MATINYAN, S.G.

Parity nonconservation in strong interactions of strange particles. Zhur.eksp.i teor.fiz. 37 no.4:1034-1040 O '59.
(MIRA 13:5)

1. Institut fiziki Akademii nauk Gruzinskoy SSR.
(Nuclear reactions)

24(0)
AUTHOR: Chentsov, N. SOV/53-67-4-7/7

TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ya Vsesoyuznaya konferentsiya po fizike nizkikh temperatur)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 4, pp 745-750

ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi. It was organized by the Otdeleniye fiziko-matematicheskikh nauk Akademii nauk SSSR (Department of Physico-mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy universitet im. Stalina (Tbilisi State University imeni Stalin). The Conference was attended by about 300 specialists from Tbilisi, Moscow, Kharkov, Kiyev, Leningrad, Sverdlovsk, and other cities as well as by a number of young Chinese scientists at present working in the USSR. About 50 lectures were delivered and which were divided according to research fields. - I. Liquid Helium. Reports were delivered by the researchers: of the Laboratoriya nizkikh temperatur TGU (Laboratory for Low Temperatures of Tbilisi State University) under the supervision of E. L. Andronikashvili: R. S. Pakhadze, Yu. G. Mamaladze and G. K. Kaliyeva spoke about the investigation of the damping of rotational oscillations of a single disk in He II in dependence on the rotation rate. G. A. Gamsakhurdiya spoke about the influence exercised by the state of the disk surface on critical rate and on the damping of the disk oscillations in the transcritical range. V. P. Peshkov (Institute for Physical Problems AS USSR) spoke about further investigations of the boundary between superfluid and non-superfluid helium (discovered by himself) in a heat flow. This boundary characterizes the density- and temperature jump. Kuang, Wei-yen, K. K. Zinov'yeva and V. P. Peshkov spoke about investigations at extremely low temperatures (down to 0.5° K) which were attained by the method of the evacuation of He^3-vapors. Kuang, Wei-yen investigated in the interval 0.57 - 2.07° K the phenomenon of the temperature jump (discovered by P. L. Kapitsa in 1941) on the boundary of a solid (in this case Cu) by means of He II for the thermal resistance. Peshkov investigated, among other things, also the phase diagram of He^3 dissolved in He^4 (20 - 87%). V. P. Silin (FIAN) gave a report on the phenomenological theory of He II in the region of the λ-point in consideration of quantum effects (the theory was developed by himself and by L. P. Pitayevskiy). E. Ye. Yevtikhiyev (FIAN SSSR - Institute for Atomic Energy, AS USSR) delivered a short report on the theory of phase transition in liquid He^4. I. M. Lifshits and D. G. Sanikidze (FIAN SSSR - Institute for Physical Problems AS USSR) investigated the melting of solid He^3 on the basis of Landau's theory of the Fermi-fluid and found that melting pressure as a function of temperature has a minimum at 0.5° K (Pomeranchuk-effect). The comprehensive discussion was held under the supervision of P. L. Kapitsa.

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MATINYAN, S.G., MESOYED, K.B., and TSAKADZE, D.S., (Tbilisi) MAMALADZE, Yu. G.

"On the Dynamics of an Oscillatory Motion in Perfect Rotating Fluids Theory and Experiment."

report presented at the First All-Union Congress on Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb 1960.

AUTHOR: Marinyan, S.G.

TITLE: Some consequences of the existence [illegible] isotopic spin [illegible]

SOURCE: Akademiya nauk Gruzinskoy SSR. Institut [illegible]. Trudy [illegible] 37-42 (In Russian).

TEXT: The existence of a charge triplet and singlet of strange par[illegible] the Fermi Yang view (Phys. Rev., v. 76, 1949, 17[illegible]) of the π-mesons [illegible] antinucleon-pair compound raise the question of the possible existen[illegible] (ρ-meson). The author uses the isotopic-spin formalism to investigate [illegible] ence of a possibly existing π' meson or the decay branching ratio[illegible] strange particles on the basis of the $|\Delta I| = 1/2$ selection rule (G. W[illegible] Rev., v. 101, 1956, 1214. G. Takeda, Phys. Rev., v. 101, 1956, [illegible]). A of experimental data (7th Rochester Conference on the Physics of High-E Particles) with calculation based on this selection rule manifests good [illegible] for Λ-decay, but not for K^0-decay. The correlation is not good for [illegible] if a degree of nonconservation of parity great enough to achieve good [illegible] assumed, then a significant asymmetry in the decay is implied, which [illegible] experimentally. The present study endeavors to determine whether [illegible]

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Some consequence[illegible] of the existence ...

S 74 [illegible]

ta[illegible] observed [illegible] explained without [illegible]
but by introducing the isotopic singlet [illegible] of which would be
mass and might interfere with the [illegible] son to the positive
ratios. An examination of the expressions [illegible] leads to extremely
pressions which lead the author to the conclusion that there are no
constants employed by him. For which [illegible] expressions for the [illegible]
Σ, and Σ^+ decays would yield [illegible] to those obtained [illegible]
similar attempt to find expressions for the [illegible] ratio of K
terminates in six equations with three unknowns, so that the [illegible]
characterize the hypothetical [illegible] cannot be found the [illegible]. If
however, that [illegible] such a particle [illegible], or that it were replaced [illegible]
as the π^0 meson, then its [illegible] would hardly [illegible]
tion rule $\Delta I = 1/2$ with experimental [illegible] to be [illegible]
consideration. There are [illegible] to be [illegible]

ASSOCIATION: None given.

Card 2/2

MAMALADZE, Yu.G. (Tbilisi); MATINYAN, S.G. (Tbilisi)

Hydrodynamics of the oscillations of a disk in a rotating liquid. Prikl.mat.i mekh. 24 no.3:473-477 My-Je'60. (MIRA 13:10)
(Hydrodynamics)

MAMALADZE, Yu.G.; MATINYAN, S.G.

Comments on the damping of the oscillations of a disc in rotating helium II. Zhur. eksp. i teor. fiz. 38 no.1:184-187 Jan '60. (MIRA 14:9)

1. Institut fiziki AN Gruzinskoy SSR.
(Damping (Mechanics)) (Helium)

MATINYAN, S.G.

24.5600

S/056/60/038/02/55/061
B006/B014

AUTHORS: Mamaladze, Yu. G., Matinyan, S. G.

TITLE: Damping of Vibrations of a Cylinder Located in Rotating Helium II

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 2, pp. 656-657

TEXT: The present "Letter to the Editor" deals with a previous article (Ref. 1) which shows that interaction between a disk vibrating in rotating helium II and the vortex filaments leads to a specific dependence of the damping on the speed of rotation, which has a characteristic maximum. The solution of the system of hydrodynamic equations for an infinite cylinder whose surface is parallel to the vortex filaments shows that in the case of slight vibrations the force acting upon the cylinder surface results only from the momentum flux of the normal component. A formula (without derivation) is given for the sum of all moments of force acting upon the unit length of the outer and inner surface of a thin-walled cylinder of the radius R. A formula

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Damping of Vibrations of a Cylinder Located in Rotating Helium II

S/056/60/038/02/55/061
B006/B014

is also given for the complex wave number k. These formulas indicate that M depends on the velocity of rotation only if the coefficients of the mutual friction between superfluid and normal component β_n and β_s do not vanish. Consequently, the rotation-dependent vibration damping of the cylinder is characteristic only of He II. Within a wide frequency range it was found that at R $\approx$ 1 cm the penetration depth of the cylindrical waves produced by the vibrations of the cylinder in rotating He II is considerably smaller than the cylinder radius. Thus, the application of an asymptotic expansion of the cylinder functions for great arguments is justified. Thus, one obtains an expression for the damping γ', and in order to exclude boundary effects, the difference of the damping factors $\gamma_2 - \gamma_1$ is measured at two different immersion depths of the cylinder. For the ratio between the differences, once measured in rotating and once in resting He II, one obtains $(\gamma_2 - \gamma_1)/(\gamma_2 - \gamma_1)_{\omega_0=0} = 1 + \omega_0 \rho_s B/2\Omega\rho$, where ρ_s/ρ denotes the relative density of the superfluid component, and B is a coefficient according to Hall and Vinen. The authors thank E. L. Andronikashvili and the

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Damping of Vibrations of a Cylinder Located in Rotating Helium II

S/056/60/038/02/55/061
B006/B014

co-workers of the cryogen laboratory of Tbilisskiy gosudarstvennyy universitet (Tbilisi State University) for their interest in this investigation. There are 8 references: 6 Soviet and 2 British.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute of the Academy of Sciences, Gruzinskaya SSR)

SUBMITTED: November 20, 1959

Card 3/3

88454

S/056/60/039/006/046/063
B006/B063

24.6900

AUTHOR: Matinyan, S. G.

TITLE: Determination of the Sign of the Mass Difference of K_1^0 and K_2^0 Mesons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), pp. 1747-1755

TEXT: The experimental method suggested by I. Yu. Kobzarev and L. B.Okun' (Ref. 1) for determining the sign of the mass difference $\Delta m = m_1 - m_2$ of K_1^0 and K_2^0 mesons makes use of interference phenomena: A beam of K_2^0 mesons penetrates two plates with different nuclear properties. The different types of interaction of the strongly interacting component of K_2^0 mesons give rise to a K_1^0 wave in the latter, which has a non-vanishing phase difference $\Delta\varphi$. The sign of Δm is determined from this phase difference between the two coherent states. This experiment has been proposed by Kobzarev and Okun' when using thin plates yielding a small number of K_1^0

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Determination of the Sign of the Mass Difference of K_1^0 and K_2^0 Mesons

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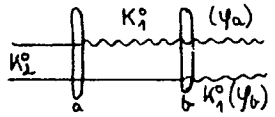
B006/B063

mesons to the right of b (for a given number of K_2^0 mesons). In addition



to a theoretical description of the effects, the present paper presents a discussion of modifications of this experiment and of other methods for determining the sign of Δm. First, the author discusses the problem of choosing the plate thickness so that the K_1^0 meson yield reaches a maximum. In doing so it is assumed that the number of K_1^0 mesons leaving the plate as a function of the plate thickness x is mainly determined by an expression of the form $1-2\cos(\Delta mt/\gamma)\exp(-t/2\gamma\tau_1) + \exp(-t/\gamma\tau_1)$ ($x = vt$; v - K^0 meson velocity which is taken to be constant during the passage of the beam through the plate; t - time of flight; τ_1 - K_1^0 meson lifetime; $\gamma = 1/\sqrt{1-v^2}$; $\hbar=c=1$). This expression has a maximum for $x > l = \gamma\tau_1 v$ (e.g. for 40-Mev mesons the maximum lies at $x \approx 3$cm, $l = 1.2$cm). From this point of view, the "optimum" thickness of a can be chosen. The consequences of taking into account the finiteness of the plate thickness is studied next. It is shown that the sign of Δm can be still determined

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Determination of the Sign of the Mass Difference of K_1^0 and K_2^0 Mesons

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B006/B063

even if the K_1^0 meson yield is increased. After extensive calculation, the following equation is obtained for the number of K_1^0 mesons (per incident K_2^0 meson) flying in the same direction to the right of plate b in the same direction as the K_2^0 meson:

$$N_1 = \exp\left\{-\frac{n}{2}\left[N_a(\sigma_a+\bar{\sigma}_a)t_a + N_b(\sigma_b+\bar{\sigma}_b)t_b\right]\right\}\left\{r_a^2 P(t_a)\exp\left[-\frac{t_0+t_b}{\gamma\tau_1}\right] + r_b^2 P(t_b) + 2r_a r_b\left[C(t_a,t_b)\cos\left(\Delta\varphi - \frac{\Delta m}{\gamma}(t_0+t_b)\right) - S(t_a,t_b)\sin\left(\Delta\varphi - \frac{\Delta m}{\gamma}(t_0+t_b)\right)\right]\exp\left[-\frac{(t_0+t_b)}{2\gamma\tau_1}\right]\right\}, \quad (11)$$

where $\sigma_i(\bar{\sigma}_i)$ is the total interaction cross section between $K_o(\bar{K}_o)$ mesons and nuclei of plate i (i = a,b); $\Delta\varphi = \varphi_a - \varphi_b$. The time-of-flight functions obtained are defined by

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Determination of the Sign of the Mass Difference of K_1^0 and K_2^0 Mesons

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$$P(t) = \left[1 - 2\cos\left(\frac{\Delta m}{\gamma} t\right)\exp\left\{-\frac{t}{2\gamma\tau_1}\right\} + \exp\left\{-\frac{t}{\gamma\tau_1}\right\}\right]\left[\left(\frac{\Delta m}{\gamma v}\right)^2 + \left(\frac{1}{2\gamma\tau_1 v}\right)^2\right]^{-1},$$

$$C(t_a, t_b) = \left[1 - \cos\left(\frac{\Delta m}{\gamma} t_a\right)e^{-t_a/2\gamma\tau_1} - \cos\left(\frac{\Delta m}{\gamma} t_b\right)e^{-t_b/2\gamma\tau_1} - \right. \quad (12)$$

$$\left. - \cos\left(\frac{\Delta m}{\gamma}(t_a + t_b)\right)\exp\left\{-\frac{t_a + t_b}{2\gamma\tau_1}\right\}\right]\left[\left(\frac{\Delta m}{\gamma v}\right)^2 + \left(\frac{1}{2\gamma\tau_1 v}\right)^2\right]^{-1},$$

$$S(t_a, t_b) = \left[\sin\left(\frac{\Delta m}{\gamma} t_a\right)\exp\left\{-\frac{t_a}{2\gamma\tau_1}\right\} - \sin\left(\frac{\Delta m}{\gamma} t_b\right)\exp\left\{-\frac{t_b}{2\gamma\tau_1}\right\} - \right.$$

$$\left. - \sin\left(\frac{\Delta m}{\gamma}(t_a - t_b)\right)\exp\left\{-\frac{t_a + t_b}{2\gamma\tau_1}\right\}\right]\left[\left(\frac{\Delta m}{\gamma v}\right)^2 + \left(\frac{1}{2\gamma\tau_1 v}\right)^2\right]^{-1}.$$

(11) is discussed in detail and analyzed for 40-Mev mesons and different experimental conditions. N_1 as a function of x_o (plate distance) and x_b is graphically shown for a number of different cases. The other possibilities of determining the sign of Δm, which have been discussed in this paper, are based on the determination of the hyperons formed in plate b as a function of x_o, and on a study of the lepton decay of K_{e3}^0 and $K_{\mu 3}^0$ as a function of x_o. The author thanks I. Yu. Kobzarev, L. B. Okun', and B. Pontekorvo for advice and discussions; Z. Sh. Mandzhavidze, N. N.

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88454

Determination of the Sign of the Mass Difference of K_1^o and K_2^o Mesons

S/056/60/039/006/046/063
B006/B063

Roynishvili, G. R. Khutsishvili, and G. Ye. Chikovani for their interest in the work; and G. I. Lebedevich, D. M. Kotlyarevskiy, and A. N. Mestvirishvili for computations. There are 6 figures and 4 references: 1 Soviet and 3 US.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences Gruzinskaya SSR)

SUBMITTED: July 9, 1960

Card 5/5

38141

S/058/62/000/004/018/160
A058/A101

AUTHORS: Matinyan, S. G., Perel'man, M. Ye.

TITLE: On the anomalous connection of spin and statistics

PERIODICAL: Referativnyy zhurnal, Fizika, no. 4, 1962, 45, abstract 4A350 ("Sakartvelos SSR Metsniyerebata Akademiis moambe", 1961, v. 27, no. 1, 25 - 32, Gruz.; "Soobshch. AN GruzSSR", 1961, v. 27, no. 1, 25 - 32, Russian)

TEXT: The authors examine the possibility of an anomalous connection of spin and statistics (when the field with integral spin is quantized with the aid of anticommutators while the field with half-integral spin is quantized with the aid of commutators) for strange particles. They suggest experiments in setting up K-meson and hyperon statistics and analyze the experimental consequences of anomalous statistics. They show that anomalous statistics lead to violation of the SRT theorem if weak interactions are also included in the investigation.

S. M.

[Abstracter's note: Complete translation]

Card 1/1

LAPERASHVILI, L.V.; MATINYAN, S.G.

Single-meson contribution to the photoproduction of π^- -mesons on protons. Zhur.eksp.i teor.fiz. 41 no.1:272-275 Jl '61. (MIRA 14:7)

1. Institut fiziki AN Gruzinskoy SSR.
(Photonuclear reactions) (Mesons) (Protons)

MATINYAN, S.G.

Sign of the mass difference of K_1^0 and K_2^0 mesons and their leptonic decay. Zhur. eksp. i teor. fiz. 41 no.5:1503-1506 N '61. (MIRA 14:12)

1. Institut fiziki AN Gruzinskoy SSR.
(Mesons--Decay)

26719
S/056/61/041/005/034/038
B109/B102

3.1900 (1057, 1538)

AUTHORS: Matinyan, S. G., Tsilosani, N. N.

TITLE: Transformation of photons into neutrino pairs and its significance in stars

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1681-1687

TEXT: The cross sections of the processes $\gamma + A \to A + \nu + \bar{\nu}$ and $\gamma + \gamma \to \nu + \bar{\nu}$ are given and discussed in connection with the luminosity and the energy removal mechanism of stars. Denotations: ε_{ikl} - antisymmetric unit tensor of the third rank, ω - the frequency of the gamma quantum, $\vec{\varsigma}$ - the momentum imparted to the nucleus, e_k - the polarization vector of the photon, p_ν and $p_{\bar{\nu}}$, respectively, the four-momenta of neutrino and antineutrino, u and v - the corresponding spinors, $G = 10^{-5}/M_p^2$, M - the proton mass; $h = c = 1$.

(A) Cross section of the process $\gamma + A \to A + \nu + \bar{\nu}$ (Fig. 2). Starting from the nonrelativistic matrix element of the transition amplitude

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$$-\frac{\alpha Z G}{2\pi\sqrt{\omega}}\frac{1}{|\bar{q}|^2}\varepsilon_{ikl}q_i e_k\left[\bar{u}(p_\nu)\gamma_l(1+\gamma_5)v(-p_{\bar{\nu}})\right] \qquad (1)$$

and after averaging over all directions of polarization of the neutrino and the antineutrino and integration over the $\bar{\nu}$ and ν directions one obtains $\sigma_1 = (7/576\pi^5)Z^2\alpha^2G^2\omega^2$ for the total neutrino pair production cross section according to Fig. 2. In the case of $\omega = 250$ kev, $\sigma_1 = 0.4Z^2 \cdot 10^{-52}$ cm^2, i.e., aside from conditions as in stellar interiors, σ_1 is insignificant.

(B) The approximative expression $\sigma_2 \approx (\alpha^2G^2/2\pi^5)\omega\omega'$ is given for the cross section of the process $\gamma + \gamma \rightarrow \nu + \bar{\nu}$ (Fig. 3a; the double line indicates an intermediate vectorial boson of mass M). ω and ω' are the frequencies of the incident photons. The energy transfered from photons to neutrino pairs per cm^3 per sec in a $\gamma + A \rightarrow A + \nu + \bar{\nu}$ process is

$$q_\nu^{(1)} = \int\omega\sigma_1 n_{nucl}\,dn_\gamma = 3.4\cdot10^{-8}\frac{\varrho}{\nu}T^6 \qquad (6),$$

where n_{nucl} denotes the number of nuclei per cm^3, ϱ - the mean densi[illegible].

Card 2/5

Transformation of photons into...

$1/\lambda = \sum C_i Z_i^2/A_i$, C_i - the weight concentration of an element, Z_i - its atomic number, A_i - its atomic weight. The sum goes over all elements occurring in the considered stellar matter. T is given in kev. Eq. (6) shows that the energy liberation in a $\gamma + A \rightarrow A + \nu + \bar{\nu}$ process is considerable as soon as there are almost no nuclear fusions and the stellar matter is characterized by a large Z. The rate of energy liberation by $\gamma + \gamma \rightarrow \nu + \bar{\nu}$ is approximately $q_\nu^{(2)} \approx 1.8 \cdot 10^{-8} T^9$. Denoting the specific energy liberation rate determined by G. M. Gandel'man and V. S. Pinayev (Ref. 4: ZhETF, 37, 1072, 1959) by q_ν, one has $q_\nu^{(1)}/q_\nu = 2.5 \cdot 10^2 T^{3/2}/\varrho$ for stars consisting of only Mg^{24}. This indicates that $q_\nu^{(1)} > q_\nu$ already at $T > 50$ kev and $\varrho \approx 10^5$. For the neutrino luminosity

$$L_\nu^{(1)} = \int q_\nu^{(1)} dv = 3{,}4 \cdot 10^{-8} \frac{1}{\nu} 4\pi \int_0^R \rho T^6 r^2 dr, \qquad (8)$$

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Transformation of photons into...

(R stellar radius); relative to L_ν (Ref. 4), $L_\nu^{(2)}$ (process $\gamma + \gamma \to \nu + \bar{\nu}$), and L_γ (photon luminosity) one has

$$L_\nu^{(1)}/L_\gamma = 10^{-11}\rho_c^2/\nu\mu b T_c^{0,5}, \quad (10),$$

$$L_\nu^{(1)}/L_\nu = 1{,}3\cdot 10^2 \mu_e T_c^{1,5}/\rho_c, \quad (11),$$

$$L_\nu^{(2)}/L_\gamma \approx 5{,}82\cdot 10^{-12} T_c^{2,5}\rho_c/b\mu \quad (16),$$

$$L_\nu^{(2)}/L_\nu^{(1)} \approx 0{,}48\nu T_c^2/\rho_c. \quad (17),$$

where $1/\mu_e = \sum C_i Z_i/A_i$, b - the Kramers coefficient for the photon path in the stellar interior (= 1 for Mg). T_c and ϱ_c, respectively, denote temperature and density in the center of the star. The considered processes play a considerable role at high temperatures and densities. The energy liberated in the process $\gamma + A \to A + \nu + \bar{\nu}$ of 1 g of substance amounts 10^3 erg/g·sec at $\varrho = 10^5$, T = 42 kev ($5\cdot 10^8$°K), and Z = 12. This value is above the energy emitted via photons. B. M. Pontekorvo (ZhETF, 36, 1615,

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Transformation of photons into...

1959) and G. M. Gandel'man and V. S. Pinayev (ZhETF, 37, 1072, 1959) are mentioned. There are 4 figures and 12 references: 6 Soviet and 6 non-Soviet. The four most recent references to English-language publications read as follows: G. Gamow, M. Schoenberg. Phys. Rev., 59, 539, 1941; R. Feynman, M. Gell-Mann. Phys. Rev., 109, 193, 1958; H. Y. Chiu, R. Stabler. Phys. Rev., 122, 1317, 1961; M. Gell-Mann. Phys. Rev. Lett., 6, 70, 1961.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics of the Academy of Sciences Gruzinskaya SSR)

SUBMITTED: June 24, 1961

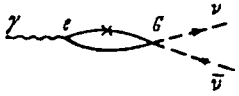

Fig. 2

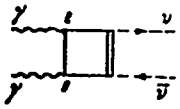

Fig. 3

S/053/61/073/001/001/004
B006/B056

AUTHORS: Andronikashvili, E. L., Mamaladze, Yu. G., Matinyan, S. G., Tsakadze, D. S.

TITLE: The Properties of Quantized Vortices Occurring in Rotating Helium II

PERIODICAL: Uspekhi fizicheskikh nauk, 1961, Vol. 73, No. 1, pp. 3 - 40

TEXT: A detailed review is given of experimental and, above all, theoretical investigations on the hydrodynamics of oscillations of solids suspended in rotating He II. Progress achieved recently in this field is of special importance for problems of superfluidity. The present review gives no new material but merely an explanation of the present stage of research work in this field, the authors mainly discussing their own publications and the results of their own investigation. The paper consists of four parts. The first part deals with the transcritical properties connected with the rotation of He II, the superfluid and normal components of He II, the hypothesis by Onsager-Feynman on the formation of vortex filaments and the variational problem connected herewith, the

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The Properties of Quantized Vortices Occurring in Rotating Helium II

S/053/61/073/001/001/004
B006/P056

velocity distribution in moving vortices of a superfluid liquid, and the experiments by Hall and Vinen (measurement of the circulation quantum). The second part deals with the oscillations of a solid in rotating He II; the following problems are discussed in detail: results obtained by Hall and Vinen, the energy properties of vortex systems, experimental and theoretical results obtained by Andronikashvili and Tsakadze, a disk in rotating He II, the effective density of the superfluid component as a function of the rate of rotation; comparison of the results obtained by Hall with those of scientists of the Tbilisi group (the authors); study of the damping of oscillations of a solid in rotating He II, results obtained by experimental investigations carried out at the Cryogenic Laboratory of Tbilisskiy universitet (Tbilisi University); the law of their damping, decrement of oscillations as a function of [illegible] conditions, temperature dependence of [illegible] damping and oscillation frequency, resonance phenomena, investigation of the rate dependence of damping of torsional oscillations, etc. Part [illegible] deals with the hydrodynamics of rotating helium II; after [illegible] several results obtained by theoretical investigations by Hall

Card 2/3

The Properties of Quantized Vortices Occurring in Rotating Helium II

S/053/61/073/001/001/004
B006/B056

I. L. Bekarevich and I. M. Khalatnikov, as well as by Yu G. Mamaladze and S. G. Matinyan are discussed. In the fourth part, the theory of small oscillations of axially-symmetric bodies in rotating He II is explained. The hydrodynamic equations for the case of small oscillation amplitudes are linearized, and methods of solution are discussed. Several special cases are discussed. I. P. Kaverkin, L. D. Landau, P. L. Kapitsa, I. M. Chkheidze, Kiknadze and Tkemaladze are mentioned. There are 17 figures and 35 references: 22 Soviet, 2 Dutch, 5 US, 1 Italian, and 5 British.

Card 3/3

S/825/62/000/000/002/002
B102/B186

AUTHOR: Matinyan, S. G.

TITLE: The sign of the mass difference of K_1^o and K_2^o-mesons

SOURCE: Voprosy teorii sil'nykh i slabykh vzaimodeystviy elementarnykh chastits. Fiz. inst. AN Arm. SSR. Ed. by V. B. Berestetskiy. Yerevan, 1962, 186 - 190

TEXT: As I. Yu. Kobzarev showed (cf. p. 175), the possibility of measuring the absolute value of the mass difference between the two K^o-mesons, but hitherto there has been no experiment to decide the sign of Δm. To do this, it is necessary to determine the interference terms containing odd functions of Δm: (the terms $\sim e^{im_1 t}$ and $\sim e^{im_2 t}$ yield even functions of Δm). One suggestion as to how to determine the sign of Δm has been made by Kobzarev and Okun' (ZhETF, 39, 605, 1960). It is based on investigating the passage of a K^o wave through two thin plates, x=vt apart, where v is the velocity of the K_2^o-meson. Another possibility, requiring only one plate, is suggested here. It is based on observing the decay modes

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S/825/62/000/000/002/002
B102/B186

The sign of the mass difference...

$K^0 \rightarrow e^+ + \pi^- + \nu$ and $\overline{K^0} \rightarrow e^- + \pi^+ + \bar{\nu}$ in the beam passing undeflected through a plate of thickness x. The number of these decays is equal to $N_{\pm} \sim \frac{1}{2} \pm xr \exp(-t/2\tau_1).\sin(\varphi - \Delta mt)$; $\pm$ refers to $e^{\pm}$; t is the time of flight from the plate to the point of decay, and $\tan \varphi = \mathrm{Im}[f(0) - \bar{f}(0)]/\mathrm{Re}[f(0) - \bar{f}(0)]$, where $f(0)$ and $\bar{f}(0)$ are the zero-angle elastic scattering amplitudes of K^0 and $\overline{K^0}$. It is easier to determine the sign of φ than that of $\Delta\varphi$ in the experiment using two plates. From elastic scattering data, φ can be estimated as $\approx +30^\circ$. The effect can be considerably magnified by increasing the oscillation amplitude and, as in the experiment using two plates, by choosing plates of optimum thickness. The sign of Δm can be determined uniquely from that of $R = (N_+ - N_-)/(N_+ + N_-)$. Such an experiment using one thick plate is technically possible. There are 2 figures.

Card 2/2

The use of analog computers ...

analog computer МПТ-9(MPT-9). The obtained graphs of transients show that direct determination of transients for the nominal and perturbation cases have no practical meaning since, owing to the analog inaccuracy, it is impossible to distinguish the nominal transient from that obtained with a changed magnitude of feedback. At the same time the solution of the perturbation equations result in a curve which clearly shows the resulting changes in the transient process. There are 5 figures.

SUBMITTED: May 10, 1962

Card 2/2

MATINYAN, S.; CHEYSHVILI, O.

Polarization arizing in the elastic scattering of fast deuterons on protons and nucleon-nucleon interaction. Trudy Inst.fiz.AN Gruz.SSR 8:95-101 '62. (MIRA 16:2)
(Deuterons—Scattering) (Nuclear reactions)

LAPERASHVILI, L.V.; MATINYAN, S.G.

Analytic properties of the scattering amplitude and lifetime of Σ-hyperons. Trudy Inst.fiz.AN Gruz.SSR 8:161-172 '62. (MIRA 16:2)

(Hyperons)

MATINYAN, S.G.

Formation of hypernuclei in collisions of Λ^0 particles with nuclei. Trudy Inst.fiz.AN Gruz.SSR 8:173-181 '62. (MIRA 16:2)

(Hyperons) (Collisions (Nuclear physics))

L 10805-63 EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3003133 S/0056/63/044/006/2011/2015

AUTHOR: Matinyan, S. G.

TITLE: Theory for determining the sign of the neutral K_1—K_2 mass difference

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2011-2015

TOPIC TAGS: Kaon mass difference, K-meson mass-difference sign, elementary particles

ABSTRACT: The interference phenomena occurring during the passage of neutral K_2^0 mesons through a stack of n pairs of thin plates of different materials are analyzed theoretically to determine the sign of the K_1^0–K_2^0 mass difference. It is shown that the use of n pairs of plates results in a considerable increase in the yield of transmission-regenerated K_1^0 mesons, with no increase in complexity of the formula for determining the sign of mass difference. It is pointed out that a method suggested by the author for measuring the sign of mass difference, based on leptonic decay, can be used even though the selection rule

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L 10805-63

ACCESSION NR: AP3003133

$\Delta S = \Delta Q$ might be violated (i. e., reactions for which $\Delta S = \Delta Q$ can occur). It is also suggested that the K^0 and $\overline{K}^0$ meson-charge-exchange effect can be utilized in determining the $K_2^0 - K_1^0$ mass difference by the one-plate method.

"The author thanks Ye. V. Gedalin and O. V. Kancheli for useful discussions."

Orig. art. has: 7 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences Georgian SSR)

SUBMITTED: 04Jan63 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 006 OTHER: 007

Card 2/2

L 13839-63 EWT(1)/BDS AFFTC/ASD GG

ACCESSION NR: AP3003147 S/0056/63/044/006/2118/2121

AUTHOR: Mamaladze, Yu. G.; Matinyan, S. G. 53

TITLE: On the stability of rotation of a superfluid liquid 21

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2118-2121

TOPIC TAGS: superfluidity, stability of rotation, vortex filament, helium-two

ABSTRACT: It is shown that the region of stability of the stationary mode of motion of a superfluid liquid rotating between two coaxial cylinders is broader than the corresponding region for an ideal classical liquid, this being due to the stabilizing influence of the quantized vortex filaments. This theoretical deduction is checked against an experiment made for a gap between coaxial cylinders with inside and outside radii of 1.9 and 2 cm, with one cylinder stationary, at 1.35°K, and is found to agree satisfactorily with the experimental data. Orig. art. has: 15 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences, Georgian SSR)

Card 1/2

L 17217-63 EWT(m)/BDS AFFTC/ASD S/0056/63/045/002/0386/0388

ACCESSION NR: AP3005300

AUTHOR: Matinyan, S. G.

TITLE: Eta sup 0 meson and the mass difference of the K sup 0 sub 1 and K sup 0 sub 2 mesons

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 386-388

TOPIC TAGS: neutral K meson, neutral eta meson, mass difference, kaon-pion interaction

ABSTRACT: The K-transition coefficient is estimated by making use of the single pole mechanism of the decay of the η^0 and K meson into three pions via a virtual pion, a mechanism which is not definitely proved but which recent research by Mirza et al (Phys. Rev. lett. v. 8, 45, 1962 and v. 9, 67, 1962), Barton et al (Phys. Rev. Lett. v. 8, 414, 1962), Wall (Phys. Rev. Lett. v. 9, 120, 1962), and Berley

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L 17217-63
ACCESSION NR: AP3005300

et al (Phys. Rev. Lett. v. 10, 114, 1963) has shown to be in agreement with experiment. The K-π transition coefficient is necessary for a theoretical determination of mass difference of the K_1^0 and K_2^0 mesons. The final estimate for the ratio of this mass difference to the Kaon mass is found to be about 3.3×10^{-14}, which is of the same order of magnitude as found by other researchers. Orig. art. has 3 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute, Academy of Sciences Georgian SSR)

SUBMITTED: 08May63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 000 OTHER: 012

Card 2/2

ACCESSION NR: AP4037583 S/0056/64/046/005/1700/1714

AUTHORS: Verdiyev, I. A.; Kancheli, O. V.; Matinyan, S. G.; Popova, A. M.; Ter-Martirosyan, K. A.

TITLE: Complex asymptotic expressions for inelastic processes amplitudes and singularities in the angular momentum plane

SOURCE: Zh.eksper. i teor. fiz., v. 46, no. 5, 1964, 1700-1714

TOPIC TAGS: asymptotic solution, inelastic scattering, Regge pole, moving pole method, high energy particle

ABSTRACT: A previously developed momentum integration technique for a small number of particles (ZhETF v. 46, 568 and 1295, 1964) is used to calculate the total cross sections for the production of n particles (or n groups of particles having a low particle energy in the c.m.s. of each group) and the energy distribution of the particles in high-energy inelastic collisions. The values previously obtained

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ACCESSION NR: AP4037583

for the most important "genuinely inelastic" collisions, corresponding to the contribution of an isolated vacuum Regge pole, are used to determine the asymptotic amplitudes. It is assumed that all particles are identical and have no isospin. It is shown that for any inelastic process there is a definite particle momentum configuration making the most significant contribution to the amplitude. The distributions of these particles with respect to the logarithms of their momenta are determined and are found to depend on the behavior of the vertex functions. Unitarity in the s-channel for the zero-angle elastic-scattering amplitude is shown to be violated if these vertex functions do not decrease with decreasing squares of the reggeon momenta. The dependence of both halves of the s-channel unitarity condition for elastic scattering at nonzero angle on the momentum transfer is investigated, and it is shown that the right half of this condition does not represent the Regge asymptotic amplitude corresponding to the vacuum pole if the terms corresponding to the production of an arbitrary number of particles are taken into

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ACCESSION NR: AP4037583

account. The momentum-transfer dependence can be duplicated only if all asymptotic contribution from all the branch-point singularities on the right of the vacuum point, condensing toward the point j = 1, are taken into account. Orig. art. has: 48 formulas.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki (Institute of Theoretical and Experimental Physics); Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences, Georgian SSR); Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Nuclear Physics Institute, Moscow State University)

SUBMITTED: 03Sep63 DATE ACQ: 09Jun64 ENCL: 00

SUB CODE: NP NR REF SOV: 004 OTHER: 003

L 16507-65 EWT(1) ESD(t)/ESD(gs)/SSD/AFWL/ASD(p)-3

ACCESSION NR: AP5000334 S/0056/64/047/005/1790/1799

B

AUTHORS: Kanchel', O. V.; Matinyan, S. G.

TITLE: Contribution to the field theory of weak interactions

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 5, 1964, 1790-1799

TOPIC TAGS: field theory, weak interaction theory, boson, lepton, perturbation theory

ABSTRACT: Weak interaction between bosons and leptons is analyzed on the basis of the Feinberg-Pais procedure, with an aim at clarifying the mechanism of renormalization of the amplitude by high-order effects, which in the case of boson-lepton interaction is expected to be more thorough than in the Born approximation. It is shown that the contact terms which are present in the Born term drop out of the amplitude, and account of the "spreading out" of the contact

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L 16507-65
ACCESSION NR: AP5000334

term by the strong interactions leads to the reappearance in the renormalized amplitudes of all the terms that enter in first order of perturbation theory, except that some of these terms are not renormalized at all compared with the Born term. Quantitative relations are given for the account of the strong-interaction form factors. It is suggested that this effect of suppression of the contact terms may hold true for other than ladder diagrams. Orig. art. has: 23 formulas.

ASSOCIATION: None

SUBMITTED: 20Apr64 ENCL: 00

SUB CODE: NP NR REF SOV: 002 OTHER: 011

Card 2/2

GERDALIN, E.V.; KANCHELI, O.V.; LAPERASHVILI, L.V.; MATINYAN, S.G.

Anomalous thresholds and the mass spectrum of elementary particles. Fiz. chast. vys. energ. no.1:30-32 '65. (MIRA 18:12)

KANCHELI, O.V.; MATINYAN, S.G.

Weak meson interaction and regularization. Fiz. chast. vys. energ. no.1:37-40 '65. (MIRA 18:12)

L 00756-66 EWT(m)/T/EWA(m)-2 UR/0386/65/001/002/0029/0033

ACCESSION NR: AP5014199

AUTHOR: Matinyan, S. G. 44,55

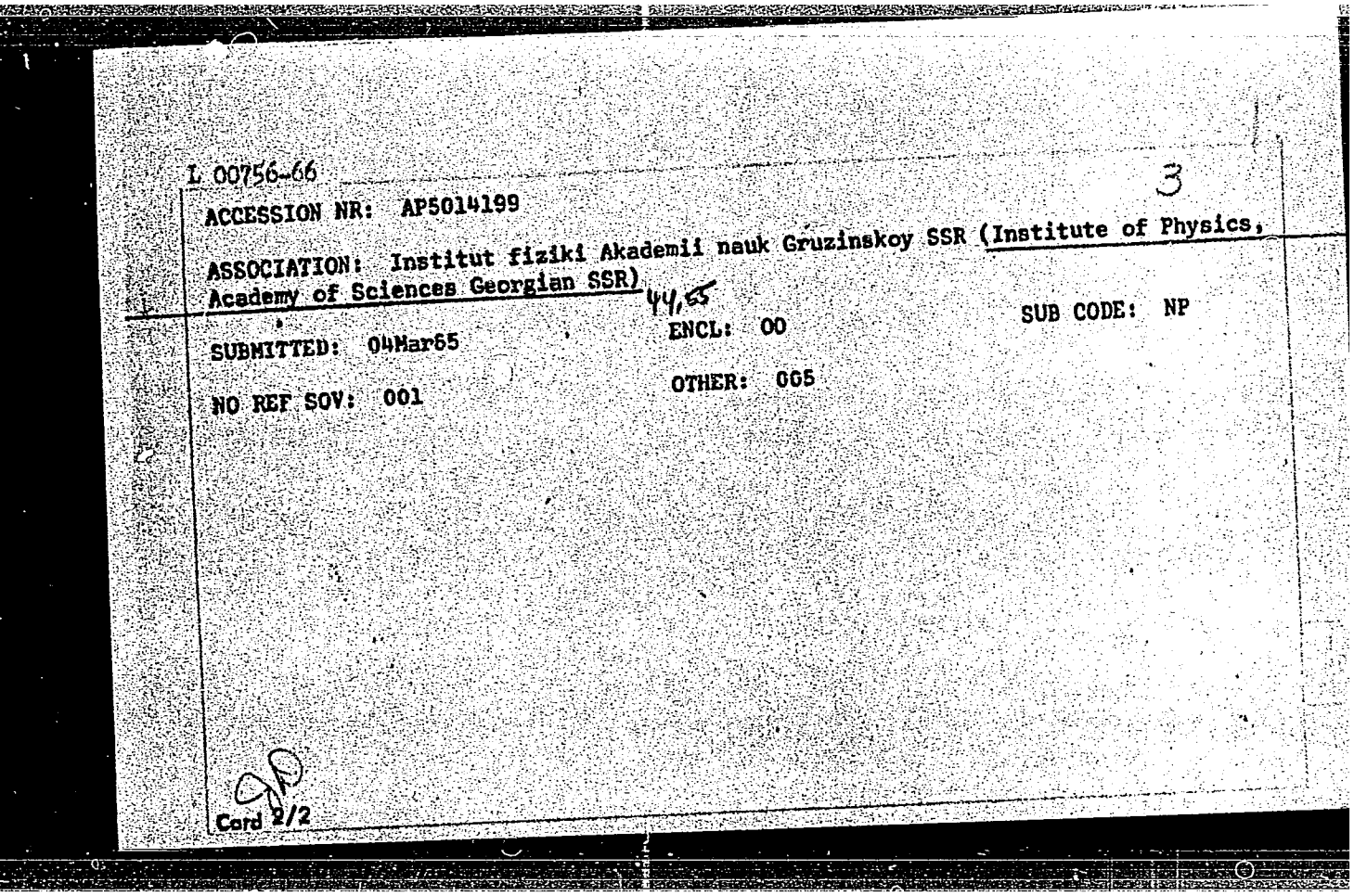
TITLE: Transformation properties of the Lagrangian of weak interaction and S-amplitudes of adron disintegrations of hyperons in SU(6) symmetry 44,55,19

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 2, 1965, 29-33

TOPIC TAGS: particle interaction, weak nuclear interaction, strange particle, hyperon

ABSTRACT: A number of authors have recently determined the ratios between the amplitudes of S-waves in adron disintegrations of hyperons on the basis of SU(6) symmetry (G. Altarelli, F. Bucella, R. Gatto, Preprint, 1964; S. G. Matinyan, *ZhETF*, 48, 1204, 1965; K. Kawarabayashi, Preprint, Trieste, 1964). This paper discusses to what extent the ratios found in the previous papers are stable with respect to the transformation properties of the Lagrangian of weak interaction for the adrons. "The author thanks O. V. Kancheli for consultation." Orig. art. has: 3 formulas. 44,55

Card 1/2



L 00756-66

ACCESSION NR: AP5014199

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences Georgian SSR)

SUBMITTED: 04Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 001 OTHER: 005

Card 2/2

L 00716-66 EWT(m)/T/EWP(m)-2

ACCESSION NR: AP5014238 UR/0386/65/001/003/0035/0040

AUTHOR: Gedalin, E. V.; Kancheli, O. V.; Matinyan, S. G.

TITLE: Renormalization of baryon vector current by destruction of SU(6) symmetry

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 3, 1965, 35-40

TOPIC TAGS: particle physics, baryon

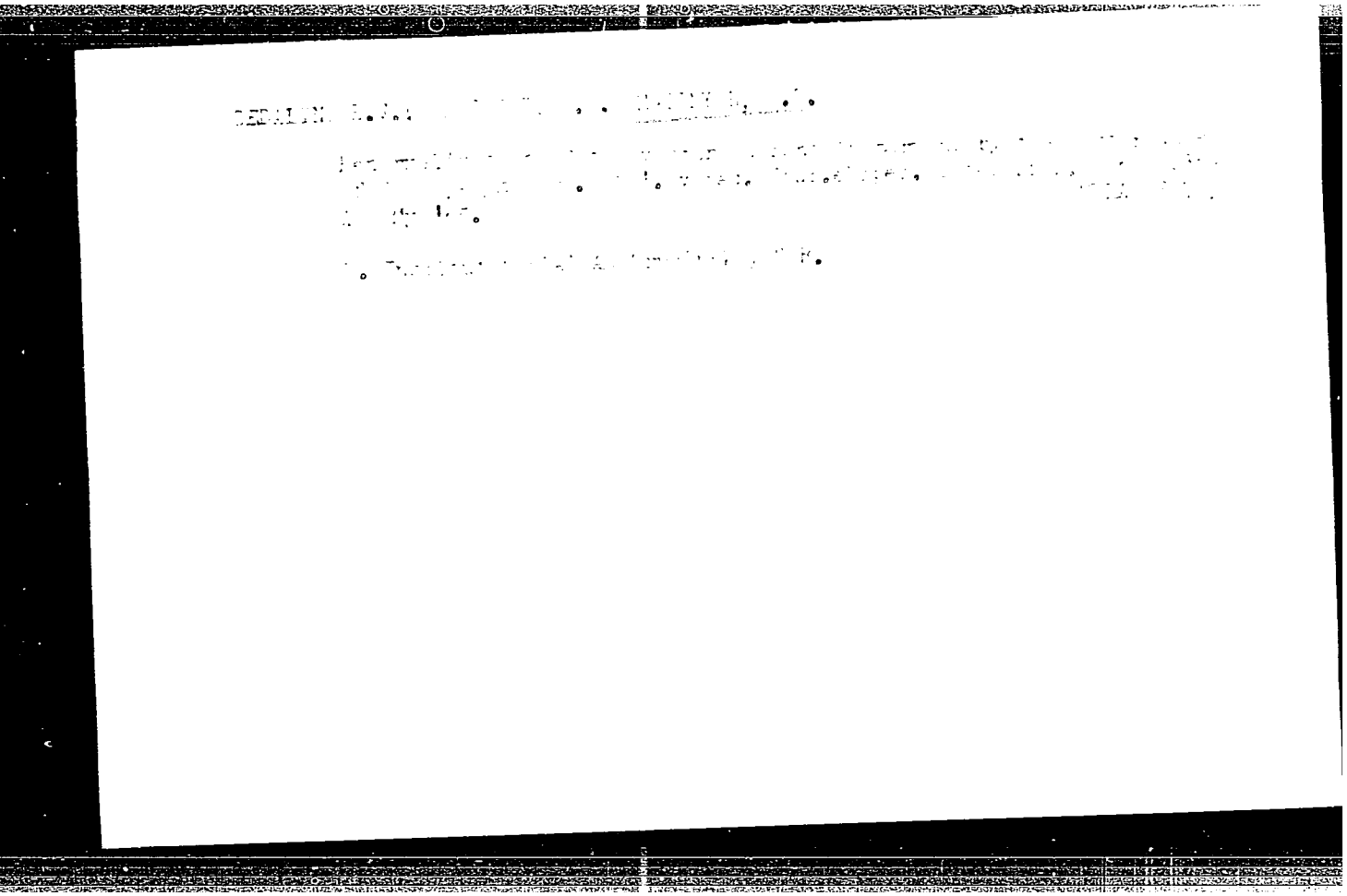
ABSTRACT: The vector constants of weak baryon currents are not renormalized in the first approximation of destruction of SU(3) symmetry. In the second order with respect to this destruction, renormalization takes place which is associated with an increase in the number of independent amplitudes. The authors present an analog of the Ademollo-Gatto theorem (M. Ademollo, R. Gatto, *Phys. Rev. Lett.*, 13, 264, 1964) in SU(6) symmetry. Orig. art. has: 7 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences Georgian SSR)

SUBMITTED: 29Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 002 OTHER: 002

Card 1/1



L 60943-65 EWT(m)/T/EWA(m)-2

ACCESSION NR: AP5016278 UR/0386/65/001/005/0012/0017

11
10
B

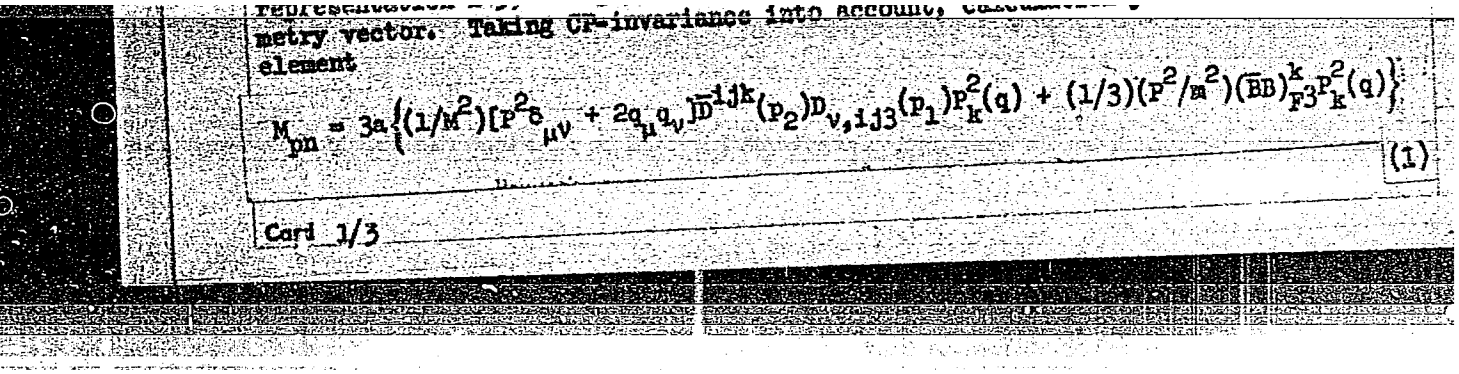
AUTHOR: Gedalin, E. V.; Kancheli, O. V.; Matinyan, S. G.

TITLE: Hadron decays of baryons in the $\tilde{U}(12)$ symmetry scheme

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 1, no. 5, 1965, 12-17

TOPIC TAGS: baryon decay, hadron decay, symmetry property, hyperon decay, spurion

ABSTRACT: The authors consider hadron decays of hyperons in the $\tilde{U}(12)$ symmetry scheme which is one of the possible relativistic generalizations of SU(6) symmetry. [illegible] the parity-nonconserving amplitudes for the S-waves [illegible] The trans-



metry vector. Taking CP-invariance into account, [illegible]
element

$$M_{pn} = 3a\left\{(1/M^2)[P^2\delta_{\mu\nu} + 2q_\mu q_\nu]\bar{D}^{ijk}(p_2)D_{\nu,ij3}(p_1)P^2_k(q) + (1/3)(P^2/m^2)(\bar{B}B)^k_{F3}P^2_k(q)\right\} \quad (1)$$

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where $P^2 = (p_1 + p_2)^2$, $(\overline{BB})^i_{Fj} = \overline{B}^i_t B^t_j - \overline{B}^t_j B^i_t$, M is the "average" mass decuplet, and m is the "average" mass of the baryon octet. From (1) follow all the previously obtained relations between the S-wave amplitudes of hadron decays of the baryon octet. The relation $(\Lambda \to p\pi^-)_S = (2)^{-1/2}(\Omega^- \to \Xi^{0*}\pi^-)_S$, obtained by one of the authors (Matinyan, ZhETF v. 48, 1204, 1965), is generalized with allowance for the D-wave in the $\Omega^- \to \Xi^{0*}\pi^-$ decay. Relations between the parity-conserving amplitudes of hadron decays of baryons are also derived. The essentially new factor brought about

in the [illegible] also derived. The [illegible] amplitudes is the deduction
ron decays of baryons are also derived. The [illegible] amplitudes is the deduction
by $\tilde{U}(12)$ symmetry with respect to parity-nonconserving amplitudes is the deduction
which follows from (1), that the decays $\Omega \to \Lambda K^-$ and $\Omega \to \Xi\pi$ proceed with conservation
of parity (i.e., only in the P-wave). In the case of parity-conserving amplitudes,
two possibilities are considered. One is that the spurion H (which has a zero 4-
momentum) can belong to representation 143 of the $\tilde{U}(12)$ scheme. The other possi-
bility is that the spurion is regarded, with respect to the transformation proper-
ties of "internally-broken" $\tilde{U}(12)$ symmetry, on an equal basis with real particles.
In this case it should be transformed in accordance with the higher representations
of $\tilde{U}(12)$ (4212, 5940). It is shown that the first alternative leads to contradic-
tion with experiment for parity-conserving amplitudes. The second possibility will
be considered in the next paper. Orig. art. has: 5 formulas.

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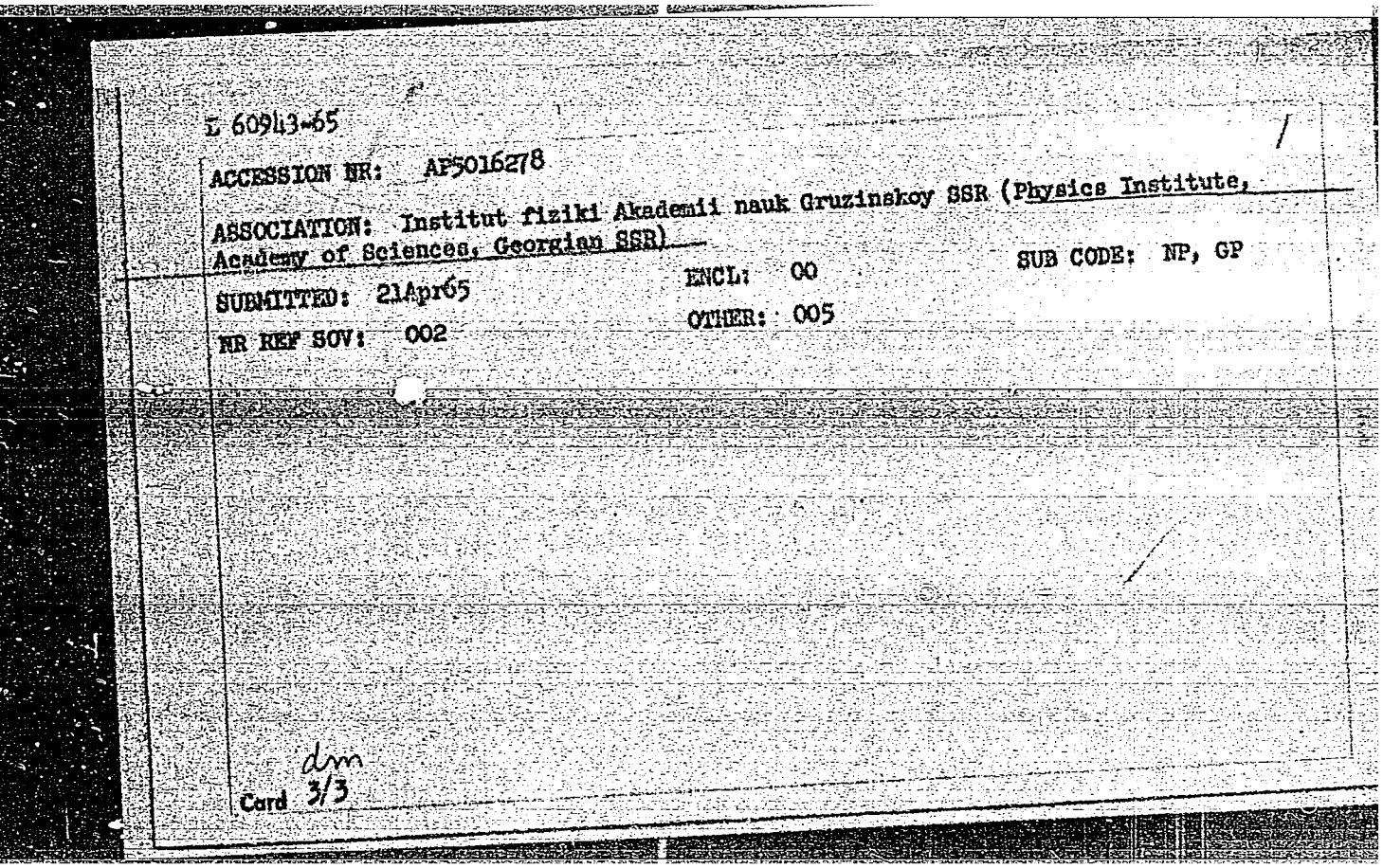

L 60943-65

ACCESSION NR: AP5016278

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute, Academy of Sciences, Georgian SSR)

SUBMITTED: 21Apr65 ENCL: 00 SUB CODE: NP, GP

NR REF SOV: 002 OTHER: 005

Card 3/3 dm

L 4886-66 EWT(m)/T/EWA(m)-2
ACCESSION NR: AP5021140 UR/0386/65/002/001/0009/0013

AUTHOR: Gedalin, E. V.; Kancheli, O. V.; Matinyan, S. G.

TITLE: Parity conserving amplitudes of hadron decays of baryons in the $\tilde{U}(12)$ symmetry scheme

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 1, 1965, 9-13

TOPIC TAGS: parity principle, elementary particle, baryon, hyperon, meson

ABSTRACT: This is a continuation of earlier work by the authors (ZhETF Pis'ma v redaktsiyu v. 1, no. 3, 35, 1965), where they reported the results of application of the $\tilde{U}(12)$ symmetry to hadron decays of hyperons. In the present paper they consider another possibility for parity-conserving amplitudes whereby the spurion enters on an equal basis as the real particles with respect to the transformation properties of $\tilde{U}(12)$ symmetry. The lowest representations of $\tilde{U}(12)$ symmetry, containing a CP-even scalar, are in this case 4212 and 5940, and are used to describe the weak spurion H. An expression is derived for the CP-invariant parity-conserving matrix element of hadron decays and a connection is obtained between the parity-conserving amplitudes of hadron decays of barions and the invariant functions of this matrix element. When the latter are eliminated, the result is, in

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L 4886-66

ACCESSION NR: AP5021140

addition to the Gell-Mann--Rosenfeld triangle relation, also new relations between the parity-conserving amplitudes of hadron decays of the hyperons. The relation between Λ, Ξ, and Σ^- strongly contradicts the experimental data, in spite of the great inaccuracy of the latter, and it is concluded on the basis of this and the earlier result that within the framework of U(12) symmetry there is no satisfactory discription of the parity-conserving amplitudes of hadryon decays of hyperons. It is possible that this circumstance is closely connected with the recently noted contradiction between U(12) symmetry and experiment in polarization phenomena. "We are grateful to Ya. A. Smorodinskiy for interest in the work and for discussions." Orig. art. has: 4 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute, Academy of Sciences, Georgian SSR)

SUBMITTED: 17May65 ENCL: 00 SUB CODE: GP, NP

NR REF SOV: 001 OTHER: 009

Card 2/2

MATINYAN, S.G.

Proton decay of hyperons and the SU_6-symmetry. IAd. fiz. 2 no.1:151-153 Jl '65. (MIRA 18:8)

1. Institut fiziki AN GruzSSR.

L 2751-66 EWT(m)/T/EWA(m)-2 UR/0367/65/002/002/0315/0320

ACCESSION NR: AP5024346

AUTHOR: Kancheli, O. V.; Laperashvili, L. V.; Matinyan, S. G.

TITLE: Schwinger's broken W_3 symmetry

SOURCE: Yadernaya fizika, v. 2, no. 2, 1965, 315-320

TOPIC TAGS: particle symmetry, unitary symmetry, group theory, baryon, meson, particle physics

ABSTRACT: The dynamic aspects of the Schwinger model are used for deriving expressions relating meson-baryon coupling constants and scattering amplitudes where disruption of W_3 symmetryyy [$W_3 = SU_1(3) \oplus SU_2(3)$] is introduced by interaction between the fields of the fermion and boson triplets:

$$f^{1}(\bar{\psi}_b \psi_c \bar{V}^{ca} + \bar{\psi}^a \bar{\psi}^c V_{cb}), \quad a = 1, 2, 3$$

A detailed analysis is given based on an example with splitting of the baryon masses. A relationship is found between W_3 symmetry and $SU(3)$ symmetry in which the octet is perturbed by a unitary singlet. It is concluded that W_3 symmetry may be considered a higher form than $SU(3)$ symmetry where the singlet is separated from

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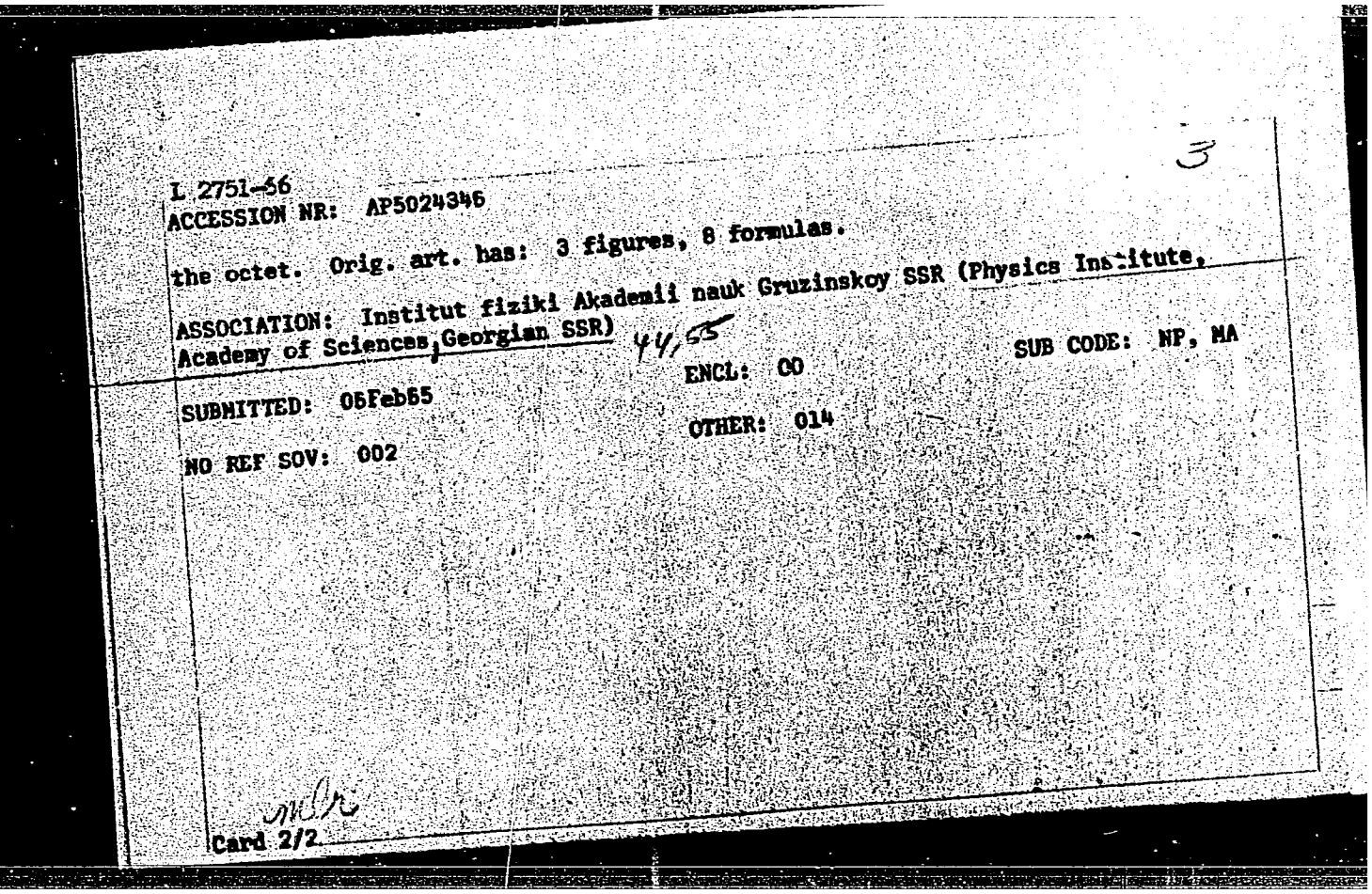

L 2751-66
ACCESSION NR: AP5024346

the octet. Orig. art. has: 3 figures, 8 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Physics Institute, Academy of Sciences, Georgian SSR)

SUBMITTED: 05Feb65 ENCL: 00 SUB CODE: NP, MA

NO REF SOV: 002 OTHER: 014

Card 2/2

MATINYAN, S.G.

Hadronic decay of baryons in disturbed SU(6) symmetry. (MIRA 18:11)
IAd. fiz. 2 no.4:752-756 O '65.

1. Institut fiziki AN GruzSSR.

L 4460-66 EWT(m)/T/EWA(m)-2

ACC NR: AP5024630 SOURCE CODE: UR/0048/65/029/009/1670/1671

AUTHOR: Matinyan, S.G.

ORG: none

TITLE: Inelastic interactions at ultrahigh energies /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 9, 1965, 1670-1671

TOPIC TAGS: theoretic physics, particle production, high energy particle, particle collision, nucleon, pion

ABSTRACT: In a series of papers (Zh. eksperim. i teor. fiz., 46, 568, 1295, 1700 (1964)) by K.A.Ter-Martirosyan, S.G.Popova and different collaborators, the complex angular momentum technique has been applied to the problem of multiple production at ultrahigh energies and general conclusions independent of any specific reaction mechanism, have been drawn concerning the momentum distribution of the secondaries for the limiting case of "truly elastic" collisions. In the present paper the author introduces the "natural" assumption that the "mass" of the nonbarionic object transferred between the colliding particles is small compared with the energy of the colliding particles and draws by verbal arguments a number of qualitative conclusions concerning multiple production in ultrahigh energy collisions. These conclusions include

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L 4450-66

ACC NR: AP5024630

the following: Two jets are formed, each of which contains several groups of particles (resonances or fireballs), which move in the center of mass system nearly in the direction of motion of the colliding particles. The momenta of the particles in each group vary widely in magnitude but nearly coincide in direction. The inelasticity is large when isobars are formed and small when they are not. A correlation between the inelasticity and the presence of fireballs does not obtain in the limit of very high energies. The average multiplicity in pion-nucleon collisions exceeds that in nucleon-nucleon collisions. The relative number of secondaries other than pions is not energy dependent. Among the momenta of the particles of a single group there subsists a certain relation that has received some experimental confirmation (S.Hayakawa, Theoretical Physics, IAEA, p. 485. Trieste seminar, Viennaa Vienna, 1962). Orig. art. has: 6 formulas and 1 figure.

SUB CODE: NP/ SUBM DATE: 00/ ORIG REF: 003/ OTH REF: 001

Card 2/2

L 52969-65 EWT(m) Peb DIAAP

ACCESSION NR: AP5010523 UR/0056/65/048/004/1204/1206

AUTHOR: Matinyan, S. G.

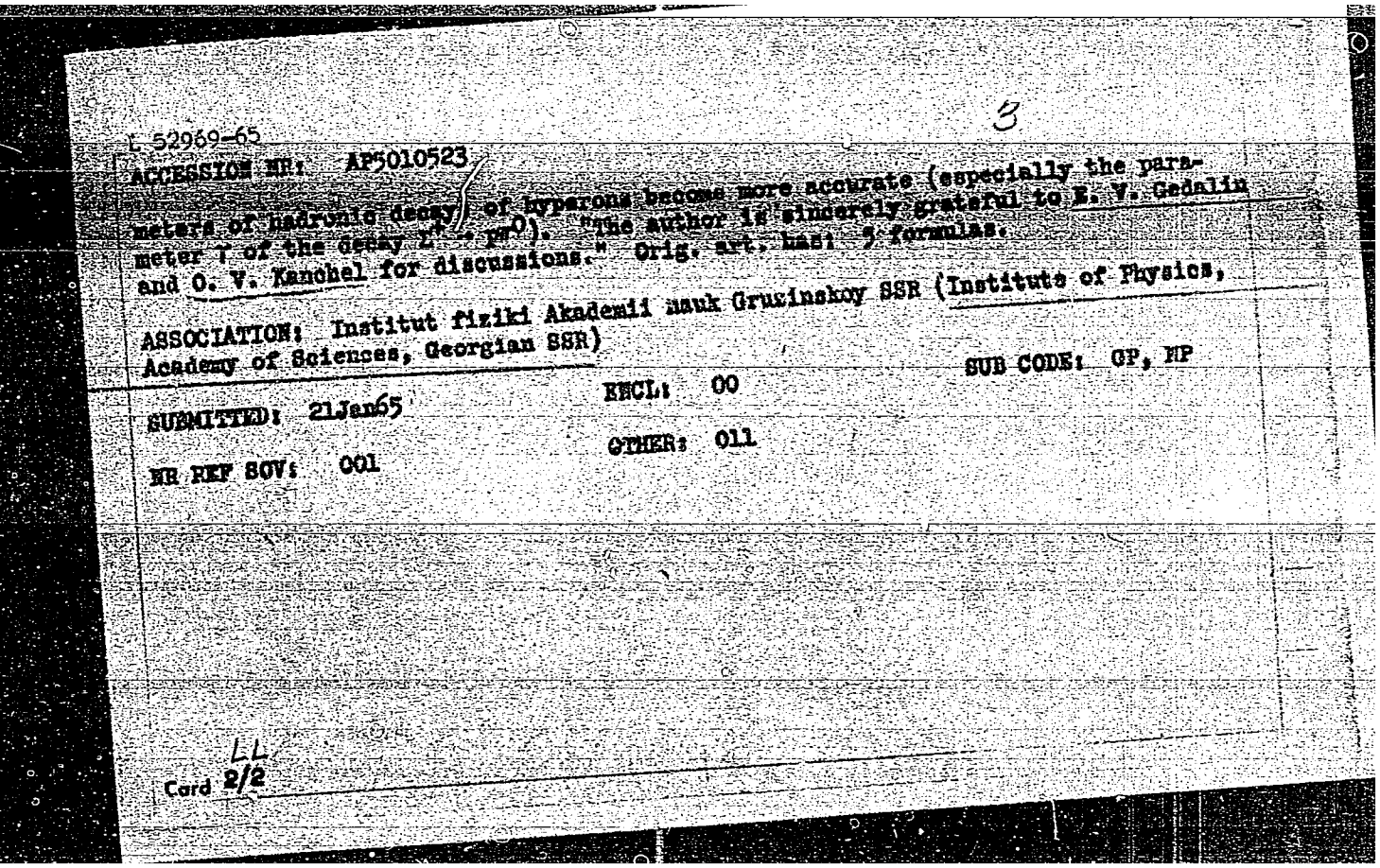
TITLE: S-amplitudes of hadron decays of baryons and SU(6) symmetry

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 4, 1965, 1204-1206

TOPIC TAGS: hadron decay, baryon, hyperon

ABSTRACT: The author examines the S-wave amplitudes of hadronic decays of baryons in the SU(6) symmetry scheme. Unitary relations are written out for the spurion associated with the hadron weak interaction Lagrangian. It is shown that the S-wave amplitude of the $\Sigma^+ \to n\pi^+$ decay is zero. This explains theoretically for the first time the well-known experimental fact that there is no asymmetry in the decay $\Sigma^+ \to n\pi^+$ and $\Sigma^- \to n\pi^-$. Relations are then derived between the S-amplitudes of all the hadronic decays of baryons ($B \to B + M$). These relations satisfy the triangle relations between the amplitudes of Λ-, Ξ-, and Σ-decays, obtained in several other papers and agreeing with experiment. Whether these relations are in full accord with experimental data will become clear only after the measurements of the para-

Card 1/2



L 52969-65

ACCESSION NR: AP5010523

meters of hadronic decay of hyperons become more accurate (especially the parameter γ of the decay $\Sigma^+ \to p\pi^0$). "The author is sincerely grateful to E. V. Gedalin and O. V. Kancheli for discussions." Orig. art. has: 2 formulas.

ASSOCIATION: Institut fiziki Akademii nauk Gruzinskoy SSR (Institute of Physics, Academy of Sciences, Georgian SSR)

SUBMITTED: 21Jan65 ENCL: 00 SUB CODE: GP, NP

NR REF SOV: 001 OTHER: 011

Card 2/2

L 45813-66 EWT(m)/T

ACC NR: AR6023262 SOURCE CODE: UR/0058/66/000/003/B020/B020

28
B

AUTHOR: Kancheli, O. V.; Matinyan, S. G.

TITLE: Weak interaction of mesons and peratization

SOURCE: Ref zh. Fizika, Abs. 3B187

REF. SOURCE: Sb. Fiz. chastits vysok. energiy. No. 1. Tbilisi, Metsniyereba, 1965, 37-40

TOPIC TAGS: meson, weak nuclear interaction, nuclear spin, pion scattering, strong nuclear interaction

ABSTRACT: For weak interaction of mesons with zero spin, due to exchange of a charged vector meson, the authors consider the peratization procedure of Feinberg and Pais (RZhFiz, 1964, 5B229; 1964, 6B218) with summation of the most diverging terms of the ladder diagrams. It is shown that for the "allowed" peratized amplitude of meson-meson scattering, all the contact terms drop out in this case. It is noted that allowance for strong interactions can make a contribution to the peratized amplitude. L. Galkina. [Translation of abstract]

SUB CODE: 20

Card 1/1 hs

MATINYAN, S.M. (Isaakyan)

Method of measuring the spatial field velocities in an irregular flow during the formation of vortices. Izv. AN Arm. SSR. Ser. FMET nauk 8 no.2:63-73 Mr-Ap '55. (MLRA 8:7)

1. Vodno-energeticheskiy institut Akademii nauk Armyanskoy SSR.
(Hydrodynamics)

MATINYAN, T.K.

Characteristics of the regulation of the seasonal cycle in varios geographical strains of the cabbage aphid Brevicoryne brassicae L. Izv. AN Arm. SSR. Biol. nauki 17 no.8:39-45 Ag '64. (MIRA 17:10)

1. Zoologicheskiy institut . N Armyanskoy SSR.

MATINYAN, T.K.

Adaptations of seasonal cycles to geographical changes in day length and temperature in cabbage worms Pieris napi and Pieris rapae L. Izv. AN Arm.SSR.Biol.nauki 19 no.10:81-98 O '65. (MIRA 18:12)

1. Zoologicheskiy institut AN Armyanskoy SSR. Submitted April 14, 1965.

L 34866-65 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD
ACCESSION NR: AP5005058 B/0051/65/018/002/0347/0349

AUTHOR: Georgobiani, A. N.; Matinyan, Ye. G.; Savin, A. N.

TITLE: Low voltage electroluminescence of ZnS

SOURCE: Optika i spektroskopiya, v. 18, no. 2, 1965, 347-349

TOPIC TAGS: electroluminescence, zinc sulfide optic material, impact excitation, voltage dependence

ABSTRACT: Inasmuch as earlier studies of low-voltage electroluminescence of ZnS were made under conditions in which minority carrier injection was possible, the authors excluded this possibility by exciting the electroluminescence by the Destriau method (J. Chim. Phys. v. 33, 620, 1936). In this case the luminor crystallites are mixed with the dielectric, which insulates them from the electrodes. The resultant electroluminescent capacitors were similar to those investigated by one of the authors earlier (with M. V. Fok, Opt. i spektr. v. 9, 775, 1960) but the thickness was approximately 10 μ and the capacitor electrode area was 4.1 cm^2. At low voltages each elementary capacitor produced approximately 5000 quanta per second, corresponding to approximately one quantum from each small crystal every

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ACCESSION NR: AP5005058

10,000 cycles. Measurement of the dependence of the electroluminescence brightness on the voltage at 63 cps showed a noticeable variation at voltages between 2.4 and 3 V. The frequency dependence of the brightness also changed noticeably with decreasing voltage, with the maximum brightness shifting towards lower frequencies with decreasing voltage. The results are interpreted from the point of view of the fact that at low voltages the predominant mechanism producing the glow is impact excitation of the luminescence centers. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 16Apr64 ENCL: 00 SUB CODE: OP

NR REF SOV: 001 OTHER: 003

Card 2/2

MATIRNYY, A.; ROZHOK, F.

In the cities and villages of Lvov Province. Pozh.delo 9 no.3:28 Mr '63. (MIRA 16:4)
(Lvov Province—Fire prevention—Study and teaching)

MATIS, B.

Track brakes on the mechanical interlocking installations of railroad yards. p. 299.
ZELEZNICE, Prague, Vol. 4, no. 11, Nov. 1954.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 6, June 1956, Uncl.

MATIS, Boh., inz.

From the theory and practice of safety relay electric circuits. Zel dop tech 11 no.4:114-115 '63.

MATIS, Bohuslav, inz.

Relay semi-automatic block. Zelez dop tech 11 no.1:8-10 '63.

MATIS, Bohumil, inz.

Assistance of the telecommunication and safety services.
Zel dop tech 12 no.9:244-245 '64.

1. Operations Department, Usti nad Labem.

MATIS, E.G., entomolog; GLUSHKOVA, L.A., fitopatolog

Bean pests and diseases in Kustanay Province. Zashch. rast. ot vred. i bol. 7 no.2:17 F '62. (MIRA 15:12)

1. Kustanayskaya opytnaya stantsiya, Karabalykskiy rayon, Kustanayskaya oblast'.
(Kustanay Province--Beans--Diseases and pests)

BADULIN, A.V., kand.biolog.nauk; MATIS, E.G., starshiy nauchnyy sotrudnik; SUSIDKO, P., kand.biolog.nauk; FED'KO, I., kand.biolog.nauk; RAKHIMOV, U.Kh., aspirant; SHUL'GA, N.G., aspirantka; KOBLENTS, L.V., starshiy nauchnyy sotrudnik; PAN'SHIN, I.V., starshiy nauchnyy sotrudnik; KULIKOVA, M.T., aspirantka; SIDOROVA, S.F., aspirantka

Brief information. Zashch. rast. ot vred. i bol. 9 no.1:52-55 '64. (MIRA 17:4)

1. Kustanayskaya sel'skokhozyaystvennaya opytnaya stantsiya (for Badulin, Matis). 2. Vsesoyuznyy institut kukuruzy, Dnepropetrovsk (for Susidko, Fed'ko). 3. Samarkandskiy universitet (for Rakhimov). 4. Belorusskiy institut zemledeliya (for Shul'ga). 5. TSentral'naya torfobolotnaya opytnaya stantsiya, Dmitrov, Moskovskaya obl. (for Koblents). 6. Lazarevskiy insektariy, Krasnodarskiy kray (for Pan'shin). 7. Kazakhskiy institut zashchity rasteniy, Alma-Ata (for Kulikova). 8. Vsesoyuznyy institut zashchity rasteniy (for Sidorova).

BADULIN, A.V., kand.biolog.nauk; MATIS, E.G.

The sugar-beet tortoise beetle Cassida nebulosa. Zashch. rast. ot vred. i bol. 9 no.3:43 '64. (MIRA 17:4)

1. Kustanayskaya oblastnaya sel'skokhozyaystvennaya opytnaya stantsiya (for Matis).

VRANA, Bohumir; MATIS, Frantisek; MALY, Bohmmir; DEMEL, Josef

Congenital obliteration of the gastrointestinal lumen. Cesk. pediat. 14 no.2:130-133 5 Feb 59.

1. Detske oddeleni nemocnice OUNZ v C. Tesine, prednosta dr. B. Vrana Chirurg. oddeleni nemocnice OUNZ v. C. Tesine, prednost dr. F. Matis Ghirurg. oddeleni nemocnice KUNZ v Ostrave-Zabrehu, prednosta dr. K. Typovsky Detske oddeleni KUNZ v Ostrave-Zabrehu, prednosta dr. B. Vranova.
(GASTROINTESTINAL SYSTEM, abnorm.
obliteration of lumen (Cz))

L 15939-66

ACC NR: AP5027382 SOURCE CODE: UR/0371/65/000/005/077/0091 42 41 B

AUTHOR: Matiss, I. G. Matiss, I.

ORG: Institute of Mechanics of Polymers, AN Latv. SSR (Institut mekhaniki polimerov AN Latv. SSR)

TITLE: Electric field calculation of a capacitor with one-sided arrangement of the electrodes

SOURCE: AN LatSSR. Izvestiya. Seriya fizicheskikh i tekhnicheskikh nauk, no. 5, 1965, 77-91

TOPIC TAGS: electric field, electrode, calculation, capacitor, dielectric property

ABSTRACT: When working with high-frequency electric fields, it is often difficult to arrange electrodes on both sides of the analyzed material. Such is the case when the analyzed material is subject to high-frequency heating. The dielectric properties of materials were measured by a capacitor whose electrodes were placed only on one side of the material. The calculations were obtained by the use of conformal mapping, yielding the intensity of the electric field and the

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ACC NR: AP5027382

capacitance of the capacitor. These items were also calculated for the general case when the widths of two tape electrodes were unequal. The results of the proposed method compared satisfactorily with the usual one when the analyzed material was placed between the two plates of the capacitor. The work was supervised by Doctor of Technical Sciences Professor A. V. Netushila. Orig. art. has: 8 figures and 39 formulas.

SUB CODE:09,20/ SUBM DATE: 10May65/ ORIG REF: 007

FW

MATIS, J.

"Organization of the preservation of nature and landscape in Hungary," p. 62. (Ochrana Prirody. Vol. 8, no. 3, July 1953. Praha.)

SO: Monthly List of East European Accessions, Library of Congress, Vol. 3, No. 2, February 1954, Uncl

MATIS, J.

State protection of nature has been established by law in Slovakia. p. [illegible]. OCHRANA PRIRODY. (Ministerstvo kultury. Statni pece of ochranu prirody Praha. Vol. 11, no. [illegible], Feb. 1954.

SOURCE : East European Accessions List, Vol. 5, no. [illegible], September 19[illegible]

MATIS, J.

"Symposium on the protection of nature."

P. 267. (Ministerstvo kultury. Statni pece o ochranu prirody --Praha, Czechoslovakia.) Vol. 12, no. 9, Dec. 1957.

SO: Monthly Index of East European Accession (EEAI) LC, Vol. 7, No. 5, May 1958

BALAZ,V.; PLINTOVIC,V.; MATIS.J.

Change in the estrogen steroid spectrum following histamine. Cas.lek.cesk. 103 no.14 :380-383 3 Ap'64.

1. Vyzkumny ustav pre fyziatriu, balneologiu a klimatologiu, pobocka v Bratislave (riaditel: prof.dr. J.Hensel); Gynekologicko-porodnicke oddelenie KUNZ v Banskej Bystrici (vedouci: MUDr. J.Scholtz) a Cls orny liecebny ustav endokrinologicky v Lubochni (riaditel: ..JDr. E.Spanar, CSc.).

MATIS, Jan, inz.; ADAMEC, Otto, inz.

Chromatographic separation of 17-hydroxycorticoides on the column $CaSO_4$. Chem zvesti 16 no.6:482-485 Je '62.

1. Odborny liecebny ustav endokrinologicky, Lubochna.
Adresa autorov: Lubochna, okres Liptavsky Mikulas.

Matic, C.

5

[illegible], Oldrich [illegible]

Country: Czechoslovakia

Academic Degrees: MD

Affiliation: Director of Endocrinological Hospital (Oblastny liecebny ustav endokrinologicky) in Lubochna

Source: Bratislava, Lekarsky Obzor, No 4, 61, pp 211-227

Data: "The Pituitary-Adrenal-Ovarian Relationships in the Aetiopathogenesis of Some Forms of Amenorrhoea"

Co-authors:

[illegible], V. Endocrinological Hospital, Lubochna

[illegible], O. " " "

[illegible]

GERSHOV, M.M.; MAMONTOVA, L.D.; MATIS, V.A.; MOZHEYKO, N.N.

Using reduction-oxidation process in bleaching wool caps. Leg. prom. 18 no.2:36-37 F '58. (MIRA 11:2)
(Bleaching)

STARKA, L.; MATIS, Z.

Fractionation of 17-ketosteroids with the aid of paper chromatography. Suvrem med., Sofia no.3:123-126 '61.

1. Nauchno-izsledovatelski endokrinologichen institut, Praha.

(17-KESTOSTEROIDS chem)

MATISCSAK, S.; NAGY, G.

Influence of the correct working of spark plugs on the reduction of gasoline consumption. P 235.

REVISTA TRANSPORTURILOR. (Asociatia Stinitifica a Inginerilor si Technicienilor din Rominia si Ministerul Transporturilor Rutiere, Navale si Aeriene) Bucuresti, Romania. Vol. 6, no. 6, June 1959.

Monthly List of East European Accesions (EEAI) LC. Vol. 8, no. 9, Sept. 1959.

Uncl.

MATISEN, O.A.

Comparative characteristics of the age and growth of sockeye salmon (Oncorhynchus nerka (Walb)) from Lake Kurile, Kamchatka, and Bristol Bay in Alaska. Vop. ikht. 2 no.1:42-54 '62. (MIRA 15:3)

1. Issledovatel'skiy institut rybnogo khozyaystva Vashingtonskogo universiteta i kafedra ikhtiologii Moskovskogo gosudarstvennogo universiteta.

(PACIFIC OCEAN--SOCKEYE SALMON)

MATISEN, V. A.

Science

(Activity of the station of young naturalists in the Nevskii district of Leningrad; manual for teachers) Leningrad, Gos. uchebno-pedagog. izd-vo, 1951

Monthly List of Russian Accessions, Library of Congress, July 1952. UNCLASSIFIED.

MATISEN, V.A., kand.pedagog.nauk

Protected soil and students' work on it. Biol.v shkole no.2:51-58 Mr-Ap '61. (MIRA 14:3)

1. Leningradskiy pedagogicheskiy institut imeni A.I. Gertsena.
(School gardens) (Hotbeds)

MATISEN, V.A., kand.pedagogicheskikh nauk; SYSKOVA, M.V.

Conducting an excursion on the topic "Field weeds." Biol. v shkole. no.3:17-20 My-Je '62. (MIRA 15:7)

1. Leningradskiy pedagogicheskiy institut imeni A.I. Gertsena.
(Weeds) (School excursions)

GUREVICH, I.L.; MA[illegible], V.A.

Triethylene glycol as a solvent for the dearomatization and desulfurization of oil fractions. Trudy MINKHiGP no.44:72-79 '63. (MIRA 18:5)

MATISHEV, V.A.; BOGATOVA, L.S.

Complex formation of paraffin hydrocarbons of normal structure with carbamide. Trudy MINKHiGP no.44:275-277 '63. (MIRA 18:5)

ACC NR: AP6035576 SOURCE CODE: UR/0065/66/000/011/0018/0022

AUTHOR: Matishev, V. A.

ORG: MINKh, GP

TITLE: Temperature of complex formation of urea with individual normal alkanes C_6 - C_{10} and their binary mixtures

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 11, 1966, 18-21

TOPIC TAGS: normal alkane, urea, carbamide, urea complex, urea alkane complex, ~~complex formation temperature~~, ALKANE, HEAT OF FORMATION

ABSTRACT: The purpose of the work was to determine the upper temperature limit of the complex formation (UTLCF) of normal alkanes with urea in the presence of some suitable activator, and to determine the analytical relationship between the UTLCF and the number of carbon atoms in the n-alkanes studied (C_6 - C_{10}). The UTLCF is the maximum temperature at which the n-alkanes of the range C_6 - C_{10} still form complexes with urea. In addition, the lowest temperature limit of the complex decomposition (LTLCD) in the presence of activator and in the medium of the corresponding alkane was determined. Alcohols, such as methanol, ethanol or isopropanol, and ketones, such as acetone or methyl ethyl ketone, were selected as activators because of their frequent use in laboratory and industrial practice for this purpose. The experiments indicated that methanol, used in an amount of 3% on the alkane, was the most suitable activator. It was found that a linear relationship exists between

UDC: 547.495.2:66.0[illegible] 2

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ACC NR: AP6035576

the UTLCF or LTLCD and the number of carbon atoms in the complex rming alkanes. The equation

$$\theta = a(n - b) + \nu$$

was derived, in which θ is the temperature limit of the complex formation or decomposition, a, b and ν are the constants and n the number of carbon atoms. The study of binary mixtures of n-alkanes with some other hydrocarbons which form no complexes with urea indicated the applicability and accuracy of the above equations for theoretical computations of the complex formation temperatures. Further data on binary mixtures will be published in the future. Orig. art. has: 4 tables and 2 graphs.

SUB CODE: 07, 21/ SUBM DATE: none/ ORIG REF: 006/ OTH REF: 01/

Card 2/2

MATISHEVS'KA, M.S.

Seventh All-Union Coordinating Conference on Plant Protection. (MLRA 10:5)
Mikrobiol. zhur. 17 no.2:79-80 '55
(PLANTS, PROTECTION OF)

MATISHEVS'KA, M.S.

BEL'TYUKOVA, K.G.; MATISHEVS'KA, M.S.

Results of experiments in treating clover and alfalfa seeds with silicate bacteria. Mikrobiol. zhur. 19 no.4:45-47 '57. (MIRA 11:1)

1. Z Institutu mikrobiologii AN URSR.
(BACTERIA, SILICATE) (SEEDS) (LEGUMES)

MATISINA, Z.A.; SMIRNOV, A.A.

On the electrical resistance theory of ordering transition--nontransition metal alloys. Ukr.fiz.zhur. 2 no.1:14-20 Ja-Mr '57. (MLRA 10:5)

1. Institut metalofiziki AN URSR.
(Alloys--Electric properties)