"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

BEREZANTSEV, Vsevolod Glebovich, doktor tekhn. nauk, prof.; KSENOFONTOV, Aleksandr Ivanovich, kand. tekhn. nauk, dots.; PLATONOV, Yevgeniy Vladimirovich, prof.; SIDOROV, Nikolay Nikolayevich, kand. tekhn. nauk, dots.; YAROSHENKO, Vsevolod Aleksandrovich, kand. tekhn.nauk, dots.; GOL'DSHTEYN, M.N., doktor tekhn. nauk, prof., retsenzent; TERLETSKIY, V.P., inzh., retsenzent; LAPIDUS, L.S., inzh., retsenzent; ZHEREBTSOV, I.V., inzh., retsenzent; GLOTOV, N.M., inzh., retsenzent; SILIN, K.S., inzh.,retsenzent; SURODEYEV, V.P., inzh., red.; KHITROV, P.A., tekhn. red.

[Soil mechanics and foundation engineering] Mekhanika gruntov, osnovaniia i fundamenty. Moskva, Vses. izdatel'sko-poligr. ob"edinenie M-va putei soobshcheniia, 1961. 339 p. (MIRA 14:8)

(Soil mechanics) (Foundations)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, V.P.

Approximation solution of a contact problem. Vop. geotekh. no.6:81-89 '63. (MIRA 17:9)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

84464

S/123/59/000/010/022/068
A004/A001

18.6200 2308, 1417, 1497

Translation from: Referativnyy zhurnal, Mashinostroyeniye, 1959, No. 10, p. 109, # 38023

AUTHOR: Terletskiy, V.Ye.

TITLE: Ceramet Articles in the Electrical Engineering Industry

PERIODICAL: Byul. tekhn.-ekon. inform. Sov. nar. kh-va Khar'kovsk. ekon. adm. r-na, 1958, No. 1, pp. 36-40

TEXT: Ceramet articles are applied for electro-contact materials used as breaking and current-carrying contacts of automatic on-off switches, contactors, starters, electronic devices, high-voltage oil and air switches. Contact materials have the following compositon: Ag-W, Ag-Ni, Ag-Mo, Ag-graphite, Cu-W, Ag-CdO. The A3130 and A3140 apparatus manufactured by the KhEMZ Plant for stationary contacts have the composition Ag-Ni graphite, which is distinguished by a higher mechanical strength and preserves some of the properties of the Ag-graphite composition. The size of the powder particles should not exceed 50-60 μ. Pressing is effected in multiple-position press-molds with a specific

Card 1/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

84464

S/123/59/000/010/022/068
A004/A001

Ceramet Articles in the Electrical Engineering Industry

pressure of 2-2.5 t/cm^2. A number of press-molds of original design have been developed which make it possible to obtain articles of complex configuration with one motion of the press. The allowance for pressing amounts to 0.2-0.5 mm. Sintering takes place at a temperature which amounts to $\frac{2}{4}$ of the melting point of the main component. Contacts on the basis of Ag are sintered at 800-850°C in H_2, those with a CdO base are sintered at the air. Shrinkage during the sintering process depends on the composition and amounts to 0.5-11%. Sintered contacts are subjected to two-fold calibration and intermediate annealing. Self-lubricating bronze-graphite bearings are manufactured for the ВЭ-1 (VE-1) and ВЭ-3 (VE-3) electric fans (replacing textolite bearings) and for the УСМ-1 (USM-1) washing machines (replacing cast bronze bearings). Bronze-graphite bearings are sintered at 700-750°C in H_2 for one hour, then they are oil-impregnated during 4-6 hours at temperatures between 100 and 120°C. The pore volume filled with oil is 20-25%. The bearing structure consists of tin bronze with graphite inclusions. Works were carried out to replace bronze-graphite bearings by ferrographite ones which, after oil hardening, have ferrite-pearlitic and pearlitic structures. H_B amounts to up to 200 at a volumetric oil

Card 2/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/122-58-7-29/31

AUTHORS: Yufa, E.P., Engineer and Terlazskiy, V.Ye.

TITLE: Powder Metallurgical Components (Metallokeramicheskiye izdeliya)

PERIODICAL: Vestnik Mashinostroyeniya, 1958, Nr 7, pp 84-85 (USSR) 38.

ABSTRACT: The advantages and production methods are surveyed with emphasis on electric contact and antifriction materials. Controlled porosity in contact materials enables the pores to hold the low-melting alloy fused by the breaking arc, which prevents welding. A contact pair, with a stationary contact of a silver carbon composition and a moving contact of a silver nickel composition has been successful. To increase the mechanical strength of the moving contact, a new silver nickel carbon composition permitting up to 8 kg/cm^2 pressure compared with 4 in the older type, has been developed under the direction of L.S. Palatnik, Doctor of Physical and Mathematical Sciences, Professor, by the Khar'kovskiy elektromekhanicheskiy zavod (Khar'kov Electro-mechanical Works) in co-operation with departments of the Khar'kovskiy gosudarstvennyy universitet (Khar'kov State University) imeni Gor'kogo and Khar'kovskiy politekhnicheskiy institut (Khar'kov Polytechnical Institute)

Card1/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/122-58-7-29/31

Powder Metallurgical Components

imeni Lenina. Another group of materials, a composition of silver and cadmium oxide, is used in AC relays working in special atmospheres. The silver powder is prepared at the Khar'kov Works by the electrolytic method which produces a sponge of 10 μ particles. A special method for pulverising the sponge avoids work-hardening the particle surfaces and a loss of dendritic structure. In the pressing of components, the observance of optimum pressure is vital. Experience of the Khar'kov Works has shown that the porosity can be reduced to 2-3%, instead of the customary 5-7%. Sintering is carried out in a hydrogen atmosphere at 850 °C during 2.5 hours. Silver-cadmium oxide components are sintered without protective atmosphere for 1 hour at 830 - 850 °C. Calibration follows at pressures of 4 000 - 5 000 kg/cm^2. Oil-impregnated bronze-graphite bearings are made by the Khar'kov Works. Iron graphite bearing sleeves up to 150 mm dia and 60 mm length for silent electric motors are being developed by the works in co-operation with the Institut metallokeramiki AN USSR (Powder Metallurgy Institute of the Ukrainian Ac.Sc. SSR). Made with 20-25% porosity, the composition contains 97% iron powder and 3% graphite. Carburising

Card2/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Powder Metallurgical Components SOV/122-58-7-29/31

by sintering in a carburising medium is practised on powder metallurgical iron components. It is stated that bearings of a table top fan made of an iron-graphite composition have seven times the service life of fabric reinforced plastic bearings and twice the service life of bronze graphite bearings.
There is 1 table.

Card 3/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/126-6-3-22/32

AUTHORS: Palatnik, L. S., Levchenko, A. A., Bogdanova, A.F. and Terletskiy, V. Ye.

TITLE: Determination of the Type of Equilibrium Phase Diagram for Cu-Ni at High Temperatures by Spectral Analysis. II. (Opredeleniye tipa diagrammy ravnovesiya Cu-Ni v oblasti vysokikh temperatur metodom spektral'nogo analiza. II)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 3, pp 540-544 (USSR)

ABSTRACT: Palatnik's spectral method (Ref 1) is applied to systems consisting of liquid plus vapour; the method utilises the fact that the selective evaporation (or retention) of a component is dependent on the type of interaction (i.e. ultimately the type of euilibrium diagram). Spark discharges are passed through the vapour, using as solid electrode a sample of the alloy; the surface of the electrode becomes depleted by selective evaporation (solid-state diffusion negligible). The main application is to binary systems, in which only three types of diagram exist, and where the type of diagram can therefore be readily established (from the deviations from Raoult's

Card 1/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/126-6-3-22/32

Determination of the Type of Equilibrium Phase Diagram for Cu-Ni at High Temperatures by Spectral Analysis. II.

law on varying the composition). The Cu-Ni alloys used were prepared by sintering the pressed powders in hydrogen at 950°C for one hour. The Cu was electrolytic; the Ni was prepared from nickel oxalate by hydrogen reduction. Fifteen alloys were used. Spark lines of Cu II and Ni II were used as reference lines; the wavelenths are given in Table 2. Fig. 2 shows how the experimental curve (top) compares with the liquid-vapour (middle) and solid-liquid (bottom) equilibrium curves. It is pointed out that the middle curves are really only deduced from the experimental spark curves, and are only very approximately correct. The tendency to selective evaporation, although slight, indicates that a narrow two-phase region may exist in the liquid. There are 2 tables, 3 figures and 2 references, one of which is a Soviet original and the other a translation of a work by Hansen.

Card 2/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/126-6-3-22/32

Determination of the Type of Equilibrium Phase Diagram for Cu-Ni at High Temperatures by Spectral Analysis. II.

ASSOCIATIONS: Khar'kovskiy gosudarstvennyy universitet imeni A. M. Gor'kogo (Khar'kov State University imeni A. M. Gor'kiy) and Khar'kovskiy politekhnicheskiy institut imeni V.I.Lenina (Khar'kov Polytechnical Institute imeni V. I. Lenin)

SUBMITTED: September 15, 1956

1. Copper-nickel alloys--Analysis 2. Copper-nickel alloys--Sintering
3. Copper-nickel alloys--Phase studies 4. Hydrogen--Applications

Card 3/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

S/137/62/000/001/058/237
A060/A101

AUTHOR: Terletskiy, V. Ye.

TITLE: Preparation of brass powder and of metallo-ceramic brass articles by the method of diffusion saturation from the gaseous phase

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 1, 1962, 39, abstract 10293 ("Poroshk. Metallurgiya", 1961, no. 3, 35-39, English summary)

TEXT: Brass powder was prepared by roasting a mixture of brass shavings and Cu powder in a closed container at 670 - 700°C for 1 hour. The Zn content in the powder after such a roasting constituted ~20.9%. The process of brass plating may be combined with sintering. Cu briquets were loaded in a container and poured over with Al_2O_3 and brass shavings (50 : 50), the sintering was carried out in the furnace without a protective environment at 800 - 900°C for 0.5 - 1 hour. By varying the initial porosity, it is possible to obtain both a throughout saturation with Zn and a layer of definite thickness. Zn saturation may be carried out for a mixture of 50% Cu - 50% Fe, and others.

R. Andriyevskiy

[Abstracter's note: Complete translation]

Card 1/1

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

41901
S/220/62/000/004/011/012
E073/E203

1.1600

AUTHOR: Kagan, Ya.I., Terletskiy, V.L., Sidorenko, I.Ya. and Bundur, G.K.

TITLE: Investigation of the process of compression of ferro-magnetic powders

PERIODICAL: Poroshkovaya metallurgiya, no 4, 1962, 90-93

TEXT: The aim is to obtain data on the cold-working effect during the compression of metal powders. The maximum coercive force for nickel and iron powders samples, with densities ranging from 2.75 to 7.25 g/cm^3, was found for samples with a density of 5.5 g/cm^3. This fact, and the straight-line decrease in the coercive force with increase in the density of the same samples which underwent an annealing at 800°C, led the authors to the conclusion that the compression process of metal powders increases the deformation of their crystal lattices up to a certain limit. For the above powders this limit is expressed by the maximum coercive force found for samples with a density of 5.5g/cm^3. There are 4 figures.

ASSOCIATION: VNITElektromash, g. Khar'kov (VNITElectromash, Khar'kov)

Card 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

S/220/62/000/004/011/012
I003/I203

Investigation of the process...

SUBMITTED: December 23, 1961

Card 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Electrons in a field of plane nonpolarized electromagnetic waves from the point of view of the Dirac equation. D. M. Volkov. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 7, 1291 (1937). **The limiting transition of quantum into classical mechanics.** Ya. P. Terletskii. *Ibid.* 1200 8.

The change of width of a wave packet with time and the transition of the quantum mechanics of a particle with a density probability function to the classical gas kinetic equation are discussed. F. H. Rathmann

ASTIA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P.

"Generalization of the Theorem Showing the Impossibility of a Classical Interpretation of Magnetism," Zhur. Eksper. i Teoret. Fiz., 9, No 7, 1939.

Sci. Res. Inst. Physics, Moscow State U.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLITSKIY, Ya. P.

"An Examination of a Generator of Electronic Rays with a Brake in the Electrical Field," Dok AN No 7, 1941.

Phys. Inst., Moscow State U.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

3

CA

Relativistic problem of the movement of an electron in a parallel alternating magnetic field with axial symmetry. Ya. P. Terletskii. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 11, 96-100(1941).—Theoretical. A partial solution is obtained. A possible practical application for the production of very fast particles is discussed. F. H. R.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P.,

"Calculation of the Steady-State Amplitude for the Simplest Electron Beam Oscillator with a Retarding Field," Radiotekh, 1-47, 61. Moscow State University, 1945--.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3rd AND 4TH ORDERS

3

Stability of the electron motion in an induction accelerator of the betatron type. Ya. Terletskii (Moscow State Univ.). *J. Phys.* (U.S.S.R.) 9, 159-66(1945).—Calcns. looking toward construction of a betatron having no Fe cores in the solenoids.

A. O. Allen

COMMON ELEMENTS

OPEN

MATERIALS INDEX

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

CA

V

Hydrodynamic theory of the translational Brownian motion. V. Vladimirskii and Ya. Terletskii (P. N. Lebedev Phys. Inst., Acad. Sci. U.S.S.R., Moscow State Univ.). *J. Exptl. Theoret. Phys.* (U.S.S.R.) 15, 258-63 (1945)(in Russian).—Theoretical. Since the Einstein-Smoluchowski formula for the mean square displacement of a particle is valid only for sufficiently long intervals of time, a new theory is developed leading to a more complex formula valid for short time intervals. In the development, Stokes' formula for the force acting on the particle in the fluid medium is replaced by the more complete formula of Boussinesq (1902). The Ornstein-Langevin formula for the mean square displacement is shown to be a special case of the exact expression and to apply only to gases. N. Thon

Phys. Inst. im. P.N. Lebedev, AS USSR
Moscow State U.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

PROCESSES AND PROPERTIES INDEX

Geophysical and Extraterrestrial Phenomena

W.E.

75

523.105 523.7 525.2

On Currents of Fast Charged Particles induced by Revolving Magnetized Cosmic Bodies. J. P. Terlezky. (C. R. Acad. Sci. U.R.S.S., 20th April 1945, Vol. 47, No. 2, pp. 101-102.) An electric field is induced around the earth and sun owing to the non-coincidence of their magnetic axes and axes of rotation. This field will accelerate charged particles. The maximum energy attainable in the earth's field due to this cause is 3 10⁸eV and in the sun's field 2 10⁸eV. Similar phenomena associated with other stars may induce currents of particles with energies of the order of that of cosmic ray particles.

Jan '46

Physics Dept., Moscow State U. im. M.V. Lomonosov

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA.

PA 54T70

USSR/Nuclear Physics - Cosmic Radiation Jul/Aug 1946
Nuclear Physics - Acceleration

"Induction of Fast Charged Particles Currents by Rotating Magnetized Cosmic Bodies," Ya. Terletskiy, Moscow State U, 6 pp

"Journal of Physics USSR" Vol X, No 4

Calculation of motion of charged particles in the electromagnetic field of a rotating magnetized cosmic body with noncoincident magnetic and geographic poles, and of the energy up to which particles can be accelerated in such field. Received, 5 Jan 1945.

[redacted] 54T70

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya.P.

Is thermodynamic reversibility a consequence of quantum mechanics? Zhur. eksp.i teor.fiz. 17 no.9:837-844 '47. (MLRA 6:7)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Thermodynamics) (Quantum theory)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

PA 7/49T90

TERLETSKIY, YA. P.

USSR/Nuclear Physics - Cosmic Radiation May 48
Nuclear Physics - Accelerators

"Magnetized Stars as Induction Accelerators Producing Cosmic Rays," Ya. P. Terletskiy, Moscow State U, 1 p

"Zhur Eksper i Teoret Fiz" Vol XVIII, No 5

In a letter to the editor, Terletskiy refers to recent articles in Russian scientific journals by Babcock and Bleket, for support of his hypothesis on the production of cosmic rays by revolving magnetized stars, which he first published in 1945.

7/49T90

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

PA 55/49T107

TERLETSKIY, YA. P.

USSR/Physics Dec 48
Rest Mass
Electromagnetic Waves

"The 'Rest Mass' of Electromagnetic Radiation," Ya. P. Terletskiy, Phys Faculty, Moscow State U. imeni M. V. Lomonosov, 4 pp

"Dok Ak Nauk SSSR" Vol LXIII, No 5

Finds equations to prove advantages of introducing the concept of rest-mass in electromagnetic radiation; but such radiation must not be represented as a stable formation moving with a certain velocity like a real body, since wave packets

55/49T107

USSR/Physics (Contd) Dec 48

limited in two directions must spread. Submitted by Acad S. I. Vavilov 13 Oct 48.

55/49T107

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya.P.; IVANENKO, D.D., otvetstvennyy redaktor; ORLOVA, N.S., tekhnicheskiy redaktor

[Dynamic and statistical laws of physics] Dinamicheskie i statisticheskie zakony fiziki. [Moskva] Izd-vo Moskovskogo univ., 1949. 95 p. [Microfilm]

(Physics)

(MLRA 9:11)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA. P.

PA 152T78

USSR/Nuclear Physics - Cosmic Rays Dec 49

"Origin of Cosmic Rays," Ya. P. Terletskiy, Moscow State U, 17 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 12

Shows that experimental and theoretical studies of recent years confirm the hypothesis on the generation of the primary component of cosmic rays by electrical fields that are induced by magnetic fields due to cosmic objects. By proceeding from an analysis of the trajectories of charges in electromagnetic fields of cosmic objects, one can discuss the various types of

[redacted]

152T78

USSR/Nuclear Physics - Cosmic Rays (Contd) Dec 49

"cosmic induction accelerators" which are able to generate cosmic rays. Describes total picture of the genesis of cosmic radiation. Submitted 29 Sep 49.

[redacted]

152T78

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

168T102

USSR/Physics - Molecules Sep 50
Academy of Sciences USSR

"Discussion: 'The Content of the Problem of Many Particles in Molecular Physics,'" Ya. P. Terletskiy, Moscow State U

"Zhur Eksper i Teoret Fiz" Vol XX, No 9, pp 854-859

Reveals that A. A. Vlasov denies materialistic science concerning nature of a body as proposed by M. V. Lomonosov and attempts to interpret classical problem of many particles of molecular

168T102

USSR/Physics - Molecules (Contd) Sep 50

physics in spirit of this departure from material position as just an accidental episode in Vlasov's scientific activity. Submitted 10 Dec 49.

TERLETSKIY, Ya. P.

168T102

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P. PA 175T95

USSR/Physics - Thermodynamics 21 Jun 50
Entropy

"Is the Increase in Entropy in the Infinite Universe Absolute?" Ya. P. Terletskiy

"Dok Ak Nauk SSSR" Vol LXXII, No 6, pp 1041-1044

Author holds usual concept of "heat death" of the universe to be improper and reactionary. Cites Engels' critical analysis of "heat theory" in his "Materialistic Dielecticism." Submitted 29 Apr 50 by Acad S. I. Vavilov.

[redacted] 175T95

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

5707

ENERGY SPECTRUM OF THE PRIMARY COMPONENT OF COSMIC RAYS. Ya. P. Terletskii and A. A. Logunov. Zhur. Eksptl'. i Teoret. Fiz. 21, 567-8(1951) Apr. (Letter to editor; in Russian)

Fermi sees in collisions between ions and moving magnetized clouds of interstellar matter the mechanism that accelerates primary cosmic particles (protons and other ions). However, owing to ionization losses, only ions whose initial energy exceeds certain threshold values, depending on the ions' atomic numbers, can thus be accelerated; it follows that another accelerating mechanism, probably involving magnetic fields of individual stars, must furnish the threshold energies. It is shown that these threshold values are high, reaching the order of magnitude of the mean energy of the cosmic primaries, and that the role of the Fermi mechanism is essentially that of a redistributor of energies. An attempt is made to calculate the corresponding distribution function.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

PROCESSES AND PROPERTIES INDEX

N

ORIGIN OF COSMIC RAYS. Ya P. Terletskiĭ. Uspekhi Fiz. Nauk 44, 46-69(1951) May. (In Russian)

In a synthetic view on recent hypotheses of the origin of cosmic rays, the primary source of energy of this radiation is sought in interstellar nuclear transformations which furnish the energy (1) to grand-scale eruptions by the stars of ionized matter of high electric conductivity and, thus, (2) to magnetic fields both around the star itself and around interstellar clouds that form from the erupted material; these fields act as inductive accelerators on some of the particles of the ejected matter, first while the particles are still within the rotating or pulsating magnetic field of the parent star, then during multiple collisions with wandering interstellar clouds. The primary component of the cosmic radiation is thus formed in a two-step acceleration process. The main accumulation of energy takes place during the first, stellar, phase, whereas the second (Fermi's) mechanism serves chiefly for the special homogenization of the radiation and for its redistribution according to the final energy spectrum. The author was among the first to point to stellar magnetic fields as probable accelerators of cosmic particles (Doklady Acad. Nauk S.S.S.R. 47, 104 945); Zhur. Ekspt'l. i Teoret. Fiz. 16, 463(1946)); he also resaw the presence of heavy ions in the primary component (Vestnik Mosk. Univ., 75(1948)).

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

FA 175T4

TERLETSKIY, YA. P.

USSR/Astronomy - Astrophysics, Solar 11 Jan 51
Electromagnetic Fields

"Problem of Propagation of Electromagnetic Spot Field Within the Solar Atmosphere," P. E. Kolpakov, Ya. P. Terletskiy, Moscow State U imeni Lomonosov

"Dok Ak Nauk SSSR" Vol LXXVI, No 2, pp 185-188

Despite strong ionization of solar atm, computation and observed phenomena prove propagation of electromagnetic fld within atm, inducing motion of chromospheric material and protuberances.

175T4

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

KORCHAK, A. A., TERLETSKIY, Ya. P.

Astrophysics.

Electromagnetic radiation of cosmic protons and radio-emanation of the galaxy. Zhur. eksp. i teor.fiz. 2 no. 4, 1952.

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

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA. P.

Physics

"Dynamic and statistical laws of physics." YA. P. Terletskiy. Reviewed by M. I. Shakhparonov. Vest. Mosk. un., 7, No. 3, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October, 1952 ~~1953~~. Unclassified

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, [Ya. P.]
TERLECKI, and KORCHAK, A.A.

Electromagnetic Emission from Cosmic Protons and the Galactic Radio Emission.

Zh. Exp. i Teor. Fiz., 22, (1952), 4, 507-509.

SO: Translation Sup.-2524467, 30 Dec 1954.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA. P.

Thermodynamics

"Fluctuational hypothesis" of Boltzmann Zhur.eksp. i teor. fiz. 22, no. 4, 1952.

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

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

USSR

523 161

10 **Distribution function of cosmic particles of the primary component.** Ya. P. TERLETSKII AND A. A. LOGUNOV *Zh. eksper. teor. Fiz.*, 23, *No.* 6 (12) 682-5 (1952) *In Russian.*

A study of the equation of diffusion of cosmic particles in the interstellar medium. The equation is obtained with the assumptions that the coefficient of diffusion is linearly dependent on the energy of the particles, and that the increase in the magnetic field, caused by the turbulent motion of the interstellar gas produces acceleration of the particles. The solution of the simplified equation of diffusion, with the [illegible] located nearer than some critical radius, gives [illegible] exponential distribution of the particles with [illegible] energies. The exponential index is [illegible] and is the same for protons and for ions [illegible]

P. KAGAN

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKII, YA. P.

RT-1337 [An explanation of the principles of the special theory of relativity]
Ob izlozhenii osnov spetsial'noi teorii otnositel'nosti.
Voprosy Filosofii, (4): 207-212, 1953.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya.P.; OVCHINNIKOV, N.F.; KUZNETSOV, I.F.

Concerning a "Discussion of the report of I.V.Kuznetsov." Reply to Ia.P. Terletskii. Usp.fiz.nauk 50 no.1:157-159 My '53. (MLRA 6:7)
(Kuznetsov, I.F.) (Force and energy)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA. P.

USSR/Nuclear Physics - Cosmic Rays' Origin Nov 53

"The Origin of Cosmic Rays and Radio-Astronomy," V. L. Ginzburg

Usp Fiz Nauk, Vol 51, No 3, pp 343-392

A review of current literature, Western and Soviet, on the subjects: cosmic radio-emanation and electron component of cosmic rays; movement of charged particles in interstellar space; the statistic mechanism governing the acceleration of particles in interstellar space and in the

272T54

---

shells of stars; theory of the solar origin of cosmic rays; the theory that supernovae and novae are the probable sources of cosmic rays. Cites 30 Western and 25 Soviet references: Ya. P. Terletskiy, G. G. Getmantsev, I. S. Shkloviskiy, L. A. Artsimovich, I. Ya. Pomeranchuk, V. V. Vladimirskiy, A. A. Sokolov, I. M. Frank, S. B. Pikel'ner, I. M. Gordon (DAN USSR, No 3, 1953), V. I. Gol'danskiy, A. L. Lyubimov, B. V. Medvedev, A. A. Logunov, L. E. Gurevich, and S. Z. Belen'kiy.

272T54

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

AMBARTSUMYAN, V.A., akademik, redaktor; GINZBURG, V.L., redaktor; LEYKIN, G.A., kandidat fiziko-matematicheskikh nauk, redaktor; MASSEVICH, A.G., kandidat fiziko-matematicheskikh nauk, redaktor; TERLETSKIY, Ya.P., doktor fiziko-matematicheskikh nauk, redaktor; SHKLOVSKIY, I.S., doktor fiziko-matematicheskikh nauk, redaktor; FRADKIN, M.I., redaktor; ALEKSEYEVA, T.V., tekhnicheskiy redaktor.

[Transactions of the Third Conference on Problems of Cosmogony, May 14-15, 1953. Origin of cosmic rays] Trudy...soveshchaniia...14-15 maia 1953 g.; proiskhozhdenie kosmicheskikh luchei. Moskva, Izd-vo Akademii nauk SSSR, 1954. 319 p. (MIRA 8:4)

1. Chlen-korrespondent AN SSSR (for Ginzburg).
(Cosmic rays)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P.

FD-611

USSR/Astronomy - Particle acceleration

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

Author : Logunov, A. A., and Terletskiy, Ya. P.

Title : Acceleration of charged particles by a moving magnetized medium

Periodical : Zhur. eksp. i teor. fiz. 26, 129-138, February 1954

Abstract : Analyze the process of acceleration of charged particles by a moving magnetized interstellar medium. Establish that the increase in the average energy of a particle is proportional to this average energy only for moderate values of the energy. For such values, when the radius of curvature of the particle's trajectory in the magnetic field exceeds the dimensions of the homogeneous portions of the magnetic field, the average energy increase declines as the energy increases.

Institution : Moscow State University

Submitted : July 23, 1953

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P.

FD-978

USSR/Physics - Gas-discharge plasma

Card 1/1 Pub. 146 - 2/20

Author : Konyukov, M. V., and Terletskiy, Ya. P.

Title : Electro-accoustic waves in gas-discharge plasma

Periodical : Zhur. eksp. i teor. fiz., 27, No 5 (11), 542-548, Nov 1954

Abstract : On the basis of the system of hydrodynamic equations for electron and ion gases and equations of electrodynamics the authors solve the problem of the propagation of electro-accoustic waves in plasma. They show that when the friction is taken into account the neutral gas and creation of particles in consequence of ionization in a cylindrically symmetric discharge can realize two types of running waves, along the axis of the discharge tube; namely, electronic and ionic. The electronic waves turn out to be rapidly damped, and the ionic waves are both damped and amplified. Acknowledge the consultation and advice of A. A. Zaytsev. Twelve references, 7 USSR (e.g. Yu. L. Klimontovich, ibid., 21, 1951; A. A. Logunov, ibid., 20, 1950; M. F. Shirokov, DAN SSSR, 89, 1953; G. V. Spivak and Ye. L. Stolyarova, Vestn. MGU, 5, 1952).

Institution : Moscow State University

Submitted : December 28, 1953

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P.

Structure of the [illegible]

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya.P., redaktor; GUSEV, A.A., redaktor; PRONCHENKOV, I.V., redaktor; VILLENEVA, A.V., tekhnicheskiy redaktor

[Problems of causality in quantum mechanics; collection of translations] Voprosy prichinnosti v kvantovoi mekhanike; sbornik perevodov. Moskva, Izd-vo innostrannoi lit-ry, 1955. 333 p. (MLRA 8:7)
(Quantum theory)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Category : USSR/Theoretical Physics - Quantum Mechanics B-4

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 5650

Author : [redacted]
Title : Introductory Article

Orig Pub. : Vopr. prichinnosti v kvantovoy mekhanike. Sb. perev., M., Izd-vo in. lit., 1955, 3-10

Abstract : See Referat Zhur Fizika, 1957, 168

Card : 1/1

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

MAGALINSKIY, V.B.; TURLETSKIY, Ya.P.

Statistics of a system manifesting charge conservation and the application of these aspects to the theory of multiple particle formation. Izv. AN SSSR Ser.fiz.19 no.6:617-623 N-D '55. (MLRA 9:4)

1.Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova. (Cosmic rays) (Nuclear physics)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P.

530.145

1934 THE STATISTICS OF CHARGE-CONSERVING
SYSTEMS AND ITS APPLICATION TO THE THEORY OF

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

FD-2877

USSR/Physics - Gravitational fluctuations

Card 1/1 Pub. 146 - 14/26

Author : Terletskiy, Ya. P.

Title : Discussion. Some more on fluctuations in gravitating systems

Periodical : Zhur. eksp. i teor. fiz., 29, August 1955, 237-241

Abstract : In connection with objections made by M. I. Shakhparonov (ibid., 27, 646, 1954) against the conclusions of the present writer (ibid., 22, 506, 1952; Trudy Vtorogo soveshchaniya po voprosam kosmogonii [Works of 2nd Conference on Problems of Cosmogony], Acad. Sci. USSR Press, 1953, 507-512), the author presents certain explanations in the present note that confirm the correctness of these conclusions, namely that for sufficiently large gravitating systems the magnitude of the fluctuations increases with increase in the dimensions of the system. This has been demonstrated by means of a simplified model of an isothermal ideal gas e.g. in a container (M. A. Leontoovich, Statisticheskaya fizika, OGIZ, State Technical Press, 1944). Eleven references: e.g. Ya. P. Terletskiy, DAN SSSR, 72, 1041, 1950; Voprosy filosofii, No 5, 1951; Dinamicheskiye i statisticheskiye zakony fiziki [Dynamic and statistical laws of physics], MGU Press, 1950; ZhETF, 17, 837, 1947.

Institution : Moscow State University

Submitted : November 22, 1954

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

FD-3350

USSR/Nuclear Physics - Cosmic Radiation TERLETSKIY, YA. P.

Card 1/1 Pub. 146-22/28

Author : Logunov A. A. and Terletskiy Ya. P.

Title : Diffusion coefficient of particles in the magnetized interstellar medium. (Letter to the editor)

Periodical : Zhur. Eksp. i Teor. Fiz., 29, No 5, 701-702, 1955

Abstract : Ratio of diffusion coefficient to particle energy is analyzed. This ratio is assumed to be linear within a certain energy range. Six references including three foreign.

Institution : Moscow State Universtiy

Submitted : May 25, 1955

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya.P.

FD-3264

USSR/Physics - Plasma waves

Card 1/1 Pub. 146-23/44

Author : Konyukov, M. V.; Terletskiy, Ya. P.

Title : Electroacoustic waves in gas-discharge plasma taking account of space recombination

Periodical : Zhur. eksp. i teor. fiz., 29, No 6(12), Dec 1955, 874-876

Abstract : Previously (ibid., 27, 542, 1954) the authors considered electroacoustic waves taking into account the generation of particles; however, they did not pay attention to space recombination, which exists together with recombination at the wall (Krefft, Reger, Rompe, ZS. f. techn. Phys., 14 242, 1933) and which plays an essential role in a number of cases, e. g. in molecular gases. In the present communication the authors clarify the role of space recombination in problems connected with the behavior of electroacoustic waves. They conclude that study of the influence of space recombination upon oscillations of electrons and ions in gas discharge shows that the variation of the damping coefficient during generation of particles through space ionization depends upon the role played by space and surface ionization in the realization of the stationary state. The authors thank A. A. Zaytsev and G. V. Spivak for consultation. Three references.

Institution : Moscow State University

Submitted : July 12, 1955

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

OMEL'YANOVSKIY, Mikhail Erazmovich; TERLETSKIY, Ya.P., otvetstvennyy redaktor; DEUYANOV, L.A., redaktor izdatel'stva; ZELENKOVA, Ye.V., tekhnicheskiy redaktor

[Philosophical problems of quantum mechanics] Filosofskie voprosy svantovoi mekhaniki. Moskva, Izd-vo Akademii nauk SSSR, 1956. 267 p. (MLRA 9:10)
(Quantum theory)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya. P.

USSR/Nuclear Physics - Cosmic Rays, C-7

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34115

Author: Logunov, A. A., Terletskiy, Ya. P.

Institution: None

Title: On the Acceleration of Charged Particles Moving in a Magnetized Medium

Original Periodical: Vestn. Mosk. un-ta, 1956, No 3, 63-66

Abstract: The possibility of accelerating charged particles is analyzed when the charged particles move in a magnetized interstellar medium under the condition that the process of the increase in the magnetic field by the kinetic energy of the turbulent motion of the interstellar gas has already been computed and all that occurs at the present time are fluctuations in the changes of the magnetic field in the individual regions. The analysis of the acceleration mechanism pertains to the region of particle energies, where the radius of the curvature of the trajectory in the magnetic field is much smaller than the average length of the homogeneous regions of the magnetic field. It is shown that in this case acceleration of the particles will always occur. The equations derived agree with the equations obtained by Fermi (E. Fermi, Physical Review, 1949, 75, 1169).

1 of 1

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA. P.

C-7

Category : USSR/Nuclear Physics - Cosmic rays

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 616

Author : Logunov, A.A., Terletskiy, Ya.P.
Inst : Moscow State University, USSR

Title : Diffusion and Acceleration of Charged Particles in Magnetized Interstellar Space.

Orig Pub : Izv. AN. SSSR, ser. fiz., 1956, 20, No 1, 22-23

Abstract : The diffusion and the process of acceleration of charged particles moving in a magnetized medium is analyzed under various assumptions concerning the ratio of the radius of curvature R_k, of the particles in the magnetic fields, and the average dimension L of the homo-geneous portion of the magnetic field. If $R_k \ll L$ one obtains the usual equations as obtained by Fermi, but if $R_k \gg L$, the degree of acceleration of the particles depends on the charge of the particles and obeys the following law

$$\frac{dE}{dt} = \frac{Z^2 e^2 u^2 H^2}{E} \tau$$

where E and Ze and the energy and the charge of the particles respectively, u the velocity of the inhomogeneities, and τ the average time that the

Card : 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Category : USSR/Nuclear Physics - Cosmic rays

C-7

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 616

particle stays in the homogeneous section of the magnetic field of intensity H. In this case, the coefficient of diffusion, $D \approx cE^2/Le^2H^2$, is proportional to the square of the particle energy.

Card : 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Category : USSR/Theoretical Physics - Quantum Field Theory B-6

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 216

Author : Terletskiy, Ya.P.
Inst : Institute of Nuclear Problems, USSR Academy of Sciences
Title : On Relativistic Repulsion Effects in Scalar Field and Attraction Effects in Vector Field

Orig Pub : Zh.eksperim. i tebr. fiziki, 1956, 30, No 2, 419-420

Abstract : The Klein-Gordon equation for a spinless particle interacting with a purely static vector field and with a scalar field is transformed into the usual non-relativistic Schroedinger equation with a certain effective potential. Considering the behavior of the effective potential at small distances, the author reaches the conclusion that (1) the purely attracting scalar potential leads to an effective potential that is attracting at greater distances and is repelling at smaller distances; (2) the purely repelling static vector potential leads to an effective potential that is repelling at greater distances and attracting at smaller distances. An example with a repelling static vector potential is considered. It is shown that repulsion can occur in a Coulomb field only

Card : 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Category : USSR/Theoretical Physics - Quantum Field Theory B-6

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 216

if the coupling constant is more than 15 times greater than the electron charge. All the author's results are in agreement with the results obtained by P. Ye. Kunin and I.M. Taksar (Izv. AN Latv SSR, 1952, 8, 137), Verle (RZhFiz, 1954, 11077), Marks and Samoshi (RZhFiz, 1956, 15766) and others.

Card : 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

~~TERLETSKIY, Ya.P.~~ TERLETSKIY, Ya. P.

SUBJECT USSR / PHYSICS CARD 1 / 5 PA - 1783
AUTHOR TERLECKIJ, JA.P.
TITLE On a Rational Symbolics of Elementary Particles.
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.4, 703-704 (1956)
Issued: 1 / 1957

According to the latest investigations on the systematics of elementary particles and on the classification of elementary interactions, the numbers E, n, s, and ν are found to be the principal parameters which determine the type of the production- and decay reactions of elementary particles as well as their place in natural systematics. Here e = Q/e denotes the difference between the numbers of positive and negative charges, n - the difference between the numbers of heavy particles (baryons) and heavy antiparticles (antibaryons) or "nuclear charge", s - the "strangeness" or v-charge, ν - the difference between the numbers of light particles (leptons) and light antiparticles (antileptons), or "neutrino charge". The numbers n and E are conserved in the case of all known reactions. The conservation of n is equal to a certain absolute law of conservation of the baryon number. The number n is conserved only in the case of reactions which are due to strong reactions and to such which are due to electromagnetic reactions and may change by one unit on the occasion of slow acts of decay of hyperons and heavy mesons (which are due to weak interactions). Instead of s, the quantities "neutrino charge" ε, attribute a, or the projection of μ -isotopic spin μ_3, which all obey the same rules, may be introduced.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Žurn.eksp.i teor.fis,31,fasc.4,703-704 (1957) CARD 2 / 5 PA - 1783

According to JA.P.TERLECKIJ, Dokl.Akad.Nauk,108, 236 (1956), 101, 1035 (1955) the following relations apply: $\mathcal{E} + E = s + n = -a = 2\mu_3$;

$E = \mu_3 + \tau_3$; $\mathcal{E} = \mu_3 - \tau_3$; $\tau_3 = (1/2)(E - \mathcal{E})$, $\mu = (1/2)(E + \mathcal{E})$.

The quantity $\mathcal{E}$ can actually be looked upon as a certain analogy to electric charge, and therefore the author believes it to be rational to make use of this quantity $\mathcal{E}$ and not of the quantities s, a or μ_3.

The conservation of the number ν means conservation of the number of leptons, and may perhaps also be an absolute law of conservation.

The expressions "nuclear charge" for n and "neutrino charge" for ν can be justified only by the fact that, like in the law of the conservation of the electric charge, certain integral quantities remain conserved. Hitherto, however, there is no reason to believe that the "nuclear charge" and the "neutron charge" cause any sort of field that is similar to the electric field to be formed. Therefore the term "charge" can be applied to the quantities n and ν only with reserve, and the following denotations are therefore best used:

$\mathcal{E}$ - neutron number, n - baryon number, $\lambda = -\nu$ - lepton number.

These numbers E, $\mathcal{E}$, n and λ determine the place of the particle in the systematics, its main properties, and the permitted production- and decay reactions. Therefore the author believes it to be rational to use these numbers in the symbols for elementary particles. He suggests that the number

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Žurn.eksp.i teor.fis,31,fasc.4,703-704 (1957) CARD 3 / 5 PA - 1783

E, ε, n and λ be used as indices according to the following scheme: ${}^{\lambda}_{n}Z^{E}_{\varepsilon}$
In order to avoid the symbols on the left (λ, n) to be confused with those on the right (E, ε) on the occasion of the representation of reactions, those on the left are represented by the signs 1 and -1, and those on the right by + and - . If any of the numbers λ , n, E or ε is equal to zero, no sign at all is put at the respective place. By means of the denotation system suggested here, the denotations mentioned in table 2 are now obtained instead of the denotations hitherto used for elementary particles and shown in table 1. (The tables will be found at the end of the review). The denotation system in table 2 offers some important advantages over systems hitherto used as e.g. that in the equations for all production reactions of particles which satisfy the condition $\Delta\varepsilon = 0$ (or $\Delta s = 0$) the sum of all indices must, in all cases, remain the same, e.g.:

$${}_1p^+ + {}_1p^+ \rightarrow {}_1\Lambda + k^+ + {}_1p^+, \quad {}_1p^+ + {}_1p^+ \rightarrow {}_1\Sigma^+ + k_+ + {}_1p^+$$

$$\pi^-_+ + {}_1p^+ \rightarrow {}_1\Lambda + k_+, \quad \pi^-_+ + {}_1n_+ \rightarrow {}_1\Xi^- + k_+ + k_+$$

However, the reaction ${}_1n_+ + {}_1n_+ \rightarrow {}_1\Lambda + {}_1\Lambda$ is forbidden because of $\Delta\varepsilon = -2$. In the case of the slow decay reactions of hyperons and mesons

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

($\Delta \mathcal{E} = \pm 1$) it applies for example that: ${}_1\Xi^- \to {}_1\Lambda + \pi^-_+$, ${}_1\Xi^-_- \to {}_1\Lambda + \pi$, $\Sigma^+_- \to {}_1p^+ + \pi$, ${}_1\Sigma^-_+ \to {}_1n_+ + \pi^-_+$, ${}_1\Sigma^+_- \to {}_1n_+ + \pi^+_-$, ${}_1\Lambda \to {}_1p^+ + \pi^-_+$, ${}_1\Lambda \to {}_1n_+ + \pi$, $k^+ \to \pi^+_- + \pi$, $k_+ \to \pi^+_- + \pi^-_+$, $\pi^+_- \to {}^{-1}\mu + {}^1\nu$, ${}_1n^+ \to {}_1p^+ + {}^1e^- + {}^{-1}\nu$

It is easily seen that the following particles, which have as yet not been discovered, might exist: 1.) Heavy mesons M^+_+, and M^-_-. 2.) Baryons and antibaryons B^+_+. B^-_-, ${}_{-1}B^-_-$, ${}_{-1}B^+_+$. 3.) Analogous leptons corresponding to all analogous baryons.

All these particles, which were suggested as being possible, like all discovered particles, have E, $\mathcal{E}$, n, and ν , have the numerical values -1, 0, + 1.

The symbolic system suggested here, according to the author's opinion, is the best method of expressing the basic features of the system of elementary particles.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Žurn.eksp.i teor.fis.,31,fasc.4,703-704 (1957) CARD 5 / 5 PA - 1783

Table 1		Table 2	
ν	$\tilde{\nu}$	$-{}^{1}\nu$	${}^{1}\nu$
e^-	e^+	$-{}^{1}e^-$	${}^{1}e^+$
μ^+	μ^-	$-{}^{1}\mu^+$	${}^{1}\mu^-$
π^+	$\pi^0\pi^-$	$\pi^+_-\pi$	π^-_+
K^+K^-	K^+	K^-	
$K^0\tilde{K}^0$	K_+	K_-	

Table 1		Table 2	
p	$\tilde{p}$	${}_{1}p^+$	${}_{-}p^-$
n	$\tilde{n}$	${}_{1}n_+$	${}_{-1}n_-$
Λ^0	$\tilde{\Lambda}^0$	${}_{1}\Lambda$	${}_{-1}\Lambda$
$\Sigma^+\Sigma^0\Sigma$	$-\tilde{\Sigma}\ \tilde{\Sigma}^0\ \tilde{\Sigma}^+$	${}_{1}\Sigma^+_-\ {}_{-1}\Sigma\ {}_{1}\tilde{\Sigma}$	${}_{1}\Sigma^-_+\ {}_{-1}\Sigma\ {}_{-1}\Sigma^+_-$
Ξ^-	$\tilde{\Xi}^+$	${}_{1}\Xi^-$	${}_{-1}\Xi^+$
Ξ^0	$\tilde{\Xi}^0$	${}_{1}\Xi_-$	${}_{-1}\Xi_+$

INSTITUTION: Moscow State University.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA.P

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1238
AUTHOR TERLECKIJ, JA.P.
TITLE The Systematology developed by SALAM and POLKINGHORNE and the Hypothesis of the Neutron Charge.
PERIODICAL Dokl. Akad. Nauk, 108, 236-238 (1956)
Publ. 5 / 1956 reviewed 8 / 1956

This hypothesis of the neutron charge (JA.P.TERLECKIJ, Dokl.Akad.Nauk, 94, 209 (1954), ibid. 101, 1035 (1955)) is nothing but another and physically simplified formulation of the theorem of conservation introduced by M.GELL-MANN (Conference of Pisa), R.G.SACHS as well as by A.SALAM and J.C.POLKINGHORNE, Nuovo Cimento, 2, 685 (1955), if the non-conservation of the neutron charge in the case of slow processes of decay is admitted. This is best found out by the analysis of the systematology developed by SALAM and POLKINGHORNE. The here investigated operator of the infinitesimal transformation of the group of rotation $I_{\alpha\beta}$ in the fourdimensional Euclidian isotopic spin space satisfies the condition $I_{\alpha\beta} = - I_{\beta\alpha}$ as well as a further condition. Herefrom, with $I_{21}=-h_3, I_{31}=h_2, I_{32}=-h_1, I_{41}=e_1, I_{42}=e_2, I_{43}=e_3$ there result the relations $[\tau_i \tau_j] = i\tau_k$, $[\mu_i \mu_j] = i\mu_k$, $[\tau_i \mu_j] = 0$ for the linear combinations $\tau_i=(e_i+h_i)/2$, $\mu_i=(e_i-h_i)/2$. Thus, two isotopic spins are formally introduced in this system, namely the usual spin τ_i and another, μ_i, but the physical significance of μ_i is not explained.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Dokl. Akad. Nauk, 108, 236-238 (1956) CARD 2 / 2 PA - 1238

The author defines $\mathcal{E} = - h_3 = \mu_3 - \tau_3$ as "neutron charge" and shows the behavior of various elementary particles with respect to the quantities τ_3, μ_3, the electric charge $E = \mu_3 + \tau_3$, $\mathcal{E}$, and the "strangeness" $s = \mathcal{E} + E + N$ in a table. The entire systematology developed by SALAM and POLKINGHORNE may be derived from the following conditions: a) $\Delta\mathcal{E} = 0$ applies in the case of creation processes of mesons with the simultaneous creation of heavy mesons and hyperons, b) $|\Delta\mathcal{E}| = 1$ applies in the case of slow processes of decay of hyperons and heavy mesons, c) $|\Delta\mathcal{E}| = 2$ applies in the case of very slow and strongly forbidden processes. The same rules were formulated for the "strangeness" s and for the quantity $a = -(\mathcal{E} + E) = -s + N$, which is called "attribute". According to the author's opinion it is more sensible from a physical point of view not to proceed from the formal notions concerning isotopic spin or the isotopic spins τ_i or μ_i, but from the assumption of an approximated theorem of conservation of the neutron charge $\mathcal{E}$ and from the absolutely valid theorem of conservation of the electric charge E. The antisymmetry of the wave function of the nucleons if coordinates, spins, E- and $\mathcal{E}$ charge are exchanged may be due to the full equality of particles with either E- or $\mathcal{E}$ -charges in the case of sufficiently near distances. Therefore the neutron charge may be considered the cause for the creation (1st case) of the vectorial neutron field, similar to the electric charge which creates the electromagnetic field.

INSTITUTION: Institute for nuclear Problems of the Academy of Science in the USSR.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETS'KIY, Ya.P.[Terlets'kyi, IA.P.]

Transmutability of elementary particles. Dos. such. fiz. no.5: 98-101 '57. (MIRA 16:6)

(Particles(Nuclear physics))

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya.P.

Gibbs method for calculating fluctuations and correlations. Vest. Mosk. un. Ser.mat. mekh.astron. fiz. khim. 12 no.4:119-123 '57. (MIRA 11:5)

1.Kafedra statisticheskoy fiziki i mekhaniki Moskovskogo gosudarstvennogo universiteta.
(Statistical mechanics) (Brownian movements)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

PA - 2701

AUTHOR TERLETSKIY Ya.P.,

TITLE The Production of Extremely Strong Magnetic Fields by the Rapid Compression of Conducting Shells.
(Polucheniye sverkhsil'nykh magnetnykh poley putem bystrogo szhatiya provodyashchikh obolochek, -Russian)

PERIODICAL Zhurnal Eksperim.i Teoret,Fiziki,1957,Vol 32,Nr 2,pp 387-388 (U.S.S.R.)
Received 5/1957 Reviewed 6/1957

ABSTRACT By means of the method mentioned in the title, much stronger magnetic fields can be produced than by means of the impulse method. The author examines a conductive hollow sphere in an exterior magnetic field H_0 which is produced in any possible manner. If, for instance, suddenly the source of the exterior magnetic field is switched off, the field within the sphere will be weakened as a result of induction currents with the time of relaxation $\tau = \alpha(4\pi\sigma/c^2)R^2$. Here R denotes the radius of the sphere, σ the coefficient of electric conductivity in absolute units, C -light velocity, α -a numerical coefficient of the order of magnitude 1 which depends upon the shape of the conductor. The sphere located in the exterior field may now be assumed to be rapidly compressed by strong pressure from all sides (to the n-th part of the linear dimensions). The duration of compression T is assumed to be much smaller than the relaxation time τ. In this case the conductive sphere during the time T may be regarded as a conductor with infinitely great conductivity and therefore the magnetic lines of force may be assumed to be connected rigidly with the matter. ("Frozen" magnetic Field). The magnetic flow through the cross section of the sphere there-

Card 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

The Production of Extremely Strong Magnetic Fields by the Rapid Compression of Conductiving Shells. PA - 2701

fore remains constant: $\Phi = \int_0^R H(r)\, 2\pi r dr$ = const. With an initially primary magnetic field $\pi R^2 H$ = const is therefore obtained and following herefrom further $H/H_0 = (R_0/R)^2 = n^2$. Here R_0 and H_0 denote the initial values of the interior radius of the sphere and of the magnetic field respectively. The energy of the compressed magnetic field increase. $\mathcal{E}/\mathcal{E}_0 = R_0/R = n$ applies for the energy increase. With an n-fold compression of the hollow sphere the magnetic field therefore increases in the interior of the cavity by the n^2 -fold. The same therefore applies not only to spherical shells but to any massive boundary, for instance for a torus. Such constant intense compressions are realizable by means of explosives. Naturally, an accelerator based upon the method described here cannot work periodically.

ASSOCIATION Moscow State University
PRESENTED BY
SUBMITED 5.11.1956
AVAILABLE Library of Congress
Card 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

AUTHOR: MAGALINSKIY, V.B., TERLETSKIY, YA.P. PA - 2975

TITLE: Application of the Microcanonical Distribution to the Statistical Theory of the Multiple Production of Particles. (Primeneniye mikrokanonicheskogo raspredeleniya k statisticheskoy teorii mnozhestvennogo rozhdeniya chastits. Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 3, pp 584 - 591 (U.S.S.R.)
Received: 6 / 1957 Reviewed: 7 / 1957

ABSTRACT: For systems with precisely assumed total momenta and precisely assumed total energy the law of microcanonical distribution must apparently be applied. The authors apply this distribution also for the derivation of a more general formula than that of LEPORE and STUART. The authors here examine the general case of a system in which particles of various kinds (bosons as well as fermions of any mass) exist and can be created.

The microcanonical distribution: The authors here examine a system which consists of ν kinds of particles with the masses $m_1, m_2, \ldots$ which are not in interaction. The total energy E of the system and the total momentum $\vec{P}$ are assumed, but the total number of particles of any type is assumed to be otherwise in no way restricted. In this paragraph a formula for the computation of statistical weights which, according to the authors' opinion, is the most accurate and

Card 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Application of the Microcanonical Distribution to the Statistical Theory of the Multiple Production of Particles. PA - 2975

takes the due account of the type of statistics, is derived. The autho authors are of the opinion that the formula by LEPORE and STUART applies only on the assumption that all particles obey BOLTZMANN's statistics.

The general formula here found is then used for the determination of the statistic weight of the creation reaction of mesons on the occasion of the collision of a nucleon with a nucleon. The authors here confine themselves to those expressions resulting from the formula, in which, in the end state of the reaction, not more than three equal particles of each type are created.
The next paragraph deals with the statistical weights of the creation of single mesons. Here the pions are regarded as ultrarelativistic and the nucleons as nonrelativistic.
In conclusion there follow some comments on the method. (1 table)

ASSOCIATION: Moscow State University. Institute for Nuclear Problems of the Academy of Science of the U.S.S.R.

PRESENTED BY:

SUBMITTED: 12.2.1956

AVAILABLE: Library of Congress.

Card 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

AUTHOR TERLETSKIY, Ya. P. 56-4-37/52

TITLE On the Motion of a Thinned-Out Plasm in a Magnetic Alternating Field. (O dvizhenii razreshennoy plazmy v peremennem magnitnem pole.- Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 4, pp 927 - 928 (USSR)

ABSTRACT The author here investigates a highly diluted plasm located in a magnetic field which changes quasi-steadily with time. The author confines himself to the case in which the free length of path of the electrons and ions can be regarded as being of any order, and the magnetic field H can be considered to be sufficiently intense. The following condition is then always satisfied: $\delta \mid \nabla H \mid / H \ll 1$. Here $\varrho = p_\perp c/eH$ denotes the radius of the curvature of the trajectory of a free charged particle in a magnetic field, $p_\perp$ - the component of the momentum of the particle, which is vertical to the direction of the magnetic field, e - the charge of the electron, c - the velocity of light. The condition given above is to apply to electrons as well as to ions.

For the case investigated here the motion of the electrons and ions of the plasm can be represented as a rotation on a sphere having a radius ϱ (with the frequency $\Omega = eH/mc$) round the direction of the magnetic field. Here the center of this

CARD 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

56-4-37/52

On the Motion of a Thinned-Out Plasm in a Magnetic Alternating Field.

sphere (called "drive-center") has a drive in a vertical as well as in a parallel direction towards the magnetic field. Expressions are given for the corresponding components of the velocity of drive,
If the field changes sufficiently slowly

$\mu = e\Omega\varrho^2/2c = e^2H\varrho^2/2mc^2 =$ const is true.

For the energy of the rotational motion of the particle

$W = p_\perp^2/2m = m\ \Omega^2\varrho^2/2 = \mu H$ the applies. The drive in a vertical direction towards H can then be represented as a common motion with the "lines of force".
Thus, the image of the matter adhering to the "lines of force" or of the lines of force frozen in matter is suitable for the distinct description of the motion of the plasm also in the case of a highly diluted gas.
Next, the motion of the plasm for the two most simple axially-symmetric cases is investigated.

1) $\vec{H}$ is assumed to be directioned alon the symmetry axis (z - axis) and is produced by sources which are outside a cylinder with the radius R.
2) The magnetic field is produced by an axially-symmetric current which is directioned parallel to the z-axis.

CARD 2/2 Moscow State U.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/169-59-4-4066

Translation from: Referativnyy zhurnal, Geofizika, 1959, Nr 4, p 127 (USSR)

AUTHOR: Torletskiy, Ya.P.

TITLE: Symposium on the Problems of Electromagnetic Phenomena in Cosmic Physics

PERIODICAL: V sb.: Vopr. kosmogonii, Vol 6, Moscow, AS USSR, pp 334 - 337. 1958

ABSTRACT: The symposium took place in Stockholm on August 27 - 31, 1956. The discussions dealt with theoretical and experimental problems of magnetic hydrodynamics and plasma dynamics, problems of electrodynamics of the solar atmosphere and the interplanetary medium, problems of the solar magnetism and the stellar magnetism, and also the problem of studying the interplanetary space by investigating cosmic rays.

Card 1/1

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/56-34-3-30/53

AUTHORS: Magalinskiy, V. B., Terletskiy, Ya. P.

TITLE: Calculation of the Probabilities of Coordinates by the Gibbs method (O vychislenii veroyatnostey koordinat po metodu Gibbsa)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 729 - 734 (USSR)

ABSTRACT: Ya. P. Terletskiy (Reference 5) showed that all main momenta which can be defined in the theory of fluctuations and also in the theory of Brownian movement, can be calculated with the method developed by Gibbs. The present report shows that not only the momenta, but also the corresponding densities of the probabilities of the coordinates can precisely be determined when the behavior of the mean values of these coordinates in the presence of additional constant-acting forces, of forces engaged in the beginning of the elapse of time, is known. The density of probability of a given value of the coordinate is calculated in the first chapter.

Card 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/56-34 -3-30/55

On the Calculation of the Probabilities of Coordinates According to the Method Developed by Gibbs

The terms obtained for this, are given. The afore-said is demonstrated by means of 2 simple examples: 1) With the probability of the coordinate of an harmonic oscillator. 2) With the probability of a volume (V) occupied by an ideal gas. The density of probability of a transition is calculated in the second chapter. The method proposed here, makes the solution of a by far vaster range of problems possible than do the known methods of the theory of Brown-motion. The author subsequently explains the method developed here by means of the simple example of a Brown particle which is located in a field of gravity. There are 5 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvenny universitet (Moscow State University)

SUBMITTED: October 26, 1957

Card 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

56-34-4-36/60

AUTHORS: Konyukov, M.V., Terletskiy, Ya.P.

TITLE: The Relativistic Problem of the Motion of an Electron in an Axially-Symmetric Magnetic Field Shifted Along the Symmetry Axis (Relyativistskaya zadacha o dvizhenii elektrona v aksial'no-simmetrichnom magnitnom pole, peremeshchayushchemsya vdol' osi simmetrii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 4, pp. 1003-1005 (USSR)

ABSTRACT: According to a well-known suggestion made by R.Wideröe (Ref 1) only the following 2 varieties of the relativistic problem of an electron were investigated in a variable axially symmetric magnetic field: The motion in a parallel field which is homogeneous in the direction of the symmetry axis, and the motion in a barrel shaped magnetic field. The present paper investigates a new variety of this problem, in which the magnetic field narrowing in the direction of the symmetry axis (bottle-shaped magnetic field shifts with variable or constant velocity along this axis. This new variety of the problem may also serve, like the varieties previously dealt with, as a theoretical basis of a new type of

Card 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

The Relativistic Problem of the Motion of an Electron in an Axially-Symmetric Magnetic Field Shifted Along the Symmetry Axis

56-34-4-36/60

accelerators, viz. of a linear induction accelerator, or, in short, of a linear betatron. First the equations of motion of the electron resulting from a Lagrangian are written down. Next, a solution of the field equations which is possible in quasisteady approximation is given and discussed in short for various special cases. Unlike what is the case with an ordinary betatron a strong field H can be concentrated within a very small range. There are 4 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)
Tul'skiy pedagogicheskiy institut (Tula Pedagogical Institute)

SUBMITTED: December 16, 1957

1. Electrons--Motion

Card 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

24 (5) SOV/56-35-2-20/60

AUTHORS: Glasko, V. B., Leryust, F., Terletskiy, Ya. P., Shushurin, S. F.

TITLE: Investigation of Particle-Like Solutions of a Nonlinear Scalar Field Equation (Issledovaniye chastitsepodobnykh resheniy nelineynogo uravneniya skalyarnogo polya)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2, pp 452-457 (USSR)

ABSTRACT: For the investigation of possibilities offered by the nonlinear field theory of elementary particles (Refs 1 - 9) an investigation of the particle-like solution (Ref 1) of the simplest nonlinear equation of the scalar complex field is of especial importance. Thus it is e. g. possible to find a qualitative solution of the problem of the existence and character of the mass spectrum. The authors proceed from the Lagrangian for a complex scalar field

$$\alpha = - \nabla\Psi^* \nabla\Psi + \frac{\partial\Psi^*}{\partial x_0}\frac{\partial\Psi}{\partial x_0} - m^2\left[\Psi^*\Psi + F(\Psi^*\Psi)\right]$$

Card 1/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

($x_0 = ct$, $F(v)$ - a determined nonlinear function, m - a parameter with the dimension of a reciprocal length) with the field equations

$$\nabla^2\Psi - \partial^2\Psi/\partial x_0^2 - m^2\left[1 + F'(\Psi^*\Psi)\right]\Psi = 0;$$

$$\nabla^2\Psi^* - \partial\Psi^*/\partial x_0^2 - m^2\left[1 + F'(\Psi^*\Psi)\right]\Psi^* = 0$$

where $F'(v) = dF(v)/dv$

E and Q are then written down as functions of Ψ, Ψ^* and introduced:

$$\Psi = u(r)e^{-i\varepsilon x_0} \qquad \Psi^* = u(r)e^{i\varepsilon x_0}$$

(ε = parameter, proportional to a frequency), and E and Q are given as functions of u and r. With $F(v) = -\lambda v^2/2$, $\eta = \sqrt{\lambda}mru$ and $\rho = r\sqrt{m^2 - \varepsilon^2}$ η and ρ are introduced and with their aid the first three particle-like solutions are derived. (See also figures 1 to 3). The relevant mass spectrum is obtained by numerical integration for the simplest cubic term. Under favorable physical conditions a finite spectrum

Card 2/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Investigation of Particle-Like Solutions of a Nonlinear Scalar Field Equation SOV/56-35-2-20/60

is obtained. There are 3 figures and 10 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: March 22, 1958

Card 3/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA. P.

PHASE I BOOK EXPLOITATION SOV/3405

Soveshchaniye po voprosam kosmogonii. 6th, Moscow, 1957

Vnegalakticheskaya astronomiya i kosmologiya; trudy soveshchaniya (Extragalactic Astronomy and Cosmology; Transactions of the 6th Conference on Problems of Cosmogony, June 5-7, 1957) Moscow, AN SSSR, 1959. 273 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR.

Ed. of Publishing House: L.V. Sansonenko; Tech. Ed.: G.N. Shevchenko; Editorial Board: D.A. Frank-Kamenetskiy (Resp. Ed.) Professor; B.A. Vorontsov-Vel'yaminov, Corresponding-Member.

PURPOSE: The book is intended for astronomers and physicists studying problems of general cosmology.

COVERAGE: The book is a collection of papers on cosmogony read by scientists participating in a conference held in Moscow on June 5-7, 1957. The papers review recent observational and theoretical work in extragalactic astronomy, gravitational theory, theory of relativity, red shift, radio astronomy, formation of chemical elements, thermodynamics of the universe, entropy, etc. No personalities are mentioned. There are references following most of the reports.

Markaryan, B.Ye. Spiral Galaxy M 101 51

Martynov, D.Ya. Reliability of Observational Data in Extragalactic Astronomy 70

Krasovskiy, V.I. and P.V. Shcheglov. Application of Electronic-Optical Methods to Extragalactic Astronomy 89

Vitkevich, V.V. Discrete Sources of Radio Emission (Radio Stars) and Prospects for their Study 94

Ginzburg, V.L. Experimental Verification of the General Theory of Relativity (Summary of Report) 114

Vlasov, A.A. Spatial, Non-homogeneous Distributions of the System of Gravitating Particles 116

Smorodinskiy, A.Ya. Isotropic Models of the Universe 131

Lifshits, Ye.M. Gravitational Stability in the General Theory of Relativity (Summary of Report) 141

Zel'manov, A.L. Relativistic Theory of an Anisotropic Non-Homogeneous Universe 144

Shirokov, M.F. Theory of Red Shift in Spectra of Distant Nebulae 175

Shklovskiy, I.S. Radio Astronomy and Cosmology (Summary of Report) 186

Cherdyntsev, V.V. Conditions of Formation of Atomic Nuclei According to Data on Their Distribution 192

Frank-Kamenetskiy, D.A. Origin of Chemical Elements From the Point of View of the Theory of Internal Structure and Stellar Evolution 200

Terletskiy, Ya. P. Problems of Statistical Physics and Thermodynamics of Gravitating Systems 214

Idlis, G.M. Structural Infinity of the Universe and the Metagalaxy as a Typical Populated Cosmic System (Summary of Report) 270

Flytkin, I.R. Some Remarks on the Growth of Entropy 228

Stanyukovich, K.P. On the Thermodynamics of the Universe 219

Nazin, G.I. General Problems of Cosmology 243

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

PHASE I BOOK EXPLOITATION SOV/3762

Konferentsiya po magnitnoy gidrodinamike. Riga, 1958.

Voprosy magnitnoy gidrodinamiki i dinamiki plazmy; trudy Konferentsii. (Problems in Magnetohydrodynamics and Plasma Dynamics; Transactions of a Conference) Riga, Izd-vo AN Latviyskoy SSR, 1959. 343 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agency: Akademiya nauk Latviyskoy SSR. Institut fiziki.

Editorial Board: D.A. Frank-Kamenetskiy, Doctor of Physics and Mathematics, Professor; A.I. Vol'dek, Doctor of Technical Sciences, Professor; I.M. Kirko, Doctor of Physics and Mathematics; V.Ya. Veldre, Candidate of Physics and Mathematics; V.G. Vitol, Candidate of Physics and Mathematics; Yu.M. Krumin'; and V.Ya. Krawchenko.

Ed.: A. Teytel'baum; Tech. Ed.: A. Klyuvinya

PURPOSE: This book is intended for physicists working in the field of magnetohydrodynamics and plasma dynamics.

COVERAGE: This volume contains the transactions of a conference held in Riga, June 1958, on problems in applied and theoretical magnetohydrodynamics. The objects of the conference were the investigation of the basic trends in theoretical and applied magnetohydrodynamics, establishing contact between the people doing research in different branches of magnetohydrodynamics, and promoting the participation of theoretical physicists in problems in applied magnetohydrodynamics. More than 160 persons from different parts of the Soviet Union took part in the conference, and 55 papers were read. Similar conferences are to be held regularly in the future; the next such conference is scheduled to be held in Riga in June 1960. In this present collection of the transactions of the conference, most of the papers and comments on papers are presented by the authors themselves in an abridged form. The book is divided into two parts: the first part deals with problems in theoretical magnetohydrodynamics and plasma dynamics, and consists of 35 articles on such aspects of the problem as the application of magnetohydrodynamics in astrophysics (D.A. Frank-Kamenetskiy), magnetohydrodynamics and the investigation of cosmic-ray variations (L.I. Dorman), acceleration of plasma in a magnetic field (G.V. Gordeyev and A.I. Oubanov), stability of shock waves and magnetohydrodynamics (A.I. Akhiyezer). The second part, consisting of 33 articles, deals with problems of experimental magnetohydrodynamics, including the application of physical simulation for investigation of electromagnetic processes in liquid metals (I.M. Kirko) and the development of electromagnetic pumps (P.G. Kirillov), at the Institute of Physics of the Academy of Sciences, Latvian SSR. Several articles are devoted to induction pumps, electromagnetic crucibles, electromagnetic stirrers for molten metals, and their application in the metallurgical industry including schematic diagrams of their power-supply systems. References are given at the end of most of the articles.

Velikhov, Ye.P. The Influence of a Magnetic Field on the Flow Stability of a Conducting Fluid 49

Terletskiy, Ya.P. Certain Problems of the Movement of Rarefied Plasma in a Magnetic Field 59

Sagdeyev, R.Z. On Nonlinear Steady Flow of Rarefied Plasma in a Magnetic Field 63

Bragizskiy, S.I. One Criterion for the Applicability of Magnetohydrodynamic Equations to Plasma 67

Polovin, R.V. Comments on the Paper 71

Gordeyev, G.V., and A.I. Oubanov. The Problem of Plasma Acceleration in a Magnetic Field 73

Gordeyev, G.V. Comments on the Paper 74

Dorman, L.I., and G.I. Freydman. On the Possibility of Charged-Particle Acceleration by Shock Waves in Magnetized Plasma 77

Card 4/12

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

24(5) PHASE I BOOK EXPLOITATION SOV/3313

Akademiya nauk SSSR. Institut filosofii

Filosofskiye voprosy sovremennoy fiziki [sbornik]; (Philosophical Problems of Modern Physics; Collection) Moscow, Izd-vo AN SSSR, 1959. 426 p. Errata slip inserted. 7,000 copies printed.

Ed.: I. V. Kuznetsov and M. E. Omel'yanovskiy; Ed. of Publishing House: V. K. Moroz; Tech. Ed.: S. G. Markovich.

PURPOSE: This book is intended for physicists but may be read gainfully by other scientists and the educated layman interested in the philosophical questions of advanced physics.

COVERAGE: This book contains 12 articles on philosophical problems in physics. Problems are divided into three subject divisions: 1) general problems; 2) problems of quantum theory; 3) problems in the theory of relativity. The views of Einstein, Bohr, Born, Planck, Pauli, Schrödinger, Heisenberg, Janossy, et al. are presented, and subjected to criticism from the Soviet side by Omel'yanovskiy, Polikarov, Fok, et al. Questions dealing with idealism, agnosticism, and dialectical materialism in the philosophy of physics are discussed. This collection of articles is the third in a series under the same title. Earlier volumes were published in 1952 and 1958. References accompany each article.

TABLE OF CONTENTS:

Foreword 3

Omel'yanovskiy, M. E. Dialectical Materialism and the Problem of Reality in Quantum Physics 5

Janossy, L. Philosophical Problems of Modern Physics 55

Kuznetsov, I. V. Basic Ideas in the Work of Max Planck 81

Fok, V. A. The Interpretation of Quantum Mechanics 154

Bohr, N. Discussions With A. Einstein on Epistemological Problems in Atomic Physics 177

Einstein, A. Answer to the Criticism [of N. Bohr, V. Pauli, et al] 223

Tarletskiy, Ya. P. The Intertransmutability of Elementary Particles 249

Aleksandrov, A. D. The Theory of Relativity as a Theory of Absolute Space-Time 269

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, YA.P.

"THE POSSIBLE ACCELERATION OF CHARGES BY THE ELECTROMAGNETIC FIELD OF THE EARTH'S MAGNETIC DIPOLE"

Ya.P. Terletskiy

1. Previous calculations of the electric and magnetic fields of the Earth's magnetic dipole were refined. The calculations were carried out both in the inertial coordinate system in relation to which the Earth is rotating, and in the coordinate system affixed to the Earth. It is shown that both methods of calculation give the same results for an electric field component parallen to the magnetic field.

2. An analysis is made of the equations of electron and ion motion in the Earth's electromagnetic field, and the pattern of their movement is described. It is shown that the drift of the particles in a direction perpendicular to the magnetic field lines may almost alsays be ignored compared with the movement along magnetic lines. The latter is valid oth for the inertial coordinate system and the system rigidly connected with the Earth.

3. An evaluation is made of the energy of the particles accelerated both by the induction effect and by the unipolar induction field. It is shown that the particles may be accelerated by these fields to energies of the order of 20 kev. Particles with maximum energies may be observed at the geomagnetic latitude of 45°.

4. The possible quasi-equilibrium states of the particle distributions in the Earth's electromagnetic field are considered. It is shown that positive charges may accumulate in theequatorial regions of the Earth.

5. Possible currents are evaluated and certain other mechanisms of particle acceleration in the field of the Earth's magnetic dipole are discussed.

Report presented at the Intl. Cosmic Ray Conference, Moscow, 6-11 July 1959.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SOV/56-36-6-16/66

24(5)

AUTHORS: Magalinskiy, V. B., Terletskiy, Ya. P.

TITLE: Diffusion Equation in the Phase Space for Nonlinear Systems (Uravneniye diffuzii v fazovom prostranstve dlya nelineynykh sistem)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1731 - 1735 (USSR)

ABSTRACT: The authors have already shown (Refs 1,2) that by means of Gibbs' method it is possible to derive not only exact formulas in the theory of Brown's motion for fluctuations and correlations (Refs 3,4), but also general expressions for the transition probability density in the configuration space and equations for this probability density in the case of the existence of nonlinear systems. In the present paper the authors show that the statistical method developed by them may be used also for the purpose of deriving a general equation of motion for the probability densities in the phase space of coordinates and momenta (or velocities) for any nonlinear systems. The general space-velocity equation of motion for the probability density is derived only on the basis of general principles

Card 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

of statistical mechanics and assumptions concerning the form of the averaged equation of motion of the system; it is not necessary to make any assumptions concerning force-correlations of the character of stochastic processes. In the case of a linear friction law, this equation corresponds to the known space-velocity equation by Einstein-Fokker-Planck (equation 20). The diffusion equation in its general form reads (18):

$$\frac{\partial W}{\partial t} + V \frac{\partial W}{\partial Q} = \frac{1}{M} \frac{\partial}{\partial V} \sum_{n=0}^{\infty} \frac{(\Theta/M)^n}{n!} \frac{\partial^n}{\partial V^n} \left[W \frac{\partial^n}{\partial V^n} F(Q,V) \right].$$

This equation is finally solved for the special case in which the external force and the nonlinear frictional force are independent of coordinates, i.e. that the ansatz $F(Q,V) = K+G(V)$ can be made. There are 6 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: November 25, 1958

Card 2/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

SEMENCHENKO, Vladimir Ksenofontovich; TERLETSKIY, Ya.P., prof., retsenzent; DROZHZHIN, Yu.N., red.; KOVALENKO, V.L., tekhn. red.

[Selected chapters of theoretical physics] Izbrannye glavy teoreticheskoi fiziki. Moskva, Gos. uchebno-pedagog. izd-vo M-va prosv. RSFSR, 1960. 337 p. (MIRA 14:7)

(Physics)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

PHASE I BOOK EXPLOITATION SOV/[illegible]

International Cosmic Ray Conference. Moscow, 1959.

Proceedings. v. III. Moscow, 1960. 253 p. Errata slip inserted. No. of copies printed not given.

Sponsoring Agency: International Union of Pure and Applied Physics. Cosmic Ray Commission.

Ed.: S. I. Syrovatskiy, Editorial Board: G. B. Zhdanov (Ed.-in-Chief), I. P. Ivanenko (Assistant Ed.-in-Chief), N. M. Gerasimova, A. I. Nikishov, V. I. Zatsepin, B. A. Khrenov, L. I. Dorman, V. P. Tulinov, S. I. Syrovatskiy, V. M. Fedorov, Yu. E. Vavilov, and A. T. Abrosimov.

PURPOSE: This book is intended for physicists, astronomers and other scientists concerned with the earth's radiation belts and cosmic ray research.

COVERAGE: This is Volume 3 of a 4-volume work containing the proceedings of the Moscow Cosmic Ray Conference held July 6-11, 1959. This volume contains 40 reports on the earth's radiation belts and primary cosmic radiation. The reports delivered by Soviet scientists are abstracted below. References accompany individual reports.

III. THE ORIGIN OF COSMIC RAYS

33. Ginzburg, V.L. Some Aspects of the Theory of Cosmic Ray Origin 196-204
This paper elucidates the following problems: 1) The mean gas concentration in the galaxy (including the halo). 2) The role of different cosmic ray sources; the injection and particle acceleration mechanism in sources. 3) The mechanism and role of cosmic ray escape from the galactic halo into intergalactic space; the fraction of metagalactic cosmic rays in the Galaxy. 4) The nature of cosmic ray movement in the galactic spiral in connection with cosmic ray isotropy and chemical composition. 5) The origin of the cosmic ray electron component in the halo.

34. Shklovskiy, I.S. Achievements in Radioastronomy and Radioastronomical Theory of the Origin of Cosmic Rays 205-210
This paper explains the radioastronomical theory of the origin of cosmic rays on the basis of the latest achievements in radioastronomy.

35. Korchak, A.A., and S.I. Syrovatsky (Syrovatskiy). On the Composition of Primary Cosmic Rays 211-219
This paper points out the inadequacy in the explanations of the composition of cosmic rays and presents another approach to the solution of this problem.

39. Terletsky (Terletskiy), Y.P. Possible Acceleration of Charges by the Electromagnetic Field of the Magnetic Dipole of the Earth 233-238
This paper presents the results of new computations of the electromagnetic field of a rotating dipole, as well as of a corrected analysis of ion motion equations pertaining to this field. Questions regarding the divergence between computations in inertial and rotating systems of coordinates are considered, and general conclusions with regard to the nature of distribution of charges around a rotating dipole and with regard to analysis of possible currents are made.

40. Dorman, L.I. On the Initial State of Charged-Particle Acceleration 239-244
The author analyzes the following problems: 1) Injection energy in a solar flare in the case of charged-particle acceleration by the Fermi statistical mechanism. 2) Portion of accelerated particles and necessity of preliminary acceleration by the first order Fermi mechanism. 3) Acceleration of particles of the medium between approaching magnetic clouds: nonrelativistic case, relativistic case, and the case of particle acceleration from very low energies to relativistic energies. 4) Maximum energy of accelerated particles in various specific cases: compression of the plasma column under laboratory conditions and under conditions of solar flares, collision of magnetized clouds in interplanetary and in interstellar space, and collision of galaxies.

AVAILABLE: Library of Congress

TERLETSKY, Y.P.

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

81678

S/057/60/030/05/04/014
B012/B056

24.4500

AUTHORS: Gutsunayev, Ts. I., Terletskiy, Ya. P.

TITLE: On the Theory of the Motion of an Electron in a Linear Betatron

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 5, pp. 491 - 496

TEXT: In the new electron accelerator developed by M. Ya. Konyukov and Ya. P. Terletskiy (Refs. 1, 2), which these authors described as a linear betatron, a variety of the problem of the motion of the electron in an axially-symmetric magnetic field moving along the symmetry axis was investigated. The most important special case of this problem is a non-uniformly moving field, where a motion of the electron along a spiral with constant radius is possible. The question of the nature of the magnetic field, however, remained unclear in the course of these investigations. The solution of this problem is given in the present paper. For this purpose the vector potential is used, which describes the magnetic field moving nonuniformly along the z-axis. The solution

Card 1/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

81678

On the Theory of the Motion of an Electron in a Linear Betatron

S/057/60/030/05/04/014
B012/B056

obtained is the exact solution of the wave equation. The law of the energy increase of the accelerated particle is obtained, and the problem of the steadiness of the electron motion in the electromagnetic field is investigated with a vector potential described by formula (6). The condition for the steadiness of the electron motion (formula 19) is derived. The radiation losses of the electron when accelerated in a linear betatron are investigated. It is shown that these losses in a linear betatron are smaller by a multiple than those in a betatron. The following summary is then given: The calculations made here show that the linear betatron with a constant radius of the path can, from the theoretical point of view, not only be realized in the form of the variety previously suggested (Refs. 1, 2). Calculations show that the motion in a linear betatron with constant radius may be made steady, whereas the electromagnetic radiation itself is no hindrance to the function of the device even at energies of billions of electron-volts. Further advantages offered by the linear betatron are the simplicity of deflecting the accelerated particles in the direction of the z-axis and the possibility of being able to accelerate a mixture of positively and negatively charged particles. There are 4 references: 2 Soviet, 1 Italian, and 1 American.

Card 2/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

On the Theory of the Motion of an Electron in a Linear Betatron

81678
S/057/60/030/05/04/014
B012/B056

ASSOCIATION: Fizicheskiy fakul'tet MGU, Kafedra statisticheskoy fiziki i mekhaniki (Department of Physics, Moscow State University, Chair of Statistical Physics and Mechanics)

SUBMITTED: October 24, 1959

Card 3/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

TERLETSKIY, Ya.P.

Causality principle and the second law of thermodynamics. Dokl.AN SSSR 133 no.2:329-332 Jl '60. (MIRA 13:7)

1. Institut Anri Puankare, Parizh, Grantsiya. Predstavleno akademikom Lui de Broylem.
(Thermodynamics)

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

S/020/60/133/003/027/031/XX
B019/B067

AUTHOR: Terletskiy, Ya. P.

TITLE: Statistical Theory of a Nonlinear Field

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 3, pp. 568 - 571

TEXT: The equations of motion for the totality of classical fields are determined from the principle of least action. In the statistical investigation of this totality the probability density in the functional space must be introduced. The mean value of any physical quantity $F\{\psi(x)\}$ is determined from the integral $\bar{F} = \int F\{\psi(x)\} W\{\psi(x)\} d\psi(x)$ (3), where, in analogy to the classical statistical mechanics, the function W is called the microcanonical probability distribution. The probability that a field function $Q\{\psi(x)\}$ has a given form $q(x)$ is determined from the following integral: $W\{q(x)\} = \int \delta\{q(x) - Q[\psi(x)]\} W\{\psi(x)\} d\psi(x)$ (4). The authors then briefly show when the canonical probability distribution $W = B\exp[bS\{\varphi(x)\}]$ (7) may be introduced. If the Lagrangian L is a square function of the fields and their derivatives, (7) leads to a paradox called

Card 1/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Statistical Theory of a Nonlinear Field S/020/60/133/003/027/031/XX
B019/B067

a "violet catastrophy". Furthermore, it is shown that in the nonlinear case when the Lagrangian may be represented as a sum of the square terms and of the terms of 4th, 6th, ... order, particle-like solutions exist. For these nonlinear fields, the probability density may be represented as a function of the world lines. $W\{x(t)\} = A\delta[S_m - S\{x(t)\}]$ (9) is obtained for the microcanonical distribution and $W\{x(t)\} = B \cdot \exp \cdot [bS\{x(t)\}]$ (10) for the canonical distribution. The mean values of physical quantities are then determined as usual. If the constant b in (10) is imaginary, (10) may be written in the form $W\{x(t)\} = B\exp \frac{i}{\hbar} S\{x(t)\}$ (13) and the quantum-mechanical mean is obtained by the ordinary averaging. It is demonstrated that all results of quantum mechanics may be obtained from the general statistical theory of nonlinear classical fields. These nonlinear classical fields are assumed to be in statistical equilibrium with a thermostat having a constant, imaginary temperature. Finally, two important questions are discussed: 1) What is the physical significance of the imaginary temperature? 2) How can a constant imaginary temperature be attained? There are 7 references: 5 Soviet, 1 US, and 1 British.

Card 2/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

Statistical Theory of a Nonlinear Field S/020/60/133/003/027/031/XX
B019/B067

ASSOCIATION: Institut Henri Poincaré, Paris, France (Henri Poincaré Institute, Paris, France)

PRESENTED: March 30, 1960, by Louis de Broglie, Academician

SUBMITTED: March 23, 1960

Card 3/3

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"

"APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0

S/056/61/040/002/021/047
B112/B214

AUTHORS: Vigier, J. P., Terletskiy, Ya. P.

TITLE: Physical significance of negative probabilities

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, 508-512

TEXT: Negative or even complex probabilities appear in many formalisms of quantum-field theory as, for example, in relativistic quantum mechanics, in Feynman's functional representation of quantum mechanics, and in some recent interpretations of quantum mechanics as a classical statistical theory of systems in interaction with an "imaginary" thermostat. In the present paper, such probabilities are termed formal or quasi-probabilities, and it is shown that they can be used for the calculation of the statistical mean values of physical quantities in the same way as true probabilities even though they cannot be interpreted as probabilities. On the contrary, formal probability densities are to be considered to be distribution functions having the significance of the mathematical expectation values of particle densities. Only for the case of similar

Card 1/2

APPROVED FOR RELEASE: 07/16/2001 CIA-RDP86-00513R001755410017-0"