16.8100,16.8300,24.6000

76995
SOV/56-37-6-35/55

AUTHORS: Okun, L. B., Shabalin, E. P.

TITLE: The K_{e4}-Decay

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1775-1780 (USSR)

ABSTRACT: Calculations were carried out of the probabilities of K_{e4}-decays. The selection rules for the decays and the isotopic relations between various K_{e4} decays were determined on the basis of the Sakata model (cf. S. Sakata, Prog. Theor. Phys., 16, 686, 1956). The numerical value of K_{e4} decays probabilities was:

$$w = \frac{G^2\lambda^2}{2^{16}\pi^5 3!0}(f^2 0{,}0296 + g^2 0{,}0029). \quad (34)$$

as compared with the probabilities of K_{e3} decays (cf.

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The K_{e4}-Decay

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L. B. Okun, Uspekhi Fiz. Nauk, 68, 449, 1959):

$$w_{\chi_{e3}} = 0{,}58 G^2 \chi^2 M^5 / 768\pi^3,$$

(where χ is dimensionless coefficient; M is mass of K-meson). It may be seen that the probability of the K_{e4}-decay is extremely small in comparison with the probability of the K_{e3}-decay. Therefore, an experimental check of the derived results probably cannot be carried out with present-day techniques. An exception is the possibility of checking the absence of the decay $K^+ \longrightarrow 2\pi^+ + e^- + \tilde{\nu}$. In a photoemulsion this decay should have the appearance of an anomalous τ-decay. Should this decay exist, it would mean that the model of Sakata (cf. loc. cit.) is incorrect. The text contains 9 references, 3 Soviet, 6 U.S. The 5 most recent U.S. references are: S. Oneda, Nucl. Phys., 4, 21 (1957); S. Sakata, Prog. Theor. Phys., 16, 686 (1956); S. Okubo, et. al., Phys. Rev., 112,

21 (1)

AUTHOR: Okun', L. B. SOV/53-68-3-6/11

TITLE: Strange Particles (Strannyye chastitsy). Decays (Raspady)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 68, Nr 3, pp 449-480 (USSR)

ABSTRACT: This article has already been published in the English language in "Annual Review of Nuclear Science, Vol 9. There are 7 figures, 6 tables, and 118 references, 34 of which are Soviet.

Card 1/1

KOLMUNOV, V.A.; OKUN', L.B.; RUDIK, A.P.

Singularities of some Feynman diagrams. Zhur.eksp.i teor. fiz. 38 no.3:877-881 Mr '60. (MIRA 13:7)
(Collisions(Nuclear physics))

KOBZAREV, I.Yu.; OKUN', L.B.; RUDIK, A.P.

Remarks pertaining to the decay of the cascade hyperon.
Zhur.eksp.i teor.fiz. 38 no.3:1012-1013 Mr '60.
(MIRA 13:7)

(Mesons)

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

Symbols for atron interaction constants. Zhur. eksp. i teor. fiz. 39 no. 1:210 Jl '60. (MIRA 13:12)
(Nuclear physics--Notations)

OKUN', L.B.

Properties of the axial interaction and decay $\Sigma \rightarrow \Lambda + e + \nu$.
Zhur. eksp. i teor. fiz. 39 no. 1:214-216 Jl '60. (MIRA 13:12)
(Nuclear research)

KOLKUNOV, V.A.; OKUN', L.B.; RUDIK, A.P.; SUDAKOV, V.V.

Position of the nearest singularities of the $\pi\pi$-scattering amplitude. Zhur. eksp. i teor. fiz. 39 no.2:340-344 Ag '60. (MIRA 13:9)

(Field theory) (Scattering (Physics))

OKUN', L.B.; RUDIK, A.P.

$\Sigma^{\circ} \rightarrow \Lambda^{\circ} + 2\gamma$-decay and magnetic moment of the Σ°-hyperon.
Zhur. eksp. i teor. fiz. 39 no.2:378-383 Ag '60. (MIRA 13:9)
(Mesons—Decay)

84963

S/056/60/039/003/049/058/XX
B006/B070

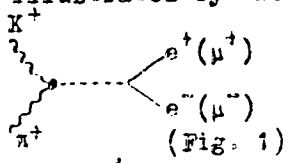
24.6900

AUTHORS: Okun', L. B., Rudik, A. P.

TITLE: The Decays $K^+ \to \pi^+ + e^+ + e^-$ and $K^+ \to \pi^+ + \mu^+ + \mu^-$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3(9), pp. 600 - 604

TEXT: A theoretical study of the decay reactions[19] (2): $K^+ \to \pi^+ + e^+ + e^-$ and (3): $K^+ \to \pi^+ + \mu^+ + \mu^-$ is made in this paper. These reactions have not yet been observed; however, they are not absolutely forbidden in the realm of the present-day theories but cannot be due to weak interactions alone. The authors show that both these reactions may be due to the combined weak lepton interaction and electromagnetic interaction and can be illustrated by the Feynman graph of Fig. 1. The dotted line represents a virtual photon, and the full circle of the graph shows a K-decay into pion + gamma quantum. Such a graph is shown in Fig. 2.



(Fig. 1)

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The Decays $K^+ \to \pi^+ + e^+ + e^-$ and $K^+ \to \pi^+ + \mu^+ + \mu^-$

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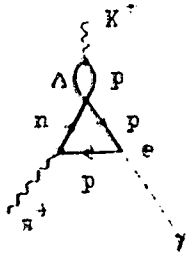
B006/B070



(Fig. 2)

The decays (2) and (3) are analogous to the known 0 - 0 conversion transitions in nuclei. The matrix element of the graph (Fig. 1) is formulated as

$M = efGk^2 p_\mu \frac{\varphi_K \varphi_\pi}{k^2} \sqrt{4\pi}\, \bar{e} \gamma_\mu u = \sqrt{4\pi}\, \alpha G f \bar{u} \gamma_\mu \varphi_K \varphi_\pi$, where

$\alpha = e^2 = 1/137$, $\hbar = c = 1$; u are spinors of the lepton field (e or μ), φ_K and φ_π are the wave functions of K- and π-mesic fields, G is the weak interaction constant ($G \sim 10^{-5} m_p^{-2}$, m_p - proton mass), $\varphi_K \varphi_\pi efGk^2 p_\mu$ is the vertex part (full circle) of the graph (Fig. 1), f is a dimensionless function of k^2; $k^2 = m_K^2 + m^2 - 2E m_K$ and is considered to be constant. The total probabilities for the decays (2) and (3) are found to be $W_e = 0.56\ W_c$ and $W_\mu = 0.11\ W_c$; $W_c = \frac{1}{48} \alpha^2 G^2 m_K^5 f^2 \approx 5.10^6 f^2 sec^{-1} = W_\gamma f^2$, where W_γ is the

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The Decays $K^+ \to \pi^+ + e^+ + e^-$ and $K^+ \to \pi^+ + \mu^+ + \mu^-$

S/056/60/039/003/049/058/XX
B006/B070

probability of τ decay. From the number of the observed τ decays in which no single decay of the type (3) was found, it is concluded that $f^2 < 5.10^{-4}$. The relative probability, however, does not depend on f^2: $W_\mu/W_e = 0.2$. In the following, the authors discuss the calculation of the pion, electron, and muon spectra for the decays (2) and (3). The results are given by formulas (9) and (10), and (12) and (13), respectively, and are illustrated in Figs. 3 and 4, respectively. The authors thank L. D. Landau and I. Yu. Kobzarev for discussions, S. A. Nemirovskiy for numerical calculations, and Ye. D. Zhizhin for pointing out an error. There are 6 figures and 2 references: 1 Soviet and 1 US.

SUBMITTED: March 2, 1960

24.6900

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

TITLE: Which Is Heavier: the K_1^0 Meson or the K_2^0 Meson ?

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 3(9), pp. 605 - 609

TEXT: In the present paper, a method is proposed for determining the sign as well as the magnitude of the mass difference between K_1^0 and K_2^0 mesons. The K_1^0 meson has the shorter lifetime, $\tau_{K_1^0} = (1.00 \pm 0.04).10^{-10}$ sec (K_{π_2} decay); $\tau_{K_2^0} = (6.1^{+1.6}_{-1.1}).10^{-8}$ sec. From the fact that only transitions with $\Delta S = \pm 1$ are allowed in weak interactions (S - strangeness), it is concluded following Ya. B. Zel'dovich (Ref.4) that the mass difference of these two mesons is equal to
$\Delta m \sim g^2 \tau_K \sim 1/\tau_{K_1^0} \approx 10^{10}\,\text{sec}^{-1} \approx 10^{-5}$ ev, where $g^2 \approx 10^{-13}$ is the square of

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B006/B070

Which Is Heavier: the K_1^o Meson or the K_2^o Meson ?

If transitions with $\Delta S = \pm 2$ were allowed, one would have $\Delta m \sim g m_K \sim 10^{16} sec^{-1}$. It is known experimentally that $\Delta m \approx 10^{10} sec^{-1}$; so transitions with $\Delta S = \pm 2$ are forbidden. The authors now propose a method of determining the sign of Δm. Experiments of this kind have so far been inconclusive. The method makes use of an interference phenomenon in a K_2^o beam, which can appear only if $\Delta m \approx 10^{10} sec^{-1}$. Suppose a monochromatic beam of K_2^o falls on a target consisting of two thin plates, the plates (a and b) being made of different materials and separated from each other by a distance l. The following relation is derived for the total probability of K_1^o decays on the right side of the plate b:

Which Is Heavier: the K_1^0 Meson or the K_2^0 Meson ?

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are the refractive indices of the K^0 and $\bar{K}^0$ mesons, respectively). It is suggested that one of the plates be made of a material with small Z and the other with large Z. Some other details of the experiment are discussed. The possibility of working with a non-monochromatic K_2^0 beam is considered but found to be less favorable. It is mentioned in conclusion that the experiment in practice would be more complicated than is sketched here. It is recommended that thick plates be used, because in that case the yield of K_1^0 mesons would be greater. According to S. G. Matinyan, for example, the yield for a copper plate of ~1 cm thickness is 10^{-4}. The authors thank V. I. Veksler, Ya. B. Zel'dovich, I. Ya. Pomeranchuk, and B. M. Pontekorvo for interest and discussions. There are 1 figure and 7 references: 4 Soviet and 3 US.

SUBMITTED: March 12, 1960

Card 4/4

OKUN', L.B.; PONTEKORVO, B.

What is heavier "muonium one" or "muonium two"? Zhur.eksp.i teor.fiz. 41 no.3:989-991 S '61. (MIRA 14:10)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Mesons)

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

Model for anomalous muon interaction. Zhur.eksp.i teor.fiz. 41 no.4:1205-1214 O '61. (MIRA 14:10)

1. Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR.
(Nuclear models) (Mesons)

S/056/61/041/006/026/054
B102/B138

AUTHORS: Gribov, V. N., Kolkunov, V. A., Okun', L. B., Shekhter, V. M.

TITLE: Covariant deduction of the Weizsäcker-Williams formula

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6(12), 1961, 1839-1841

TEXT: A covariant deduction of the Weizsäcker-Williams formula (G. Weizsäcker. Zs. Phys., 88, 612, 1934; E. Williams. Phys. Rev. 45, 729, 1934) is given in explicit form. The process illustrated by the graph in Fig. 1 is reduced to the photoprocess (Fig. 2) in order to calculate its cross section. k and p are the momenta of the colliding charged particles, k' and p' those of the particles produced ($k^2=\mu^2$, $p^2=m^2$; $p'^2=p^2=m^2$; q - momentum of the virtual photon). The cross section of the photoprocess is given as $\sigma^e_{ph}=-e_\mu e_\nu T^0_{\mu\mu}$, for a non-polarized photon $\sigma_{ph}=\frac{1}{2}\sum_{\mu\nu}T^0_{\mu\nu}=\frac{1}{2}T^0_{\mu\mu}$; $T^0_{\mu\nu}=T_{\mu\nu}\big|_{q^2=0}$. In most general representation

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Covariant deduction of the ...

$$T_{\mu\nu} = a\left(\frac{q^2}{kq} k_\mu k_\nu + kq \cdot \delta_{\mu\nu} - k_\mu q_\nu - k_\nu q_\mu\right) + b\,(q^2 \delta_{\mu\nu} - q_\mu q_\nu). \qquad (5)$$

holds, satisfying the conditions of gradient invariance. With $\sigma_{ph} = a(kq)$, the process of Fig. 1 is given by

$$d\sigma_{BB} = -\left[\frac{kq}{\sqrt{(kp)^2 - k^2p^2}}\right] \cdot e^2 Z^2 \frac{1}{q^4} (2p-q)_\mu (2p-q)_\nu T_{\mu\nu} \frac{dp'}{(2\pi)^3 2E'}. \qquad (7).$$

The factor in brackets is the ratio of the invariant fluxes in the reactions k+q=k' and k+p=k'+p', Ze(2p-q) is the photon vertex part of the spin-free nucleus p. With the variables q^2, $^2=(k+q)^2$ and $($ is the angle between $\vec{p'}$ and $\vec{k}$ in the laboratory system),

$dp'/2E' = d\,^2 d(-q^2) d\,/8\sqrt{(kp)^2 - k^2p^2}$. with $2pq=q^2$, integration of (7) with respect to ψ yields

$$d\sigma_{BB} = \frac{Z^2\alpha}{\pi} \sigma_\Phi \left(1 - \frac{k^2p^2}{(kp)^2}\right)^{-1} \left\{\left[1 + \frac{(kq)^2 p^2}{(kp)^2 q^2} - \frac{(kq)}{(kp)}\right] + \frac{b}{a} \frac{(p^2 - q^2/4)(kq)}{(pk)^2}\right\} \frac{dq^2}{q^2} \frac{d\omega^2}{2kq}. \qquad (10).$$

Card 2/

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ACC NR: AT6006751 SOURCE CODE: UR/3138/65/000/383/0001/0014

AUTHOR: Okun', L.

ORG: Institute of Theoretical and Experimental Physics, State Committee on the Use of Atomic Energy, SSSR (Institut teoreticheskoy i eksperimental'noy fiziki Gos. kimiteta po ispol'zovaniyu atomnoy energii SSSR)

TITLE: On neutral a-particles 19

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 383, 1965. O neytral'nykh alpha-chastitsakh, 1-14

TOPIC TAGS: elementary particle, parity principle, strong nuclear interaction, K meson, pi meson

ABSTRACT: The author presents a new formulation for the model of a-particles, introduced by T. D. Lee (Preprint, Columbia University, 1965) to describe CP violation. The present article deals with a model, in which the a-particles are neutral and it is shown that even

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in the case when the decay $K_2^0 \to 2\pi$ is due to the presence of a superweak interaction with $\Delta Y = 2$, the effects of CP violation can be of the order of unity in experiments in which real a-particles participate. It is shown that if strong interaction of a-particles with usual hadrons (called X_a interaction) is defined such that it is invariant under charge conjugation of normal particles and changes sign under charge conjugation of a-particles, then there will be no CP-violating effects in processes that do not involve real a-particles. However, if the a-particles are assumed to have electric charge, then in processes not involving a-particles C-violating effects will appear which are of the same order as in the case of C-violation in electromagnetic interaction. If the a-particle is neutral, then it can be shown that the CP-violating interaction may become observable by raising the accelerator energy enough to be able to produce a particles. The numerical values of the interaction constants, the particle energies, and the interaction distances required for observation of the effects are briefly discussed. The author thanks Kobzarev and [illegible] for interesting discussions.

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SUB CODE: [illegible] SUBM DATE: 14Sep65/ ORIG REF: 001/

Card 2/

31793
S/056/61/041/006/043/054
B109/B102

24.6700

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

TITLE: Heavy neutral pseudoscalar mesons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6(12), 1961, 1949 - 1952

TEXT: Arguments in favor of the existence of heavy neutral pseudoscalar mesons with zero isotopic spin are discussed. Some experiments are suggested, which should help to ascertain whether such mesons exist. According to L. B. Okun' (ZhETF, 34, 469, 1958; Proc. CERN Conf. on High Energy Phys., 1958, p. 223), two neutral pseudoscalar mesons σ_1 and σ_2 with the zero isotopic spin state $\sigma_1 = \{\alpha(p\bar{p} + n\bar{n})/\sqrt{2} - \beta\Lambda\bar{\Lambda}\}$, $\sigma_2 = \{\beta(p\bar{p} + n\bar{n})/\sqrt{2} - \alpha\Lambda\bar{\Lambda}\}$ might exist in addition to the well-known pseudoscalar mesons π and K within the framework of the Sakata model ($\alpha^2+\beta^2 = 1$). In the case of identity of the strong interaction of the baryons p, n, and Λ, the mesons in the octet (π, K, σ_1) would have equal

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Heavy neutral pseudoscalar mesons

masses according to the unitary symmetry, whereas the mass of the ninth meson σ_2 is possibly much larger. From the deviation from unitary symmetry it is concluded that the mass of the σ_1^0 meson is not likely to exceed 1 Bev (the mass of the σ_2^0 meson is still unknown). The decay modes $\sigma \to 2\pi^+ + 2\pi^-$, $\sigma \to 2\pi^0 + \pi^+ + \pi^-$, $\sigma \to 4\pi^0$, suggested by Ya. B. Zel'dovich (ZhETF, 34, 1644, 1958) are improbable according to V. I. Ogiyevetskiy. The probability of the mode $\sigma \to 2\pi^+ + 2\pi^-$ is $w \sim 10^{-7} L^{14} (\Delta/\mu)^{17/2} \mu$, where $\Delta = m_\sigma - 4\mu$ (μ - pion mass). Another possible decay mode is $\sigma \to K^0 + \bar{K}^0 + \pi^0$ (either $2K_1^0 + \pi^0$ or $2K_2^0 + \pi^0$) $w \sim 10^{-3} L^2 \Delta^2/m_\sigma$ ($L \sim 1$).

The modes $\sigma \to \pi^0 + e^+ + e^-$, $\sigma \to \pi^0 + \mu^+ + \mu^-$, $\sigma \to 2\pi^0 + \gamma$ are forbidden, whereas $\sigma \to \pi^+ + \pi^- + \gamma$, $\sigma \to 2\gamma$ ($w_{2\gamma}^{\sigma} = w_{2\gamma}^{\pi^0} (m_\sigma/\mu)^3$) are possible. For large m_σ, the process $\sigma \to \pi^+ + \pi^- + \gamma$ ($w \sim 10^{-7} \mu L^6 (m_\sigma/\mu)^7$ for $m_\sigma \gg 2\mu$) is important. In this case, the photon spectrum can be described by

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B109/B102

Heavy neutral pseudoscalar mesons

$n(\omega)\, d\omega \sim \omega^3 (m_\sigma^2 - 2m_\sigma\omega - 4\mu^2)^{3/2} (m_\sigma^2 - 2m_\sigma\omega)^{-1/2} d\omega$ For the reaction $d + d \rightarrow He^4 + \sigma^0$, experimental data of M. E. Booth, O. Chamberlain, and E. H. Rogers (Nuovo Cim., 19, 853, 1961) indicate $\sigma < 7 \cdot 10^{-32}$ cm^2 for the σ_1^0 production cross section for $m_\sigma = \mu$. and $\sigma < 0.2 \cdot 10^{-32}$ cm^2 for $m_\sigma = 1.8\mu$. Other studies furnished $d\sigma/d\Omega < 6 \cdot 10^{-32}$ cm^2/steradian for the cross section of the reaction $\gamma + p \rightarrow \sigma + p$ for σ-meson masses of up to 3.5μ. There are no experimental data indicating that the heaviest meson is the K meson. The authors think that the existence of the σ-meson can be proved by such experiments as made by G. Bernardini, R. Querozoli, G. Salvini, A. Silverman, G. Stoppini (Nuovo Cim., 14, 268, 1959), V. T. Zinov, A. D. Konin, S. M. Korenchenko, B. Pontekorvo (ZhETF, 38, 1708, 1960), and F. Solmitz (Proc. of the 1960 Ann. Int. Conf. on High Energy Phys. at Rochester, Univ. of Rochester, 1960, p. 165) and, with a sufficient σ-meson mass, by a study of the kinematic distribution of K mesons produced by the reaction $\sigma \rightarrow 2K + \pi$. S. M. Bilen kiy, V. N. Gribov, V. I. Ogiyevetskiy, M. I. Podgoretskiy, I. Ya. Pomeranchuk, B. M.

Card 3/4

KOBZAREV, I. Yu. and OKUN, L. B.

On Fermion Gravitational Interaction"

Institute of Theoretical and Experimental Physics, Moscow, USSR

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

OKUN, L. B.; PONTECORVO, B. M.

"Is 'Muonium one' Heavier than 'Muonium two', or Vice Versa"

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

Joint Inst. Nuclear Research, Lab. of Nuclear Problems.

[redacted], I. Yu. and [redacted], L. B.

"Model of Muon Anomalous Interaction"

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

Institute of Theoretical and Experimental Physics, Moscow, USSR

KOLGANOV, I. Yu., OKUN, L. B.

"New Meson Possible Decays"

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

Inst. of Theoretical and Experimental Physics

BERMAKOV, I. Yu. and OKUN, L. B.

"Unitary Symmetry and Universal Weak Interaction"

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

Inst. of Theoretical and Experimental Physics, Moscow, USSR

KOKKAREV, I. Yu. and OKUN, L. B.

"New particles and sakata model"

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

Inst. of Theroretical and Experimental Physics, Moscow, USSR

24.6610

37889
S/056/62/042/005/040/050
B108/B138

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

TITLE: Unitarian symmetry and universal weak interaction

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 5, 1962, 1400-1403

TEXT: The hypothesis is discussed according to which the strange particle lepton decay constant G_Λ is approximately a quarter of the universal constant $G = 10^{-5}\ m^{-2}$. From the Sakata model it follows that the lepton decay matrix elements must satisfy the conditions

$$M(\Lambda \to p + e(\mu) + \bar{\nu}) : M(n \to p + e(\mu) + \bar{\nu}) = G_\Lambda : G_N, \quad (3)$$

$$M(K \to e(\mu) + \nu) : M(\pi \to e(\mu) + \nu) = G_\Lambda : G_N. \quad (4)$$

$$2M(K^+ \to \pi^0 + e(\mu) + \nu) : M(\pi^+ \to \pi^0 + e(\mu) + \nu) = G_\Lambda : G_N, \quad (5)$$

$$M(K^+ \to \sigma_1^0 + e(\mu) + \nu) : M(K^+ \to \pi^0 + e(\mu) + \nu) = \sqrt{3}. \quad (5')$$

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which are imposed by the unitarian symmetry of strong interaction. This hypothesis agrees with recent experimental data and permits a number of predictions. It holds particularly for the decay probabilities, which should fit the relations

$$w(K_{e3}) = G_{\Lambda}^2 m_K^5 \cdot 0.6/1536\pi^3 = 5.1 \cdot 10^6 \text{ sec}^{-1}$$

$$w(K_{\mu 3}) = 0.4 \cdot G_{\Lambda}^2 m_K^5/1536\pi^3 = 3.4 \cdot 10^6 \text{ sec}^{-1}$$

$$w(_{e3})/w(K_{\mu 3}) = 1.5$$

$$w(\Lambda \to p + e + \bar{\nu}) \approx 6 \cdot 10^6 \text{ sec}^{-1}.$$

The spectra and polarizations of the particles emitted in $K_{\mu 3}$ decay and in lepton decays of the Λ-hyperon can be predicted. There is 1 figure.

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

SUBMITTED: January 3, 1962

S/056/62/042/006/037/047
B104/B112

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

TITLE: New particles and Sakata's model

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1651-1657

TEXT: Based on Sakata's model a classification of new particles was developed on the assumption that there is no difference between long-lived particles and resonances. Recently detected resonances in the interactions of elementary particles are interpreted as coupled states in Sakata's model. The ω^0 meson, for example, is regarded as a coupled $^3S_1$ state of baryons and antibaryons. Some predictions are made regarding the spin, parity, and charge parity of new mesons. Consequences following from the unitary symmetry of strong interaction are illustrated with the aid of the vecton model. There are 3 figures and 1 table.

Card 1/2

S/056/62/043/004/024/061
B108/B186

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

TITLE: Possible decays of new mesons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 4(10), 1962, 1288 - 1295

TEXT: The probabilities of various decay modes of the neutral vector meson ω^0 and of the neutral pseudoscalar meson σ^0 (not hitherto observed) were studied using the matrix elements of these decays. Results: $\omega^0 \longrightarrow \pi^+ + \pi^- + \pi^0$, $w = L^6 m_\omega^7 f/2^{12} 90\pi^3$ with $f = 0.23$. $\omega^0 \longrightarrow \pi^0 + \gamma$, $w = \alpha L^2 m_\omega^3/96\pi$ with $\alpha = 1/137$. $\omega^0 \longrightarrow \pi^+ + \pi^-$, $w = \beta^2 p^3/6\pi m_\omega^2$ where p is the momentum of the decay products, β is a dimensionless quantity, L has the dimension of length. $\sigma^0 \longrightarrow \pi^+ + \pi^- + \gamma$, $w = \alpha L^6 m_\sigma^7 f/2^{12} 30\pi^3$ with $f \approx 0.3$ when $m_\sigma = 700$ Mev. $\sigma^0 \longrightarrow 2\gamma$, $w = \alpha^2 L^2 m_\sigma^3/64\pi$. Probably this decay is predominant in a wide

Card 1/2

S/056/62/043/004/024/061
B108/B186

Possible decays of new mesons

range of L and m. $\sigma^0 \to \pi^+ + \pi^- + \pi^0$, $w = \beta^2 m_\sigma f / 2^9 \pi^3$ with $f \sim 0.37$ if $m_\sigma = 700$ Mev. The small widths may in some cases be explained by the kinematic factors. The small widths of the pion decays show that the photon decays too may play an important role. There are 5 figures.

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

SUBMITTED: February 4, 1962

Card 2/2

43378
S/056/62/043/005/043/058
B125/B104

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

TITLE: On the gravitation interaction of fermions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 5(11), 1962, 1904-1909

TEXT: The effect of the spin of a fermion on its interaction with a spinor field is studied in linear relativistic approximation (S. Gupta. Proc. Phys. Soc., A65, 161; 608, 1952). In such an approximation, the interaction of two particles is described by Møller diagrams. The relation

$$\int \langle 2 | \theta_{ik}(x) e^{iqx} | 1 \rangle d^4 x = (2\pi)^4 \delta(p_1 - p_2 - q) \Gamma_{ik}(p_1, p_2, q). \qquad (3),$$

which is the mathematical formulation of the principle of equivalence, is deduced for the determination of the graviton vertex. $\langle 2|$ and $|1\rangle$ are the physical states of a given particle. The symmetrical energy-momentum tensor θ_{ik} corresponds with the total Lagrangian $L=L_f+L_s+L_e+L_w+L_x$ of the

Card 1/5

On the gravitation interaction...

interacting elementary particles. L_f is the free Lagrangian of the elementary particles, L_s, L_e, and L_w are the Lagrangians of strong, electromagnetic, and weak interaction, respectively. L_x is the Lagrangian of unknown interactions that are possibly present. The vertex part satisfies the transverse condition $q_k \Gamma_{ik} = 0$. The gravitation vertexes for the bare particles after removal of L_s, L_e, L_w, and L_x are

$$\Gamma_{ik}^{\circ} = \varphi_2^{\circ} \{2p_i p_k - \tfrac{1}{2}(q_i q_k - q^2 \delta_{ik})\} \varphi_1, \tag{7}$$

for a spin-zero meson (pion) and

$$\Gamma_{ik}^{\circ} = \tfrac{1}{2} \bar{u}_2 (\gamma_i p_k + \gamma_k p_i) u_1 = \tfrac{1}{2} \bar{u}_2 (\gamma_i p_k) u_1. \tag{8}$$

for a spin-1/2 fermion (proton). The formulas

$$\Gamma_{ik}^{\circ} = \tfrac{1}{2} \bar{u}_2 (\gamma_i p_k)(1 + \gamma_5) u_1, \tag{9}$$

Card 2/5

S/056/62/043/005/043/058
B125/B104

On the gravitation interaction...

and

$$\Gamma_{ik}^{\circ} = \tfrac{1}{2} \bar{u}_2 (\gamma_i p_k) u_1, \tag{10}$$

hold for a neutrino whose free Lagrangian is 2 and 4, respectively. In the case of (10) the virtual gravitons can turn into a neutrino-antineutrino pair with "irregular" helicity. It is therefore a physical problem to establish whether a neutrino is a two-component particle. In principle this problem can be solved by measuring the neutrino flux in outer space using two different methods (gravitation effect and weak interaction). It would also be possible to establish whether abnormal, inert neutrinos exist in nature. At a total energy of

$$E \sim \sqrt{2pk} \sim \varkappa^{-1} \approx 10^{+19}\ m_p,$$

in the c.m.s., the gravitation interaction becomes a strong interaction. The redshift and the deflection of light can be described as classical effects by means of the Lagrangian $L_g = \frac{1}{2} \gamma_{ik} \Gamma_{ik}$ for the interaction of the particle with the external weak gravitational field γ_{ik}. The perihel

Card 3/5

$$\Gamma^{\pi}_{lk} = \varphi^{*}_{2}\{g_1 p_l p_k + g_2 (q_l q_k - q^2 \delta_{lk})\}\varphi_1,$$

and

$$\Gamma^{p}_{lk} = \bar{u}_2 m^{-1}\{f_1 p_l p_k + \tfrac{1}{4} f_2 (\sigma_{lr} q_r p_k) + f_3 \gamma_5 (\sigma_{lr} q_r p_k) + \quad (23)$$

$$+ f_4 \gamma_5 ((\gamma_l q^2 - 2m q_l) p_k) + f_5 (q_l q_k - q^2 \delta_{lk}) + f_6 \gamma_5 (q_l q_k - q^2 \delta_{lk})\}u_1. \quad (24)$$

hold, respectively, for a pion and a proton. The f's and g's are scalar functions of q^2. In a discussion it is shown that the vertex of the interaction of fermions with a gravitational field has properties analogous to the electrodynamical vertex as described by Ward's theorem.

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

SUBMITTED: June 14, 1962

Card 5/5

OKUN', Lev Borisovich; KOZLOV, V.D., red.; PLAKSHE, L.Yu., tekhn. red.

[Weak interaction of elementary particles] Slaboe vzaimodeistvie elementarnykh chastits. Moskva, Fizmatgiz, 1963. 247 p. (MIRA 17:1)

ACCESSION NR: AP4031166 S/0056/64/046/004/1418/1419

AUTHORS: Kobzarev, I. Yu.; Okun', L. B.

TITLE: Absence of $\eta - 2\pi$ decays and conservation of space and combined parities

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1418-1419

TOPIC TAGS: parity conservation, combined parity, P invariance, CP invariance, η meson, strong interaction, 2π decay

ABSTRACT: The importance of a search for the 2π mode of decay of the η meson is emphasized in view of its relevance to the question of P and CP invariance of strong interactions. It is pointed out that present evidence on the absence of this decay indicates that the invariances in question hold to an accuracy of one part in 10^5--10^6. It is suggested that this result could be improved by perhaps three orders of magnitude and it is pointed out that it would

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ACCESSION NR: AP4031166

then provide a test of CP much superior to any known at present.
"The authors express gratitude to P. A. Krupchitskiy for useful remarks."

ASSOCIATION: None

SUBMITTED: 24Oct63	DATE ACQ: 07May64	ENCL: 00
SUB CODE: PH	NO REF SOV: 002	OTHER: 003

Card 2/2

OKUN', L.B.; TSUKERMAN, I.S.

Weak -meson decay. Zhur. eksp. i teor. fiz. 47 no.1: 349-351 Jl '64. (MIRA 17:9)

L 16500-65 EWT(l)/EWT(m)/T/EWA(m)-2 SSD(t)/SSD/AFWL/IJP(c)
ACCESSION NR: AP5000332 S/0056/64/047/005/1777/1781

AUTHOR: Okun', L. B.

TITLE: On the possible types of elementary particles

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 5, 1964, 1777-1781

TOPIC TAGS: elementary particle, lepton, baryon, spin, boson, fermion, elementary particle interaction

ABSTRACT: The possibility of existence of particles with unusual combinations of baryon and lepton numbers and spins is discussed both for particles possessing and not possessing strong interaction. It is pointed out that whereas electric charge can be possessed by bosons and fermions, and both by strongly interacting particles and by particles that do not interact strongly, not all particles can carry baryon or lepton charge, and particles with zero ba-

Card 1/3

L 16500-65
ACCESSION NR: AP5000332

or lepton charge must possess integer spin. The author there
investigates the degree to which these limitations can be pr
experimentally, and also the extent to which it has been pr
that there do not exist in nature interactions which do not
to one of the four known types of interactions (strong, weak
electromagnetic, and gravitational). By considering all poss
combinations of the three quantum numbers that characterize
elementary particles and the ability of particles to interb
strongly, it is shown that there may be 16 kinds of particles
have not yet been observed, although we do not need these
covered particles to explain any known phenomenon. By est
the possible energies and lifetimes it is shown that some s
particles could not have been observed in the experiments
out so far, but an increase in the energy of accelerators a
provement in experimental techniques may lead to the discove
new types of elementary particles. "The author thanks V. B.
Berestetskiy, V. N. Gribov, Ya. B. Zel'dovich, I. Yu. Kobzar

Card 2/3

L 16500-65
ACCESSION NR: AP5000332

G. M. Kukavadze, I. Ya. Pomeranchuk, and A. P. Rudik for useful discussions." Orig. art. has: 2 tables.

ASSOCIATION: None

SUBMITTED: 16Jun64 ENCL:

SUB CODE: NP NR REF SOV: 003 OTHER:

Card 3/3

L 34548-65 EWT(l)/EPF(w)-2/EEC(t) Pab-10 IJP(c)
ACCESSION NR: AP5000350 S/0056/64/047/005/1905/1918

AUTHORS: Ioffe, B. L.; Okun', L. B.; Rudik, A. P.

TITLE: Weak interactions in colliding electron beams

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 5, 1964, 1905-1918

TOPIC TAGS: weak interaction, colliding beams, electron electron colliding beam, electron positron colliding beam

ABSTRACT: The authors calculate the cross sections for several inelastic processes involving weak interaction, and discuss the possible experimental observation of these processes using electron and electron-positron colliding beams at energies 100-- BeV, when the weak interaction becomes strong. The derivation is based on the point-like four-fermion structure of weak interaction (assuming that there is no W meson), and that the standard scheme

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of the "square of the charged current" holds. The procedures used to calculate the matrix elements and the differential cross sections, and to integrate the differential cross sections, are described in detail. The values obtained for the cross sections of the processes $e^+e^- \to e^+\mu^-\bar{\nu}_e\nu_\mu$, $e^+e^- \to \mu^+\mu^-\bar{\nu}_\mu\nu_\mu$, $e^+e^- \to \mu^+\mu^-\bar{\nu}_e\nu_e$, and $e^-e^- \to \mu^-e^-\bar{\nu}_\mu\nu_e$ are 4.2×10^{-40}, 1.6×10^{-40}, 1.2×10^{-40}, and 5.5×10^{-40} cm^2, respectively, and are much smaller than the cross section for the process $e^+e^- \to \nu_e\bar{\nu}_e$ (1.1×10^{-34}). "The authors thank A. D. Dolgov, I. Yu. Kobzarev and I. Ya. Pomeranchuk for useful discussions." These cross sections are still below the capabilities of present day experimental means. Orig. art. has: 3 figures, 55 formulas, and 1 table.

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

L 34546-65

ACCESSION NR: AP5000350

SUBMITTED: 20May64 ENCL: 0

SUB CODE: NP NR REF SOV: 009 OTHER:

Card 3/3

L 29670-66 EWT(1)/T IJP(c)
ACC NR: AT6012696

SOURCE CODE: UR/3138/65/000/385/0001/0011

AUTHOR: Kobzarev, I. Yu.; Okun', L. B.; Terent'yev, M. V.

ORG: Institute of Theoretical and Experimental Physics of the State Committee on the Use of Atomic Energy SSSR, Moscow (Institut teoreticheskoy i eksperimental'noy fiziki Gos. komiteta po ispol'zovaniyu atomnoy energii SSSR)

TITLE: Remark concerning C-odd multipoles

SOURCE: USSR. Gosudarstvenny komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 385, 1965. Zamechaniye o C-nechetnykh mul'tipolyakh, 1-11

TOPIC TAGS: parity principle, elementary particle, electron scattering, boson, fermion, nuclear spin, quantum electrodynamics

ABSTRACT: The authors discuss the possibility of the presence of C-odd terms in the vertices of particles of angular momentum $J \geq 1$ and show that in the case of particles with spin $J > 1/2$ the violation of charge invariance in electrodynamics leads to the appearance of C-odd form factors. The number of such form factors is equal to $J - 1/2$ for fermions and J for bosons. The presence of a C-odd and vertex parts with $J \geq 1$ can give rise to certain correlations which might become ob-

Card 1/2

L 1742-66 EWT(m) DIAAP

ACCESSION NR: AT5022105 UR/3138/64/000/306/0001/0007

AUTHOR: Okun', L. B. 44,55

TITLE: Note on CP-parity

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 306, 1964. Zamechaniye o CP-chetnosti, 1-7

TOPIC TAGS: elementary particle, parity, meson, weak interaction, strong interaction

ABSTRACT: A brief statement is made concerning the $K_2^0 \rightarrow 2\pi$ decay reported by Christenson, Cronin, Fitch and Turlay (Phys. Rev. Lett.13, 138 1964). It is contended that this decay can be observed if a new type of interaction (x) is 10^3 times stronger than the weak interaction w, approximately 10^3 times weaker than the strong interaction S, conserves hypercharge Y and P-parity but violates CP-parity. Increasing the accuracy of the following experiments: asymmetry and polarization of scattered protons; cross sections of direct and inverse reactions; $\gamma\gamma$ and $\beta\gamma\gamma$ -correlations; correlations in β-decay and in strange particle decay, by an order of magnitude, one would be able to check up the above hypothe-

Card 1/2

L 1742-66

ACCESSION NR: AT5022105

sis. "The author is indebted sincerely to B. L. Ioffe, I. Yu. Kobsarev, I. Ya. Pomeranchuk, M. V. Terentyev and I. S. Shapiro for discussions.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki, Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii, SSSR (Institute of Theoretical and Experimental Physics, State Committee for the Utilization of Atomic Energy, SSSR)

SUBMITTED: 14Dec64 ENCL: 00 SUB CODE: GP

NO REF SOV: 002 OTHER: 029

Card 2/2

L 41603-65 EWT(m)/T/[illegible]

ACCESSION NR: AP5007717 S/0367/65/001/001/0160/0162

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

TITLE: The DELTA T = 1/2 rule for adron decay

SOURCE: Yadernaya fizika, v. 1, 1965, 160-162

TOPIC TAGS: DELTA T = 1/2 rule, strange particle production, Tau particle decay, SU sub 3 symmetry

ABSTRACT: Cabbibo noticed recently (Phys. Rev. Lett., 12, 62, 1964) that the subs[illegible] (~5%) deviation from the Δ T = 1/2 rule in $K_{\pi 2}$ decay may be due to the fact that the [illegible] 2π reactions are suppressed because of the SU_3 symmetry and, consequently, stat[illegible] concerning the $K_{\pi 2}$ decays need not contradict the assumption that the Δ T = 1/2 [illegible] strong rule and may be violated only by virtual electromagnetic interactions. In the present communication, the authors point out that such a viewpoint may be checked experimentally, and they discuss possible experiments which could elucidate the [illegible] of the Δ T = 1/2 rule. One of the experiments consists of the measurement of the [illegible] of transitions with Δ T = 5/2 in τ-decays, while in the other, one should test isotop[illegible] relations during single production of strange particles. "The authors thank V. V. A[illegible]

Card 1/2

L 41603-65
ACCESSION NR: AP5007717

for very useful discussion on the role of $\pi\pi$-scattering during γ-decay." Orig. art. has: 8 formulas and 1 figure.

ASSOCIATION: none

SUBMITTED: 20Jul64 ENCL: 00 SUB CODE: NP

NO REF SOV: 001 OTHER: 007

Card 2/2

DOLGOV, A.D.; OKUN', L.B.; POMERANCHUK, I.Ya.; SOLOV'YEV, V.V.

Electromagnetic differences of baryon masses, and the SU_6-symmetry. IAd, fiz. 1 no.4:730-732 Ap '65. (MIRA 18:5)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

[illegible], I.S.

Note on Cr-sil interactions with $|\Delta S| > 1$. Zhur. [illegible]
2132-2133 De '65.

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

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

Multiplication of currents by the admixture $\Delta T = 3/2$ in Λ-hyperon decay. Izd. fiz. 1 no.6:1134-1136 Je '65.
(MIRA 18:6)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

L 1961-66 EWT(m)/T/EWA(m)-2

ACCESSION NR: AT5024120 UR/3138/65/000/330/0001/0004

AUTHOR: Okun', L. B.

TITLE: Baryon charge degeneracy in quarks model with charge parity mesons

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 330, 1965. O vyrozhdenii po barionnomu zaryadu v modeli kvarkov s zaryadovochetnymi mezonami, 1-4

TOPIC TAGS: fermion, meson, vector meson

ABSTRACT: Because of the success of $SU(6)$ symmetry, interest has been aroused by composite models in which the fundamental fermions (for example, quarks) interact by exchanging neutral scalar mesons ϕ. It is shown that a degeneracy exists in such models between states with different values of the baryon charge. This degeneracy is due to the fact that the interaction of Lagrangian for ϕ-mesons with quarks p, n, λ

$$g(\bar{p}p + \bar{n}n + \bar{\lambda}\lambda)\phi$$

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L 1961-66

ACCESSION NR: AT5024120

is invariant relative to the charge conjugation of each of the quarks. The existence of diquarks with masses of the order of m_π would result in the splitting of ordinary atomic nuclei into diquarks in nuclear times. Since the nuclei are stable in the experiments, and physical quarks with masses of the order of the masses of nucleons are absent, it is concluded that the composite model in which quarks interact through exchange of neutral scalar mesons contradicts the experiment. This conclusion also applies to neutral pseudoscalar and pseudovector mesons. "I thank Ya. B. Zel'dovich, I. Yu. Kobzarev, and I. Ya. Pomeranchuk for the discussions which resulted in this note." Orig. art. has: 1 formula.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki, Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii (Institute of Theoretical and Experimental Physics, State Committee for the Application of Atomic Energy)

SUBMITTED: 10Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 000 OTHER: 002

Card 2/2

L 3911-66 EWT(1)

ACCESSION NR: AT5022319 UR/3138/65/000/343/0001/0007

AUTHOR: Zel'dovich, B. Ya.; Okun', L. B. 44,55

TITLE: Possible nonconservation of CP parity and nature of the $\Delta T = 1/2$ rule

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 343, 1965, Vozmozhnoye nesokhraneniye CP-chetnosti i priroda pravila $\Delta T = 1/2$, 1-7

TOPIC TAGS: parity principle, K meson, lepton, particle interaction

ABSTRACT: It is known that the decay $K_2^0 \to 2\pi$ may be interpreted as the result of nonconservation of CP parity. Wolfenstein (L. Wolfenstein, Imaginary Fermi Constant G as a Model of CP Violation, CERN preprint 65/249/5 - Th. 525. 8.2.1965) has recently proposed a model in which the entire nonconservation of CP parity is due to an additional factor i in front of the Lagrangian of weak nonleptonic interaction with $\Delta Y = 1$. All the other terms of the weak interaction Lagrangian remain the same as in the standard current × current theory. It is shown that two phenomena are tied together in Wolfenstein's model: the nonconservation of CP, and the $\Delta T = 1/2$ rule for the Lagrangian of nonleptonic interaction with $|\Delta Y = 1/2|$. Cer-

Card 1/2

L 3914-66
ACCESSION NR: AT5022319

9

tain qualitative estimates of the scale of nonconservation of CP parity in amplitudes with $\Delta T = 1/2$, 3/2, and 5/2 are made. From the observed probability of the decay $K_2^0 \to 2\pi$ it follows that CP-odd corrections to amplitudes with $\Delta T = 1/2$ amount to 10^{-3} (or even 10^{-4}). CP-odd corrections to amplitudes with $\Delta T = 3/2$ may be of the order of 2%, and to amplitudes with $\Delta T = 5/2$, about 10^{-2}% if the transitions from $\Delta T = 3/2$ and $\Delta T = 5/2$ are comparable. "The authors are deeply grateful to I. Yu. Kobzarev, I. Ya. Pomeranchuk, and M. V. Terent'yev for many useful discussions of the problems touched upon in the paper." Orig. art. has: 1 figure, 4 formulas.

ASSOCIATION: none

SUBMITTED: 22Mar65 ENCL: 00 SUB CODE: GP, NP

NO REF SOV: 002 OTHER: 007

Card 2/2

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

On the rule $\Delta T = 1/2$ for adron decay. IAd. fiz. 1 no.1:160-162 Ja '65. (MIRA 18:7)

L 11140-66 EWT(m)/T/EWA(m)-2

ACCESSION NR: AP5019593 UR/0386/65/001/006/0028/0033

AUTHOR: Okun', L. B.; Pomeranchuk, I. Ya. 44,55 44,55 28

TITLE: The "shadow universe" and neutrino experiments 44,55

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozhaniye, v. 1, no. 6, 1965, 28-33

TOPIC TAGS: neutrino, nuclear particle, meson

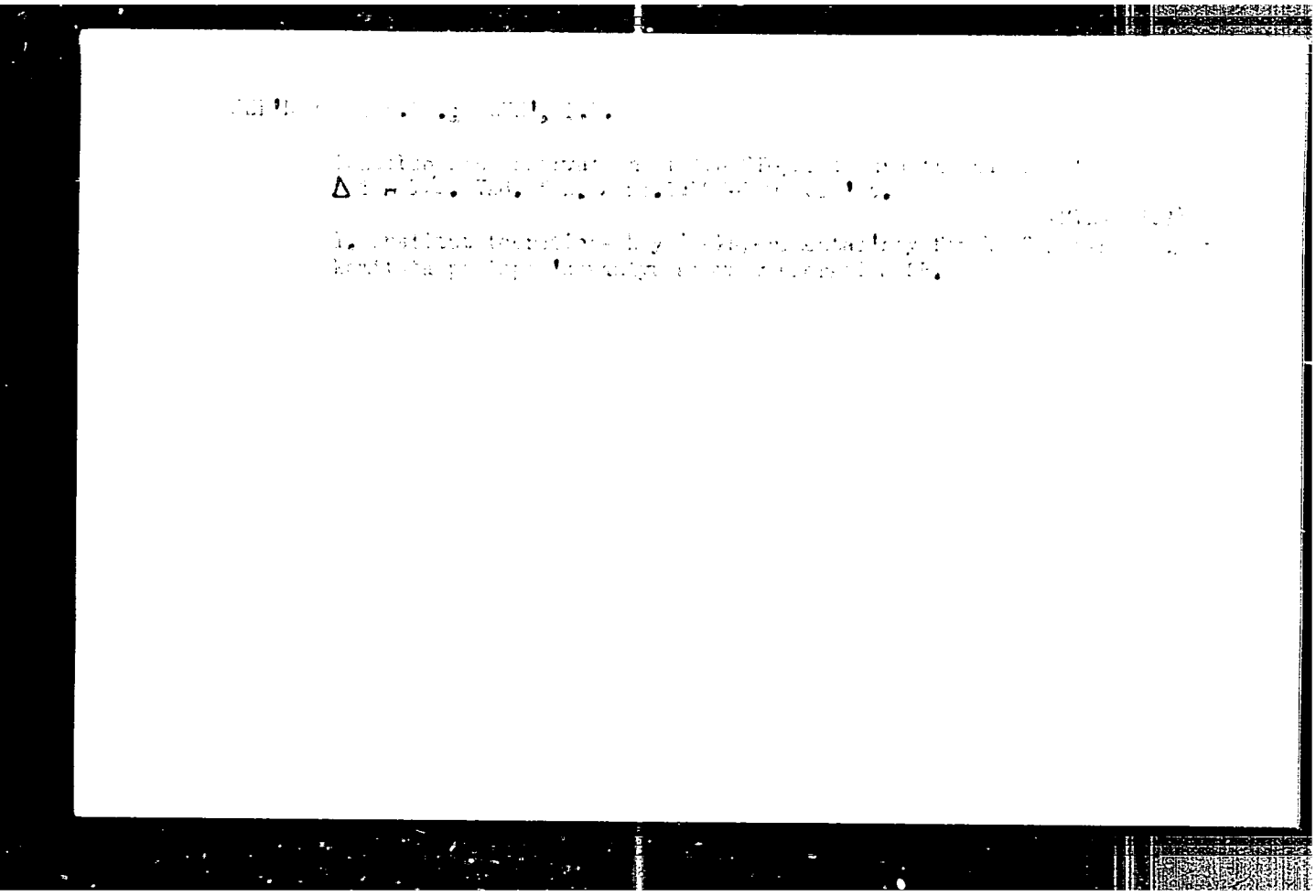
ABSTRACT: It is pointed out that the "shadow universe" hypothesis strongly contradicts the results of neutrino experiments. It is shown that the discrepancy between the "shadow universe" model and experimental data with regard to the number of θ-decays is about ten orders of magnitude. The considerations given in this paper do not pertain to hypotheses which allow strong interaction for long-lived θ_L-mesons. Recommendations are given for experimental verification of theories of this type. "The authors are grateful for useful consultation toV. N. Gribov, V. Kaftanov, I. D. Kobzarev, and B. M. Pontekorovo." Orig. art. has: 5 formulas.

ASSOCIATION: Otdeleniye yadernoy fiziki Akademii nauk SSSR (Department of Nuclear Physics, Academy of Sciences, SSSR)

SUBMITTED: 10May65 ENCL: 00 SUB CODE: NP

NO REF SOV: 003 OTHER: 009

Card 1/1



OKUN', L.B.

Degeneration on a baryon charge in a quartet model with charge-parity mesons. IAd. fiz. 2 no.3:587 S '65. (MIRA 18:9)

1. Institut teoreticheskiy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii.

L 13117-66 EWT(1)/EWA(m)-2 IJP(c) AT

ACC NR: AP6001773 SOURCE CODE: UR/0386/65/002/010/0466/0469

AUTHOR: Kobzarev, I. Yu.; Okun', L. B.; Terent'yev, M. V.

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

TITLE: A note on C-odd multipoles

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 10, 1965, 466-469

TOPIC TAGS: parity principle, photon scattering, electromagnetic interaction, nucleon scattering, deuteron scattering, correlation statistics

ABSTRACT: The authors discuss briefly the possible presence of C-odd terms in vertex parts with $I \geq 1$. When $I = 1$ (e.g., deuteron) this term is shown to vanish for real photons. The effect will therefore be maximal for large-angle scattering of electrons. The coefficients in the term may becom small. The smallness connected with the non-elementary nature of the nucleus is manifest in the smallness of the form factor, which can be naturally assumed to be the same for C-even and C-odd terms. Therefore, at large momentum transfer, one can expect correlation effects of the order of unity in the model of J. Bernstein, G. Feinberg, and T. D.

Card 1/2

L 13117-66

ACC NR: AF6001773

CP	+1	-1	+1	-1
P	+1	+1	-1	-1
N	2I +1	I	I	2I
	2I +1	I - 1/2	I + 1/2	2I

Lee (Columbia Univ. Preprint, 1965). It does not follow that the foregoing correlations must be additionally small in electron-deuteron scattering. For light nuclei, however, these effects are small and, furthermore, they can be estimated theoretically to a considerable degree. For a particle with spin I the number of C-odd multipoles is equal to integer or half-integer. In the general case (taking into account possible parity nonconservation), the number of corresponding multipoles is given in the table. The number of corresponding multipoles N in the third and fourth lines pertains to integer and half-integer I, respectively. The results of the table can be easily obtained by determining the number of states in the t-channel, where the particle and antiparticle with spin I form an "atom" with total angular momentum 1. Authors thank I. Ya. Pomeranchuk and B. M. Pontecorvo for useful discussions. L. B. Okun' is grateful to S. Coleman and S. Glashow for interesting discussions in Trieste. Orig. art. has: 2 formulas and 1 table.

SUB CODE: 20/ SUBM DATE: 28Sep65/ OTH REF: 003

Card 2/2 HW

ZEL'DOVICH, Ya.B., [illegible]

Quartetes [illegible]
nauk 87 no.1 [illegible] 1952. (MLRA 5:9)

L 22700-66 EWT(m)/T

ACC NR: AP6016664 SOURCE CODE: UR/0053/65/087/001/0113/0124

AUTHOR: Zel'dovich, Ya. B.; Okun', L. B.; Pikel'ner, S. B.

ORG: none

TITLE: Quarks[1] Astrophysical and physical-chemical aspects

SOURCE: Uspekhi fizicheskikh nauk, v. 87, no. 1, 1965, 113-124

TOPIC TAGS: nucleon, cosmic ray, meson, baryon, mass spectroscopy

ABSTRACT: Various approaches to the search for new stable particles are reviewed: namely, three assumed quarks, having charges 2/3e, -1/3e, and -1/3e[1.2], as well as others having integral charges. The lightest fractional-charge quark is supposed to be stable in vacuum as well as in contact with ordinary matter (nuclei, electrons). Conditions are given under which integral-charge particles can be stable. Various possible sources of quarks are reviewed, the most powerful being cosmic rays from superstars or quasistars. The annihilation of quarks is then discussed in detail. Since quarks are heavier than nucleons, the process $q_1 + q_1 \rightarrow q_3 + q_{-1}$ is possible, followed by $q_1 + q_{-1} \rightarrow nq_0$ (where the subscript indicates the number of quarks and the minus sign indicates an antiparticle;) q_3 is thus an ordinary baryon of three quarks, and q_0 is a meson. Quarks are therefore annihilated via

Card 1/2

UDC: 539.12

L 25700-66

ACC NR: AP6016664

a series of pair collisions. Other likely ways are also traced. Possibilities of detecting quarks are reviewed, including physical-chemical and mass spectroscopic methods. Orig. art. has: 14 formulas. [JPRS]

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 017 / OTH REF: 031

Card 2/2

L 39763-66 EWT(m)/T GD-2

ACC NR: AP6014821 SOURCE CODE: UR/0367/65/001/004/0730/0737

AUTHOR: Dolgov, A. D.; Okun', L. B.; Pomeranchuk, I. Ya.; Solov'yev, V. V.

ORG: none

TITLE: Electromagnetic mass differences of baryons and SU sub 3 symmetry

SOURCE: Yadernaya fizika, v. 1, no. 4, 1965, 730-737

TOPIC TAGS: baryon, Coulomb interaction, particle interaction

ABSTRACT: The results are presented from a calculation of the electromagnetic mass differences of barions. The authors began with a model of "non-relativistic" quarks, assuming that they are located in a state with full orbital momentum equal to zero and that the electromagnetic mass differences of the barions result from differences in electromagnetic quark masses, coulomb interactions between quarks, and interactions between magnetic quark moments. The authors thank V. Singh for sending a preprint of his work; and Ya. B. Zel'dovich and I. Yu. Kobzarev for their valuable critique. Orig. art. has: 1 table. [JPRS]

SUB CODE: 20 / SUBM DATE: 23Jan65 / OTH REF: 013

Card 1/1 UDC 539.12.01

ACC NR: AP7008927 SOURCE CODE: UR/0053/66/089/004/0603/0646

AUTHOR: Okun', L. B.

ORG: none

TITLE: Violation of SR-invariance

SOURCE: Uspekhi fizicheskikh nauk, v. 89, no. 4, 1966, 603-646

TOPIC TAGS: particle interaction, alpha particle, K meson, pi meson, radioactive decay, lepton, proton scattering, elastic scattering, hyperon, baryon, neutrino

SUB CODE: 20

ABSTRACT:

I. INTRODUCTION:

§ 1. $K_2^0 \to \pi^+\pi^-$ decay. Principal experimental results.
§ 2. Attempts to explain $K_2^0 \to \pi^+\pi^-$ decay without violation of SR-invariance.
§ 3. Purpose of the present article.
§ 4. Hypothesis of SRT-invariance.
§ 5. A new interaction.
§ 6. Alpha-particles.
§ 7. Summary of processes.

II. NEUTRAL K-MESONS

§ 8. Description of K^0 - mesons.

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9. $K_L^0 \to \pi^+\pi^-$ and $K_L^0 \to 2\pi^0$ decays.
10. Interference experiments with two-pi decays.
11. Lepton decays of K^0 - mesons and the $\Delta Q = \Delta S$ rule.
12. Lepton decays of the K_L^0 - meson.
13. Decays of K - mesons into three pi-mesons.
14. Contribution of real states to the $K_1^0 \leftrightarrow K_2^0$ transition.
15. Radiative decays of K^0 - mesons.

III. FAST PROCESSES

16. On the properties of $X0^+$ and $Z0^+$ interactions
17. $\pi^0 \to 3\gamma$ decay.
18. $\eta^0 \to \pi^0 e^+ e^-$ and $\eta^0 \to \pi^0 \mu^+ \mu^-$ decays.
19. $\eta^0 \to \pi^+\pi^-\pi^0$ decay.

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001237920008-9"

- ∅ 20. $\eta^0 \rightarrow \pi^+ \pi^- \gamma$ and $\eta^0 \rightarrow \pi^0 \gamma$ decays.
- ∅ 21. Decays of the X^0 - meson.
- ∅ 22. Decays of mesons with $J \geq 1$.
- ∅ 23. $\Sigma^0 \rightarrow \Lambda^0 e^+ e^-$ decay and $\pi^- p \rightarrow n e^+ e^-$, $K^- p \rightarrow \Lambda^0 e^+ e^-$ reactions.
- ∅ 24. Reactions in an antiproton beam.
- ∅ 25. Polarization and asymmetry in elastic proton scattering.
- ∅ 26. Comparison of cross sections of direct and reverse reactions.
- ∅ 27. Electron scattering by protons and nuclei.
- ∅ 28. Other electromagnetic reactions.
- ∅ 29. Electromagnetic transitions in nuclei.
- ∅ 30. Dipole moments of particles.

IV. SLOW PROCESSES

- ∅ 31. General remarks on weak currents
- ∅ 32. Decays of $K^{\pm}$ mesons.
- ∅ 33. Lepton decays of baryons and neutrino reactions.
- ∅ 34. Weak nuclear decays.

ACC NR: AP7008927

§ 35. Nonlepton decays of Λ^{0-} and $\Sigma^{\pm}$ hyperons.

§ 36. Nonlepton and radiative decays of Ξ and Ω hyperons.

§ 37. Nonlepton decays of hyperons and antihyperons.

§ 38. Radiative decays of hyperons and antihyperons.

V. CONCLUDING REMARKS

§ 39. Absolute difference between particles and anti-particles.

§ 40. Absolute spirality.

§ 41. "Mirror" particles.

Orig. art. has: 2 figures, 38 formulas and 9 tables. [JPRS: 38,417]

Card 4/4

OKUN', L. M.

"The TU-5 Wired Radio Equipment", Svyaz'izdat, 100 pp, 1950.

OKUN', L.M.; KULISH, M.Ya.

[TU-500-2 diffusion unit] Radiotransliatsionnaia apparatura TU-500-2. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio, 1953. 110 p. (MLRA 6:12)

(Radio--Apparatus and supplies)

OKUN', LIDIYA [illegible]

OKUN', Lidiya Moiseyevna; FEL'DMAN, Kh.S., otvetstvennyy redaktor; NOVIKOVA, Ye.S., redaktor; HITTBERGER, N.V., tekhnicheskiy redaktor

[TUB-100 radio relay apparatus for wire program distribution] Radiotranslatsionnaia apparatura provodnogo veshchaniia TUB-100. Moskva, Gos.izd-vo lit-ry po voprosam sviazi i radio, 1957. 57 p. (MLRA 10:9)
(Radio relay systems)

OKUN', Lidiya Moiseyevna; METER, Ch.M., otv. red.; KUZANTSEVA, N.N., red. izd-va; DIKOV, V.N., tekhn. red.

[Equipment of automatical transformer substations for wire broadcasting] Apparatura avtomaticheskikh transformatornykh podstantsii provodnogo veshchaniia. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio 1961. 143 p. (MIRA 14:10)
(Wire broadcasting) (Electric substations)

DOTSENKO, L.K.; OKUN', L.M., tekhnik

Introducing automatic control at the radio center of Rostov-on-Don.
Vest. sviazi 21 no.5:16-17 My '61. (MIRA 14:6)

1. Starshiy inzhener Rostovskogo-na-Donu radiouzla (for Dotsenko).
(Rostov-on-Don--Radio stations)

OKUN', Lidiya [illegible], M.K., tekh. red.; KOLOVA, T.N., red.

[TU-6-4 repeating apparatus] Translatsionnaia apparatura TU-6-4. Moskva, Svviaz', 1964. 108 p.
(MIRA 18:9)

L 16568-66 EWT(m)/T
ACC NR: AP6023826 SOURCE CODE: UR/0367/66/003/003/0590/0591

AUTHOR: Okun', L.

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

TITLE: Formfactors in non-leptonic decays and W-boson production reactions

SOURCE: Yadernaya fizika, v. 3, no. 3, 1966, 590-591

TOPIC TAGS: boson, lepton, meson, baryon, nucleon, nuclear collision, nuclear reaction, radioactive decay

ABSTRACT: This short article, a "Letter to the Editor", contains three statements: 1. The decays of intermediate bosons into adrons (mesons and baryon-antibaryon pairs) may prove to be markedly less probable than decays into leptons ($W \to \mu\nu$ and $W \to e\nu$). 2. The production cross-sections of W-bosons in the processes of collision between nucleons or mesons with nucleons and nuclei may prove to be markedly smaller than is normally assumed. 3. When the lower limit for the mass of a W-boson is established on the basis of an investigation of such processes, it is pertinent to refer the boson's production cross-section to the electromagnetic formation cross-section of the pairs e^+e^- and $\mu^+\mu^-$, arising in the same processes as a result of internal conversion and having

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ACC NR: AP6023828

a mass of the order of the sought mass of the W-boson. The author expresses his gratitude for valuable comments to B. L. IOFFE, V.S. KAFTANOV, I. Yu. KOBZAREV, I. Ya. POMERANCHUK, B. M. PONTECORVO, and M. V. TERENT'YEV, and also to V. P. KADYSHEVSKIY and A. A. TYAPKIN FOR notifying him of the existence of the article by A. ZICHICHI et al. (Proceedings of the Oxford Conference, 1965, to be published) as well as of the source publication itself of this article. Orig. art. has: 1 formula. [JPRS]

SUB CODE: 20 / SUBM DATE: 02Dec65 / OTH REF: 005

Card 2/2

OKUN', Lev Savel'yevich; SHADURSKIY, K.S., prof., doktor med.nauk, red.; CHERNYAK, I., red.; STEPANOVA, N., tekhn.red.

[Principles of pharmacology and elements of prescription writing] Osnovy farmakologii s retsepturoi. Pod red. K.S.Shadurskogo. Minsk, Gos.izd-vo BSSR, 1959. 179 p. (MIRA 12:11)

(PHARMACOLOGY) (PRESCRIPTION WRITING)

BERG, S.L., polkovnik; VOROB'YEV, V.I., kapitan pervogo ranga; GIL'DO, G.M., kapitan pervogo ranga; ANANCHENKO, A.A.; BALAKSHINA, N.N.; BANNIKOV, B.S., kapitan vtorogo ranga; BAKHTINA, G.F.; BERENGEYAN, N.V.; BUTYRINA, N.Ya.; VOROB'YEV, V.I., kapitan pervogo ranga; GASS, I.P.; GINEYSH, N.S.; GLADIN, D.F., polkovnik; GOLOVANOVA, L.G., kand. ist. nauk; GOLUBEVA, Z.D., kand. filol. nauk; GONCHAROVA, A.I.; ZAMADVOROVA, R.N.; IVANOVA, N.G.; KARAMZIN, G.B.; KOVAL'CHUK, A.S.; KRONIDOVA, V.A.; LITOVA, Ye.I.; MOLCHANOVA, T.I.; OKUN', L.S.; POCHEBUT, A.N.; RAYTSES, V.I.; SAVINOVA, G.N.; SENICHKINA, T.I.; SKRYNNIKOV, R.G., kand. ist. nauk; FURAYEVA, I.I.; CHIZHOVA, N.N.; YASINSKAYA, L.F.; GLADIN, D.F., polkovnik; LAKETSKIY, Ye.F., podpolkovnik; LEBEDEV, S.M., kapitan pervogo ranga; ORDYNSKIY, N.I., kapitan pervogo ranga; NADVODSKIY, V.Ye., podpolkovnik; DEMIN, L.A., inzh.-kontr-admiral, glav. red.; FRUMKIN, M.S., polkovnik, zam. otv. red.; LEVCHENKO, G.I., admiral, red.; BAKHTINA, G.F., tekhn. red.

[Naval atlas] Morskoi atlas. n.p. Izd. Glavnogo Shtaba Voenno-Morskogo Flota. Vol.3. [Naval history] Voenno-istoricheskii. Pt.1. [Text for the maps] Opisaniia k kartam. 1959. xxii, 1942 p. (MIRA 15:5)

1. Russia (1923- U.S.S.R.) Ministerstvo oborony. (Naval history)

L 3573-66 EWT(l)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/GG
ACCESSION NR: AP5024816 UR/0032/65/031/010/1219/1222
619.24

AUTHOR: Kaganovskiy, I. P.; Okun', L. S.; Ovodova, A. V.; Ryabykina, L. V.; Lepikhova, Ye. Ye.

TITLE: Macrostructural standards for using dislocation density to evaluate nonuniformity in germanium single crystals

SOURCE: Zavodskaya laboratoriya, v. 31, no. 10, 1965, 1219-1222

TOPIC TAGS: germanium single crystal, semiconductor single crystal, metal inspection, metal test

ABSTRACT: A visual method is proposed for evaluating nonuniformity in germanium crystals according to the appearance of etched thin sections. The visual forms of the macrostructures on specimens of this type are divided into five classes: uniform, ring-type, ring-star, star and slip band. A photograph is given illustrating each category. The nomenclature refers to the distribution of pits caused by etching of the samples. Each of these types of distribution is associated with a definite relationship between axial and radial temperature gradients at the crystallization or growth front of the crystal. The entire surface of several typical specimens from each of these groups was studied under a 100× metallographic microscope.

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Assuming that the number of dislocations falling into the cells of the reticle is a random quantity, the average values and fluctuation coefficients of this quantity were calculated as an index of microscopic nonuniformity in the specimen. The macroscopic nonuniformity was evaluated by isolating localized regions on the reticle with various dislocation densities according to the visual categories. The coefficient of variation between the values of the average dislocation density in the isolated regions is an index of the macroscopic nonuniformity of the specimen. The results showed satisfactory agreement between the coefficients of variation of the macroscopic and microscopic nonuniformity for specimens belonging to the same visual class. Thus standards were developed for evaluating nonuniformity in single crystals of germaniun. It is recommended that a pattern recognition electronic device should be developed for use with the proposed method to eliminate human errors resulting from the use of inspection personnel. Orig. art. has: 3 figures, 1 table.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (State Design and Planning Scientific Research Institute of the Rare Metals Industry)

SUBMITTED: 00 ENCL: 00 SUB CODE: SS
NO REF SOV: 001 OTHER: 000

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L 3572-66 EWT(l)/EWT(m)/EWP(w)/T/EWP(t)/EWP(b)/EWA(c) LJP(c) JD/GG
ACCESSION NR: AP5024817 UR/0032/65/031/010/1222/1224
519.24

AUTHOR: Kaganovskiy, I. P.; Okun', L. S.; Lepikhova, Ye. Ye.

TITLE: Metrologic determination of nonuniformity in germanium single crystals according to resistivity

SOURCE: Zavodskaya laboratoriya, v. 31, no. 10, 1965, 1222-1224

TOPIC TAGS: germanium single crystal, semiconductor single crystal, metal inspection, metal test, resistivity

ABSTRACT: Resistivity was measured along the generatrix and through the cross sections of 22 germanium single crystal specimens 28 ± 1 mm in diameter and 220 ± 10 mm long to develop method for evaluating the average value and resistivity as qualitative parameters of crystals to be used in making semiconductor devices. The results of the measurements were used for calculating the mean values $\bar{x}_{\rho l}$ and the coefficients of variation $v_{\rho l}$ of the resistivity along the generatrix, the mean values $\bar{x}_{\rho s}$ and coefficients of variation $v_{\rho s}$ of the resistivity in the cross section, and for plotting graphs showing the variation in these parameters along the

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crystals. An analysis of these graphs showed that the variations in resistivity along the generatrix are strongly oscillatory in nature with an amplitude of 15%. In addition to this, the average resistivity along the generatrix exceeds that in the cross section by 15% which may be due to high evaporation of the impurity from the surface of the crystal during growth. This reduces the reliability of resistivity measurements along the generatrix for determining the distribution of resistivity through the crystal. On the other hand, the average resistivity shows a linear reduction within ±3% in the cross sections along the cylindrical part of the crystal. Thus, if the average resistivity is known in the initial and final sections, the law of its variation along the crystal may be determined. Methods were then developed for selective evaluation of the average resistivity and the coefficient of variation in the cross section. The resistivities at fixed points in the cross section were considered as a random quantity, and the mean and root-mean-square deviations were calculated from a sample space of 120 points. Typical distribution polygons are shown for three cross sections of the same crystal. It is found that ten measurements uniformly distributed throughout the cross section give sufficient accuracy for practical purposes in evaluating the average resistivity (3%) and the coefficient of variation (5%). The mean coefficient of variation in resistivity in several cross sections may serve as a measure of the nonuniformity of the crystal and be used as an optimizing parameter. Orig. art. has: 2 figures.

L 3572-66
ACCESSION NR: AP5024817

3

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut redkometallicheskoy promyshlennosti (State Design and Planning Scientific Research Institute of the Rare Metals Industry)

SUBMITTED: 00 ENCL: 00 SUB CODE: SS

NO REF SOV: 000 OTHER: 000

Card 3/3

1. STRZHEMECHNYY, A.A., OKUN', M.A.

2. USSR (600)

4. Iron Founding

7. Using quick-drying mixtures. Lit proizv No. 12 1952

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

USSR

Chemistry of cuprammonium solutions of cellulose. VI. Alcoholate copper atoms in cuprammonium complexes of cellulose. ... L. Handley and M. G. Okun ... Vysokomol. Khim. 24 2151 ... 32 ... Expts. on electrophoresis with and without sepn. of the electrodes of ammoniacal solns. of Cu and cellulose, alginic acid, sugars, and ... show conclusively that Cu separates only ... (cf. Hess et al., C.A. 20, 964, 24 1971) ... do not migrate to the anode, in either the presence or absence of NaOH. The hypothesis of a Cu alcoholate in cuprammonium cellulose is not confirmed even by ion exchange expts. When the solns. are passed through a cation exchanger NH_3 and Cu are absorbed, and the cellulose is pptd. on the resin. The passage of the solns. through an anion resin does not alter their compn. although the presence of Cu in the anion would have called for an absorption of Cu on the anion resin. The cellulose-cuprammonium solns. can be regarded as mol. compds. of variable compn. caused by equil. reactions within them and can be ... alkali cellulose. ... M. Kosolapoff

52

CKUN', M. G.:

Ckun', M. G.:

"Investigations of cuprammonium solutions of cellulose and other polyoxy compounds." Min Higher Education USSR. Leningrad Order of Labor Red Banner Technological Inst imeni Leningrad Soviet. Leningrad, 1956. (Dissertation For the Degree of Doctor in Chemical Sciences).

Knizhnaya letopis'
No 34, 1956. Moscow.

OKUN, M.G.

Chemistry of cuprammonium solutions of cellulose. VII. Reaction of polyhydroxy compounds with the amine complex of copper. S. N. Danilov and M. G. Okun (Lensovet Technol. Inst., Leningrad). Zhur. Obshchei Khim. 26, 3005-14(1956); cf. C.A. 49, 9268g.—The compn. of ppts. formed on addn. of NaOH or LiCl to cuprammonium cellulose solns. (I) was examd. and the spectra of I were detd. The ppts. have variable compn., and the molar ratio of cellulose to Cu can be regarded as approximating 1:1, but not necessarily equal to this value; with excess NaOH the Cu is replaced totally to give an alkali cellulose of the approx. compn. $2C_6H_{10}O_5 \cdot NaOH$. No stoichiometric regularities as reported by Normann (Chem. Ztg. 30, 584(1906)) could be confirmed in the ppts. The spectra of I and of [illegible] solns. (these are reproduced) are quite unlike those of acetate or sulfate; this indicates a definite [illegible] in [illegible] I. Methylcellulose, hydroxyethylcellulose, [illegible] lose, sucrose, glucose, glycerol, alginic acid, Na alginate, tartaric acid, and Cellophane were examd. spectrographically from 2000 A. to 1 μ. $Cu(OAc)_2$ has an abs. max. at 400-510 mμ and absorbs continuously from 800 mμ. $CuSO_4$ shows a band at 400-375 mμ, has a max. at 800 mμ beyond which the [illegible] gradually decreases. Cuprammonium reagent has a band of 237-254 mμ, with addn. [illegible] at 420 mμ and a max. at 640 mμ. Fehling soln. absorbs totally at 360 mμ, has a min. at 440 mμ, and a max. at 670 mμ. Cuprammonium solns. of the lower saccharides are essentially duplicates spectroscopically of the cuprammonium soln. with slightly increased optical d. at 420-480 mμ; tartaric acid has a [illegible] at [illegible] mμ and a max. at 640 mμ. Cuprammonium cellulose has a max. at 640 mμ and a min. at 420 mμ, the same being true of the cellulose derivs. [illegible] [illegible] special complex between the cellulose and the amine complexes. The soln. in Schweizer reagent is a colloid-chem. phenomenon with possible formation of unstable internal compds. G. M. Kosolapoff

PLISKO, Ye.A.; OKUN', M.G.; GRAD, N.M.; GINTSE, N.F.

Work of S.N. Danilov in the field of cellulose and its ethers and esters. Zhur.ob.khim. 28 no.12:3174-3184 D '58. (MIRA 12:2)
(Danilov, Stepan Nikolaevich, 1889-)
(Cellulose)

DANILOV, S.N.; GINTSE, N.F.; OKUN', M.G.

Chemistry of xanthogenates and viscose. Part 9: Discovery of polysulfide compounds in viscose and their effects. Zhur.ob. khim. 28 no.12:3192-3202 D '58. (MIRA 12:2)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR i Leningradskiy khimiko-tekhnologicheskiy institut imeni Lensoveta.
(Viscose) (Sulfides)

OKUN', M.G.; SUKHANOVSKIY, S.I.; CHUDAKOV, M.I.; KRASNOVA, A.P.

Rapid method for determining lignin. Gidroliz i lesokhim. prom. 12 no.5:10-11 '59. (MIRA 12:10)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut gidrolizmoy i sul'fitno-spirtovoy promyshlennosti.
(Lignin)

AUTHORS: Plisko, Ye. A., Okun', M. G., Grad, N. M., Gintse, N. F. SOV/79-28-12-3/41

TITLE: On S. N. Danilov's Work in the Field of Cellulose and Its Ethers (O rabotakh S. N. Danilova v oblasti tsellyulozy i yeye efirov)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 28, Nr 12, pp 3174-3184 (USSR)

ABSTRACT: The manifold scientific activity of Danilov was closely connected with the chemistry of cellulose and its derivatives, as well as with alginic acid and chitin. It led to new findings on the behavior of cellulose to its solvents, on nitrocellulose, acetyl cellulose, nitro-acetyl cellulose, cellulose ether, the hydrolysis of alginic acid and chitin. Together with Gintse, N.F. Danilov investigated the solution conditions of cellulose in phosphoric acid (Ref 104), and it was found that the hydrates play an important role in their dissolution in concentrated solutions of the electrolytes. A new method for the determination of the copper numbers required for important outstanding properties of cellulose (Ref 67) was devised. The investigation of the cellulose molecules with one oxygen less,

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their desoxy, anhydride and unsaturated derivatives raised great interest. The use of acetyl cellulose membranes as a substitute of glass in hotbeds was worked out. Danilov's excellent investigation of the nitration of cellulose was proof of the nitration theory devised by Mendeleyev-Sapozhnikov (Ref 68). The oxy-butyl ethers of cellulose (Ref 51) and the carboxy-methyl cellulose (Ref 35) were synthesized for the first time. The work carried out by Danilov and his cooperators on chitin considerably widened the knowledge of natural polymers. His work in the field of cellulose ether and cellulose ester is directly continued by his work on cuprammonia solutions of cellulose, xanthates, and viscose. The cuprammonia solution of cellulose consists, according to Danilov, of the high-molecular compound: $\left\{(C_6H_{10}O_5)_x \cdot \left[Cu(NH_3)_m(OH)_2\right]_y \cdot (H_2O)_z\right\}_n$, where the cellulose and the cuprammonia base form a molecular compound of variable compositon at the expense of the hydrogen

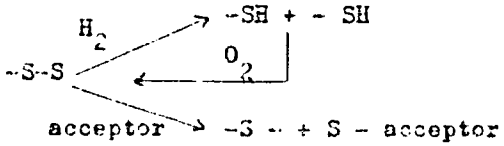
bonds. The viscose research was widened by new knowledge and was put on a new basis (its compositon during the process of maturation). In Danilov's laboratory synthesis methods were devised which are closely connected with the technology of viscose processing. There are 141 references, 130 of which are Soviet.

AUTHORS: Danilov, S.N., Gintse, N.F., Okun', M.G. SOV/79-28-12-6/41

TITLE: Chemistry of Xanthates and Viscose (Khimiya ksantogenatov i viskozy) IX. The Detection of Polysulfur Compounds in Viscose and the Part Played by Them (IX. Obnaruzheniye polisernistykh soyedineniy v viskoze i ikh rol')

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 12, pp 3192-3202 (USSR)

ABSTRACT: Viscose, alkali cellulose, and the cuprammonium solutions of cellulose differ from many other products and technical mixtures in their complex character and the strange processes occurring in them. These processes are not only of technical but also of purely scientific interest. In a certain sense they can be regarded as models of important biological systems in which the oxidizing and redox processes, as well as the the occurring transport of sulfur and the transitions between disulfide and mercaptan groupings are of great importance (the transformation of cysteine, cystine, glutathione).



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