S/056/63/044/001/048/067
B102/B186

AUTHORS: Demina, N. V., Yevteyev, V. L., Kovalenko, V. A., Solov'yev, L. D., Khrenova, R. A., Ch'en Ts'ung-mo

TITLE: Derivation of the photoproduction amplitude from the dispersion relations

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 272-283

TEXT: Expressions for the low-energy photoproduction amplitudes of pions on nucleons are derived when nucleon recoil is taken into account and the possible influence of the unobservable region is considered. Only the S- and P-waves are taken, these being obtained from the one-dimensional dispersion relations by the usual integral method (which yields the integral amplitudes) and by a differential method based on an expansion of the amplitude, near the threshold of the momentum transferred (that yields the differential amplitudes). The latter method offers various advantages over the integral method. The formulas are simpler and the contribution of the unobservable region is not explicitly contained in them. In the

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Derivation of the photoproduction ...

integral method, because of the narrow resonance, this contribution is very small below the resonance and very large above it; it is then comparable with the total contribution of the dispersion integral. A continuation into the unobservable region by way of a finite number of Legendre polynomials does not involve any notable errors in the partial amplitudes if the energy is below resonance, but above it the error increases with the energy. At 460 Mev, however, it is not higher that 1-2% for the contributions of the dispersion integrals in the S-wave amplitude and 10-20% in the P-wave amplitudes. The error arising in the differential method due to setting equal zero of the higher partial waves is ~1% for the dispersion integral contributions in the S-wave amplitudes and ~10% in the p-wave amplitudes. If nucleon recoil is ignored the differential and the integral methods yield the same results. If it is taken into account the results are very similar at low energies. The agreement between the theoretical results and experimental data is rather poor; for further investigations, it is suggested that $\pi\pi$-interaction be taken into account. There are 5 figures. The most important English-language references are: L. D. Solov'yev et al. Nucl. Phys., 4, 427, 1957; 5, 256, 1958; J. S. Ball. Phys. Rev. Lett., 5, 73, 1960; G. F. Chew et al. Phys. Rev. 106, 1337.

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Derivation of the photoproduction ... S/056/63/044/001/048/067
B102/B186

1957 and A. V. Yefremov et al. Nucl. Phys. 22, 202, 1961.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: July 31, 1962

Card 3/3

S/056/63/044/001/051/067
B184/B108

AUTHOR: Sclov'yev, L. D.

TITLE: Dispersion relations in quantum electrodynamics

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 306-310

TEXT: A method for writing down the dispersion relations in quantum electrodynamics is considered. The proof is conducted in the lowest orders of perturbation theory improved by the renormalization group. The following three cases are considered: infrared singularities, vertex function (vertex with three ends), Compton effect, and electron-positron scattering.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Nuclear Research Institute)

SUBMITTED: July 31, 1962

Card 1/1

S/056/63/044/002/056/065
B163/B186

AUTHORS: Solov'yev, L. D., Khrustalev, O. A.

TITLE: Infrared singularities and Regge trajectories in electrodynamics

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 2, 1963, 758-760

TEXT: The consequence of a dispersion relation (L.D. Solov'yev, ZhETF, 44, 306, 1963) for photon-electron scattering over a Regge trajectory for the electron-positron-interaction is discussed theoretically along with a generalization of this consequence for the case of particles with unequal masses. The matrix element M_λ for photon-electron scattering, which results from inserting a photon "mass" $\sqrt{\lambda}$ into the Green photon function, can be written $M_\lambda = \exp[F(t)]M$, where

$$F((p'-p)^2) = \frac{i\alpha}{8\pi^3}\int \frac{dk}{k^2-\lambda}\left(\frac{2p'-k}{2p'k-k^2}-\frac{2p-k}{2pk-k^2}\right)^2, \quad (2)$$

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Infrared peculiarities and Regge ...

$$M = \sum_{b=s,\,u} \frac{A_b}{b-m^2} \exp\left[\beta(t) \ln \frac{m^2-b}{m^2} + \tau(t)\right] + M_a. \qquad (3)$$

$$\beta(t) = \frac{\alpha}{\pi} t \int_{4m^2}^{\infty} \frac{t'-2m^2}{\sqrt{t'(t'-4m^2)}} \frac{dt'}{t'(t'-t-i\varepsilon)} \qquad (4).$$

In these equations, s, u, and t denote the Mandelstam variables for the direct, crossed and third channel, respectively, and α is the fine structure constant. The first term in equation (3) is for large s a term of the Regge type with an exponent $\alpha(t) = -1 + \beta(t)$, which is represented in the figure. The Regge equation $\alpha(t) = 1$; $1 = 0, 1, 2, \ldots$ determines bound states in the t-channel, i.e. the electron-positron system. It has solutions only for $0 < t < 4m^2$ where

$$\alpha(t) = -1 + \frac{\alpha}{\pi}\left[1 + \frac{2t-4m^2}{\sqrt{t(4m^2-t)}} \operatorname{arcig} \sqrt{\frac{t}{4m^2-t}}\right]. \qquad (7)$$

These results are generalized for the case of particles with unequal

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Infrared peculiarities and Regge ...

masses using dimensional analysis. If a particle with charge ze, mass m and initial and final momenta p and p' reacts with a particle correspondingly characterized by Ze, M, P, and P', the bound states of these particles are found by studying the asymptotic behavior of the scattering matrix element M_λ for $t \to \infty$, which must contain a term $t^{-1}(t/\lambda)^{\beta(s)}$.

Thus, in order to determine $\beta(s)$, it is sufficient to consider the infrared peculiarities of M_λ. From this, the Regge exponent $\alpha(s)$ is derived, which is equal to

$$\alpha(s) = -1 + \frac{\alpha}{\pi}\left[1 + 2\frac{s - m^2 - M^2}{\sqrt{-k(s)}}\operatorname{arctg}\frac{s-(m-M)^2}{\sqrt{-k(s)}}\right]. \quad (14)$$

if $(m-M)^2 < s < (m+M)^2$. Thus the principal Regge trajectory can be obtained, taking into account linear terms in α which enables a description of the Coulomb interaction. There is 1 figure.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

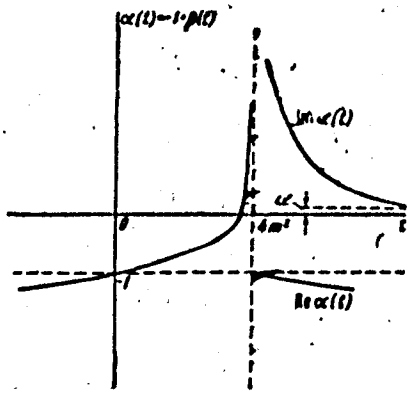
Card 3/4

S/056/63/044/002/056/065
B163/B186

Infrared peculiarities and Regge ...

SUBMITTED: November 16, 1962

Fig.



Card 4/4

MESHCHERYAKOV, V.A. NEMENOV, L.L.; SOLOV'YEV, L.D.

The $\pi^+ + N \to \pi^+ + \Lambda^0 + K^+$ reaction and the constants of photoproduction of π^--mesons on π^--mesons. Zhur. eksp. i teor. fiz. 45 no.4:1188-1191 O '63. (MIRA 16:11)

1. Ob"yedinennyy institut yadernykh issledovaniy.

SOLOV'YEV, L.D.; YUSHIN, Yu.Ya.

Infrared characteristics of matrix elements in scalar electrodynamics. Zhur. eksp. i teor. fiz. 45 no.4:1202-1207 O '63. (MIRA 16:11)

1. Ob"yedinennyy institut yadernykh issledovaniy i Matematicheskiy institut AN SSSR.

L 11058-65 EWT(m)/T/EWA(m)-2 SSD/AFWL/ASD(a)-5/ESD(dp)
ACCESSION NR: AP4046424 S/0056/64/047/003/1043/1049

AUTHOR: Solov'yev, L. D.

TITLE: Asymptotic relations between cross sections with account of electromagnetic interaction

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 3, 1964, 1043-1049

TOPIC TAGS: pion proton scattering, scattering cross section, asymptotic property, electromagnetic interaction, differential cross section

ABSTRACT: To explain the difference between the cross sections for π^--p and π^+-p scattering at 20--30 BeV, wherein the difference in the scattering cross sections differs by several per cent, whereas it has been shown theoretically by A. A. Logunov et al (Preprint OIYaI, R-1353, 1963; ZhETF v. 46, 1079, 1964) that the differential

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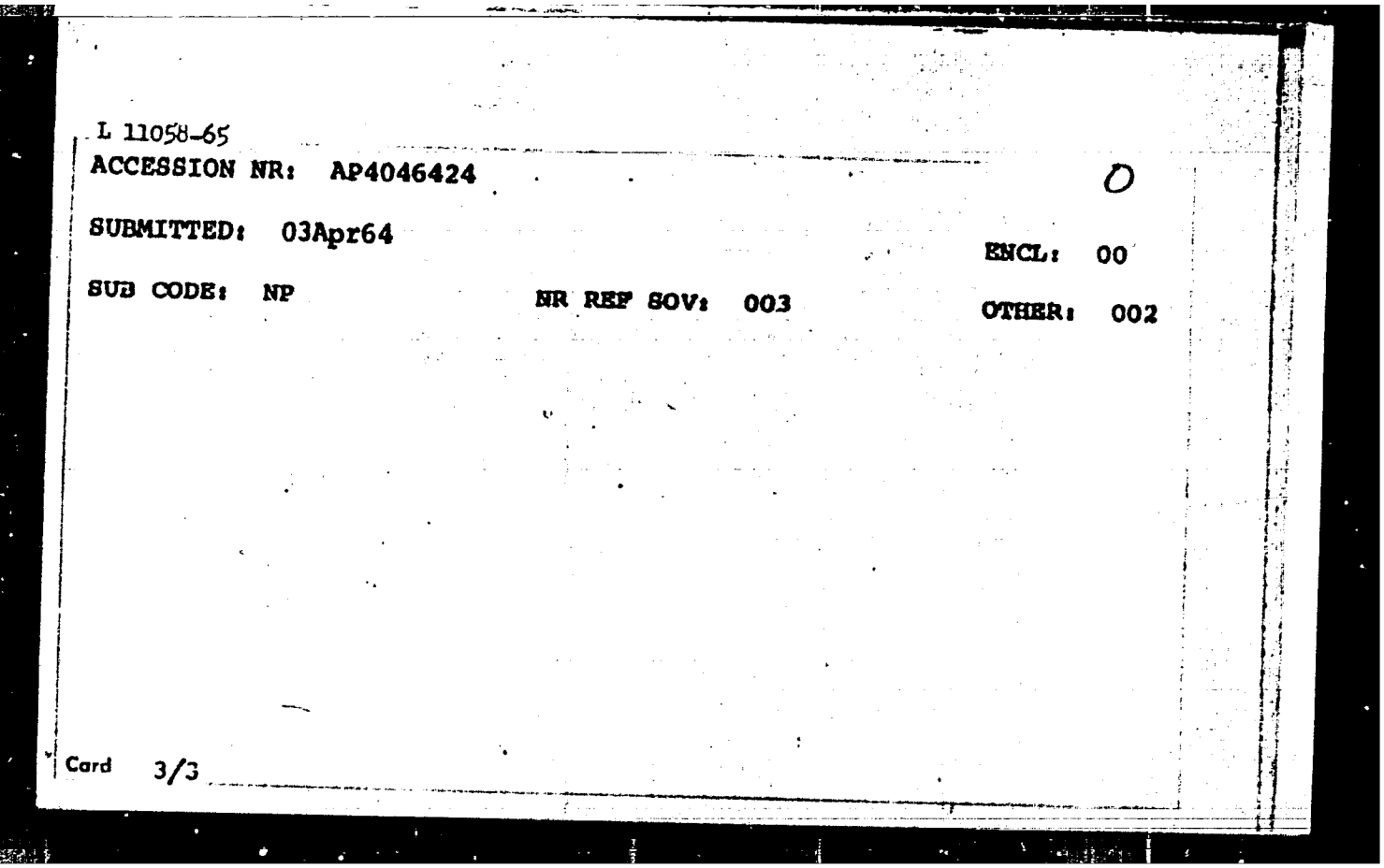
cross sections of these processes should be asymptotically equal at high energies, the author checks whether this discrepancy could be due to electromagnetic interaction. An examination of the analytic properties of the amplitudes for four-particle processes shows that if strong and electromagnetic interactions are taken into account, the ratio of the differential cross sections for particles and anti-particles still tends to unity at high energies, provided that these cross sections are measured with identical (and sufficiently high) energy resolution. The assumptions made concerning the behavior of the amplitudes at high energies are analogous to those made by Logunov in the discussion of strong interactions. "The author is grateful to Nguyen Van Kh'yeu, I. T. Todorov, and M. I. Podgoretskiy for discussions." Orig. art. has: 38 formulas.

ASSOCIATION: Ob"yedinenny*y institut yaderny*kh issledovaniy (Joint Institute of Nuclear Research)



L 11058-65
ACCESSION NR: AP4046424 O

SUBMITTED: 03Apr64 ENCL: 00

SUB CODE: NP NR REF SOV: 003 OTHER: 002

Card 3/3

L 1996-66 EWT(m)/EWA(h)

ACCESSION NR: AP5020263 UR/0367/65/002/001/0124/0130

AUTHOR: Meshcheryakov, V. A.; Nemenov, L. L.; Solov'yev, L. D.; Strokach, P.; Tkebuchava, F. G.

TITLE: Mechanism of emission of hard γ quanta in the reaction π + n → π + γ + N

SOURCE: Yadernaya fizika, v. 2, no. 1, 1965, 124-130

TOPIC TAGS: photon emission, pion proton interaction, nuclear interaction, pion pion interaction

ABSTRACT: The authors analyze the mechanism of hard-photon emission when pions interact with nucleons. The contributions of different Feynman diagrams to the cross section of this process are first analyzed, and it is shown by comparison with experimental data that various contributions and interferences of the high-order diagrams can be neglected. From the experimental data on the reaction $\pi^- + p \to \pi^- + \gamma + p$ the authors determine the interaction constant for the reaction $\gamma + \pi \to \pi + \pi$, and find it to be equal to $C^2 = 0.9 \pm 0.5$. Only the single-meson diagrams are taken into account, and the contribution of diagrams with rescattering are neglected. Diagrams in which γ quanta are emitted by nucleons are likewise neglected. The solution of the dispersion equation for the amplitude of the process in question is obtained in this paper as a function of only a single constant,

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L 1996-66
ACCESSION NR: AP5020263

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which facilitates the analysis of experimental data, inasmuch as they are too scanty for the determination of two constants. "The authors thank B. M. Pontecorvo for interest in the work and L. I. Lapidus for valuable hints." Orig. art. has: 3 figures and 22 formulas.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: 04Dec64 ENCL: 00 SUB CODE: NP

NR REF SOV: 005 OTHER: 005

Card 2/2 DP

L 9812-66 EWT(m)/T/EWA(m)-2 SOURCE CODE: UR/0386/65/002/007/0314/0317

ACC NR: AP5027991

AUTHOR: Babayev, Z. R.; Zamiralov, V. S.; Solov'yev, L. D.

ORG: Joint Institute of Nuclear Research (Ob"yedinennyy institut yadernykh issledovaniy

TITLE: Electromagnetic properties of mesons in broken SU(6) symmetry

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. (Prilozheniye), v. 2, no. 7, 1965, 314-317

TOPIC TAGS: strong nuclear interaction, quantum field theory, vector meson, radiative decay, magnetic moment

ABSTRACT: It is shown that the relations between the radiative-decay probabilities and the magnetic moments of vector mesons, obtained from unitary symmetry broken only by electromagnetic interaction, remain unchanged when account is taken of medium-strong interaction that leads to observable mass splitting within unitary multiplets. Within the framework of both SU(6) and SU(3) symmetry, the electromagnetic current describing the radiative decays is a linear combination of octets and singlets, made up of the tensors of vector and pseudoscalar mesons and of a tensor that corresponds to the medium-strong interaction. In the case of SU(6) symmetry it is necessary to make up all the possible tensors $I^{\alpha}_{\beta} = I^{aA}_{bB}$ of the 35-plet of mesons M and the tensor I + aT, where T corresponds to the medium-strong interaction. By separating the contributions that transform in accordance with representations (8, 3) and (1, 3) of the

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L 9812-66

ACC NR: AP5027991

group SU(3) x SU(2), and using for T the tensor employed in the derivation of the mass formulas (M. A. Beg and V. Singh, Phys. Rev. Lett. v. 13, 418, 1964), which is a combination of parts of the 35-, 189-, and 405-plets that transform in accordance with the representations (1, 1) and (8, 1), an expression is obtained, taking C-invariance into account, for the Lagrangian describing radiative decays and the scattering in a magnetic field, as well as for the current. The latter is shown in the general case to lead only to the relations of SU(3) symmetry. If the current is assumed to be an octet, then the two schemes give, generally speaking, different results. It is perfectly feasible to check these relations experimentally. V. Zamiralov is grateful to S. A. Rogova for a preprint of her paper dealing with similar problems. Orig. art. has: 9 formulas.

SUB CODE: 18, 20 SUBM DATE: 28Jul65/ OTH REF: 004

Card 2/2

L 43744-65 EWT(1)/EEC(t)/T/EED(b)-3 Pl-4 IJP(c)
ACCESSION NR: AP5006526 S/0056/65/048/002/0731/0741

AUTHOR: Solov'yev, L. D.

TITLE: Infrared characteristics in local field theory

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 2, 1965, 731-741

TOPIC TAGS: quantum electrodynamics, Compton scattering amplitude, infrared asymptotic Green function

ABSTRACT: The first term and an estimate of the following term in the Green function expansion for a charged particle in the infrared region are obtaind using local field theory, including quantum electrodynamics in all e-orders: $G(r^2) = Z_2^2(-x)^{\gamma-1}(1+O(x)) + \text{const}$, where $Z_2^2 = Z_1^2 \frac{\pi \exp(-C\gamma)}{\Gamma(\gamma)\sin\pi\gamma}$. A similar expansion is obtained for Compton scattering amplitude with a fixed imparted momentum:

$$T(s, t) = -\frac{\pi \exp(-C\beta+\delta)}{m^2\Gamma(\beta)\sin\pi\beta}(1+sm^{-2})^{\beta-1}M^{ab}(0)+O((1-sm^{-2})^{\beta})+\text{const}.$$

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ACCESSION NR: AP5006526

The method is based on the use of dispersion relations and expansions of the current matrix elements in terms of momenta of soft photons. The application of the obtained expansions to nonelastic processes is investigated and the first terms of the bremsstrahlung cross section are found:

$$d\sigma(\Delta E) \doteq \left(\frac{2\Delta E}{m}\right)^{d}\left(1+\frac{g}{1+d}\Delta E \ln\frac{m}{\Delta E}\right)\times\frac{\exp(-Cd+D)}{\Gamma(1+d)}d\sigma'+O\left(\left(\frac{\Delta E}{m}\right)^{1+d}\right).$$

The problem of factorization of infrared dispersion is studied. It is shown that this factorization is a simple result of spectral characteristics and of the absence of infrared properties, if momenta of the charged particles do not vary. Orig. art. has: 53 formulas.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute for Nuclear Research)

SUBMITTED: 31Jul64 ENCL: 00 SUB CODE: NP, OP

NO REF SOV: 016 OTHER: 005

Card 2/2

L 00597-66

ACCESSION NR: AP5016568 UR/0056/65/048/006/1740/1749

30
27
B

AUTHOR: Solov'yev, L. D. 44, 55

TITLE: Infrared asymptotic form of the Green's function 16, 44, 55

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 6, 1965, 1740-1749

TOPIC TAGS: Green function, asymptotic expansion, IR phenomenon, quantum electrodynamics 21, 44, 55

ABSTRACT: The author has shown in an earlier paper (ZhETF v. 48, 731, 1965) that the infrared asymptotic Green's function has in all orders in the interaction constant the form

$$G(p^2) \sim (-x)^{-1+\gamma} + O(x^\gamma) + \text{const},$$

and this paper is devoted to finding an explicit form of the function $O(x^\gamma)$. The result is a formula which contains in explicit form

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L 00597-66

ACCESSION NR: AP5016568

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the infrared asymptotic value of the Green's function of a charged particle with spin 0 and 1/2, including all singular terms in the infrared region, to all orders in e, without using perturbation theory, and taking complete account of the electromagnetic interaction. The Kallen-Lehmann representation is used, and the expansion of the matrix elements of the fields with respect to the momenta of the soft photons takes into account the method employed by the author earlier (preprint OIYaI, R-1692, 1965; Nucl. Phys. v. 64, 657, 1965). These matrix elements do not contain infrared divergencies. It is shown in the conclusion that the method can also be used to find the infrared asymptotic expressions of the vertex functions and the matrix elements of scattering in all orders in the coupling constants. This means, in particular, that scattering at small angles obeys Coulomb's law for arbitrarily small energies. Orig. art. has: 78 formulas and 2 figures.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint

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L 00597-66

ACCESSION NR: AP5016568

3

Institute of Nuclear Research) 44,55

SUBMITTED: 15Jan65 ENCL: 00 SUB CODE: GP, MA

NR REF SOV: 013 OTHER: 003

Card 3/3 NP

L 2212-66 EWT(m)/T/EWA(m)-2

ACCESSION NR: AP5019243 UR/0056/65/049/001/0292/0295

44
B

AUTHOR: Solov'yev, L. D. 44,55

TITLE: Small-angle scattering of charged particles 19, 44,55

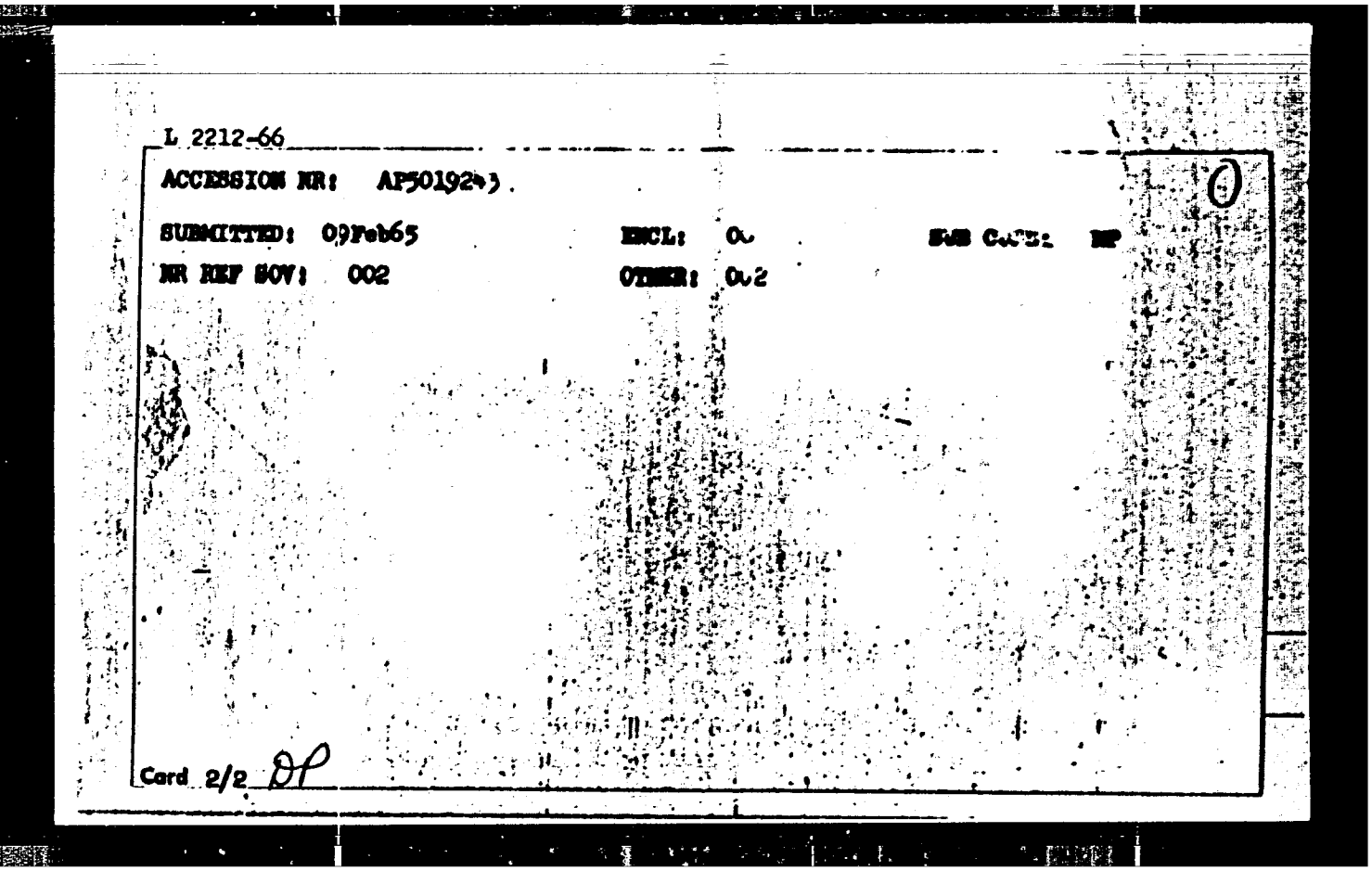
SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 292-295

TOPIC TAGS: scattering amplitude, Coulomb scattering, elastic scattering, scattering cross section

ABSTRACT: A relativistic formula is derived for the small-angle elastic scattering cross section of charged elementary particles on the basis of relativistic quantum field theory. Radiative corrections of order $\alpha = 1/137$ are taken into account, as is the interference between the nuclear and Coulomb interactions. The optical theorem is then established for the nuclear scattering amplitude for the charged particles, with interference taken into account. "The author thanks S. Bilen'kiy, S. Gerasimov, V. Nikitin, R. Ryndin, V. Sviridov, T. Sitnik, L. Slepets, and L. Strunov for a discussion of this work." Orig. art. has: 16 formulas and 1 figure.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) 44,55

Card 1/2



L 2212-66

ACCESSION NR: AP5019243

SUBMITTED: 09Feb65 ENCL: 00 SUB CODE: MP

NR REF SOV: 002 OTHER: 002

Card 2/2 DP

BABAYEV, Z.K.; ZAMIRAILOV, V.S.; SOLOV'YEV, L.D.

Electromagnetic properties of mesons in disturbed SU(6)-symmetry. Pis'. v red. Zhur. eksper. i teoret. fiz. 2 no. 7:314-317 O '65. (MIRA 18:12)

1. Ob"yedinennyy institut yadernykh issledovaniy. Submitted July 28, 1965.

ACC NR: AP6023091 (A) SOURCE CODE: UR/0213/66/006/003/0542/0547

AUTHOR: Solov'yev, L. G.; Tsverkova, A. M.

ORG: Institute of Oceanology, AN SSSR (Institut okeanologii AN SSSR)

TITLE: Experience of using the oximeter for continuous determinations of oxygen forming in the process of photosynthesis

SOURCE: Okeanologiya, v. 6, no. 3, 1966, 542-547

TOPIC TAGS: oximeter, chemical laboratory apparatus, chemical absorption, alga, photosynthesis

ABSTRACT: The Solov' yev oximeter (Device for estimating oxygen content Okeanologiya, 4, no. 1, 1961) has been used together with a special laboratory apparatus made of chemically inertial materials for evaluating the photosynthetic process. The alga Rodomonas has been used for the studies. Oxygen isolation and absorption by this alga have been shown. The accuracy of determining the

Card 1/2 UDC: 541:464.34/621:541.14(26)

L 44122-66

ACC NR: AP6020991

oxygen content is 0.003 ml/l. Orig. art. has: 4 figures and 2 tables. [Based on authors' abstract] [NT]

SUB CODE: 08/ SUBM DATE: none/

Card 2/2

SOLOV'YEV, L.G.

Electrodes for electromagnetic current meters. Trudy Inst. okean. 35:92-101 '59. (MIRA 13:3)
(Ocean currents) (Electrodes)

23840

S/020/61/138/002/023/024
B103/B220

3.9110 (1121,1482)
AUTHOR: Solov'yev, L. G.

TITLE: Measuring of electric fields in the sea

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no. 2, 1961, 445-447

TEXT: The insufficient attention paid by several researchers of the USSR to the experimental methods of measuring electric currents in the sea is critized and possible consequences are pointed out by the author. Particularly, if no attention is paid to the factors determining the electrochemical state of the current and potential measuring devices, errors may occur which surpass the measured values. From the Nernst formula $E = \frac{RT}{nF} \ln a$, where E = electrode potential, R = Rydberg's constant, T = temperature, F = Faraday's number, a = activity of the solution (in the present case T and a may be variable), it is evident that the state of an electrode is defined by 2 factors: 1) by the temperature and 2) by the salt concentration. It has been shown by laboratory tests that the variation of the temperature of an electrode is able to vary its potential

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Measuring of electric fields in the sea

by an average of 0.45 to 0.55 mv/deg, and that this value is not the same for all electrodes. A test in the sea showed a difference of the electrode potentials of 3.2 mv for a temperature difference of 14°C. On the other hand, it has been shown by experiments made in the Institut okeanologii AN SSSR (Institute of Oceanology AS USSR) that the difference of the potentials of two electrodes is not dependent on a pressure gradient up to 30 atm. The author emphasizes that a potential difference develops between electrodes, even in case of simultaneous variation of temperature, due to their individual properties. The value of this difference is indeterminate and should be stated by exact experiments and eliminated from the results. Besides the influence of temperature, further factors have to be considered, such as rate of flow, its distribution as to depth, velocity and direction of the drift of the ship, etc. The author studied the electric field intensity in the Black Sea between the Feodosiyskiy Bay and Cape Indokopas (Caucasian Coast). He made use of silver-chloride electrodes designed at the Institute of Oceanology AS USSR and equipped with resistance thermometers which were connected to a differential circuit. The temperature difference between the electrodes was recorded by means of a potentiometer, whereas the second potentiometer recorded the

Measuring of electric fields in the sea

difference between the potentials of the positions of the two electrodes. The vector of the electric field intensity was determined by measuring the intensity gradients in 4 directions normal to each other. In order to eliminate the influence exerted by the electric field of the ship, the basic electrode was suspended from a buoy made of foam plastics in a distance of 40 to 100 m from the ship. Tables ' and 2 summarize the values measured in the Black Sea. The differences between the electric field intensity in major depths far from the coast and that in minor depths in the coastal zone show satisfactory agreement with the data obtained at Cape Indokopas and in the North-western Pacific for the determination of the correction coefficient K related to ЭМИТ (EMIT, not explained). Thereby, it has been stated, that the value of K begins to alter soon in small depths, but remains constant in major depths. In the author's opinion, this is due to the general character of the variation of the electric field intensity in the sea as well as to the dependence of the field intensity on the flows and on the depth. This fact may not be regarded as variation of short duration, but as a stable process. Conclusions: 1) In the Black Sea as well as in the Pacific Ocean it has been stated that the electric field intensity in major depths

Card 3/6

Measuring of electric fields in the sea

does not exceed an average of 10^{0} mv/km. In the North-eastern coastal zones of the Black Sea in a depth of 50 to 70 m fields were measured in the water attaining 90 mv/km, and on the bottom 140 mv/km. 2) An analysis of the data shows that these fields are determined mainly by the movement of the water in the magnetic field of the earth. The influence of the electric earth currents is considerable in the bottom zones of the seas. 3) The temperature coefficient of the cadmium and silver chloride electrodes attains 0.4 - 0.5 mv/deg. For this reason the temperature corrections of the electrodes have to be considered and eliminated. This is of particular importance for the definition of the vertical component of the electric field intensity. There are 3 tables and 6 Soviet-bloc references.

PRESENTED: October 18, 1960, by D. I. Shcherbakov, Academician

SUBMITTED: October 17, 1960

Card 4/4

SOLOV'YEV, L.G.

Device for the determination of the oxygen content in sea water. Okeanologiia 4 no.1:149-155 '64. (MIRA 17:4)

1. Institut okeanologii AN SSSR.

GOLIDOV, M.V.; SOLOV'YEV, L.G.

Utilization of Van Dam's micromethod for determining the intensity of oxygen consumption by fish embryos. Okeanologiia 5 no.5:912-917 '65. (MIRA 18:11)

1. Institut morfologii zhivotnykh AN SSSR i Institut okeanologii AN SSSR.

ACC NR: AP6030464 (N) SOURCE CODE: UR/0213/66/006/004/0715/0722

AUTHOR: Solov'yev, L. G.; Gulidov, M. V.

ORG: Institute of Oceanology, AN SSSR (Institut okeanologii AN SSSR); Institute of Zoo-Morphology, AN SSSR (Institut morfologii zhivotnykh AN SSSR)

TITLE: Polarographic method for determining the intensity of oxygen consumption by fish embryos

SOURCE: Okeanologiya, v. 6, no. 4, 1966, 715-722

TOPIC TAGS: biologic respiration, fish egg, oxygen consumption, electrode, polarography, BIOSENSOR

ABSTRACT: To determine the intensity of respiration of fish eggs, they were placed in a closed chamber with a sensor attached to the bottom. The sensor, which records polarographically the oxygen content of the water, consists of platimum and chloroargentic electrodes submerged in a potassium chloride solution. The platinum electrode is separated from the respiratory chamber by a polyethylene film. Conditions were obtained under which a linear relationship between the maximum current value and the O_2 concentration is observed. The respiration intensity is measured at a constant temperature and definite speed of water mixing. It was established that the sensor's operational stability remains constant for several weeks. A formula is suggested for computing the respiration intensity that may be used to introduce

UDC: 578.087.9

Card 1/2

ACC NR: AP6030464

corrections for the amount of oxygen reduced during the experiment on the platinum cathode. Orig. art. has: 6 figures.

SUB CODE: 08/ SUBM DATE: 27Oct65/ ORIG REF: 009/ OTH REF: 010

Card 2/2

SIMIN, S.Kh., inzh.; SOLOV'YEV, L.I., inzh.

Lint control on circular knitting machines. Tekst.prom. 20 no.3: 53-56 Mr '60. (MIRA 14:5)
(Knitting machines) (Dust collectors)

25(1), 28(2) SOV/115-59-9-13/37

AUTHOR: Solov'yev, L.I.

TITLE: Measuring Angular Displacements of Reversibly Rotating Links of Machines

PERIODICAL: Izmeritel'naya tekhnika, 1959, Nr 9, pp 27-28 (USSR)

ABSTRACT: For recording the angles of rotation of reversibly rotating parts, the author developed, manufactured and tested a special transducer at the Leningradskiy filial NIILTekmash (Leningrad Branch of NIILTekmash). This transducer is basically a thin collector disk, whose contacts are connected in a certain sequence to four different sections, as shown in Fig 1. The sectionsare connected with each other by resistors. The last section is grounded thru another resistor. The feed voltage is applied by a brush thru a variable resistor. Consequently, when the collector disk is rotating in one direction, the current received by the brush from approaching contacts will rise in steps. During a rotation in the opposite direction the current will decrease. Fig 2 is an

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Measuring Angular Displacements of Reversibly Rotating Links of Machines

oscillogram obtained by this method. The author describes the components of the device in more detail. There are 1 diagram, 1 oscillogram, and 1 table.

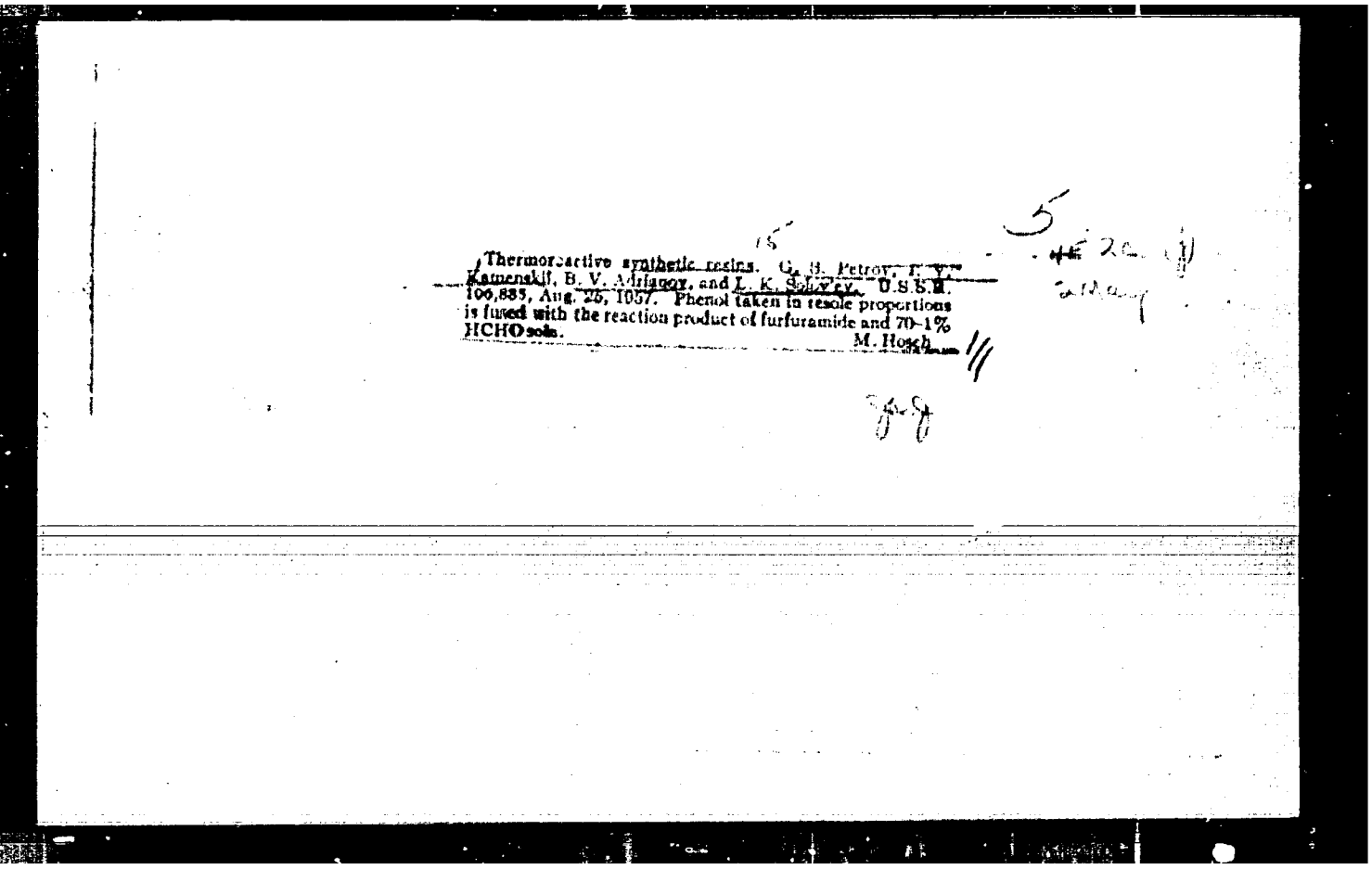
1. SOLOV'EV, L. I., Eng.

2. USSR(600)

4. Peat Industry

7. Performance of electric cutter machines ESM-7 on top layer peat fields. Torf. prom., 29 no. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.



Thermoreactive synthetic resins. G. S. Petrov, P. V. Kamenskii, B. V. Mitinger, and L. K. Solov'ev. U.S.S.R. 106,835, Aug. 25, 1957. Phenol taken in resole proportions is fused with the reaction product of furfuramide and 70–1% HCHO soln.

M. Hosch

137-58-4-6980

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 95 (USSR)

AUTHORS: Mitrenin, B. P., Burdiashvili, Sh. S., Shamba, N. A., Volkov, V. P., Kovyrzin, V. K., Solov'yev, L. K.

TITLE: Obtaining Single Crystals of Silicon by Extraction From a Melt (Polucheniye monokristallov kremniya metodom vytyagivaniya iz rasplava)

PERIODICAL: V sb.: Vopr. metallurgii i fiz. poluprovodnikov. AN SSSR 1957, pp 24-34

ABSTRACT: The possibility of obtaining large single crystals with a specified orientation from material purified by acid washing or obtained by reduction of $SiCl_4$ by zinc, and the distribution of certain impurities in the extracted bar was investigated by the use of tagged atoms. The apparatus built employed high frequency heating of a base in which there was emplaced a quartz crucible containing the Si, or by means of a graphite resistance heater in the center of which, and on a quartz base, there was placed a graphite holder with the quartz crucible having the Si. A vacuum of 10^{-4} mm Hg was maintained in the apparatus. The crucible was free to rotate at a speed of 1 rpm, and the seed in a direc-

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Obtaining Single Crystals of Silicon by Extraction From a Melt

tion opposite to that of the rotation of the crucible at a rate of 2 rpm. The rate of extraction was 0.5-1 mm/min. It was established that when a slag film existed at the surface of the melt it was not possible to obtain any single crystals, as a number of small crystals appeared at points of accumulation of slag and at the point of inoculation. Repeated extractions after careful etching and upon removal of visible slag inclusions on the surface of the bar by emery and cutting away of its ends made it possible to obtain single crystals of 15-20 mm diameter and lengths up to 240 mm. Before pulling the crystal the melt was held for 15-20 min at the pulling temperature in order for equilibrium to be established. The opinion is offered that the polycrystallinity of a drawn bar is also due to the formation a film of SiO_2 when the vacuum is reduced below 10^{-4} mm Hg, additional centers of crystallization being set up thereby. One of the possible causes of further increase in vacuum is the reaction of quartz and graphite, and therefore the crucibles in the apparatus employed were placed so that they would touch the bases only at three points. It was observed that vibration of the apparatus facilitated twinning in the single crystal being grown. Radioactive isotopes made it possible to determine that Sb and Ag (respectively 1.5 and 6.1 mg per 40 g Si) were completely distilled from the melt and were not to be found in the crystal Ta (12.5 mg per 40 g Si) remained in its entirety in the zone, and was the last to solidify, while Fe

137-58-4-6980

Obtaining Single Crystals of Silicon by Extraction From a Melt

(46.6 mg per 40 g Si) undergoes virtually uniform distribution through the bar in the process of extraction, the bulk of it remaining in the melt. 1 S.

1 Single crystals--Production 2 Silicon tetrachloride--Reduction
3. Zinc--Applications

Card 3/3

37729

S/200/62/000/002/002/003
D204/D301

AUTHORS: Valtsev, V.K., Oziashvili, Ye.D., and Solov'yev, L.K.

TITLE: Zone crystallization of lanthanon compounds from certain molten salts

PERIODICAL: Akademiya nauk SSSR. Sibirskoye otdeleniye, Izvestiya, no. 2, 1962, 53 - 57

TEXT: Description of an investigation aimed at clarifying the rules prevailment during the zone crystallization of complex systems of lanthanon compounds from fused NH_4NO_3 and NH_4CNS (as oxides) and $MgCl_2$ and $BaCl_2$ (as chlorides). The following mixtures were tested (%): (1) La 2.5, Pr 8-11, Nd 86.84, Sm 2-3, and (2) Pr 3.66, Sm 29.3 Eu 1.0, Gd 24.3, Dy 5.77, Ho 0.5, Eb 4.7, La, Tb, Yb 1, Y 25.2. The melts were cast into rods which were then zone crystallized 6-9 times, passing the zone at 5 cm/hr. The experimental method for chloride melts is indicated; for the other two the procedure was that used earlier. Sections of rod were then analyzed spectrographically for the lanthanons. The results are tabulated and diacus-

Card 1/3

Zone crystallization of lanthanon ...

sed. In NH_4NO_3 the heavier elements tended in general to concentrate at the end of the bar and the same was observed for Sm (mixture (1)) in the NH_4CNS melt. Similar tendencies were observed for the chloride melts although the results were only qualitative. It is concluded that (a) zone crystallization from NH_4NO_3 or NH_4CNS is promising owing to the low temperature of the process. The chloride process is further made difficult due to the nygroscopic properties of the lanthanon chlorides. (b) Concentration of the heavier elements at the end of the bar is probably due to their lower m.p.'s although discrepancies to this rule were observed. (c) Relative proportions of the lanthanons (mixture (1)) in NH_4NO_3 and NH_4CNS melts were relatively unaltered after zone crystallization. The distribution is probably affected rather more in the high temperature chloride process. Analytical work was carried out by R.R. Shvangiradze. There are 3 tables and 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: H. Reed, B.S. Hopkins, J. Amer. Chem. Soc., 57, 1159, 1935.

Card 2/3

Zone crystallization of lanthanon ... S/200/62/000/002/002/003
D204/D301

ASSOCIATION: Institut neorganicheskoy khimii sibirskogo otdeleniya AN SSSR, Novosibirsk (Institute of Inorganic Chemistry of the Siberian Branch of the AS USSR, Novosibirsk)

SUBMITTED: September 30, 1960

Card 3/3

X

VAL'TSEV, V.K., OZIASHVILI, Ye.D., SOLOV'YEV, L.K.

Zone crystallization of compounds of rare earth elements from some molten salts. Izv. Sib. otd. AN SSSR no.2:53-57 '62. (MIRA 16:10)

1. Institut neorganicheskoy khimii Sibirskogo otdeleniya AN SSSR, Novosibirsk.

ACC NR: AM026773 SOURCE CODE: UR/0081/66/000/009/S063/S063

AUTHOR: Solov'yeva, L. K.; Kamenskiy, I. V.; Korshak, V. V.

TITLE: Determination of the influence of admixtures and heat treatment on the degree of curing and thermomechanical characteristics of a plastic prepared from epoxy polymers and a mineral filler

SOURCE: Ref. zh. Khimiya, Part II, Abs. 8S417

REF SOURCE: Tr. Mosk. khim-tekhnol. in-ta D. I. Mendeleyeva, vyp. 48, 1965, 218-219

TOPIC TAGS: epoxy plastic, thermomechanical property, filler, plasticizer

ABSTRACT: The degree of curing (content of extractable substances), which characterizes the process and order of formation of three-dimensional structures of compositions based on an epoxy binder, was investigated by extracting with acetone in a Soxhlet extractor for 6 hr and studying the thermomechanical curves recorded with a Zhurkov instrument. Into the composition, based on (in parts by weight) 3 parts of ED-5 resin cured at 20° for 1.5-2 hr and 0.45 part of polyethylenepolyamines, were introduced 1 part of fiber glass, 1 part of asbestos and a plasticizer (PL), 0.15-0.6 dibutyl phthalate. The effect of heat treatment was studied by preheating in a thermostat (5 hr at 50°, 10 hr at -50°, and 6 hr at -120°). It was found that additional heat treatment of the samples sharply lowers the content of extractable substances (e. g., in the sample without PL it dropped from 5.4 to 2.3%) and creates a compact

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ACC NR: AR6026773

structure, which is manifested in a decrease of the initial deformation and a rise of the temperature at which it starts. The presence of PL in the compositions insures a uniform distribution of the components in the mixture and increases the amount of extract. A rise of the PL content increases the deformation and lowers the temperature of the start of its increase. Further heating of the samples (6 hr at 200°) does not affect the content of extractable substances or the magnitude of deformation. L. Kotlyarevskaya. [Translation of abstract]

SUB CODE: 07

Card 2/2 UDC

BABAKOV, A.A.; [illegible], V.I.; SOLOV'YEV, L.L.; IOIA, V.N.; LOLOKA, I.I.; CHERKASHINA, M.P.; SHAMIL', Yu.P.; SMOLYAKOV, V.F.; BABKOV, T.M.; MOSHKEVICH, Ye.I.; PARADA, A.N.; REPYSHKO-IVAVCHENKO, S.I.; ALEKSEYENKO, M.F.; KOROBKO, M.I.; KOROBKO, I.M.; AVERIN, N.N.; MATOV, A.A.; NIGUTSKIY, L.R.

Inventions. Met. i gornorud. prom. no.4:83 Jl-Ag '64. (MIRA 18:7)

CHEN, N.G.; TRAYGER, I.N.; SOLOV'YEV, L.L.; MIRKINA, R.Ye.; YUDIN, M.I.

Acid pickling of steel with the use of a new additive.
Stal' 24 no.5:451-452 My '64. (MIRA 17:12)

1. Dneprodzerzhinskiy metallurgicheskiy zavod-vtuz i zavod "Zaporozhstal'".

L 42222-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JH
ACC NR: AP6029056 SOURCE CODE: UR/0413/66/000/014/0082/0082

INVENTOR: Averchenko, P. A.; Alekseyenko, M. F.; Babakov, A. A.; Babitskaya, A. N.; Batrakov, V. P.; Bondarenko, A. L.; Gabuyev, G. Kh.; Yel'tsov, K. S.; Kulygin, G. V.; Loin, V. N.; Orekhov, G. N.; Pridantsev, M. V.; Sklyarov, P. I.; Smolyakov, V. F.; Soroko, L. N.; Solov'yev, L. L.; Frantsov, V. P.; Shamil', Yu. P.; Moshkevich, Ye. I.; Natanov, B. S.

53
13

ORG: none

TITLE: Stainless steel. Class 40, No. 183947.

SOURCE: Izobret prom obraz tov zn, no. 14, 1966, 82

TOPIC TAGS: stainless steel, chromium titanium steel, molybdenum containing steel, nitrogen containing steel, titanium containing steel

ABSTRACT: This Author Certificate introduces a stainless steel containing chromium, molybdenum, and nitrogen. In order to improve weldability, the steel has the following composition: .08% C, up to 0.8% Mn, up to 0.8% Si, 15—18% Cr, 0.2—0.6% Mo, 0.04—0.15 N 0.4—1.2% Ti, up to 0.035 S, and up to 0.030 P. [WW]

SUB CODE: 11/ SUBM DATE: 20Jan65/ Art. pres. seis

Card 1/1 UDC: 669.14.018.8: 669.15'26-194

SOLOV'YEV, L. M.

SOLOV'YEV, L. M. -- "Dynamics of the Resotration of Endocrine Function After Chronic Protein Insufficiency." Sub 11 Jun 52, Acad Med Sci USSR. (Dissertation for the Degree of Candidate in Medical Sciences.)

SO: Vechernaya Moskva January-December 1952

SOLOV'YEV, L.M.

USSR/Medicine - Anesthesia May/Jun 52

"Anesthesia in Tonsilectomy by Electrophoresis of Novocain," Cand Med Sci L. M. Solov'yev, Clinic of Ear, Nose, and Throat Diseases, Kiev Med Inst; Dept of Ear, Nose, and Throat Diseases, Kiev City Clinical Hosp imeni October Revolution

"Vest Oto-Rino-Laringol" Vol XIV, No 3, pp 51-55

Application of anesthesia produced by electrophoresis theough the skin of the neck of a 5% soln of novocain in 80° alc is painless, reduces hemorrhage during the operation of tonsilectomy, and does not interfere with the healing of wounds.

215T52

Infiltration anesthesia with a 0.5% soln of novocain plus adrenalin delays the healing of wounds resulting from the operation and is therefore harmful.

215T52

GIRENKO, L.; SOLOV'YEV, L.; RADZIMIRSKIY, K.

Outstanding scientist of the Ukrainian S.S.R., Professor IAkov Aleksandrovich Shvartsberg; 40 years of medical, scientific, pedagogical and social activity. Vest. oto-rin. 16 no.6:79-80 N-D '54. (MLRA 8:1)

1. Po poruchen'yu kollektiva kliniki bolezney ukha, gorla i nosa Kiyevskogo meditsinskogo instituta
(SHVARTSBERG, IAKOV ALEKSANDROVICH)

SOLOV'YEV, Lev Nikolayevich; SHAKHBAZYAN, Sh.A., retsenzent; MALIYEV, D.A., red.; ZHERNEKOV, I.V., red.izd-va; MARINYUK, M.V., tekhn.red.

[For young grinding-machine operators] V pomoshch' molodomu shlifovshchiku. Rostov-na-Donu, Rostovskoe knizhnoe izd-vo, 1959. 73 p. (MIRA 13:5)
(Grinding and polishing)

SOLOV'YEV, L.N., inzhener.

Chip-breaking in drilling. Vest.mash.35 no.10:58-59 O '55.
(Drilling and boring) (MLRA 9:1)

GURINOVICH, G.P.; PIKULIK, L.G.; SOLOV'YEV, L.N.

Sixth conference on luminiscence. Inzh.-fiz. zhur. no. 6:115-117 Je '58. (MIRA 11:7)

(Luminiscence)

SOLOV'YEV, L.N.

Karst and recent tectonics of the historic period in the surroundings of Sukhumi; theses. Nov.kar.i spel. no.2:60-62 '61. (MIRA 15:9)

(Sukhumi region—Karst)
(Sukhumi region—Geology, Structural)

SOLOV'YEV, L.N.

How the "Common Market" will affect workers. Sov. profsoiuzy 19 no.6:8-10 Mr '63. (MIRA 16:3)

1. Sekretar' Vsesoyuznogo tsentral'nogo soveta professional'nykh soyuzov.

(European economic community)

KHAYET, G.I.; SOLOV'YEV, I.N.

Analysis of the utilization of heavy lathes. Stan. i instr. 35 no.3:38-42 Mr '64. (MIRA 17:5)

[illegible], L.

The party's and government's concern for the health of Soviet citizens
Izd. 2., dop. Moskva Profizdat, 1950. 39 p. (50-28394)

RA513.P65

Trade-Unions

International unity of the working class, V pom. profaktivu, 13, No. 8, 1952

Monthly List of Russian Accession, Library of Congress, July 1952. Unclassified.

1. SOLOV'YEV, L.

2. USSR (600)

4. Peace

7. Movement of the partisans for peace is growing stronger and broader. V pom. profaktivu 13 no.20, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

SOLOV'YEV, L., sekretar'.

Under the banner of proletarian internationalism. Sov. profsoiuzy 1 no.1:15-20 S '53. (MLRA 6:12)

1. Vsesoyuznyy tsentral'nyy sovet professional'nykh soyuzov. (Trade unions)

1. SOLOV'EV, Leonid
2. USSR (600)
4. Insurance, social
7. Social insurance and security in the Soviet Union. Vsem. prof. dvizh. No. 4, 1953

9. Monthly List of Russian Accessions, Library of Congress, May 1953. Unclassified.

SOLOV'YEV, Leonid, sekretar'.

Concern of Soviet trade-unions for the well-being of workers. Vsen.prof. dvizh. no.18:27-31 S '53. (MLRA 6:8)

1. Vsesoyuznyy tsentral'nyy sovet profsoyuzov. (Trade-unions)

SOLOV'YEV, L.

SOLOV'YEV, L.

International relations of Soviet trade unions. Vsem.prof.dvizh. no.9: 23-26 My '54. (MLRA 7:6)
(Trade unions)

SOLOV'YEV, L.

Under the banner of proletarian internationalism. Vsem.prof. dvizh.no.10:13-14 O '55. (MLRA 9:1)
(World Federation of Trade Unions)

SOLOV'YEV, L.

Militant tasks of Soviet trade unions. Sov.profsoiuzy 4 no.4: 15-26 Ap '56. (MLRA 9:7)

1.Zamestitel' predsedatelya Vsesoyuznogo Tsentral'nogo Soveta professional'nykh soyuzov.
(Trade unions) (Russia--Economic policy)

SOLOV'YEV, L.

Militant program of the struggle of the working class. Sov.profsoiuzy 4 no.11:78-81 N '56. (MIRA 10:1)

1. Zamestitel' predsedatelya Vsesoyuznogo tsentral'nogo soveta professional'nykh soyuzov.
(Sofia--World Federation of Trade Unions--Congress)

SOLOV'YEV, L.

Congress of militant solidarity of the international proletariat. Sov.profsoiuzy 5 no.11:77-81 N '57. (MIRA 10:11)

1. Zamestitel' predsedatelya Vsesoyuznogo tsentral'nogo soveta profsoyuzov.
(Leipzig--Trade unions--Congresses)

SOLOV'YEV, Leonid

Congress of international unity. Vsem.prof.dvizh.[no.6]:6-8 Je '60. (MIRA 13:6)

1. Sekretar' Vsesoyuznogo tsentral'nogo soveta profsoyuzov. (World Federation of Trade Unions)

SOLOV'YEV, L.N.

University of Friendship of Peoples. Sov.profsoiuzy 16 no.8:17-18 Ap '60. (MIRA 13:6)

1. Sekretar' Vsesoyuznogo tsentral'nogo soveta profsoyuzov.
(Russia--Foreign relations)
(Moscow--Universities and colleges)

SOLOV'YEV, L.N.

Internationalism is our banner. Vsem. prof. dvizh. no.8:3-6 Ag '61. (MIRA 14:8)

1. Sekretar' Vsesoyuznogo tsentral'nogo soveta professional'nykh soyuzov.
(Trade unions)

SOLOV'YEV, L.

Internationalism is our banner. Sov.profsoiuzy 17 no.12:1-4 Je '61. (MIRA 14:6)

1. Sekretar' Vsesoyuznogo tsentral'nogo Soveta professional'nykh soyuzov.

(Trade unions) (Internationalism)

SOLOV'YEV, L.N.

In the name of workers' peace and happiness. Sov. profsoiuzy 17 no.23:1-4 D '61. (MIRA 14:12)

1. Sekretar' Vsesoyuznogo tsentral'nogo soveta professional'nykh soyuzov.

(Trade unions) (World politics)

[redacted], N.S., [redacted]YEV, L.N.

Analysis of the parameters and arrangement of a new series of roll-turning lathes. Stan. i instr. 36 no.11:9-11 N '65.
(MIRA 18:11)

PLAKSIN, I.N.; BESSONOV, S.V.; SOLOV'YEV, L.R.

Study of modifications in flotation properties of the surface of sulfides under the effect of gases and reagents. Trudy Inst.gor. dela no.2:193-205 '55. (MLRA 9:3)

1. Chlen-korrespondent AN SSSR (for Plaksin)
(Flotation) (Sulfides)

SOLOV'YEV, L.P.

SOLOV'YEV, L.P.; AL'BOV, P.A.; VOLOSHANOVICH, N.F.

On hydraulic cleaning of castings. Lit.proizv. no.1:31-32 Ja '55. (MLRA 8:3)
(Foundry machinery and supplies)

SOLOV'YEV, L. P

Cleaning by Hydraulic Sand-Blasting. L. P. Solov'ev. (*Liteinoe Proizvodstvo*, 1956, (3), 10–13). [In Russian.] Investigations carried out with a special experimental installation for supplying jets of high-pressure sand-containing water are described. The jets were allowed to impinge on a series of steel plates, the resulting loss in weight of these being used to estimate the effectiveness of the particular arrangement, nozzle wear also being determined. The cleaning of steel, iron, and non-ferrous castings, and of sheet steel 20 and 10 mm. thick, by hydraulic sand-blasting was studied. Comparison with dry sand-blasting showed that the productivity of the hydraulic method was 4·0–5·8 times higher.

SOV/128-59-10-12/24

18(5)

AUTHOR: Solov'yev, L.P., Engineer

TITLE: On the Problem of Cleaning Castings

PERIODICAL: Liteynoye proizvodstvo, 1959, Nr 10, pp 33-35 (USSR)

ABSTRACT: The author presents short abstracts with critical remarks on books and articles (Refs.1-11). Several data from these studies are compared in tables. The author state that the material given in these studies is not sufficiently worked out. Important recommendations on the synchronous use of chambers with high and low pressures are not sound. In this context, the economic factor is especially important. There are 7 tables and 13 Soviet references.

Card 1/1

S/128/60/000/010/010/016/XX
A033/A133

AUTHOR: Solov'yev, L. P.

TITLE: Hydraulic and hydraulic sand cleaning of castings

PERIODICAL: Liteynoye proizvodstvo, no. 10, 1960, 22 - 23

TEXT: The author compares the efficiency of low and high-pressure hydraulic installations for the cleaning of castings and points out that the productivity of such installations can be nearly doubled if the pressure of the water jet is 100 atm instead of 25 - 35 atm [Ref. 2: V. L. Volynskiy. Povysheniye proizvoditel'nosti truda v liteynom proizvodstve (Increasing the labor productivity in foundry practice), v. 38, Mashgiz, 1955]. Table 1 shows a detailed comparison of the technological parameters of various hydraulic cleaning installations used in the USSR plants; besides th· comparative data of a USA installation are given (16). Some of the hydraulic cleaning chambers in operation have been designed as hydraulic sand cleaning installations but, according to the author, they have so many deficiencies that hydraulic sand cleaning cannot be carried out on them. In particular, the mixing tanks of these installations do not meet the requirements,

Card 1/4

Hydraulic and hydraulic sand cleaning of...

so that the sand-water mixture is either too poor in sand or too rich. But since the addition of sand to the hydraulic water jet increases the cutting abilities by a factor of 10 - 12 it is this fact which points to the further development trend. One of the main factors determining the efficiency of hydraulic sand cleaning installations is the facility of shaking out the cores from the castings. This problem can be solved by increasing the water jet pressure to 150 atm and higher, by raising the sand content of the water jet to 15% of its volume and by modifying the core mixture composition. The author cites the cleaning practice of a USA plant [Ref. 8: A. N. Sokolov, A. M. Lipinskiy. Mekhanizatsiya rabot po obrubke i ochistke lit'ya (Mechanization of casting cleaning operations), 1957] which shows the highest efficiency per nozzle, i.e. 5.35 tons/hour, in comparison with the USSR installations. As an example he states that 7.6 - 8.4 gram/minute of pure metal are removed if the sand content is 41.5%, while this figure increases to 9 - 10 gram/minute at a sand content in the water jet of 50%. The investigations of the Staro-Kramatorsk Plant have shown [Ref. 9: A. Zh. Khovzun. Prozvodstvo krupnykh tochnykh otlivok (Production of big-size precision castings). Sb. Peredovoye v tekhnologii liteynogo prozvodstva, Kharkov, 1958] that a

Card 2/4

...ruble and kopecks; 8) "Lenstankolit" (after 1954); 9) test installation of the Plant im. Ordzhonikidze; 10) Kolomenskiy stankostroitel'nyy zavod (Kolomna Machine Tool Plant); 11) "Kompressor" Plant; 12) "Lenstankolit" (up to 1954); 13) Uralmashzavod; 14) model 385 (MILITMASh design); 15) Khar'kovskiy stankostroitel'nyy zavod (Kharkov Machine Tool Plant); 16) USA plant; 17) the cleaning efficiency and costs are given according to the output per nozzle; 18) the cleaning costs per ton of casting are conventional, assuming the hydraulic monitor operator wages to be 3.5 rubles/hour; overhead costs - 200%, electric power costs - 20 kopecks/1 kwh, water costs - 50 kopecks/m3; 19) including cleaning from scale and scab.

Card 3/4

SOLOV'YEV, L.S.

USSR/ Physics - Wave propagation

Card 1/1 Pub. 22 - 18/49

Authors : Burshteyn, E., and Solov'ev, L.

Title : On propagation of a phase velocity (wave) between parallel surfaces

Periodical : Dok. AN SSSR 101/3, 465-468, Mar 21,1955

Abstract : A method is presented for determining the phase and group velocities of "basic" waves propagating between parallel well-conducting surfaces. The method is strictly analitica and consists of a solution of the Maxwell equation with the application of Lame's con stants. Four references: 1 Germ., 2 USSR and 1 Engl. (1935-1948).

Institution : .....

Presented by : Academician M. A. Leontovich, December 1, 1954

SOLOV'YEV, L. S.

CARD 1 / 2 PA - 1423

SUBJECT USSR / PHYSICS
AUTHOR BURSTEJN, E.L., SOLOV'EV, L.S.
TITLE On the Diffraction of a Finite Bundle of Electromagnetic Waves in a Cylindrical Obstacle.
PERIODICAL Dokl. Akad. Nauk, 109, fasc. 3, 473-476 (1956)
Issued: 9 / 1956 reviewed: 10 / 1956

On the basis of the known solutions of the twodimensional problems of the diffraction of a plane wave inciding vertically on a cylindrical obstacle this diffraction is here computed by the method of the superposition of plane waves. Here only one bundle of the inciding waves is studied in which the fields in the cross section z = 0 (for the components E_y and H_y) depend only on the coordinate x and are determined by the function $\phi(x)$. (The Ox axis is parallel to the generator of the cylindrical obstacle). The distribution of the field $\phi(x)$ is represented by a FOURIER integral: $\phi(x) = \int_{-\infty}^{\infty} \varphi(\nu) e^{i\nu x} d\nu$ or with the substitution $\nu = k\sin\beta$ ($k=\omega/c$): $\phi(x) = k \int_{C} f(\beta)\cos\beta \, e^{ikx\sin\beta} \, d\beta$. Here $\varphi(\nu) = f(\beta)$, and integration is carried out in the complex. The azimuthal component of the diffracted field on the occasion of the incidence of a plane wave under the angle β towards the x-axis is: $u_{\varphi}(\beta) = F(k\cos\beta, r, \varphi) \cdot e^{ik(x\sin\beta + r\cos\beta)}$. If the point of observation is in the wave zone of radiation, the u_{φ} is in the case under obser-

SOLOV'YEV, L. S.

CARD 1 / 2 PA - 1468

SUBJECT USSR / PHYSICS
AUTHOR BURŠTEJN, E.L., SOLOV'EV, L.S.
TITLE On the Theory of Focussing with a Change of Sign.
PERIODICAL Dokl. Akad. Nauk, 102, fasc. 4, 721-724 (1956)
Issued: 10 / 1956 reviewed: 11 / 1956

The computation of such a focussing in accelerators and several other problems lead to a differential equation of the type: $\ddot{x} + \varepsilon p(\varepsilon t, \vartheta)\dot{x} + q(\varepsilon t, \vartheta)x = 0$. Here ε denotes a small parameter, p and q - periodic functions with the argument ϑ, $d\vartheta/dt = \gamma(\varepsilon t)$. The coefficients of this equation are "periodic" as functions of t with slowly changing "amplitude" and "period". Here two linearly independent solutions $f_n(t)$ and $\varphi_n(t)$ of the above equation (for any n-th "period" of the coefficients p and q) are assumed as known. The duration of the n-th period is here denoted by τ_n. The solution of the above equation in the n-th period and its derivation are represented in the form: $x = af_n(t) + b\varphi_n(t)$, $\dot{x} = af_n' + b\varphi_n'(t)$ because of the linearity of this equation. f_n and φ_n are selected in accordance with the initial conditions $f_n(0) = \varphi_n'(0) = 1, f_n'(0) = \varphi_n(0) = 0$. Here the values of the required solution and of its derivation are to be determined at the beginning of the n-th "period". The coefficients a_{ik} of the equations $x_{n+1} = a_{11}x_n + a_{12}\dot{x}_n$, $\dot{x}_{n+1} = a_{21}x_n + a_{22}\dot{x}_n$

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Fizika plazmy i problema upravlyayemykh termoyadernykh reaktsiy, t. IV. (Plasma Physics and the Problem of Controlled Thermonuclear Reactions, v. 4) [Moscow] Izd-vo AN SSSR, 1958. 439 p. 3,000 copies printed.

Resp. Ed.: Leontovich, M.A., Academician.

PURPOSE: This collection contains previously unpublished work of members of the Institut atomnoy energii (Institute of Atomic Energy) of the Academy of Sciences of the USSR. It is intended for scientist interested in this field.

COVERAGE: This book is the last of four volumes of previously unpublished work of members of the Institute of Atomic Energy during the period of 1951-58. The exploitation cards on the other volumes in this series have been released under the numbers 1241, 1242, and 1243.

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24(3) SOV/20-128-3-20/58

AUTHORS: Morozov, A. I., Solov'yev, L. S.

TITLE: The Integrals of Drift Equations

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 3, pp 506-509 (USSR)

ABSTRACT: When the electromagnetic field slowly changes with respect to space and time, the travel of particles in it is defined by an approximate equation, i.e. by the drift equation. These equations are obtained by taking the mean (N. N. Bogolyubov, Yu. A. Mitropol'skiy, Refs 1, 2) of the fast revolution of the particles in the Larmor orbit, and they may be written down as the following equations for the center motion of the Larmor orbit (the principal center):

$$\frac{d\vec{r}}{dt} = v_{\parallel}\frac{\vec{H}}{H} + \frac{c}{H^2}\left[\vec{E}, \vec{H}\right] + \frac{mcv_{\parallel}^2}{eH^4}\left[\vec{H}(\vec{H}\nabla)\vec{H}\right] + \frac{mcv_{\perp}^2}{2eH^3}\left[\vec{H}, \nabla H\right]$$

$$\frac{d}{dt}(mc^2) = e\vec{E}\frac{d\vec{r}}{dt} + \frac{mv_{\perp}^2}{2H}\frac{\partial H}{\partial t}, \quad \frac{d}{dt}\left(\frac{m^2v_{\perp}^2}{H}\right) = 0, \quad v^2 = v_{\parallel}^2 + v_{\perp}^2, \quad m = \frac{m_0}{\sqrt{1-v^2/c^2}}$$

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$v_{\parallel}$ and $v_{\perp}$ denote the longitudinal and transverse component of the particle velocity with respect to the magnetic field $\vec{H}$. The time dependence of the unit vector $\vec{H}/H$ was also taken into account for the deduction of the above equations. The latter define the motion of the principal center along the line of force $\vec{H}$ at the velocity $v_{\parallel}\vec{H}/H$ as well as the drift across the lines of force of $\vec{H}$. For time-independent $\vec{E}$ and $\vec{H}$, the second and third equation of the above set may be represented in the form of the laws of conservation $mc^2 = e\Phi = E = \text{const}$ and $m^2v_{\perp}^2/m_0^2H = J_{\perp} = \text{const}$. The following expression may thus be written down for the longitudinal velocity:

$v_{\parallel} = \sqrt{v^2 - J_{\perp} H \frac{m_0^2}{m^2}}$. For the drift equation in the constant fields $\overline{E}$ and $\overline{H}$, the relation $\operatorname{curl}\left(mv_{\parallel}\frac{\vec{H}}{H}\right) = mv_{\parallel}\operatorname{curl}\frac{\vec{H}}{H} + \left[\nabla(mv_{\parallel})\frac{\vec{H}}{H}\right]$ results, which can also be written down in the form

$\frac{d\vec{r}}{dt} = \frac{\vec{H}}{H}\left\{v_{\parallel} - \frac{mc^2v_{\parallel}^2}{eH}\left(\frac{\vec{H}}{H}\operatorname{curl}\frac{\vec{H}}{H}\right)\right\} + \frac{cv}{eH}\operatorname{curl}\left(mv_{\parallel}\frac{\vec{H}}{H}\right)$. In determining the integrals of the drift equations, the authors restricted

themselves to the case $(\vec{H}.\text{curl}\,\vec{H}) = 0$ if the second term in the above equation becomes equal to zero. The equation is thus reduced to the expression

$\frac{d\vec{r}}{dt} = \frac{v_{\parallel}}{H}\,\text{curl}\left(\vec{A} + \frac{mcv_{\parallel}}{eH}\vec{H}\right)$. The authors then introduce the vector potential $\vec{A}^* = \vec{A} + \frac{mcv_{\parallel}}{eH}\vec{H}$, and write the equation for the trajectories of the principal center in the Lagrangian form $\frac{d}{dt}\left(\frac{\partial L}{\partial \dot{q}_i}\right) = \frac{\partial L}{\partial q_i}$, where $L = \left(\frac{dr}{dt}\vec{A}^*\right)$ is assumed. By using this Lagrangian form, various integrals of motion may be obtained for the set of drift equations on the basis of the symmetry of this problem. Since drift equations are differential equations of second order, their integrals provide the equations of the trajectories. At $\vec{A}^* = \vec{A}$ the resultant formulas present the equations of the lines of force of the magnetic field $\vec{H} = \text{curl}\,\vec{A}$. At $\text{curl}\,\vec{H} \neq 0$, drift equations are difficult to solve even in the presence of certain symmetries. The article is concluded with an investigation of the motion of particles within the field of a circular current J which is

superimposed by the field of a straight wire with the current I. Finally, the authors thank Academician M. A. Leontovich and Academician L. A. Artsimovich for useful advice. There are 2 figures and 5 Soviet references.

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AUTHORS: Morozov, A. I., Solov'yev, L. S.

TITLE: Motion of Particles in a Crimped Toroidal Magnetic Field

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 3, pp 261-270 (USSR)

ABSTRACT: The authors investigated motion of charged particles inside a crimped toroidal magnetic field and showed for a sufficiently large radius of the torus such a trap is absolute in drift equation approximation. They call a magnetic trap absolute when all particles coming from a region V_0 inside the trap, with velocities of arbitrary direction but of bounded modulus, remain inside a finite volume V_1, in the region of the trap. Such an absolute trap is represented by an uniform or crimped magnetic field, infinite in the Z direction. It is natural to try to

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Investigate such fields when they are bent into a torus of sufficiently large radius R. Since the crimped toroidal field does not posses symmetries, it is extremely difficult to use exact equations, and the authors limit themselves to the order of accuracy of the drift equations. Instead of starting from equations of drift, the authors start from the so-called longitudinal adiabatic invariant, introduced by Rosenbluth and Longmire (see reference) and Kadomtsev (Fizika plazmy (Plasma Physics), Vol III, p 285, 1958).

$$J_{\parallel} = \int v_{\parallel} dl. \qquad (1)$$

Here $v_{\parallel}$ - "longitudinal" velocity, along the direction of the H lines, and the integral is evaluated along H over a period of the field if the particle is "flying through," i.e., moving along the whole torus,