SOV/142-58-4-21/30

AUTHOR: Professors: Polivanov, K.M., Netushil, A.V., Fradkin, P.M.

TITLE: A Symposium of Scientific Essays of the Belorussian Polytechnic Institute imeni I.V.Stalin, Nr 61, "Power- and Electrical Engineering," 1957. (Sbornik nauchnykh trudov Belorusskogo Politekhnicheskogo instituta imeni I.V. Stalina, Vypusk 61, Energetika, Elektrotekhnika, 1957)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Radiotekhnika, 1958, Nr 4, pp 510-511 (USSR)

ABSTRACT: This is a review of the above mentioned book.

SUBMITTED: April 21, 1958

Card 1/1

FRADKIN, S.A.

Making and using standard prestressed ceiling beams. Prom. stroi. 38 no.11:48-51 '60. (MIRA 13:10)

1. Proyektnyy institut No.1 Ministroya RSFSR.
(Ceilings) (Prestressed concrete)

FRADKIN, S.A., inzh.; SOKOLIN, Ya.F., inzh.; ZAROVKINA, N.S., inzh.; GOFENSHEFER, A.E., inzh.

Manufacture of standard wire-reinforced concrete beams. Mat. i zhel.-bet. no.7:315-319 Jl '61. (MIRA 14:7)
(Beams and girders)

FRADKIN, S.A.

Use of standard prestressed beams for the roofs of industrial buildings. Prom.stroi. 40 no.4:36-41 '62. (MIRA 15:5)

1. Proyektnyy institut No.1.
(Beams and girders) (Roofing, Concrete)

FRADKIN, S.A.

Precast reinforced concrete foundations for standard columns.
Biul. stroi. [redacted] '63. (MIRA 16:11)

1. Glavnyy konstruktor proyekta Proyektnogo instituta No.1 Glavnogo upravleniya po stroitel'nomu proyektirovaniyu predpriyatiy, zdaniy i sooruzheniy Gosstroya SSSR.

FRADKIN, S. D.

"Use of Bin Excavators by Medium-Sized and Small Peat Enterprises," Mekh. Trud. rab., 6, No1 3, 1952

FRADKIN, S. D.

1391. SPREADING OF RAW PEAT MASS BY EXCAVATOR IN A WAVY RIBBON. Fradkin, S.D. (Torf. Prom. (Peat Ind., Moscow), 1956, (6), 18-20). An illustrated description is given of experiments in which peat was extruded from the spreading machine through a nozzle which faced backwards and pointed up at 15 to 21° to the horizontal. The extruded ribbon was made to move 20 to 60% faster than the machine and formed waves 400 to 550 mm long and 150 to 200 mm high to the underside of the ribbon. The surface in contact with the ground is only 15% of the whole and the evaporating area is increased 40% over the current method of spreading in omega-shaped sods. Drying time is reduced 40 to 50%. (L).

BOBORYKIN, Ye.P., red.; SARYCHEV, I.I., red.; FRADKIN, S.D., red.; SHAKIROV, R.A., red.; LISOGOR, A.A., red.; VENTSKEVICH, L.A., red.

[Technological information and propaganda at construction projects in Russia] Tekhnicheskaia informatsiia i propaganda na stroikakh Rossii; sbornik statei. Moskva, TSentr. biuro tekhn. informatsii, 1962. 106 p. (MIRA 16:7)

1. Russia (1917- R.S.F.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.
(Construction industry--Technological innovations)

FRADKIN, S.Z.

Combined wound of the heart and left lung. Khirurgiia 35 no.1:131 Ja '59. (MIRA 12:2)

1. Iz travmatologicheskogo otdeleniya (zav. Ye.N. Yel'kina) Prokop'yevskoy gorodskoy bol'nitsy (glavnyy vrach M.M. Sovtsova) Kemerovskoy oblasti.
(HEART--WOUNDS AND INJURIES)
(LUNGS--WOUNDS AND INJURIES)

FRADKIN, S.Z.

Experimental physiological and histochemical study of the adaptation of intestinal transplants incorporated in the urinary system. Izv. Sib. otd. AN SSSR no.8:103-109 '62. (MIRA 17:8)

1. Novokuznetskiy gosudarstvennyy institut usovershenstvovaniya vrachey i Institut eksperimental'noy biologii i meditsiny Sibirskogo otdeleniya AN SSSR, Novosibirsk.

FRADKIN, S.Z.

Results of cystometry in plastic surgery on the bladder using the small and the large intestine. Urologiia no.6:27-33'62. (MIRA 16:7)

1. Iz khirurgicheskoy kliniki (zav. - prof. B.I.Fuks) Novokuznetskogo instituta usovershenstvovaniya vrachey.
(BLADDER--EXPLORATION) (BLADDER--SURGERY)
(SURGERY, PLASTIC)

CHERVINSKIY, A.A., kand.med.nauk; SELIVANOVA, Z.F.; FRADKIN, S.Z.

Significance of azygography in solving the problem of the operability of cancer of the lungs and esophagus. Vest.khir. no.6:30-36 '62. (MIRA 15:11)

1. Iz kafedry khirurgii (zav. - prof. B.I. Fuks) Novokuznetskogo gosudarstvennogo instituta dlya usovershenstvovaniya vrachey im. S.M. Kirova (Kemerovskaya oblast') i rentgenologicheskogo otdeleniya 1-y gorodskoy klinicheskoy bol'nitsy (gl. vrach - S.F. Kirin).
(LUNGS—CANCER) (ESOPHAGUS—CANCER) (ANGIOGRAPHY)

VINOGRADOV, V.V.; FRADKIN, S.Z.

"Hidden" metachromasia of some epithelial mucins. Izv. Sib. otd. AN SSSR no. 11:151-153 '62. (MIRA 17:9)

1. Institut eksperimental'noy biologii i meditsiny Sibirskogo otdeleniya AN SSSR, Novosibirsk.

FRADKIN, V.A.

Determination of tuberculin titer in schizophrenia. Zhur. nerv. i psikh. 54 no.9:747-751 S '54. (MLRA 7:9)

1. Tallinskiy institut epidemiologii, mikrobiologii i gigiyeny Ministerstva zdravookhraneniya Estonskoy SSR.
(SCHIZOPHRENIA, immunology,
tuberculin titer)
(TUBERCULIN REACTION,
in schizophrenia)

FRADKIN, V.A.

USSR/Microbiology - Medical and Veterinary Microbiology F-6

Abs Jour : Ref Zhur-Biologiya, No 1, 1957, 667

Author : K. A. Akhundova, and V. A. Fradkin

Inst :

Title : On Modifications in the Normal Microflora of the Intestine Upon the Simultaneous Administration of Sintomycin and Streptomycin

Orig Pub : Naukogude Eesti tervishoid, Zdravookhr. Sov. Estonii, 1955, sb. 4, 254-260

Abstract : No abstract.

Card 1/1

FRADKIN, V. A.

USSR/Human and Animal Physiology. Blood. V

Abs Jour: Ref Zhur-Biol., No 6, 1958, 26794.

Author : V.A. Fradkin.
Inst :
Title : The Connection Between Posttransfusion Reactions and the Degree of Allergy to Tuberculin.

Orig Pub: Sov. Meditsina, 1956, 20 No 9, 71-75.

Abstract: The degree of allergy to tuberculin was studied in 120 patients before and immediately after blood transfusions. The results of the Mantoux reaction over a 48 hour period were taken into account. Positive reactions to tuberculin in dilutions of 1:100,000 and higher were attributed to heightened sensitivity, while reactions to dilutions of 1:1000

Card : 1/3

Inst. Exptl. & Clin. Med., AS Est. SSR

and lower were attributed to decreased sensitivity. When transfusions of 250 ml of preserved blood were performed upon 82 patients, posttransfusion reactions appeared twice as often as with transfusions of 125 ml (38 patients) and were of a graver nature. With repeated transfusions, independently of the volume of transfused blood (250 or 125 ml), the incidence of posttransfusion reactions, even with high tuberculin titers, decreased from approximately 30 to 35% to 6%, and the course of the reactions was considerably milder. There was no apparent correlation between nature of illness, blood group, Hb content, age and the incidence of posttransfusion reactions. A connection was noted between incidence and severity of posttransfusion reactions and increased allergy to tuber-

USSR/Human and Animal Physiology. Blood. V

Abs Jour: Ref. Zhur-Biol., No 6, 1958, 26794.

culin. In the case of transfusions involving a blood volume of 125 ml, even when there was increased sensitivity to tuberculin, transfusion reactions were observed relatively infrequently and were of a milder nature. Determination of tuberculin titer is recommended when there is a danger of adverse effects upon a patient from posttransfusion reactions. In cases of high sensitivity to tuberculin, one should initiate transfusions with a lower dose, increasing it subsequently if necessary.

Card : 3/3

FARDKIN, V.A.

Experimental studies on the phenomenon of passive allergy to tuberculosis antigen. Suvrem. med., Sofia 9 no.7:11-18 1958.

1. Iz 3-ta Moskovska gradska tuberkulozna bolnitsa Zakhar'ino (Gl. lekar: V. P. Petrik). i Katedrata po tuberkuloza pri TSIU (Profesor pri katedrata: F. I. Levitin).

(TUBERCULOSIS, immunol.
passive allergy to buberc. antigen in animals (Bul))

FRADKIN, V.A.

Influence of the process of preserving blood on its "passive-allergizing properties. Probl. gemat. i perel. krovi 4 no. 10:47-50 O '59. (MIRA 13:8)

1. Iz 3-y Moskovskoy gorodskoy tuberkuleznov klinicheskoy bol'nitsy "Zakhar'ino" (glavnyy vrach V.P. Petrik).
(BLOOD--COLLECTION AND PRESERVATION)
(ALLERGY)

FRADKIN, V. A., Cand Med Sci -- (diss) " 'Passive' allergy to tubercular antigen and the role of leucocytes in its genesis." Moscow, 1960. 13 pp; (Ministry of Public Health USSR, Central Inst for Advanced Training of Physicians); 250 copies; price not given; (KL, 26-60, 144)

FRADKIN, V.A.(Moskva)

Experimental study of the effect of active and "passive" forms of allergic reaction to tuberculous antigens on the reactivity of the organism to histamine. Pat.fiziol.i eksp.terap. 4 no.2:18-22 Mr-Ap '60. (MIRA 14:5)

1. Iz Moskovskoy klinicheskoy gorodskoy tuberkuleznoy bol'nitsy "Zakhar'ino" (glavnyy vrach V.P.Petrik).
(HISTAMINE) (TUBERCULOUS)

FRADKIN, V.A.

Results of a bacteriological study of resected cavities of tuberculous disintegration. Vrach. delo no.8:91-94 Ag '61. (MIRA 15:3)

1. 3-ya Moskovskaya klinicheskaya tuberkuleznaya bol'nitsa "Zakhar'ino". Nauchnyy konsul'tant laboratorii prof. L.M. Model'.

(LUNGS—MICROBIOLOGY)

KHAYKIN, A.Ya.; FRADKIN, V.A.

Results of determining the level of a specific allergy in various forms of pulmonary tuberculosis. Sov. med. 25 no.10:33-37 O '61. (MIRA 15:1)

1. Iz kafedry tuberkuleza (zav. - prof. A.Ye.Rabukhin) TSentral'nogo instituta usovershenstvovaniya vrachey (dir. - M.D.Kovrigina) i 3-y Gorodskoy klinicheskoy tuberkuleznoy bol'nitsy "Zakhar'ino" (nauchnyy rukovoditel' - prof. F.I.Levitin, glavnyy vrach V.P.Petrik).
(TUBERCULIN--TESTING) (TUBERCULOSIS)

FRADKIN, V.A.

Method for the quantitative determination of urease activity in micro-organisms. Zhur.mikrobiol., epid. i immun. 33 no.3:42-46 Mr '62. (MIRA 15:4)

1. Iz 3-y moskovskoy klinicheskoy tuberkuleznoy bol'nitsy Zakhar'ino.
(UREASE) (MICRO-ORGANISMS)

FRADKIN, V.A.

Reaction of blood neutrophils as an index of infectious and drug allergy. Sov. Med. 26 no.9:41-47 S '62. (MIRA 17:4)

1. Iz 3-y Moskovskoy tuberkuleznoy klinicheskoy bol'nitsy "Zakhar'ino" (glavnyy vrach V.P. Petrik).

FRADKIN, V.A.

Study of allergy in pulmonary tuberculosis by the method of neutrophil reaction to tuberculin. Akt. vop. tub. no.2:76-83 '63. (MIRA 17:9)

LEVITIN, F.I.; GOL'DSHTEYN, V.D.; PROKHOROV, Ye.P.; FRADKIN, V.A.

Tuberculin reactions in elderly persons with pulmonary tuberculosis. Trudy TSIU 63:56-63 '63. (MIRA 17:9)

1. Kafedra tuberkuleza TSentral'nogo instituta usovershenstvovaniya vrachey i Klinicheskaya bol'nitsa "Zakhar'ino", Moskva.

FRADKIN, V.A.

Evaluation of the allergic state of a body in vitro. Vestn. Akad. med. nauk SSSR 18 no.4:77-82 '63 (MIRA 17:4)

1. Moskovskaya klinicheskaya tuberkuleznaya bol'nitsa "Zakhar'ino".

FRADKIN, V.A.; GUSELNIK, Ya.S.; OTSUP, L.K.

Materials on the determination of the prothrombin index and anticoagulant therapy in a phthisiosurgical clinic. Akt. vop. tub. no.2:246-252 '63. (MIRA 17:9)

FRADKIN, V.A.

Efficient method of blood coagulation control. Akt. vop. tub. no.2: 253-255 '63. (MIRA 17:9)

LEVITIN, F.I.; GOL'DSHTEYN, V.D.; KORNFAN, V.I., [illegible]

Clinical importance of the diagnostic use of tuberculin. Akt. vop. tub. no.2:84-91 '63. (MIRA 17:9)

LEVITIN, F.I.; GOL'DSHTEYN, V.D.; KUDISH, E.A.; PROKHOROV, Ye.P.; FRADKIN, V.A.; CHAUSOVSKAYA, M.M.

Technic and evaluation of the results of tuberculin tests. Probl. tub. no.7:9-16 '63. (MIRA 18:1)

1. Iz kafedry tuberkuleza (zav. - zasluzhennyy deyatel' nauki prof. A.Ye. Rabukhin) TSentral'nogo instituta usovershenstvovaniya vrachey.

FRADKIN, V.A.

Allergenic properties of the Grasse antigen of the L-forms of Streptococcus haemolyticus. Vest. AMN SSSR 20 no.8:64-66 '65.
(MIRA 18:9)

1. Gosudarstvennyy kontrol'nyy institut imeni L.A.Tarasevicha, Moskva.

L 12810-66 EWT(1)/EWA(j)/T/EWA(b)-2 JK
ACC NR: AP5028186 SOURCE CODE: UR/0248/65/000/008/0064/0066

AUTHOR: Fradkin, V. A.

ORG: State Control Institute (Gosudarstvennyy kontrol'nyy institut im. L. A. Tarasevicha, Moscow

TITLE: Allergenic properties of the Grasse antigens of hemolytic streptococcus L-forms

SOURCE: AMN SSSR. Vestnik, no. 8, 1965, 64-66

TOPIC TAGS: antigen, streptococcus, immunology, microbiology

ABSTRACT: The author describes the allergenic properties of Grasse antigens (obtained by alternate freezing and thawing) from the L-forms of hemolytic streptococcus in a model of the Schwartzman phenomenon and on the cross-sensitizing effect between Grasse antigens of the same microorganism's bacterial and L-forms. The Schwartzman phenomenon was produced by Grasse antigens of the L-forms of hemolytic streptococcus Nos. 196-L and 409-L, antigens of the original culture of streptococcus No. 10-S, and antigens of streptococci of the reverting L-forms Nos. 196-p and

Card 1/2

UDC: 576.851.214.095.5.097.2

L 12810-66

ACC NR: AP5028186

409-p. The latter two antigens manifested their sensitizing property very distinctly. The Grasse antigens from the bacterial forms of the hemolytic streptococci Nos. 10-S and 196-p were superior in this respect to the similar antigens from the L-form cultures. A cross-sensitizing effect was noted in all the experiments between the Grasse antigens from the bacterial and L-forms of the streptococci. The initial sensitization to the L-forms gave rise to the Schwartzman phenomenon in response to the challenge injection of the bacterial forms of the streptococci, and vice versa.

SUB CODE: 06/ SUBM DATE: 01Jun65/ ORIG REF: 000/ OTH REF: 000

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Card 2/2

FRADKIN, V.A.; MEYEROVICH, Ye.G.

Materials of dynamic study of allergy to tuberculin by means of the blood neutrophil reaction in vitro. Sov.med. 28 no.12:10-14 D '65. (MIRA 18:12)

1. Kontrol'nyy institut meditsinskikh biologicheskikh preparatov imeni L.A.Tarasevicha (direktor - dotsent T.F. Mikhaylov) i Moskovskaya tuberkuleznaya klinicheskaya bol'nitsa "Zakhar'ino" (glavnyy vrach V.P.Petrik).

FRADKIN, Ya.M., inzh.

Electric power distribution networks should be operated by one agency. Energetik 11 no.1:3-4 Ja '63. (MIRA 16:1)
(Electric power distribution)

ESTHONIA/General Problems of Pathology - Tumors. Human Tumors. U.

Abs Jour : Ref Zhur - Biol., No 2, 1959, 8906

Author : Barshteyn, Yu.A., Fradkin, Ya.P.

Inst : -

Title : A Malignant Nevogenic Tumor with Multiple Metastases in the Central Nervous System

Orig Pub : Noukogude Eesti tervishoid, Zdravookhr. Sov. Estonii, Sb. 5, 1956, 61-65

Abstract : The patient's disease began with a severe headache, particularly on the left side. Involvement of the III, V and VI pairs of cranial nerves was found on the left and multiple verrucoid structures in the skin of the hairy part of the head. The data of the history, clinical picture and histological examination of the verrucoid structures led to the conclusion that the patient had a nevogenic malignant tumor of the hairy part of the head with metastases to the skull, dura mater, brain,

Card 1/2

sacrum, left lung and lymph nodes. This conclusion was confirmed by pathological examination, and metastases were also found in all the muscle groups including the diaphragm, heart muscle, stomach submucosa and intestinal submucosa, kidneys, spleen. liver and other organs as well as in the skull vault. -- Ye.A. Skvirskaya

FRADKIN, Ye. S.

"The Theory of Particles with Higher Spins", Zhur. Eksper i Teoret. Fiz., No. 1, Vol. 20, 1949.

FRADKIN, Ye. S.

"Problem of the Reaction of the Natural Field of a Charged Particle," Zhur. Eksper. i Teoret. Fiz., 20, No. 3, 1949.

Physics Inst. im. P.N. Lebedev, Acad. Sci. USSR

USSR/Mathematics - Tensor Jan 50
Physics - Spin

"The Theory of Particles With Higher Spins," Ye. S. Fradkin, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 12 pp

"Zhur Eksper i Teoret Fiz" Vol XX, No 1

Discusses method of obtaining equations for particles with given spin in spin-tensor form. Considers problem of uniqueness of these equations and problem of their disintegration in absence of a field. Submitted 20 Jun 49.

[redacted] 155T26

FRADKIN, Ye. S. 155T62

USSR/Physics - Electrons Mar 50
Field, Electric

"Problem of the Reaction of the Natural Field of a Charged Particle," Ye. S. Fradkin, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 7 pp

"Zhur Eksper i Teoret Fiz" Vol XX, No 3

Shows improbability of existence of natural oscillatory motions of charged particles, as asserted by number of authors. Investigates equations of motion of particles with consideration for reaction of the natural field. Submitted 12 Sep 49.

155T62

FRADKIN, Ye. S.

USSR/Physics - Quantum electrodynamics, renormalization FD-724

Card 1/1 : Pub. 146-12/18

Author : Fradkin, Ye. S.

Title : Renormalization in quantum electrodynamics

Periodical : Zhur. eksp. i teor. fiz., 26, 751-754, Jun 1954

Abstract : Letter to the editor. Attempts to find such form of Green functions (J. Schwinger, Proc. Nat. Acad. Sci. 37, 452 (1951)) as to contain values expressed by experimental data of charge and mass of electron. Shows that the analysis can be simplified because of gradient invariance. Further detailed analysis will be the subject of a separate article. One Soviet and two American references.

Institution : Physics Institute imeni Lebedev, Acad. Sci. USSR

Submitted : March 30, 1954

FRADKIN, E. S.

USSR/ Physics - Nuclear physics

Card 1/1 : Pub. 22 - 12/44

Authors : Fradkin, E. S.

Title : Green's functions for interaction between nuclons and mesons

Periodical : Dok. AN SSSR 98/1, 47-50, Sep 1, 1954

Abstract : Derivation and solution are given of a system of functional equations (Green's functions) in the S-matrix expressing the interaction between nuclons and mesons. Three references (1951-1954).

Institution : Physical Institute im. P. N. Lebedev of the Acad. of Scs. of the USSR

Presented by : Academician I. E. Tamm, April 14, 1954

FRADKIN, E.S.

Fradkin, E. S. On the asymptotics of Green functions in quantum electrodynamics [illegible]

[illegible] 95 [illegible] 15, [illegible] The question, whether these results [illegible] [illegible] electrodynamics rigorously implies [illegible] expect [illegible] divergence difficulties a natural explanation of the [illegible] and unity [illegible] F. J. Dyson [illegible]

Fradkin, E. S.

7000

Fradkin, E. S. On quantum field theory. I. Z. Eksper 1 - F/W

29 (1955), 121-134

[illegible]

equations are derived by [illegible]

Schwinger's variational principle [illegible]

[illegible]

[illegible] An appendix [illegible]

of [illegible] for zero coupling strength [illegible]

theorem. A. S. Wightman (Princeton [illegible])

RAW

FD-2887

USSR/Physics - Quantum electrodynamics

Card 1/1 Pub. 146 - 24/26

Author : Fradkin, Ye. S.

Title : Certain general relations in quantum electrodynamics

Periodical : Zhur. eksp. i teor. fiz., 29, August 1955, 258-261

Abstract : In the present note the writer presents the derivation of certain general relations connected with the gradient invariance of quantum electrodynamics as discussed in his earlier works (ibid., 26, 752, 1954; DAN SSSR, 100, 897, 1955). He considers the relation for the case of the presence of an external source of photon field G, studied in functional form and by Green's functions. Five references: e.g. L. D. Landau et alii, DAN SSSR, 95, 773, 1954.

Institution : Physics Institute im. P. N. Lebedev, Academy of Sciences USSR

Submitted : March 9, 1955

USSR/Nuclear Physics - Meson theory FD-2979

Card 1/1 Pub. 146 - 20/28

Author : Fradkin, Ye. S.

Title : Problem concerning the asymptote of the Green function in the theory of mesons with weak pseudoscalar bond

Periodical : Zhur. eksp. i teor. fiz., 29, September 1955, 377-379

Abstract : In an earlier work (A. A. Abrikosov, A. D. Galanin, I. M. Khalatnikov, DAN SSSR, 97, 793, 1954) nonrenormed equations were used to find the asymptote of the Green function for the case of weak pseudoscalar interaction. In the present article the writer finds the asymptote of the nonrenormed equations for the same problem. Here the found asymptote coincides with the nonrenormed expression obtained in the above mentioned work. In contrast to this work the equations for the Green function in the present writer's form do not contain an infinities, and in the finding of the asymptote he did not have to seek small additions to the Green functions, which considerably simplifies the calculation.

Institution : Physical Institute im. P. N. Lebedev, Academy of Sciences USSR

Submitted : April 18, 1955

FRADKIN, E.S.

USSR/ Physics - Quantum fields

Card 1/1 Pub. 22 - 15/49

Authors : Fradkin, E. S.

Title : About the problem on the interreaction of two quantum fields

Periodical : Dok. AN SSSR 100/5, 897-900, Feb 11, 1955

Abstract : A non-trivial solution of the expectation Z represented by the matrix S is submitted. The matrix S is a system of functional equations expressing an interaction between two quantum fields (Fermi's and Bose's). The solution is given in the form, $Z = AZ_0$ (for $g \neq 0$), where A is the operator dependent on the functional derivatives, $\delta/\delta J$, $\delta/\delta \psi$ and $\delta/\delta \bar{\psi}$; j(x) is the source of meson field; and ψ and $\bar{\psi}$ are anticommunting sources of a nuclear field. (Trivial solution would be $g = 0$, and $Z = Z_0 = \ldots$). Three references: 2 USSR and 1 British (1954).

Institution : Academy of Sciences of the USSR, P. N. Lebedev Physical Institute

Presented by: Academician I. E. Tamm, October 16, 1954

FRADKIN, E.S.

SUBJECT USSR / PHYSICS CARD 1 / 1 PA - 1655
AUTHOR FRADKIN, E.S.
TITLE A Dispersion Relation for Any Scattering Angle.
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.3, 515-517 (1956)
Issued: 12 / 1956

Here a connection between the imaginary- and real part of the scattering amplitude for any angle is determined. For this purpose the method developed by M.L.GOLDBERGER, Phys.Rev. 99, 979, 1955, is well suited, but here this dispersion relation is derived by using some results obtained by I.NAMBU, Phys.Rev., 100, 394 (1955).
At first, FEYNMAN'S matrix element of the scattering of a BOSE particle (with the momentum k and the charge index α) by a FERMI particle (with the momentum p and the other quantum numbers λ) is written down. Investigation is carried out in a system of coordinates in which the total momentum of the nucleons is equal to zero. The dispersion relations are written down for the case that the polarization of the nucleon does not change. Within the energy domain of from 0 to ω_0 (ω denotes the variable energy of the meson) the "neutron state" and the entire spectrum of the states from $|m\mu - p^2)|$ // $|m^2+p^2|^{1/2}$ to ω_0 make a contribution towards $A(\omega')$. The contribution made by the neutron state can be computed and an expression herefore is explicitly given. The final and very voluminous expression for the dispersion relation is explicitly given.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR

SUBJECT. USSR / PHYSICS
AUTHOR AVRORIN, E.N., FRADKIN, E.S.
TITLE On the Problem of the Renormalizability of the Pseudoscalar Meson Theory with Pseudovectorial Coupling.
PERIODICAL Žurn.eksp.i teor.fis, 30, fasc.4, 756-760 (1956)
Publ. 4 / 1956 reviewed 9 / 1956

At first it is shown that the convergence of the pseudoscalar theory with pseudoscalar coupling is not improved also if, in the case of the propagation function of the mesons the corrections connected with the polarization of the vacuum are taken into account.
For a pseudoscalar meson field with pseudovectorial coupling, a formula, here shortly referred to as "equivalence theorem", holds good which is, in a certain sense, analogous to the theorem of the conservation of the current in quantum electrodynamics. Equations for the GREEN'S function of the spinorial field, which is defined according to J.SCHWINGER, Proc.Nat.Acad.Scie.37, 452 (1951)), are given and transformed. Also the equation for the GREEN'S function of the meson field and an expression for the polarization operator are given.

Next, the polarization operator is specialized for the first perturbational approximation by inserting the corresponding summit part, and an equation following from the "equivalence theorem" is given. The integral contained therein occurs also in quantum electrodynamics where it is equal to zero because of the theorem of the conservation of the current. The corresponding proof by direct computation can only be accomplished by means of tricks.

Žurn.eksp.i teor.fis, 30, fasc.4, 756-760 (1956) CARD 2 / 2 PA - 1295

However, when carrying out the proof of the "equivalence theorem" in the momentum space the integration variable can be "shifted". The polarization operator is computed for k=0 and is then renormalized.
Now the difference between the polarization operators computed by means of FEYNMAN'S method and those computed by the authors is demonstrated. This difference leads to no unambiguities on the occasion of the computation end of the part of the polarization operator, but it cannot be removed in the present theory. However, when using the equivalence theorem, it is possible to represent the polarization operator as a logarithmically divergent expression which can be renormalized without any tricks. The cause of the difficulties occurring on the occasion of the polarization of the vacuum is to be found in quantum electrodynamics and, in the case investigated here, also in the insufficient definition of a boundary value. This boundary transition must not destroy the general properties following from the basic equations of the theory. If, however, a proper boundary transition is chosen, the condition of gradient invariance in quantum electrodynamics and the "equivalence theorem" are satisfied in the above theory.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413530002-3"

FRADKIN, E.

CARD 1 / 2 PA - 1431

SUBJECT USSR / PHYSICS
AUTHOR FAJNBERG,V., FRADKIN,E.
TITLE A Dispersion Relation for FERMI Particles.
PERIODICAL Dokl.Akad.Nauk,109, fasc.3, 507-510 (1956)
Issued: 9 / 1956 reviewed: 10 / 1956

At first the matrix element:

$$\langle p_\lambda, q_\mu | S | p'_\lambda, q'_{\mu'} \rangle = i \int dx dy \bar{U}^\lambda(p,x) \cdot \langle q_\mu, \alpha' | T\{\Psi_\alpha(x)\bar{\Psi}_\beta(y)\} | q'_{\mu'}, \beta' \rangle \bar{L}_y U^{\lambda'}(p',y)$$

for the scattering of two fermions from the state with four-momenta p', q' and the polarizations λ' and μ' into the state with the momenta p', q' and the polarizations λ, and μ are given. Here $|q_\mu, \alpha\rangle$ - denotes the Heisenberg vector of the state of a fermion with the four-momentum:

$q(\vec{q}, q_o = \sqrt{\vec{q}^2 + M^2}$; Ψ_α - the Heisenberg operators of the fermion, $U^\lambda(p,x)$ - the solution of the free DIRAC equation with the four-momentum $p(\vec{p}, p_o = E = \sqrt{\vec{p}+M^2}$ and the polarization λ; $L_x = (\gamma_\mu \partial/Dx_\mu + M)$; $\bar{L}_y = (-\gamma_\mu \partial/\partial y_\mu + M)$; $\bar{U} = U^* \gamma_4$.

The indices $\alpha.\beta.\alpha'$ and β' pass through the values 1 and 2 and characterize the charge state of the fermion.

Next, an expression for forward scattering is given, viz. in a system in which the fermion with the four-momentum q is at rest. The matrix element then depends only on the energy of the inciding fermion.

The expressions obtained by M.L.GOLDBERGER, Phys.Rev.99, 979 (1955) have universal character. - Thus, the matrix element of nucleon-nucleon scattering for negative

energies can be expressed by the matrix element antinucleon-nucleon for positive energy. The sum of the amplitudes of the forward proton-proton and antiproton-proton scattering on this occasion becomes an even function of energy. The analogous difference then becomes an odd function of energy. Analogous symmetry properties are found with the sum (difference) of proton-neutron and antiproton-neutron scattering amplitudes (if the neutron is at rest at the beginning and at the end of the process). Within the domain $0 \leqslant E < M$ we find - in contrast to the case of meson-nucleon scattering - a whole spectrum of states, which also comprises a real coupled state, the deuteron.
The contribution made by all the mentioned states in the domain $0 \leqslant E < M$ can be brought into connection with the physical quantities or may be expressed by known physical constants, namely: 1.) The contribution made by the state with a meson by the constant f of pseudoscalar interaction. 2.) The deuteron state by the binding energy ε of the deuteron. 3.) All other states making a contribution in the domain $0 \leqslant E \leqslant M - 2\mu^2/M$ by the analytical continuation of the annihilation part of the total nucleon-antinucleon interaction cross section. The dispersion relation found in consideration of all that has been said above is explicitly given.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR.

FRADKIN, E.S.

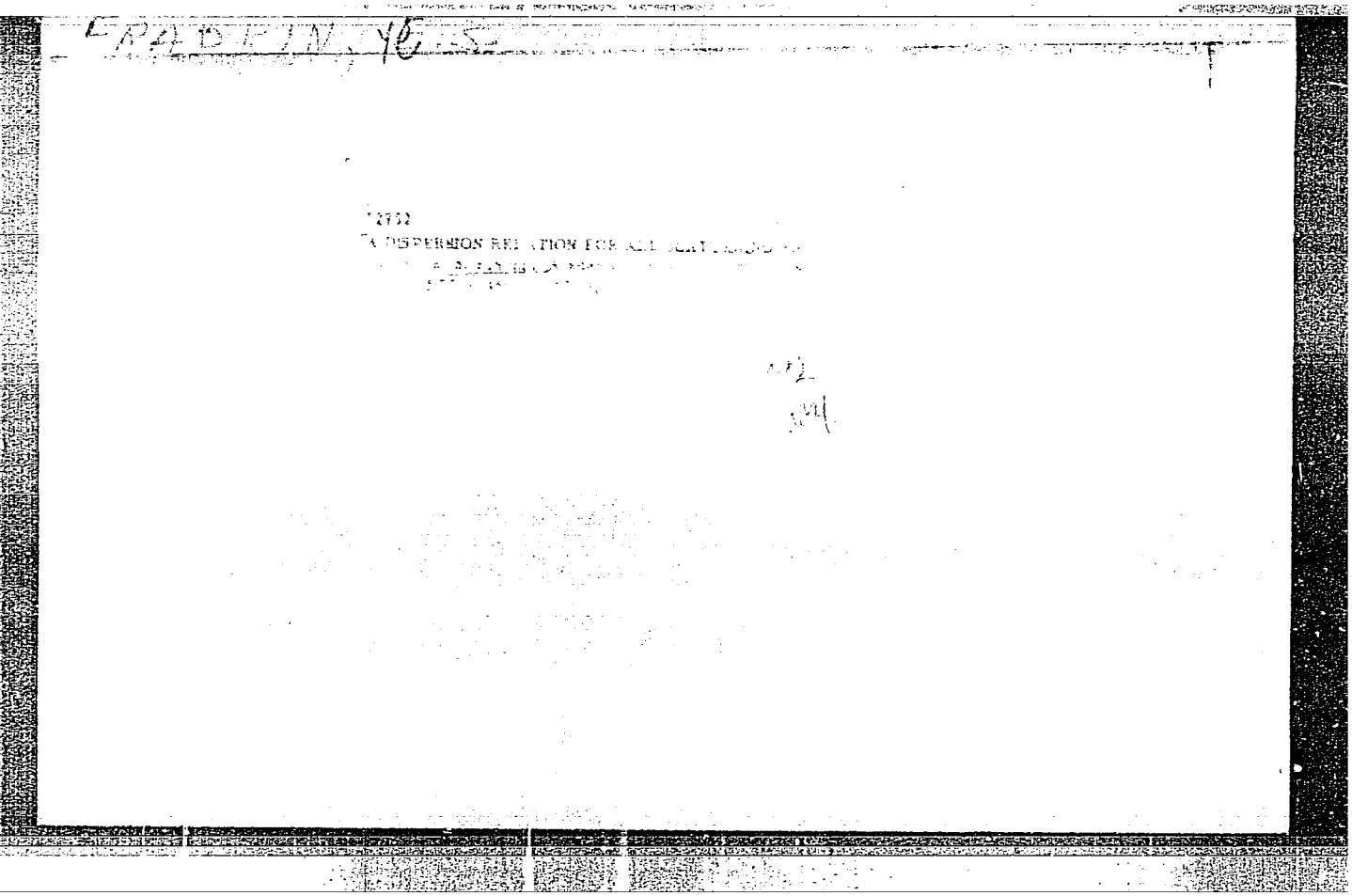
4206

RENORMALIZABILITY OF PSEUDOSCALAR MESON THE[ORY] WITH PSEUDOVECTOR COUPLING

E. S. Fradkin, Academy of Sciences

Phys JETP 5, 862 5(1957) Jan.

It is shown that the convergence of a perturbation theory with pseudovector coupling is not improved even when corrections for the propagation function for the mesons which are connected with the vacuum polarization are taken into account. (auth)



FRADKIN, E.S.

56-5-30/55

AUTHOR FRADKIN, E.S.

TITLE On the Theory of the Transmission Processes in a Plasma Situated in a Magnetic Field. (K teorii protsessov perenosa v plazme, nakhodyashcheysya v magnitnom pole.- Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 5, pp 1176-1187 (USSR)

ABSTRACT The note under review develops the kinetic theory of a plasma which is situated in an electrical and in a magnetic field. The essence of the approximate method employed for the solution of the kinetic equation is the following: The terms of the expansion of the distribution function are determined, with the distribution being, related to a certain parameter of smallness. The appropriate parameter of smallness is characteristic of the given concrete problem. In this context, the so-called "local" distribution function is found, the significance of which is explained in greater detail in the paper under review. The equations utilized for the solution of the problem are generalizations of the known hydrodynamic equations.

CARD 1/3

56-5-30/55

On the Theory of the Transmission Processes in a Plasma Situated in a Magnetic Field.

First of all, the paper under review writes down the kinetic equation for the particles of the kind s which in presence of an electric and of a magnetic field, are in a mixture with particles of other kinds. Then a transition is made, in this system of equations, to other independent variables. This equation is solved by expanding the corresponding solution ansatz in a series with respect to the above-mentioned small parameter. In an axially symmetrical problem, the following parameters have to be dealt with: L - dimensions of the system, l - range, R - Larmor's radius. Then the author of the paper under review proceeds to investigate the stationary axially symmetrical problem of the mixture of two charged gases in a strong magnetic field. The next chapter deals with the transmission phenomena in a mixture of electrons and ions for a stationary problem with arbitrary symmetry. In this case, we are concerned with the expansion parameters R/L and 1/L. Let the gradients of the concentrations be directed vertically to the magnetic field. Then the author of the paper under review proceeds to discuss the transmission phenomena

CARD 2/3

56-5-30/55

On the Theory of the Transmission Processes in a Plasma Situated in a Magnetic Field.

in a mixture of electrons and ions which is situated in a weak magnetic field. For the sake of generality, the instationary problem is dealt with. Finally, investigation is made of a plasma in a strong magnetic field with weak deviation from the axial symmetry as well as of a plasma consiting of electrons and ions in an electromagnetic field variable with respect to space and time. (No reproductions).

ASSOCIATION: Institute of Physics "P.N. Lebedev", Academy of Sciences of the USSR.
PRESENTED BY: -
SUBMITTED: 5.7. 1956.
AVAILABLE: Library of Congress.

CARD 3/3

24(5) SOV/56-36-3-61/71

AUTHOR: Fradkin, Ye. S.

TITLE: On a Relation in Quantum Statistics (Ob odnom sootnoshenii v kvantovoy statistike)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 951 - 953 (USSR)

ABSTRACT: The density matrix ϱ can be written down as $\varrho = e^{-\beta H}$, $H = H_0+H_1 = \int[H_0(x)+H_1(x)]\,d^3x$; $\beta = 1/kT$ (H= Hamiltonian system, H_0 = "free" Hamiltonian, H_1 = interaction Hamiltonian). For $H_\lambda = H_0+\lambda H_1$ instead of H it holds that $-\partial\varrho/\partial\beta = (H_0+\lambda H_1)\varrho$. The formal operator solution of this equation then is $\hat{\varrho} = e^{-\beta H_0}\, T\left\{\exp(-\lambda\int H_1(xt)\,dt\,d^3x)\right\}$ (Integration over t from 0 to β). T denotes the arrangement ordered from right to left according to growing powers of t. For an arbitrary operator f(xt) it is assumed that

Card 1/3

$f(xt) = e^{tH_0} f(x) e^{-tH_0}$. For the determination of all thermodynamical quantities it is sufficient to know

$Z = \ln \mathrm{Sp}\, e^{\alpha N - \beta H}$; N denotes the operator of the total number of particles and commutes with the total Hamiltonian; $\alpha = \beta\mu$, μ then is the chemical potential. For Z the author derives the following formula:

$$Z = Z_0 - \int_0^g \frac{dg'}{g'} \int M(xt, x't') G(x't', xt) d^3x dt dt' d^3x' \qquad (8)$$

This relation holds if H_0 does not contain the charge g; M denotes the mass operator of the Green's (Grin) single particle function G(xt, x't') (integration with respect to t and t' from 0 to β). In this way all statistical characteristics of systems can be written down by means of the mass operator of Green's single particle function. Thus, it is easily possible by means of (8) to derive the known relation for the energy of the ground state ($\beta = \infty$, T=0).

On a Relation in Quantum Statistics SOV/56-36-3-61/71

$$\bar{E} = E(g=0) + \int_0^g \frac{dg'}{g'} \int M(x\beta, x't')G(x't', x\beta)d^3x d^3x' dt'.$$

There is 1 reference.

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

SUBMITTED: November 29, 1958

Card 3/3

24(5)

AUTHOR: Fradkin, Ye. S. SOV/56-36-4-47/70

TITLE: The Method of Green's Functions in Quantum Statistics (Metod funktsiy Grina v kvantovoy statistike)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 4, pp 1286-1298 (USSR)

ABSTRACT: Recently, a number of methods deviating from the usual thermodynamic perturbation theory in statistics and from the usual perturbation theory in the multiparticle theory have been published. The methods differ considerably from one another, and their explanation is complicated. The author of the present paper found a more general method of dealing with quantum-statistical problems, which is not connected with the perturbation theory, but is based upon the use of Green's functions (which have already been successfully applied to the case $T = 0$, and by Matsubara (Ref 3) also to $T \neq 0$ (Feynman method)). The problem of setting up closed equations for these Green's functions in the x-space was, however, not definitely solved, and in particular, transition to the p-space, which is of importance for the practical solution, has not yet been investigated. This development of the

physics of high energies makes it necessary to develop the apparatus of quantum statistics in consideration of the relativistic corrections and second quantization of the Hamiltonian of the system. For the investigation of the energy spectrum of the system it is also necessary to know the time-dependence of Green's function. These problems are investigated in the present paper. (Also Abrikosov, Gor'kov, and Dzyaloshinskiy carried out similar investigations (Ref 12)). It is shown that various methods of statistical physics in the multiparticle theory as well as their generalizations obtained for the case $T \neq 0$ (e.g. Debye-Hueckel, the Hartree-Fok, the Thomas-Fermi, the Gell-Mann, and Brueckner methods), are contained in the equations obtained in simple approximation. Also the transition to time-dependent Green's functions is investigated, and a method for the determination of the energy spectrum of the system is developed. These investigations are intended to be continued in a publication yet to follow. The author finally thanks I. Ye. Tamm, V. L. Ginzburg, and D. A. Kirzhnits for their interest and discussions. There are 12 references, 8 of which are Soviet.

The Method of Green's Functions in Quantum Statistics SOV/56-36-4-47/70

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

SUBMITTED: December 19, 1958

Card 3/3

24(5)
AUTHOR: Fradkin, Ye. S. SOV/56-36-5-36/76

TITLE: A Certain Improvement of the Thomas-Fermi Model at Small Distances (Nekotoroye utochneniye modeli Tomasa-Fermi na malykh rasstoyaniyakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 5, pp 1533-1535 (USSR)

ABSTRACT: In the present paper the author suggests a quantum correction to the Thomas-Fermi model which corresponds to the quasiclassical approximation of the Hartree equation $\Delta E = -\rho_{nuc} + \frac{8\pi e}{(2\pi\hbar)^3}\int f(\hat{H})d^3p$ (1). $i\hbar\nabla$ can be neglected in quasiclassical approximation, so that (1) coincides with the Thomas-Fermi equation. It is suggested that this term is to be taken into account with $f(H) = (1 + \exp\{\beta(H - \mu)\})^{-1}$ and $\hat{H} = (\vec{p} - i\hbar\nabla)^2/2m - eB(\vec{r})$ (ρ_{nuc}-charge density of the nucleus, $\beta = 1/kT$, $\hat{H}$- the Hamilton operator in selfconsistent approximation). A generalization of the Thomas-Fermi model is obtained, which makes it possible to calculate the total energy E of the atoms with considerably

Card 1/3

better agreement with the experiment. The following is obtained:

$E_{average} \sim 15{,}9\ Z^{7/3}$ ev for $50 \leq Z \leq 90$.

Numerical computation for a number of nuclei leads to the following result:

Z	$E_{comp} Z^{-7/3}$ [e v]	$(E_{exp}-E_{comp})/E_{exp}$
26	15,9	0,06
36	16,2	0,053
54	16,7	0,047
80	16,9	0,05
92	17,1	0,056

Computations are carried out for $\lambda = 0{,}9\ Z^{2/3}$, which corresponds to an $|E_{min}|$-value, which corresponds to the double energy of the lowest level of the hydrogen atom. The author thanks D. A. Kirzhnits for discussions and L. V. Pariyskaya for carrying out numerical computations. There are 1 table and 2 Soviet references.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR

A Certain Improvement of the Thomas-Fermi Model at Small Distances SOV/56-36-5-36/76

(Physics Institute imeni P. N. Lebedev of the Academy of Sciences, USSR)

SUBMITTED: November 29, 1958 (initially) and January 7, 1959 (after revision)

Card 3/3

24 (5)

AUTHOR: Fradkin, Ye. S.

SOV/20-125-1-16/67

TITLE: Functional Equation and Operator Solution for a Statistical Sum (Funktsional'noye uravneniye i operatornoye resheniye dlya statisticheskoy summy)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 1, pp 66-68 (USSR)

ABSTRACT: The density matrix of the canonic assembly has the form $\varrho = \exp[-\beta(H + \mu N)]$. In this connection $\beta = 1/kT$ and $H = H_0 + H_1$ the total Hamiltonian of the system, H_0 - the Hamiltonian of the free fields, H_1 - the Hamiltonian of interaction, μ- the chemical potential, N - the operator for the total number of particles which are conserved (e.g. of electrons minus protons). By the usual methods of the field theory one obtains

$$\varrho = \exp[-\beta(H_0 + \mu N)]T \exp\left[-\int_0^{\beta} dx_4 \int d^3x H_1(xx_4)\right],$$

where T denotes the ordered arrangement of the operators from right to left in the sequence of increasing x_4, the operator $f(\vec{x}, x_4)$ being defined by the equation

$$f(\vec{x}, x_4) = \exp[(H_0 + \mu H)x_4] f(\vec{x}) \exp[-(H_0 + \mu N)x_4].$$

Card 1/4

Functional Equation and Operator Solution for a Statistical Sum

In analogy with the quantum field theory the author generalizes the Hamiltonian of the system, by adding an additional interaction with the external sources of the Bose- and Fermi-fields. The further investigation is made without affecting the generality for the case of interaction of a Fermi-field ψ with the mass m with a scalar Bose-field with the mass zero. In this case the interaction Hamiltonian runs as follows:

$$H_1(\vec{x}, x_4) = -\int\{\bar{\eta}(\vec{x}, x_4)\psi(\vec{x}, x_4) + \bar{\psi}(\vec{x}, x_4)\eta(\vec{x}, x_4) +$$

$$+ [J(\vec{x}, x_4) + g\bar{\psi}(\vec{x}, x_4)\psi(\vec{x}, x_4)]\varphi(\vec{x}, x_4)\} d^3x,$$

where J-denotes the source of the Bose-field, η - the source of the Fermi-field; η and $\bar{\eta}$ anticommute both among one another and with ψ and $\bar{\psi}$. The equations holding for the operators $\hat{\psi}$ and $\hat{\varphi}$ (the sign $\hat{}$ over ψ and φ is left out in the following) are: $(i\hat{p} + m - g\varphi)\psi(\vec{x}, x_4) = \eta(\vec{x}, x_4)$, $\bar{\psi}(\vec{x}, x_4)(-i\hat{p} + m - g\varphi) =$

$= \bar{\eta}(\vec{x}, x_4)$, $-\hat{k}^2\varphi(\vec{x}, x_4) = J(\vec{x}, x_4) = J(\vec{x}, x_4) +$

Card 2/4

$+ g\mathrm{Sp}\bar{\psi}(\vec{x}, x_4)\psi(\vec{x}, x_4)$. In this case it holds

Functional Equation and Operator Solution for a Statistical Sum

$$\hat{p} = -i\left[\gamma_k \frac{\partial}{\partial x_k} + \gamma_4\left(\frac{\partial}{\partial x_4} - \mu\right)\right] = -i\gamma_\nu \partial_\nu;$$

$$\hat{k}^2 = \frac{\partial^2}{\partial x_k^2} + \frac{\partial^2}{\partial x_4^2}\ ;\ k = 1, 2, 3;\ \nu = 1, 2, 3, 4;\ \partial_4 = \frac{\partial}{\partial x_4} - \mu$$

The preceding equations differ from the Heisenberg equations of field theory as follows: 1) instead of time they contain $-ix_4$, whereby the four-dimensional space becomes Euclidean, 2) they contain the chemical potential. The following functional equations then result therefrom for :

$$(i\hat{p} + m - g\frac{\delta}{\delta J})\frac{\delta \varrho}{\delta \bar{\eta}(x)} = \eta(x)\varrho,\ \frac{\delta \varrho}{\delta \eta(x)}(-i\hat{p} + m - g\frac{\delta}{\delta J}) = +\bar{\eta}(x)\varrho -$$

$$- \hat{k}^2\frac{\delta \varrho}{\delta J} = J(x)\varrho + gSp\frac{\delta^2 \varrho}{\delta \eta(x)\delta \bar{\eta}(x)}$$

The operator solution for the statistical sum is then derived. The expression for this solution also may be easily written down as an infinitely dimensional integral. There are 4 references, 1 of which is Soviet.

Card 3/4

SOV/20-125-1-16/67

Functional Equation and Operator Solution for a Statistical Sum

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

PRESENTED: November 20, 1958, by I. Ye. Tamm, Academician

SUBMITTED: October 28, 1958

Card 4/4

24(5)

AUTHOR: Fradkin, Ye. S.

SOV/20-125-2-18/64

TITLE: The Method of Green Functions in Quantum Statistics (Metod funktsiy Grina v kvantovoy statistike)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 2, pp 311-314 (USSR)

ABSTRACT: In an earlier paper (Ref 1) a system of functional equations was derived for the state integral in quantum statistics. In the present paper the method of Green's functions was investigated for the solution of these functional equations. Here the author has the application of the results found in the course of the present investigation to processes of high and low energies in mind, and therefore the entire operation is formulated in consideration of the relativistic corrections. The author investigates the interaction between the Fermi-field ψ of the mass m and the Bose-field φ of the mass $\varkappa$. In this case the system of equations

$$(i\hat{\partial} + m - ig\gamma\frac{\delta}{\delta J(x)})\frac{\delta z}{\delta\bar{\eta}(x)} = \eta(x)z,$$

Card 1/3

$$\left(-\frac{\partial^2}{\partial x_\nu^2} + \varkappa^2\right)\frac{\delta z}{\delta J(x)} = J(x)z + ig\,\mathrm{Sp}\frac{\delta^2 z}{\delta\bar{\eta}(x)\delta\eta(x)} \quad \text{with}$$

$z = \mathrm{Tr}(\rho(\hat{H} - \mu\hat{N}))$ is obtained for the integral of state. Here $\rho(\hat{H} - \mu\hat{N})$ denotes the density matrix of the canonic assembly; $\hat{H}$ - the operator of the complete Hamiltonian of the system, including the external sources of the Bose-field $(J(x))$ and of the Fermi-field (η); $H = H_0 + H_1$; H_0 denotes the Hamiltonian of the free fields. Also the expression for H_1 is explicitly written down. The author does not commit himself with respect to the exact form of the interaction γ and the invariance properties of the field φ. A system of equations is then derived for the "single-particle" Green's functions, which were for the first time introduced by Matsubara (Ref 2). This system of equations may be simplified, and the necessary boundary conditions may be derived from the spectral representations for the introduced quantities. The "single-particle" functions G,D,Γ depend only on the difference

of the coordinates. Following this, the system of equation is written down also in p-representation. By means of the aforementioned Green functions it is possible to derive also the time-dependent functions of quantum statistics. The system of equations derived here offers considerable advantages as against its field-theoretical analogue: 1) For its derivation the stability of the ground state and of the single-particle state were not used in connection with the beginning of interaction. 2) Because of the Euclidity of the x-space Green's functions in the p-space have no poles, and division by G^{-1}, D^{-1} is always unique. There are 2 references, 1 of which is Soviet.

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

PRESENTED: December 1, 1958 by I. Ye. Tamm, Academician

SUBMITTED: November 18, 1958

FRADKIN, Ye. S., Doc Phys-Math Sci -- (diss) "Method of Green's functions in the theory of quantum fields and in quantum statistics." Moscow, 1960. 9 pp; (Academy of Sciences USSR, Inst of Theoretical and Experimental Physics); 100 copies; price not given; bibliography at end of text (40 entries); (KL, 25-60, 125)

FRADKIN, Ye.S.

Some general relations in statistical quantum electrodynamics.
Zhur. eksp. i teor. fiz. 38 no.1:157-160 Jan '60. (MIRA 14:9)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.
(Quantum electrodynamics)

KIRZHNITS, D.A.; FAYNBER, V.Ya.; FRADKIN, Ye.S.

Structure of Green's function of a photon. Zhur. eksp. i teor. fiz. 38 no.1:239-242 Jan '60. (MIRA 14:9)

1. Institut im. P.N.Lebedeva AN SSSR.
(Potential, Theory of) (Photons)

MILEKHIN, G.A. [deceased]; FRADKIN, Ye.S.

Log-log approximation in quantum electrodynamics. Zhur. eksp. i teor. fiz. 45 no.6:1926-1939 D '63. (MIRA 17:2)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.

ACCESSION NR: AP4025934 S/0056/64/046/003/1025/1032

AUTHORS: Babak, V. G.; Ignatovich, V. K.; Fradkin, Ye. S.

TITLE: Asymptotic value of the interaction cross section of two Fermi particles in the e^4 approximation

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 46, no. 3, 1964, 1025-1032

TOPIC TAGS: Fermi particle, high energy Fermi particle, interaction cross section, asymptotic cross section doubly logarithmic accuracy, e^4 approximation, electron electron scattering, electron positron scattering, electron muon scattering, muon pair production, electron pair annihilation, colliding beam experiment, Regge pole trajectory, perturbation theory series

ABSTRACT: The purpose of the study is to establish correct expressions for the following cross sections: electron-electron scattering,

Card 1/3

ACCESSION NR: AP4025934

electron-positron scattering, electron-muon scattering, and muon pair production following annihilation of an electron pair. Asymptotic values valid for all angles are obtained (in the e^4-approximation) with doubly-logarithmic accuracy for the cross section of interaction of two high energy Fermi particles. These asymptotic values are of interest in view of the planned colliding-beam experiments proposed to check on the laws of electrodynamic at small distances, and also in view of attempts at obtaining the Regge-pole trajectory with the aid of perturbation theory series. It is shown that near 180° the electron positron cross section decreases, in agreement with the work of Milekhin and Fradkin (ZhETF v. 45, 1926, 1963), and in sharp contrast with the results of A. A. Abrikosov (ZhETF v. 30, 545, 1956). Misprints contained in papers of other investigators are pointed out. Orig. art. has: 1 figure and 44 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR

Card 2/3

ACCESSION NR: AP4025934

(Physics Institute, AN SSSR)

SUBMITTED: 17Aug63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 001

Card 3/3

FRADKIN, Ye.S.

Method of Green's functions in quantum field theory and in quantum statistics. Trudy Fiz. inst. 29:7-138 '65.

Stability of an arbitrary one-dimensional hydrodynamic flow. Ibid.:250-256

Refraction and reflection of a shock wave from the interface of two media of different density. Ibid.:257-278

(MIRA 18:8)

BELEN'KIY, S.Z. [deceased]; FRADKIN, Ye.S.

Turbulent mixing theory. Trudy Fiz. inst. 29:207-238 '65.
(MIRA 18:8)

FRADKINA, D. L. Cand Agr Sci -- (diss) "~~The Influence~~ Effect of ~~Square and Square-Nest Distribution~~ check-row placement of Sugar Beet Plants on ~~the~~ their check Growth and Development ~~of Sugar Beet~~ Under Conditions of the Humid Climate of the Latvian SSR." Mos, 1957. 18 pp 20 cm. (Mos Order of Lenin Agricultural Academy im K. A. Timiryazev), 110 copies

(KL, ~~25-57~~ 25-57, 116)

USSR/Cultivated Plants - Commercial. Oil-Bearing. Sugar-Bearing. M-5

Abs Jour : Ref Zhur - Biol., No 7, 1958, 29942

Author : Fradkina, D.L.
Inst : -
Title : Features of Sugar Beet Growth and Development with Square Planting.

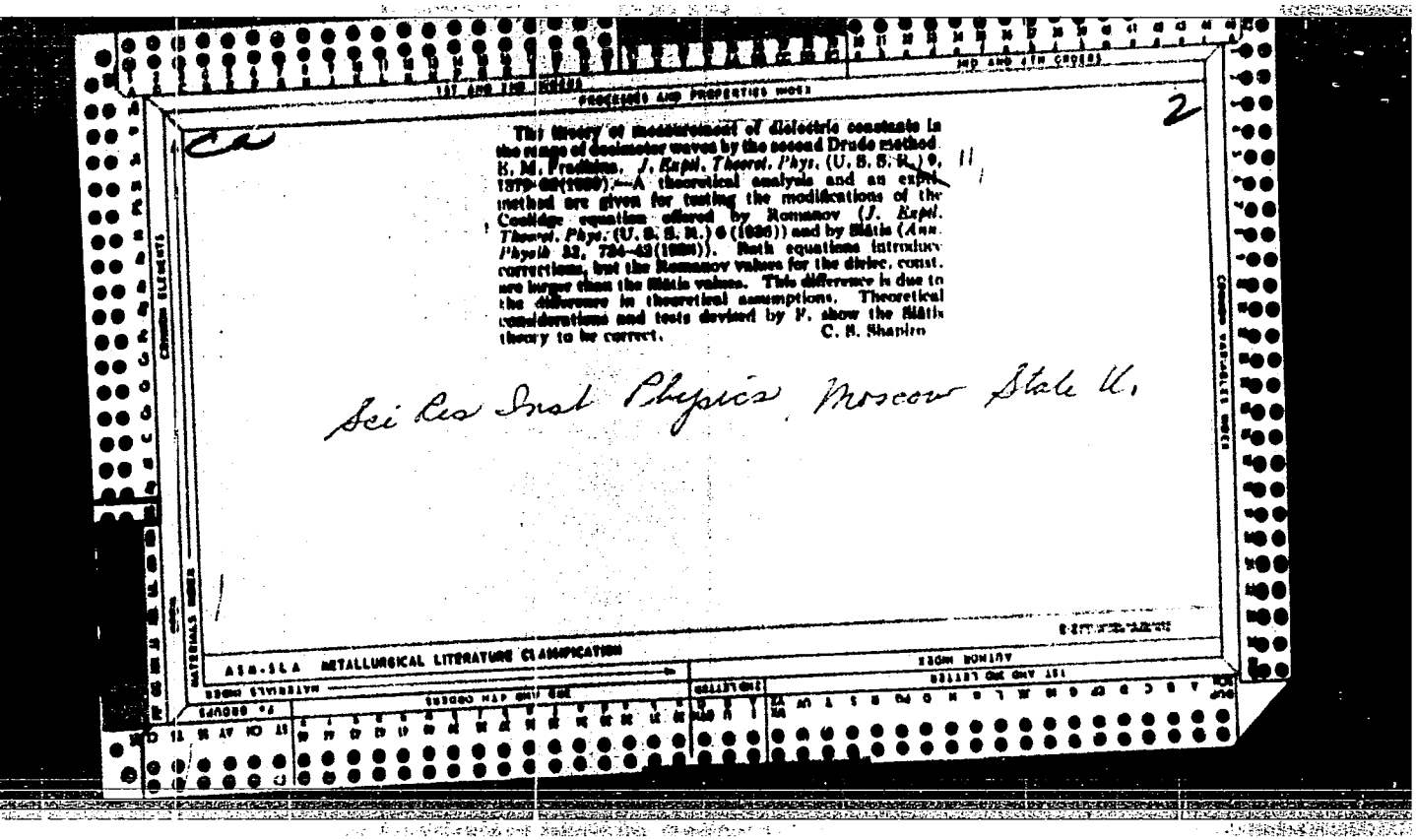
Orig Pub : Sakharnaya svekla, 1957, No 2, 23-31

Abstract : Field tests with the M_2E, V23, Yanash and J752 varieties were made at the Mezhotnenskaya Experimental Selection Station in the Latvian SSR in 1952-1954 on turf carbonate soil. The square planting placement stimulated the intensive leaf and root growth in the sugar beet plants. In 1952 the average root weight at the end of vegetation in square beds reached 1462, and with ordinary beds 528 g.; in 1953 it was respectively 2352 and 791 g. The saccharinity of the roots with square planting was 18.3% in 1953, and with ordinary planting 19.6%.

Card 1/2

FRADKINA, D. L.

Cand Agr Sci - (diss) "Change in the biological characteristics of varieties of sugar beet under various conditions of growing and selection." Kiev, 1961. 22 pp; (Ministry of Agriculture Ukrainian SSR, Ukr Academy of Agr Sci); 180 copies; free; (KL, 7-61 sup, 253)



The theory of measurement of dielectric constants in the range of decimeter waves by the second Drude method. E. M. Freidzon. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 9, 1979-88(1939).—A theoretical analysis and an experimental method are given for testing the modifications of the Coolidge equation offered by Romanov (*J. Exptl. Theoret. Phys.* (U. S. S. R.) 6 (1936)) and by Slätis (*Ann. Physik* 32, 734-43(1938)). Both equations introduce corrections, but the Romanov values for the dielec. const. are larger than the Slätis values. This difference is due to the difference in theoretical assumptions. Theoretical considerations and tests devised by F. show the Slätis theory to be correct. C. R. Shapiro

Sci Res Inst Physics, Moscow State U.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

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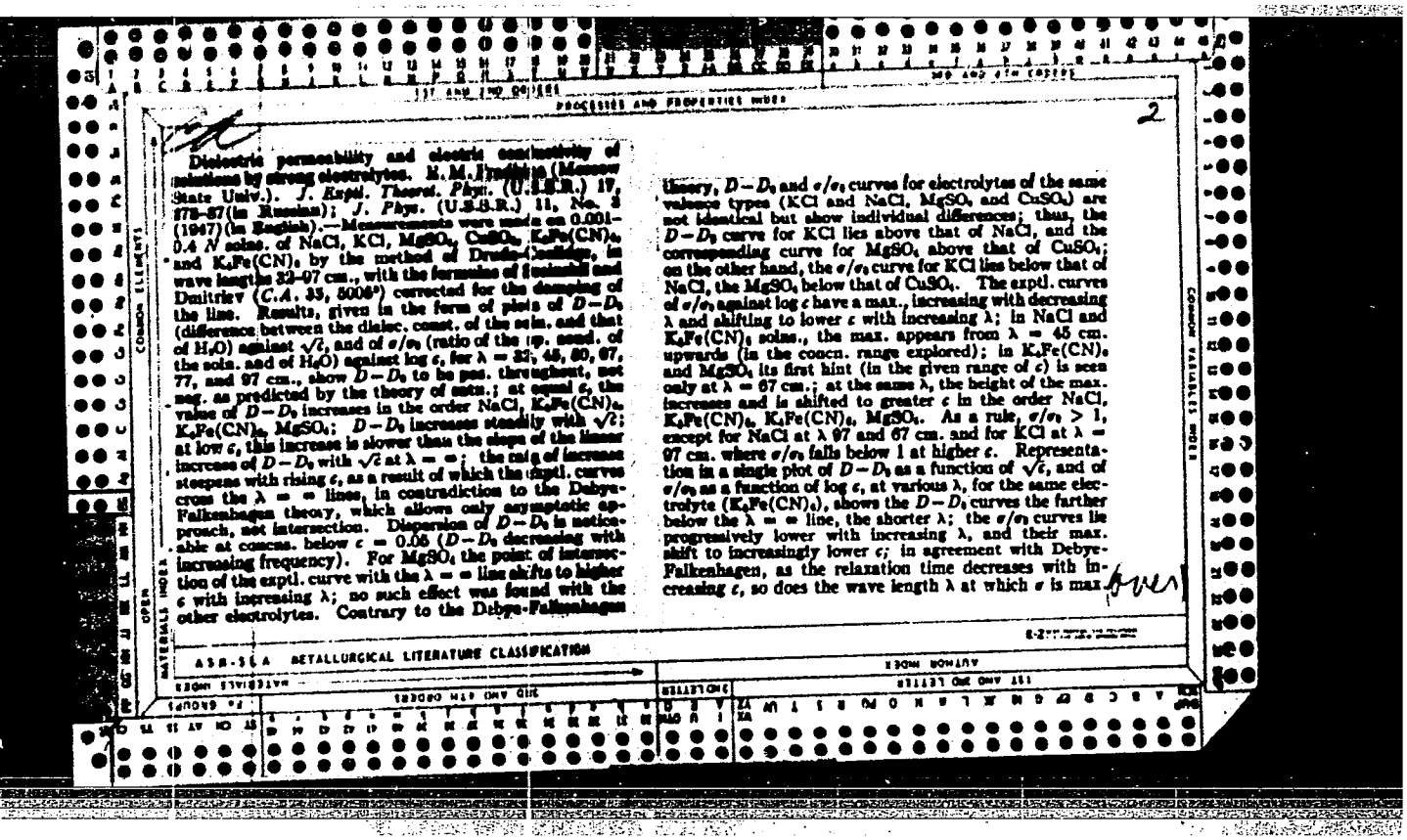
The energy equation in acoustics of moving media and some of its applications. [illegible]OKOV, M. F., AND FRADKINA, E. M. C.R. Acad. Sci. URSS, 52 (No. 1) 29-32 ([illegible]).—The energy equation is set up and applied to the sound field acting upon a moving sound receiver (e.g. one exposed to a wind or connected to an aircraft). A formula is deduced for the sound intensity registered by the receiver and a polar diagram of the distribution of sound intensity in the space surrounding the source is constructed. A general formula for the Doppler effect is established. L. S. G.

Moscow Aviation Inst.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

2

Dielectric permeability and electric conductivity of solutions of strong electrolytes. M. M. Dmitriyev (Moscow State Univ.). *J. Exptl. Theoret. Phys.* (U.S.S.R.) 17, 875–87 (in Russian); *J. Phys.* (U.S.S.R.) 11, No. 3 (1947) (in English).—Measurements were made on 0.001–0.4 *N* solns. of NaCl, KCl, $MgSO_4$, $CuSO_4$, $K_4Fe(CN)_6$, and $K_3Fe(CN)_6$ by the method of Drude-Cambridge, in wave lengths 32–97 cm., with the formulas of Fuoss and Dmitriev (*C.A.* 35, 8008[9]) corrected for the damping of the line. Results, given in the form of plots of $D-D_0$ (difference between the dielec. const. of the soln. and that of H_2O) against $\sqrt{c}$, and of σ/σ_0 (ratio of the sp. cond. of the soln. and of H_2O) against log c, for λ = 32, 45, 60, 67, 77, and 97 cm., show $D-D_0$ to be pos. throughout, not neg. as predicted by the theory of anom.; at equal c, the value of $D-D_0$ increases in the order NaCl, $K_4Fe(CN)_6$, $K_3Fe(CN)_6$, $MgSO_4$; $D-D_0$ increases steadily with $\sqrt{c}$; at low c, this increase is slower than the slope of the linear increase of $D-D_0$ with $\sqrt{c}$ at $\lambda = \infty$; the rate of increase steepens with rising c, as a result of which the exptl. curves cross the $\lambda = \infty$ lines, in contradiction to the Debye-Falkenhagen theory, which allows only asymptotic approach, not intersection. Dispersion of $D-D_0$ is noticeable at concns. below c = 0.05 ($D-D_0$ decreasing with increasing frequency). For $MgSO_4$ the point of intersection of the exptl. curve with the $\lambda = \infty$ line shifts to higher c with increasing λ; no such effect was found with the other electrolytes. Contrary to the Debye-Falkenhagen theory, $D-D_0$ and σ/σ_0 curves for electrolytes of the same valence types (KCl and NaCl, $MgSO_4$ and $CuSO_4$) are not identical but show individual differences; thus, the $D-D_0$ curve for KCl lies above that of NaCl, and the corresponding curve for $MgSO_4$ above that of $CuSO_4$; on the other hand, the σ/σ_0 curve for KCl lies below that of NaCl, the $MgSO_4$ below that of $CuSO_4$. The exptl. curves of σ/σ_0 against log c have a max., increasing with decreasing λ and shifting to lower c with increasing λ; in NaCl and $K_4Fe(CN)_6$ solns., the max. appears from λ = 45 cm. upwards (in the concn. range explored); in $K_4Fe(CN)_6$ and $MgSO_4$ its first hint (in the given range of c) is seen only at λ = 67 cm.; at the same λ, the height of the max. increases and is shifted to greater c in the order NaCl, $K_4Fe(CN)_6$, $K_3Fe(CN)_6$, $MgSO_4$. As a rule, $\sigma/\sigma_0 > 1$, except for NaCl at λ 97 and 67 cm. and for KCl at λ = 97 cm. where σ/σ_0 falls below 1 at higher c. Representation in a single plot of $D-D_0$ as a function of $\sqrt{c}$, and of σ/σ_0 as a function of log c, at various λ, for the same electrolyte ($K_4Fe(CN)_6$), shows the $D-D_0$ curves the farther below the $\lambda = \infty$ line, the shorter λ; the σ/σ_0 curves lie progressively lower with increasing λ, and their max. shift to increasingly lower c; in agreement with Debye-Falkenhagen, as the relaxation time decreases with increasing c, so does the wave length λ at which σ is max.

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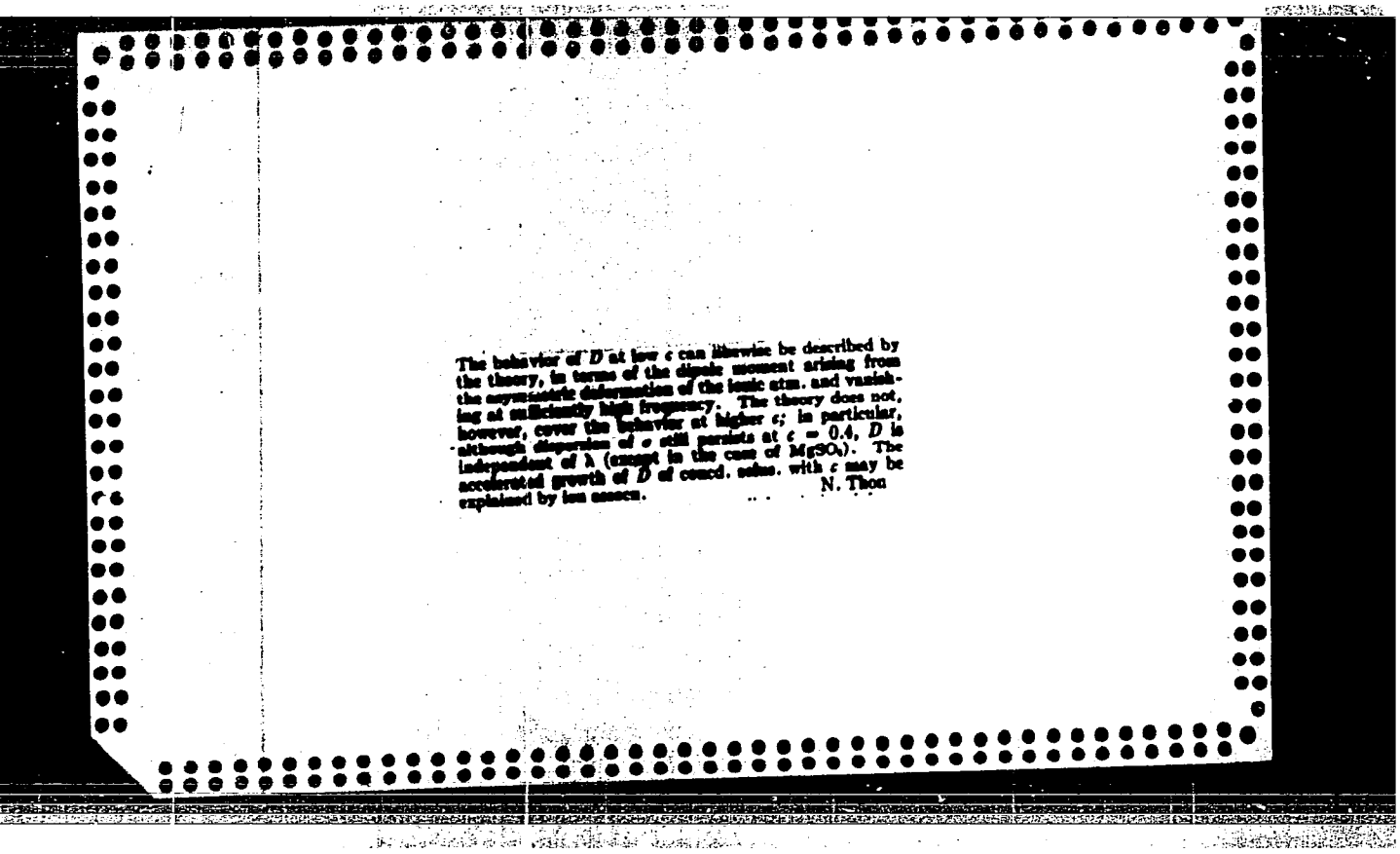
A S M - S E A METALLURGICAL LITERATURE CLASSIFICATION



The behavior of D at low c can likewise be described by the theory, in terms of the dipole moment arising from the asymmetric deformation of the ionic atm. and vanishing at sufficiently high frequency. The theory does not, however, cover the behavior at higher c; in particular, although dispersion of ϵ still persists at $c = 0.4$, D is independent of λ (except in the case of $Mg(SO_4)$). The accelerated growth of D at concd. solns. with c may be explained by ion assocn.

N. Thon

FRADKINA, E. M.

ID

USSR/Physics
Dielectrics - Constants
Electrolytes - Conductivity
Apr 1947

"The Work of O. K. Davtyan on the Dielectric Permeability and Conductivity of Electrolytes," E. M. Fradkina, M. F. Shirokov, I. A. El'tsin, 1½ pp

"Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki" Vol XVII, No 4

Authors maintain that there are a number of serious errors in two articles published in the "Journal of Physics" and "Izvestiya Akademii Nauk" by Davtyan on "Dielectrical Properties and Electrostriction of Solutions and Electrolytes," and "The Complexity of

34776

USSR/Physics (Contd) Apr 1947

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Electrical Conductivity of Electrolytes in an Alternating Electric Field." Eight equations are presented to show the errors in Davtyan's work.

34776

USSR/Chemistry - Dispersed Systems May/Jun 1948
Chemistry - Electric Moments

"Electrical Parameters of Dispersed Systems," Ya. I. Frenkel', E. M. Fradkina, Phys Tech Inst, Acad Sci USSR, Leningrad, 4 pp

"Kolloid Zhur" Vol X, No 3

Show how Frenkel's formula for electrical moments induced in conducting ball-shaped drop can be used for making subject calculations. Submitted 28 Aug 1947.

[redacted] 78T11

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Electric parameters of disperse systems. E. M. Pratkina (Moscow Aviation Inst.). *Zhur. Eksptl. Teoret. Fiz.* 20, 1011–18(1950).—Frenkel's (*C.A.* 43, 7776*f*) expression of the elec. moment p induced in a spherical drop of radius a and dielec. const. ϵ_1 placed in a medium of dielec. const. ϵ and an external field E_0, $p = E_0a^3(1 - \alpha)/(1 + \alpha)$ (where α is a certain function of γa, and $\gamma^2 = \kappa^2 + (i\omega/D)$, with κ = reciprocal radius of the ionic atm.), leads to an expression for the mean macroscopic dielec. const. $\delta = \epsilon_0[1 + 3f(1 - \alpha)/(1 + 2\alpha)]$, where f = relative vol. of the spherical drops. For emulsions of not too dil. aq. solns. of electrolytes in petroleum, $\gamma a \gg 1$, $\alpha = 0$, and $\delta = \epsilon_0(1 + 3f)$, i.e. depends solely on the H_2O content of the emulsion and does not depend either on the electrolyte concn. or on the dispersity. This formula can also be derived from $\delta = \epsilon_0[1 + (4\pi P/E_0)]$, with the polarization $P = (3/4\pi)fE_0$ valid for ideally conducting spheres. If the spheres have a dielec. const. ϵ_1, the expression is $\delta = \epsilon_0[1 + 3f(\epsilon_1 - \epsilon_0)/(\epsilon_1 + 2\epsilon_0)]$; for pure H_2O ($\epsilon_1 = 80$) in petroleum ($\epsilon_0 = 2$), this becomes $\delta = \epsilon_0(1 + 3f \times 0.926)$. With the mutual perturbation of the emulsion drops taken into account, one has $\epsilon = \epsilon_0[1 + (3f/(1 - f - 1.63f^{10/9})]$; values computed with the aid of this formula, at f as high as 30%, differ by not more than 1% from those obtained with 4 terms of the development of the formula $\epsilon = \epsilon_0(1 + 2f)/(1 - f)$, derived from Wagner's (*Arch. Elektrotech.* 2, 378(1914)) expression for the elec. cond. of a system of isotropic spheres. In the case of ideally conducting emulsion drops, e.g. H_2O with a salt content of several 0.01% or higher, the effective elec. field is reduced by a factor of $(1 - f)$, which leads to the expression $\epsilon = \epsilon_0(1 + f)/(1 - 2f)$. This formula was tested by measurements, by the 2ω Drude method, on emulsions of 2 *N* aq. solns. of NaCl in petroleum, up to $f = 30\%$, with satisfactory agreement between the observed and the calcd. ϵ. The dielec. consts. of the emulsions show some upward trend with time.

N. Thon

FRADKINA, E.M.

Metr: 4E30/4E4f

1055. Fradkina, E. M., and Shirokov, M. F., The noise of a rotating aircraft propeller during its forward movement in a medium, and movement of the medium in relationship to the sound receiver (In Russian) *Trudi NAI* no. 51, 5-14, 1955; *Ref. Zh. Mekh.* 1956, Rev. 5068.

5
2

Application of the theory of a delaying potential to the equation of acoustics in Lamb's form enables the following equations to be obtained for the sound pressure set up in the moving unlimited medium by a variable volume force

$$p = \frac{e^{i\omega t}}{4\pi} \int_{\Omega} (K_a \operatorname{grad} f)\, dx\, dy\, dz,$$

$$f = \left[r'\left(1 - \frac{v}{c}\cos\vartheta\right)\right]^{-1} \exp\left(-\frac{i\omega r'}{c}\right)$$

In which $K_a(x,y,z)$ is the amplitude value of the density which varies according to the harmonic law with angular velocity ω of the volume force, f is the function of the coordinates of the power wave at the moment t, c the velocity of sound, r' the distance from the imaginary sound source to the observer, v the speed of movement of the medium, and ϑ the angle between r and v.

The point source of this type is an acoustic dipole, the sound characteristic of which essentially depends upon v/c and the orientation K. The equations obtained make it possible (using L. Ya. Gutin's method, *Zh. tekhn. Fiz.* 6, p. 899, 1936) to calculate the approximate value of the power radiation of the propeller. The sound field of the propeller in the moving medium cannot be

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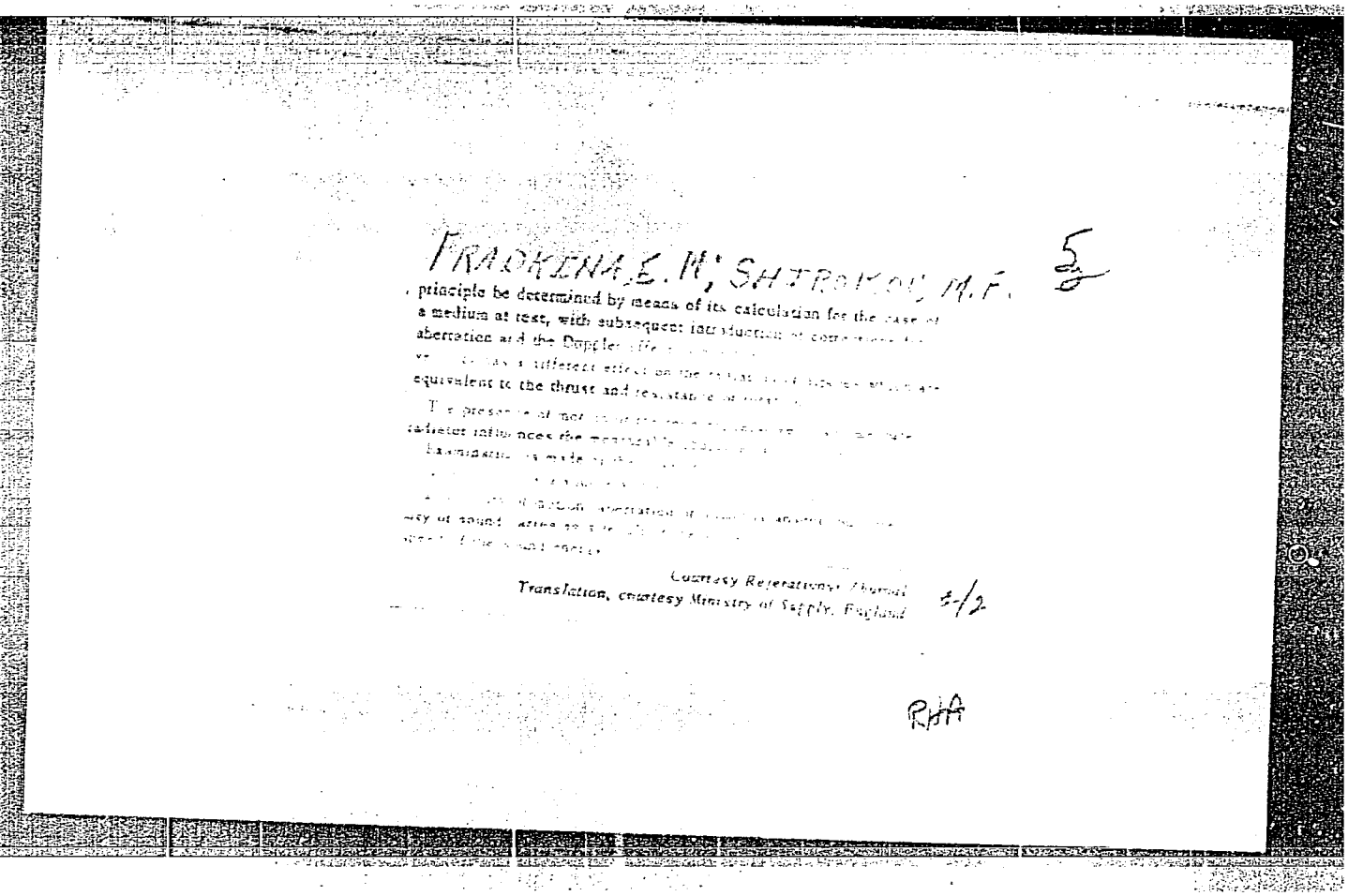

TRADKINA, E. M.; SHTROKOV, M. F. 5

principle be determined by means of its calculation for the case of a medium at rest, with subsequent introduction of corrections for aberration and the Doppler effect

equivalent to the thrust and resistance

radiator influences the

Courtesy Referativnyy Zhurnal
Translation, courtesy Ministry of Supply, England 5/2

RHA

FRADKINA, E.M.

USSR/Electricity - Dielectrics G-2

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 12102

Author : Fradkina, E.M.
Inst : -
Title : Method of Measuring the Dielectric Constant of Conducting Liquids and Dispersed Systems in UHF Fields.

Orig Pub : Kolloid. zh. 1956, 18, No 4, 480-484

Abstract : A method is proposed for measuring the dielectric constant of strongly-conducting liquids and dispersed systems in UHF fields with the aid of a measuring capacitor of new construction. The proposed capacitor has electrodes that are insulated from the investigated liquid and is mechanically stronger than those previously employed. It is calibrated by means of standard liquids. Examples are given of calibration curves for two wave lengths ($\lambda_1 = 166$ cm and $\lambda_2 = 99$ mm), and values are obtained for the dielectric constants of solutions of NaCl from 0-N to 4-N.

Card 1/2

Analysis is made of the errors of the method and ways are indicated for reducing these errors (increasing the number of standard liquids for a more accurate construction of the calibration curve, and decreasing the capacity of the source of UHF energy).

Card 2/2

FRADKINA, E.M.

USSR/Colloid Chemistry. Dispersion Systems B-14

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26416

Author : E.M. Fradkina, S.F. Khmunin
Title : Temporal Dependence of Dielectric Constant of Emulsions

Orig Pub : Kolloid. zh., 1956, 18, No 5, 604-608

Abstract : The dependence of the dielectric constant (ε) of emulsions (E) of distilled water and of 2 n. NaCl solution in heavy mineral lubricating oil and in fuel oil (mazut) on the time of measurement was investigated. ε was measured by the pulsation method at the frequency of 1 megacycle and by the second Drude method at 180, 300 and 1070 megacycles. A rapid rise of ε was observed at 1 megacycle; the speed of the rise increased together with the rise of the concentration of the dispersion phase and with the drop of the viscosity of the dispersion medium; ε is greater in E-s of NaCl solutions than in E-s of water. It is surmised that the dependence on time at a given frequency is connected with the formation of chains of drops of the dispersion phase. The rise speed of ε in ultrahigh frequency fields is several times less; it depends on the temperature, the viscosity of the dispersion medium, and the dif-

Card : 1/2