

MAYZEL' Boris Isaakovich; OKUN' Boris TSalerovich; TSOKURENKO,
M.G., red.

[Thermoelectric infrared drying chamber for the drying
of paint coatings] Elektrotermoradiatsionnaya sushil'-
naya kamera dlia sushki lakokrasochnykh pokrytii. Le-
ningrad, 1963. 29 p. (Leningradskii dom nauchno-
tekhnicheskoi propagandy. Obmen peredovym opytom. Seria:
Zashchita metallov ot korrozii, iznosostoikie antifrik-
tsionnye i dekorativnye pokrytiia, no.6) (MIRA 17:5)

MAYOML, Boris Lvovovich; GREN, Boris Lvovovich; CHEPENKO,
Nata Konstantinovna; ZHOS, M.M., Eds.

[Use of the combustion products of natural gas in convec-
tion drying chambers for drying protective paint coatings]
Konvektivnyye sushil'nye kamery s ispol'zovaniem produktov
sgoraniya prirodnogo gaza dlia sushki lakokrasochnykh po-
krytiy. Leningrad, 1965. 25 p. (MIRA 18:7)

USSR/Medicine - Virus Diseases

Feb 52

"The Chronic Course of Botkin's Disease [Epidemic Hepatitis]," Prof M. A. Brener, D. N. Okun', Card Med Sci, Chair of Propeudeutic Therapy, Kazakh Med Inst

"Sov Med" Vol XVI, No 2, pp 9-11

Of acute hepatitis cases, 90-95% are due to Botkin's disease, which spread to a considerable extent during and after World War II: 35,000 members of the US Army in North Africa had hepatitis. The epidemic nature of this type of jaundice (Botkin's disease) was established by USSR authors. Botkin's disease may assume the

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USSR/Medicine - Virus Diseases (Contd)

Feb 52

following forms: (1) acute epidemic hepatitis (the usual form); (2) protracted epidemic hepatitis resulting in (a) recovery or (b) transition into the chronic form; (3) chronic epidemic hepatitis with the following modifications: (a) nonprogressing with possible regression, (b) slowly progressing with late transition into atrophic cirrhosis, (c) rapidly progressing with direct transition into mixed cirrhosis.

204T37

CRON, D. N.

OKUN', D.M., kandidat meditsinskikh nauk. (Alma-Ata); PATLAKH, P.N.,
(Alma-Ata)

Capillaroscopy in hemangiomas (Rendu-Osler disease).
Klin. med. 35 no.2:141-142 F '57 (MLRA 10:4)

1. Iz kafedry gosspital'noy terapii (i.o. zav. kafedroy-dotsent
Ye. M. Ochkur) Kazakhskogo meditsinskogo instituta imeni
V.M. Molotova.

(ANGIOMATOSIS, differ. diag.
Osler-Rendu dis. from liver cirrhosis,
capillaroscopy)

(LIVER CIRRHOSIS, differ. diag.
Osler-Rendu dis, capillaroscopy)

(CAPILLARIES, in various dis.
capillaroscopy in differ diag. of Osler-Rendu
dis. from liver cirrhosis)

ОПЕРАТИВНО-МЕДИЦИНСКАЯ

SATPAYEVA, Raykhan Abikeyevna, kandidat meditsinskikh nauk; OKIDIN,
David Natanovich, kandidat meditsinskikh nauk; ALBINA, N.M.,
redaktor; YARITDENOV, K., tekhnicheskiy redaktor

[Hypertension and its prevention] Gipertonicheskaya bolezni i
ee preduprezhdenie. Alma-Ata, Kazakhskoe gos. izd-vo, 1955.
30 p. (MLRA 9:2)

(HYPERTENSION)

EXTRACTA MEDICA Sec 6 Vol 13/7 Internal Med. July 50

4058. HELIOTROPIC TOXIC HEPATITIS, ITS TREATMENT AND PROPHYLAXIS - (Russian text) - Okun D. N., Obukhova A. V., Revyakina D. N., Sokolova M. P. and Gubarkova N. F. - ZDRAVOOKHR. KAZ. 1958, 18/3 (26-31) Tables 1

Stricter supervision of food production is necessary in order to prevent consumption of grain infested with heliotrope. Medical workers should be conversant with a minimum of agritechnical measures aiming at destruction of heliotrope. Occurrence of a suspected case of toxic heliotrope hepatitis should lead to immediate measures being taken, aimed at discovery of all suspected cases in the early stages, and admission of all such cases to hospital for early and comprehensive treatment. Patients recovered from the disease should remain under prolonged observation with, whenever possible, repeated investigations of liver function, as this form of hepatitis may become chronic.

L 0034-66 ENT(1)/EM(2)/EM(3) ETI 101(0) 00/00/00

ACC NR: AP6019224

SOURCE CODE: UR/0250/66/010/002/0083/0086

AUTHOR: Okun', E. D.

ORG: Institute of Solid State Physics and Semiconductors, AN BSSR (Institut fiziki
tverdogo tela i poluprovodnikov AN BSSR)

TITLE: Width of x-ray lines of polycrystals of mosaic structure

SOURCE: AN BSSR. Doklady, v. 10, no. 2, 1966, 83-86

TOPIC TAGS: x-ray spectrum, line width, line intensity, polycrystal

ABSTRACT: The problem of scattering of x-rays by polycrystals made up of crystallites which in turn consist of mosaic blocks is treated with the aid of the kinematic theory of x-ray scattering, taking into account the angle of disorientation of the blocks relative to some "median" plane of the crystallite. The effect of deformations at the boundary between the blocks and within the blocks is disregarded. An expression for the integral width of the x-ray line β is obtained from the function

$$B = \frac{\langle I_i^{(h)} \rangle}{\langle I_i^{(k)} \rangle}.$$

$1/B$ gives the reduced intensity at the point of the diffraction line as a function of angle $\Delta\theta$. It is assumed that the disorientation angles are small and limited by a maximum value, and that the incoherent scattering under consideration is possible only

Card 1/2

L 40334-66

ACC NR: AP6019224

for a disorientation angle that is not too small. The final expressions derived for β are

$$\beta_1 = \frac{4\pi^2 \varphi_0^2 L_0 \cos \vartheta}{\lambda \sin^2 \left(\frac{2\pi L_0 \varphi_0}{\lambda} \cos \vartheta \right)} = \pi \Delta \frac{\frac{\pi L_0 \Delta}{\lambda} \cos \vartheta}{\sin^2 \left(\frac{\pi L_0 \Delta}{\lambda} \cos \vartheta \right)}$$

and

$$\beta_2 = 2\sqrt{2}\pi\Delta \frac{\pi L_0 (\Delta/\lambda) \cos \vartheta}{1 - \exp \left[-2 \left(\frac{\pi L_0 \Delta}{\lambda} \right)^2 \cos^2 \vartheta \right]}$$

where $\Delta = 2\varphi_0$ is the angle of disorientation between two neighboring blocks, and L_0 in expression (6') is the root-mean-square dimension of a block. The derived expressions were checked in the case of aluminum and found to apply satisfactorily. The paper was presented by Sirota, N. N., member of AN BSSR. Author thanks N. N. Sirota for the suggested topic and frequent discussions of the results, and N. M. Olekhovich for reviewing the latter. Orig. art. has: 2 figures, 1 table, and 7 formulas.

SUB CODE: 20/ SUBM DATE: 23Sep65/ ORIG REF: 006/ OTH REF: 002

Card 2/2

OKUN', F. A.

USSR/Medicine - Radiation effects

Card : 1/1 Pub. 123 - 12/19

Authors : Balmukhanov, S. B. and Okun', F. A.

Title : Effect of x-rays on the blood chart of goiter patients

Periodical : Vest. AN Kaz. SSR 12, 83 - 87, December 1953

Abstract : The relation between the blood chart and goiter, is explained. The changes occurring in the red and white blood corpuscles after treatment of goiter with x-rays, are described. The data presented are based on actual case histories of 165 goiter patients treated with x-rays.

Institution : Acad. of Sc. Kaz. SSR, Alma-Ata

Presented by : A. N. Syzganov, act. memb. of the Acad. of Sc. Kaz. SSR

OKUN', G.I., insh.

Work methods of the efficiency promoter scraper operator I. I.
Ivanov. kv. der. 21 no. 4:12 Ap '58. (MIRA 11:4)
(Scrapers)

OKUN', G.I., inzh.

Cementing local road materials in Ryazan Province, Art. doc. 28

no. 6311 Ja '65.

(MIRA 18:8)

OKUN', G.N.; LOZINSKIY, V. Ye.

How to organize the work of a foreman? Mashinostroitel' no. 1:
4-6 Ja '66 (MIRA 19:1)

25668

KURIN, G. N. i CHEN, G. I.

Novyy standart na suknie kokony.

Tekstil. Prom—st', 1948, No. 6, s. 14-16.

SO: Letopis' Zhurnal'nykh Statoy, No. 30, Moskva, 1948

OKUN', G. S.

OKUN', G.S.; TUMAYAN, S.A.; XUKIN, G.N., doktor tekhnicheskikh nauk, professor,
retsenzent.

[Design and maintenance of cocoon-opening machines] Ustroistvo i obslu-
zhivaniis kokonomotal'nykh mashin. Moskva, Gos. nauchno-tekhn.izd-vo
Ministerstva promyshlennykh tovarov shirokogo potrebleniia SSSR, 1953.
162 p. (MLRA 7:6)

(Sericulture) (Silk industry)

OKUN', G.S.; KOMAROV, V.M.; KATS, Sh.N.

Use of MRSchPr-54 instruments in testing for creep and long-period strength. Zav.lab. no.11:1387-1388 '59. (MIRA 13:4)

1.TSentral'nyy kotloturbinnyy institut im. I.I.Polzunova.
(Testing machines)

ARIFOV, U.A., akademik; KILYN, G.A.; JKUN', O.S.; PASHINSKIY, S.Z.;
OSIPOVA, L.Kh.; FAYERMAN, V.T.

Vacuum investigation of deformations of natural silk irradiated
by gamma rays. Izv. AN Uz.SSR, Ser. fiz.-mat. nauk no. 3:32-37
'60. (MIR, 13:8)

1. Institut yadernoy fiziki AN UzSSR i Uzbekskiy nauchno-
issledovatel'skiy institut shelkovoy promyshlennosti. 2. AN
UzSSR (for arifov).

(Gamma rays)

(Silk)

(Materials, Effect of radiation on)

2/165/60/000/004/004/004
0111/0227

ADDRESS: Arifov, V.I., Academiets of the Academy of Sciences Uzbek-
SSR, Tashkent, U.S.S.R., 1940, No. 4, pp. 39-44.
MILITARY: The Ministry of Defense, U.S.S.R., and U.S.S.R. Army.
TITLE: The Radiation-Induced Graft Copolymerization of Natural Milk
SOLVENT: Water

ABSTRACT: Investigation of the radiation-induced graft copolymerization of natural milk.
MILITARY: The Ministry of Defense, U.S.S.R., and U.S.S.R. Army.

NOTE: Continuing the authors' investigations (Ref. 1-7) the processes
mentioned in the title were investigated, whereby it was stated. By
radiation it is possible to obtain graft polymers of natural milk,
of styrene and of viscose for an immediate contact with the monomers
and their solutions. The reaction of the graft copolymerization of
the mentioned three materials with styrene and methylmethacrylate is
studied. It is shown that the graft copolymerization of the mentioned
of the graft copolymerization takes easily place in presence of water.
Abstract often the reaction is accelerated by water. The role of the
solvent seems to be complicated. If the graft of styrene and methylmeth-

Card 1/2

acrylate takes place under conditions where no strong γ -radiation is
necessary, then it appears that the properties of the
modified fibres. The copolymerization of the three materials with
styrene and methylmethacrylate (grants 50-206) takes place in the fibres.
There are 15 references, 10 Soviet, 4 Polish and 1 other.

ASSOCIATION: Institut yadernoy fiziki im. S.S. Bakh (Institute of Nuclear
Physics of the Academy of Sciences Uzbekiya SSR)
SUBMITTED: May 21, 1940

Card 2/2

(Kling, G.S.)

ZHOLKOV, Yu.A. ; OKUN', G.S.; PLAKSIN, B.V.

Recording tachometer. Izm. tekhn. no. 3:12-14, Mr '61.
(Tachometer) (MIRA 14:2)

OKUN', G.S.; CHIZHIKOV, A.G.

Aerating and stirring grain during drying. Mekh. i elek. sots.
sel'khoz. 19 no.6:58-60 '61. (MIRA 14:12)
(Grain--Drying)

OKUN, G. S.

S/844/62/000/000/080/129
D423/D307

AUTHORS: Arifov, U. A., Klein, G. A., Philippov, A. N., Amirova, N. Yu., Adilkhodzhaneyeva, G. A., Okun', G. S. and Osipova, L. Kh.

TITLE: Radiation grafting of vinyl monomers to certain natural and chemical fibers

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 470-475

TEXT: The present work is a continuation of previous investigations by Arifov and Klein, with the object of obtaining grafted copolymers of styrene, methylmethacrylate and vinyl acetate with raw silk, caprone and viscose. Irradiation was carried out with a Co^{60} source at a dosage of 10^5 to 5×10^6 rep on solutions of the monomers in various organic solvents. Grafted polymers of natural silk, caprone and viscose with styrene and methylmethacrylate were formed more readily than with vinyl acetate, and grafting with sty-

Card 1/2

Radiation grafting of ...

5/844/62/000/000/080/129
D423/D307

rene took place on direct contact of fibers with pure styrene and with a solution of styrene in methanol. Grafting with methylmethacrylate took place by conditioning the fibers in the presence of substances which dissolve polymethylmethacrylate, i.e. acetone and acetoacetic ester. The extent of grafting was increased with increase of dosage up to defined limits, after which it is sharply retarded. Methylmethacrylate grafted to viscose produced material which could be dyed with basic dyestuffs and by grafting styrene and methylmethacrylate to the various fibers it was found that their dynamic properties were improved. It was also found that copolymerization of fibrous materials with styrene and methylmethacrylate with up to 50 - 80% grafting, took place within the fiber. There are 5 figures.

ASSOCIATION: Institut yadornoy fiziki AN UzSSSR (Institute of Nuclear Physics, AS UzSSR)

Card 2/2

OKUN', G.S.; CHIZHIKOV, A.G.

Units for grain drying. Biul.tskh.-ekon.inform. no.2:92-96
'62. (MIRA 15:3)

(Grain--Drying)

ARIFOV, U.A.; KLEYN, G.A.; OKUN', G.S.; LAPIDUS, L.A.; PASHINSKIY, S.Z.;
KIM, G.S.

Physical and mechanical properties of silk and fabrics manufactured from cocoons killed by gamma rays. Izv. AN Uz. SSSR. Ser. fiz. mat.nauk 6 no.2:59-66 '62. (MIRA 15:9)

1. Akademiya nauk UzSSR.
(Sericulture) (Gamma rays--Industrial applications)

OKUN', G.S.; FITSYN, S.D.; CHIZHIKOV, A.G.; UL'RIKH, N.N., kand.
Sel'khoz. nauk, red.; SPICHKIN, I.M., red.; PEVZNER, V.I.,
tekhn. red.; KOFNINA, N.N., tekhn. red.

[Devices for drying grain abroad; a survey of the foreign
literature] Ustanovka dlia sushki zerna za rubezhom; obzor
zarubezhnoi literatury. Moskva, Sel'khozizdat, 1963. 254 p.
(MIRA 17:1)

OKUN', G.S., inzh.

Calculating the duration of the drying of grain in a layer.
Mekh. i elek. sots. sel'khoz. 21 no.3:20-23 '63. (MIRA 16:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut mekhanizatsii
sel'skogo khozyaystva.

(Grain—Drying)

DRAPIKOVSKIY, V.; OKUN', I.

Direction dispatcher. Grazhd.av. 20 no.12:11 D '63. (MIRA 17:2)

1. Nachal'nik sluzhby dvizheniya Ukrainского upravleniya Grazhdanskogo
vozdušnogo flota (for Drapikovskiy). 2. Nachal'nik dispetcherskogo punkta
Kiyevskogo aeroporta (for Okun').

KUROCHKIN, A.P.; OKUN', I.Yu.

Pneumatic self-balancing systems. Izv. tekhn. no. 1:10-11 Ja
'63. (MIRA 16:2)
(Pneumatic gauges)

GONCHAROV, V., inzh. elektrot. SHRAMKO, G., komandir korablya Il-14 (Tashkent);
KRAYCHENKO, V., inzh. (Kiyev); OCHALOVSKO, G., komandir verolotki; OKUN',
I.; KRATNER, V., LITVINCHIK, P., LOZIN, D., aviatsionny (Leningrad).

Readers' letters, Granzh. sv. 22 no. 314-11, 28 F '69. (MIRA 38:4)

1. Nachal'nik Kiyevskogo glavnogo rayonnogo dispatcherskogo punkta (for Okun').
2. Nachal'nik slushby radiolokatsii i radiolinyantsei, g. L'vov (for Kravtchuk).
3. Nachal'nik Millerovskogo aeroporta (for Litvinchik).

OKUN', Kh. G.

Vasil'yeva, N. S. and Okun', Kh. G. - "The dynamics of affective syndromes in electro-convulsion therapy," Trudy Tsent. in-ta psikhiatrii, Vol. IV, 1949, p/ 335-41

SO: U-4934, 29 Oct 53, (Letopis 'Zhurnal 'nykh Statey, No. 16, 1949).

L 28955-66 EWT(m)

ACC NR: AF6019090

SOURCE CODE: UR/0367/66/003/001/0189/0192

AUTHOR: Okun', L.

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

TITLE: Neutral alpha particles

SOURCE: Yadernaya fizika, v. 3, no. 1, 1966, 189-192

TOPIC TAGS: alpha particle, particle interaction, radioactive decay

ABSTRACT: Recently T. D. Lee suggested a model of nonconservation of CP parity according to which the responsibility for the nonconservation rests with hypothetical charged φ -particles, which have not yet been observed since they are rather heavy ($m_\varphi > 5$ Gev). In the present note the author considers a model in which the φ -particles are neutral. In experiments with the participation of real φ -particles it is found that even if decay $K_2^0 \rightarrow 2\gamma$ is caused by the presence of a super-weak interaction with $\Delta Y = 2$ (L. Wolfenstein's model), the effects of nonconservation of CP parity may be on the order of unity. The author notes that his formulation of the φ -field model differs somewhat from that of Lee in that the antiparticle for φ^+ is $\bar{\alpha}$ rather than φ itself, and the electromagnetic current in the Lagrangian contains only a J component and no K component; but this difference is purely terminological. The author thanks I. Yu. Kobzarev and I. Ya. Pomeranchuk for interesting discussions. Orig. art. has: 6 formulas. [JPRS]

Card 1/1 SUB CODE: 20/SUBM DATE: 30Sep65/ OTH REF: 005 BLG

ACC NR: AP7011838

SOURCE CODE: UR/0367/66 004/006/1202/1206

AUTHOR: Okun', L.; Pontekorvo, B.; Rubbia, K.

ORG: Joint Institute for Nuclear Research (Ob'yedinennyy institut yadernykh issledovaniy)

TITLE: Four-lepton decays of pi minus and k-mesons and possible anomalous interactions of leptons

SOURCE: Yadernaya fizika, v. 4, no. 6, 1966, 1202-1206

TOPIC TAGS: pi meson, K meson, lepton, radioactive decay

SUB CODE: 20,18

ABSTRACT: Four-leptonic decays of the type $\pi \rightarrow e\nu e^+e^-$ and $K \rightarrow e\nu\mu^+\mu^-$ are discussed with the aim of determining whether their experimental investigations can give information on the validity limits of quantum electrodynamics and on the possibility that there exist additional interactions of leptons of the type $(\bar{e}e)(\bar{e}e)$, $(\bar{\mu}\mu)(\bar{\mu}\mu)$, or $(\bar{e}e)(\bar{\mu}\mu)$. It is shown that available experimental data on the validity of quantum electrodynamics require the branching ratios of $\pi \rightarrow e\nu e^+e^-$ and $K \rightarrow e\nu\mu^+\mu^-$ to be less than 10^{-9} of the total decay rates of π and K mesons.

Card 1/2

0932

0936

DOTSENKO, L.A.; OKUN', L.A.

Automatic control of the wire broadcasting center of Rostov-na-Don. Vest. sviazi 24 no.1:23-25 Ja '64. (MIRA 17:3)

1. Zamestitel' nachal'nika Rostovskoy-na-Domu direksii radiotranslyatsionnoy seti (for Dotsenko). 2. Nachal'nik stantsionnoy sluzhby Rostovskogo-na-Domu radiouzla (for Okun').

75860 AEC-tr-2489
 THE POLARIZATION OF ELECTRONS IN THE DECAY OF
 POLARIZED μ -MESONS. L. B. Okun'. Translated by V
 Ritsky-Karskad' from Doklady Akad. Nauk S.S.S.R. 104,
 640-2(1985). 5p.

The possibility of determining the g_i constants by measuring the correlation of the spins of the decaying μ -meson and of the electron which is emitted during the decay was investigated. The measurement of the polarization of the electrons in the decay of the polarized μ -meson made it possible to fully determine the value of these g_i constants. (P.S.)

*True
Sci*

Print for

1 vol - print

OKUN', L. B.

Okun', L. B. - "Some Problems in the Theory of Heavy Mesons and Hyperons." Acad Sci USSR. Moscow, 1956 (Dissertation for the Degree of Candidate in Physicomathematical Sciences).

So: Knizhnaya Letopis', No. 10, 1956, pp 116-127

OKUN L B

The number of different types of K mesons, ^A R. L. Galt, L. Okun, and I. Ya. Pomeranchuk (U.S.S.R. Acad. Sci. ~~Journal~~ *Nuclear Phys.* 2, 277-80 (1956)) -- Small-angle scattering from sections of K mesons by deuterium with and without charge exchange in exit and their bearing on the question of the no. of different types of K mesons is discussed. Possible interpretations are considered for the difference in K -meson scattering by free and bound nucleons. 19 R. W. Pink

3

[Handwritten scribbles and initials]

Okun, L. B.

✓ 588

THE CONSERVATION OF SPINNING MOMENT AND THE
SECTION OF THE INTERACTION OF HIGH-ENERGY
NEUTRONS AND NUCLEONS WITH NUCLEONS. *L. B. Okun*

and L. Ya. Pomerenchik (Academy of Sciences, USSR)
Soviet Phys. JETP 8, 297-31(1958) Sept. (In English). Zhur.
Eksp. i Teor. Fiz. 20, 424(1958) Feb. (In Russian)

YSS

LS

OKUM, L.B.

3995

CAPTURE OF K MESONS BY DEUTERIUM AND HYPERON
NUCLEON INTERACTION

L. B. Okun and *M. I. Strizhak*

USSR Academy of Sciences *USSR* Soviet Phys JETP 1,
192 (1966) 192

K meson capture in deuterium and deuterium was studied
for information concerning the properties of K mesons and
the interactions between hyperons and nucleons. (F.S.)

RBE

OKUM, L. B.

10602 Long-Term Reactivity Changes in Nuclear Reactors
L. B. Okum and L. B. Okum *Journal of Nuclear Energy*
v. 4, No. 1957, p. 371-388. Translated from *Atomnaya*
Energia, v. 1, no. 4, 1956, p. 80.
Method of estimating fuel burnup takes account of capture
and multiplication of the neutrons in the courses of slowing
down. Calculations are performed which allow for the burnup
of U^{235} and the formation and burnup of Np^{237} , Pu^{239} , Pu^{240} ,
 Pu^{241} and fission products.

OKON, F. B.

✓ 8617

17

2

FUEL BURN-UP IN NUCLEAR REACTORS. B. L. Kite
 and L. B. Chouh. Soviet J. Atomic Energy 3, 129-64(1956).
 A method is described of calculating fuel burn-up in
 nuclear reactors, taking into account the capture and multi-
 plication of neutrons while slowing down. In the calcula-
 tions, account is taken of the burn-up of ^{238}U and the build-
 up and burn-up of ^{239}Pu , ^{240}Pu , ^{241}Pu , ^{242}Pu and of the fis-
 sion fragments. (auth)

Handwritten notes: New Sci

Handwritten signature: Ford

Handwritten initials: up

OKUN, L.B.

USSR/Nuclear Physics - Elementary Particles

C-3

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33936

Author : Okun', L. B.

Institution : None

Title : Charge Exchange of K-Mesons in Hydrogen and Deuteron

Original

Periodical : Zh. eksperim. i teoret. fiziki, 1956, 30, No 1, 218-219

Abstract : The momentum approximation is used to calculate the charge-exchange by deuterons of K-mesons with spins zero and one and with and without exchange of parity during the charge exchange (total of 6 variants).

Card 1/1

OKUN' L. B.
USSR/Nuclear Physics - Elementary Particles

C-3

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33918

Author : Okun', L. B., Pomeranchuk, I. Ya.

Institution : Academy of Sciences USSR

Title : Isotopic Invariance and Interaction Cross Sections of π -Mesons and High-Energy Nucleons with Nucleons

Original

Periodical : Zh. Eksperim. i teoret. fiziki, 1956, 30, No 2, 424

Abstract : Based on the isotopic invariance, the authors show that at high energy of colliding particles ($\approx 10^9$ ev), when the processes are very probably inelastic, the differential cross sections of scattering of the π -mesons by nucleons and of nucleons by nucleons are independent of the charged state of the colliding particles. The same applies to the corresponding complete cross sections.

Card 1/1

OKUN', L. B.

Category : USSR/Nuclear Physics - Elementary Particles

C-3

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3148

Author : Kobzarev, I. Yu., Okun', L. B.

Title : Concerning the Spin of the Λ -Particle.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 4, 798-799

Abstract : The non-meson Λ -nucleus disintegration is considered. It is shown that were the spin of the Λ particle greater than $3/2$, the lifetime of the Λ nuclei would be considerably less than observed.

Card : 1/1

Category : USSR/Nuclear physics

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3140

Author : Okun', L. B., Smushkevich, M. I.

Inst : Academy of Sciences / USSR

Title : Capture of K^- Mesons by Deuterons and the Interaction Between Hyperons and Nucleons.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 5, 979-981

Abstract : The momentum approximation was used to calculate the cross section of the absorption of a K^- meson in deuterium with production of a nucleon, π^- -meson and hyperon. Equations are obtained for the energy spectrum of the π^- -mesons. The energy distribution of the π^- -mesons near the upper boundary of the spectrum depends on the character of the hyperon-nucleon interaction occurring upon capture of a K^- meson.

Card : 1/1

Žurn.eksp.i teor.fis, 30, 1172-1173 (1956) CARD 2 / 6

PA - 1229

properties of isotopic spin and "strangeness":

	π	K	K	N	N	Λ	$\bar{\Lambda}$	Σ	$\bar{\Sigma}$	Ξ	$\bar{\Xi}$
S	0	-1	1	0	0	+1	-1	+1	-1	2	-2
T	1	1/2	1/2	1/2	1/2	0	0	1	1	1/2	1/2

Apart from the particles, also the corresponding antiparticles, which are marked with $\bar{}$, are investigated. One of the most direct methods for the verification of the correctness of the hypothesis of the isotopic invariance of fast processes under participation of the "strange" particles is the experimental examination of the relations between reactions resulting from this hypothesis, which differ from one another only by the charge conditions of the particles concerned. Here three types of such reactions are investigated:

a) Reactions with participation of 4 particles with $T = 1/2$, for instance the scattering of K-mesons by nucleons $K + N \rightarrow K + N$, or more exact:

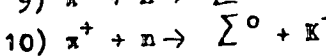
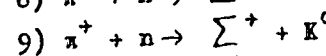
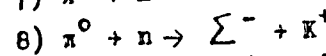
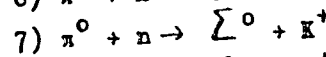
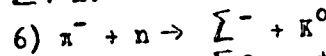
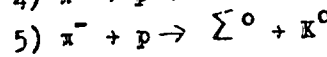
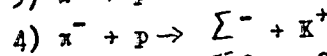
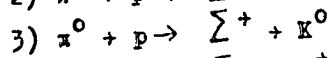
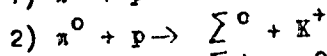
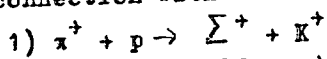
- 1) $K^+ + p \rightarrow K^+ + p$
- 2) $K^+ + n \rightarrow K^+ + n$
- 3) $K^+ + n \rightarrow K^0 + p$

- 4) $K^0 + n \rightarrow K^0 + n$
- 5) $K^0 + p \rightarrow K^0 + p$
- 6) $K^0 + p \rightarrow K^+ + n$

Zurn. eksp. i teor. fis, 30, 1172-1173 (1956) CARD 4 / 6 PA - 1229

impinges a pion bundle with the same number of π^+ , π^- , and π^0 -mesons. As interaction on the occasion of this reaction is isotopically invariant, and because target and bundle are not isotopically polarized, the number of π^+ (π^-)-mesons knocked out of the bundle must be equal to the number of π^0 -mesons. The positive pions are absorbed in reaction 1, the neutral pions in reactions 2 and 4. This immediately results in $\sigma_1 = \sigma_2 + \sigma_4$ or $\sigma_1 = 2\sigma_2$.

c) Reactions with participation of 2 particles with $T = 1$ and 2 particles with $T = 1/2$, for instance the production of a Σ -particle and of a K -meson in connection with the reaction $\pi + N \rightarrow \Sigma + K$:



From the charge symmetry there follows: $\sigma_1 = \sigma_6$, $\sigma_2 = \sigma_7$, $\sigma_3 = \sigma_8$, $\sigma_4 = \sigma_9$,

$\sigma_5 = \sigma_{10}$.

Zurn.eksp.i teor.fis, 30, 1172-1173 (1956)

CARD 5 / 6

PA - 1229

Next, an isotopically unpolarized pion bundle and a nucleon target are once more investigated. As in the preceding case the numbers of π^+ (π^-)-mesons knocked out of the bundle must be equal to the number of π^0 -mesons:

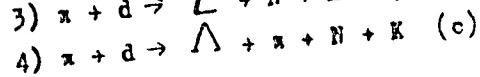
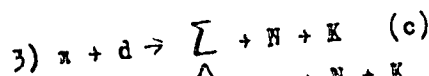
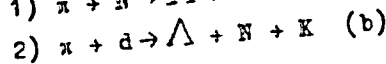
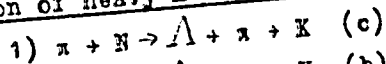
$$\sigma_1 + \sigma_4 + \sigma_5 = 2(\sigma_2 + \sigma_3).$$

Besides, the numbers of produced Σ^+ and Σ^0 -particles must be equal to one another: $\sigma_1 + \sigma_3 + \sigma_4 = 2(\sigma_2 + \sigma_5)$. From the two latter equations follows:

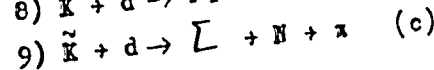
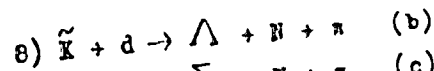
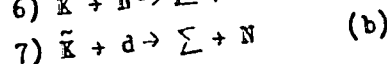
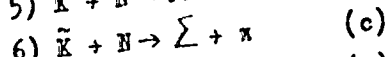
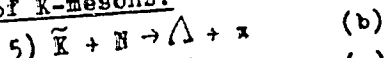
$$\sigma_3 = \sigma_5, \quad \sigma_1 + \sigma_4 = 2\sigma_2 + \sigma_5.$$

Analogous relations are obtained for the following reactions, each of which belongs to one of the types a), b), or c):

Production of heavy mesons and hyperons:



Capture of K-mesons:



Žurn. eksp. i teor. fis, 30, 1172-1173 (1956)

CARD 6 / 6

PA - 1229

Interaction of Σ -hyperons with nucleons:

$$10) \Sigma + N \rightarrow \Sigma + N \quad (c) \quad 11) \Sigma + N \rightarrow \Lambda + N \quad (b)$$

$$12) \Sigma + N \rightarrow \Lambda + N + \pi \quad (c)$$

Production of antihyperons and K-mesons:

$$13) \pi + N \rightarrow N + \Lambda + \bar{\Lambda} \quad (b) \quad 16) N + N \rightarrow d + \Sigma + \bar{\Sigma}^+ \quad (c)$$

$$14) \pi + N \rightarrow N + \Lambda + \bar{\Sigma} \quad (c) \quad 17) N + N \rightarrow d + K + K \quad (a)$$

$$15) N + N \rightarrow d + \Lambda + \bar{\Sigma} \quad (b)$$

Annihilation of antihyperons:

$$18) \bar{\Lambda} + N \rightarrow K + \pi \quad (c) \quad 20) \bar{\Sigma} + N \rightarrow K + K + K \quad (a)$$

$$19) \bar{\Sigma} + N \rightarrow K + \pi \quad (c)$$

Some of these relations were already previously obtained. (M.GELL-MANN, lecture delivered at the Pisa Conference, T.D.LEE, Phys.Rev. 99, 337, 1955). This work was supervised by Prof. I.J.POMERANČUK and Prof. I.M. ŠMUŠKEVIĆ assisted in the work by means of valuable discussions. This is a nearly literal translation.

INSTITUTION:

OKUN, L.B.

USSR/Nuclear Physics - Elementary Particles.

C-3

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8660

Author : Okun', L.B.

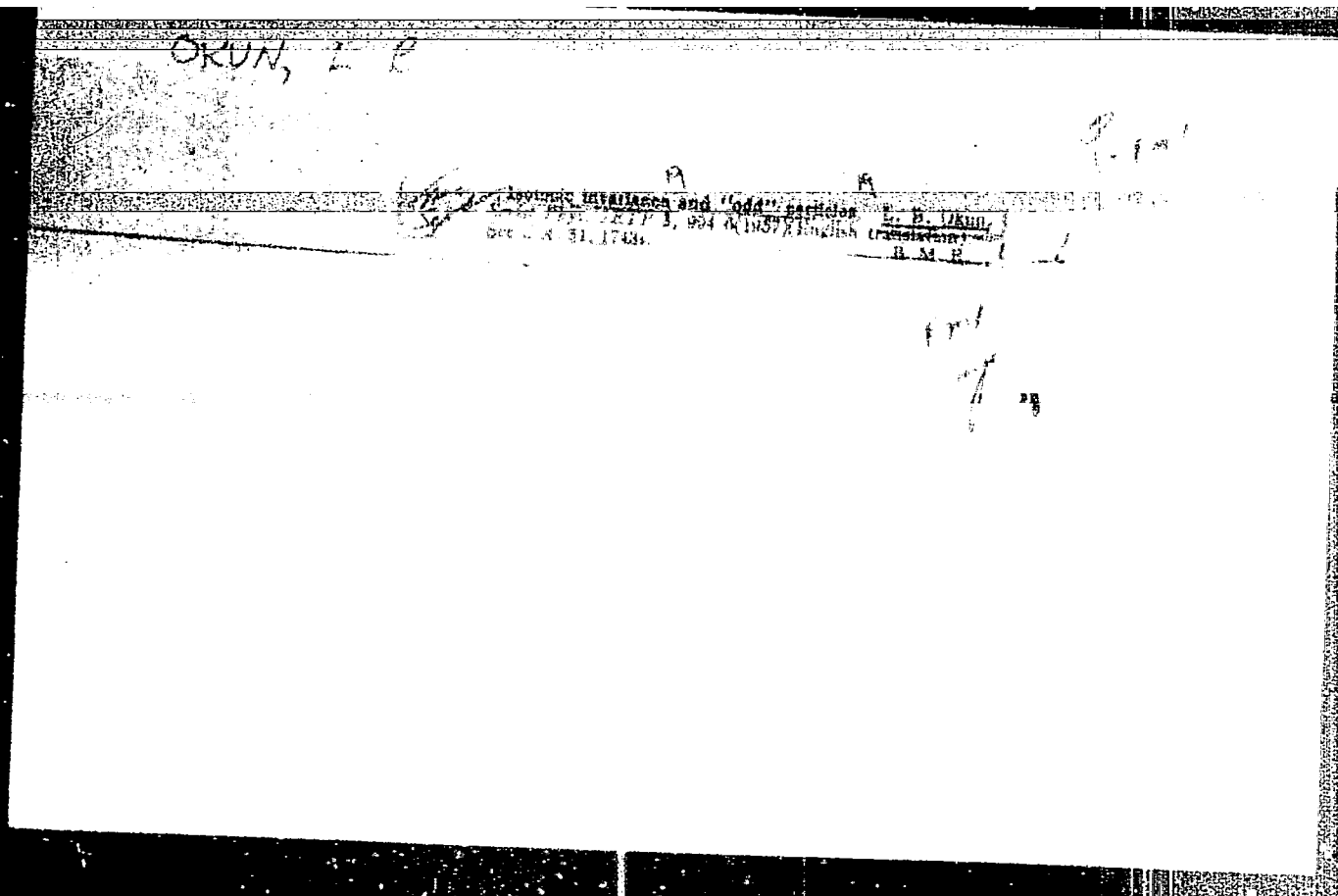
Inst :

Title : On the Probabilities of Σ -Particle Decay.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 31, No 2, 333-335

Abstract : Limitations are obtained for the ratio X of the probabilities of the decays $\Sigma^+ \rightarrow p + \pi^0$ and $\Sigma^+ \rightarrow n + \pi^+$, which result from the fact that the phases of the amplitudes of the weak π decay interactions (for transitions into a state with a definite isotopic and usual momentum and parity) are expressed in terms of the scattering phases, corresponding to the strong interaction in the final state. These limitations depend on the spin and parity of the Σ -particle. If the decay interaction changes the isotopic spin by one half ($\Delta T = 1/2$), then X is a function of the lifetime ratio $Y = \tau(\Sigma^+) / \tau(\Sigma^-)$

Card 1/2



JR 41, L.B

3999

THE SPIN OF THE Λ PARTICLE *L. N. Koshary and L. D. ...*

From ...
Soviet Phys JETP 4: 564-5 (1957) Jan.
It is shown that a large spin model of the Λ particle does not agree with experimental facts concerning the particles.
(8, 15)

RMF

JOFFE, B.L. [Ioffe, B.L.]; OKUN, L.B. [Olun, L.B.]; BOHAL, L., inz.
[translator]

Burning out of fuel in nuclear reactors. Jaderna energie 3 no.6:168-
177 Je '57.

OKUM, H. E.

2
1 - RMA

✓ 8488

19 1

ON THE PROBABILITIES OF Σ PARTICLE DECAY

~~Okum, Soviet Phys JETP 4, 224-60 (1957) March~~

~~File~~
~~see~~

Arguments developed by Fermi for the photo-production of ν mesons are applied to a consideration of the decay of the Σ hyperon (B. J. H.)

RMA

OKUN, L.B.

Distr: LEJd

4366

POSSIBLE CORRELATIONS IN $\pi^+ \rightarrow \mu^+ \nu_\mu$ DECAY
and A. BUKH, Soviet Phys. JETP 6, 670 (1957) Oct.

If parity is violated in $\pi^+ \rightarrow \mu^+ \nu_\mu$ decay, there must be correlations between the orientations of the momenta of the μ^+ mesons and the neutrinos. The results of calculations of such correlations are presented when parity is violated in both the $\pi^+ \rightarrow \mu^+ \nu_\mu$ decay and the $\pi^+ \rightarrow e^+ \nu_e$ decay [L.T.W.]

3
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1

OK

OKUN, L.B.

CZECHOSLOVAKIA/Nuclear Physics - Nuclear Power and Technology

C-8

Abs Jour : Ref Zhur - Fizika, No 3, 1958, No 5589

Author : Joffe B.L., Okun, L.B.

Inst : Not Given

Title : On the Consumption of Fuel in Nuclear Reactors.

Orig Pub : Jaderna energie, 1957, 3, No 6, 168-177

Abstract : Translation from the Russian. See Referat Zhur Fizika, 1957,
No 4, 16710.

Card : 1/1

On the Problem of Non-Conservation of Parity in the Case of Interactions. PA - 2707

interference term. The pseudoscalar terms proportional to $\vec{\sigma}_p$ become equal to zero also in the case in which a scalar and a vectorial coupling exists. Also in the case of successive processes $\pi^- + p \rightarrow \Lambda^0 + K^0$, $\Lambda^0 \rightarrow p + \pi^-$ the pseudoscalar terms will be lacking in the differential probability. It is therefore not possible to determine by measuring the angular distribution of the protons whether parity is hereby conserved or not. Also on the occasion of β -decay, phenomena may occur which are connected with the non-conservation of parity. The authors here examine the β -decay of a polarized nucleus. Also in the most simple cases of β -decay, the difference between the possibility of the conservation and non-conservation of spatial parity is lacking if the demand for charge conjugation is taken into account.

ASSOCIATION
PRESENTED BY
SUBMITTED 21/11. 1956
AVAILABLE
Card 2/2

On the μ -Decay of the K-Mesons and Hyperons.

PA - 2710

K^+ -meson, and all decay acts of the particles with the strangeness -1 through the μ -decay of the K^+ -meson. The paper under review indicates other conclusions which have to be drawn from an application of this hypothesis, and discusses them. Also the μ -decay of a cascade Ξ -hyperon is discussed. An experimental confirmation of the conclusion referred to in this paper does not yet prove the validity of this hypothesis, as it is possible that also other premises lead to these results. (No reproductions.)

ASSOCIATION
PRESENTED BY
SUBMITTED 22.11.1956
AVAILABLE Library of Congress
Card. 2/2

On the theory of the Scattering Particles by Nuclei. PA - 2711

down. Herefrom the equation of the surface S is determined which limits the "permitted domain" of the parameters used here. After computation of the number of collision which the particle 1 suffers in the time unit, an expression is obtained for the factor F . In conclusion the general expression for F for various values of the parameter p_F are specialized. The formulae obtained in this way are simplified considerably in both limiting cases $m_1/m_2 = 0$ and $m_1/m_2 = 1$. Here m_1 and m_2 denote the masses of the particles 1 and 2 respectively.
(2 ill.)

ASSOCIATION
PRESENTED BY
SUBMITTED 29.11.1956
AVAILABLE Library of Congress
Card 2/2

✓ 1961. ON POSSIBLE CORRELATIONS IN $\pi^+ \rightarrow \mu^+ + \nu$ DECAY. 19 5
I. OJALA and A. RAITIS.
Z. KR. 1961.
Assuming parity violation in both $\pi^+ \rightarrow \mu^+ + \nu$ and $\mu^+ \rightarrow e^+ + \nu$ decays the angular correlation of muon and positron momenta is calculated.
J. W. G. Wainath.

KOBZAREV, I.Yu.; OKUN', I.B.

Simultaneous production of Λ and ϕ -particles. Zhur.eksp.1
teor.fiz. 32 no.4:933-934 Ap '57. (MLRA 10:7)
(Particles, Elementary)

AUTHOR OKUN', L., PONTEKORVO, B. 56-6-52/56
 TITLE Some Notes on the Slow Transition Processes of Elementary Particles
 (Nekotoryye zamechaniya o medlennykh protsessakh prevrashcheniya elementarnykh chastits. Russian)
 PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, pp 1587 - 1588
 (U.S.S.R.)
 ABSTRACT As is known, two types of slow processes exist:
 a) Lepton processes: $n \rightarrow e + \bar{\nu} + p$, $\mu \rightarrow e + \gamma + \bar{\nu}$, $\mu + p \rightarrow n + \gamma$,
 $\pi \rightarrow \mu + \nu$, $K \rightarrow \mu + \gamma$, $K \rightarrow \mu + \gamma + \pi$, $K \rightarrow e + \gamma + \pi$.
 b) Processes not connected with leptons:
 $K \rightarrow 2\pi$, $K \rightarrow 3\pi$, $\Lambda (\Sigma) \rightarrow N + \pi$, $\Xi \rightarrow \Lambda + \pi$.
 The constants of the interaction responsible for these processes in the units ($\hbar = c = 1$, where μ denotes the mass of pions) are nearly of the same order of magnitude $G^2 = 10^{-14} - 10^{-13}$. This leads to the opinion that all these processes are based upon one and the same mechanism, i.e. a universal FERMI interaction. This idea is confirmed by the fact that for all these processes parity is not conserved. Perhaps the processes a) and b) are processes of second order with respect to neutrino interaction. Naturally, also other schemes are conceivable which

Card 1/2

С. КОБЗАРЬ, Л. Б.
KOBZAREV, I.Yu.; OKUN', L.B.

Probability of Σ -hyperon disintegration considering nonconservation
of parity. Zhur. eksp. i teor. fiz. 33 no.1:296-297 J1 '57.
(Particles, Elementary) (MLRA 10:9)

AUTHOR: Okun', L.B.

TITLE: Note on the K_{e3} Decay (0 K_{e3} -raspade)

56-2-29/47

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 2(8), pp. 525-526
(USSR)

ABSTRACT: The present paper computes the energy distribution of electrons and pions in the case of K_{e3} decay. The investigation of the processes of K_{e3} decay ($K^+ \rightarrow e^+ + \pi^0 + \nu$ and $K^0 \rightarrow e^- + \pi^+ + \nu$) is very important for the explanation of the character of weak interaction of electrons with each other. At the outset the matrix element of the K_{e3} decay of a K-meson at rest is given for the general case, containing no derivatives of the Lepton functions. With the help of this formula an expression for the probability of the emission of an electron with the energy E_0 and of a pion with the energy E_x is easily obtained. This expression is then transformed. In this way the following expressions are found. $W(\xi) = \phi_S + \phi_V [\xi_0^2 - (1 - \xi)^2] + \phi_T(1 - \xi)^2 + \phi_{ST}(1 - \xi)$. Here the functions ϕ_S, ϕ_V, ϕ_T and ϕ_{ST} are only dependent on the Energy E_x of the pion and independent of on the Energy E_0 of the electron: $\xi = 2E_0 / (M - E_x)$, $\xi_0 = k_x / (M - E_x)$, $1 - \xi_0 \leq \xi \leq 1 + \xi_0$. If $\phi_{ST} = 0$ the distribution $W(\xi)$ must be symmetrical with respect to the point $\xi = 1$. If there is a maximum or

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OKUN', L. B.

AUTHOR: KOBZAREV, I. Yu., OKUN', L. B. 56-7-57/66
TITLE: On the Decay Probabilities of Σ -Hyperons if Parity is not Conserved. (O veroyatnostyakh raspada Σ -giperonov pri nesokhraneni chetnosti.)
PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 33, Nr 7, pp. 296 - 297 (USSR)
ABSTRACT: L. Alvarez et al. Phys. Rev., Vol. 105, p. 1127 (1957) drew the conclusion that the decay of the Σ -hyperons does not obey the selection rule $\Delta T = 1/2$ The present paper is intended to show that this conclusion is not the only possible one if the conservation of parity is renounced. The non-conservation of parity in the decay of hyperons is a consequence of the non-conservation of parity in the case of $K\pi_2$ - and $K\pi_3$ - acts of decay, because the decay of the hyperon can always develop by virtual chains with $K \rightarrow \pi$ -acts of decay. The authors above all assume that the decay interactions are invariant as regards inversions with respect to time in Wigner's sense (or, which is one and the same thing, with respect to the combined inversion CI). Because of this assumption the phases of the matrix elements of the decay can be expressed by the phases of scattering in the final state. The corresponding relations are here explicitly given. Also the relations for probabilities are explicitly given.

Card 1/2

On the Decay Probabilities of
 Σ -Hyperons if Parity is not Conserved.

56-7-57/66

Explicitly given. The point X,Y is located within the domain bounded by the curve

$X = (2+2z^2 + 4z)/(1+4z^2+4z)$, $Y = 3/(1+2z^2)$. This domain agrees with that obtained by R. Gatto, *Nuovo Cim.*, Vol. 3, p.318 (1956). R.Gatto investigated the limitations resulting from the selection rule $\Delta T = 1/2$ alone without the invariance on the occasion of the reversal of time being taken into account.

It is easily understood that the data obtained by Alvarez are within the permitted domain and thus do not contradict the assumption that the selection rule $\Delta T = 1/2$ is correct.
(No illustrations)

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress
Card 2/2

1958 CONFERENCE ON THE PHYSICS OF HIGH ENERGY
PARTICLES, ed. M. Leikin, A. R. Beresnev, I. A. Pionchik
A. N. Lebedev and L. B. Okun
Doklady Akad. Nauk, Vol. 01, No. 1, 103-23 (1957). In Russian.
Report of the proceedings (Moscow, 14-22 May, 1956) with
full account of the discussions. C. R. & MacGill

AUTHOR

OKUN, L. B.

TITLE

The Strange Particles (The Scheme of the Isotopic Multiplets).
 (Strannyye chastitsy (skhema izotopicheskikh multipletov) -Russian).
 Uspekhi Fiz.Nauk, 1957, Vol 61, Nr 4, pp 535 - 559 (U.S.S.R.)

53-4-3/7

PERIODICAL

Received 6/1957

Reviewed 7/1957

ABSTRACT

- (1) The paper under review deals with the problems connected with the isotopic spin of the strange particles. The survey has the following parts:
- (2) The masses and the decay schemes of the K-mesons. The determined decay schemes of the positive, negative and neutral K-mesons are given. The decay of the negative K-mesons has not been investigated so well as the decay of the positive K-mesons.
- (3) The masses and the decay schemes of the hyperons: In all known production reactions of hyperons the rest mass of a hyperon contains the rest mass of the nucleon participating in the reaction. The hyperon is created, so to say, by excitation of the nucleon. At decay of the hyperons there are always created nucleons. Decay processes of hyperons with creation of myons or electrons have not been observed so far.
- (4) The most important properties of the strange particles: The k-mesons and hyperons are like the pions and nucleons particles with strong interaction. It is also possible that the strange particles are created simultaneously (for instance, $\pi + p \rightarrow \Lambda^0 + K^0$). Additio-

Card 1/2

The Strange Particles (The Scheme of the Isotopic Multiplets).

53-4-3/7

nal details are given.

The other chapter of the survey deals with the following topics: the types of interactions; the isotopic spin of the pions and nucleons; the isotopic spin of the K-mesons and hyperons; the concept of the strangeness of a particle (denoted by S); the strong interactions ($\Delta S=0$); the creation, scattering and absorption of the strange particles; the hypernuclei and K-nuclei; the strong interactions ($\Delta T=0$); the electromagnetic interaction ($\Delta S=0$); the decay processes of the strange particles ($\Delta S = \pm 1$); the decay processes of the strange particles ($\Delta T = \pm 1/2$); the other possible particles in the scheme of the isotopic multiplets. The limited scope of this survey prevented the discussion of some interesting trends in research. Two mathematical appendices are added to the paper under review. (3 reproductions, 1 chart).

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PRESENTED BY
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AVAILABLE
Card 2/2

Library of Congress

OKUN, L. D. (Acad. Sci. USSR)

"On the Polarization of μ -Mesons in $K_{\mu 3}$ - Decays," Nuclear Physics, Vol. 5,
No. 3, Feb 1958. (No Holland Publ. Co. Amsterdam)

Abst: A calculation of the longitudinal polarization of μ -mesons in $K_{\mu 3}$ -decays
(and electrons in $K_{e 3}$ -decays) is carried out under the assumption that the neutrino
emitted in these processes is longitudinally polarized.

AUTHOR: Okun', L. B.

10-2-26, 51

TITLE: Some Remarks on a Compound Model of Elementary Particles
(Nekotoryye zamechaniya o sostavnoy modeli elementarnykh
chastits)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1950,
Vol 34, Nr 2, pp 469-476 (USSR)

ABSTRACT: The present work investigates some properties of the
compound model of elementary particles, an Λ -hyperon and a
nucleon being assumed as original particles. This scheme is
shortly denoted as ΛN -scheme here. This work makes some
remarks on the ΛN -scheme, which obviously makes possible a
clear description of the structure and the interaction of
the various particles. As basic particles the author
investigates, according to Sakata, 3 particles: Λ -hyperon,
proton, neutron. The next chapter deals with the isotopic
scheme which in its essential parts is a repetition of
Sakata's work (reference 8). According to it the mesons
represent bound states of the initial particles and the
anti-particles with $N = 0$. The pion with $T = 1$ e. g. is
represented here as bound state of a nucleon and an anti-

Card 1/3

Some Remarks on a Compound Model of Elementary Particles

95-2-20/51

nucleon. The K-mesons and \bar{K} -mesons with $T=1/2$ are represented as bound state of $K + \bar{\Lambda}$ and $\bar{K} + \Lambda$. Within the frame of this scheme two more neutral mesons are possible which hitherto have not yet been observed: $\rho_1^0 = \Lambda\bar{\Lambda}$, $\rho_2^0 = (p\bar{p} - n\bar{n})/\sqrt{2}$. The isotope spin of the ρ -mesons equals zero. The hyperons in this scheme form a bound state of two particles and one antiparticle with $N=1$. The data on the spin and the parity of the Λ -hyperon, the proton and the neutron are collected in a table and then are discussed in detail. The interactions leading to the formation of bound systems of baryon-antibaryon must be greater by some orders of magnitudes than the other nuclear forces. In the model investigated here there are 3 types of vertex parts; they correspond to a) the interaction of a nucleon with a nucleon (interaction constant g_1), b) the interaction of two Λ -particles (constant g_2) c) the interaction of a nucleon with a Λ -particle (constant g_3). More is said on the importance of these interactions. The weak interactions, the non-lepton decays and the lepton decays are dealt with. The here discussed $N\Lambda$ -scheme makes possible a more or less satisfactory qualitative description of the essential experimental data. Besides, this scheme leads to some pre-

Card 2/3

Some Remarks on a Compound Model of Elementary Particles

56-2-26/51

dictions on the strong and weak interactions of strange particles which can be proved experimentally. Many conclusions, however, are only qualitative and can not be regarded as completely convincing. There are 6 figures, 1 table, and 12 references, 6 of which are Slavic.

SUBMITTED: August 14, 1957 (initially), and October 31, 1957 (after revision)

AVAILABLE: Library of Congress

1. Protons-Theory 2. Neutrons-Theory 3. Hyperons-Theory

Card 3/3

AUTHORS: Kobzarev, I. Yu. , Okun', L. B. SOV/56-34-3-43/55

TITLE: On the Life of the K_2^0 -Meson (O vremeni zhizni K_2^0 -mezona)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958,
Vol. 34, Nr 3, pp. 763 - 764 (USSR)

ABSTRACT: The authors assume here that the weak interactions are invariant with respect to a reversion of time, and that the K_2^0 -meson has a negative invariance with respect to time. The following possibilities exist for the decay of the K_2^0 -meson:

- 1) $K_2^0 \rightarrow e^+ + \nu + \pi^-$ 2) $K_2^0 \rightarrow e^- + \bar{\nu} + \pi^+$ 3) $K_2^0 \rightarrow \mu^+ + \nu + \pi^-$
 4) $K_2^0 \rightarrow \mu^- + \nu + \pi^+$ 5) $K_2^0 \rightarrow \pi^+ + \pi^- + \pi^0$ 6) $K_2^0 \rightarrow \pi^0 + \pi^0 + \pi^0$

(the corresponding probabilities are denoted here with w_n in which case n signifies the number of the reaction). The decays 1, 2 and 3, 4 are analogues of the decays 7) $K^+ \rightarrow e^+ + \nu + \pi^0$, 8) $K^+ \rightarrow \mu^+ + \nu + \pi^0$ and the decays 5, 6 are

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analogous to the τ^+ -decays: 9) $K^+ \rightarrow \pi^+ + \pi^+ + \pi^-$,
 10) $K^+ \rightarrow \pi^+ + \pi^0 + \pi^0$. It is essential in this connection
 that the pions emitting are in S-state in the decays 5, 6
 and also in the decays 9, 10. I. B. Okun', (Reference 3)
 showed the following: When the decays of all strange particles
 take place by way of decays of Λ -hyperons, the rule
 $\Delta T = 1/2$ (which was previously discussed in connection
 with the pion decays of the strange particles) refers also
 to the lepton decays of the strange particles. The authors
 apply here this rule for the calculation of the probability
 of the various kinds of decays of the K_2^0 -meson and for the
 evaluation of their life. $w_1 = w_2 = w_7$, $w_3 = w_4 = w_8$; $w_6/w_5 = 3/2$,
 $w_{10}/w_9 = 1/4$, $(w_5 + w_6)/(w_9 + w_{10}) = 1$ is easily obtained by means
 of the rule $\Delta T = 1/2$. The relations, however, do not take
 into account the difference of the masses of charged and
 neutral pions. The correction caused by this mass-difference
 was taken into account by R. H. Dalitz (Reference 4). The
 present report takes account of this correction only with
 statistic weights. If the statistic weights of the correspond-
 ing decays are denoted with g_n , $g_5/g_9 = 1.09$, $g_{10}/g_9 =$

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$= 1.20$, $g_6/g_9 = 1.31$ is obtained. Taking into account these relations,

$$w_6/w_5 = 3g_6/2g_5 \sim 2, \quad w_{10}/w_9 \sim g_{10}/4g_9 \sim 0.30$$

$$(w_5+w_6)/(w_9+w_{10}) \sim ((2/5)g_5 + (3/5)g_6)/((4/5)g_9 + (1/5)g_{10}) =$$

$$= 1.2 \text{ is obtained. The value } \tau_{K_2^0} = \tau_K + 100/(2.5 \cdot 3 + 2.5 \cdot 1 +$$

$+ 1.2 \cdot 7.9) = 3.9 \cdot 10^{-8}$ sec. is obtained for the life of the K_2^0 -meson by utilizing the data on the life of the K^+ -meson

and on the relative frequency of the various types of the K^+ -decays. The probabilities of the various decay-processes must then amount to the following percentages of the probability of the K_2^0 -decay: $w_1=w_2 \sim 16\%$; $w_5=w_4 \sim 19\%$;

$w_5 \sim 10\%$; $w_6 \sim 20\%$. The experimental examination of the results obtained here could be useful for the determination of the correctness of the rule $\Delta T = 1/2$ with the lepton de-

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cays and non-lepton decays of K-mesons. The probability of the decay $K \rightarrow 2\pi + \gamma$ and of the other possibilities of the K_2^0 -decay was neglected in this communication. There are 6 references, 3 of which are Soviet.

SUBMITTED: December 11, 1957

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AUTHORS: Okun', L. B., Pomeranchuk, I. Ya. 56-34-4-33/60
 TITLE: On the Determination of the Parity of the K-Meson (Ob opredelenii
 chetnosti K-mezona)
 PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
 Vol. 34, Nr 4, pp. 997 - 998 (USSR)

ABSTRACT: The determination of the parity of K-mesons and hyperons is still one of the central problems of the experimental physics of elementary particles. It is possible to speak about only a relative parity of the K-mesons and hyperons viz. about the sign of $P_{K^+N^0\Lambda}$, $P_{K^+N^0\Sigma}$ etc., because in the case of strong interactions the strangeness is maintained (whereas in the case of weak interactions parity is not maintained. This paper investigates experiment which makes the determination of the sign of $P_{K^+N^0\Lambda}$ possible. The authors investigate the capture of a slow K-meson from an S-state; it leads to the reactions
 $K^+p \rightarrow \Lambda^0 + \pi^0 + \pi^0$ (1), $K^+p \rightarrow \Lambda^0 + \pi^+ + \pi^-$ (2). The parity of the system $\Lambda + 2\pi$ has to be equal to the parity of the system $K + p$, because parity is conserved in the case of strong inter-

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56-34-4-33/60

actions. The authors investigate 2 possibilities: 1) Let it be assumed that $P_{KN}^P \Lambda = +1$. In this case the transition amplitudes for the above mentioned 2 reactions have the form $A_1 = -(a+bp^2+cq^2)/\sqrt{2} + \dots$, $A_2 = (a+bp^2+cq^2) + d\vec{p}\vec{q} + \dots$.

Here \vec{q} denotes the difference of the momenta of the 2 pions and \vec{p} the sum of their momenta, which is equal to the momentum of Λ -hyperon. If for the range in which a strong interaction exists, the validity of the inequality $1/m_p < r < 1/\mu_p$ is assumed, it is possible to confine oneself to such terms as do not depend on p and q . It is then true that $A_1 = -a/\sqrt{2}$, $A_2 = a$ and the angular distributions in both above mentioned reactions are found to be spherically symmetric. The Λ hyperon is not polarized and therefore the angular distribution of the pions forming in the case of the decay of the Λ hyperon is isotropic. For the ratio of the cross sections of the reactions (1) and (2) the ratio $\sigma_2/\sigma_1 = 1,34$ is obtained. 2) Let it be assumed that $P_{KN}^P \Lambda = -1$. The transition amplitude has to have the form

$A_1 = -a\vec{\sigma}\vec{p}/\sqrt{2}$, $A_2 = a\vec{\sigma}\vec{p} + b\vec{\sigma}\vec{q}$, with $\vec{\sigma}$ denoting Pauli's matrices.

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The differential cross section which result from the computation of the angular distribution in consideration of a possible polarization of the Λ -hyperon are explicitly written down. The cross section of the reaction (1) is still isotropic and does not depend on the polarization of the Λ -hyperon. The Λ -hyperon will be polarized in general and it will be vertical to that plane in which the products of the reactions are located. The number of pions formed in connection with the decay of the Λ -hyperons, as well as of those emitted in an upward and downward direction with respect to the reaction-plane will vary. A formula is given for the angular distribution of the 2 pions and the Λ -hyperon. In conclusion an expression for the ratio is written down (total number of charged pions/total number of neutral pions).

SUBMITTED:

December 11, 1957

1. Mesons--Nuclear reactions

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AUTHORS: Okun', L. B., Pomeranchuk, I. Ya., SOV/56-34-5-27/61
Shmushkevich, I. M.

TITLE: On the Interaction of the Ξ -Hyperons With Nucleons and Light Nuclei (O vzaimodeystvii Ξ -giperonov s nuklonami i legkimi yadrami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1246 - 1249 (USSR)

ABSTRACT: This work determines the spin-correlations of the Λ -particles occurring in the reaction $\Xi^- + p \rightarrow \Lambda + \Lambda$. In the interaction of a slow Ξ -hyperon with protons the following reactions are possible:
 1) $\Xi^- + p \rightarrow \Xi^- + p$ (elastic scattering)
 2) $\Xi^- + p \rightarrow \Xi^0 + n$ (charge exchange), 3) $\Xi^- + p \rightarrow \Lambda^0 + \Lambda^0$ (absorption).
 The other processes (of the type $\Xi^- + p \rightarrow \Sigma^0 + \Lambda^0$) have a threshold value and for low energies can be neglected. If the Ξ -hyperon is sufficiently long-lived and if experiments with slow Ξ -hyperons are possible the investigation of reaction (3) with an observation of the subsequent

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decay processes of the Λ -hyperons would be of particular interest. The Λ -hyperon is supposed to decay under non-conservation of parity. Expressions for the amplitude of the decay $\Lambda^c \rightarrow p + \pi^-$ and also for the angular distribution in the decay of a polarized Λ -hyperon are written down. The pions must fly off predominantly in the direction (or opposite to) of the polarisation of the Λ -hyperon. A table contains the spin states and the orbital states of two Λ -hyperons for the case that the Ξ^- -hyperon is captured by a proton from the S-state. In case of positive parity of the Ξ^- -particle the amplitude of only one transition

$^1S_0 \rightarrow ^1S_0$) must be considered. A formula for the angular distribution of the pions occurring in the decay of two Λ -hyperons is derived. By comparing this formula with the experimental data the parity of the Ξ^- -hyperons could be computed. The derived formulae for the process (3) hold in the capture of slow Ξ^- -particles from a continuous spectrum as well as in the capture from bound states of the system $\Xi^- + p$. The most probable one is

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the decay $\Xi^- + p \rightarrow \Lambda^0 + \Lambda^0 + \gamma$. There are 1 table and 2 references,
1 of which is Soviet.

SUBMITTED: December 10, 1957

1. Particles--Properties 2. Particles--Decay 3. Nuclear spins
--Analysis 4. Mathematics--Applications

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latter case a formula for the distribution of the electrons in the decay of a resting myon is given.

$$(1 - \xi \vec{n}) (1 - 2\xi \pm \vec{\eta} \vec{n} (1 - 2\xi)) \varepsilon^2 d\varepsilon$$

The derivation of this formula is outlined in a mathematical supplement. According to this formula the electron must be totally polarized in the longitudinal direction. Moreover, the spin of the positive myon produced by the decay of a positive pion is orientated antiparallel to its momentum. The experimental verification of this formula does not mean that the neutrino has two components. The authors mention the following problem: May a suitably chosen combination of the S, P and T-variants give a formula that is completely identical with the above mentioned formula. But an approximate investigation answers this question in a negative manner. There are 21 references, 5 of which are Soviet.

SUBMITTED: December 11, 1957

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1. Electrons--Polarization 2. Particles--Decay 3. Electrons
--Spectra 4. Mathematics--Applications

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AUTHORS: Baz', A. I., Okun', L. B.

TITLE: The Production Cross Sections of Λ -Hyperons Near the Production Threshold of Σ -Hyperons (O sechenii rozhdeniya Λ -giperona vblizi poroga rozhdeniya Σ -giperona)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 3, pp 757-761 (USSR)

ABSTRACT: In several papers (e.g. Refs 1,2), the energy- and angle-dependence of the elastic scattering of particles near the threshold of any unelastic process has already been investigated. It was shown that measurements of this dependence may supply information concerning the phases of elastic scattering as well as spin and parity of particles, which occur in unelastic processes. The same applies to investigations of the energy- and angle-dependence of an unelastic process near the threshold of another unelastic process. In the present paper this is shown by the example of the production of strange particles in pion-proton collisions, with a pion energy of approximately $E_0 = 890 \text{ MeV}$: $\pi^- + p \rightarrow K^0 + \Sigma^0$. The following

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is connected with this reaction (1): a) elastic scattering of pions, b) production of 2, 3, 4, and 5 pions, c) production of Λ -hyperons in the reaction (2) $\pi^- + p \rightarrow K^0 + \Lambda^0$, the threshold of which is about 760 MeV. The present paper investigates the reaction cross sections of (2) near the threshold of (1). It is assumed that the K-mesons have spin 0 and the Λ - and Σ -hyperons have the spin 1/2 and determine the two possible values of relative parity (Ref 2). Calculations lead to the following results if $j = 1/2$ is assumed: The $\Sigma^0 + K^0$ -production in (1) takes place in the S-state; the orbital moment is 0 or 1 according to the relative parity of Λ - and Σ -hyperons; (2) leads to a state with the isotopic spin $T = 1/2$: a) The parity of Σ -hyperons coincides with that of Λ -hyperons, $l = 0$; for the amplitudes g and h it holds that $g(\theta, E) = g(\theta) + a k/2ik_1$; $h(\theta, E) = h(\theta)$, with $\varphi(\theta) \equiv \varphi(\theta, E=E_0)$, where φ is a random quantity; $a = m_1 m_2/2$.

For the cross section of (2) it holds that

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$$\sigma(\theta, E) = \sigma(\theta) + \frac{|k|}{k_1} \begin{cases} -\operatorname{Im} g(\theta) a^* & E > E_0 \\ \operatorname{Re} g(\theta) a^* & E < E_0 \end{cases}$$

For the polarization of Λ -particles it holds that

$$P(\theta, E) = P(\theta) + \frac{|k|}{k_1} \begin{cases} \operatorname{Re} f(\theta) a^* & E > E_0 \\ \operatorname{Im} f(\theta) a^* & E < E_0 \end{cases}$$

where $f(\theta) = h(\theta) - iP(\theta)g(\theta)/\sigma(\theta)$.

b) The parity of Σ -hyperons is inverse to that of Λ -hyperons,

$$(l = 1): \quad g(\theta, E) = g(\theta) + \frac{a \cos \theta}{2ik_1} k; \quad h(\theta, E) = h(\theta) + \frac{a \sin \theta}{2ik_1} k;$$

$$\sigma(\theta, E) = \sigma(\theta) + \frac{|k|}{k_1} \begin{cases} -\operatorname{Im} l(\theta) a^* & E > E_0 \\ \operatorname{Re} l(\theta) a^* & E < E_0 \end{cases}$$

$$P(\theta, E) = P(\theta) + \frac{|k|}{k_1} \begin{cases} \operatorname{Re} f_1(\theta) a^* & E > E_0 \\ \operatorname{Im} f_1(\theta) a^* & E < E_0 \end{cases}$$

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The Production Cross Sections of Λ -Hyperons Near the Production Threshold of Σ -Hyperons

These results are discussed. Finally, the authors point out that a similar investigation of the reaction $\bar{K} + p \rightarrow \Lambda(\Sigma) + \pi$ near the threshold of $\bar{K} + p \rightarrow \Sigma + K$ would be of interest. There are 5 references, 2 of which are Soviet.

SUBMITTED: April 17, 1958

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~~21(0)~~ 24.6000
AUTHORS:

Ioffe, B. L., Okun', L. B.

66546

SOV/30-59-7-3/50

TITLE: Investigation of Elementary Particles (Issledovaniye elementarnykh chastits)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 7, pp 17-26 (USSR)

ABSTRACT: At present about 30 elementary particles are known (see Table) which can be divided into several classes. In the first class there is only one particle, the photon, the second group comprises the leptons: the neutrino, electron and μ -meson, the third group: the mesons (π and K), the fourth the baryons: nucleons (proton, neutron), and hyperons. The graviton may also be added to this list, although it has not been found experimentally, but its existence was predicted theoretically. All elementary particles show interactions which can be divided into three types: nuclear, electromagnetic, and weak interaction. At present there exists no logical theory describing all elementary particles and their interactions. Therefore only the general theorems of conservation of physics can be used for this purpose. This group of theorems is based upon the invariance theory of physical equations with respect to coordinate transformations. The other group of conservation

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Investigation of Elementary Particles

theorem is connected with the coordinate reflection. One of the basic variations of the physics of elementary particles is the replacement of particles by antiparticles which not only differ in their charge signs from one another, but also in their nuclear properties. Elementary particles are classified on the basis of the following properties: mass, charge, spin, parity, parity with respect to time. A table shows a list of the elementary particles known at present as well as their properties. Among the three kinds of interaction, electromagnetic interaction is investigated best. Nuclear interaction is of decisive importance for mesons, baryons and antibaryons. A theory of nuclear interaction has not been developed up to now. The processes of weak interaction can be classified into three groups. To the first group those processes belong in which only leptons take part, to the second group processes in which leptons as well as baryons and mesons take part. The third group includes the slow processes in which leptons do not take part. This is the known decay of hyperons and K-mesons (see Table). At present the investigation of weak interactions is one of the essential problems of the physics of elementary particles. In recent time the investigation of

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elementary particles has been intensified. There is 1 table.

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24(0)

SOV/69-6-6-6/27

AUTHORS: Lapidus, L. I., Okun', L. B.

TITLE: The Physics of High Energies (Fizika vysokikh energiy). (Survey on the Material of the VIII International Conference on Physics of High Energy) (Obzor materialov VIII Mezhdunarodnoy konferentsii po fizike vysokikh energiy)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 6, pp 648 - 656 (USSR)

ABSTRACT: The authors give a survey on the subjects which were dealt with on this Conference (Geneva, June 29 - July 5, 1958). At first, the synoptic lectures are mentioned and then the subjects of the lectures (without mentioning the individual lecturers) are divided as follows: detection of new particles, the fundamental particle properties, the interaction between the particles, the weak interaction, the non-conservation of parity, the non-conservation of the charge parity, the conservation of combined parity, the longitudinal neutrino, the "two-component" electron, the vectorial and axially-vectorial interaction variant, the universal weak interaction, the neutron decay, the muon decay, the pion decay, the decay of strange particles, the capture of muons by nucleons, the rule $T = 1/2$, the electro-

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The Physics of High Energies. (Survey on the Material SOV/69-6-6-5/27
of the VIII International Conference on Physics of High Energy)

magnetic interaction, the strong interaction, the structure of nucleons, the nucleon-nucleon interaction (communications of a group of collaborators Wang Shu-fen (China), Danish (Poland), Dalkhazhav (Mongolia), Vishki (Roumania), Markov (Bulgaria) on p-p interaction at 9 Bev, investigations on the synchrophasotron of the Ob'yedinenny institut yadernykh issledovaniy (Joint Institute for Nuclear Researches), moreover, a communication by Blokhintsev et al on diffraction scattering), the antinucleons, the interaction between pions and nucleons, the interaction between π -quanta with nucleins, the production of strange particles and the interaction of strange particles. In conclusion, the theoretical results obtained are briefly dealt with and a criticism of the Heisenberg theory (communication made by Bogolyubov) is made. The 9th International Conference on Physics of High Energies will take place in the Soviet Union in the town of Kiyev in July 1959.

SUBMITTED: February 13, 1959

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21(7)

AUTHORS: Okun', L. B., Pomeranchuk. I. Ya. SCV/56-36-1-44/62

TITLE: On the Peripheral Interactions of Elementary Particles
(O periferiynykh vzaimodeystviyakh elementarnykh chastits)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 36, Nr 1, pp 300-312 (USSR)

ABSTRACT: By means of the method of analyzing experimental data suggested by the authors it is possible to sort out the contribution made by peripheral interaction. This method is based upon the following well-known fact: Two particles having a large relative orbital momentum l enter into interaction with each other at the distance $\sim l\lambda$, where λ denotes the wave length of the particle. Penetration into shorter distances is prevented by the centrifugal barrier. For the purpose of investigating peripheral interactions it is therefore necessary to sort out that part of the experimental data which determines the amplitude of the process at sufficiently high values of l . The possibility of sorting out and of theoretically describing interaction is based upon 2 particles or 2 systems of particles separated from each other by a sufficiently long distance exchanging

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the actually smallest possible number of mesons among each other. The suggested analysis on the basis of orbital momenta permits not only determination of the value of the constant g or of similar constants, but also the determination of the relations between various physical quantities (as e. g. between scattering phases), which characterize one or the other process. With a view of illustrating the suggested method the authors investigate the interaction of two homogeneous scalar particles exchanging scalar mesons between each other. On this occasion, the obviously existing amplitude symmetry (which is due to the equivalence of the particles) was not taken into account. Such an example, which deviates considerably from reality, does, however, not make it possible to investigate such details as are connected with the dependence of the amplitude on spin and on isotopic spin. The ratio between the contributions made by one-meson approximation and two-meson approximation is estimated for large l . In the case of a large l the two-meson amplitude is exponentially small compared to the one-meson amplitude. A more exact analysis of the two-meson amplitude in the case

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Particles

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of a large l will be made in a future paper. Taking isotopic- and spin variables (which are of essential importance in the investigation of concrete processes) into account does not essentially change the results obtained, but only modifies them a little. The further chapters of the paper deal in detail with the interaction of pions and nucleons (scattering of nucleons by nucleons, scattering of antinucleons by nucleons, scattering of pions by nucleons, production of pions in collisions of pions and nucleons), the interaction of strange particles and with pions and nucleons (scattering of hyperons by nucleons, scattering of K-mesons by nucleons, production of K-mesons and pions by K-mesons), the interaction of photons with mesons and baryons (scattering of photons by nucleons, photoproduction of pions, photoproduction of K-mesons, scattering of electrons by nucleons, and production of pions and K-mesons by electrons, interaction with the participation of a neutrino). The authors thank V. B. Berestetskiy, N. N. Bogolyubov, A. P. Gnashin, B. L. Ioffe, L. D. Landau, A. P. Rudik, K. A. Ter-Mikaelian and I. M. Shmushkevich for discussions and valuable advice.

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The authors further thank Professor Chen for placing a printed copy of his paper at their disposal before its publication. There are 2 figures, 1 table, and 18 references, 6 of which are Soviet.

SUBMITTED: September 20, 1958

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SOV/56-36-4-56/70

AUTHORS: Matinyan, S.G., Okun', L. B.

TITLE: On the K_{e3}^- and $K_{\mu3}^-$ -Decays ($0 K_{e3}^- \rightarrow 1 K_{\mu3}^-$ -raspadakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, '959, Vol 36, Nr 4, pp 1317-1319 (USSR)

ABSTRACT: On the publication of a number of experimental papers dealing with V-A-interaction in β^- , μ^- , and π^- -decays and in the decays of strange particles, the authors investigated the three-particle lepton K-decays $K \rightarrow l + \nu + \pi$, where l denotes an electron or meson. In the theory of universal V-A-interaction the matrix element describing such a process may be represented in the rest-system of the K-meson by (1): $M^{-3/2} E_{\pi}^{-1/2} \left(\frac{m_l}{M} X (1 + \gamma_5) \nu \right) - Y (1 + \gamma_5) \nu$. E_{π} denotes the total pion energy, m_l - lepton mass, M - K-meson mass, X and Y are real functions of E_{π} , which are the same for K_{e3}^- and $K_{\mu3}^-$ -decays. If the dependence of X and Y on E_{π} is neglected and if it is assumed that $X = \text{const}$ and $Y = \text{const}$, these quantities can be determined experimentally.

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On the K_{e3}^- and $K_{\mu 3}$ -Decays

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which was done e.g. by Gatto (Ref 6). By calculating the probabilities for K_{e3}^- and $K_{\mu 3}$ -decays by means of (1) and by comparison with experimental data, two possible pairs of values were obtained: $X/Y = 4.2$ (solution I) and $X/Y = -0.34$ (II). The authors point out that the choice between the two values can be made much easier by measuring the longitudinal polarization of the muons in $K_{\mu 3}$ -decay. An expression is derived (for V-A-interaction) for the longitudinal polarization \bar{P} of the muon, which is a function of X/Y , v , α , m_1 , and M . For the solutions I and II a figure shows the dependence of \bar{P} on the muon energy κ ($\kappa = E_{kin}/E_{kin}^{max}$). I is in the positive, II in the negative, and also the course taken by the curve differs: I shows a nearly linear rise, II has a minimum. The curves have been plotted for the experimentally determined ν -value of 0.96 ($\nu \equiv \tau(K_{e3})/\tau(K_{\mu 3})$). A second figure shows $\bar{P}(\nu)$ for different κ -values. If an experimental determination of \bar{P} (with ν being exactly known) furnishes solutions that do not agree with those predicted here, this may mean that either the assumption as to the weak energy dependence

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of Y and X is not correct or that A-V-interaction is not applicable to K-decay. There are 2 figures and 9 references, 1 of which is Soviet.

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

SUBMITTED: December 31, 1958

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