

GINZBURG, V. L.

PA 60T90

USSR/Physics

Jun 1947

Electrons - Emission
Doppler Effect

"Emission of an Electron and an Atom Moving Along the Axis of a Channel in a Dense Medium," V. L. Ginzburg; I. M. Frank, *Corr Mem, Acad Sci*, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVI, No 7

Gives mathematical discussion concluding that energy emission in case of a Doppler effect is determined by certain formulas, with factor $\sqrt{gt/2}$. In this regard gives correct statement on analogous factor for the electron.

60T90

GINSBURG, V.L.

May 1947

USSR/Physics
Doppler Effect
Atoms

"Doppler Effect at Velocity Greater Than That of Light," V. L. GINSBURG, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVI, No 6, 1947,
Physics Inst. im. P. N. Lebedev, Acad. Sci., 1-11-47.

Describes experiments which show that supposition that Doppler effect, during movement of an atom in a compact medium, has no value because at this time it will be ionized, is not correct.

58295

Translation - 2524467-30 Apr 54

SU: LETOPIS NO. 30, 1948

PROCESSES AND PROPERTIES INDEX

SA 56

621.996.11 : 331.310.333 : 323.12 : 336...
 1481. Contribution to the theory of radio wave
 interaction (Lambert-Garbi effect). Gerasimov,
 V. L. *Izv. Akad. Nauk, SSSR, Ser. Fiz.*, 12 (No. 3)
 293-309 (1948) *In Russian*.—A theory based on the
 statistical study of the movement of electrons colliding
 with ions and molecules. The results derived have
 coefficients which differ from those obtained by
 Bailey and Martyn, who used a more elementary
 approach [Aber. 4173 (1934), 1518 (1937)]. The
 new theory is applied to the non-linear effects occur-
 ring during the propagation of radio waves in the
 solar atmosphere. P. B.

Phys. Inst. in Leningrad, AS USSR

ASB VLA METALLURGICAL LITERATURE CLASSIFICATION

SEARCHED	INDEXED	SERIALIZED	FILED

GINZBURG, V.L.

USSR/Academy of Sciences
Radio

Jan/Feb 1948

"M. D. Papaleksi and Radio Astronomy," V. L. Ginzburg.
4 pp

"Izv Akad Nauk SSSR, Ser Fiz" Vol XIII, No 1

Discusses Papaleksi's work on calculating distance of the moon from earth; claims that only wartime difficulties prevented Papaleksi from being the first to achieve a radio-location contact with the moon, and describes his work on the sun which culminated in his sponsoring the Brazil expedition.

3973

Ginzburg, V. L. On the theory of the propagation of electromagnetic waves in a magneto-active medium

(1949). (Russian)

The present paper, which is a continuation of a previous work by the author [Acad. Sci. USSR J. Phys. 7, 287-304 (1943); these Rev. 6, 54], develops further the theory of electromagnetic waves in an inhomogeneous magneto-active medium (the ionosphere under the influence of the earth's magnetic field). An approximate solution of the propagation equations is obtained in the region of the layer where the wave undergoes reflection and at the beginning of the layer, where geometrical optics is not valid. By means of an approximation method the author treats further the phenomenon of trebling, the occurrence of reflection at three positions, for small angles between the magnetic field and the direction of propagation. By the use of kinetic theory considerations he derives an expression for the effective collision frequency in the presence of a magnetic field.

N. Rosen (Chapel Hill, N. C.).

Mathematical Reviews,

Vol 11 No 4

Small

GINZBURG, V.L.

USSR/Physics

Jan 1948

Solar Phenomena

Radio Waves, Propagation

"New Data on Radio Emission of the Sun and Galactics,"
V. L. Ginzburg, 20 pp

"Uspekhi Fizicheskikh Nauk" Vol XXXIV, No 1

Describes work on sun's radio intensity during eclipse, observations of sun's radio emission at various frequencies, and radio emission of galactics according to Townes' article in "Astronomicheskiy Zhurnal" p 135, 1947.

39T106

GINZBURG, V. L.

PA 12/49T106

USSR/Physics

Apr 48

Radio Waves - Absorption
Mathematics, Applied

"Absorption of Micro-Radio Waves in the Atmosphere,"
V. L. Ginzburg, 11½ pp

"Uspekhi Fiz Nauk" Vol XXXIV, No 4

Mathematical treatment of subject. Reviews multiplet
disintegration of oxygen. Discusses absorption
of short waves in dry air, atmosphere, rain, fog
and cloud.

12/49T106

GINSBURG, V. L.

PHASE I

TREASURE ISLAND BIBLIOGRAPHICAL REPORT

AID 214 - I

BOOK

Call No.: QC661.G54

Author: GINZBURG, V. L.

Full Title: THEORY OF RADIO-WAVE PROPAGATION IN THE IONOSPHERE

Transliterated Title: Teoriya rasprostraneniya radiovoln v ionosfere

(Handwritten initials)

Publishing Data

Originating Agency: None

Publishing House: State Publishing House of Technical Theoretical Literature (OGIZ)

(Handwritten initials)

Date: 1949

No. pp.: 358

No. of copies: 7,000

Editorial Staff

Editor: None

Tech. Ed.: None

Editor-in-Chief: None

Appraiser: None

Others: Leontovich, M. A., Academician, who reviewed the book and made certain remarks, and Pariyskaya, Z. V., Engineer, who prepared the graphics.

Text Data

Coverage: The book covers: the conception of the ionosphere; dielectric constant and conductivity of an ionized gas; wave propagation in a non-homogeneous isotropic medium; reflection of radio-waves from ionosphere layers; wave propagation in an anisotropic medium, (under the effect of the earth's magnetic field); solar and galactic radiation.

Teoriya rasprostraneniya radiovoln v ionosfere

AID 214 - I

The author limits his work to the physics of the subject, using mathematical deductions only when absolutely necessary. The book from this point of view appears to be of a certain interest. However it seems to be a compilation of known facts and deductions, as is shown by the very large number of references, and not an original concept.

Purpose: To put the subject within reach of a broader circle of readers.

Facilities: The Institute of Physics imeni P. N. Lebedev of the Academy of Sciences, USSR, and the Radio-Physics Department of the Main Administration of Geodetics (GGU)

No. of Russian and Slavic References: 69 out of 147 (1915-1948)

Available: Library of Congress.

2/2

GINZBURG, V. L.

PA 30/49T95

USSR/Physics

Jan 49

Polarization

Piezoelectricity

"Polarization and the Piezoeffect of Barium Titanate Near the Point of Seigneto-Electric Transition," V. L. Ginzburg, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 6 pp

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

Examines problem of polarization and peizoeffect of barium titanate monocrystals near the point of Seigneto-electric transition. Also discusses problem of dispersion of dielectric constant of barium titanate near the Curie temperature. Submitted

7 Jul 48.

30/49T95

GINZBURG, V. L.

PA 42/49T5

USSR/Astronomy

Mar/Apr 49

Solar Phenomena
Radio Waves - Absorption

"The Absorption of Radio Waves in the Solar Corona," V. L. Ginzburg, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, Radiophys Faculty, Moscow State U, 13 pp

"Astron Zhur" Vol XXVI, No 2

Examines various formulas for absorption of radio waves in ionized gas (ionosphere, solar corona, interstellar gas). Gives results of studies conducted to determine thickness of solar corona for waves of varying frequencies in the range 0.6 - 50 meters.

42/49T5

GINZBURG, V. L.

PA 67/49T105

USSR/Physics - Piezoelectricity
Dielectrics

Aug 45

"The Theory of Piezoelectric Phenomena," V. L.
Ginzburg, 36 pp

"Uspekhi Fiz Nauk" Vol XXXVIII, No 4

Discusses (1) the theory of piezoelectric phenomena without considering anisotropy and potential, (2) the case of phase transitions close to the critical point, (3) anisotropy of dielectric properties and the piezo effect in barium titanate, (4) the properties of Rochelle salt, and (5) pyroelectrics, piezoelectrics, and ferromagnetics.

67/49T105

USSR/Physics - Helium II
Low Temperatures

11 Nov 49

"The Theory of Superfluidity and the Critical Speed of Helium II," V. L. Ginzburg, Phys Inst imeni Lebedev, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXIX, No 2

Present theory explains well almost all experimental facts relative to He II. However, one very important phenomenon -- existence of critical speed for superfluid flow He II -- cannot be quantitatively explained by the theory. This fact seems to indicate necessity of introducing into the theory more accurate essential

changes in its microscopic part: the value of the critical speed and its dependence upon the aperture's width and temperature. Submitted 15 Sep 49 by Acad M. A. Leontovich.

CA

2

Theory of superconductivity. V. L. Ginsburg and L. D. Landau (P. N. Lebedev Phys. Inst., Acad. Sci., U.S.S.R., Moscow). *Zhur. Ekspil. Teoret. Fis.* 20, 1004-82(1950).— In the theory of superconductive transition in the absence of a magnetic field, a parameter Ψ is introduced, formally analogous to the spontaneous polarization in the theory of π -electrostatics and spontaneous magnetization in the theory of ferromagnetism. In analogy with the general behavior of the corresponding parameter in the theory of transitions of the 2nd kind, the Ψ -function of "superconducting electrons" at thermodynamic equil. becomes zero above the crit. temp. and is different from zero below it. This "effective wave-function" is normalized in such a way that $|\Psi|^2$ represents the concn. of superconducting electrons. Equations are derived for the Ψ -function and the vector potential, and are solved for the case of a superconducting half-space. The theory permits, in contrast to the existing phenomenological theory, expression of the surface tension at the boundary of the normal and superconducting phases in terms of the crit. magnetic field and the depth of penetration of the field into the superconductor. That depth depends on the field strength in strong fields, particularly in superconductors of small dimensions. In thin films, the magnetic perturbation of the supercond. is a transition of the 2nd kind, and becomes a transition of the 1st kind only above a certain crit. thickness. The external crit. magnetic field increases with decreasing thickness of the superconducting film, whereas the crit. elec. current decreases with the thickness. N. Thon

GINZBURG, V. L.

USSR/Radio - Wave Diffraction Astrophysics

Apr 50

"Diffraction of Solar and Cosmic Radio Waves on the Moon," G. G. Getmantsev, V. L. Ginzburg, Physicotech Inst, Gor'kiy State U, 4 pp

"Zhur Eksper i Teoret Fiz" Vol XX, No 4

Discusses problem of diffraction of radio waves from the sun and cosmic objects by the moon from standpoint of possibility of localizing sources of these waves. Submitted 2 Dec 49.

PA 159T107

PA 171T83

GINZBURG, V. L.

USSR/Physics - Superconductivity
Helium-II

Oct 50

"Present State of the Theory of Supercon-
ductivity," V. L. Ginzburg

"Uspekhi Fiz Nauk" Vol XLII, No 2, pp 169-219

Headings: 1. History. 2. Basic Experimental
Facts. 3. Old Phenomenological Theory. 4. New
Phenomenological Theory and Basic Relations.
5. Concrete Results of the New Theory. 6. Normal
Current in Superconductors. 7. Normal and
Anomalous Skin Effect in Metals. To be con-
tinued next issue of this journal.

171T83

GINZBURG, V. L.

PA 172T98

USSR/Physics - Superconductors
Helium-III

Nov 50

"Present State of the Theory of Superconductivity,"
V. L. Ginzburg

"Uspekhi Fiz Nauk" Vol XLII, No 3, pp 333-361

Concluding article considers normal current in
superconductors, and normal and anomalous skin
effect in metals. Gives extensive bibliography,
consisting of 104 references both Russian and
foreign.

172T98

GINZBURG, V. L.

75000

Ginzburg, V. L. On magneto-hydrodynamic waves in a gas. Akad. Nauk SSSR. Zhurnal Eksp. Teoret. Fiz. 21, 788-794 (1951). (Russian)

The author examines the problem of magneto-hydrodynamic plane waves propagating through ionized gas in electromagnetic field of constant gravity. Solutions of linearized equations are obtained which, at the high-frequency end of the spectrum, correspond to the propagation of radio waves in the ionosphere under the influence of the terrestrial magnetic field, while at low frequencies they pass into a form identical with ordinary hydrodynamical approximations. The same problem has been treated with very similar results and published almost simultaneously by Åström [Ark. Fysik 2, 443-457 (1951); these Rev. 12, 778]. Z. Kopal (Manchester).

Smilow

Source: Mathematical Reviews,

Vol 13 No. 8

GINZBURG V. L.

PA 149T99

USSR/Physics - Radio-Wave Fading

Aug 51

"Effect of Interelectron Collisions on Absorption
of Radiowaves in F-Layer and in the Solar Corona,"
V. L. Ginzburg, Phys Inst imeni Lebedev, Acad Sci
USSR

"Zhur Tekh Fiz" Vol XXI, No 8, pp 943-947

Discusses problem of detg concn of mols in
F-layer. Shows that under certain circumstances,
interesting from the standpoint of F-layer and
solar corona investigations, interelectron col-
lisions do not contribute to radio-wave fading.
Submitted 31 Dec 1950.

194T99

GINZBURG, V. L.

LC

193T93

USSR/Physics - Superconductivity

Sep 51

"Behavior of Superconductors in High-Frequency Field," V. L. Ginzburg, Phys Inst Imeni Lebedev, Acad Sci USSR

PA 193T93

"Zhur Ekspier i Teoret Fiz" Vol XXI, No 9, pp 979-991

Discusses eqs representing behavior of superconductors in alternating electromagnetic field. Obtains expressions of surface impedance in superconduct. Treats problems of verification of electron theory of metals in normal state and heat conductance of superconductors with account of

LC

193T93

USSR/Physics - Superconductivity (Contd)

Sep 51

convective heat transfer. Author thanks Acad L. D. Landau for advice. Submitted 8 Sep 50.

GINSBURG, V. L.

Mathematical Reviews
Vol. 14 No. 8
Sept. 1958
Mathematical Physics.

7-13-54
LL

~~Ginsburg, V. L. and Tamm, I. E. On the theory of spin.~~
Translated by G. Belkov. National Research Council
of Canada, Ottawa, Tech Translation TT-305, 23 pp.
(1952).
Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 17, 227-
237 (1947); these Rev. 9, 553.

GINZBURG, V. L.

Theory of Propagation of Radio Waves in the Ionosphere. Glavpoligrafizdat, Main Polygraphic Publishing House, 358 pp, 1952.

GINZBURG, V.L.

Introduction of anisotropy into the theory of superconductivity. Zh.
eksper. teor. Fiz. 23, No.2, 236-8 '52. (MLRA 5:9)
(PA 56 no.668:5480 '53)

GINZBURG, V. L.

"Problems of the Theory of Electric Fluctuations," Usp. Fiz. nauk 46, No 3, 1952.

MLRA August 1952

USSR/Physics - Radio Hot Spots
Cosmic Rays 21 Jan 51

"Cosmic Rays as the Source of Galactic Radio Emission (Hot Spots)," V. L. Ginzburg, Phys Inst Imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXVI, No 3, pp 377-380

Discounts thermal radiation of interstellar electrons as source of hot spots, as proposed by A. Unseld in Zs. f. Astrophys., 26, 176, 1949. Considers noteworthy new proposal that subject galactic radio emission is the Bremsstrahlung of relativistic electrons --- i.e., the electron component of cosmic

1787102

USSR/Physics - Radio Hot Spots (Contd) 21 Jan 51

rays -- in interstellar and circumstellar magnetic fld, as proposed by Alfven and Herlofson ("Phys Rev" 78, 616, 1950) and Klepcheuer ("Phys Rev" 79, 738, 1950). Submitted 24 Nov 50 by Acad M. A. Leontovich.

1787102

GINZBURG, V. L.

USSR/Physics - Superconductivity Theory

Sep 52

"Present Status of Theory of Superconductivity. Part
II: Microscopic Theory," V. L. Ginzburg

"Uspekhi Fiz Nauk" Vol 48, No 1, pp 25-118

Reviews general knowledge on subject, emphasizing
difficulties in creating a general theory. Criti-
cizes hypothesis of spontaneous currents and analyzes
diamagnetic hypothesis and quasimicroscopic approach
to the theory. Gives 136 references.

236T77

GINZBURG, V. L.

USSR/Physics - Superconductivity 21 Mar 52

"Behavior of Superconducting Films in a Magnetic Field," V.L. Ginzburg, Phys Inst Imend Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 83, No 3, pp 385-388

States that the problem of the behavior of superconducting films in a magnetic field possesses 1st-order significance, but that until recently the theory of supercond seemed not to be in a position to give the correct picture of the behavior of superconductors in fields. Besides the remarks made earlier on this matter (see Ginzburg 227768

and Landau, "Zhur Eksper i Teoret Fiz" 20, 1064 (1950), the author indicates new works (see J.M. Lock, Proc Roy Soc 208, 391, 1951; N.V. Zavaritskiy, "Dok Ak Nauk SSSR" Vol 78, 665, 1951) which he says, are absolutely against the old theory and in qual agreement with facts. Submitted by Acad I.D. Landau 30 Jan 52.

(CA 47 no. 22: 11846 '53)
(PA 56 no. 668: 3474 '53)

227768

GINZBURG, V. L.

231760

USSR/Astronomy - Radio Stars

11 May 52

"Interstellar Matter and Ionospheric Disturbances Leading to Flickering of Radio Stars," V. L. Ginzburg, Phys Inst Imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 84, No 2, pp 245-247

Subject was recently analyzed by M. Ryle and A. Hewish (cf. M. N. Roy Soc, 110, 381, 1950). Author states he intends to develop subject by studying screening action of moon, which should eclipse, at a certain time, the flow of assumed interstellar particles to the earth, these

231760

particles allegedly being responsible for ionization of ionosphere and flickering of radio stars. Received. 28 Jan 52.

231760

Ginzburg, V. L.

[Handwritten initials]

USSR .

523.72

1971. On one possible mechanism for sporadic radio radiation from the sun. G. G. GERMANSKY AND V. L. GINZBURG. Dokl. Akad. Nauk SSSR, 27, No. 2, 181-82 (1972) In Russian.

An analysis is given of the hypothesis that these bursts of intense radiation are caused by relativistic electrons or protons in the magnetic field of a sunspot. Calculations of the number of electrons to produce the observed effect are given and lead to values of about 100 per cm².

J. M. HOLSH

[Handwritten initials]

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GINZBURG, V. L.

GINZBURG, V. L., IA. L. AL'PERT, and E. L. FEINBERG.

Rasprostranenie radiovoln. Moskva, Gostekhizdat, 1953. 883 p.,
illus., tables, diagrs.

Bibliography: p. 870-883. [365 references.]

Title tr.: Radio wave propagation.

QC661.A42

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of
Congress, 1955.

GINZBURG, V. L.

USSR

402. On certain questions in the theory of the propagation of a radio wave in the ionosphere in connection with their incorrect treatment by V. N. Kessenikh. V. L. GINZBURG. *Zh. ekspt. teor. fiz.*, 25, No. 4 (1953), 1551-1552; Russian.

A discussion of mistakes in V. N. Kessenikh's textbook *The propagation of a radio wave* (1952), under the headings: (1) The question of the effective field ($E = E_0$ or $E = E_0 + (4\pi/3)P$); (2) The reflection of a wave from an ionizing layer; (3) The influence of the earth's magnetic field and the effect of the multiplication of reflected radio signals.

W. J. SWIATECKI

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of

GINZBURG, V.I.

Relativistic "gyration" and the theory of non-localizing
Yukawa fields. Zhur. eksp. i teor. fiz. 25 no.6:757-759 D '53.
(Field theory) (MLRA 7:10)

GINZBURG, V. L.

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

272154

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. Shklovskiy, L. A. Artsimovich, I. Ya. Pomeranchuk, V. V. Vladimirov, 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.

272154

GINZBURG, V. L.

USSR

537.591.1

4662. The electron component and the origin of cosmic rays. V. L. GINZBURG AND M. I. FRADIN. Dokl. Akad. Nauk SSSR, No. 3, 537 (1955) in Russian. English translation, U.S. National Sci. Found. NSF-tr-59.

The absence of electrons in the primary cosmic ray flux is discussed in relation to interstellar magnetic fields and it is concluded that the cosmic-ray electrons are lost because of radiation in these fields. Assuming a field of $\sim 10^{-4}$ gauss it is shown that no electrons of energy greater than 5×10^8 eV are likely to be present in the primary flux.

R. ELLIOT

3
Hudson
1-RML

RML

U S S R

523.72 : 523.877

17679. The statistical mechanism of the acceleration of particles on the sun and in stellar shells. V. L. Ginzburg. Dokl. Akad. Nauk SSSR, 92, No. 4, 127-30 (1953) In English. English translation, U.S. National Sci. Found. NSF-tr-297.

The high efficiency for the acceleration of particles on the sun and in stellar shells of the statistical mechanism (proposed by Fermi in 1949 for collisions with turbulences in interstellar space) is pointed out. In a time of the order of some hours a particle in a prominence on the sun could reach relativistic velocities. The necessary injection energies for protons and electrons are estimated.

W. J. SWIATECKI

RC JAH

GINZBURG, V.L.

USSR

523.165 : 537.591.1 : 523.841.11

7076. Supernovae and novae as sources of cosmic
and radio radiation. V. L. Ginzburg. Dokl. Akad.
Nauk SSSR, 92, No. 6, 1133-6 (1953) In Russian.
English translation, U.S. National Sci. Found.
NSF-tr-230.

Order of magnitude estimates of the energy flux at
visible and radio wavelengths to be expected from
bremsstrahlung of relativistic electrons in magnetic
fields associated with novae and supernovae. Com-
parison with data on supernovae of A.D. 369, 1054,
1572.

W. J. SWIATECKI

OC Bond 1954

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., tekhnicheskij redaktor.

[Transactions of the Third Conference on Problems of Cosmogony, May 14-15, 1953. Origin of cosmic rays] Trudy...soveshchaniya...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)

GINZBURG, V. L.
USSR/Astronomy

Card 1/1

Author : Ginzburg, V. L. Memb. Corresp. of Acad. of Sc. USSR

Title : Radio-Astronomy

Periodical : Priroda, 5, 12-21, May 1954

Abstract : The basic problem of radio-astronomy is the study of extraterrestrial radiations in the interval of from 7 mm to 30 m. The development of radio-astronomy considerably enlarged the part of the electromagnetic wave spectrum used for astronomical investigations. The basic value of applying radio methods in astronomy is that the radio radiation of the sun and many other cosmic objects is usually emanated from zones of very weak illumination in the visible part of the spectrum. The basic objects studied by radio methods are: the sun, our galactics as a whole and individual galactic and extragalactic nebulae. Radio-methods are also highly effective in the study of meteors and for astrophysical investigations. Another interesting radio-astronomical task is the radio location of the moon (pick up of radio signals sent from the earth and reflected by the moon). Photos.

Institution :

Submitted :

GINZBURG, V.L.

USSR/ Physics - Properties of metals
Card 1/1 Pub. 43 - 3/62
Authors : Ginzburg, V. L., and Motulevich, G. P.
Title : Optical properties of metals
Periodical : Izv. AN SSSR. Ser. fiz. 18/6, 631-634, Nov-Dec 1954
Abstract : Report was submitted at the 9-th All-Union Conference on Spectroscopy describing various means for studying and determining the optical properties of metals with the aid of spectroscopy. The parameters most important in determining the characteristics of metals are listed. The instruments normally employed in metal spectroscopy are described. Sixteen references: 5 USSR, 3 German, 1 English and 7 USA (1913-1954). Table; graph.
Institution : Acad. of Sc., USSR, The P. N. Lebedev Physics Institute
Submitted :

GINZBURG, V. L.

FD-747

USSR/Nuclear Physics - Wave equations

Card 1/1 : Pub 146-17/22

Author : Ginzburg, V. L., and Silin, V. P.

Title : Some remarks on relativistic wave equations with mass spectrum

Periodical : Zhur. eksp. i teor. fiz., 27, 116-118, Jul 1954

Abstract : Letter to the editor. Analyze equations from works by H. Yukawa (Phys. Rev. 91 [1953]). A. Pais (physica, 19 [1953]) and J. Rayski (Nuovo Cimento, 10, [1953]) and the reasons for the divergences in computations. 11 references, including the 3 mentioned foreign.

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

Submitted : April 19, 1954

GINZBURG, V.I.

V.N.Kessenikh's old and new errors. Zhur.eksp. i teor.fiz. 27
no.4:517-520 0 '54. (MLRA 7:12)
(Radio waves) (Kessenikh, V.N.)

GINZBURG, V.L.

Radio astronomy. Priroda 43 no.5:12-21 My '54. (MIRA 7:5)

1. Chlen-korrespondent Akademii nauk SSSR. (Radio astronomy)

GINZBURG, V. L.

USSR/Physics

Card- 1/1

Author : Ginzburg, V. L.

Title : Again about the application of thermodynamics to electrical fluctuation

Periodical : Usp. Fiz. Nauk, 52, Ed. 3, 494 -498, March 1954

Abstract : In answer to the letter by M. L. Levin (pages 486 -494) regarding thermodynamic investigation of electrical fluctuations the author accuses the latter of presenting an erroneous and false picture of the subject. It is emphasized that the analysis of the problem as presented by G. S. Gorelik is by no means complete and strict in all view points. On the contrary, there are moments in the limits of applicability of the thermodynamic approach which require further thorough analysis. A summary of the original Gorelik work is included in the letter. Eight references.

Institution :

Submitted :

GINZBURG, V.L.

Red displacement in solar and stellar spectra. Dokl. AN SSSR 97
no.4: 617-620 Ag '54. (MLRA 7:9)

1. Chlen-korrespondent Akademii nauk SSSR. 2. Fizicheskiy institut
im. P.N.Lebedeva Akademii nauk SSSR.
(Sun--Spectra) (Stars--Spectra)

GINZBURG, V. L.

USSR/ Physics - Optics in metals

Card 1/1 : Pub. 22 - 14/44

Authors : Ginzburg, V. L., member corresp. of the Acad. of Scs. of the USSR

Title : About optical properties of metals

Periodical : Dok. AN SSSR 97/6, 999-1002, Aug 21, 1954

Abstract : A study of the optical properties of metals is described. The study was intended to create a dependable theory that would explain the major portion of the optical phenomena observed during experiments with metals and to show that the experimental data would not deviate from theoretical calculations. Fourteen references (1912-1954).

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

Submitted :

USSR/ Physics - Cosmic rays

Card 1/1 Pub. 22 - 10/56

Authors : Ginsburg, V. L., Member Correspondent of the Acad. of Scs. of the USSR

Title : On the origin of cosmic rays

Periodical : Dok. An SSSR 99/5, 703-706, Dec 11, 1954

Abstract : The current theories on the origin of cosmic rays are criticized. These theories, shared by Fermi, Morrison and others, are based on the assumption of interstellar acceleration acquired by primary particles due to their collisions in galaxies. The criticism mainly analyses Fermi's expression for an index showing the cosmic ray energy in the spectrum $\gamma = 1 + \frac{1}{\alpha T}$ (where T - the life of a particle in the galaxies, α - the coefficient in the equation of the particle acceleration $\frac{dE}{dt} = \alpha E \approx \frac{u^2}{c^2 T} = \frac{u^2 v}{c^2 l} E$) and those discrepancies and contradictions which one finds by substituting some experimental data into the above equation. Thirteen references 7-USSR (1949-1954).

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

Submitted : . . .

GINSBURG, V. L.

"The Nature of Cosmic Radioemission and the Origin of Cosmic Rays,"
paper submitted at the International Astronomical Union Radio Astronomy
Symposium, Jodrell Bank, UK, Aug 1955

A-40421 - II

GINZBURG, V. L.

634.22/23
 4909. THE GENERAL CONNECTION BETWEEN ABSORPTION AND DISPERSION. V.L. Ginzburg.
 Akust. Zh., Vol. 1, No. 1, 31-8 (1955). In Russian.
 This same topic is discussed first in application to the propagation of electromagnetic waves and results known previously are obtained. Next analogous formulae are derived connecting velocity and sound absorption coefficient. Lastly the peculiarities distinguishing the acoustic case from the electromagnetic are discussed.
 C.R.S. Mandors

Styer

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634.22/23

Physics Inst. im. Lebedev, AS USSR

GINZBURG, V.L.; GRAMENITSKIY, I.N.; KASHLINSKAYA, S.Ye.; LIVSHITS, D.M.

Spectrographic determination of minor impurities in a few raw materials, semi-finished products and pure metals in copper and nickel production. Izv. AN SSSR, Ser. fiz. 19 no. 2: 211-216
Mr-Ap '55. (MLRA 9:1)

(Tartu--Spectrum analysis--Congresses)

GINZBURG, V. L.

8000

Proofs

537 311 31

2075. INFLUENCE OF INTER-ELECTRON COLLISIONS ON THE ELECTRICAL CONDUCTIVITY AND THE SKIN-EFFECT IN METALS V. L. Ginzburg and V. P. Shipilov Zh. eksper. teor. Fiz., Vol. 29, No. 1 (77), 64-74 (1955) in Russian.

Bentham and Kronig's statement that the electron viscosity in metals, resulting from electron interaction, influences the absorptivity of metals for infrared radiation is investigated. This would be important in metal optics, electrical and thermal conductivity, skin effect etc. It was found that the above authors' method is incorrect, and their results wrong. Except for very high frequencies, the effects of electron interaction are negligible.

Electrical Research Association

RDW

Ginzburg, V. L.

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34429

Author: Ginzburg, V. L.

Institution: None

Title: On the Macroscopic Theory of Superconductivity

Original Periodical: Zh. eksper. i teoret. fiziki, 1955, 29, No 6, 748-761

Abstract: A discussion of many problems in the theory of superconductivity in constant and variable fields. Certain experimental data on the dependence of the depth of penetration of δ on the magnetic field and on the magnitude of the surface tension between the superconducting and normal phases are not in agreement with the V. L. Ginzburg and L. D. Landau theory (Zh. eksper. i teoret. fiziki, 1950, 20, 1064). Agreement is possible if it is assumed that the characteristic charge, entering into the theory, is not equal to the charge of the electron and exceeds it in magnitude by several times. Pippard's experiments, which give for lead a nonmonotonical behavior of the dependence of δ on the angle between the current and the tetragonal axis of the specimen, contradicts not only the Ginzburg and Landau theory, but also the London theory. However, the experimental data themselves are still not sufficiently

1 of 3

- 1 -

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abat Journal: Referat Zhur - Fizika, No 12, 1956, 34429

Author: Ginzburg, V. L.

Institution: None

Title: On the Macroscopic Theory of Superconductivity

Original Periodical: Zh. eksper. i teoret. fiziki, 1955, 29, No 6, 748-761

Abstract: reliable. Because of this, and because of many other considerations, the author considers the equation suggested by Pippard in lieu of the London equation to be invalid for the connection between the density of the superconduction current v_s and the vector potential A of the magnetic field. The section of the article devoted to the behavior of superconductors in high frequency fields contains a summary of equations relating the surface impedance, the effective conductance, and the effective dielectric constant of the metal for the general case (for the linear region, at small fields) for the case of a superconductor. Analysis of the numerical data, obtained from optical investigations, leads the author to the conclusion that the number of superconducting electrons at $T = 0$ is several times smaller than the number of conduction electrons at $T > T_k$. In this manner, a portion of the convection

2 of 3

- 2 -

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34429

Author: Ginzburg, V. L.

Institution: None

Title: On the Macroscopic Theory of Superconductivity

Original Periodical: Zh. eksper. i teoret. fiziki, 1955, 29, No 6, 748-761

Abstract: electrons should change over to the bound state in the superconduction transition. The last section of the article discusses attempts to estimate the contribution of normal electrons to the surface impedance of the superconductor under the assumption that the theory of the anomalous skin effect is applicable to them. The calculations made by the author using a simplified scheme (Zh. eksper. i teoret. fiziki, 1951, 21, 979) are compared with the calculations made by A. A. Abrikosov (Dokl. AN SSSR, 1952, 86, 43). The difference in the results can be substantial only in the vicinity of $T = 0$ and $T = T_k$. In conclusion, the need for further measurements of the properties of superconductors in the region of centimeter, millimeter, and infrared waves is emphasized.

USSR/Physics - Helium II

FD-2885

Card 1/1

Pub. 146 - 22/26

Author : Ginzburg, V. L.

Title : ~~Surface energy connected with tangential discontinuity of velocity in helium II~~
Surface energy connected with tangential discontinuity of velocity in helium II

Periodical : Zhur. eksp. i teor. fiz., 29, August 1955, 254-256

Abstract : The writer notes that one of the most essential problems in the theory of superfluidity is, as already indicated by him (ibid., 14, 135, 1944; DAN SSSR, 69, 161, 1949), the question of the character of the tangential break in the velocity of the superfluid part of helium, v_s , at the boundary of the liquid with the wall, the presence of such a discontinuity proceeding from the fact that the helium atoms stick to the wall (solid body) and simultaneously the tangential component v_s near the wall is not equal to zero from the macroscopic viewpoint, i.e. even in the immediate neighborhood of the wall (L. D. Landau, J. of Phys., 5, 71, 1941). The author thanks Academician L. D. Landau and Professor Ye. M. Lifshits. Ten references.

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

Submitted : April 21, 1955

GINSBURG, V.L.

See Math

2

Hershman [Gersman], B. N.; and Ginsburg [Ginzburg], V. L. Influence of magnetic field on convective instability in a rotating sphere of the earth (Russian. English summary.)

It is pointed out that in certain astrophysical and geophysical connections one must allow the electrical and the thermal conductivities to depend on direction. The theory of the inhibition of convection by a magnetic field [S. Chandrasekhar, Phil. Mag. (7) 43 (1952), 501-532, MR 14, 813] is revised to take into account these effects. A discussion of the orders of magnitude of the various quantities involved suggest that the inhibition will be ineffective in the applications contemplated.

S. Chandrasekhar (Williams Bay, Wis.)

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of

PIKEL'NER, S.B.; GINZBURG, V.L.; SHKLOVSKIY, I.S.

Mechanism of particle acceleration in envelopes of novae and
supernovae. *Astron. zhur.* 32 no.6:503-513 Nov '55.
(Stars, Nov) (MLBA 9:2)

LEVIN, M.L.; GINZBURG, V.L.

Application of thermodynamics to electric fluctuations. *Usp. fiz. nauk* 56 no.1:146-148 My '55. (MIRA 8:6)
(Electromagnetic theory) (Thermodynamics)

GINZBURG, V.L.; FEYNBERG, Ye.L.

Iger' Evgen'evich Tamm; on his 60th birthday. Usp.fiz.nauk 56
no.4:469-475 Ag '55. (MLRA 9:1)
(Tamm, Iger' Evgen'evich, 1895-)

GINSBURG, V. L.

USSR/ Physics - Metallo-optics

~~Card No~~ Pub. 118 - 1/3

Authors : Ginsburg, V. L., and Motulevich, G. P.

Title : Optical properties of metals

Periodical : Usp. fiz. nauk 55/4, 469-535, Apr 1955

Abstract : A theoretical experimental analysis of the optical characteristics of metals is presented. The effective indexes of refraction - $n_{\text{eff}}(\omega)$, and absorption - $\chi_{\text{eff}}(\omega)$ - of light by metals are discussed. The methods of their determination are described, as well as the determination of the $A(\omega)$, a quantity of light absorbed by metal when the light falls normally upon the metal surface; thus, $A(\omega)=1-r(\omega)$, where the $r(\omega)$ is a coefficient of light reflexion by a metal. However, only the simple cases are considered in which light, of the infra-red spectral region frequencies, is reflected by an isotropic surface of non-magnetic metals, i.e., cases in which the quantum absorption does not take place. Sixty-five references: 16 USSR, 9 German, 9 British, 24 USA and 7 French (1906-1955). Tables; diagrams; graphs.

~~Inspection~~

~~Submitted~~

GINZBURG, V. L.

USSR/Physics - Electron emission

Card 1/1 Pub. 22 - 11/54

Authors : Ginzburg, V. L., Mem. Corresp. Acad. of Scs.,USSR, and Shabanakiy, V. P.

Title : Kinetic Temperature of electrons in metals and anomalous electron emission

Periodical : Dok. AN SSSR 100/3, 445-448, Jan. 21, 1955

Abstract : A theoretical analysis of the kinetic temperature of electrons in metals is presented. Cases are considered in which the f_0 (symmetric function of distribution) is not equal to the $f_F(t)$ (the Fermi function of distribution), but, due to an electron collision, at certain temperatures, equals $f_F(\Theta)$, i.e. $f_0 = f_F(\Theta)$, where Θ and T are corresponding temperatures and $\Theta > T$. Such a fact does not change much the electric conductivity of a metal; but the electron emission is greatly affected by it, as one can see from: $i = A \Theta^2 e^{-x/K\Theta}$, x being the output work. Eight references: 7 USSR and 1 English (1937-1954).

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

Submitted :

GINZBURG, V. L.

USSR/Physics - Ionosphere

Card 1/1 Pub. 22 - 10/60

Authors : Gershman, B. N. and Ginzburg, V. L., Memb. Corresp. of the Acad. of Scs. of the USSR

Title : About the mechanism of the formation of ionospheric heterogeneity

Periodical : Dok. AN SSSR 100/4, 647-650, Feb 1, 1955

Abstract : Convective instability as a cause of the heterogeneity of the ionosphere is discussed. Thermal conductivity, viscosity of the ionosphere and magnetic field effect are considered as possible factors in the formation of such an instability. Fifteen references: 5 USSR and 10 British (1930-1954).

Institution : Physico-Technical Research Institute of the Gorkiy State University

Submitted :

GINZBURG, V.L.

Light scattering in the neighborhood of second-order phase transition points. Dokl. AN SSSR 105 no.2:240-243 '55. (MLRA 9:3)

1. Chlen-korrespondent AN SSSR; 2. Fizicheskiy institut imeni P.N. Lebedeva Akademii nauk SSSR.

(Light--Scattering)

GINSBURG, V. L., (moscow)

"On superconducting ferromagnetics," a paper submitted at the International Conference on Physics of Magnetic Phenomena, Sverdlovsk, 23-31 May 56.

GINZBERG, V. L., SHKLOVSKIY, I. S. and PIKEL'NER, S. B.

"Radio Radiation of Discrete Sources," a report delivered at the Symposium on Radioastronomy held at the Jodell-Bank Experimental Radioastronomical Station, Manchester University, Englan, is summarized in the account of this symposium in an article by V. V. VITKEVICH in Vest. Ak. Nauk SSSR for January 1956.

Sum. 900, 26 Apr 56

GINSBURG, V.L., redaktor; LEYKIN, G.A., kandidat fiz.-mat. nauk, redaktor;
CHIKHACHIN, B.M., kandidat fiz.-mat. nauk, redaktor; SHKLOVSKIY,
doktor fiz.-mat. nauk; FRADKIN, M.I., redaktor; MAKUNI, Ye. V.,
tekhnicheskiy redaktor.

[Proceedings of the Fifth Conference on Problems of Cosmogony;
radioastronomy] Trudy piatogo soveshchaniya po voprosam kosme-
gonii; radioastronomiya. Moskva, 1956, Izd. Akademii nauk SSSR.
567 p. (MLRA 9:5)

1. Soveshchan'ye po voprosam kosmogonii. 5th, Moscow 1955. 2. Chlen-
korrespondent AN SSSR (for Ginsburg).
(Radio astronomy)

GINZBURG, V.L.
Category : USSR/Radiophysics - Application of radiophysical methods

I-12

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1987

Author : Ginzburg, V.L., Pisarova, V.V.

Title : On the Nature of the Fluctuations of the Intensity of Solar Radio Waves and of the Irregularities in the Solar Corona.

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 229-241, diskus. 241

Abstract : A theoretical evaluation is made of the mechanism of scattering of radio waves by the irregularities of the solar corona. The fluctuations in the intensity of the received radio waves, caused by diffraction, may be of two types: diffraction in the corona may make the field of the radio waves inhomogeneous in the coordinate system that is tied to the sun, and the rotation of the sun with the motion of the earth will cause fluctuations in the intensity to be observed on the earth; the diffraction pattern changes on the sun itself owing to the motion of corona irregularities. The following simplified situation is considered: diffraction occurs in the corona at the edge of the thin non-transparent semi-infinite screen. The resultant diffraction pattern (with a characteristic dimension $x_0 = 7000$ km for $\lambda = 1.5$ m) will move relative to an observer on earth, so that at points located at various longitudes a shift will be observed in the patterns (with time), equal to

Card : 1/2

Card : 2/2

G I N Z B U R G , V . L .

Category : USSR/Radiophysics - Application of radiophysical methods

I-12

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2000

Author : Ginzburg, V.L.

Title : Cosmic Radio Waves and Cosmic Rays

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 438-456 ,
diskus. 457-467

Abstract : New data are reported concerning the nature of cosmic radio waves, and new materials are cited on a theory of the origin of cosmic rays, which is related to radio astronomy (identification of the fundamental part of cosmic radio radiation with magnetic bremsstrahlung of electrons of cosmic rays). An argument in favor of such a theory is the "radio coronas" observed by Baldwin (Ref. Zhur. Fiz. 1956, 23594) in the M31 nebula, confirming the galactic origin of the isotropic component of the radio waves. The hypothesis that novae and supernovae are sources of cosmic rays is confirmed by the radio waves from the Eagle Nova of 1918, the similarity between the subsystem formed by sources of cosmic rays and the subsystem of the novae and supernovae, etc. The latest data on cosmic rays (high-latitude cutoff, character of interactions between protons and nuclei, relationships between beams of various groups of nuclei, etc.) also fit completely into the picture proposed.

Card : 1/2

Category : USSR/Radiophysics - Application of radiophysical methods

I-12

Abs Jour : Ref Zhur - Fizika, № 1, 1957 No 2000

During the discussions, I.M. Gordon deduced from energy considerations that the statistical mechanism, effective in the shells of stars, cannot be employed to explain the acceleration of electrons. The electrons are accelerated not in the shells, but in the stars themselves (particularly, in the supernovas themselves).

The balanced spectrum of the electrons in the galaxy, according to a comment made by M.I. Fradkin during the discussion, becomes steeper in the higher-energy region as a result of the radiation in the magnetic fields, and becomes less sloping in the lower-energy region as the result of the ionization losses. Accordingly, the radiation spectrum produced by these electrons will be less steep in the region of the longer waves (hundreds of meters), and steeper in the shorter-wave interval. Bibliography, 56 titles.

Card : 2/2

Category : USSR/Radiophysics - Application of radiophysical methods

I-12

APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00051673

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2004

Author : Ginzburg, V.L.

Title : On the Mechanism of the Formation of Ionospheric Irregularities, Resulting in the Flicker of "Radio Stars."

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 512-519

Abstract : Fluctuations in the intensity and in the angle at which radio waves from discrete sources arrive at the earth (called the flicker of "radio stars") are due to ionospheric irregularities. Three mechanisms by which irregularities are formed are considered: 1) the incidence of interstellar matter, attracted by the sun, on the ionosphere; 2) convective instability, occurring in regions with a negative temperature gradient; 3) turbulization, due to ionospheric winds. Although the first mechanism explains the observed daily course of the flickering, there are many observation data to refute this hypothesis (flicker due to solar eclipses, relationship to ionospheric winds, etc.). The convective hypothesis can be assumed acceptable, if one can establish the existence of regions with negative temperature gradients in the ionosphere. The proposed turbulization of the ionospheric streams encounters many difficulties (the small Reynolds numbers), although an argument in its favor is the observed correlation between the flicker and the ionospheric

Card : 1/2

Category : USSR/Radiophysics - Application of radiophysical methods

I-12

Abs. Jour : Ref Zhur - Fizika, No 1, 1957 No 2004

winds, and the fact that ionospheric winds exist. In view of the lack of agreement between the first hypothesis and experiment, two alternatives remain, the choice of which depends on results of further observations on the ionosphere, on the correlation between the flicker and the ionospheric winds, etc. Bibliography, 12 titles.

Card : 2/2

Category : USSR/Radiophysics - Application of radiophysical methods

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 2010

"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00051

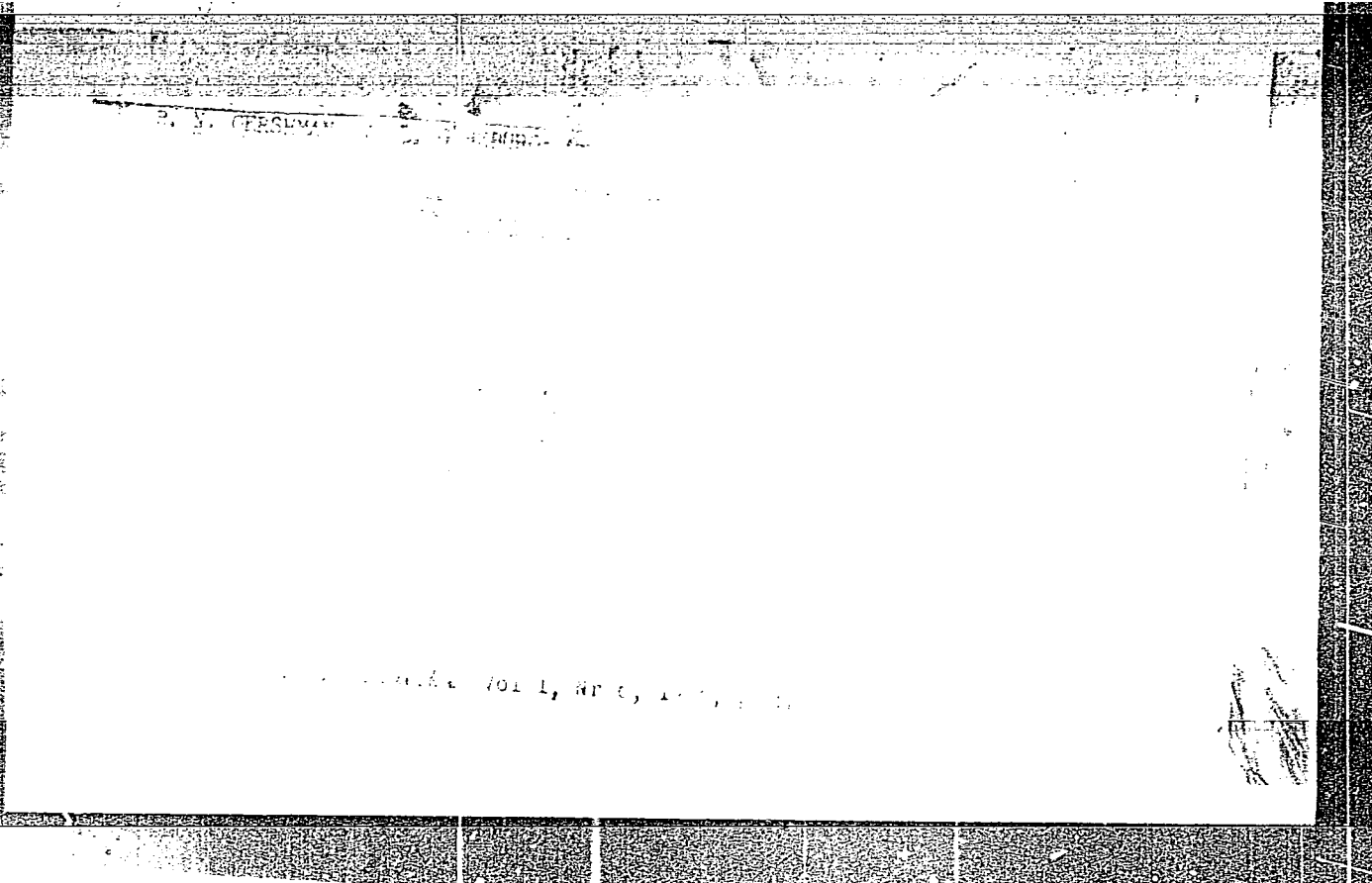
Author : Ginzburg, V.L.

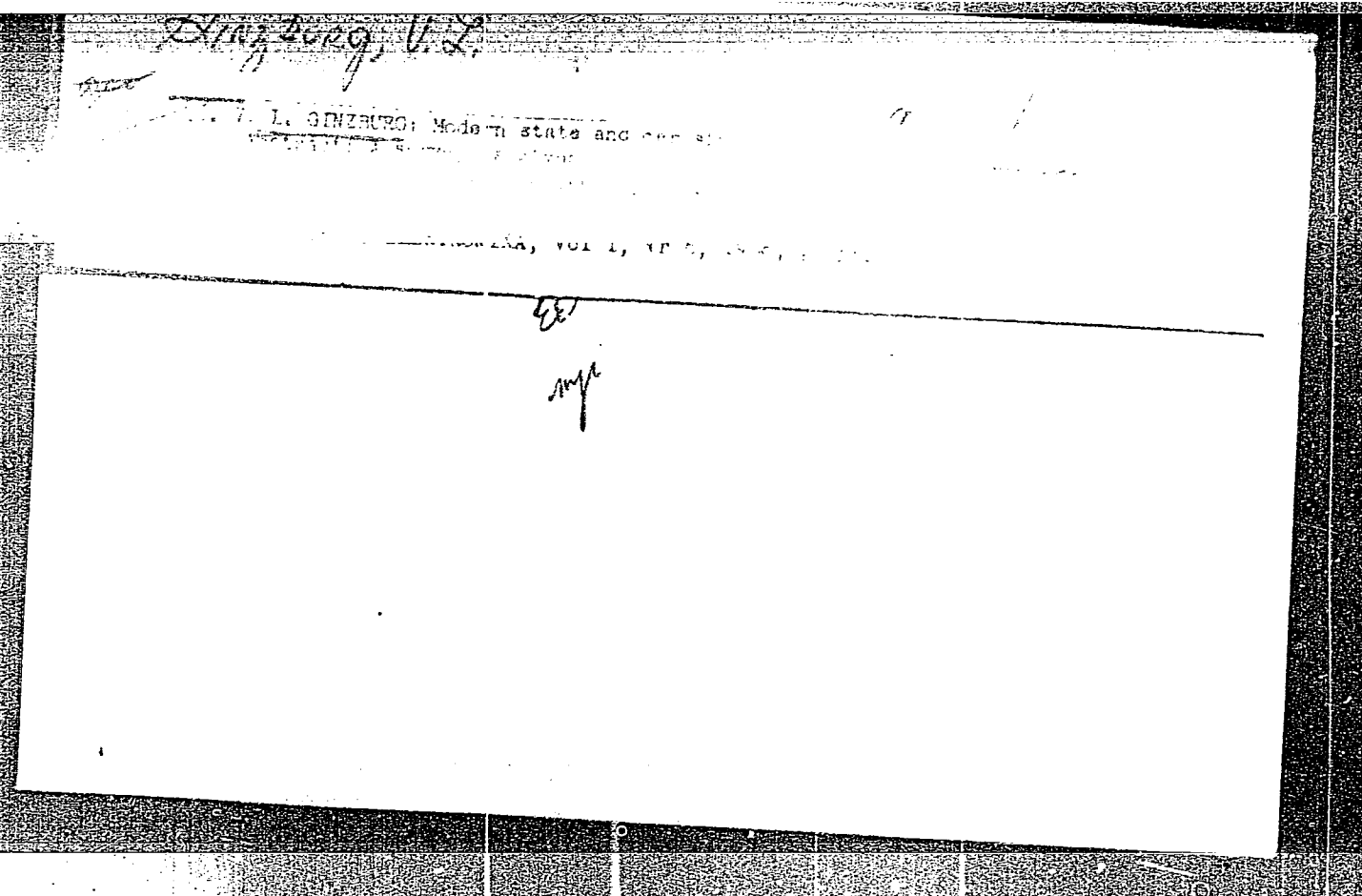
Title : Address at the Closing Session

Orig Pub : Tr. 5-go soveshchaniya po voopr. kosmogonii. 1955, M., AN SSSR, 1956, 562-564

Abstract : Formulation of many urgent problems that must be solved by radio astronomy, including the determination of the spectrum of the radio waves from the galaxy and from discrete sources, search for the polarization of the radiation from cosmic sources, the study of the sporadic radiation from the sun, intergalactic monochromatic radiation of hydrogen, etc. It is indicated that it is necessary to develop radar methods for the investigation of meteors, the moon, the planets, and the sun, and that it is necessary to establish a close collaboration between radio astronomy and optical astronomy and the physics of cosmic rays.

Card : 1/1





Ginzburg V.L.

7/1/55

THE EFFECT OF INTERELECTRONIC COLLISIONS ON THE ELECTRICAL CONDUCTIVITY AND SKIN EFFECT IN METALS

V. L. Ginzburg and V. P. Silin (P. N. Lebedev Inst. of Physics U.S.S.R.) Soviet Phys. JETP 1, 66 (1956) Jan. (In English). Zhur. Eksptl. i Teoret. Fiz. 29, 64-74 (1955) July. (In Russian)

The effect of collisions between electrons on the electrical conductivity, thermal conductivity and skin effect in metals is considered. The question of electronic viscosity is discussed. It is shown that taking account of interelectronic collisions does not introduce notable changes into the results of the theory of the anomalous skin effect in metals (auth)

SP

Ginzburg, V. L.

Macroscopic theory of superconduction. V. L. Ginzburg. *Soviet Phys., JETP* 2, 650-660 (1956) (English translation).--See C.A. 50, 11098d. H.M.R. Phy

GINZBURG, V.L.

Category : USSR/Theoretical Physics - Theory of Relativity and Unified Field Theory B-2

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 2910

Author : Ginzburg, V.L.

Title : Experimental Verification of the General Relativity Theory and Artificial Earth's Satellites.

Orig Pub : Priroda, 1956, No 9, 30-39

Abstract : No abstract

Card : 1/1

GINZBURG, V. L.

Distr: 4E3d

Ginzburg, V. L. On relativistic wave equations with a mass spectrum J.F.W

The solution of the relativistic wave equation with a mass spectrum is considered. The method of the asymptotic expansion of the solution is used. The results are applied to the problem of the scattering of particles by a potential.

GINZBURG, V. L.

USSR/Physics of the Atmosphere - Upper Layers of the Atmosphere. Ionosphere, M-6

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 3622

Author: Gershman, B. N., Ginzburg, V. L.

Institution: None

Title: On the Effect of the Magnetic Field on the Convective Instability in the Atmospheres of Stars and in the Earth's Ionosphere

Original

Periodicals: Uch. zap. Gor'kovsk. un-ta, 1956, 30, 3-29

Abstract: Analysis of the problem of the effect of the magnetic field on the convective instability under conditions when the electric conductivity is anisotropic (exactly what occurs in the ionosphere and under certain astrophysical conditions). It is shown that in the earth's ionosphere, by virtue of the presence of a considerable number of molecules, the magnetic field practically hardly changes the Rayleigh critical number. At the same time, in a purely electron-ion plasma, the effect of the magnetic field may be considerable, although it changes if the anisotropies of the electric and thermal conductivities are taken into account.

Card 1/1

Ginzburg, V.L.
Category : USSR/Nuclear Physics - Cosmic rays

C-7

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 615

Author : Ginzburg, V.L.
Inst : Phys. Inst., Acad. of Sciences USSR
Title : On the Origin of Cosmic Rays.

Orig Pub : Izv. AN SSSR, ser. fiz., 1956, 20, No 1, 5-16

Abstract : Certain new investigations are evaluated from the point of view of a theory, based on radio-astronomical data, developed by the author and others concerning the origin of cosmic rays in supernova and nova stars. In particular, the latest radio-astronomical investigations on the quasi-spherical distribution of galactic radio waves indicate a similar distribution of cosmic rays in the galaxy; the detection of radio waves from nova stars confirms indirectly the previous assumption that cosmic rays are generated not only in supernovas, but also in novas; analysis of the distribution of the cosmic radio waves over the heavens has shown that the sources of the primary cosmic rays occupy a region shaped like strongly flattened spheroid with a radius of almost the same size as the distance between the sun and the center of the galaxy. The recently established fact that the high-latitude cutoff in the spectrum of protons and multiple-charge nuclei occurs at the same

Card : 1/2

633" APPLICATION OF ^{GEO}ARTIFICIAL SATELLITES FOR
TESTING GENERAL RELATIVITY 530.12 : 531.51 ✓
Zh. eksper. teot. Fiz., Vol. 10, No. 11, 1968
Russian.

According to theory there is a direct shift in the frequency
of radio signals emerging from the surface of a
planet's gravitational field. A direct shift in the
frequency of radio signals is observed in the
case of the Earth. In considering the possibility
of observation in the case of artificial satellites
it is noted that the effect of the Earth's rotation
must be taken into account.

Category : USSR/Atomic and Molecular Physics - Low-temperature Physics D-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3528

Author : Ginzburg, V.L.

Inst : Physics Institute, Academy of Sciences USSR

Title : Certain Remarks Concerning the Macroscopic Theory of Superconductivity.

Orig Pub : Zh. eksperim .i teor. fiziki, 1956, 30, No 3, 593-595

Abstract : The author and Landau (Zh. eksperim. i teor. fiziki, 1950, 20, 1064) developed a macroscopic theory of superconductivity for the case $T_K - T \ll T_K$ (T_K is the critical temperature). The starting point of the theory was an expression for the free energy: $F_{s0} = F_{n0} + \alpha(T) |\Psi|^2 + 1/2 \beta |\Psi|^4$, where F_{n0} is the density of the free energy in the normal state, $|\Psi|^2$ is the concentration of the "superconducting electrons," and α and β are coefficients. It is indicated that a macroscopic theory, correct for all temperatures, can be derived without changing the expression given for F_{s0} . However, α and β must now be considered as functions. Expressions are given for $\alpha(T/T_K)$ and $\beta(T/T_K)$. All the equations obtained in the work by the author and by Landau and in subsequent investigations remain in force in their previous form, so that the temperature dependence of α and β does not play any role in the calculations.

Card : 1/2

Category : USSR/Atomic and Molecular Physics - Low-temperature Physics

D-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3528

The values of the surface energy at the boundary between the normal and the superconducting phases and the dependence of the depth of penetration δ on the intensity of the magnetic field H , obtained on the basis of the proposed theory, are compared with Bardin's results, in which the expression for F_{s0} , considered for a two-liquid model of a superconductor, was used. Different results are obtained for the dependence $\delta(H)$, and this may perhaps be used to choose between the expressions for the free energy on the basis of the experimental data.

Card : 2/2

Ginzburg, V.L.

Category : USSR/Atomic and Molecular Physics - Low Temperature Physics D-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6344

Author : Ginzburg, V.L.

Inst : Physics Institute, Academy of Sciences, USSR

Title : Concerning the Blatt, Butler and Shafroth Papers on Superfluidity and Superconductivity Theory.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 6, 1151-1152

Abstract : Many critical remarks are made concerning the papers by Blatt, Butler and Shafroth (Referat Zhur Fizika, 1956, 28399, 28400, 28422, 31373, 31449, 34416). It is noted that the problem of superfluidity and superconductivity of an ideal Bose gas was already considered earlier, (Ginzburg, V.L., Uspekhi fiz. nauk, 1952, 48, 25; Referat Zhur Fizika, 1956, 10130), and has only methodological significance.

It is furthermore indicated that the statement contained in the above papers on the finiteness of the correlation radius for the momenta of a pair of particles in all real systems, unlike the ideal Bose gas, appears to the author of this

Card : 1/3

Category : USSR/Atomic and Molecular Physics - Low Temperature
Physics

D-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6344

article to be incorrect. All the argumentation in favor of the existence of a finite correlation radius reduces in these papers to a remark that for a very large system there is no probability of the existence of a correlation between particles located at different ends of the system. However, for example, for any single crystal there is a correlation in the position of the particles outside the dependence on its dimensions; the same pertains to the "remote order" in ferromagnetics, etc. The author shows that a finite correlation radius occurs when the density matrix does not vanish at infinity, and that this takes place also for an ideal Bose gas and, as follows from many considerations, for He II also for electrons and superconductors (Landau, L.D., Lifshitz, Ye.M. Statistical Physics, Section 129; Ginzburg, V.L., Landau, L.D., Zh. eksperim, i teor, fiziki, 1950, 20, 1064). In the case when the density matrix does not vanish at infinity, its Fourier component contains a δ -like term. It follows from the

Card : 2/3

Category : USSR/Atomic and Molecular Physics - Low Temperature
Physics

E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6344

works by N.N. Bogoliubov and D.N. Zubarev that for a non-ideal Bose gas, in the case of weak interaction, the Fourier component of the density matrix contains a δ -like term. Also noted is the fact that the ideas concerning the unbalanced character of superfluidity of He II, cited in one of the above works (Referat Zhur Fizika, 1956, 28400), is unfounded.

Card : 3/3

GINSBURG, V.L.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA 1568
 AUTHOR GINSBURG, V.L.
 TITLE On Ferromagnetic Supraconductors
 PERIODICAL Zhurn. eksp. i teor. fis. 31, fasc. 2, 202-210 (1956)
 Issued: 10 / 1956

This work aims at proving that it is practically almost impossible to determine the supraconductivity of any ferromagnetics (by means of usual methods). A massive ferromagnetic can, if conditions are normal, pass into the supraconductive state only in exceptional cases, namely only if its spontaneous magnetization (at $T = 0$) is very low ($B_0 = 4\pi M_0 \lesssim 10^3$) and its critical field strength is very high ($\gtrsim 10^3$). Nevertheless it is possible to examine the supraconductivity of ferromagnetics in exceptional cases (in thin films and possibly in massive samples with a high coercitive power). This is naturally the case only if such a supraconductivity is at all possible, if a certain masking magnetic effect (connected with the spontaneous magnetization M_0) is lacking.

In the supraconductive state and in the case of a lacking exterior field ($H_e = 0$), $B = 0$ is true in the depth of homogeneous magnetized supraconductive ferromagneticum, whereas in a normal state $H_i = 0$, $B_i = B_0 = 4\pi M_0$ would be true. In the supraconductive state a supraconduction current j_s , which screens off the field of the "molecular" surface current i_{mol} in the depth of the metal,

Zhurn. eksp. i teor. fis., 31, fasc. 2, 202-210 (1956) CARD 2 / 2 PA - 1568

flows in a thin layer near the metal surface, even in the case of a lacking exterior field.

Next, the destruction of the superconductivity of massive ferromagnetics in a magnetic field is discussed (Here "massive" refers to samples the normal measurements of which are considerably higher than $5 \cdot 10^{-5}$ cm). Among others, a homogeneously magnetized cylindrical sample, the magnetization M_0 of which is opposed to the exterior field (such a state is metastable), is investigated. However, already in the case of massive samples the phenomenological theory of superconduction (which is valid for any field and was developed by V. L. GINSBURG and L. D. LANDAU, Zhurn. eksp. i teor. fis., 20, 1064 (1950) must be extended also to ferromagnetics.

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

GINZBURG, V.L.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1665
 AUTHOR GINSBURG, V.L., FRADKIN, M.I.
 TITLE On the Composition of Primary Cosmic Radiation.
 PERIODICAL Zhurn. eksp. i teor. fis., 31, fasc. 3, 523-525 (1956)
 Issued: 12 / 1956

This work investigates the problem of the chemical composition of primary cosmic radiation within the framework of the theory developed by V.I. GINZBURG (several works by whom are cited). The concentration $N_i(r, t)$ of the cosmic particles of the type i can be determined from the following system of equations:

$$\partial N_i / \partial t = \nabla (D_i \nabla N_i) - N_i / T_i + \sum_{j > i} P_{ij} N_j / T_j + q_i$$

Here $q_i(\vec{r}, t)$ denotes the quantity of particles of the type i per volume unit, and time unit, which are emitted into the interstellar space by the sources of cosmic radiation (novae and supernovae), $D_i(\vec{r})$ - the diffusion coefficient of cosmic radiation in interstellar space, $T_i(\vec{r})$ the life of the particles of the type i up to their spallation on the occasion of collisions with the atomic nuclei of the interstellar medium (i.e. mainly with protons), P_{ij} - the quantity of particles of the type i created on the occasion of the spallation of a particle of the type j . In the case of nuclei collisions nearly in all cases will lead to the creation of nuclei of a different type, on which occasion the energy per nucleon is the same in the case of both primary and secondary nuclei. The above equation is suited for the investigation of protons of sufficiently high

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energy but not of electrons.

In the case of an even distribution of the sources of cosmic radiation, diffusion is not essential and one finds $N_i = \sum p_{ij} N_j T_i/T_j + T_i q_j$;

$$N_M/N_H = (T_M/T_H) (q_M/q_H + P_{MH}) = 3,2 ; q_M/q_H = 1,33$$

$$N_L/N_H = (T_L/T_H) [P_{LH} + P_{LM} (q_M/q_H + P_{MH})] = 1,8 ; N_L/N_M = 0,56$$

Here $N_p, N_\alpha, N_L, N_M, N_H$ denote the concentrations of the protons, α - particles; of Li-, Be-, B-nuclei; of the nuclei of C, N, O, F, and the nuclei with $Z \gg 10$. Here $P_{LM} = P_{LH} = 0,23$ and $P_{MH} = 0,27$ as well as $q_L = 0$ are assumed. At equilibrium it follows from these equations that $q_p/q_H = N_p T_H / N_H T_p \sim 30$. Thus it must be assumed that either the sources contain no hydrogen at all or that the acceleration of the protons is considerably below that of the particles. At N_L/N_M the above system of equations is in direct contradiction to experimental data. The solutions for N_H, N_M , and N_L are explicitly given for a punctiform source. In consideration of diffusion as well as of the character of the distribution of the sources of cosmic radiation the problem of the composition of cosmic radiation is solved within the framework of the theory investigated here. However, insufficient knowledge of various parameters (particularly of N_L/N_M) requires further investigations.

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

GINSBURG, V.L.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1666
 AUTHOR GINSBURG, V.L.
 TITLE On the Experimental Determination of the Instability of the Normal Phase in Supraconductors.
 PERIODICAL Žurn. eksp. i teor. fis, 31, fasc. 3, 541-543 (1956)
 Issued: 12 / 1956

The utmost undercooling observed by T.E. FABER, Proc. Roy. Soc., 231, 353 (1955) is probably characteristic of an ideal metal which cannot be undercooled up to field strengths below a certain value H_{K1} . In this connection it is true for Al that $H_{K1} = (0,035 - 0,04) \cdot H_{KM}$. This result follows, according to the author's opinion, immediately from the theory on supraconductivity developed by LANDAU and GINSBURG, for the normal phase of the supraconductor remains unstable at certain conditions with respect to the production of intermediate layers of the normal phase. These intermediate layers occur whenever the normal phase finds itself in a magnetic field satisfying the following conditions:

$$H = \mathcal{K} H_{KM} / \sqrt{2(n+1/2)}, n=0,1,2,3,\dots; \mathcal{K} = (\sqrt{2}e/\kappa c) H_{KM} \delta_o^2 = 2,16 \cdot 10^7 H_{KM} \delta_o^2$$

Here δ_o denotes the depth of penetration of the weak magnetic field into the supraconductor. The magnetic field can, in the normal phase, be diminished only down to the value $H_{K1} = \sqrt{2} \mathcal{K} H_{KM}$. At $H > H_{K1}$ the formation of the germs of the superconducting phase is selected with the occurrence of a surface energy, and thus the normal phase is metastable within the domain $H_{K1} < H < H_{KM}$. At $H = H_{K1}$,

Zurn. eksp. i teor. fis, 31, fasc. 3, 541-543 (1956) CARD 2 / 2

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however, the normal phase is unstable and superconductive transition is compulsory. In the case of aluminium the theory is in full agreement with the experiment also with respect to surface energy. In the case of Sn the limit H_{K1} is not obtained.

In the case of metals with low values of κ instability of the normal phase can occur only with undercooling. However, with $\kappa \gg \kappa_K = 1/\sqrt{2}$ the normal phase is unstable already at $H = H_{K1} \gg H_{KM}$, and therefore the superconductors with $\kappa > 1/\sqrt{2}$ must behave anomalously.

According to the author's opinion this effect occurs particularly with certain alloys Sn + In (which were investigated by other authors). At a concentration of indium of less than $\sim 2.5\%$ these alloys behave like ideal superconductors, whereupon they change their properties abruptly. As to the reduction of the concentration $n_s = mc^2/4\pi e^2 \delta^2$ with increasing concentration N_i of the admixtures, the explanation of this fact is beyond the scope of the phenomenological theory. However, if the existing qualitative notions concerning the nature of superconductivity are taken as a basis, the reduction of n_s in the case of an increasing N_i appears quite natural.

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

GINZBURG, V L.

USSR/Nuclear Physics

C-7

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11267

Author : Ginzburg, V.L., Fradkin, M.I.

Inst : Physics Institute, Academy of Sciences, USSR

Title : On the Composition of Primary Cosmic Rays.

Orig Pub : Actron. zh., 1956, 33, No 4, 579-587

Abstract : The authors consider the problem of the chemical composition of the primary rays at the earth. It is shown that if one takes into account the diffusion of cosmic particles in the interstellar matter, the available experimental data on the composition of cosmic rays can be reconciled with the concepts of the generation of these rays in the shells of supernova and nova stars.

Card 1/1

GINZBURG, V.L.

Experimental verification of the general theory of relativity and the artificial earth satellites. Priroda 45 no:9:30-39 8 '56. (MLRA 9:10)

1.Chlen-korrespondent Akademii nauk SSSR.
(Space stations) (Relativity (Physics))

GINZBURG, V.L.

I-3

Category : USSR/Radiophysics - Statistical phenomena in radiophysics

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1793

Author : Levin, M.L., Ginzburg, V.L.

Title : On the Application of Thermodynamics to Electrical Fluctuations

Orig Pub : Uspekhi fiz. nauk, 1956, 56, No 1, 146-148

Abstract : Last articles of a discussion (Referat. Zh. Fizika, 1954, 13 431, 13 432). M.L. Levin discusses in his article the example cited by V.L. Ginzburg and representing, in Levin's opinion, the only physical argumentation of the previous answer by Ginzburg (Referat. Zh. Fizika, 1954, 13432): a thin (compared with the thickness of the skin layer) conductor at the temperature of 0.1°K , for which the classical frequency region lies below 10^{10} cycles. Levin indicates, that, since the thickness of the skin layer δ at such temperatures is less than the mean free path l at such temperatures even for meter waves, it makes no sense to speak of the conductivity σ of a thin conductor. This is why Levin considers that this example by Ginzburg is unsuccessful and does not refute his earlier statements.

Ginzburg emphasized in his article that the basic statement contained in Levin's earlier articles reduces to the fact that "in the quantum frequency region one cannot assume the resistance to be independent of the frequency, even if the skin effect is not taken into account". Contradicting this,

Card : 1/2

Category : USSR/Radiophysics - Statistical phenomena in radiophysics

I-3

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1793

Ginzburg gives the following considerations. The quantum region corresponds to the condition $\hbar\omega \gg kT$. Therefore, choosing the temperature T sufficiently low, one can make the quantum region include such low frequencies ω at which the variation of R with ω is sufficiently small. Furthermore, Ginzburg indicates that Levin in his work (Referat. Zh. Fizika, 1954, 13431) did not take this effect into account, and this is why Ginzburg (Referat. Zh. Fizika, 1954, 13432) also disregarded this effect. It is Ginzburg's opinion that the allowance for the skin effect cannot change his conclusions that it is possible to assume the resistance to be independent of frequency, with sufficient accuracy, in the quantum region.

The editor's comment states that by publishing these articles the editorial staff of "Uspekhi fiz. nauk" considers the discussion on the matter of the application of thermodynamics to electric fluctuations closed.

Card : 2/2

GINZBURG, V.L.
USSR/Theoretical Physics - Theory of Relativity and Unified Field Theory

B-2

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33712

Author : Ginzburg, V. L.

Institution : None

Title : Experimental Verification of the General Theory of Relativity

Original

Periodical : Uspekhi Fiz. Nauk, 1956, 59, No 1, 11-49

Abstract : Expanded treatment of a lecture delivered at the Einstein session of Division of the Physicomathematical Sciences, Academy of Sciences USSR, on 30 November 1955. Contents: Introduction; 1. Motion of perihelia of planets and of their satellites; 2. Gravitational shift of spectral lines; 3. Deflection of light rays passing near the sun; 4. Significance of Einstein's general relativity theory in physics and astronomy; Conclusion. 62 references.

Card 1/1

GINZBURG, V.L.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1427
AUTHOR GINZBURG, V.L.
TITLE On the Nonspherical Intensity Fluctuations of Radio Waves in Galaxies.
PERIODICAL Dokl.Akad.Nauk, 109, fasc. 1, 61-63 (1956)
Issued: 9 / 1956 reviewed: 10 / 1956

At present it is assumed that the intensity fluctuations (flickering) of the discrete sources of constant cosmic wave radiation are due exclusively to the ionosphere of the earth, for this radiation requires many days already in order to pass through the irradiating galaxy itself (three years of crabb nebula). The author considers the existence of radio stars as most improbable, for such a hypothetical radio star would have to have a radiation capacity that is at least from 10^7 to 10^8 greater than that of the sun. Here the average level of radiation is concerned which is approximately constant with respect to time. The data serving as a basis for the work by J.S.KRAUS et al. Nature, 176, 304 (1955) can by no means serve as a proof of the assumption that the character of the fluctuations is not determined by the ionosphere. If an exact proof of the existence of nonionospheric fluctuations of discrete sources were to be proved, the following possibilities for an explanation might be considered: Such fluctuations need not necessarily be ascribed to the source but might be due to the propagation of radio waves in the interstellar and interplanetary medium on the way from the source to the earth. It might be a case of diffraction on a phase screen similar to diffraction on the inhomogeneities of the ionosphere. The dif-

GINZBURG, V.L.

SUBJECT

USSR / PHYSICS

CARD 1 / 2

PA 1641

AUTHOR

GINZBURG, V.L.

TITLE

On a Macroscopic Theory of Superconductivity which is suited for all Temperatures.

PERIODICAL

Dokl. Akad. Nauk, 110, fasc. 3, 358 - 361 (1956)
 Issued: 12 / 1956

The macroscopic theory developed by V.L.GINSBURG and L.D.LANDAU (Žurn. eksp. i teor. fis, 20, 1064 (1950)) is based upon the equations

$$\frac{1}{2m} (-i\hbar\nabla - \frac{e}{c}\vec{A})^2 \psi + \partial F_{so} / \partial \psi^* = 0$$

$$\vec{\Delta A} = -\frac{4\pi}{c} \vec{j}_s, \text{div } \vec{A} = 0, \vec{j}_s = -\frac{ie\hbar}{2m} (\psi^* \nabla \psi - \psi \nabla \psi^*) - \frac{e^2}{mc} \psi^* \psi \vec{A}$$

Here $|\psi|^2$ denotes the concentration of the "superconductive electrons", \vec{A} - the vector potential, and $F_{so}(|\psi|^2)$ - the density of the free energy in the superconductive state and in the case of a lacking field.

This theory is to be generalized for the domain of all temperatures $0 \leq T \leq T_k$. J.BARDEEN, Phys.Rev. 94, 554(1954) and V.L. GINSBURG suggested the following expressions for F_{so} :

$$F_{so}^{(d)} = F_{no}(t) + (H_0^2 / 8\pi) \{ 2t^2 (1 - \sqrt{1 - |\chi|^2}) - |\chi|^2 \} \text{ and}$$

$$F_{so}^{(a)} = F_{no}(t) + (H_0^2 / 8\pi) \left\{ 2 \frac{t^2 - 1}{1 + t^2} |\chi|^2 + \frac{1}{(1 + t^2)^2} |\chi|^4 \right\} \text{ respectively.}$$

FRADKIN, Y. L., VETANOV, S. N., KURNOSOVA, L. V., RAZORICHOV, L. A., and FRADKIN, M.I.

"Study of the Primary Cosmic Radiation by Using Artificial Satellites of the Earth," a paper presented at the 8th International Congress of Astronautical Congress, 6-12 Oct 1957, Barcelona.

GINZBURG, V.L.

109-6-11/17

AUTHOR
TITLE

GINZBURG, V.L., FAYN, V.M.

On the Question of Quantum Effects on the Occasion of Interaction of Electrons with h.f. Fields in Resonators

(K voprosu o kvantovykh effektakh pri vzaimodeystvii elektronov s vysokochastotnymi polyami v rezonatorakh. Russian)
Radiotekhnika i Elektronika, 1957, Vol. 2, Nr 6, pp 780-789 (U.S.S.R.)

PERIODICAL

ABSTRACT

The problem of the quantum effects on the occasion of the passage of electrons through a hollow resonator is investigated. First the problem is treated as purely classical. The investigation is then carried out with regard to the quantum field, for which the formula of H. Nyquist (Phys. Rev., 1928, Vol 32, pp 110) is used. The authors show that this calculation is sufficient only for the determination of the energy gradient $(\Delta K_T)^*$. But in order to obtain the function of the energy distribution of the electron at the resonator outlet the classical method of investigation is not sufficient. But as this method is very different from that used in the quantum theory the authors here endeavor to solve the problem by means of the introduction of canonical variables (HAMILTON method). The authors show that the simple classical calculation must be preferred. In an analogous way those cases can be investigated where the field along the way of the electron is not homogeneous. In the end the wave characteristic of the electrons are taken into account and the authors show that the elec-

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SOV/137-58-9-19676

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 221 (USSR)

AUTHOR: Ginzburg, V.L.

TITLE: ~~On~~ On the Diffusion of Light Near Points of Second-order Phase Transition (O rasseyanii sveta vblizi tochek fazovogo perekhoda vtorogo roda)

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1957, Nr 3 (8), pp 115-116

ABSTRACT: Near the phase transition of the second as well as of the first order, which are close to the Curie point, relatively great fluctuations of the η parameter, which determines the difference between the ordered and the disordered phase, take place. Upon a change in η , the refractive index also changes and in relation therewith a supplementary diffraction should be observed. This effect had been examined earlier (RZhFiz, 1958, Nr 1, abstract 2090). In the same work a mathematical formula was developed for the relationship of the light intensity J , diffused because of the fluctuations in η , to the intensity of light J_0 diffused because of the fluctuations of the density. On approaching the critical Curie point J/J_0 increases and a phenomenon similar to the critical opalescence should be

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On the Diffusion of Light Near Points of Second-order Phase Transition

observed. This phenomenon was observed with quartz near $\alpha \rightleftharpoons \beta$ (Kristallografiya, 1956, Vol 1, p 123). The theoretical evaluation of the expected diffusion is given and good agreement with experiment is obtained.

N.P.

1. Light--Diffusion
2. Light--Intensity
3. Quartz--Applications

Card 2/2