparatus from the outside in a similar manner to the μ meson.

(auth)

13
1-RML
2

Distr: 4E4c/4E3d

JK RML



AUTHOR
TITLE

ALIKHANYAN, A.I., VAYSENBERG, A.O.,

PA -2950

The Spectrum and the Positive Surplus of the Hard Component within
Momentum Domain $(0,3-17) \cdot 10^9 \text{ eV/c}$ at an Altitude of 3250 m.(Spektr i polozhitel'nyy izbytok zhestkoy komponenty v oblasti im-
pul'sov $(0,3-17) \cdot 10^9 \text{ eV/c}$ na vysote 3250 m - Russian)

PERIODICAL

Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 3,
pp 413-416, (U.S.S.R.)

Received 6/1957

Reviewed 7/1957

ABSTRACT

The present work continues the measurement begun previously (VAYSENBERG, A.O., Zhurn. Eksp. i Teor. Fiz., 1957, Vol 32, Nr 3, p 417) of the momentum spectrum and the positive surplus by measuring the domain of much higher momenta of up to $1,7 \cdot 10^{10} \text{ eV}$. Measurements were carried out in 1952 with the large magnetic spectrometer of the ALAGEZ laboratory at a magnetic field strength of 13700 Gauss. In the case of such a field strength the probable measuring error committed when measuring the momentum $1,7 \cdot 10^{10} \text{ eV/c}$ amounts to about 50%. The construction of the magnetic spectrometer and the utilization of the results were already described several times. Above the measuring system a 7 cm thick lead layer was mounted and the entire thickness of all lead absorbers above the counter series amounted to 5,8 cm. Below the 10th series of counters a 14 cm thick lead layer, and below this series an 11th series of counters was located. The particles passed through the mentioned 10 series of counters without increasing were ascribed to the hard component. The range of these particles was larger than 5,8 cm lead. The range of the particles passing also through the 11th coun-

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ALIKHANYAN, A.I.

AUTHORS: Alikhanyan, A.I., Engineer, Grigoryan, L.A., Candidate
of Technical Sciences, and Chichikanov, V.S., Engineer. 94-4-3/25

TITLE: Automatic Field-forcing for Synchronous Motors
(Avtomaticheskoye perevozbuzhdeniye sinkhronnykh dvigateley)

PERIODICAL: Promyshlennaya Energetika, 1958, vol.13, no.4,
pp. 8 - 10 (USSR).

ABSTRACT: Ordinarily, power-factor control by synchronous motors necessitates constant attendance of the operating staff. The authors have proposed a circuit for controlling the field of a synchronous motor automatically according to the load current. Maximum use of the available free power of the synchronous motor is thus assured. The circuit is based on electromagnetic control of the field current by a saturating choke to maintain a given stator current. The reactive power delivered to the circuit is mainly limited by the maximum permissible stator current and maximum permissible field current. When the load changes, the regulator acts on the excitation to maintain the stator current constant. A limit is placed on the action of the regulator to prevent excessive field currents at small loads. The circuit of the regulator is given in Fig.1 and uses an amplidyne with negative feedback.

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Automatic Field-forcing for Synchronous Motors

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feed-back. The principles of operation of the circuit are explained. Fig. 2a gives curves of the relationship between the control current in windings 1 and 2 of the amplifier as a function of the stator current. The amp-turns of windings 1 and 2 are opposed to one another; therefore, the control amp-turns of the amplifier are determined by the difference between the amp-turns of windings 1 and 2. Fig. 2b shows a curve of the control amp-turns as function of the stator current and Fig. 3 relates the output main current to the control amp-turns. The regulator output is cross-connected to the field circuit. As the stator current falls, the control amp-turns become negative, which induces the working current of the amplifier and so increases the field current. As will be seen from Fig.1, the circuit ensures field-forcing if the output terminals of the intermediate relay are connected in parallel with the output terminal of the amplifier at appropriate points of the diagram. It is claimed that the regulator is reliable, has no moving parts or sliding contacts, and can be readily constructed. It would be advisable to organise industrial production of these regulators. There are 3 figures.

Card2/2

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Handwritten notes:
 56-1-50/56
 1958

AUTHORS: Alikhanyan, A. I. , Kirillov-Ugryumov, V. G. , Kotenko, L. P. ,
 Kuznetsov, Ye. P. , Popov, Yu. S. 56-1-50/56

TITLE: The Angular Distribution of Positrons in the $\pi^+ - \mu^+ - e^+$ Decay
 in Propane (Uglovoye raspredeleniye pozitronov pri $\pi^+ - \mu^+ - e^+$ -
 raspade v propane)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34,
 Nr 1, pp. 253 - 254 (USSR)

ABSTRACT: The measurements discussed here are also important from the stand-
 point of the suitability of propane for measurements of the pheno-
 mena of angular correlations which are of the same nature as the
 μ -e-decays. The authors in this connection think of an extensive
 use of propane bubble-chambers. The best arrangement is illustrated
 by a figure. A bubble chamber with the volume $(7,2 \times 6,5 \times 16) \text{cm}^3$
 was irradiated in a polyethylene-target with a beam of positive
 pions with the energy 175 MeV in the phasotron of the United Insti-
 tute for Nuclear Research (Ob'yedinennyy institut yadernykh issle-
 dovaniy). Altogether 8000 photographs were taken on which 6570
 $\pi^+ - \mu^+ - e^+$ -decays were determined. The authors determined the
 angular distribution for the projections of the spatial angles to
 the plane of the photoplate. The experimentally determined angular

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The Angular Distribution of Positrons in the $\pi^+ - \mu^+ - e^+$ -Decay in Propane 56-1-50/56

distribution of the decay electrons is illustrated in a diagram. This distribution can be approximated sufficiently well by a function written down here. The ratio (number of electrons emitted in the angular interval $90 - 180^\circ$)/(number of electrons emitted in the interval $0 - 90^\circ$) is 1,19. This corresponds to a coefficient $A = -0,22 \pm 0,03$ in the expression $(1 + A \cos \vartheta)$ for the distribution of the solid angles. The angles in the last-mentioned ratio were related to the direction of the projection of the initial impulse of the positive myons. There are 2 figures, and 5 references, 2 of which are Slavic.

ASSOCIATION: Physical Institute imeni P. N. Lebedev AN USSR (Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR)

SUBMITTED: October 25, 1957

AVAILABLE: Library of Congress

Card 2/2

AUTHORS: Alikhanyan, A. I., Kirillov-Ugryumov, SOV/56-34-5-8/61
V.G., Kotenko, L. P., Kuznetsov, Ye. P., Popov, Yu. S.

TITLE: The Angular Anisotropy in a $\pi^+ - \mu^+ - e^+$ -Decay, Measured in a Propane Bubble Chamber (Uglovaya anizotropiya pri $\pi^+ - \mu^+ - e^+$ -raspade, izmerennaya v propanovoy puzyr'kovoy kamere)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1101-1109 (USSR)

ABSTRACT: The authors investigated the angular anisotropy in a $\pi^+ - \mu^+ - e^+$ -decay with discrimination of the decay electrons with respect to energy. These decays were recorded by a propane bubble chamber. This chamber was irradiated in a beam of positive pions on the phasotron of the Ob'yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research). The positive pions were produced by 660 MeV protons on an external polyethylene target. The authors give a short description of the measuring device. They measured the projections of the solid angles between the momenta of the positive myon and the electron on the plane of the film in the photographic camera. In this case the distribution $dN \sim [1 + a(\pi^2/16)\cos^2\varphi]d\varphi$ is to be used. A figure gives the distributions of the projections of the

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The Angular Anisotropy in a $\pi^+ - \mu^+ - e^+$ -Decay,
Measured in a Propane Bubble Chamber

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angles between the initial momenta of the positive myon and of the electron for 6670 $\pi^+ - \mu^+ - e^+$ -decays. The experimental distribution is well approximated by the above mentioned formula. The coefficient A, which is found from the relation "(backward/forward)", was equal to $A = -0,22 \pm 0,03$. The results of the measurements discussed in this paper lead to the following conclusions: 1) When the energy of the electrons which are produced in the $\mu^+ - e^+$ -decay increased, also the angular anisotropy increases. This fact is not inconsistent with the theory of the two-component neutrino. The coefficient A in the distribution of the angles between the momenta of the myon and the electron is equal to $A = -0,22 \pm 0,03$. (This coefficient A was found by recording of the $\pi^+ - \mu^+ - e^+$ -decays in a propane chamber). The value of this parameter, averaged over 5 investigations with propane chambers (after taking into account a correction due to the depolarization) is equal to $a = -0,28 \pm 0,03$. This value nearly coincides with the value of the parameter averaged over 9 investigations with photographic emulsions. The mean value of the results of the measurements with propane bubble chambers and with photo-

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The Angular Anisotropy in a $\pi^+ \rightarrow \mu^+ + e^+$ Decay,
Measured in a Propane Bubble Chamber

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graphic emulsions is equal to $a = -0,283 \pm 0,023$. The distribution of the angles between the meson momenta in the $\pi^+ \rightarrow \mu^+$ decay is isotropic. In an appendix to this paper the relation between the spatial distribution of the angles and the distributions of the projections of the angles upon the planes of the $\mu^+ \rightarrow e^+$ -decays and of the $\pi^+ \rightarrow \mu^+ + e^+$ -decays is calculated. The authors thank Professor V.P. Dzhelepov who enabled them to carry out their experiments on the phasotron of the Ob'-yedinennyy institut yadernykh issledovaniy. Further, the authors thank B.A. Dolgoshein for his valuable discussions; L.A. Kuzin, A.V. Samoylov and F.M. Sergeyev for their participation in the evaluation of the experimental results and A.A. Bednyakov for his help in the experiments at the phasotron. There are 6 figures, 1 table, and 14 references, 4 of which are Soviet.

ASSOCIATION: Fizicheskiy inatitut im. P.N. Lebedeva Akademii nauk SSSR
(Physics Institute imeni P.N. Lebedev, AS USSR)

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The Angular Anisotropy in a $\pi^+ - \mu^+ - e^+$ -Decay,
Measured in a Propane Bubble Chamber

SOV/56-34-5-8/61

SUBMITTED: December 12, 1957

1. Radioactive substances--Decay
2. Propane bubble chambers
--Applications
3. Proton bombardment--Applications

Card 4/4

Alikhanyan, A. I.

μ -MESON SCATTERING IN LEAD

A. I. Alikhanyan, F. R. Arutyunyan

By means of an Alikhanyan-Alikhanov, magnetic mass spectrometer cosmic ray μ -meson scattering was studied in the momentum interval $P = (1.0 - 1.8) \times 10^8$ ev/s. The scattering was investigated in lead plates 7 mm thick placed in a cloud chamber. Good agreement was obtained between the experimental distribution of the scattering angles and the theoretical curve of plural Coulomb scattering for finite dimensions of the nucleus.

The cross section of μ -meson scattering at large angles is less than $\sim 10^{-28}$ cm²/nucleon.

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

24(5)

AUTHORS: Alikhanyan, A. I., Arutyunyan, F. R. SOV/55-36-1-6/62TITLE: The Scattering of μ -Mesons in Lead (Rasseyaniye μ -mezonov v svintse)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 32-40 (USSR)

ABSTRACT: In the introduction several investigations carried out of muon scattering in lead in various meson energies are discussed. For the effective scattering cross section in energies of 100 to 300 MeV a $4 \cdot 10^{-27} \text{cm}^2/\text{nucleon}$ was found (Refs 1-3). For the effective scattering cross section of anomalous scattering a value of $\sigma_{\text{an}} = (1.5 \pm 1.0) \cdot 10^{-27} \text{cm}^2/\text{nucleon}$ was measured in a depth of 60 m equivalent of water at muon momenta of 100 - 600 MeV/c in photoemulsions. This agrees with the results obtained by Alikhanov and Yeliseyev (Ref 7) at muon-momenta of 200 - 800 MeV/c. Alikhanyan and Kirillov-Ugryumov (Ref 8) investigated some muon scatterings (80 - 140 MeV/c) in thin copper plates. The present paper investigates experimental results of muon scattering at momenta of $(1.0 - 1.8) \cdot 10^8 \text{ eV/c}$ in 7 mm thick lead plates in a cloud chamber. Investigations were carried out with

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The Scattering of μ -Mesons in Lead

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cosmic muons in an altitude of 3,200 m above sea level on Mount Aragats by means of a magnetic mass spectrometer and two cloud chambers with many plates. A description of the experimental device and data may be found in references 8, 12, 13. Particle analysis was carried out in the mass spectrometer according to momentum and range. The former was calculated from the radius of curvature of the particle orbit in the magnetic field, the range was determined from the material layer through which the particles penetrated. For 812 particles the masses were determined at 150 - 360 m_e with the following coordination: $m < 240 m_e \rightarrow \mu$ -mesons; $m > 250 m_e \rightarrow \pi$ -mesons. Average values: muons with 209 m_e + pions with 278 m_e . In the muon group there should be not more than 2 % pions and in the pion group not more than 12 % muons. Measurement of angles was carried out on the basis of photographs by means of a special protractor. Momentum measurement in the scattering point, if particle mass was known, was possible by two methods: 1) from the remaining range according to scattering, 2) from the momentum measured in the magnetic field. The lead plates in which scattering was investigated had impurities, the effect of which upon

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the scattering angle and on the distribution function was determined. The effect produced by the geometry of the device upon the measurements was taken into account to the widest possible extent. 2337 muon scatterings and 818 pion scatterings were investigated in the lead plates with a total range of muons with $p = (1.0 - 1.8) \cdot 10^8$ eV/c in Pb of 19 m and for pions at $p = (1.2 - 2.0) \cdot 10^8$ eV/c of 6.7 m. Figure 2 shows the differential distribution of scattering angle projections for muons, for which purpose the measuring points and, for reasons of comparison, the curves of multiple Coulomb (Kulon) scattering according to Ter-Mikayelyan (Ref 11) are given. Agreement is good. Figure 3 shows the same for pions. The number of muon scatterings in dependence on the angle is given in a table together with the corresponding theoretical values. Agreement is good. The authors finally thank M. L. Ter-Mikayelyan for his discussions and help, B. A. Dolgoshein and B. I. Luchkov for assisting in evaluating

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measuring results, M. I. Dayon and V. G. Kirillov-Ugryumov
for discussions. There are 3 figures, 1 table, and 18
references, 7 of which are Soviet.

ASSOCIATION: Fizicheskiy institut Akademii nauk Armyanskoy SSR
(Physics Institute of the Academy of Sciences, Armyanskaya SSR)

SUBMITTED: July 14, 1958

Card 4/4

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A001/A101

24-6900
AUTHOR:

Alikhanyan, A.I.

TITLE: Scattering of μ -mesons in various substances

PERIODICAL: Referativnyy zhurnal. Fizika, no 5, 1961, 74, abstract 5B213 ("Tr. Mezhdunar. konferentsii po kosmich. lucham. 1959, v 1", Moscow, AN SSSR, 1960, 33) - 333) X

TEXT: The author describes experiments on investigations of μ -meson scattering within momentum range $(0.7-1.8) \times 10^8$ ev/c in 2-7-mm thick lead and copper plates at an altitude of 3,250 m; a magnetic mass-spectrometer was employed in combination with two multi-plate Wilson chambers. Experimental results are compared with multiple Coulomb scattering from a point-like and extended nucleus. In no experiment was detected any significant deviation from the curves of multiple Coulomb scattering.

[Abstracter's note: Complete translation.]

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ALIKHAN'YAN, A.

Pravda, Moscow. SOV/5174

Voroy Sovetskoy Koshchenskiy Korabl'; materialy, opublikovannyye v gazete "Pravda" (The Second Soviet Cosmic Ship Materials Published in the Newspaper "Pravda") Moscow, 1960. 198 p. 50,000 copies printed.

Resp. for this Publication: V. Reut and V. Salimov; Tech. Ed.: V. Zagladina.

PURPOSE: This book is intended for the General reader.

CONTENTS: This book is a compilation of articles which appeared in the newspaper Pravda after the launching, orbiting, and recovery of the capsule of the Soviet 4,600 kg spaceship on August 19, 1960. The articles give some details of scientific research undertaken in this flight in the fields of biology, cytology, genetics, cosmic radiation, solar radiation, ultra-violet radiation, and radiation levels. A description and three photos of the capsule are given. No personalities are mentioned. There are no references.

Mathematical Sciences. V. Fedinichiy, Doctor of Physical and Mathematical Sciences 90

Care for Future Astronauts. D. Markov, Academician of the Academy of Sciences USSR (Head of the Chemical and Physiological Laboratory of the Institut Fiziologi (Institute of Physiology), Krasik) 91

Forerunner of Great Conquests. A. Alikhan'yan, Corresponding Member of the Academy of Sciences USSR (Director of the Priblenny Institute of the Academy of Sciences Armyanskaya SSR) 93

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Event Which Surprised the World. D. Martynov, Professor, Director of the Gosudarstvennyy Astronomicheskyy Institut (State Astrophysical Institute) (Members: I. Shernberg) 104

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Alikhanyan, A.I.

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AUTHORS: Alikhanyan, A. I., Kirillov-Ugryumov, V. G.,
Kotenko, L. P., Kuznetsov, Ye. P., Samoylov, A. V.

TITLE: Single Scattering of μ^- -Mesons on Carbon at Energies of
10 - 30 Mev ¹⁹

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 2, pp. 387 - 393

TEXT: The authors investigated the single μ^- -meson scattering on carbon with a propane bubble chamber and compared the experimental results with theory. The chamber had a size of 370·104·100 mm. The μ^- -mesons used for irradiation originated from the decay of π^- -mesons from the synchrocyclotron of the Ob'yedinenny institut yadernykh issledovaniy (Joint Institute of Nuclear Research). The 150-Mev π^- -mesons had been produced in the inner beryllium target of this synchrocyclotron. The experimental setup is briefly described. On an average 3 - 4 μ^- stopping points were recorded per photograph (with Industar-23 lenses), or a total of about 60,000. On interpreting the pictures, such

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Single Scattering of μ^- -Mesons on Carbon at
Energies of 10 - 30 Mev

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μ^- -tracks were selected for analysis as were longer than 1.5 cm, which corresponds to an energy of over 10 Mev. The μ^- -stopping point was identified according to the μ -e decay. Table 1 offers data concerning the flux and the energy spectrum of μ^- -mesons. 48,100 ($\pm 2.3\%$) μ^- -mesons were recorded, whose range was >1.5 cm. The investigated energy range of 10 - 30 Mev corresponded to a muon range of 1.5 - 10 cm in propane, the density of the latter amounting to 0.4 g/cm^3 . Table 2 gives the numbers of scattering events recorded in angular intervals of 10° each between 15 and 85° , and in the interval $85 - 180^\circ$. The following columns of the table contain the numbers of events after correction for non-recording, the finite chamber size, the passage from one angular interval to another, the π^- -decay, and the scattering on hydrogen. The correction factors averaged over the angular intervals are compiled in Table 3. The various corrections are discussed in greater detail. Column 7 of Table 2 contains the final numbers of scattering events after the application of all corrections. 204,350 cm μ^- -tracks were evaluated, which number corresponds to 1260 nuclear path lengths of carbon. In this connection, 263 single scattering events on carbon were

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Single Scattering of μ^- -Mesons on Carbon at
Energies of 10 - 30 Mev

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ascertained, whose angular projection onto the photographic emulsion was greater than 15° . The obtained angular distribution of μ^- -mesons is illustrated by a diagram. The two curves show the theoretically calculated course with Coulomb scattering in the case of a finite nucleus (Curve 1, Column 8 in Table 2), and in the case of a point nucleus (Curve 2, Column 9 in Table 2). Finally, considerations concerning "anomalous" scattering are discussed; the cross section for an "anomalous" scattering, if any, cannot exceed $1.25 \cdot 10^{-28}$ cm² per nucleon at a scattering angle $> 45^\circ$, for scattering through an angle $> 90^\circ$ it cannot exceed $0.7 \cdot 10^{-28}$ cm² per nucleon. Not a single muon decay into three electrons was recorded among all 60,000 stopping events. Hence, the ratio $(\mu \rightarrow e + \nu + \bar{\nu}) / (\mu \rightarrow e + e + e) < 1.7 \cdot 10^{-5}$ is derived. The authors finally thank Professor V. P. Dzhelepov for having rendered the experiments on the synchrocyclotron possible, and furthermore the co-workers of the laboratoriya yadernykh problem OIYaI (Laboratory for Nuclear Problems of the OIYaI), especially N. B. Yedovina and V. G. Sryatkina, as well as A. A. Bednyakov for his assistance. There are 1 figure, 3 tables, and 10 references: *LL*

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Single Scattering of μ^- -Mesons on Carbon at
Energies of 10 - 30 Mev

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B006/B011

5 Soviet, 3 British, 1 Indian, and 1 Dutch.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Institute of Physics imeni P. N. Lebedev of the Academy
of Sciences, USSR)

SUBMITTED: August 11, 1959

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B109/B102

24.6800

AUTHORS: Alikhanyan, A. I., Arutyunyan, F. R., Ispiryan, K. A.,
Ter-Mikayelyan, M. L.

TITLE: A way of detecting high-energy charged particles

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41,
no. 6(12), 1961, 2002-2010

TEXT: The case is considered where a fast charged particle passes through a layer consisting of two different substances of thicknesses l_1 and l_2 and of electron densities N_1 and N_2 , where $N_1 > N_2$. Then, the exciting particle can be detected by way of the resulting photon emission.

$$dm = \frac{4p^2(1+\alpha)}{137\pi l_1} \sum_{r=1}^{r_{max}} \frac{d\omega}{r^2\omega^2} \frac{\left[1 - \frac{1}{4}(E_{in}/E)^2 \omega/r - \omega^{-2}\right]}{(1-p/\omega r)^2 (1+p\alpha/\omega r)^2} \times$$

$$\times \sin^2 \left[\left(\frac{l_2}{1+\alpha} \right) \pi r - \frac{\pi}{\omega} \left(\frac{\alpha p}{1+\alpha} \right) \right]. \quad (1.3)$$

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A way of detecting high-energy...

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is obtained according to M. I. Ter-Mikayelyan (DAN SSSR, 134, 318, 1960; Izv. AN ArmSSR, 14, 103, 1961) for the number of photons emitted in the frequency interval $d\omega$ per cm of layer thickness. The frequency is measured in terms of $\omega_{\min} = l_1 r_e \alpha (N_1 + \alpha N_2)$. r_e is the classical electron radius, c - light velocity, $\alpha = l_2/l_1$, $p = (N_1 - N_2)/(N_1 + \alpha N_2)$,

$$E_{\min} = mc^2 h [\pi^{-1} r_e (1 + \alpha) (N_1 + \alpha N_2)]^{1/2}. \quad (1.6), \quad r_{\max} \approx h [\pi^{-1} r_e (1 + \alpha) (N_1 + \alpha N_2)]^{1/2}. \quad (1.7).$$

The photon spectrum is between ω_{\min} and ω_{\max} , where

$$\omega_{\max}^{(r)} = (r \mp \sqrt{r^2 - (E_{1p}/E)^2}) / (E_{1p}^2 / 2E^2). \quad (1.8)$$

and is shown in Fig. 1 for the case of $E = 2.2 E_{1p}$, $\alpha = 1$. Fig. 2 shows the total number of quanta (πl_1) as dependent on the particle energy for $\alpha = 1$ and for different ω . For ω , values between 1.2 and 1.6 are shown to be the most convenient as regards the attainable number of quanta. The energy

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A way of detecting high-energy...

of the exciting particles can be inferred from the energy of emitted quanta. The particle energy range of $2 \cdot 10^2 \leq E/mc^2 \leq 5 \cdot 10^3$ is covered by using proportional or scintillation counters (determined lines of a gaseous absorber are excited. The factors (bremsstrahlung effects) affecting the noise level, and problems of recording of cosmic radiation are discussed. There are 4 figures, 3 tables, and 7 references: 5 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: J. A. Northrop, R. Nobles. Nucleonics, 14, 36, 1956; F. Reines, C. H. Cowan. Phys. Today, 10, 12, 1957.

ASSOCIATION: Institut fiziki Akademii nauk Armyanskoy SSR (Institute of Physics of the Academy of Sciences Armyanskaya SSR)

SUBMITTED: July 25, 1961

Card 3/6 3

ALIKHANYAN, A.I., red.; NIKITIN, S.Ya., prof., otv. red.; TER-
MARTIROSYAN, K.A., prof., otv. red.; AMATUNI, A.TS., red.;
SHARKHATUNYAN, R.O., red.; SHAKHBAZYAN, V.A., red.;
SHTIBEN, R.A., red. izd-va; KAPLANYAN, M.A., tekhn. red.

[Problems in the physics of elementary particles] Voprosy fi-
ziki elementarnykh chastits; lektsii, pročitannye na 2. ses-
sii... Pod obshchey red. A.I. Alikhaniana. Erevan, Izd-vo
Akad. nauk Armianskoi SSR, 1962. 396 p. (MIRA 16:3)

1. Vesenniyaya shkola teoreticheskoy i eksperimental'noy fiziki.
2. sessiia, Nor-Amberd, 1962. 2. Chlen-korrespondent Akademii nauk SSSR (for Alikhanyan).

(Particles (Nuclear physics))

S/048/62/026/006/001/020
B125/B112

AUTHORS: Alikhanyan, A. I., and Vaysenberg, A. O.

TITLE: New experimental data on μ -mesons

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26,
no. 6, 1962, 698 - 710

TEXT: This is a survey of the experimental data published from 1946 to 1961 relating to electromagnetic interactions of muons (production of meson pairs by photons, scattering of high-energy muons from nuclei, measurement of the magnetic moment of a meson) and to the weak interactions of the muons (total probability of the muon-electron decay, asymmetry spectrum in the $\mu \rightarrow e + \nu + \bar{\nu}$ decay, muon polarization at the time of $\pi - \mu$ -decay, "spirality" of the particles produced in the decay $\mu \rightarrow e + \nu + \bar{\nu}$). There are 8 figures. The most important English-language reference is: R. Feynman, N. Gell-Mann, Phys. Rev., 109, 193 (1958).

Card 1/1

S/048/62/026/006/003/020
B125/B112

AUTHORS: Alikhanyan, A. I., Asatiani, T. L., Krishchyan, V. M.,
Matevosyan, E. M., Sharakhatunyan, R. O.

TITLE: Cosmic muon polarization

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26,
no. 6, 1962, 713 - 715

TEXT: The results hitherto obtained by the authors and G. W. Clark (see reference) cannot be regarded as definite since data on polarization are inadequate and no check measurements with depolarizing material have been made. More reliable results were obtained at momenta of ~ 2.1 Bev/c with the aid of two identical improved apparatus (Fig. 2). Constant hodoscopic counters were attached to the counter series I, II, III for determining the muon direction. The anti-coincidence pulse I + III - IV separates the muon stopping events in the copper absorber and produces a high voltage pulse. This pulse is transmitted to the counters 1 to 10 which fix the decay electrons 1.2 to 4.7μ sec after the stopping. The constant hodoscope and the pulse hodoscope were recorded with an Φ P-2 (FR-2) photo-

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Cosmic muon polarization

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recorder. Each decay event was evaluated with a special stencil. A possible asymmetry of the apparatus was eliminated by a magnetic field of 80 gauss automatically switched on and off at intervals of 30 min. $P = R_o/R_{80} = 1.20 \pm 0.03$ holds for the polarization P. The present experimental data do not indicate any significant amount of muon impurities produced in $K_{\mu\mu}$ -meson decay. There are 2 figures and 1 table. The most important English-language reference is: G. W. Clark, J. Hersil, Phys. Rev., 108, 1538 (1957).

ASSOCIATION: Fizicheskiy institut Akademii nauk ArmSSR (Physics Institute of the Academy of Sciences ArSSR)

Card 2/0 Z

34003
S/056/62/042/001/020/048
B104/B102

24.6700

AUTHORS: Alikhanyan, A. I., Asatiani, T. L., Matevosyan, E. M.,
Sharkhatunyan, R. O.

TITLE: Study of the polarization of cosmic-ray μ^+ -mesons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,
no. 1, 1962, 127-129

TEXT: The counter arrangement shown in Fig. 1 was used to determine the polarization of underground cosmic-ray μ^+ -mesons from the asymmetry in the angular distribution of positrons emitted in μ^+ decay. The resolution of the coincidence circuit was $5 \cdot 10^{-7}$ sec. The asymmetry of the device was determined with a solenoid S around a copper absorber M, which generated a depolarizing magnetic field of 80 oe inside the absorber. The magnetic field was automatically switched on and off every 30 minutes. Number of recorded events without magnetic field: $N_0 = 16,290$; number of recorded events with magnetic field: $N_H = 14,920$; ratio between positrons escaping upward and such escaping downward (without magnetic field):

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31003
S/056/62/042/001/020/048
B104/B102

Study of the polarization of...

$R_0 = 1.35 \pm 0.017$; the relevant ratio with magnetic field:
 $R_H = 1.12 \pm 0.018$; $R_0/R_H = 1.20 \pm 0.03$. Polarization when allowing for the angular distribution of muons and for their depolarization on entering into the copper absorber: $P = 0.25 \pm 0.03$. Calculations made in accordance with I. I. Gol'dman (ZhETF, 34, 1017, 1958) yielded an index of the pion production spectrum of $\gamma = 1.87 \pm 0.37$ for the polarization obtained. The polarization was calculated from $P = K(R-1)/(R+1)$. To obtain correct values, the geometry factor K of the experimental setup was computed at the Vychislitel'nyy tsentr AN Armyanskoy SSR (Computer Center of the AS Armyanskaya SSR). It can be determined, however, with sufficient accuracy in an accelerator experiment. B. I. Luchkov, B. A. Dolgoshein, I. I. Gol'dman, and S. A. Kheyfets are thanked for interest and advice, A. V. Karakhanyan and Zh. Ye. Nazaryan for help in measurements, L. G. Akhverdova for assistance, the team of the Computer Center of the AS Armyanskaya SSR, headed by T. M. Ter-Mikayelyan, for computations, and A. G. Tigranyan for help in the experiments. There are 2 figures and 10 references: 6 Soviet and 4 non-Soviet. The three references to English-language publications read as follows:

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34003

Study of the polarization of...

S/056/62/042/001/020/048
B104/B102

S. Hayakawa. Phys. Rev., 108, 1533, 1957; G. W. Clark, J. Hersil. Phys. Rev., 108, 1538, 1957; H. V. Fradt, G. W. Clark. Bull. Am. Phys. Soc., 6, 263, 1961.

ASSOCIATION: Fizicheskiy institut Akademii nauk Armyanskoy SSR (Physics Institute of the Academy of Sciences Armyanskaya SSR)

SUBMITTED: August 29, 1961

Fig. 1. Experimental arrangement.

Legend: (IV) copper counter, 2 cm in diameter, 45 cm long; the other counters are of the type MC-9 (MS-9), 3 cm in diameter and 28 cm long; series I and III are connected in coincidence, series IV in anti-coincidence; (M) copper absorber; (S) solenoid.

Card 3/A₃

38965

S/048/62/026/006/011/020
B125/B102

9.6150

AUTHORS: Alikhanyan, A. I., Arutyunyan, F. R., Ispiryan, K. A.,
and Ter-Mikayelyan, M. L.

TITLE: The possibility of detecting charged particles of high
energies.

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,
v. 26, no. 6, 1962, 746-753

TEXT: The question is discussed whether resonance radiation resulting
from fast particle passage through periodically (period l) alternating
plates of thickness l_1 and l_2 ($l=l_1+l_2$, $\alpha=l_2/l_1$) can be used to detect
fast particles and to measure their energy. The main contribution to the
processes under consideration is that of the harmonics lying below a
certain threshold. If the particle energy is much higher than threshold
energy, the emitted frequencies ω of all harmonics lie somewhere between
a maximum and a minimum, i.e. between $1/r$ and $4rE^2/E_n^2$; r is the order

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The possibility of detecting ...

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of the harmonics. At energies which are not too high, but already relativistic, the particle radiates only on harmonics of large r . Radiations with new harmonics arise when the particle energy increases gradually. The energy loss due to resonance radiation depends only slightly on the thickness of the plates and decreases slowly with increasing α . The rapid decrease of the number of quanta beyond the maximum (for any harmonic) at $\omega \approx 1.5 \omega_{\min}$ makes it permissible to neglect the contribution of high frequencies to radiation intensity. The particle energy in the range $E/mc^2 = 2 \cdot 10^2 - 2 \cdot 10^3$ can be measured by the method of energy release. The method of characteristic radiation, applicable in the range $E/mc^2 = 5 \cdot 10^2 - 5 \cdot 10^3$, depends on the radiation in the layered medium being passed through an absorbing gas which thereupon emits radiation which is characteristic. Using the method of Compton scattering, which is suitable for a wide energy interval, the particle produced in the layer medium undergoes simple Compton scattering. The γ -quanta striking the lateral faces of the layer medium are recorded by liquid scintillators. The occurrence of resonance radiation is

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The possibility of detecting ...

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accompanied by background radiation. Cosmic muons of $\sim 10^{11}$ ev can be detected with a coincidence circuit. Muons of $\sim 5 \cdot 10^{11}$ ev and above can be detected by the method of characteristic radiation. Adequate experiments are in preparation. There are 4 figures and 2 tables.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physics Institute AS ArSSR)

Card 3/3

ALIKHANYAN, A.I.; GARIBYAN, G.M.; LORIKYAN, M.P.; VAL'TER, A.K.; GRISHAYEV, I.A.;
PETRENKO, V.A.; FURSOV, G.L.

Ionization loss of energy by fast electrons in thin films. Zhur. eksp. i
teor. fiz. 44 no.3:1122-1124, Mr '63. (MIRA 16:3)
(Ionization) (Electrons) ...

ALEKSANYAN, A.S.; ALIKHANYAN, A.I.; VEREMEYEV, M.M.; GAL'PER, A.M.;
KIRILLOV-UGHIYUMOV, V.G.; KOTENKO, L.P.; KUZIN, L.A.; KUZNETSOV, Ye.P.;
MERZON, G.L.

Freon 570 liter bubble chamber. Prib. i tekhn. eksp. 6 no.6:34--
38 N-D '61. (MIRA 14:11)

1. Fizicheskiy institut AN SSSR.
(Bubble chamber)

ALIKHANYAN, A.I., red.; NIKITIN, S.Ya., prof., otv. red.;
ISPIRYAN, K.A., red.; AMATUNI, A.TS., red.; KAPLANYAN,
M.A., tekhn. red.

[Physics of elementary particles] Voprosy fiziki elementarnykh chastits. Pod obshchei red. A.I.Alikhaniana. Erevan, Izd-vo AN Arm.SSR, 1963. 594 p. (MIRA 16:12)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. 2. Chlen-korrespondent AN SSSR (for Alikhanyan).

(Particles (Nuclear physics))

ACCESSION NR: AT4014038

S/2918/63/000/000/0553/0572

AUTHOR: Alikhanyan, A. I.

TITLE: Two electrode spark chamber in a magnetic field

SOURCE: AN ArmSSR. Fizicheskiy institut. Voprosy* fiziki elementarny*kh chastits, 1963, 553-572 .

TOPIC TAGS: spark chamber, two electrode spark chamber, particle trajectory, charged particle momentum measurement, inclined track, particle registration accuracy, particle registration efficiency

ABSTRACT: Research performed at the laboratory of Fizicheskiy institut AN ArmSSR (Physics Institute AN ArmSSR) on spark chambers in which the spark traces the chamber trajectory of this particle is reported. The possibility of using such chambers for precision measurement of charged-particle momenta was established by A. Alikhanyan et al. (ZhETF v. 44, 77, 1963). The topics treated are:

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ACCESSION NR: AT4014038

1. Conditions for the occurrence of inclined tracks. 2. Mechanism of formation of inclined track. 3. Accuracy with which the spark traces the particle trajectory. 4. Efficiency of particle registration. 5. Bending of sparks in two-electrode spark chamber placed in a magnetic field. 6. Measurement of particle momentum in a two-electrode spark chamber. The size of the gap and the required accelerating voltage are also discussed briefly. Although the experimental data are yet insufficient for final conclusions, some ideas are advanced with respect to the possible accuracy of the method. It is stated that plans are under way to use the spark chambers to measure the momenta of particles from the accelerator in Dubna, so as to establish their attainable accuracy. Orig. art. has: 25 figures.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physics Institute, AN ArmSSR)

Card

2/3

S/056/63/044/002/063/065
B185/B102

AUTHORS: Alikhanyan, A. I., Asatiani, T. L., Matevosyan, E. M.

TITLE: A two-electrode spark discharge chamber with large gap in a magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 2, 1963, 773-775

TEXT: The authors studied the possibilities of applying large spark discharge chambers to the recording of charged-particle trajectories. The measurements, of which earlier results are given here, were made with the chamber of the cosmic-ray mountain station Nor-Amberd of the Institut, fiziki GKAE (Physics Institute GKAE). The chamber volume is 40 · 40 · 21cm³ and the electrodes of duraluminum are 20 mm thick. The chamber was evacuated to $3 \cdot 10^{-2}$ mm Hg and then filled with neon up to 1.5 atm. Boundary effects were avoided by extending the bottom and top plates outside the chamber like wings. Particle trajectories with a 40° inclination were found to be well reproduced. The same is true for particles entering the chamber through the side walls and for showers.

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A two-electrode spark discharge ...

S/056/63/044/002/063/065
B185/B102

The chamber electrodes are connected to a coincidence circuit with a 0.25-0.3 μ sec delay that starts a discharger generating pulses of 10^{-7} sec duration and 60-80 kv height. The magnetic field strength was $5 \cdot 10^3$ gauss and the resulting trajectory curvature coincided with the streamer channel without visible distortion. For muons the track curvature agreed with the expected value. There are 3 figures.

ASSOCIATION: Fizicheskij institut GKAE, Yerevan (Physics Institute GKAE, Yerevan.)

PRESENTED: December 30, 1962

Card 2/2

L 17633-63

S/050/63/044/003/050/053
EWT(1)/EWP(q)/EWT(m)/BDS/ES(w)-2 AFFTC/ASD/IJP(C)/SSD

Pah-4 GG/JD

AUTHOR: Alikhanyan, A. I., Garibyan, G. M., Lorikyan, M. P., Val'ter, A. K.,
Grishayev, I. A., Petrenko, V. A., and Fursov, G. L. 72

TITLE: Ionization energy losses of fast electrons in thin films 16

PERIODICAL: Zhurnal eksperimental'noy i tekhnicheskoy fiziki, v. 44, no. 3,
1963, 1122-1124

TEXT: G. M. Garibyan (Ref. 1: ZhETF, 37, 527, 1959) showed that whenever a charged particle passes through a sufficiently thin film, its electric field is the same as in the vacuum. Consequently, within such a layer the particle produces ionization as if there is no screening effect due to the medium, i.e., the density effect is not present. The measurements were carried out on the linear accelerator of the Fiziko-tekhnicheskoy institut Akademii nauk SSSR (Physico-Technical Institute of the AN USSR) using a battery of thin films to obtain the total losses with a sufficient accuracy and minimum fluctuations. The results are shown on Fig. 2. The results for a very thin film agree with the theoretical curve derived in Ref. 3 (R. M. Sternheimer, Phys. Rev., 103, 511, 1956). There are 2 figures.

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L 17633-63

S/056/63/044/003/050/053

Ionization energy losses...

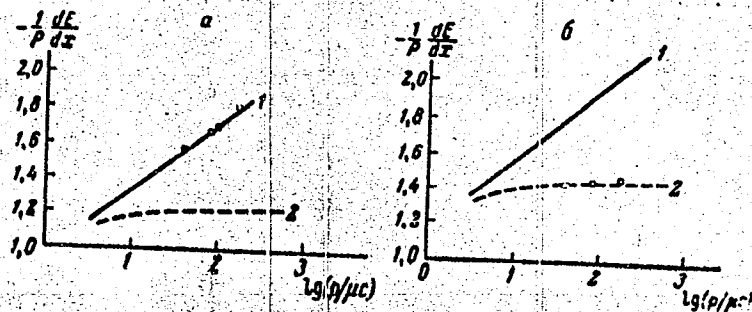


Fig. 2. Theoretical curves and experimental values for losses of energy in polystyrene (a) 10⁻⁶ cm thick and (b) 2·10⁻³ cm thick. 1 - Theoretical curve neglecting density effects; 2 - theoretical curve taking care of the density [polarization] effects. Circles denote experimental results. The ordinate represents the specific transmission in relative units. [Curves are normalized at the 40 Mev electron energy points and the standard experimental error is 1%.]

SUBMITTED: January 7, 1963
Card 2/2

ACCESSION NR: AP4031191

S/0056/64/046/004/1504/1507

AUTHOR: Aleksanyan, A. S.; Alikhanyan, A. I.; Gal'per, A. M.; Kavalov, R. L.; Kirillov-Ugryumov, V. G.; Kotenko, L. P.; Kuzin, L. A.; Kuznetsov, Ye. P.; Merzon, G. I.

TITLE: Study of decays of K_2^0 mesons into three neutral pions

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1504-1507

TOPIC TAGS: neutral kaon decay, electron positron pair, kaon three pion decay, inelastic neutron interaction

ABSTRACT: This is an elaboration of an earlier preliminary report (Sb. Voprosy fiziki elementarnykh chastits. Izd. AN ArmSSR, Yerevan, 1963, p. 324). Some 50,000 stereo photographs were taken and the events classified as K^0 -meson decay were those with 3, 4, 5, or 6 electron-positron pairs directed approximately towards one point, and also V-events. The measure of the convergence of the γ quanta producing the pairs was the maximum distance h from the point of intersection of the trajectories of the two nearest γ quanta to the trajectories of the other γ quanta. Comparison of the histograms corresponding to different numbers of prongs indicates that there exist definite physical reasons which lead to the appearance

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ACCESSION NR: AP4031191

of three or more electron-positron pairs whose vertices are directed approximately towards one point. The calculated probability for the $K_2^0 + 3\pi^0$ decay relative to all K_2^0 meson decay is $0.2 + 0.06$. This agrees with theoretical predictions (23.6%) obtained by assuming the validity of the $\Delta T = 1/2$ rule. The authors are grateful to E. O. Okonov for a discussion of several problems during the planning of the experiment, to Academician V. I. Veksler, I. V. Churilo, and the proton synchrotron crew for making the irradiation possible, and also to I. B. Vartazaryan, L. P. Kishinevskaya, N. V. Magradze, and the laboratory group for help in the reduction of the experimental material. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR); Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering Physics Institute); Fizicheskiy institut GKAE, Yerevan (Physics Institute GKAE)

SUBMITTED: 25Jan64

DATE ACQ: 07May64

ENCL: 01

SUB CODE: NP

NR REF SOV: 004

OTHER: 001

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ACCESSION NR: AP4031191

ENCLOSURE: 01

1 Вид события с электронно-позитронными парами	2 N _{total} h < 1,5 см	3 Число событий, появившихся в результате различных процессов, включая распады $K_2^0 \rightarrow 2\pi^0$			4 Число распадов $K_2^0 \rightarrow 2\pi^0$
		5 N _{случ}	N ($K_2^0 \rightarrow 2\pi^0$)	N _{яд} 6	
Six	1	0	0	0	1
Five	8	2	0	0	6
Four	28	8	3	0	17
Three	157	46	17	8	88
Сумма Sum	194	56	20	8	110

*Convergence parameter h = 2.1 cm.

1 - Number of electron positron pairs in event
 2 - N_{total}, 3 - Number of events resulting from processes other than $K_2^0 \rightarrow 3\pi^0$ decays, 4 - Number of $K_2^0 \rightarrow 3\pi^0$ decays,

5 - number of random events, 6 - number of nuclear interactions

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ALIKHANYAN, A. I.

CO

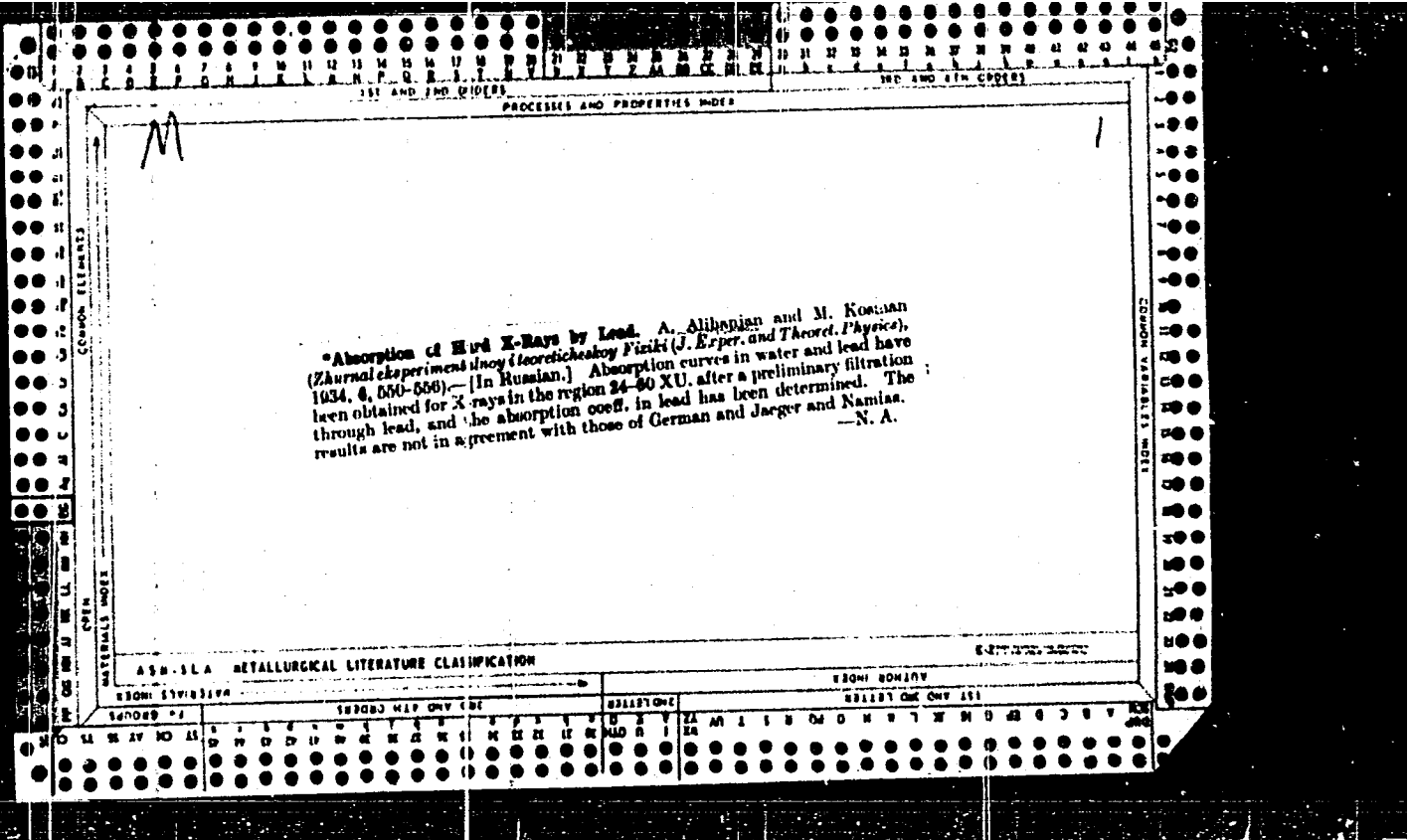
Diffraction of fast electrons. M. Kozman and A. Alikhanyan. *Physik. Z. Sowjetunion* 4, 551-5 (1933); *C. A. 27, 3301*.—The p. d. from a Lange-Max tube to produce high-voltage electrons which were diffracted by an evap. Ag film. The De Broglie wave length of the electrons is 0.0136 Å., corresponding to an energy of 590 kv. Howard A. Smith

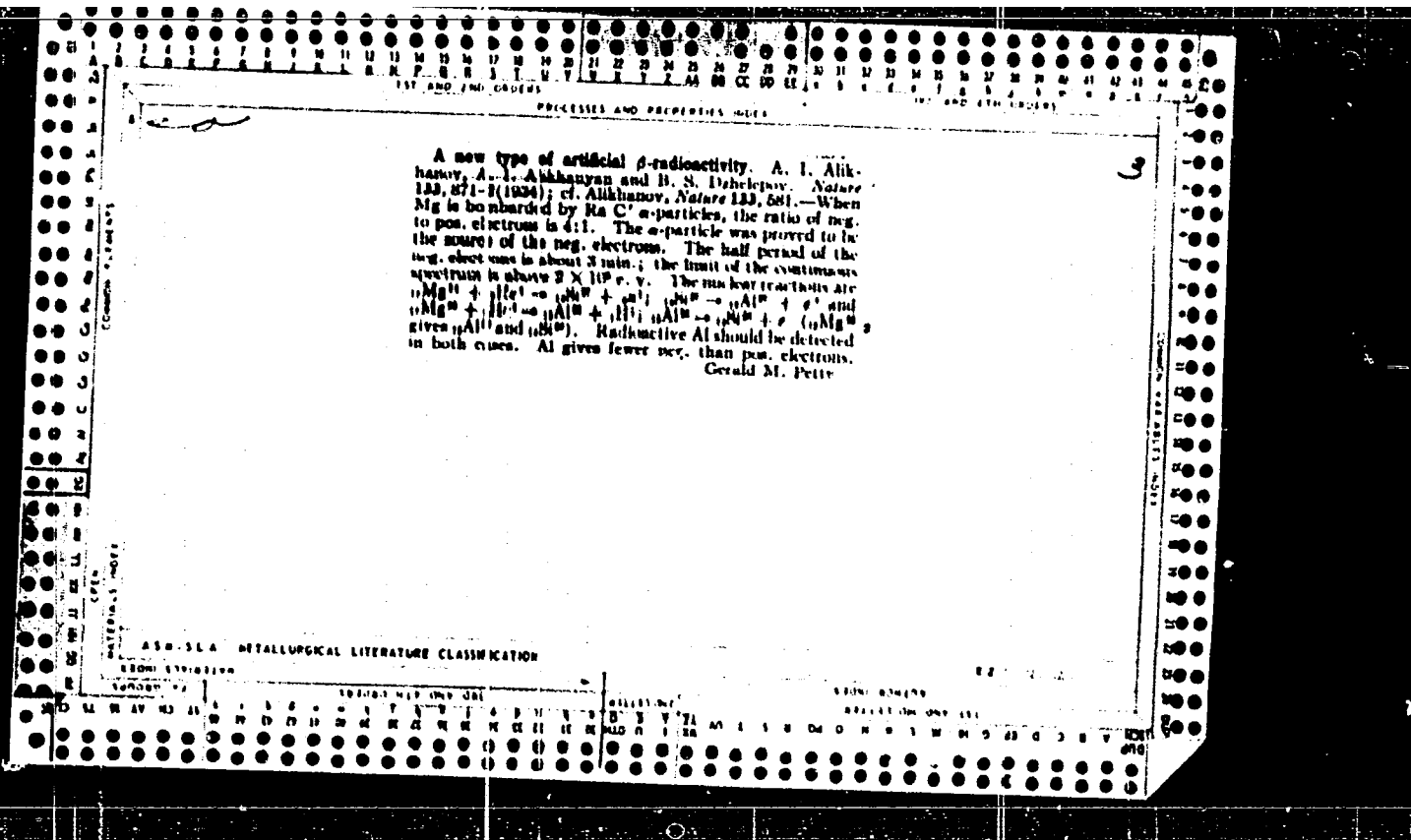
3

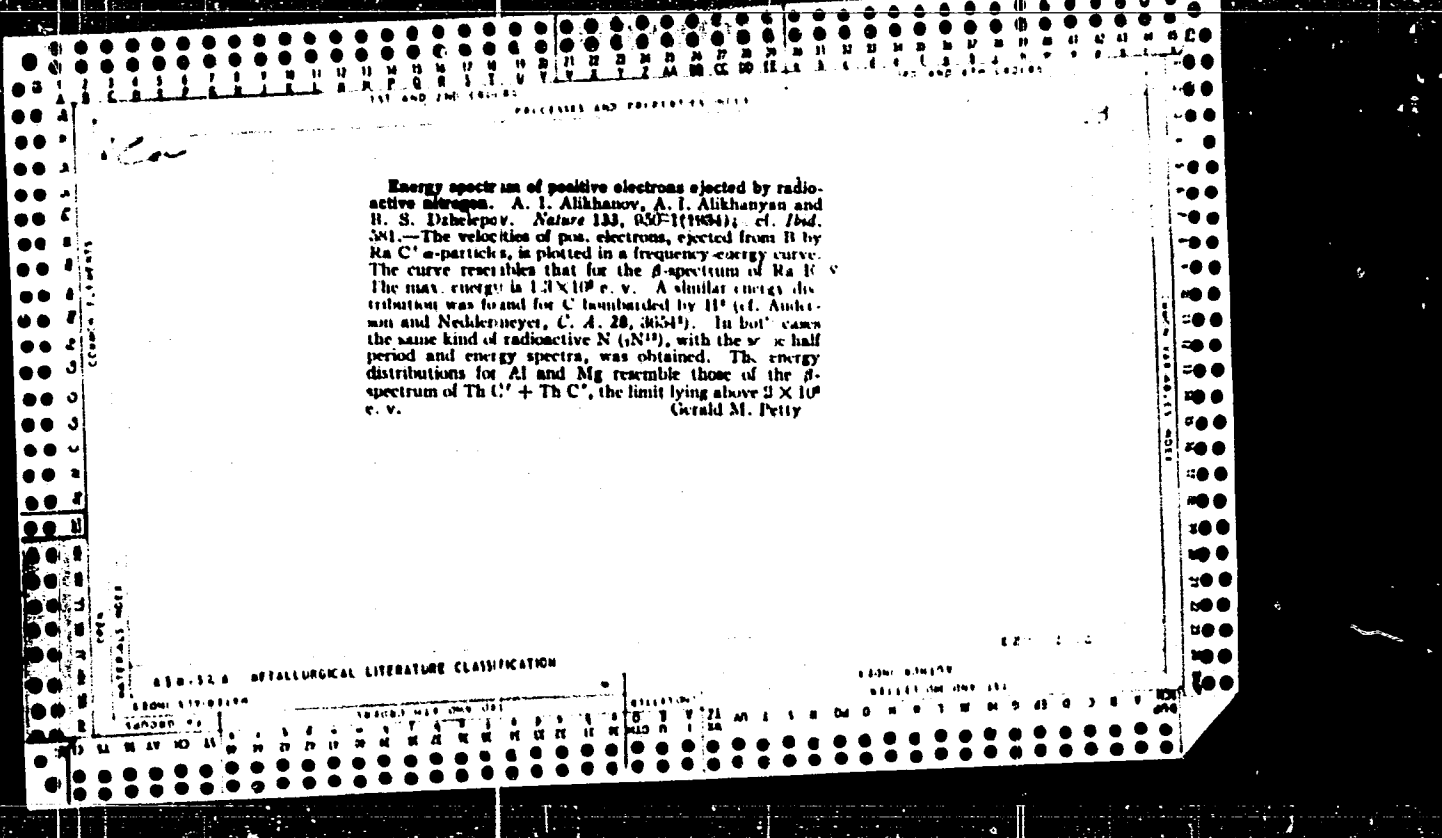
ASB-11A METALLURGICAL LITERATURE CLASSIFICATION

STON BOWING

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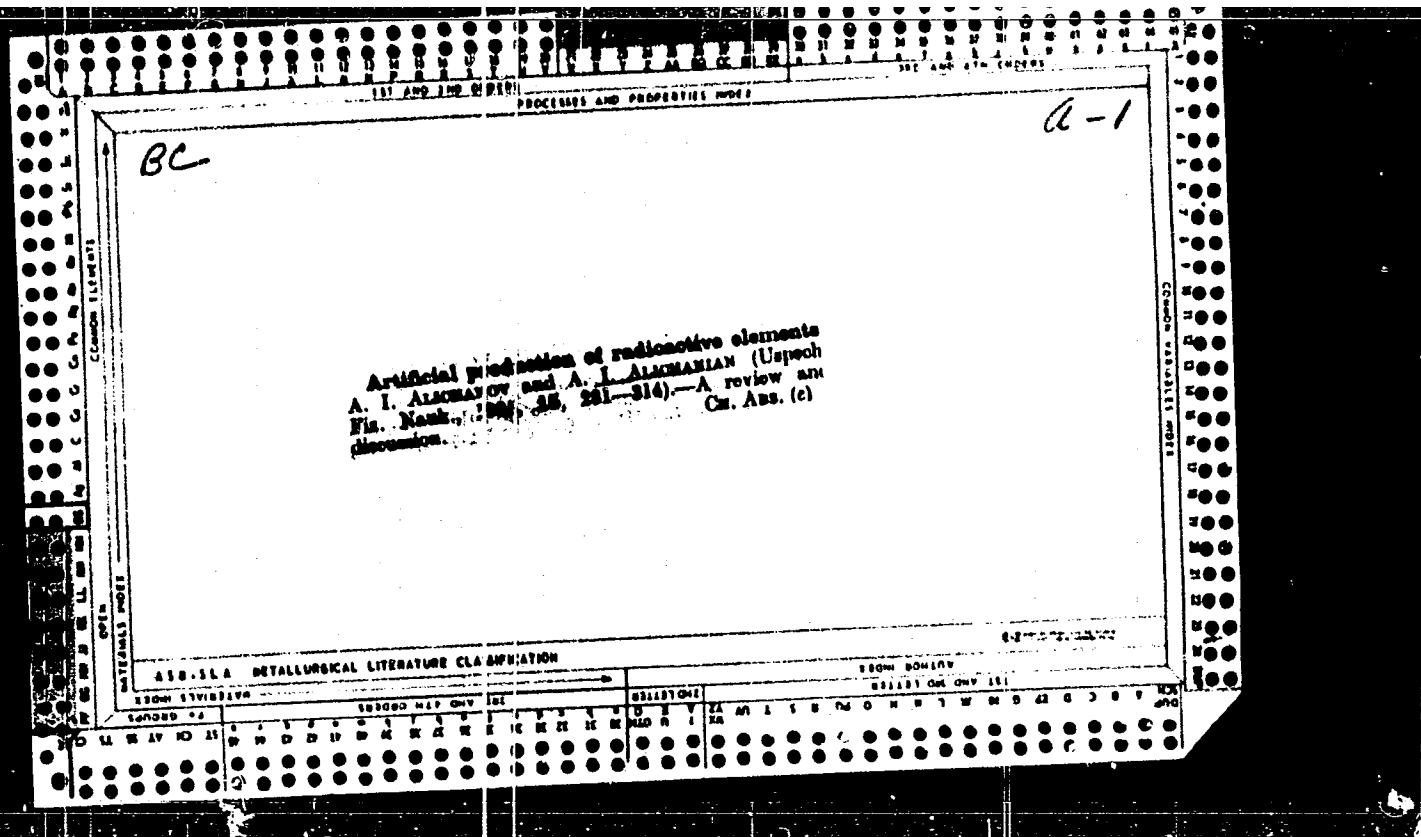
PROCESSES AND PROPERTIES WITH

Limits of the energy spectra of positrons and electrons from artificial radioisotopes. A. I. Alkhanov, A. I.

Alkhanov and B. S. Dabelekov. *N. Sura* 134, 254-5 (1937); *C. A. 28, 5120*.—Limit in the positron spectrum of R₁-N (N from bombardment of B by α-particles) is 1450 kv; for α-particles of 5.5-cm. range. For R₂-P (from Al) it is 3700 for 6.1- and 5.2 cm.-range particles. Limit in the electron spectrum of R₂-Al (from Mg) was 3050 for 0.1-cm. particles. The dependence of electron yield on the range of the particle is given. A R P (1)

METALLURGICAL LITERATURE CLASSIFICATION

E-2



ALIKHANYAN A.I.
ALICHANIAN, A.I., ALIKHANOV, A.I., and DZELEPOV, B.S.

" β -Spectra of Some Radioactive Elements," Nature, Vol. 135, p. 393, 1935.

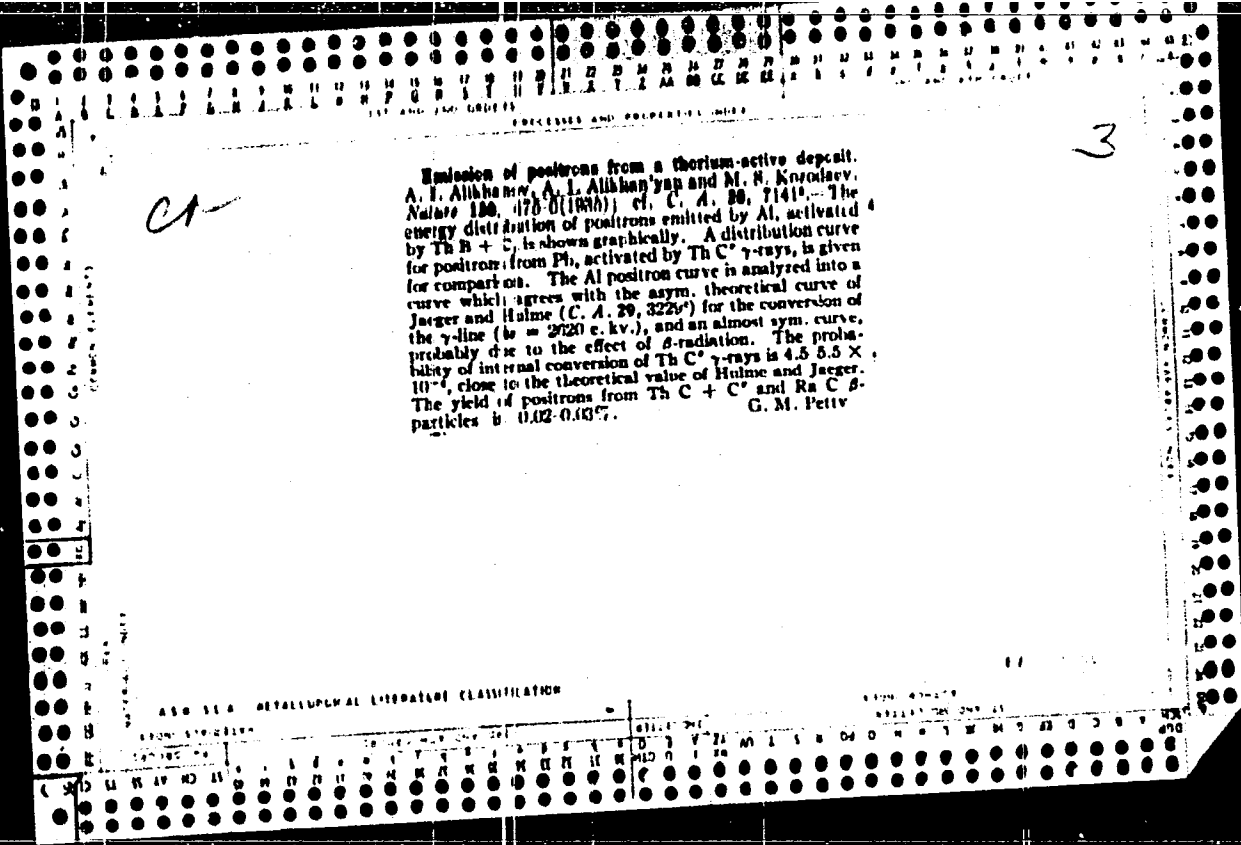
Physical-Technical Institute, Leningrad.

ALIKHANYAN A.I.

ALICHANIAN, A.I., ALIKHANOV, A.I., and DZELEPOV, B.S.

"Beta Ray Spectra of Artificially Produced Radioactive Elements," Nature,
Vol. 136, pp. 257-258, 1935.

Physical-Technical Institute, Leningrad.



ALIKHANYAN A.I.

ALICHANIAN, A.I., ALIKHANOV, A.I., and KOZODAEV, M.S.

"Emission of Positrons by a Radioactive Source," Le Journal de Physique
et le Radium, Serie 7, Vol. 7, pp. 163-172, 1936.

Institut Physico Technique de Leningrad.

АЛИХАНОВ А. И.

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

"The Continuous Spectra of RaE and Ra³⁰," Nature, Vol. 137, pp. 314-315,
1936.

Physical-Technical Institute, Leningrad.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3336. Conservation of Momentum in Positron Annihilation. A. J. Alcheringas, A. J. Alchenov and L. A. Arzirmovic. *Comptes Rendus (Doklady) de l'Académie des Sciences, U.S.S.R.* 1. 7. pp. 287-288, 1936. *In German.*--The coincidence method of Kienpferer is developed to establish whether the two γ -ray quanta produced at the annihilation of a positron are emitted in opposite directions. The authors observe the coincidences which occur when two pairs of counters, one counter behind the other, are placed horizontally, one pair on each side of the source of positrons, and find that after allowing for coincidences due to cosmic rays, etc., this number is more than twice that observed when one pair of counters is moved to a position vertically above the source. They conclude that at least sometimes two quanta are emitted in opposing directions, according to the law of conservation of momentum. K. M. C.

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438.554 METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

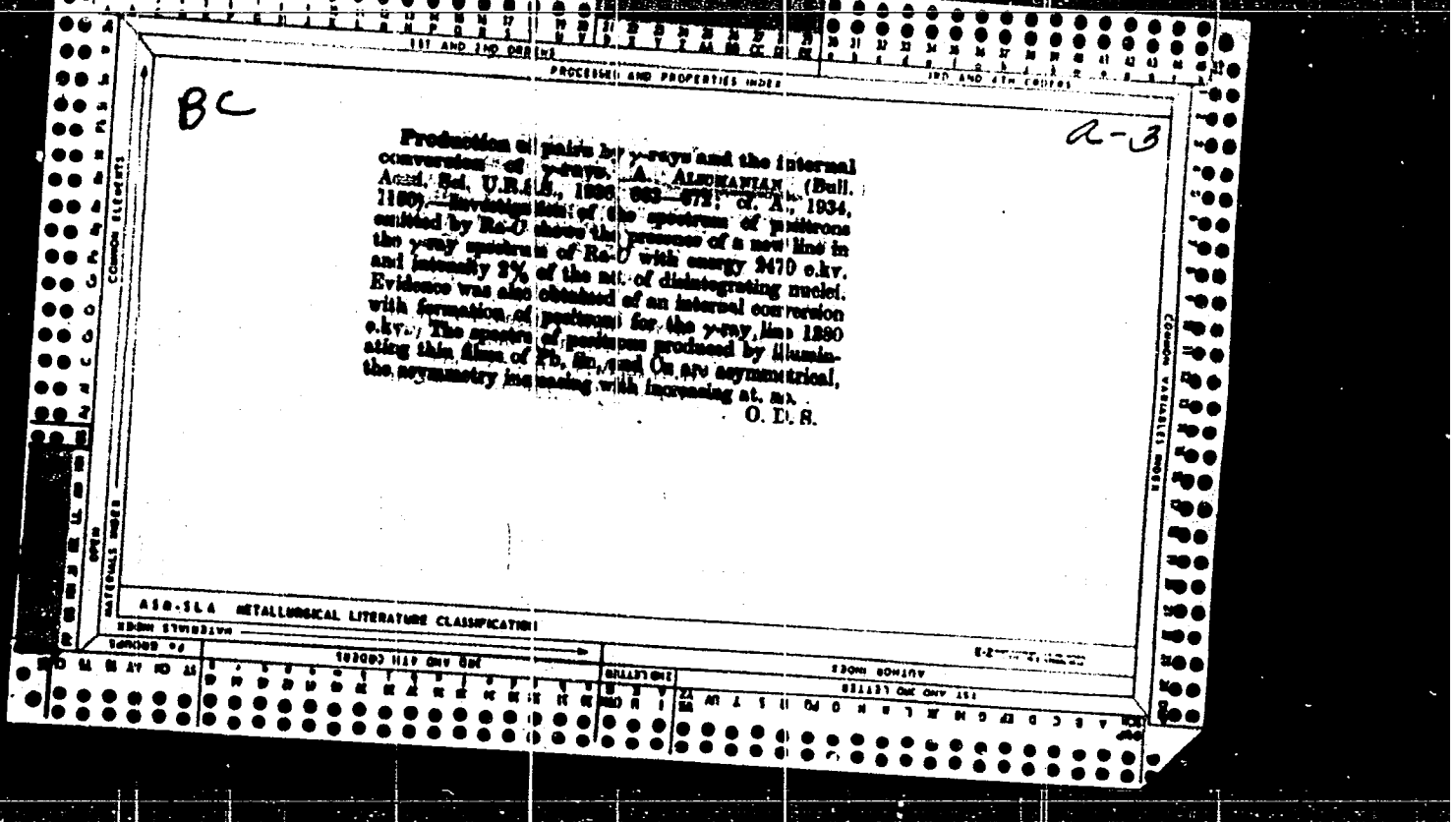
PROBLEMS AND PROPERTIES

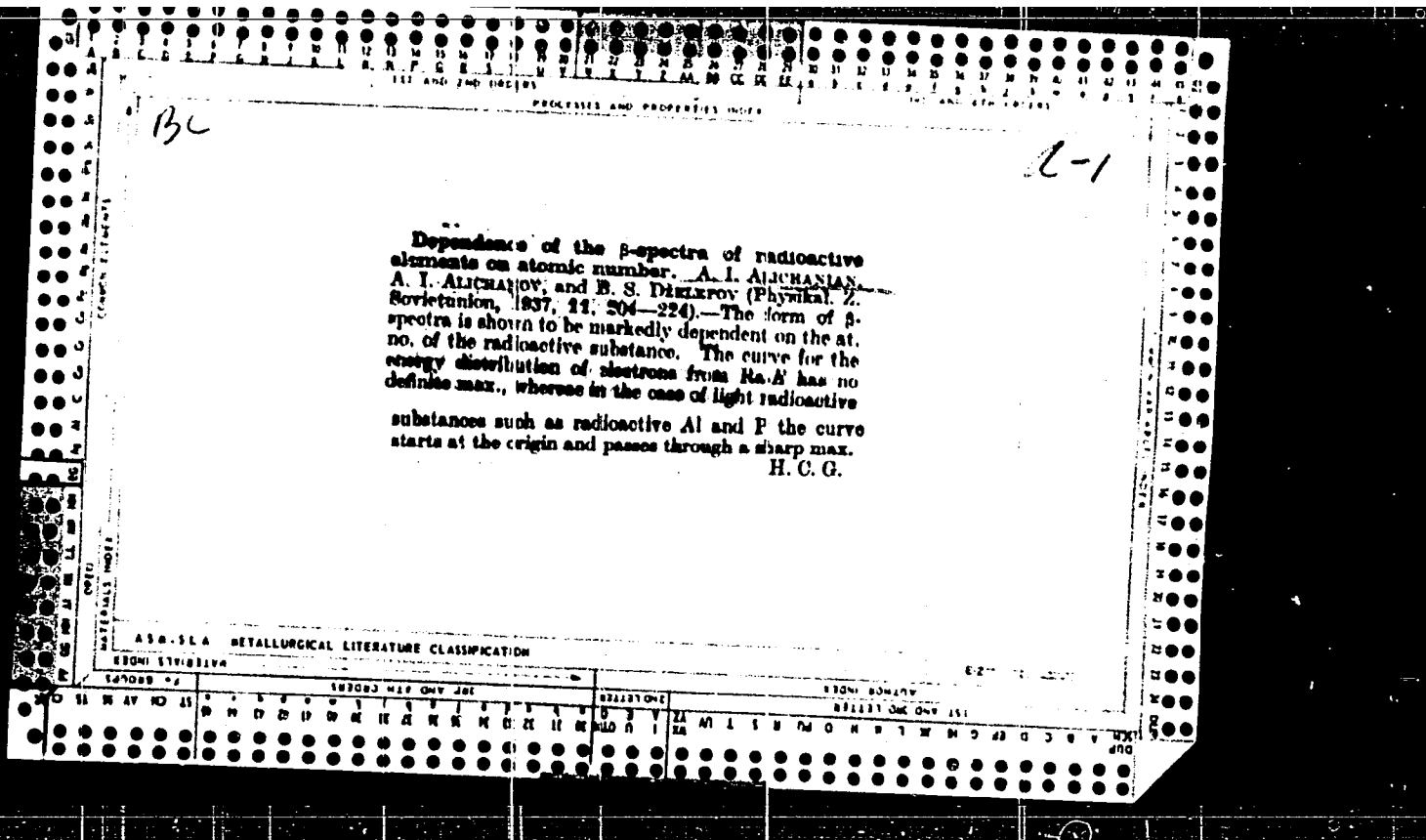
The investigation of artificial radioactivity. A. I. Alikhanov, A. I. Alikhanov and B. S. Dabelesov. *Physik. Z. Sowjetunion* 10, 78-102 (1939) (in English). The energy of the β -particles was measured by magnetic analysis, and the particles were detected by means of 2 Geiger-Müller counters, coincident discharges of which were recorded with an amplifier. The radioelements were prep'd. and exam'd. after chem. treatments which varied with the elements. The results obtained are summarized in the following table:

Element	At no	Half period of decay	Upper limits of β ray spectrum in μ A.
P	15	14.7d	1050 \approx 100
Mn	25	2.5h	3200 \approx 100
Br I	35	18m	2000 \approx 100
Br II	35	4.2h	2050 \approx 100
Br III	35	36h	850 \approx 200
Rh I	45	44z	2500 \approx 100
Ag I	47	22z	2700 \approx 100
I	53	25m	2100 \approx 100
Ir	77	19h	2200 \approx 200
Au	79	2.7d	1150 \approx 200

The relation between the decay constants, and the spectral limits of the majority of the new radioactive elements cannot be put in the simple form found by Sargent for the natural radioactive elements. In order to find out whether any relation exists between the decay constants, and spectral limits and whether the light elements can be divided into 2 classes according to the character of this relationship, use was made of Fermi's theory (cf. C. A. 28, 5329) of β -disintegration with neg. results. M. F.

ASB-31A METALLURGICAL LITERATURE





Bc

d-1

γ -rays from Mithium bombarded with protons.
 A. I. ALCHAIKIAN (Physical Z. Sovietunion, 1937,
 11, 362-364). The electron pairs observed by Crane
 and Gaertner (cf. this vol., 100) must have been
 largely produced by internal conversion. The differ-
 ence in the behavior of the γ -quanta 14.4 and 17.5
 m.e.v. with respect to the formation of pairs and the
 Compton effect, can therefore be explained without
 the hypothesis of Crane (*ibid.*, 110). O. D. S.

A 13-11.3 METALLURGICAL LITERATURE CLASSIFICATION

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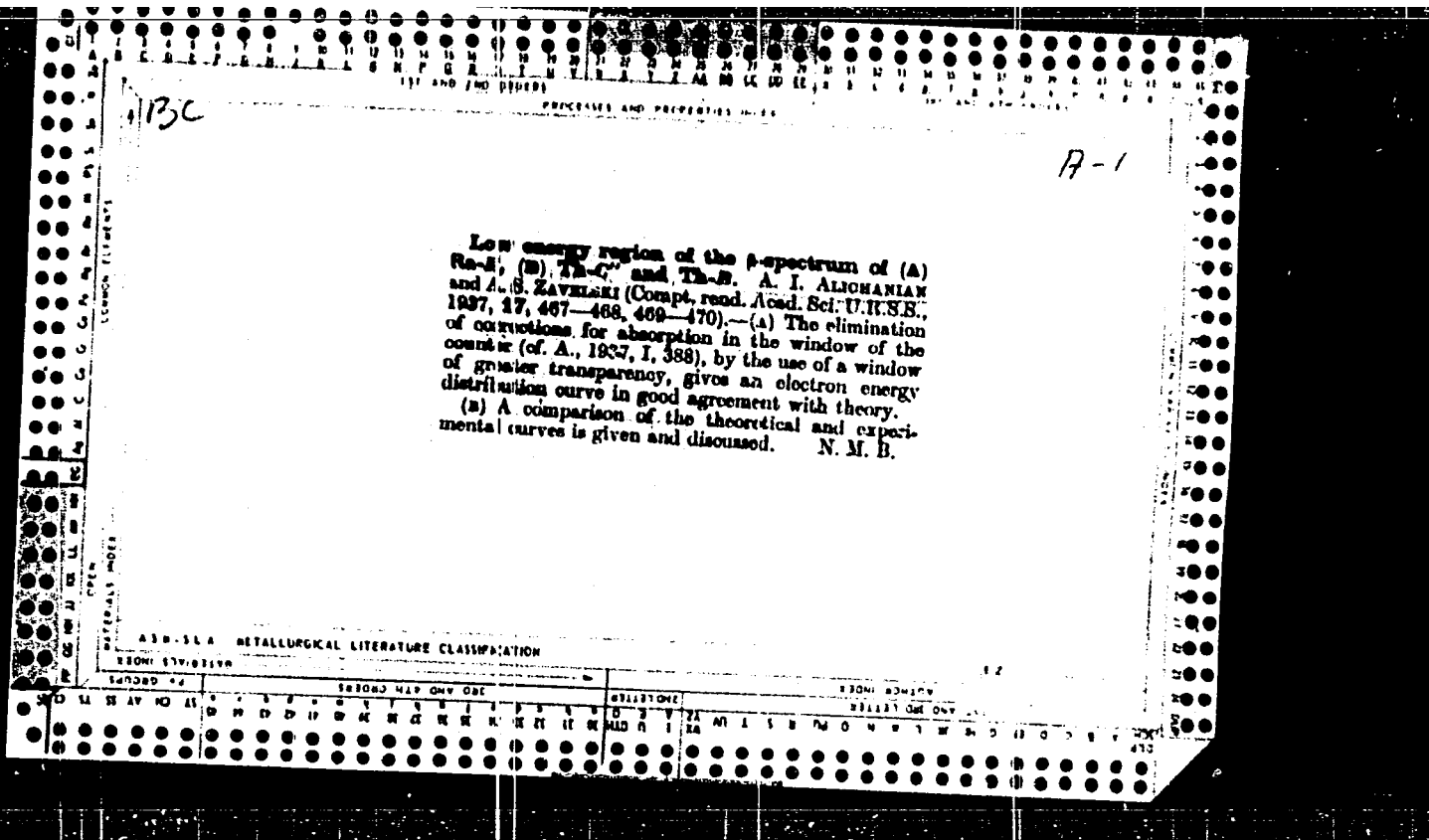
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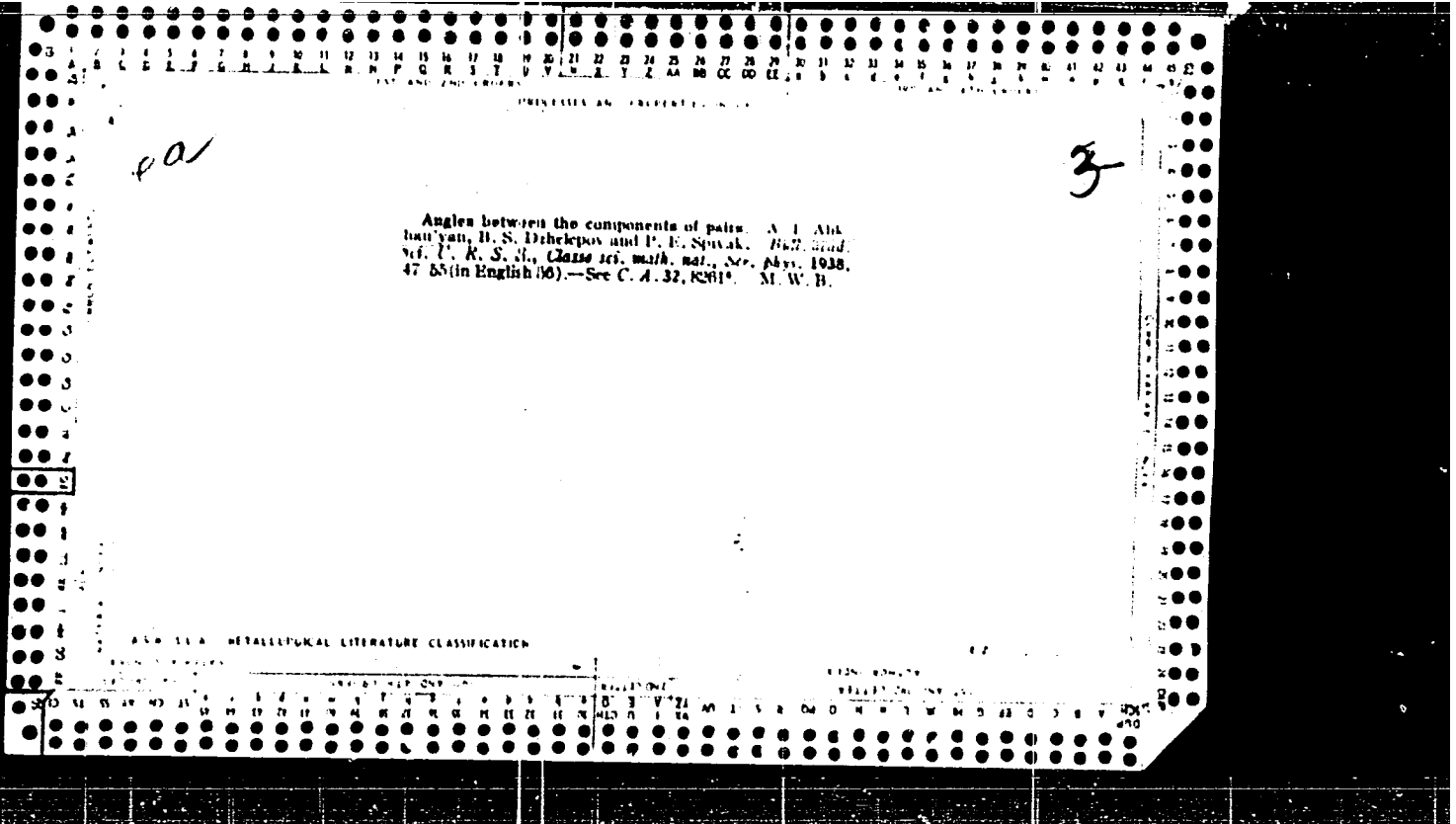
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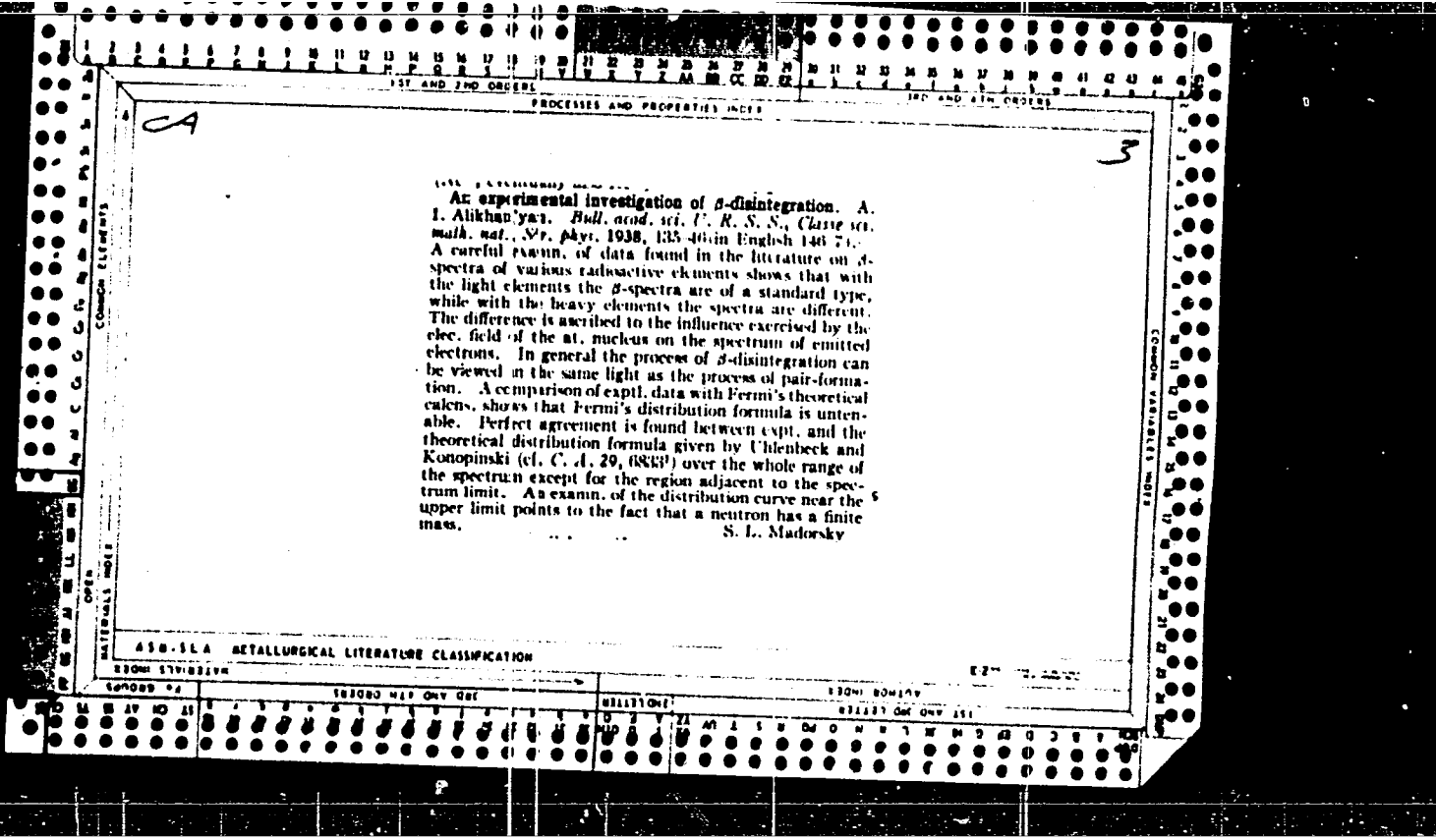
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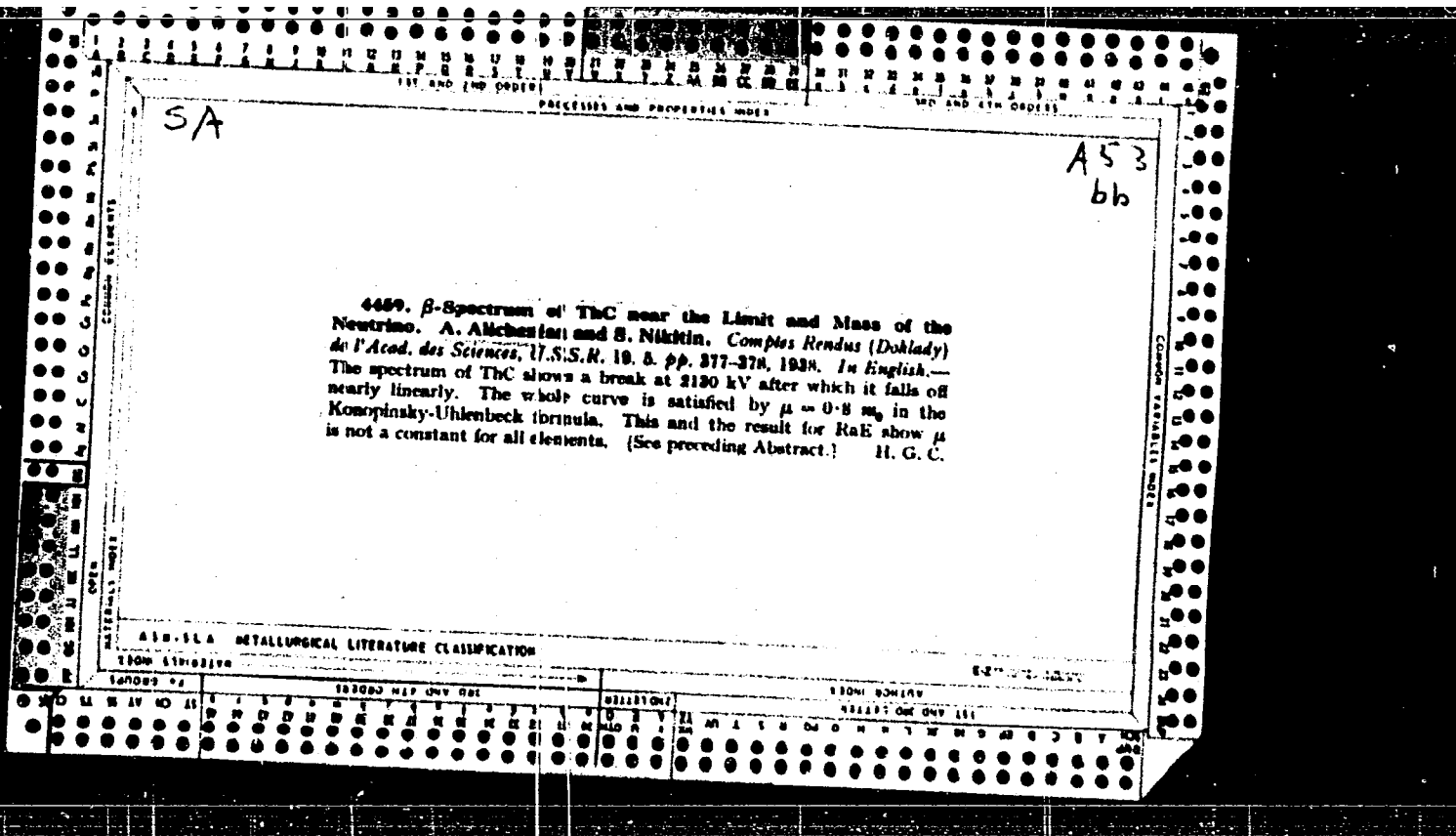
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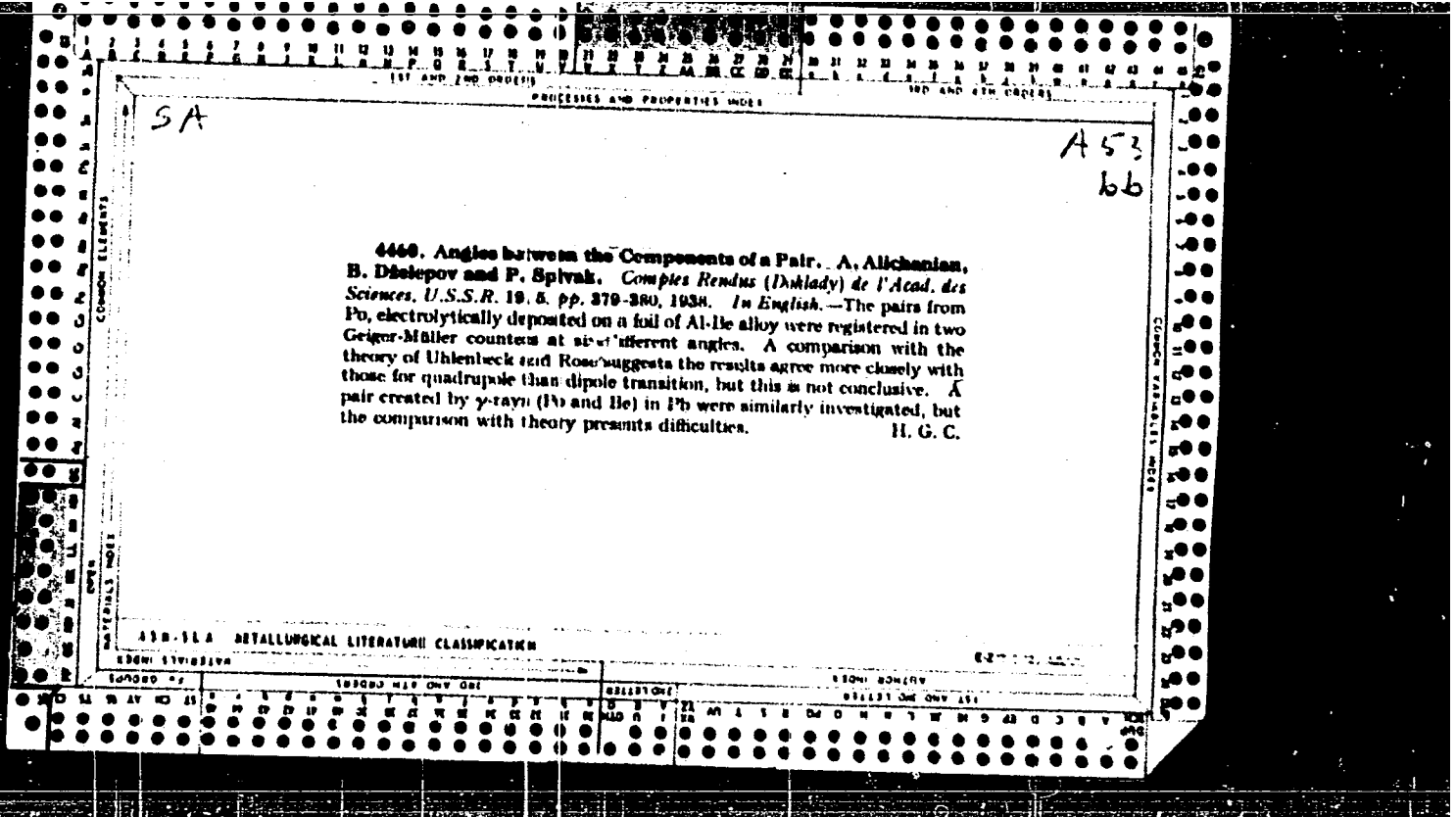
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bb

4458. β -Spectrum of RaE near the Upper Limit and Mass of the Neutrino. A. Alkhanian, A. Alkhanov and B. Dolegov. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 19, 5, pp. 275-276, 1938. *In English.*—The spectrum of β -particles from RaE departs from that given by the Uhlenbeck-Konopinsky formula in the upper limits. There is a change in the curve at about 1120 kV, after which the number of electrons decreases nearly linearly. The whole curve fits the Uhlenbeck-Konopinsky theory for $\mu = 0.3 m_0$. [See Abstract 1577 (1938) and following Abstract.] H. G. C.

ASH-55A METALLURGICAL LITERATURE CLASSIFICATION

SANDS #2		SANDS #1		SANDS #3	
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
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31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
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55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
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85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102

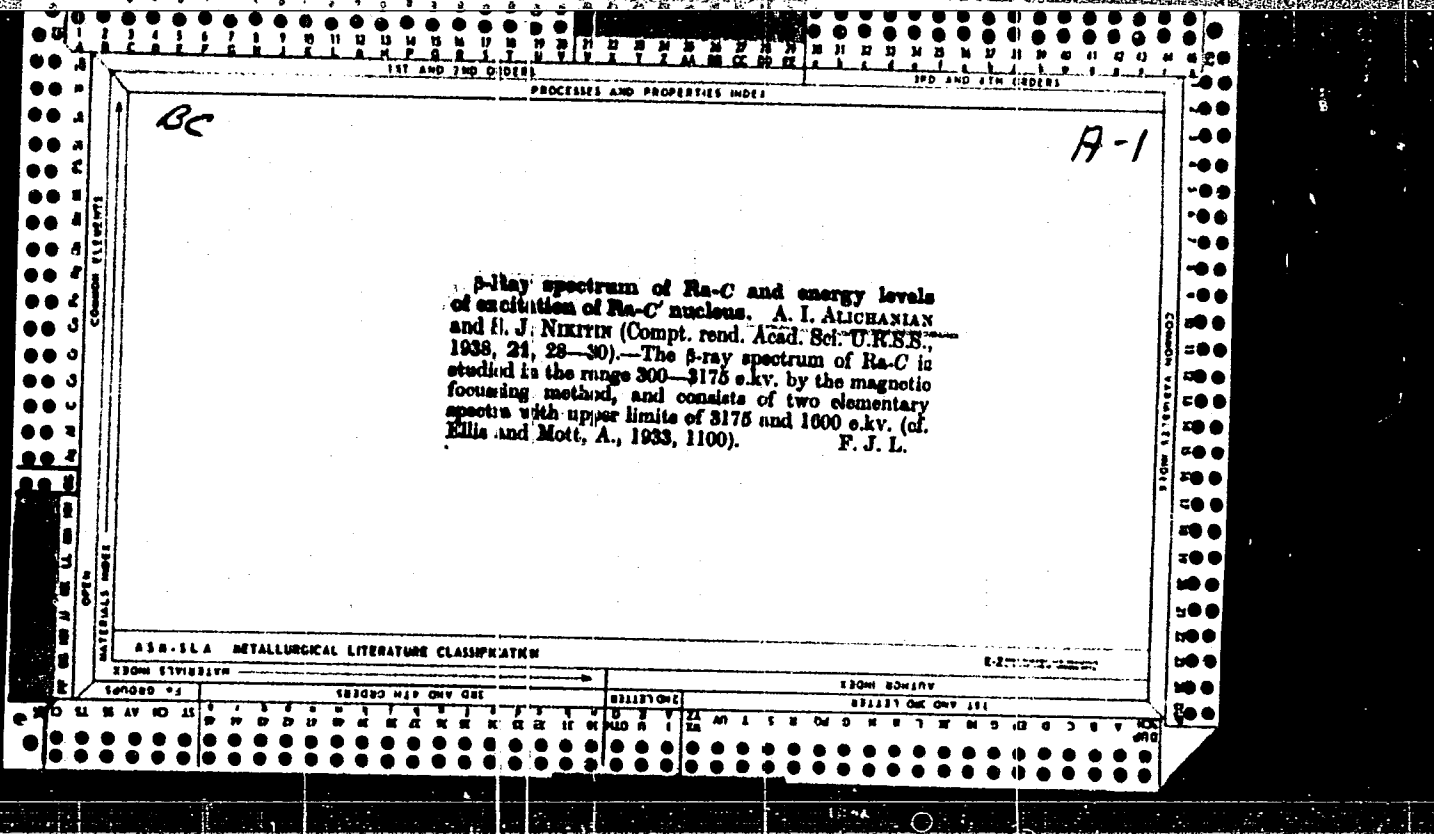




PROCESSES AND PROPERTIES

Measurement of e/m_e for β -particles of radium C. A. I. Alikhanov, A. L. Alikhan'yan and M. Kozlov. *Compt. rend. acad. sci. U. R. S. S.* 20, 427-8(1938)(in English).--Analysis of the β -particles from Ra C with a mass spectrograph shows that if heavy electrons, with masses 2, 3, 4 or 5 m_e , are emitted in addn. to ordinary electrons, the ratio of heavy to ordinary electrons is less than 1:300. Since this ratio is much smaller than that ruled for the emission of heavy electrons, apparently electrons with masses from 2 to 5 m_e do not exist in nature. Analogous results are obtained with β -particles from Ra E. L. R. Steiner

ASME-STEEL METALLURGICAL LITERATURE CLASSIFICATION

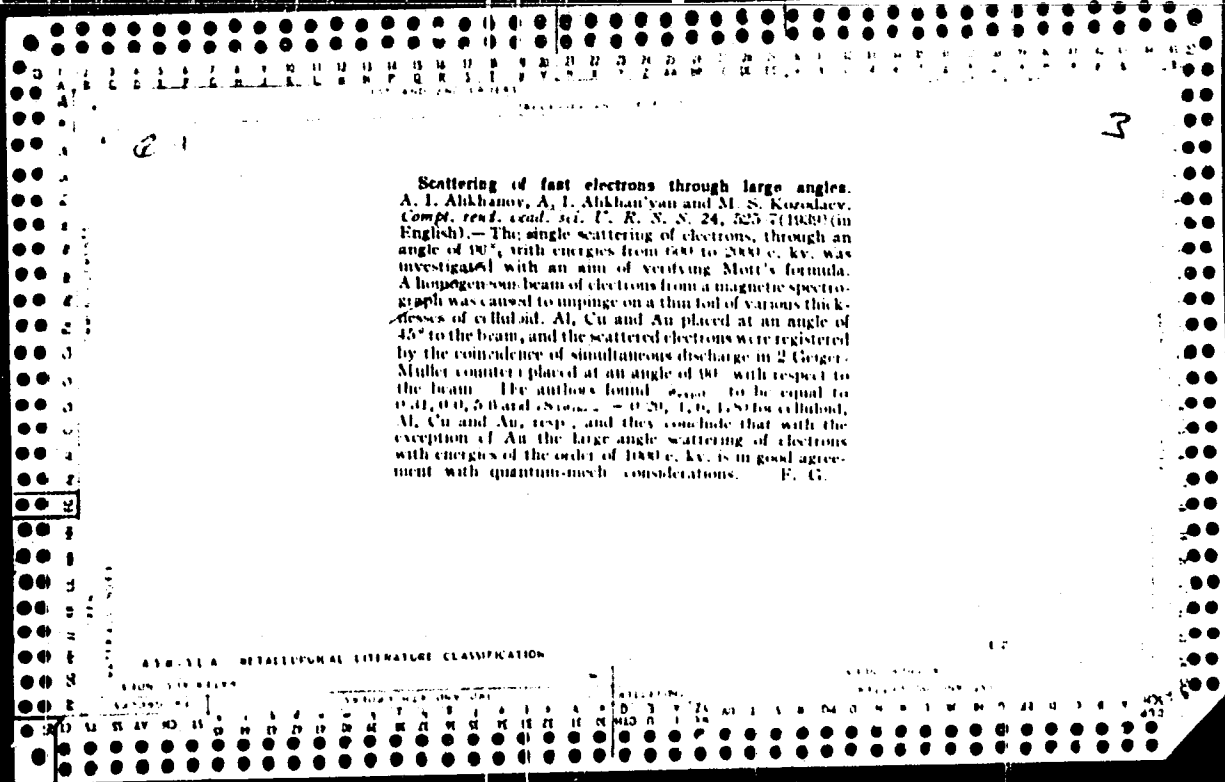


ALIKHANIAN A.I.

ALICHANIAN, A.I., ALIKHANOV, 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.

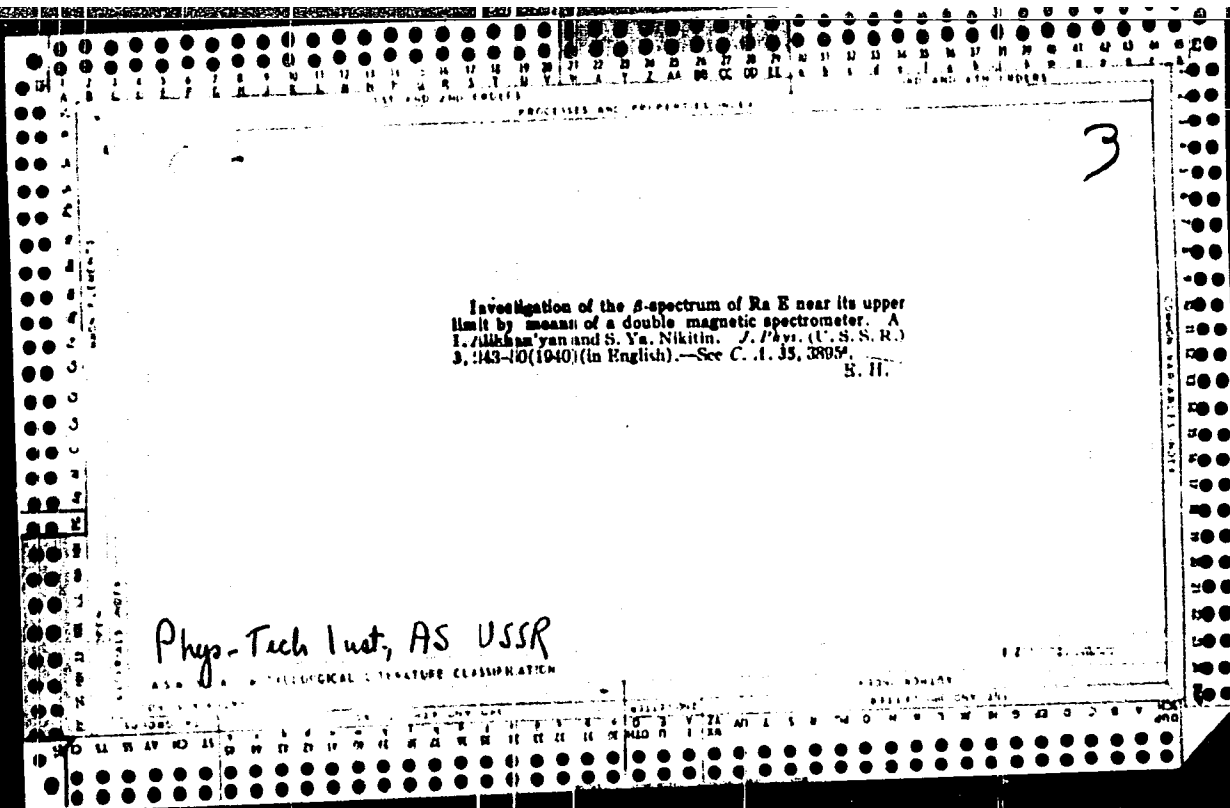


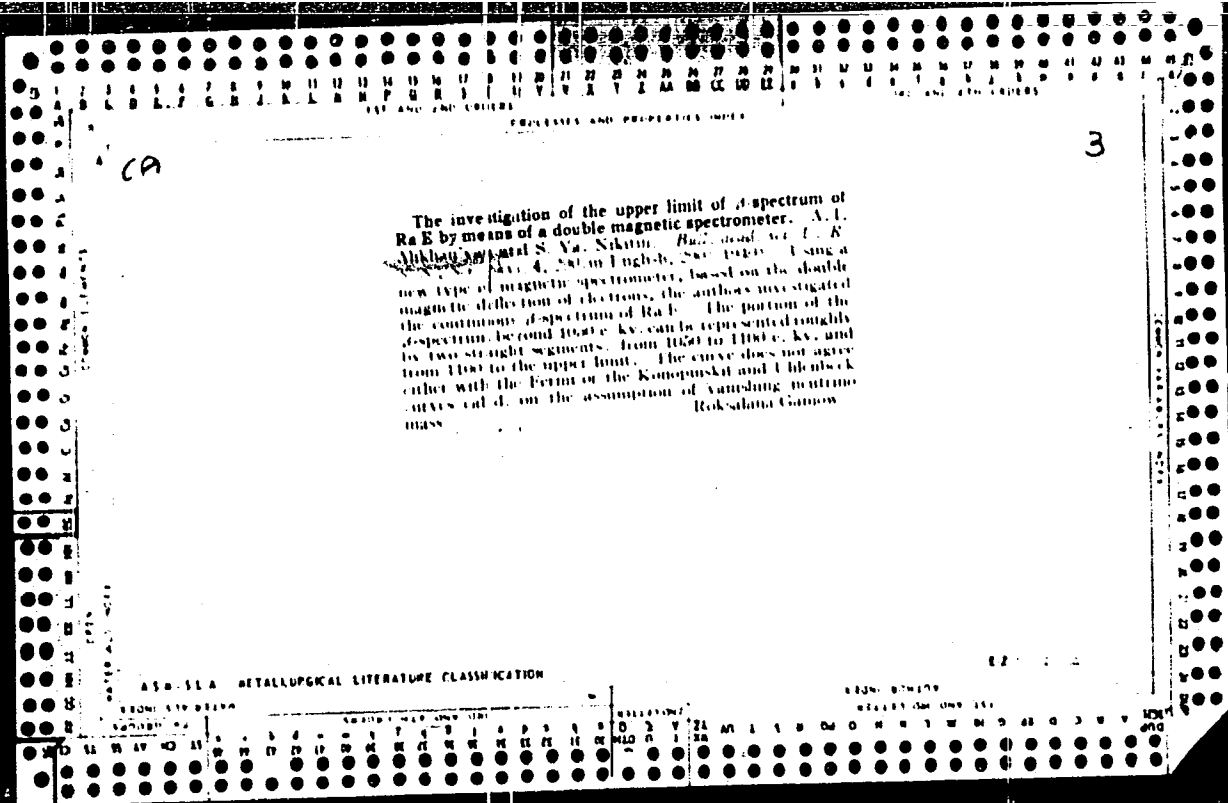
191 AND 190 ENGINE
PROCESS AND PROPERTIES INDEX
191 AND 190 ENGINE

Energy losses of fast electrons. A. I. Alkhanov and A. I. Alkhanova. *Compt. rend. acad. sci. U. R. S. S.* 25, 192-4(1931)(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 calcul. 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, 1569) and Rublig and Crane (*C. A.* 32, 4423)). The results do not allow for any conclusions concerning cases when the loss in energy experience by the electrons is very high. F. Gonet.

Phys-Tech Inst., Leningrad

ASB-PLA METALLURGICAL LITERATURE CLASSIFICATION





ALIKHANYAN, A.

Zhur. Fiz.,
"Die Regulierung des Blutkreislaufs in Auge," Vol. 28, No. 1, pp 72-87, 1940
(and 88-103)

A

3

Measurement of the angle-independent intensity of the soft and the hard component of cosmic rays at 3250-meter altitude. A. I. Allikhanov, A. I. Alikhanyan, and G. M. Mirianashvili (Phys. and Geophys. Inst., Acad. Sci. Georgian S.S.R., and Tbilisi State Univ.). *Bull. Acad. Sci. Georgian S.S.R.* 4, 617-40(1943)(in Georgian and Russian); cf. *C.A.* 41, 336. — A setup involving a small (7 cm. long, 2 cm. diam.) counter disposed between 3 counters in parallel permits recording particles without limitation to any direction and is free from the error inherent in measurements in a given solid angle which record not only single particles but pairs and showers as well. The intensity ratio r of the soft and the hard component was obtained from measurements with and without a 10-cm. Pb screen. At 3250 m. altitude, $r = 0.65$ as against 0.55 at 1000 m. This increase is considerably greater than could be expected if the whole of the soft component were constituted by meson-disintegration electrons; from 1000 m. to 3250 m., r would increase 1.3 times; hence, at 3250 m., r should be $= 0.45$. Subtracting from r at 1000 m., 0.33, the contribution of π particles, 0.07, multiplying by 1.3 and adding 0.07, one would find at 3250 m., $r = 0.43$. Consequently, at this altitude about $1/3$ of the total soft component must be constituted by a radiation unrelated to meson disintegration and increasing with altitude much faster. From 1000 to 3250 m., the intensity of the hard component increases 1.8 times. N. Thon

ASB.55A METALLURGICAL LITERATURE CLASSIFICATION

ALIKHANYAN 4818

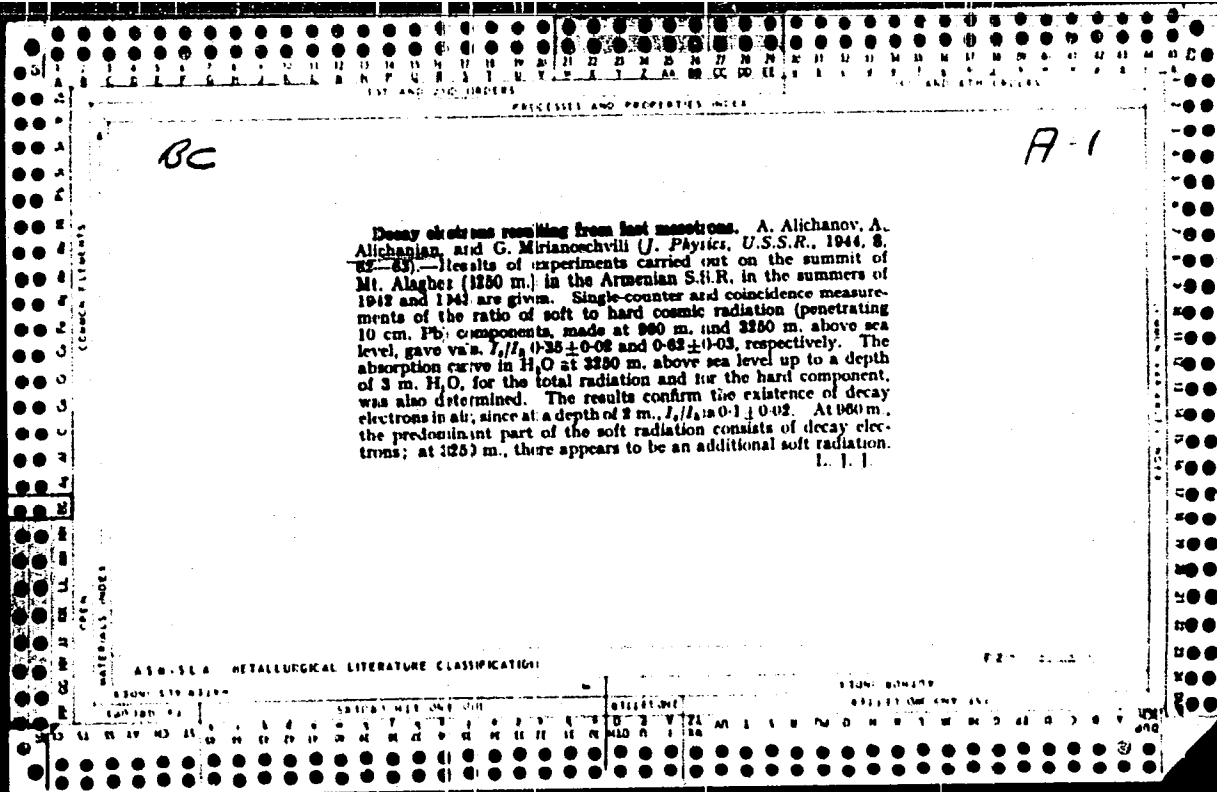
600

1. ALIKHANOV, A.I., Academician; ALIKHANYAN, A.I.

2. USSR (600)

"New Facts About the Nature of Cosmic Rays."
Academician Acad Sci Armenian SSR. Vest. Ak.
Nauk SSSR, No. 3, 1944.

9. ~~████~~ Report U-1551, 7 November 1951.



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LEFT AND RIGHT SIDES

PROCESSES AND PROPERTIES INDEX

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The absorption of the soft component in water of an altitude of 3200 m. ALCHAMIAN, A., ALCHAMIAN, A., KOCHAMAN, N., KVAREZAVA, I., AND MIRIAN-KHVELI, G. *J. Phys. USSR*, 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.

METALLURGICAL LITERATURE CLASSIFICATION

REGIONAL INDEX

SUBJECT INDEX

CROSS INDEX

PROCESSES AND PROPERTIES INDEX

3

Existence of the third component of cosmic rays. A. I. Alikhanov and A. I. Alikhan'yan. *J. Phys. (U.S.S.R.)* 8, 314-15(1944). Data obtained for hard and soft radiation at an elevation of 3250 m. with counters do not agree with those obtained with ionization chambers, the latter giving $J/J_0 = 1.15$. This result, with consideration of other observations, is interpreted as indicative of a third component, not connected genetically with mesotrons, electrons, or photons. S. L. Gerhard

ASTM A54 METALLOGICAL LITERATURE CLASSIFICATION

1901 BOMBY

PROCESSED AND PROPERTY INDEX

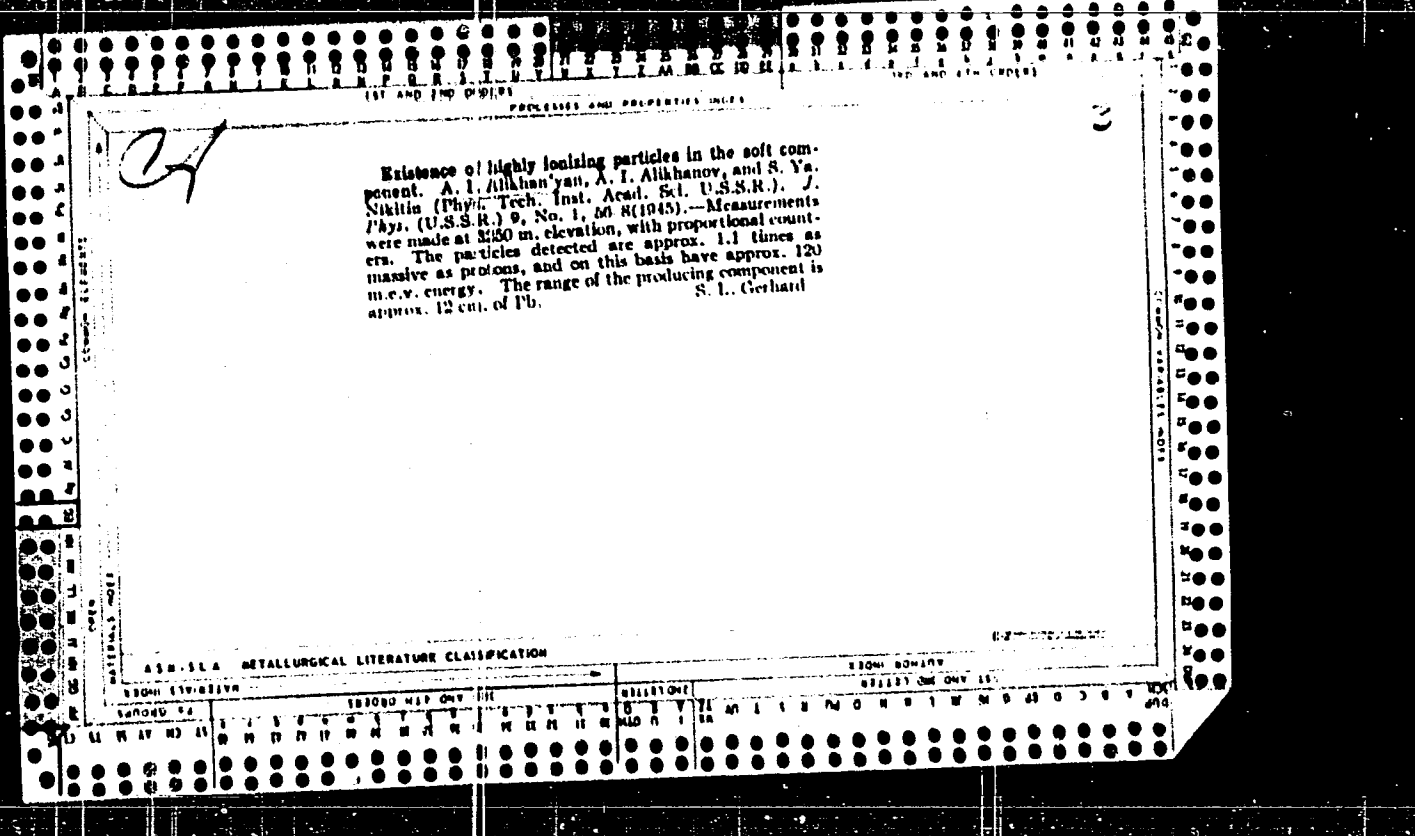
21

Investigation of extensive showers. A. I. Alikhan'yan and T. Ashtiani (Yerevan State Univ. and Phys. Tech. Inst., Acad. Sci. U.S.S.R.). *J. Phys. (U.S.S.R.)* 9, No. 1, 55-9(1945).—Measurements were made at 3250 m. elevation, on the no. of double and triple coincidences as a function of the distance between counters, 10 to 3000 cm. Only at distances less than 1 or 2 m. does the no. of coincidences rise appreciably. The large no. of coincidences at small distances is attributed to narrow showers.
S. L. Gerhard

Yerevan State U. + Phys. Tech. Inst, AS USSR

ASB-31A METALLURGICAL LITERATURE CLASSIFICATION

GROUP	CLASS	SUBCLASS	SECTION	ITEM



100 AND 2TH DIGIT

PROCESSES AND PROPERTIES INDEX

WE.

Geophysical & Astronomical Phenomena

73

STATION 451: 701

The Composition of the Soft Component of the Cosmic Rays at an Altitude of 2800 m above Sea Level. A. Alchanov & A. Alchanian. (*J. Phys. U.S.S.R.*, 1943, Vol. 6, No. 2, pp 73-86.) Cosmic ray measurements by means of counters and ionization chambers showed a systematic difference between the data obtained by the two methods. This is due to the presence in the soft component of particles with ionization power exceeding that of the relativistic particles 2.5 to 3.5 times. It is shown that these particles constitute about 20% of the intensity of mesotrons and that they are not connected genetically with the electrons, quanta, or mesotrons and that they are produced by an independent component.

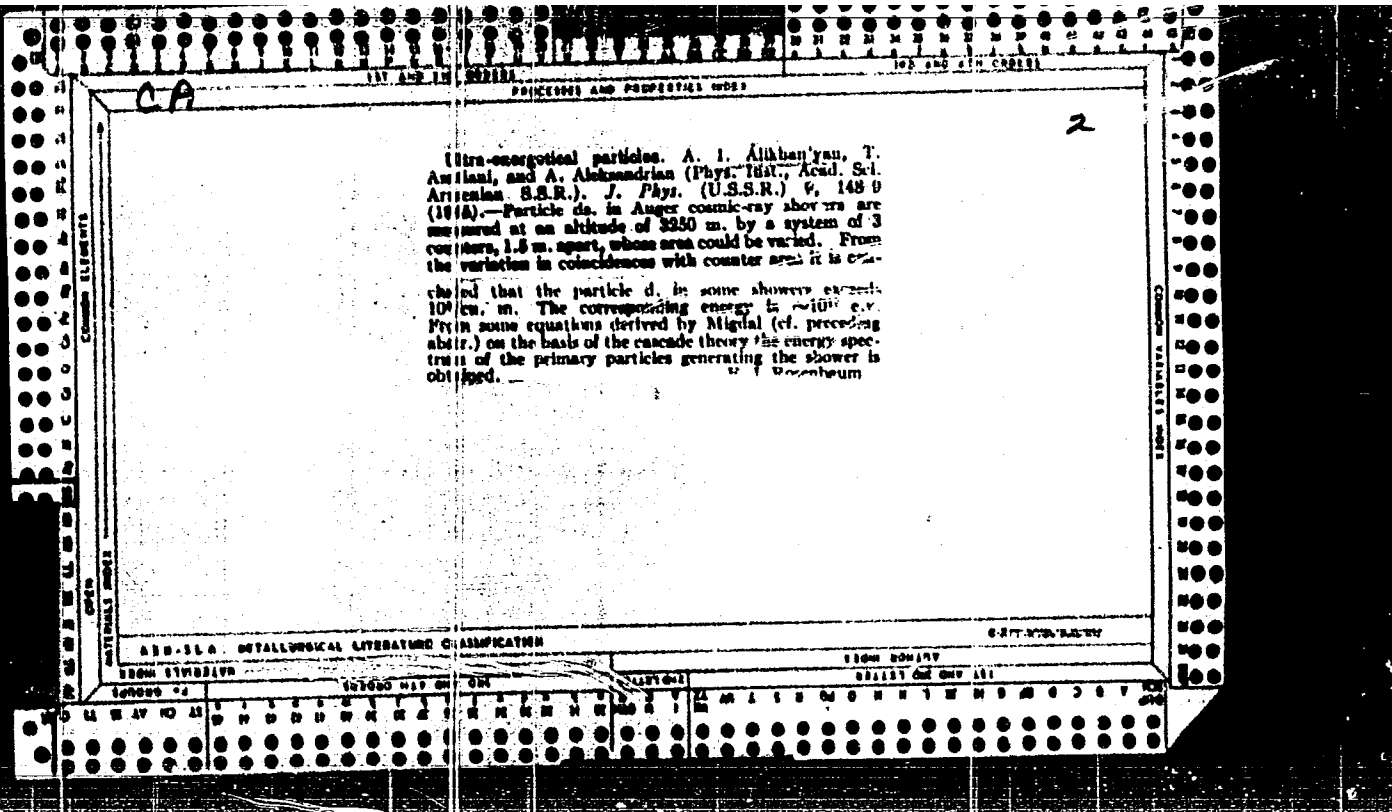
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ASU-55A METALLURGICAL LITERATURE CLASSIFICATION

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PROCESSES AND PROPERTIES INDEX

3

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.), *J. Phys. (U.S.S.R.)* 9, 167-73 (1945); cf. *C.I.* 40, 272².—An arrangement of proportional counters with linear amplifiers, triggered 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 estm. of the mass and range showed that the particles probably are protons of about 150 m.e.v. energy.
A. O. Allen

ASR. 51A METALLURGICAL LITERATURE CLASSIFICATION

EDOM STATION

GROUP #

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ALIKHANYAN, A. I.

"Third Component of Cosmic Radiation," a report given at the sessions of the General Assemblies of OPIA in 1944

IAN-Ser Fiz, Vol 9, No 3, 1945

ALIKHANYAN, A. I.

"Preliminary Results of the High Mountain Expedition to Mt. Alagez in 1944 for the Study of Cosmic Rays," report submitted at General Assemblies of OZNI in 1944.

IAN-Ser Fiz., Vol 9, No 3, 1945

ALIKHANYAN, A. I.

"Scattering of Relativistic Electrons Through Large Angles," Zhur. Fiz.,
9, No.4, 1945

ALIKHANYAN, A. I.

"Investigation of Augur Showers," Zhur. Eksper. i Teoret. Fiz., 15, No.6,
1945. also in Zhur. Fiz., 9, No.3, 1945

Yerevan State U., and Physical Inst., AS Arm SSR

ALIKHANYAN, A. I.

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 Alikhanov, A. and Alikhanian, A., So-
 3250 m nad urovnem mornits. [The compo-
 sition of the soft component of cosmic radiation at 3250 m
 sea level.] Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki, 15(4/5):143-160, 1945. 10
 figs., 8 tables, 11 refs., eqs. English summary p. 160. DUC—Results of investigations of the
 composition of the soft component of cosmic radiation carried out during three expeditions on Mt.
 Aragats in Armenia (13,250 ft) in 1942, 1943, and 1944 are presented and discussed. Measurements
 were made with counters and an ionization chamber. The results are compared with those obtained by the two methods
 between data obtained by the two methods. It is also shown that these particles amount
 to about 20% of the intensity of the relativistic particles, and they
 are not generally connected with the electrons and quanta of the mesotrons, and that they are
 produced by an independent component of cosmic rays. 3: Mt. Aragats, U.S.S.R.—A.

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 tion of the soft component of cosmic radiation at 3250 m
 of i Teoreticheskoi Fiziki, 15(4/5):143-160, 1945. 10
 DUC—Results of investigations of the
 Results of investigations of the
 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
 3.3 times larger than that of the relativistic particles.
 is about 20% of the intensity of the mesotrons, and they
 are and quanta of the mesotrons, and that they are
 called the "third" component. Subject Headings: 1. Soft

①
RML