GINZBURG, V.L.

Conveyer belt with a zipper fastener (from "Gummi u.Asbest,"
10 no.2 1956). Kauch.i rez. 16 no.5:39-40 My '57. (MLRA 10:7)
(Belts and belting)

GINZBURG, V.L.; ROTLEDER, V.M.

Review of foreign patents of type "RS" tires. Kauch.i rez. 22 no.2:36-38 F '63. (MIRA 16:2)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Tires, Rubber--Patents)

GINZBURG, V. L.

Spectrum analysis method of cathode copper for metallic impurities. V. L. Ginzburg, I. N. Grigorenitskii, and D. M. Livshits (Mining and Met. Combine, Nadi'sk). *Zavodskaya Lab.* 22, 1277-80(1956).—Spectrum analysis methods for the detn. of Ni, Fe, Bi, Sb, Pb, As, Sn, and Zn are described. The method is sensitive to within 0.002% (abs.) for Ni, Bi, Sb, As, and Sn, and to within 0.005% for Fe, Pb, and Zn. The samples are obtained by drilling the cathode sheets, and special tests showed that the samples were not contaminated by the drill. The electrodes for spectrum analysis were cast from drillings fused in graphite crucibles, and no changes in concn. were observed in using a U.S.S.R. standard sample fused with pure Cu which contained only 0.001% Ni and Fe. Details of manipulations are given.

W. M. Sternberg

GINZBURG, V. L.

Category: USSR/Analytical Chemistry - General Questions. G-1

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 30945

Author : Ginzburg V. L., Alekseyenko Ye. F., Belokrinitskaya Ye. Ye., ~~Vitushkina I. N.~~, Ineshina F. M.
Inst : not given
Title : Accuracy of Photographic Methods of Spectral Analysis

Orig Pub: Zavod. laboratoriya, 1956, 22, No 11, 1331-1333

Abstract: A comparison was made of the accuracy of analyses of fused nickel, copper regulus, fused cobalt and cathodic nickel, according to calibration graphs in Δ S, lg C coordinates, and in accordance with the solid graph method. Determinations were made of Cu, Fe, Au, Pt, Pd, Ni, Si, Mn, Pb, Sb, Bi, Sn, Co, at concentrations from several thousandth to decimal fractions of one percent, with spectrum excitation in arc discharge of direct and alternating current, and photographic recording on plates of type I, II and III. In most instances no substantial differences were found in the magnitude of errors with different calibration graphs.

Card : 1/1 -18-

Ginzburg V.L.

USSR/Optics - Optical Methods of Analysis, Instruments. K-7

Abs Jour : Referat Zhur - Fizika, No 3, 1957, 7962

Author : Vitushkina, I.N., Ginzburg, V.L.
Inst : Noril'sk Mining and Metallurgical Combine, USSR.
Title : Spectral Analysis of Nickel in Low-Voltage Spark Using Cast Electrodes.

Orig Pubq : Zavod. laboratoriya, 1956, 22, No 4, 438-440

Abstract : In the determination of copper and iron admixtures in pure nickel, the spectrum is excited by a DG-1 generator, operating in the spark mode (current 2 -- 2.5 amp). The analytic pairs of lines are Cu 3273.96 -- Ni 3286.95 A and Fe 2599.40/57 -- N 2551.01 A. The interval of the determined concentrations of copper and iron is 0.01 -- 0.5%.
The mean arithmetic error of the determination ranges from 5 to 9%.

Card 1/1 - 105 -

AUTHORS: Nedler, V.V., Ginzburg, V.L. 32-24-4-64/67

TITLE: The Third Conference of Spectroscopy Analysts of Nonferrous Metallurgy (Tret'ye soveshchaniye spektroskopistov-analitikov tsvetnoy metallurgii)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 4, pp. 507-508 (USSR)

ABSTRACT: The above mentioned conference took place at Moscow from November 15 to November 20, 1957; it was called by the Scientific-Technical Society of Nonferrous Metallurgy, and was attended by 255 representatives of 175 organizations. The contributions made by I.E. Britske (Gintsvetmet, Moscow) and N.S. Poluektova (Ukrgiredmet, Odessa) dealt with questions of flame photometry. The report delivered by L.I. Kononenko dealt with the method of determining zirconium, hafnium, molybdenum and vanadium. An interesting contribution was made by Ya.D. Raykhbaum, Ye.S.Kostyukova, and V.D. Malykh (Irgiredmet, Irkutsk) under the title "On some Causes of the Influence Exercised by Chemical Composition on the Results of Ore Analyses". A detailed report by N.A. Makulova (Giprotsvetmetobrabotka, Moscow) dealt with investigations of the rule governing the transition of test material to the emission

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cloud. A.A.Frishberg and V.V. Nedler (Nigrizoloto, Moscow) spoke about problems of the physical-chemical theory in connection with chemical reactions during the formation of volatile compounds in the electric arc. V.L. Ginzburg (Noril'skiy Combine) gave a report on the development of a method of determining the temperature intensity of electrodes. The following contributions dealing with special methods of spectral analysis deserve mentioning: The reports by D.M. Shvarts, L.N. Kapomskiy and V.V. Portnova (Gipronikel', Leningrad) and I.S. Nilova (Severonikel', Monchegorsk), which deal with the analysis of zinc, thallium and antimony; the reports by S.M. Solodovnik (Giredmet, Moscow) and others on the analysis of silicon, silicon dioxide and silicic acid; the reports by V.P. Khrapay and G.M. Gusev on the increase of sensitivity in determinations of microadmixtures in silver; the contributions made by N.A. Sin'kov and D.M. Livshits (Noril'sk Combine) deal with the analysis of solutions containing platinum metals. The report delivered by V.O. Khandros and L.N.Filimonov (Giprotsvetmetobrabotka) deals with the problems of the application of quantometers. A.G. Krest'yaninov, Yu.I. Stakheyev and Ya.D.Raykhbaum (Irgiredmet) were the first to use photoelectric apparatus for the

direct analysis of ores for lithium. The contribution made by V.V.Nedler dealt with attempts made at using the horizontal electric arc, stabilized by an air current. The reports concerning standards published by the institutes Gintsvetmet, Giprotsvetmetobrabotka, VIAM (all at Moscow), TsNIIolovo (Novosibirsk), Irgiredmet (Irkutsk), Gipronikel' (Leningrad), VNIItsvetmet (Ust'-Kamenogorsk), Ukrgiredmet (Odessa) confirm the work performed by these institutes during recent years. The necessity of centralizing the publishing of standards was stressed, and the industrial production of high-quality spectral carbons and an increased distribution of ordinary spectral carbons was urgently demanded.

1. Metallurgy--USSR 2. Spectroscopy--USSR

GINZBURG, V. L.

18(6) PHASE I BOOK EXPLOITATION SOV/1794

Vsesoyuznoye soveshchaniye spektroskopistov-analitikov tsvetnoy metallurgii. 2d, Moscow, 1955

Materialy... (Papers Read at the Second All-Union Conference of Analytical Spectroscopists in Nonferrous Metallurgy) Moscow, Nauchno-tekhn. Ob-vo tsvetnoy metallurgii, 1957. 128 p. 1,000 copies printed.

Sponsoring Agency: Nauchno-tekhnicheskoye obshchestvo tsvetnoy metallurgii.

Editorial Board: [illegible], [illegible], [illegible], V.V. [illegible], L.S. [illegible]; Tech. Ed.: [illegible].

PURPOSE: This book is intended for analytical chemists in the field of nonferrous metallurgy.

COVERAGE: This is a collection of papers dealing with the use of the spectroscopic method as practiced in the USSR for the quantitative determination of various elements in the field of nonferrous metallurgy. Experience gained at several important Soviet metallurgical plants is described. In addition to practical application of the method, a number of papers deal with problems in the production of standard samples. For a brief account of the state of affairs as of 1955 in this field in the USSR, see Table of Contents, first article. There are a few scattered references, both Soviet and non-Soviet.

12. [illegible], T.V. [Vsesoyuznyy alyuminiyevo-magniyevyy institut-All-Union Aluminum and Magnesium Institute, Leningrad]. Preparation of Standard Samples for the Spectroscopic Analysis of Light Metals 77

13. [illegible], A.G., A.V. [illegible], and R.A. [illegible] [Institut tsvetnykh metallov i zolota imeni Kalinina-Institute for Nonferrous Metals and Gold im. Kalinin, Moscow]. An Investigation of Methods of Casting Standard Samples for the Spectroscopic Analysis of Bronzes 86

14. [illegible], E.L. [Podol'skiy zavod vtorichnykh tsvetnykh metallov-Podol'sk Secondary Nonferrous Metals Plant]. From the Work Practice of the Spectrographic Laboratory of the Podol'sk Secondary Nonferrous Metals Plant 90

15. [illegible], V. I. [Khar'kovskiy zavod vtorichnykh tsvetnykh metallov-Khar'kov Secondary Nonferrous Metals Plant]. Determination of Antimony, Tin, Copper, and Zinc in Antimonial Lead With the ST-7 Styloscope 94

16. [illegible], B.Ya. [Khar'kov Secondary Nonferrous Metals Plant]. Work Done at the Plant Spectrographic Laboratory 96

17. [illegible], T.I. [Moskovskiy bronzo-latunnyy zavod-Moscow Bronze and Brass Plant]. Application of Spectroscopic Methods of Analysis at the Moscow Bronze and Brass Plant 98

18. [illegible], N.S. [Leninogorskiy polimetallicheskiy kombinat-Leninogorsk Polymetallic Combine]. From the Work Practice of the Spectrographic Laboratory of the Lead Plant of the Leninogorsk Polymetallic Combine 101

19. [illegible], L.P. [Novosibirskiy olovozavod-Novosibirsk Tin Plant]. Application of Spectroscopic Analysis at the Novosibirsk Tin Plant 103

20. [illegible], S.M. [Podol'skiy olovozavod-Podol'sk Tin Plant]. Work practice of the Laboratory of the Podol'sk Tin Plant 107

21. [illegible], V.L., Ye.F. [illegible], Ye.Ye. [illegible], I.S. [illegible], and V. L. Ginzburg [Noril'skiy gornometallurgicheskiy kombinat-Noril'sk Mining and Metallurgical Combine]. On the Accuracy of Photographic Methods of Spectroscopic Analysis in Preparing Calibration Curves by Various Methods 109

22. [illegible], S.B. ["[illegible]" Plant]. Quantitative Determination of Zinc in Chrome Bronze 114 27

GINZBURG, V. L. (MOSCOW)

"Spectral Method of Analysis of Technical Tellurium in Noble Metals."

paper submitted to the Fifth Conference on the Analysis of Nobel Metals, Novosibirsk, 20-23 September 1960

So: Zhurnal analiticheskoy khimii, Vol XVI, No 1, 1961, page 119

GINZBURG, V.L.; ROGOVER, G.B.

Regularities in the distribution of nonferrous and noble metals in the predominant ore minerals and silicates of the Noril'sk deposit. Sov. geol. 3 no.3:48-60 Mr '60. (MIRA 13:11)

1. Ministerstva geologii i okhrany nedr SSSR.
(Noril'sk region--Metals)

S/032/60/026/05/18/063
B010/B005

AUTHORS: Ginzburg, V. L., Glukhovetskaya, N. P.

TITLE: Determination of Silicon and Other Impurities in Selenium

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 5, pp. 559-561

TEXT: N. N. Danilova and L. A. Lerner collaborated in the experimental part of the present investigation. A spectrum analysis for determining impurities in selenium was worked out. The calibration samples used were produced by fusing together Si and Se; less Si was used than corresponds to the stoichiometric ratio in the compound $SiSe_2$. Thus, it was possible to obtain a chemically stable mixture of $SiSe_2$ and Se. By increasing the addition of Se, a series of calibration samples was produced up to a Si content of $2 \cdot 10^{-4}$%. Silicon was determined according to the following spectral lines: Si 2516.12A (from $1 \cdot 10^{-4}$ to $3 \cdot 10^{-3}$% of Si), Si 2881.58A (from $2 \cdot 10^{-4}$ to $2 \cdot 10^{-2}$% of Si), Si 2514.33A (from $1 \cdot 10^{-3}$ to $5 \cdot 10^{-2}$% of Si), Si 2435.16A (from $1 \cdot 10^{-2}$ to $3 \cdot 10^{-1}$% of Si). The calibration samples for determining the other impurities in selenium were also prepared by fusing together the initial alloy with pure selenium. The initial alloy was

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Determination of Silicon and Other Impurities in Selenium

S/032/60/026/05/18/063
B010/B005

produced at the institut "Gintsvetmet" ("Gintsvetmet" Institute), and contained 1% each of Cu, Pb, Mg, Al, Ag, As, Fe, Sb, Ni, Bi, Te, as well as the selenides of Cd, Hg, Sn, Cu, Ni, and/or their melts with selenium. The samples, as well as the calibration samples, were granulated and fused into the crater of the carbon electrode (Fig. 2). There are 2 figures and 4 non-Soviet references.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences, USSR)

Card 2/2

SVESHNIKOVA, V.N.; GINZBURG, V.L.

Study of the ternary system consisting of cerium phosphate - phosphoric acid - water at 70°C. Zhur.neorg.khim. 7 no.5: 1169-1173 My '62. (MIRA 15:7)
(Cerium phosphate) (Phosphoric acid)

GINZBURG, V.L.; GLUKHOVETSKAYA, N.P.

Spectral line intensity as a function of the effective ionization potential of an electric arc. Opt. i spektr. 12 no.3:344-349 Mr '62. (MIRA 15:3)
(Spectrum analysis) (Electric arc) (Plasma (Ionized gases))

GINZBURG, V. L.; GLUKHOVETSKAYA, N. P.

Note on O. P. Semenova and M. A. Levchenko's article "Dependence of the effective ionization potential on the concentration of readily ionizable impurities in an arc discharge." Opt. i spektr. 13 no.6:881-882 D '62. (MIRA 16:1)

(Electric discharges) (Ionization)

S/075/62/017/009/005/006
E071/E436

AUTHORS: Ginzburg, V.L., Glukhovetskaya, N.P., Danilova, N.N.

TITLE: A spectrochemical method for the determination of impurities in selenium

PERIODICAL: Zhurnal analiticheskoy khimii, v.17, no.9, 1962, 1096-1100

TEXT: A method of determination of small amounts of impurities by their preliminary concentration and subsequent spectral analysis is proposed. The concentration is carried out by distilling a sample of selenium placed on a powdered carbon support at 315°C in a stream of nitrogen oxides. Selenium distils off in the form of SeO_2 while impurities remain in the carbon powder which is then submitted to spectral analysis on carbon electrodes. To increase the sensitivity of the determination of impurities in carbon powder, sodium chloride (0.6%) or potassium chloride (0.3%) are added to the concentrates. The degree of recovery of various elements in the concentrates was tested. According to the degree of recovery the elements were divided into three groups: 1) 70 to 80%, Au, Mg, Sn, Sb, Bi, Te, Al, Cu, Ag; 2) 40 to 50% Cd, As, Fe, Pb, Ti, Mn;

A spectrochemical method ... S/075/62/017/009/005/006
E071/E436

3) 20% Cr and Ni. For the elements of the 3rd group, the method cannot be used. There are 4 figures and 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova AN SSSR Moskva (Institute of General and Inorganic Chemistry imeni N.S.Kurnakov AS USSR, Moscow)

SUBMITTED: November 20, 1961

Card 2/2

S/032/62/028/006/012/025
B101/B138

AUTHORS: Ginzburg, V. L., Glukhovetskaya, N. P., and Lerner, L. A.

TITLE: Increasing the sensitivity of the spectral determination of impurities in selenium

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 6, 1962, 682 - 684

TEXT: By adding NaCl (ionization potential V_i = 5.1 ev), the V_i eff of the arc plasma may be controlled in such a way that the sensitivity of the impurity determination is increased considerably. Calibration curves ΔS against log C were plotted for selenium samples with impurity standards in the presence of carbon powder containing various NaCl additions in the counterelectrode. The dependence of the intensity of the spectral lines on V_i eff was determined. V_i eff = 7 - 8 ev, achieved by carbon powder with 1% Na (= 2.5% NaCl), was the optimum. The sensitivity increase results from the ratio $\Delta C = C_{\text{without NaCl}}/C_{\text{NaCl}}$. For the elements investigated, the following ΔC values were found: Te 0.46; Hg 0.20; As 0.50; Cd 0.30; Mg 5.0; Ni 2.2; Al 5.5; Au 5.0; Pb 4.0; Bi 2.5; Cu 5.0; Ti 50;

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S/032/62/028/006/012/025
B101/B138

Sb 1.0. The brightness of the Cd, Hg, Te, and As lines is not increased when reducing the selenium arc temperature because of the high ionization potential of these elements ($V_i > 8.6$ ev). There are 2 figures and 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

GINZBURG, V.L.; GLUKHOVETSKAYA, N.P.; LERNER, L.A.

Fluorination of samples in spectral analysis. Zav. lab. 29 no.6:684-685 '63. (MIRA 16:6)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova AN SSSR.
(Spectrum analysis) (Fluorination)

GINZBURG, V.L.; LIVSHITS, D.M.; SATARINA G.I.

Determination of silver, gold, palladium, platinum, and rhodium by atomic absorption flame spectrophotometry. Zhur.anal.khim. 19 no.9: 1089-1093 '64. (MIRA 17:10)

1. Konstruktorskoye byuro "TSvetmetavtomatika" i TSentral'nyy nauchno-issledovatel'skiy gornorazvedochnyy institut, Moskva.

GINZBURG, V.L.; OSERNOY, L.M.

Gravitational collapse of a magnetic star. Zhur. eksp. i teor. fiz. 47 no.3:1030-1040 S '64. (MIRA 17:11)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.

GINZBURG, V.L.; MOTULEVICH, G.P.; PITAYEVSKIY, L.P.

Optical properties of polyvalent metals and electron interaction. Dokl. AN SSSR 163 no.6:1352-1355 Ag '65.

(MIRA 18:8)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR i Institut fizicheskikh problem AN SSSR. 2. Chlen-korrespondent AN SSSR (for Ginzburg).

L 11250-66 EWT(1)/FCC/EWA(h) GW
ACC NR: AP6002686 SOURCE CODE: UR/0033/65/042/006/1129/1134

AUTHOR: Ginzburg, V. L.

ORG: Institute of Physics of the Academy of Sciences, SSSR (Fizicheskiy institut im. Lebedeva Akademii nauk SSSR)

TITLE: Cosmic rays and plasma phenomena in the Galaxy and the Metagalaxy

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 6, 1965, 1129-1134

TOPIC TAGS: cosmic ray, metagalaxy, ~~space~~, magnetic field, ~~anisotropic pressure~~, galaxy, ~~plasma~~, adiabatic invariant, cosmic ray anisotropy, rarefied plasma

ABSTRACT: It has been generally held that in metagalactic space no anisotropy of cosmic rays can exist because the magnetic field of this space is unable to offset the anisotropic pressure of cosmic rays. This, however, has not been borne out by calculations. The problem of anisotropy of cosmic rays and the transition space between a galaxy and the Metagalaxy is considered to be unsolved. V. L. Ginzburg hypothesized that the unsolved problems of cosmic rays are associated with plasma effects in space, especially with cluster and other instabilities in rarified plasma. The transition of the magnetic field from galaxy to metagalactic space occurs smoothly without hindrances. In moving under such conditions, anisotropic cosmic rays preserve the adiabatic invariant and form clusters in the Metagalaxy. The clusters move along magnetic force lines and become unstable, generating their own waves. Instability of the cluster causes turbulent motion in the plasma and

Card 1/2 UDC:

L 11250-66

ACC NR: AP6002686

isotropic motion of the cluster. A transition region is formed in which the magnetic field becomes turbulent and the movement of cosmic rays isotropic. In this way a solution is found for the unsolved problems of cosmic rays in metagalactic intermediate space. Orig. art. has: 8 formulas. [EG]

SUB CODE: 03/ SUBM DATE: 29Apr65/ ORIG REF: 018/ OTH REF: 006/ ATD PRESS: 4174

BC

Card 2/2

L 15889-66 EWT(1)/EWT(m)/T/EWP(t) IJP(c) JD

ACC NR: AT6002491 SOURCE CODE: UR/0000/65/000/000/0001/0009

AUTHOR: Ginzburg, V. L.; Motulevich, G. P.; Pitayevskiy, L. P.

ORG: Physics Institute im. P. N. Lebedev (Fizicheskiy institut)

TITLE: Optical properties of polyvalent metals and interelectronic interaction

SOURCE: AN SSSR. Fizicheskiy institut. Doklady, 1965. Opticheskiye svoystva polivalentnykh metallov i mezhduelektronnoye vzaimodeystviye, 1-9

TOPIC TAGS: electron, gold, aluminum, tin, lead, electron interaction, metal crystal, permittivity, absorption band

ABSTRACT: In polyvalent metals (Al, Sn, Pb), on the one hand, the approximation of weakly bound electrons is adequate, but on the other hand, the concentration of optical electrons N_{opt} is much lower than that of valence electrons N_{val} (by definition, N_{opt} figures in the expression for the permittivity $\epsilon \simeq 4 e^2 N_{opt} / m\omega^2$ for optical frequencies w lying outside the absorption band). This difference can be explained by the influence of interelectronic interaction, since in the theory of the Fermi liquid for crystalline metals $N_{opt} \neq N_{val}$. At the same time, for liquid metals, the equality $N_{opt} \simeq N_{val}$ should take place, and this is indeed observed in practice. Authors are grateful to M. Ya. Azbel' and D. Pays for

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L 15889-66

ACC NR: AT6002491

a discussion of the problems touched upon in the present note. Orig art. has: 2 tables and 5 formulas.

SUB CODE: 07, 20 SUBM DATE: none / ORIG REF: 013 / OTH REF: 004

Card 2/2

GINZBURG, V.L.

Cosmic rays and plasma phenomena in the galaxy and metagalaxy. Astron. zhur. 42 no.6:1129-1134 N-D '65. (MIRA 19:1)

1. Fizicheskiy institut im. Lebedeva AN SSSR. Submitted April 29, 1965.

L 25930-66 EWT(m) IJP(c)

ACC NR: AP6016663 SOURCE CODE: UR/0053/65/087/001/0065/0111

AUTHOR: Ginzburg, V. L.; Syrovatskiy, S. I.

ORG: none

TITLE: Cosmic magnetobremsstrahlung (synchrotron) radiation

SOURCE: Uspekhi fizicheskikh nauk, v. 87, no. 1, 1965, 65-111

TOPIC TAGS: bremsstrahlung, cosmic radiation, particle acceleration, relativistic particle

ABSTRACT: Magnetobremsstrahlung theory is reviewed and its role in radioastronomy and astrophysics is described. All of the necessary details are given for the application of the theory to astrophysical problems. Magnetobremsstrahlung is rather widespread in space: cosmic radio-radiation in most cases has magnetobremsstrahlung characteristics. This holds for the overall galactic radio-radiation, as well as for that from supernova, ordinary and radio galaxies, etc. Magnetobremsstrahlung is highly important in the study of the origin of cosmic rays and gamma- and x-ray astronomy. The nature of electromagnetic radiation from accelerating nonrelativistic and super-relativistic particles is discussed, and formulas are derived for individual electrons. This is compared with magnetobremsstrahlung from groups of elec-

Card 1/2 UDC: 523.165

L 25930-66

ACC NR: AP6016663

trons, and the Stokes parameters are defined. The influence of cosmic plasma on the propagation and radiation of electromagnetic waves is considered. It is pointed out that magnetobremsstrahlung radiation can be reabsorbed by relativistic particles, and the absorption coefficient is calculated. Certain applications of magnetobremsstrahlung are discussed in relation to cosmic plasma and magnetic instabilities. The more important formulas are summarized without proof. Orig. art. has: 8 figures, 4 formulas, and 2 tables. [JPRS]

SUB CODE: 20 / SUBM DATE: none / ORIG REF: 042 / OTH REF: 027

Card 2/2 FW

L 25773-66 - EWT(1) GW

ACC NR: AP6016379 SOURCE CODE: UR/0048/65/029/010/1825/1829

34

B

AUTHOR: Ginzburg, V. L.; Ozernoy, L. M.; Syrovatskiy, S. I.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Relativistic electrons in the M82 galaxy 12

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 10, 1965, 1825-1829

TOPIC TAGS: galaxy, relativistic electron, hot star, Compton effect, bremstrahlung, pi meson, nebula/M82 galaxy

ABSTRACT: The galaxy M82 (also called NGC 3034 and 3C 231), which is part of the Ursus Major group, is of special interest, since its relatively close position makes possible a comparatively detailed study of the nonsteady-state (explosion) stage of galactic development. It belongs in a special subclass of irregular galaxies whose members are characterized by an anomalously red light, high luminosity, considerable quantities of dusty matter with flocoular structure, and the absence of high-luminosity hot stars. In this connection, the authors present formulas for calculating the energies and energy losses of the relativistic electrons in this galaxy - particularly with respect to the total energy of the light-emitting relativistic electrons, the energy losses due

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L 25773-66

ACC NR: AP6016379

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to the Compton effect, and the energy losses due to magnetic bremsstrahlung. It is shown that the total flux of Compton γ-rays from M82 equals the Compton losses. An evaluation of the bremsstrahlung flux of γ-rays due to the decay of π^0-mesons and bremsstrahlung is presented. The magnetic X-ray bremsstrahlung of M82 is evaluated on the assumption that the optical spectral index of M82 is close to the optical index $\alpha = 1.5$ of the Crab Nebula, which is correct only up to the frequency $\nu = 10^{16}$ cps. Orig. art. has: 12 formulas. [JPRS]

SUB CODE: 03, 20 / SUBM DATE: none / ORIG REF: 005 / OTH REF: 012

Card 2/2 CC

L 31467-66 EWT(1)/FCC GW

ACC NR: AP6023130 SOURCE CODE: UR/0053/66/088/003/0485/0504

AUTHOR: Ginzburg, V. L.; Syrovatskiy, S. I.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Origin of cosmic rays 12

39
B

SOURCE: Uspekhi fizicheskikh nauk, v. 88, no. 3, 1966, 485-504

TOPIC TAGS: cosmic ray, supernova, astronomic conference, galaxy, electron spectrum

ABSTRACT: It is argued that cosmic rays cannot be of metagalactic origin and that plasma effects are of fundamental importance to the further development of the astrophysics of cosmic rays; this also pertains to the quasars. According to the authors, the principal sources of cosmic rays in the Galaxy are the bursts of supernovae and possibly also explosions of the galactic nucleus. Emphasis is placed on the role of instability in the formation of the boundary of the galactic halo and in the isotropicization of the cosmic rays emerging from the Galaxy into the Metagalaxy. Allowance is made for the new knowledge that has been gained following the Jaipur Conference on Cosmic Rays in 1963. The Ninth International Conference on Cosmic Rays held in London (September 1965) is critically evaluated; at this conference no new proofs in favor of the theory of the metagalactic origin of galactic cosmic rays - unless the highest energies are concerned - were presented. It is shown that studies of the electron spectrum provide a means of verifying the

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L 31467-66

ACC NR: AP6023130

hypothesis that a large part of cosmic rays (or more exactly, their electron component) is generated during powerful explosions of the galactic nucleus. Any proofs refuting this hypothesis would serve as a strong argument in favor of the local metagalactic theory of the origin of cosmic rays, but no such proofs have yet been presented; nevertheless, this theory merits further discussion. Orig. art. has: 5 formulas. [JPRS]

SUB CODE: 03 / SUBM DATE: none / ORIG REF: 032 / OTH REF: 027

Card 2/2 mc

SOURCE CODE: UR/0020/66/169/004/0959/0962

AUTHOR: Ginzburg, V. L.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy Institut AN SSSR)

TITLE: Powerful x radiation from the radio galaxies (Delivered at the Scientific Session of the Division of General and Applied Physics, AN SSSR, 20 April 1966)

SOURCE: Doklady Akademii nauk, v. 169, no. 4, 1966, 959-962

TOPIC TAGS: cosmic radio source, galaxy, x ray emission, x ray astronomy

ABSTRACT: This is a review article stimulated by recent observation of powerful x-ray sources in A-Cygni. It deals with the history of x-ray astronomy since the observation of x radiation from the sun in 1948 and with the main results obtained in x-ray astronomy of the galaxy and of the metagalactic regions. The major sources of cosmic x radiation are listed and their luminosities given. The nature of the cosmic x radiation is discussed and the most important processes which can give rise to x rays are described (bremsstrahlung, characteristic radiation due to atomic transitions, synchrotron radiation, Compton radiation). Estimates of the relative contributions of the different mechanisms are given. Further prospects and the required apparatus are discussed in the conclusion. Orig. art. has: 2 figures and 5 formulas.

SUB CODE: 03/ 20/ SUBM DATE: 00/ ORIG REF: 010/ OTH REF: 024

Card 1/1 UDC: 523.85

GINZBURG, V.I.

"On the Exclusion of the Longitudinal Magnetic Field from the Hamilton Function," Zhur. Eksper. i Teoret. Fiz., 9, No.8, 1939

Optics Lab. and Sci. Res. Inst. of Physics, Moscow State U.

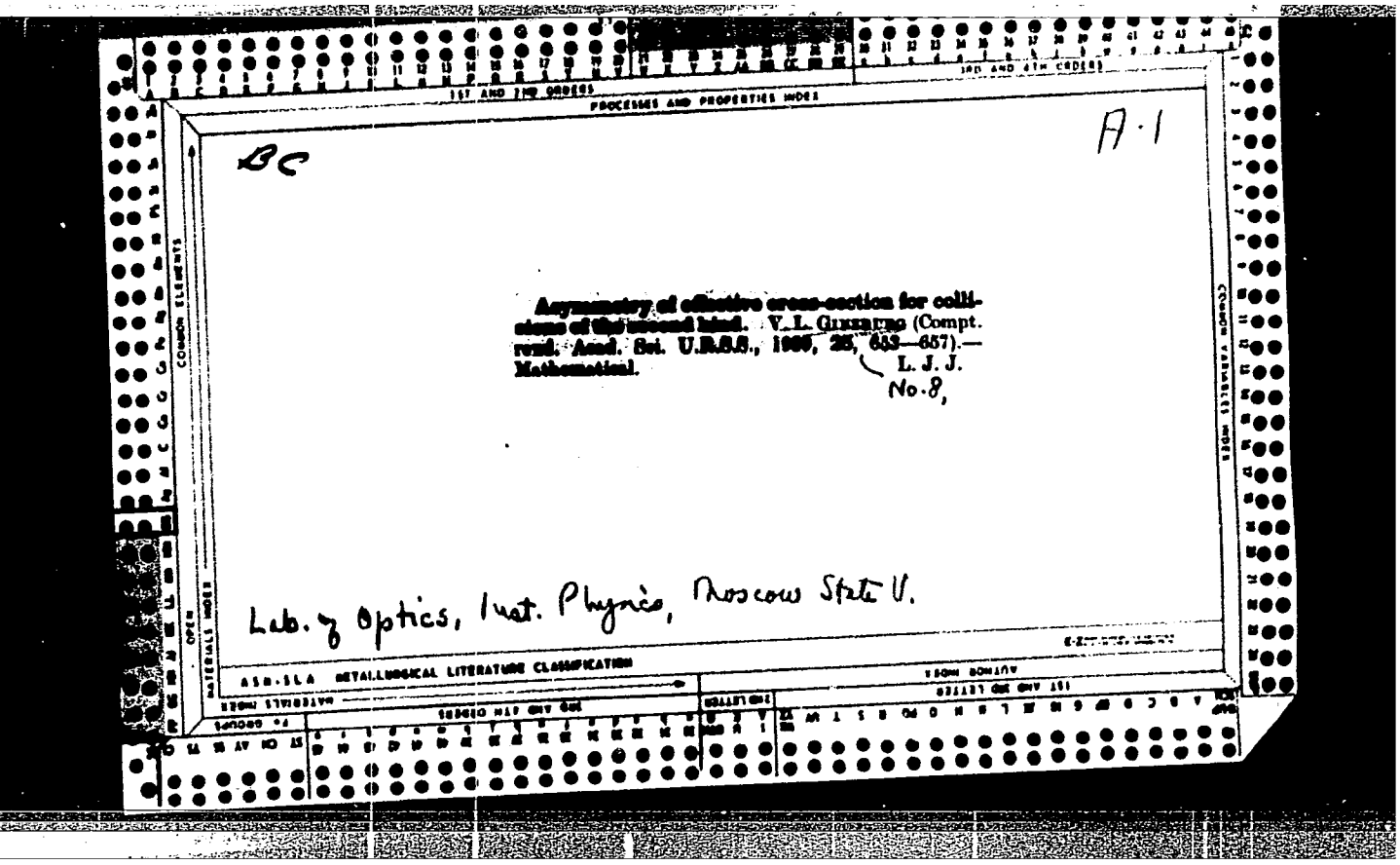
GINSBURG, V.L.

"On Quantum Electrodynamics. I," Dokl. AN SSSR, 23, No.8, 1939.
"On Quantum Electrodynamics. II", Dokl. AN SSSR, 23, No.9, 1939

GINSBURG, V. L.

"Some Contribution to Quantum Electrodynamics. III," Dokl. AN SSSR, 24, No.2, 1939.

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



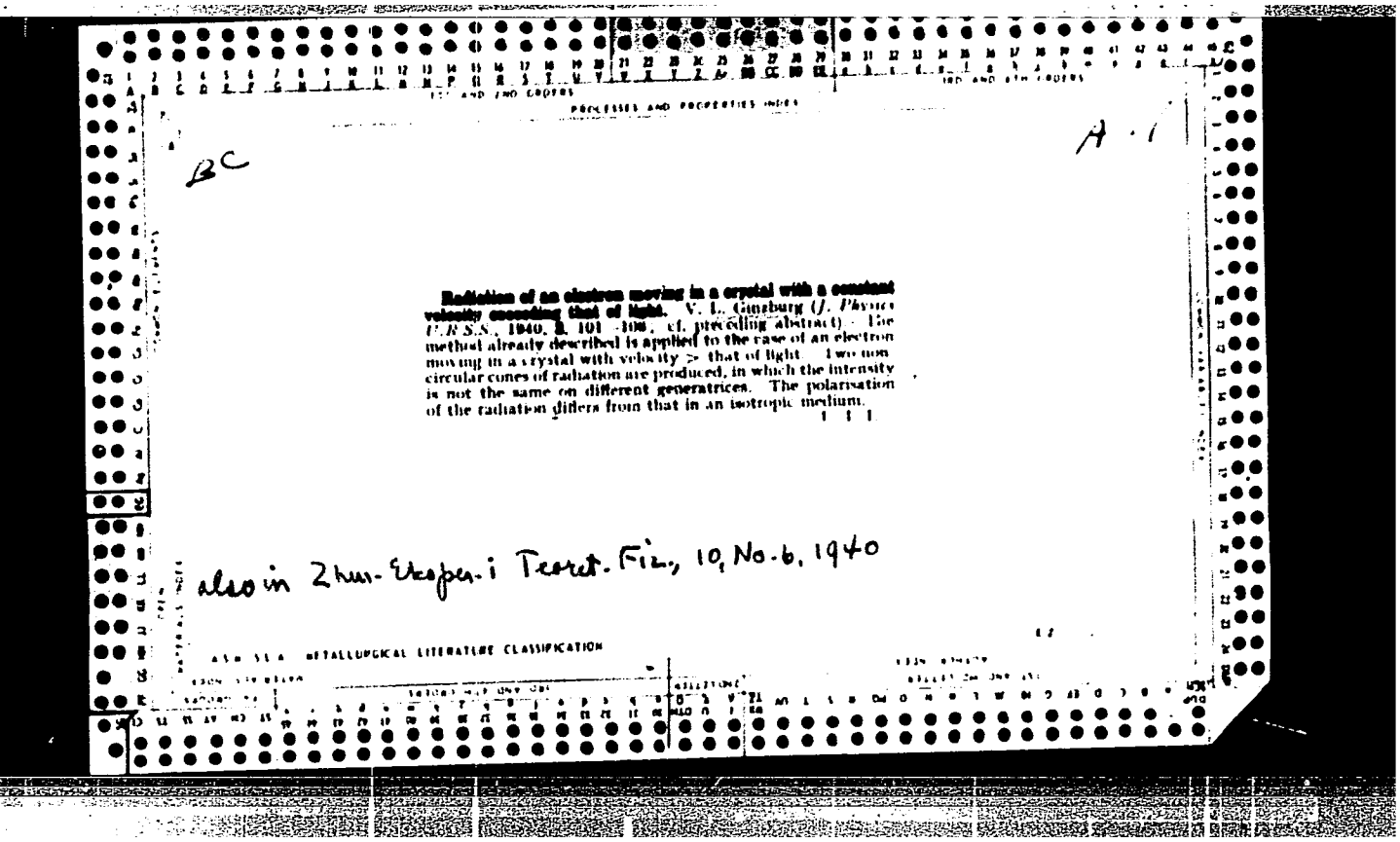
BC

A-1

Asymmetry of effective cross-section for collisions of the second kind. V. L. Ginzburg (Compt. rend. Acad. Sci. U.R.S.S., 1949, 25, 633—637).—Mathematical.

L. J. J.
No. 8,

Lab. of Optics, Inst. Physics, Moscow State U.

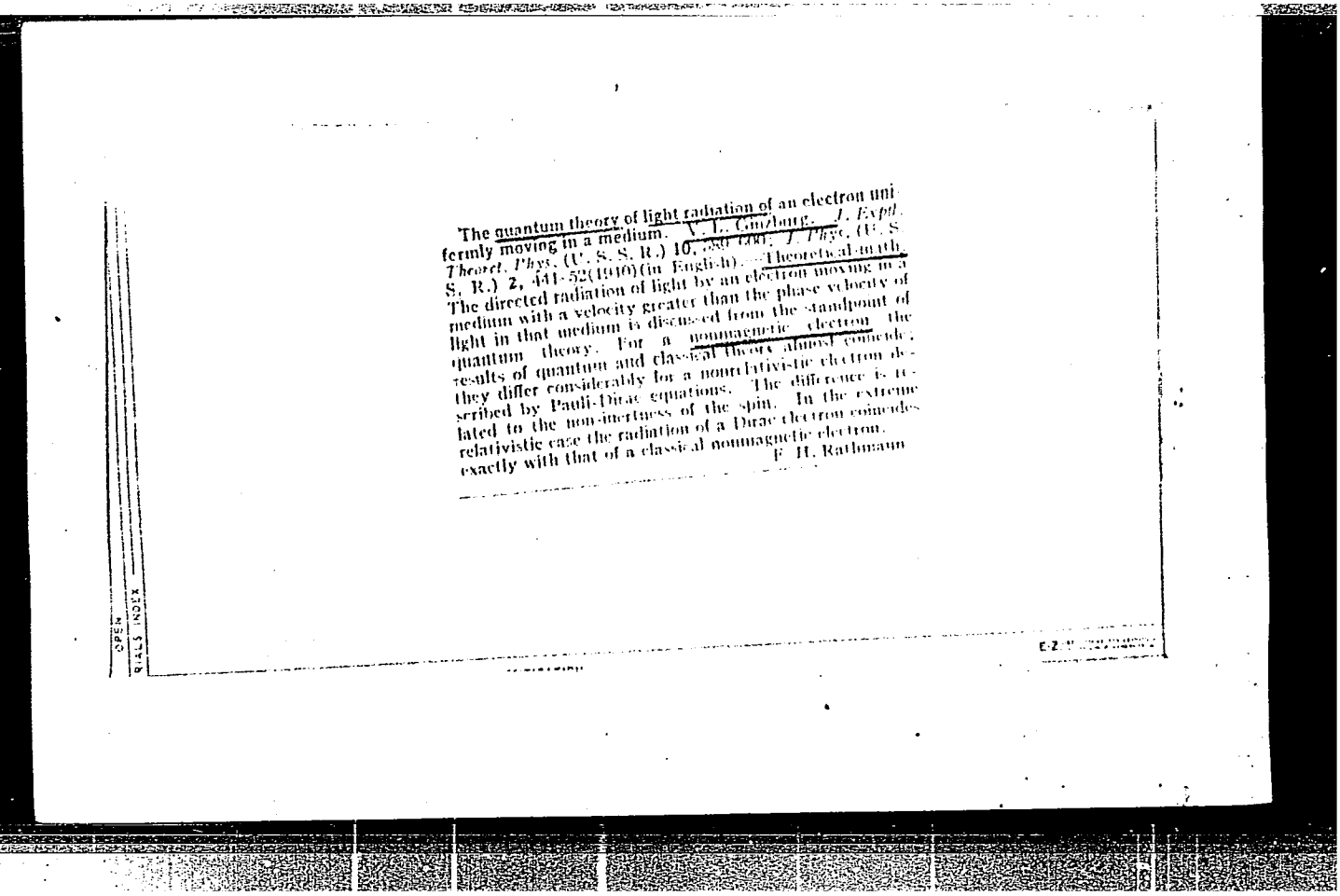


BC

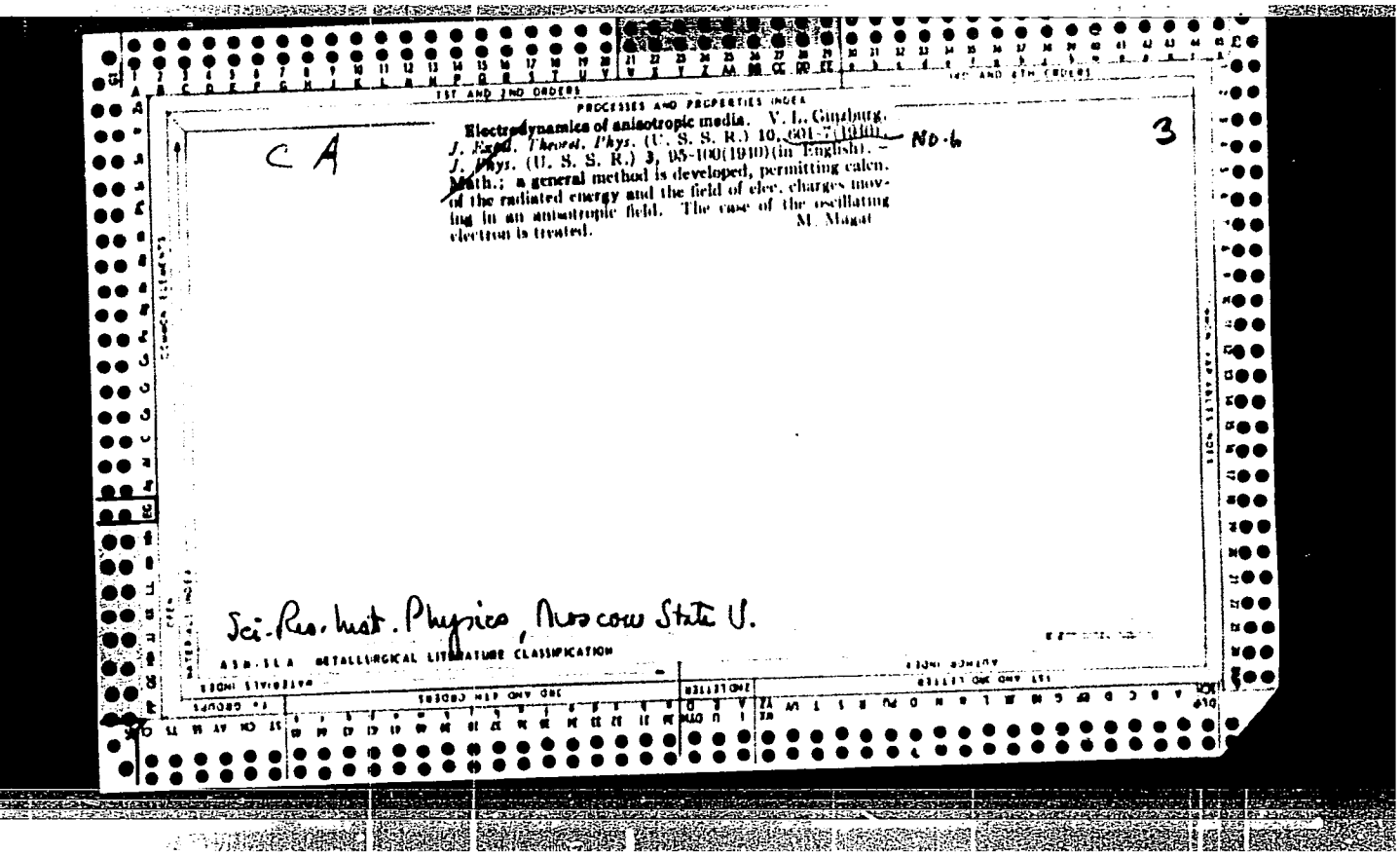
A-1

Radiation of an electron moving in a crystal with a constant velocity exceeding that of light. V. L. Ginzburg (*J. Physics U.R.S.S.*, 1940, **2**, 101–108; cf. preceding abstract).—The method already described is applied to the case of an electron moving in a crystal with velocity > that of light. Two non-circular cones of radiation are produced, in which the intensity is not the same on different generatrices. The polarisation of the radiation differs from that in an isotropic medium.

also in Zhur. Eksper. i Teoret. Fiz., 10, No. 6, 1940



The quantum theory of light radiation of an electron uniformly moving in a medium. V. L. Ginzburg. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 589-600; *J. Phys.* (U. S. S. R.) 2, 441-52(1940)(in English).—Theoretical-math. The directed radiation of light by an electron moving in a medium with a velocity greater than the phase velocity of light in that medium is discussed from the standpoint of quantum theory. For a nonmagnetic electron the results of quantum and classical theory almost coincide; they differ considerably for a nonrelativistic electron described by Pauli-Dirac equations. The difference is related to the non-inertness of the spin. In the extreme relativistic case the radiation of a Dirac electron coincides exactly with that of a classical nonmagnetic electron.
F. H. Rathmann



PROCESSES AND PROPERTIES INDEX

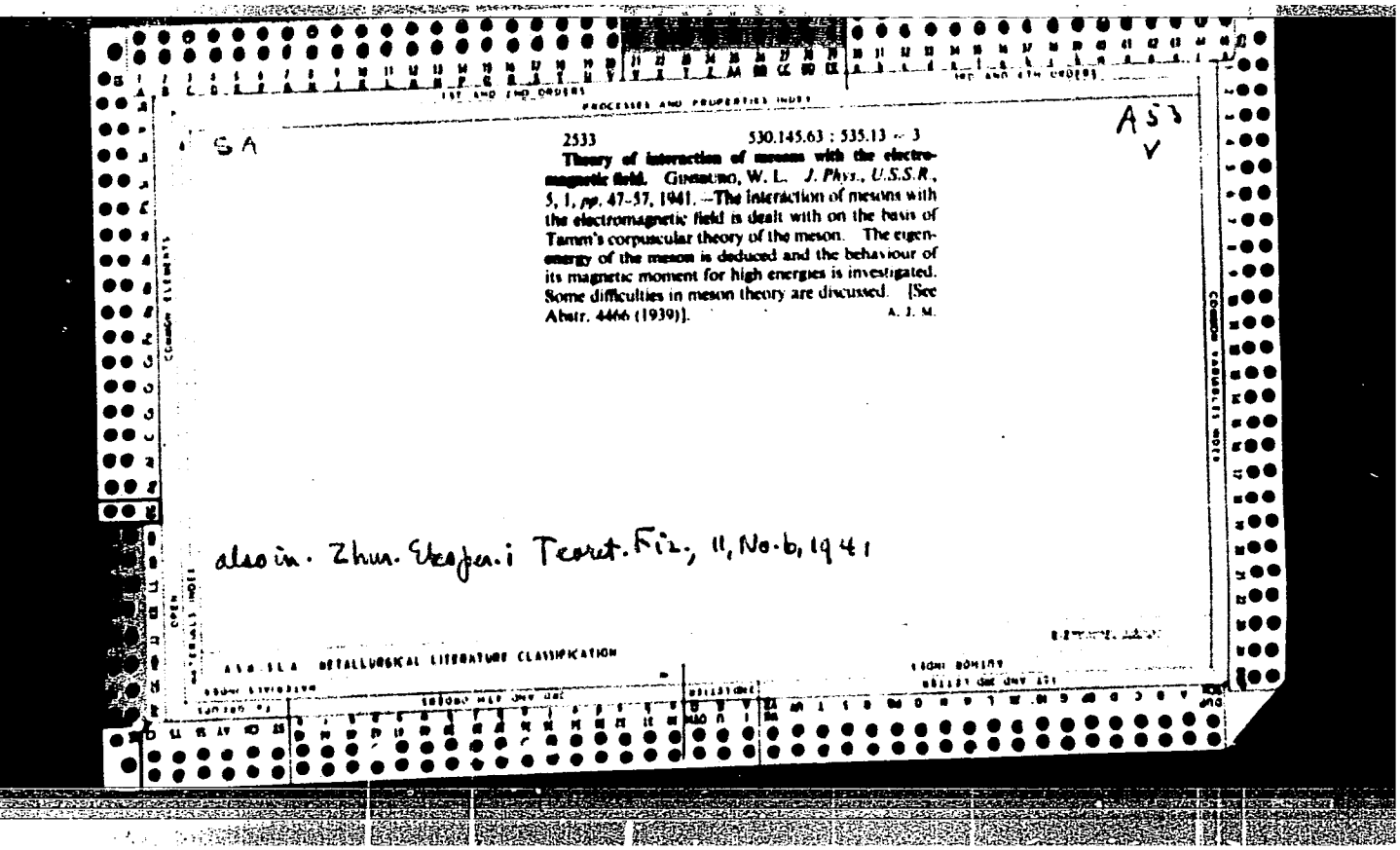
C A

3

Electrodynamics of anisotropic media. V. L. Ginzburg. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 601-7(1940). — ND-6
J. Phys. (U. S. S. R.) 3, 95-100(1940)(in English). — Math.: a general method is developed, permitting calcn. of the radiated energy and the field of elec. charges moving in an anisotropic field. The case of the oscillating electron is treated.
M. Magat

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

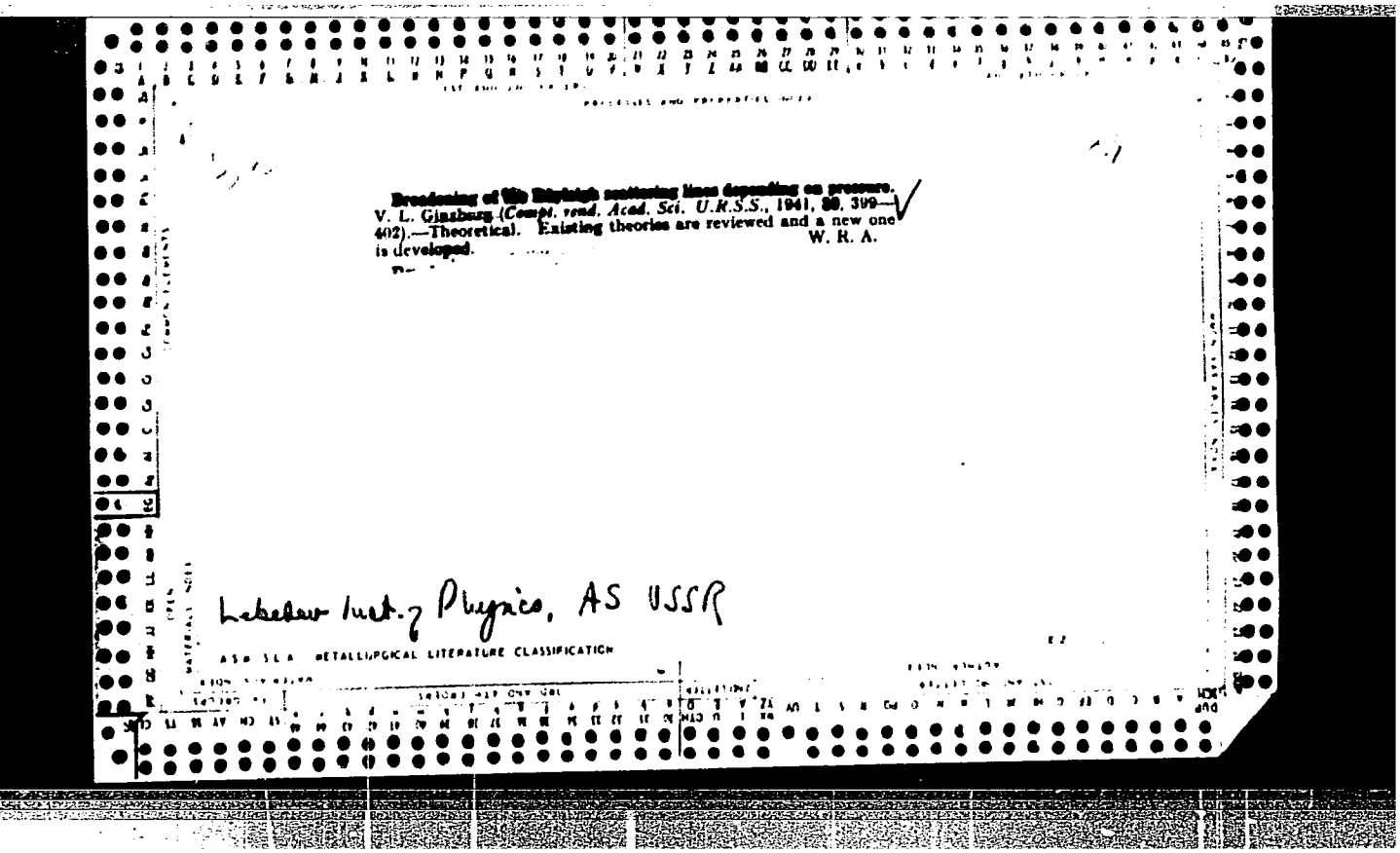
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



2533 530.145.63 : 535.13 – 3

Theory of interaction of mesons with the electromagnetic field. Ginsburg, W. L. *J. Phys., U.S.S.R.*, 5, 1, pp. 47–57, 1941. —The interaction of mesons with the electromagnetic field is dealt with on the basis of Tamm's corpuscular theory of the meson. The eigenenergy of the meson is deduced and the behaviour of its magnetic moment for high energies is investigated. Some difficulties in meson theory are discussed. [See Abstr. 4466 (1939)]. A. J. M.

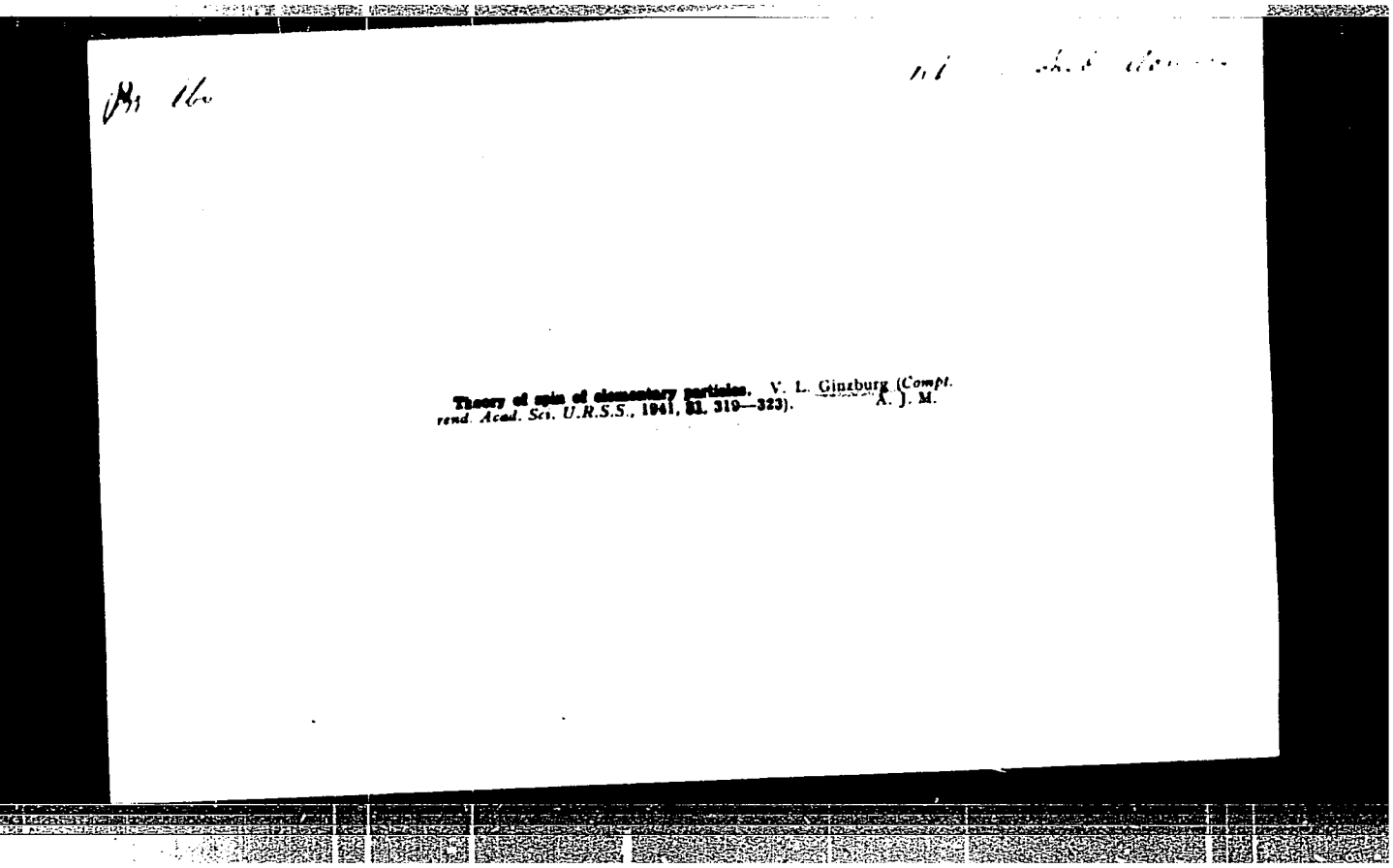
also in. Zhur. Eksper. i Teoret. Fiz., 11, No. 6, 1941



Broadening of the Rayleigh scattering lines depending on pressure.
V. L. Ginzburg (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 399—402).—Theoretical. Existing theories are reviewed and a new one is developed. W. R. A.

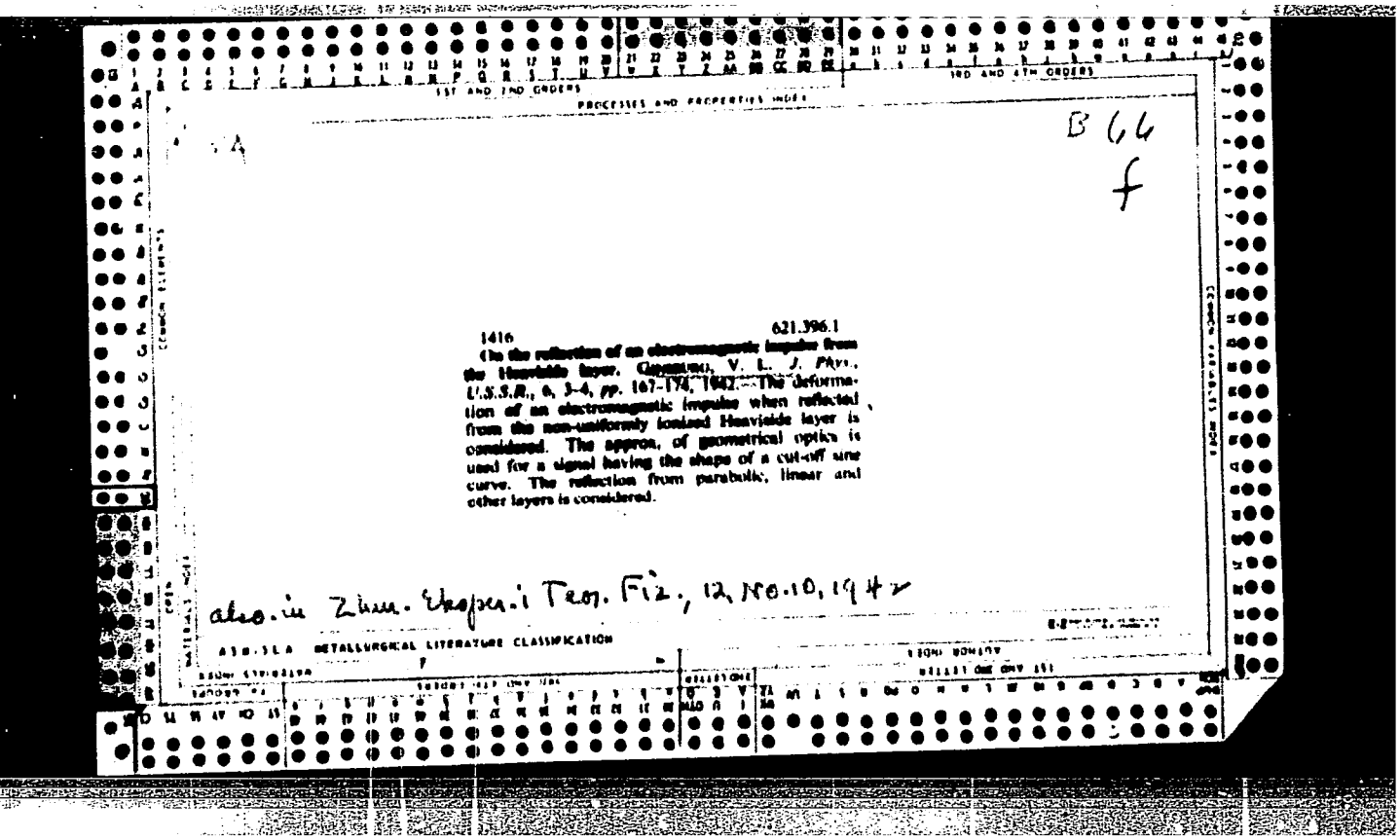
Lebedev Inst. of Physics, AS USSR

A.S.T.M. METALLURGICAL LITERATURE CLASSIFICATION



Theory of spin of elementary particles. V. L. Ginzburg (Compt. rend. Acad. Sci. U.R.S.S., 1941, 31. 319—323). A. J. M.

Theory of the bi-meson. V. L. Ginzburg. (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 857–860).—Wave equations are developed for the bi meson, a particle having spin 0 in the lowest state, and 1 in the singly excited state. A. J. M.



B 64
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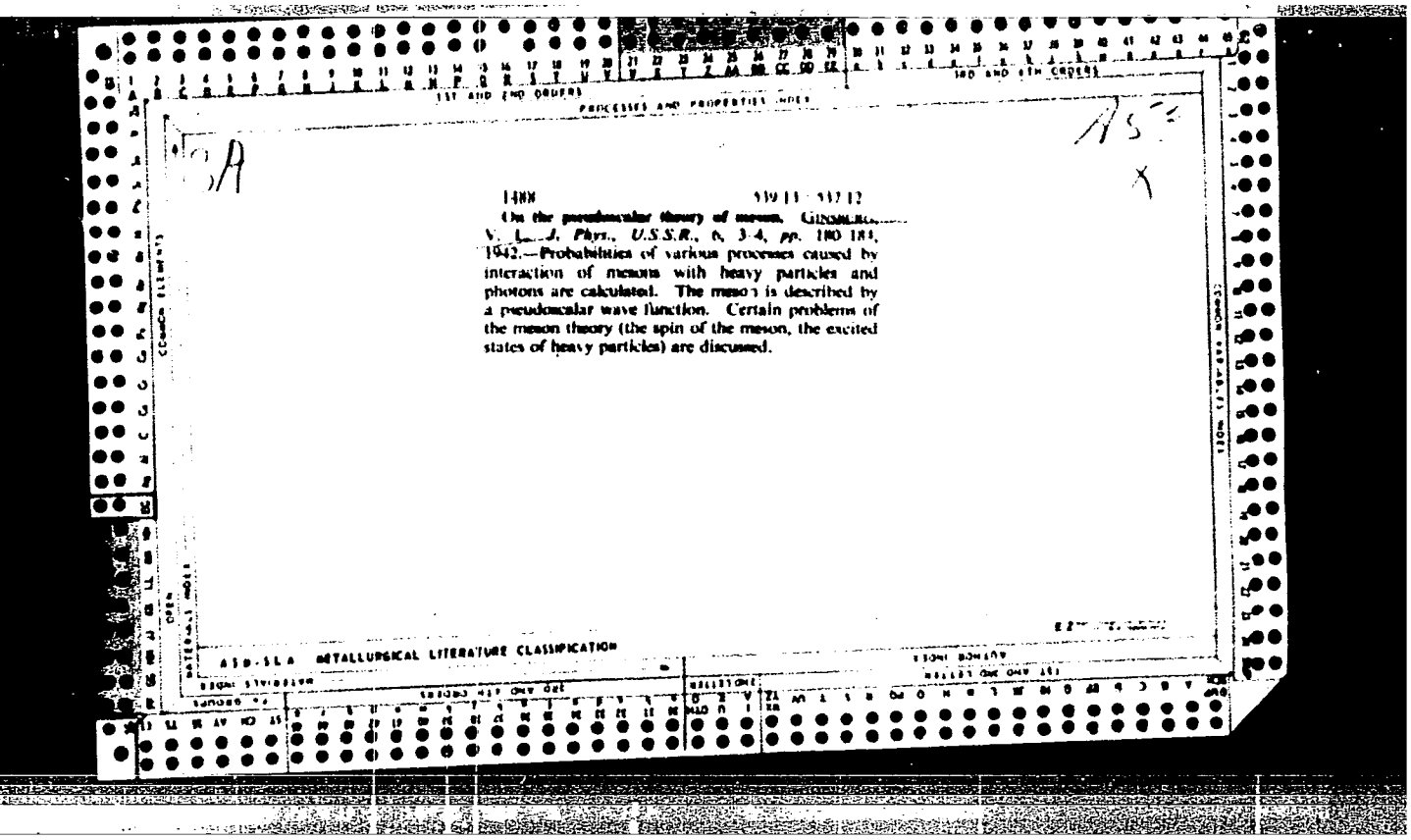
1416 621.396.1

On the reflection of an electromagnetic impulse from the Heaviside layer. Gaponov, V. L. *J. Phys., U.S.S.R.*, 6, 3-4, pp. 167-174, 1942.—The deformation of an electromagnetic impulse when reflected from the non-uniformly ionized Heaviside layer is considered. The approx. of geometrical optics is used for a signal having the shape of a cut-off sine curve. The reflection from parabolic, linear and other layers is considered.

also in Zhur. Eksper. i Teor. Fiz., 12, No. 10, 1942

A58-51A METALLURGICAL LITERATURE CLASSIFICATION



1488 539.11 : 537.12

On the pseudoscalar theory of mesons. Ginsburg, V. L. *J. Phys., U.S.S.R.*, 6, 3-4, *pp.* 180-181, 1942.—Probabilities of various processes caused by interaction of mesons with heavy particles and photons are calculated. The meson is described by a pseudoscalar wave function. Certain problems of the meson theory (the spin of the meson, the excited states of heavy particles) are discussed.

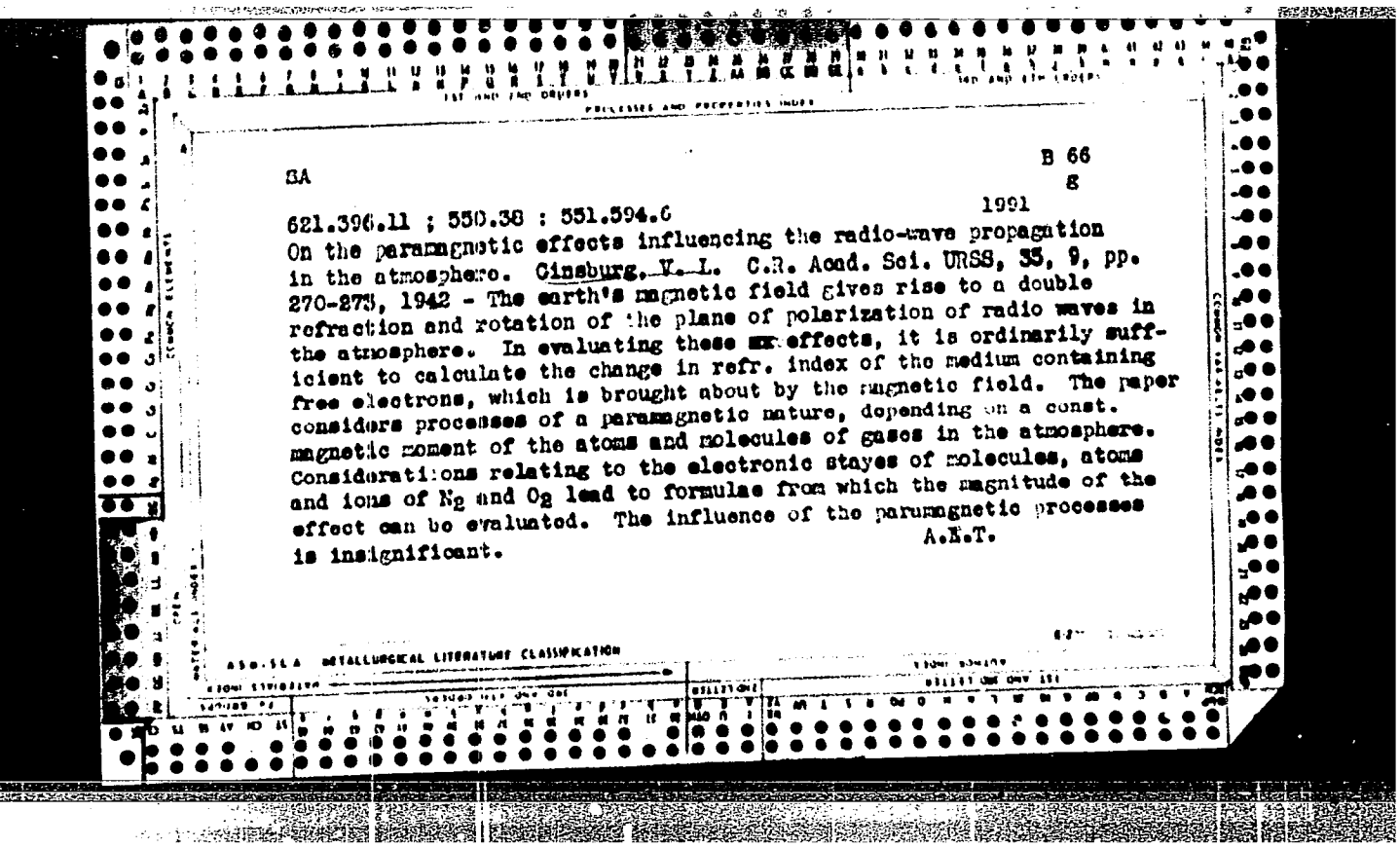
A10-5LA METALLURGICAL LITERATURE CLASSIFICATION

GINSBURG, V. L.

"Wave Equation for a Particle with a Spin 1/2 and with Two Values of the Rest Mass," Zhur. Eksper. i Teoret. Fiz., 12, No.10, 1942

"On the Theory of a Particle with a Spin 3/2," ibid.

Physics Inst. im. Lebedev, AS USSR



GA B 66
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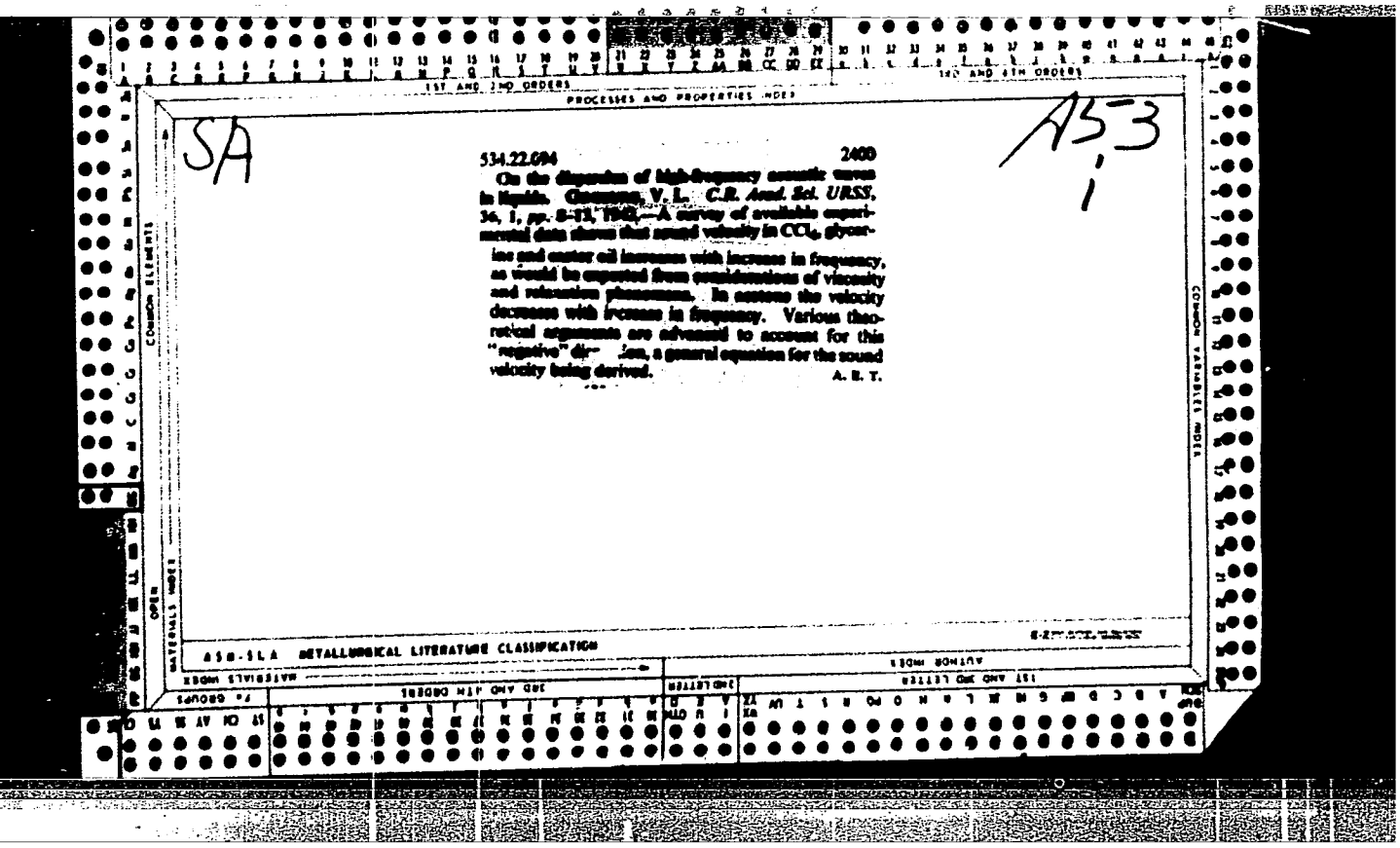
621.396.11 ; 550.38 : 551.594.6

On the paramagnetic effects influencing the radio-wave propagation in the atmosphere. Ginsburg, V. L. C.R. Acad. Sci. URSS, 35, 9, pp. 270-273, 1942 - The earth's magnetic field gives rise to a double refraction and rotation of the plane of polarization of radio waves in the atmosphere. In evaluating these ~~ex~~ effects, it is ordinarily sufficient to calculate the change in refr. index of the medium containing free electrons, which is brought about by the magnetic field. The paper considers processes of a paramagnetic nature, depending on a const. magnetic moment of the atoms and molecules of gases in the atmosphere. Considerations relating to the electronic stayes of molecules, atoms and ions of Ng and Og lead to formulae from which the magnitude of the effect can be evaluated. The influence of the paramagnetic processes is insignificant. A.M.T.



SA

A53
1

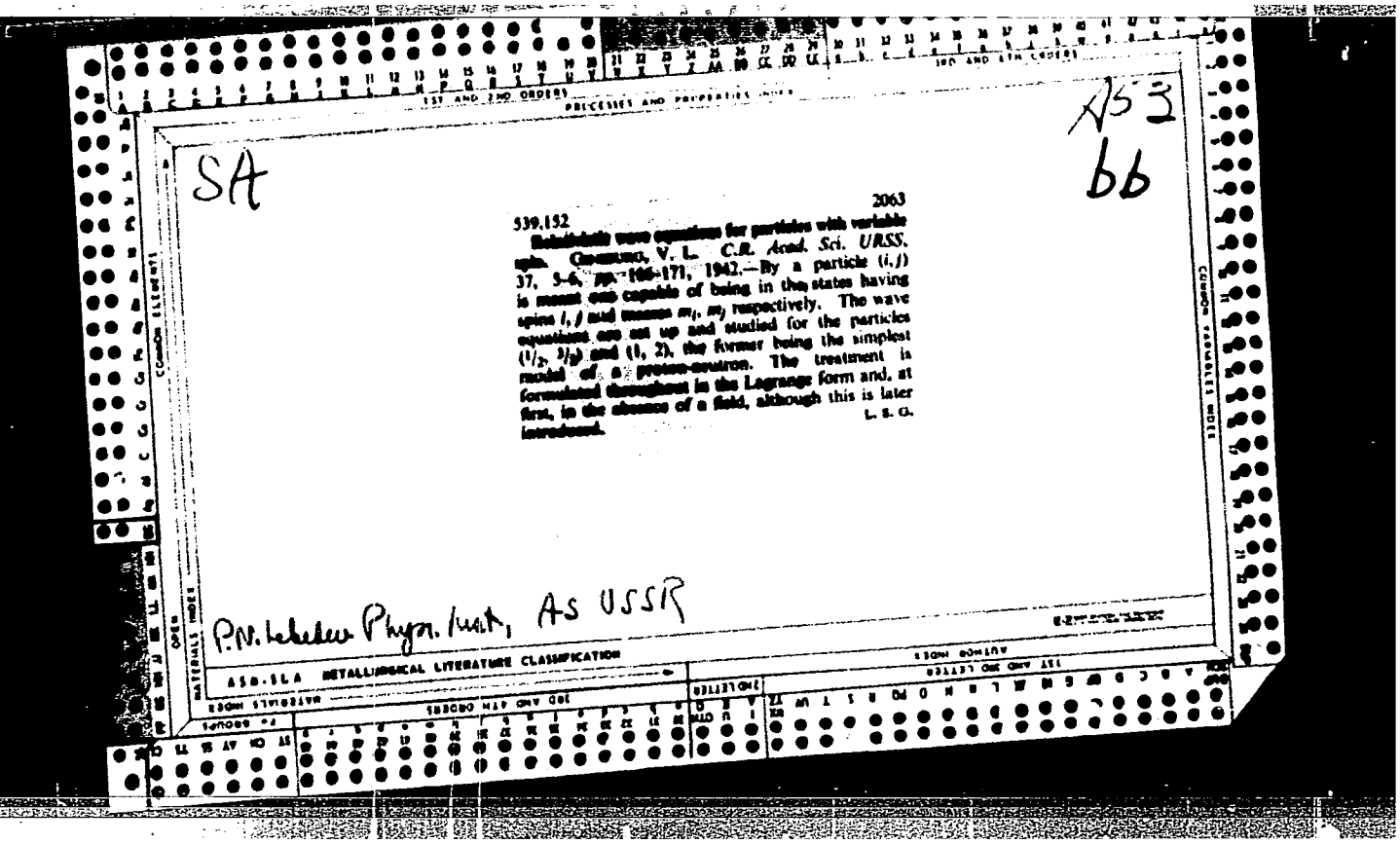
534.22.094 2400

On the dispersion of high-frequency acoustic waves in liquids. Gavreau, V. L. *C.R. Acad. Sci. URSS*, 36, 1, pp. 8-11, 1942.—A survey of available experimental data shows that sound velocity in CCl_4, glycerine and castor oil increases with increase in frequency, as would be expected from considerations of viscosity and relaxation phenomena. In acetone the velocity decreases with increase in frequency. Various theoretical arguments are advanced to account for this "negative" dis- ion, a general equation for the sound velocity being derived.

A. B. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Excited states of elementary particles. V. L. Ginzburg. (Compt. rend. Acad. Sci. U.R.S.S., 1942, 37, 9—13).—Two types of difficulty in relativistic quantum particle theory are discussed: (*a*) difficulties arising from the infinite proper energy of elementary particles; (*b*) difficulties arising from not taking into account the effect of the proper field of the particle on its scattering properties. If the proper field of the magnetic moment is taken into account, excited spin states of the particle must be postulated, and the wave equation must contain an empirical const. L. J. J.



SA

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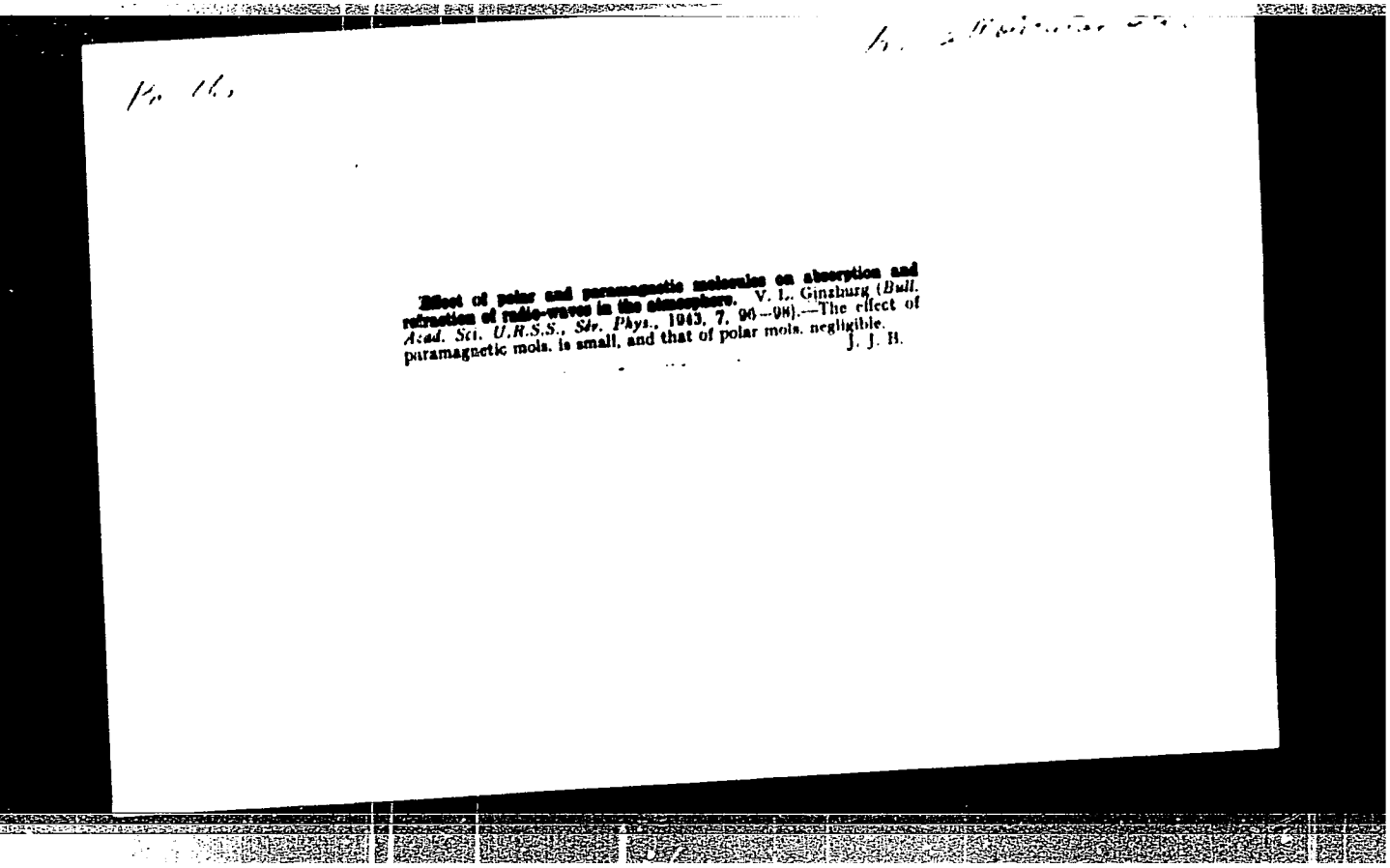
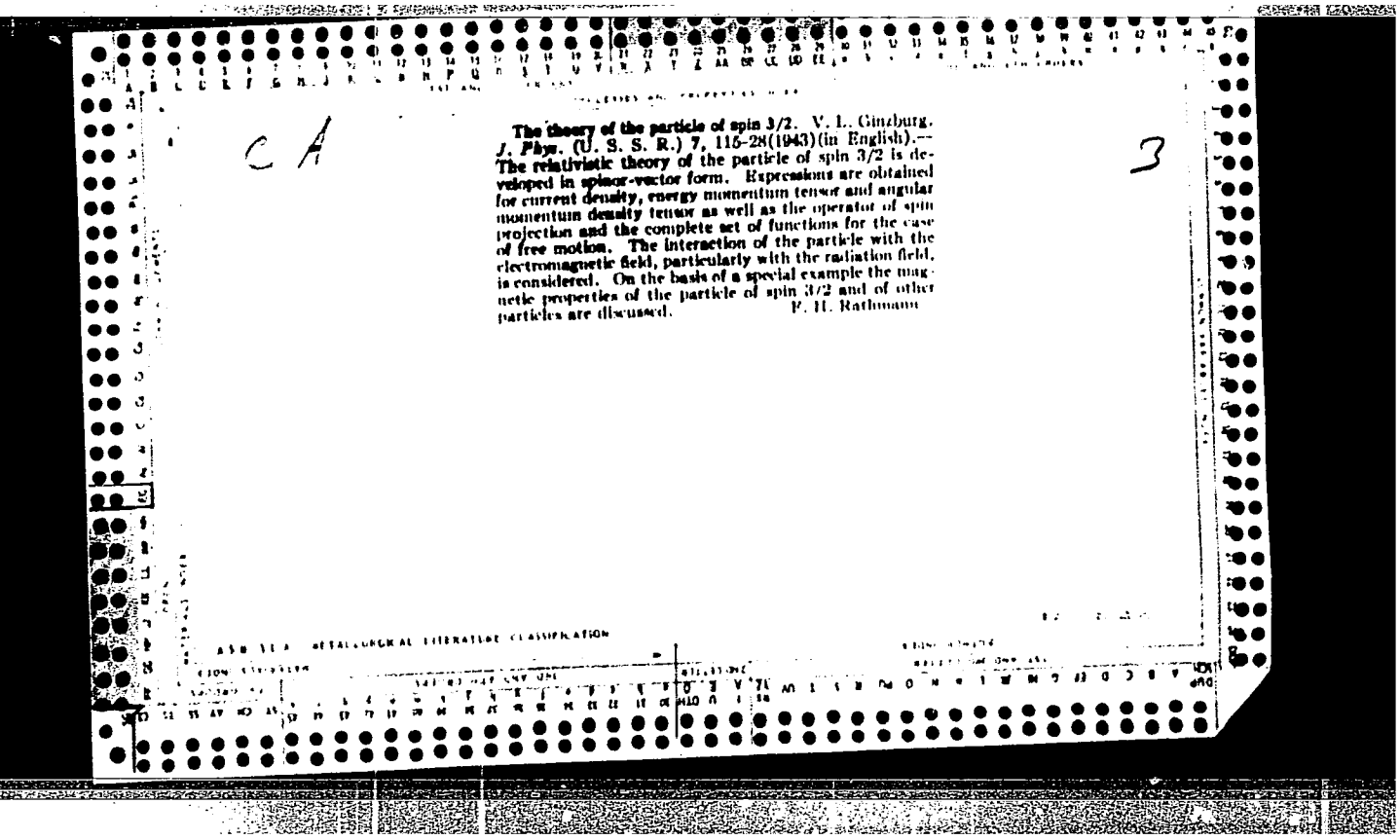
539.152

Relativistic wave equations for particles with variable spin. Gel'fand, I. M., and Yaglom, V. L. *C.R. Acad. Sci. URSS.* 37, 5-6, pp. 165-171, 1942.—By a particle (i, j) is meant one capable of being in two states having spins i, j and masses m_i, m_j respectively. The wave equations are set up and studied for the particles $(1/2, 3/2)$ and $(1, 2)$, the former being the simplest model of a proton-neutron. The treatment is formulated throughout in the Lagrange form and, at first, in the absence of a field, although this is later introduced. L. S. G.

P.N. Lebedev Phys. Inst., AS USSR



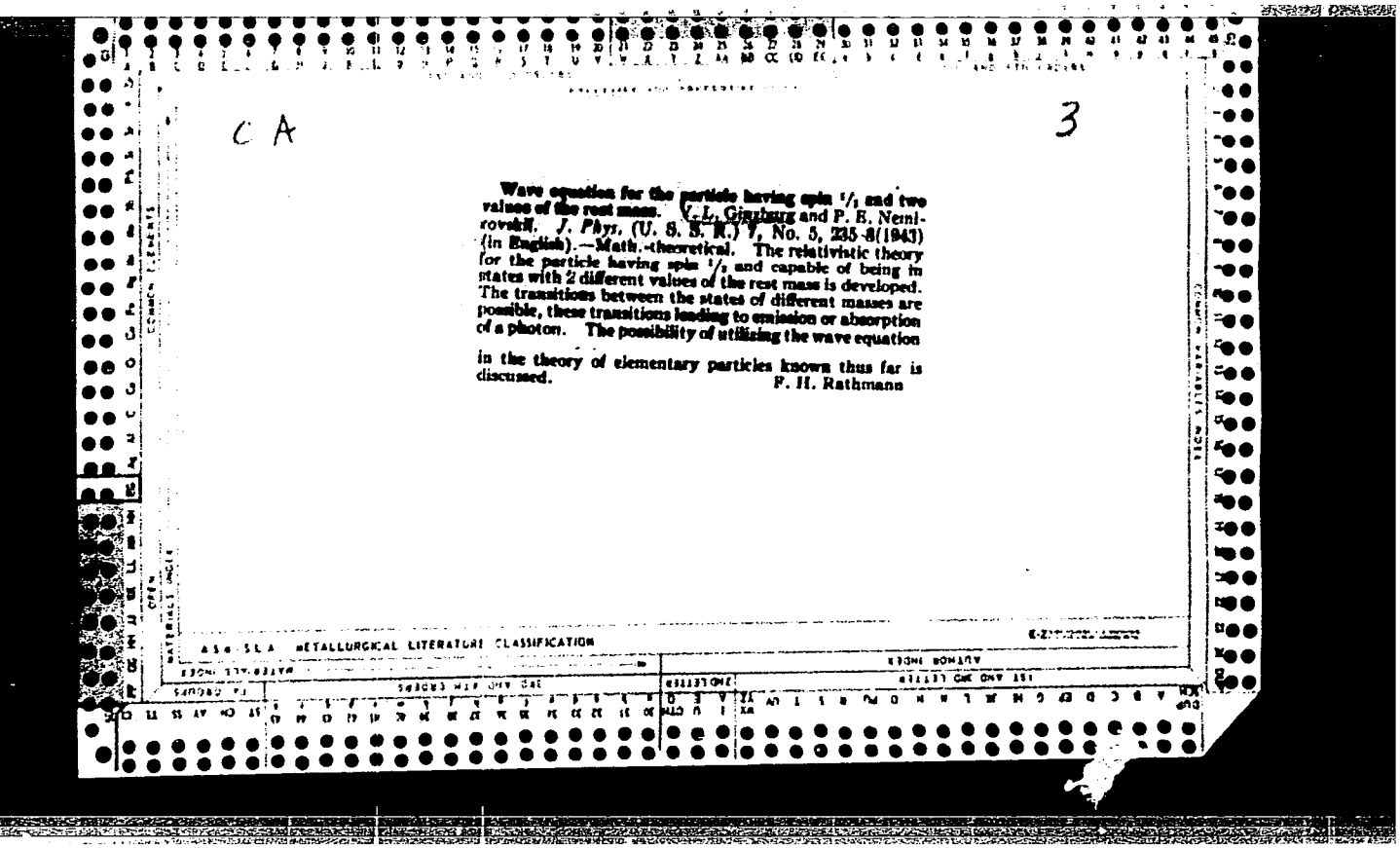
Effect of polar and paramagnetic molecules on absorption and refraction of radio-waves in the atmosphere. V. L. Ginzburg (*Bull. Acad. Sci. U.R.S.S., Sér. Phys.*, 1943, 7, 90–98).—The effect of paramagnetic mols. is small, and that of polar mols. negligible.
J. J. B.



C A

3

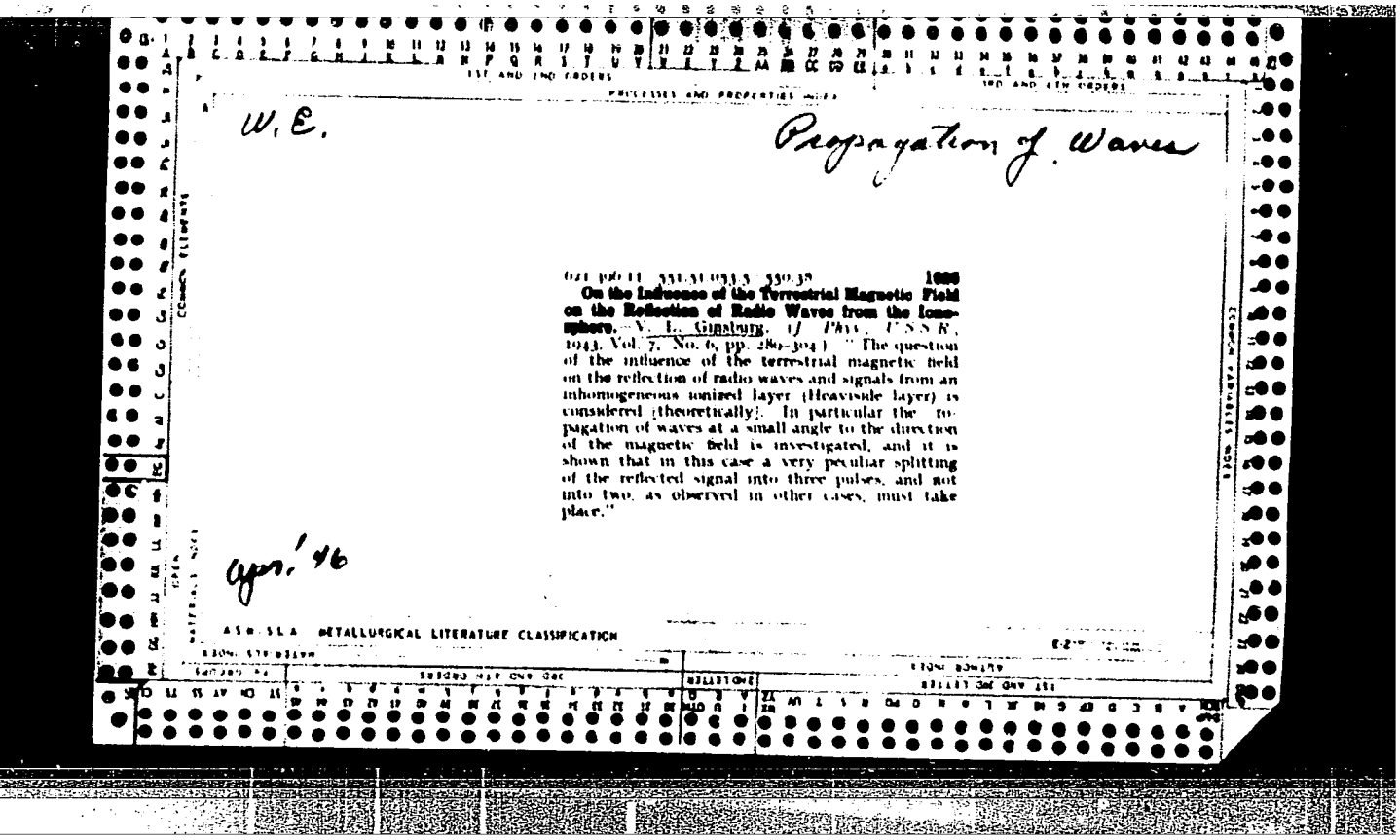
The theory of the particle of spin 3/2. V. L. Ginzburg. *J. Phys.* (U. S. S. R.) 7, 115–28(1943)(in English).—The relativistic theory of the particle of spin 3/2 is developed in spinor-vector form. Expressions are obtained for current density, energy momentum tensor and angular momentum density tensor as well as the operator of spin projection and the complete set of functions for the case of free motion. The interaction of the particle with the electromagnetic field, particularly with the radiation field, is considered. On the basis of a special example the magnetic properties of the particle of spin 3/2 and of other particles are discussed. P. H. Rathmann



CA 3

Wave equation for the particle having spin 1/2 and two values of the rest mass. V. L. Ginzburg and P. E. Nemirovskiĭ. *J. Phys.* (U. S. S. R.) 7, No. 5, 235-8(1943) (in English).—Math.-theoretical. The relativistic theory for the particle having spin 1/2 and capable of being in states with 2 different values of the rest mass is developed. The transitions between the states of different masses are possible, these transitions leading to emission or absorption of a photon. The possibility of utilizing the wave equation in the theory of elementary particles known thus far is discussed.
F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



W. E.

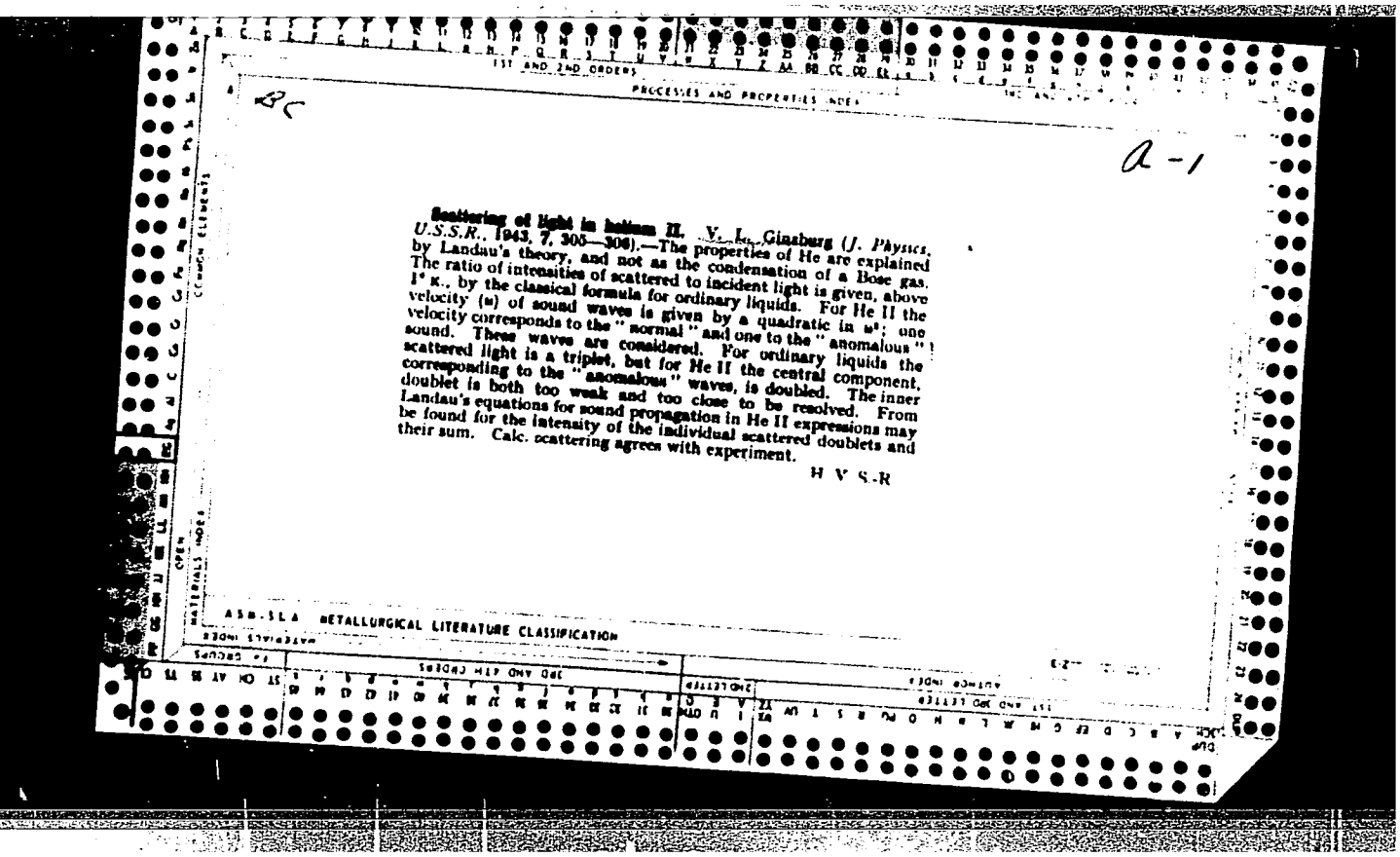
Propagation of Waves

621.396.11 551.51.053.5 550.38 1006

On the Influence of the Terrestrial Magnetic Field on the Reflection of Radio Waves from the Ionosphere.—V. L. Ginsburg. (*J. Phys., U.S.S.R.*, 1943, Vol. 7, No. 6, pp. 289–304.) "The question of the influence of the terrestrial magnetic field on the reflection of radio waves and signals from an inhomogeneous ionized layer (Heaviside layer) is considered (theoretically). In particular the propagation of waves at a small angle to the direction of the magnetic field is investigated, and it is shown that in this case a very peculiar splitting of the reflected signal into three pulses, and not into two, as observed in other cases, must take place."

Oppn. '46

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



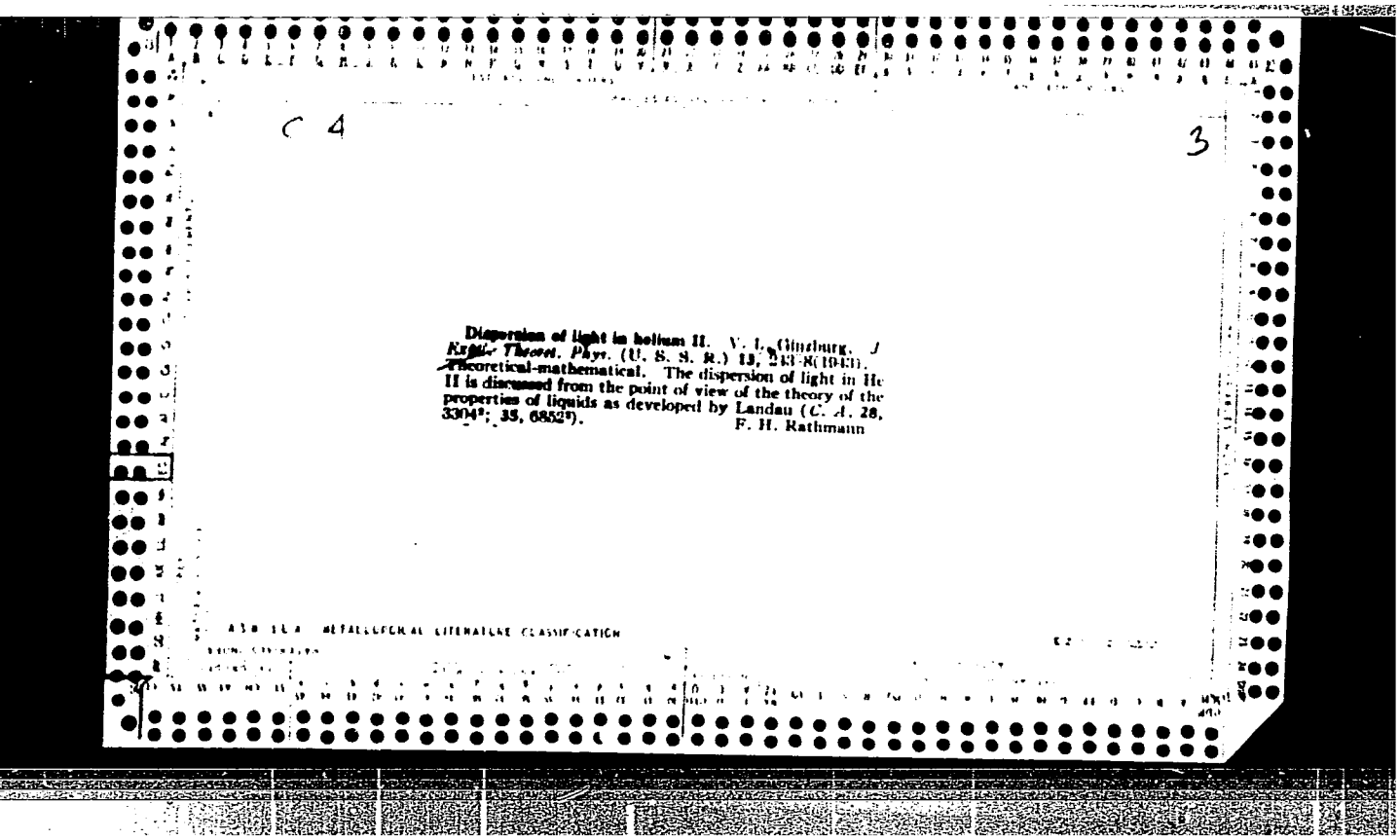
PROCESSES AND PROPERTIES INDEX

a-1

Scattering of light in helium II. V. L. Ginsburg (*J. Physics, U.S.S.R.*, 1943, 7, 305—306).—The properties of He are explained by Landau's theory, and not as the condensation of a Bose gas. The ratio of intensities of scattered to incident light is given, above 1° K., by the classical formula for ordinary liquids. For He II the velocity (*u*) of sound waves is given by a quadratic in u^2; one velocity corresponds to the "normal" and one to the "anomalous" sound. These waves are considered. For ordinary liquids the scattered light is a triplet, but for He II the central component, corresponding to the "anomalous" waves, is doubled. The inner doublet is both too weak and too close to be resolved. From Landau's equations for sound propagation in He II expressions may be found for the intensity of the individual scattered doublets and their sum. Calc. scattering agrees with experiment.

H V S-R

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



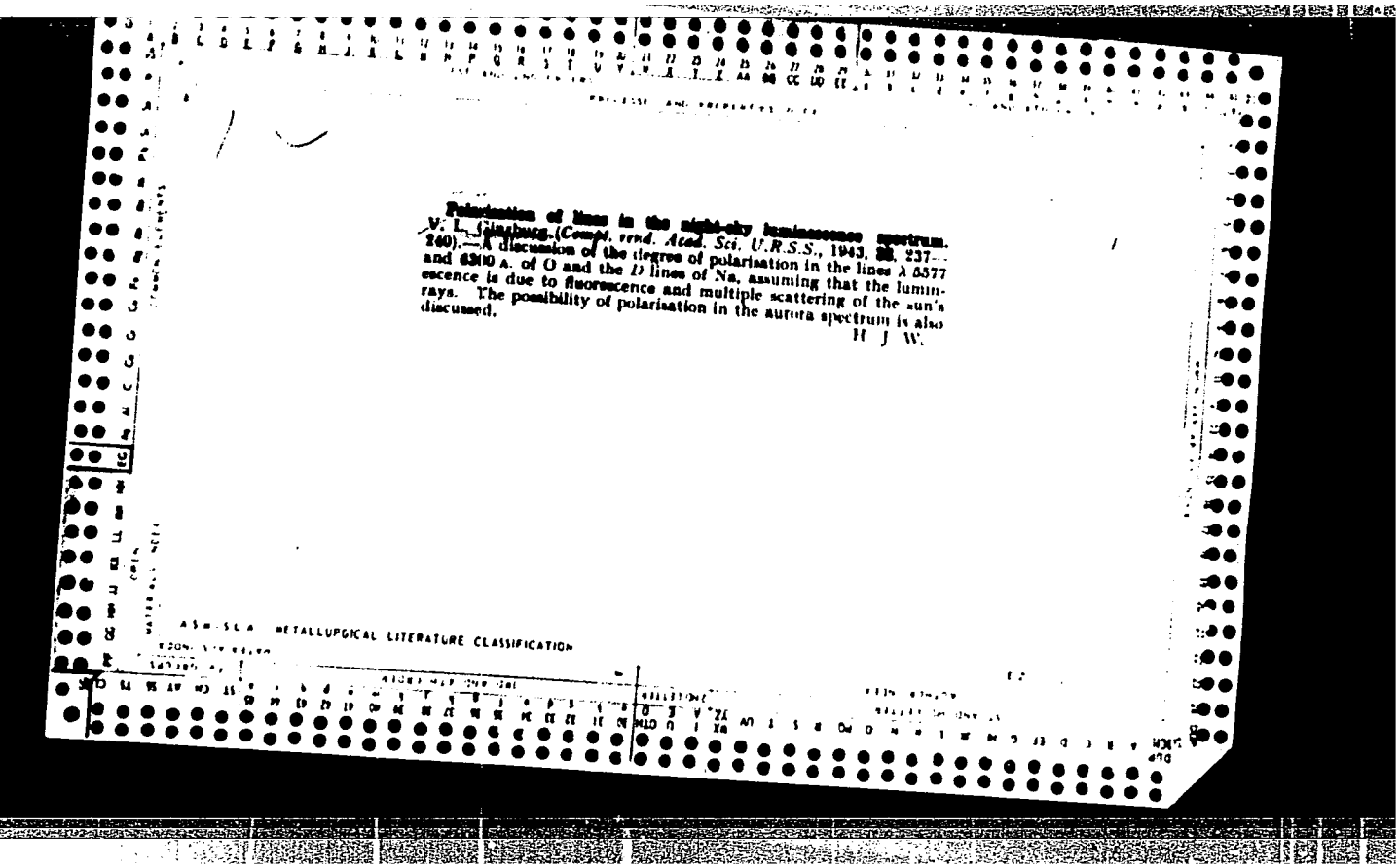
C 4

3

Dispersion of light in helium II. V. L. Ginzburg. *J Exptl. Theoret. Phys.* (U. S. S. R.) 13, 243-8(1943). Theoretical-mathematical. The dispersion of light in He II is discussed from the point of view of the theory of the properties of liquids as developed by Landau (*C. A.* 28, 3304[9]; 35, 6852[8]).
F. H. Rathmann

A S M E A METALLURGICAL LITERATURE CLASSIFICATION

"On Wave Equations for Particles with Variable Spin," Zhur. Eksper. i Teoret. Fiz., 13, No.7-8, 1943



Polarisation of lines in the night-sky luminescence spectrum. V. L. Ginzburg. (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **38**, 237—240).—A discussion of the degree of polarisation in the lines λ 5577 and 6310 A. of O and the *D* lines of Na, assuming that the luminescence is due to fluorescence and multiple scattering of the sun's rays. The possibility of polarisation in the aurora spectrum is also discussed.

H. J. W.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

GINZBURG, V. L.

O polyarizatsii liniy v spektre svecheniya nochnogo neba i v spektre polyarnykh siyaniy (On the Polarization of the Lines in the Spectrum of Night Sky Luminescence and in the Auroral Spectrum). Akademiya Nauk SSSR. Doklady, 1943, v. 38, no. 8, p. 266-269.

AS262.S3663 v. 38

Propagation of Waves

[illegible] On the Anomalies in the Polarisation of Twilight. V. L. Ginsburg. [illegible] (Doklady [illegible] SSSR, 5th March 194[illegible], Vol. 38, No. 6, pp. [illegible] In English.)

Within the last years Khvostikov and others carried out measurements on the polarisation of twilight at the zenith . . . It was found that the dependence of the degree of polarisation upon the height of the sun is no monotonic one, but shows several maxima and minima. The position of these maxima and minima, as well as the rest of details in the shape of the curve, vary according to the day ; the first deep minimum, however, lies invariably within the region of 75–100 km. It has been suggested that polarisation anomalies are directly associated with the presence in the stratosphere of ionised layers, and that the decrease in the polarisation of light scattered by these layers is due to a sharp increase in the anisotropy of the ions, as compared to neutral particles. The author finds this interpretation unacceptable ", he gives his reasons, among which is the calculation that the light scattered by the ions of the E layer makes up no more than about one ten-thousandth of the total light scattered in this region.

Among the points discussed, " it should be noted that in the course of the twilight there may take place redistribution of density in the atmosphere (pulsating atmosphere), changes in the density gradient [" for instance, the gradient of electron concentration in the F layer is known to vary sharply during twilight. This process may be not only a static one, but a dynamic as well, i.e. it may prove to be connected with redistribution of the density of the atmosphere "], air streams, etc. Dynamical processes of this kind must tell upon changes in the polarisation and in the intensity of the light scattered. Moreover, polarisation may be affected by meteoric dust, which may be present in considerable amounts at altitudes around 100–150 km . . . In the course of the day, polarisation processes are strongly dependent on the solar activity and on the conditions of illumination of the given region of earth surface by the sun. There is no reason to suppose that these factors play a less important part during twilight. As the state of the ionosphere is also dependent on solar radiation, the existence of a correlation between polarisation and the state of the ionosphere is quite natural. The rotation of the polarisation plane at high altitudes, which has been observed by Rosenberg, as well as its rotation during solar eclipses, stand in need of special explanation and further experimental study. The possibility of the rotation observed being due to fluorescent luminescence of the atmosphere, excited either by solar radiation or by electronic impact, cannot yet be rejected " [" the rotation of the plane of fluorescence polarisation may be due to the influence of the terrestrial magnetic field, and to disturbances of normal illumination conditions (changes in the direction of the sun's rays as a result of refraction, etc.)"].

GINSBURG, V. L.

"On Secondary Light Scattering in the Atmosphere and on Polarization Anomalies During Twilight," Dokl. AN SSSR, 40, No.6, 1943

W.E.

Miscellaneous

1,917. Rotation of Polarisation Plane of "Forbidden" Lines in Outward Magnetic Field, and Polarisation of Light Scattered by Excited Atoms: also on the Scattering of Light in Liquids.—Hermann: Ginsburg. (*Comptes Rendus (Doklady) de l'Acad. des Sci. de l'URSS*, 30th Dec. 1943, Vol. 41, No. 9, pp. 369-371 & 10th Feb. 1941, Vol. 32, No. 6, pp. 164-167 & 10th Feb. 1941, Vol. 32, No. 6, pp. 168-170: all in English.)

1945

GINSBURG, V. L.

"On the Scattering of Light in Liquids," Dokl. AN USSR, 42, No.4, 1943

P.N.Lebedev Physics Inst., AS, USSR

SA

530.145.1 2145

On the theory of excited spin states of elementary particles. GINSBURG, V. *J. Phys. USSR*, 8, 1, pp. 33-51, 1944.—A development of the relativistic theory of the particle ($1/2$, $3/2$). The cross-section for the scattering of light (or mesons) on the magnetic (or quasi-magnetic) moment of such a particle increases at first with the energy as in the usual theory but becomes constant for photon energies $h\nu \gg (m_2 - m_1)c^2$ where m_1 and m_2 are the rest-masses. Thus, the introduction of higher spin states leads to the cutting-off of the cross-section for scattering and to the possibility of a non-contradictory consideration of the interaction of the heavy particle's moment with the radiation and the meson field. The theory of the particle (1, 2) is also developed and this, together with the above theory, makes it possible to consider the excited states of the proton-neutron and the meson in a relativistic form. L. S. O.

A53

6

GINSBURG V.

530.145.6 2744

On the wave equations for particles with variable spin. GINSBURG, V., AND SHORONOSSOV, I. — *J. Phys., USSR*, 8, 1, *pp.* 52-53, 1944.— By an (*l*, *j*) particle is meant one which can exist in states with spins *l* and *j* and with different values of the rest mass. The relativistic wave equations for such a particle, recently proposed by Ginsburg, are said to split up if, by means of a certain transformation of the wave functions, they reduce to a system of equations for a particle with the spin *l* and for a particle with the spin *j*, which are independent of each other. It is shown that the equations for a (0, 1) particle and for a $(\frac{1}{2}, \frac{1}{2})$ particle always split up in the absence of a field and also in the case of a certain type of interaction with an electromagnetic field. The equations for a (1, 2) particle are also separable in the absence of a field, but this is not the case for a $(\frac{1}{2}, \frac{1}{2})$ particle.

L. S. O.

modern physics

GINZBURG V. L.

Absorption of radio waves in the ionosphere. Yu. L. Al'pert and V. L. Ginzburg. *Bull. acad. sci. U. R. S. S., Sér. phys.* 8, No. 2, 42-67 (1944) (in Russian).—Theoretical-math. The mechanism of absorption is discussed on the basis of exptl. data on the no. of ions and mols. per cc. and the frequency of collisions between electrons, ions and neutral mols. as well as of the effect of the earth's magnetic field.
F. H. Rathmann

← Electromagnetics 3

4/2

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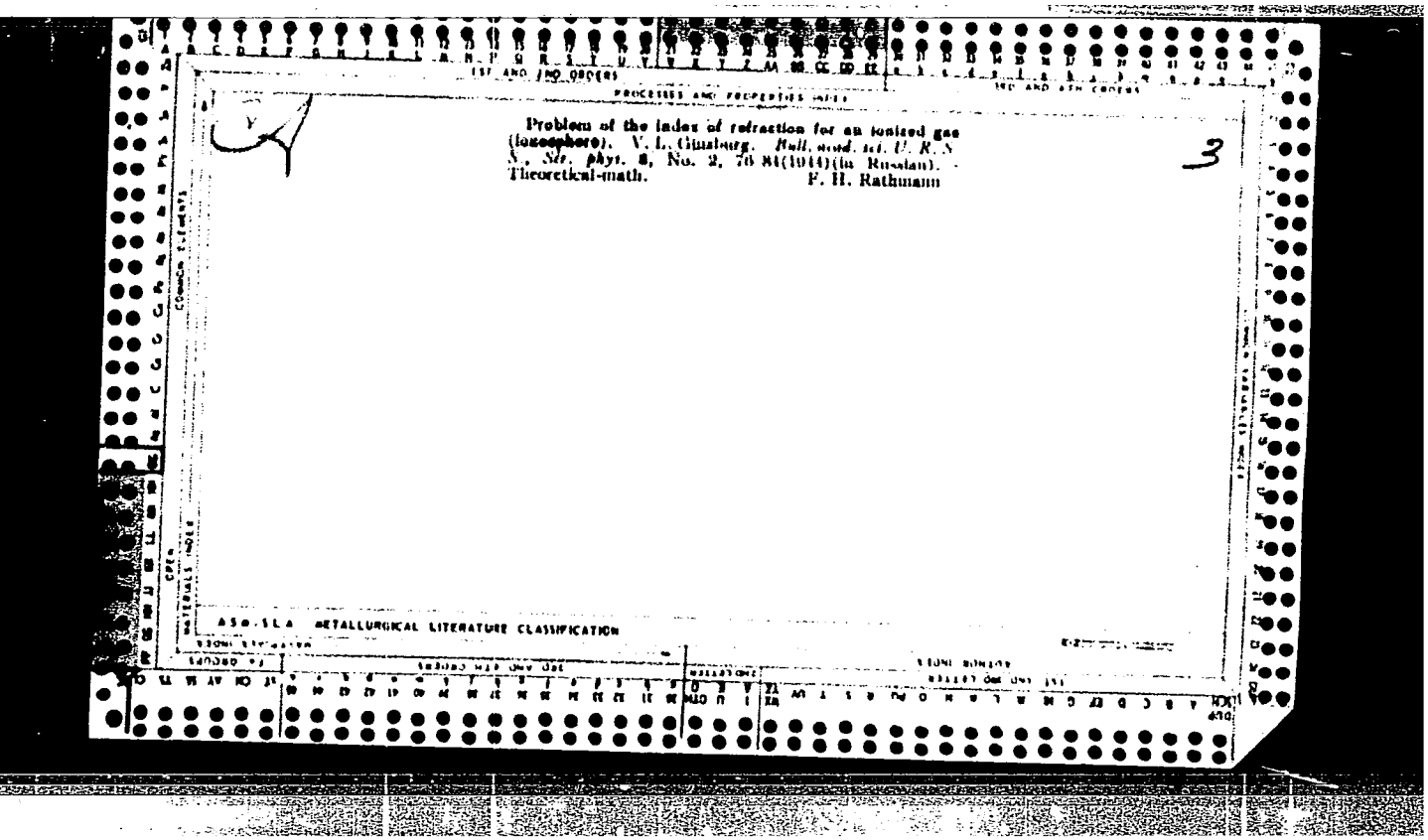


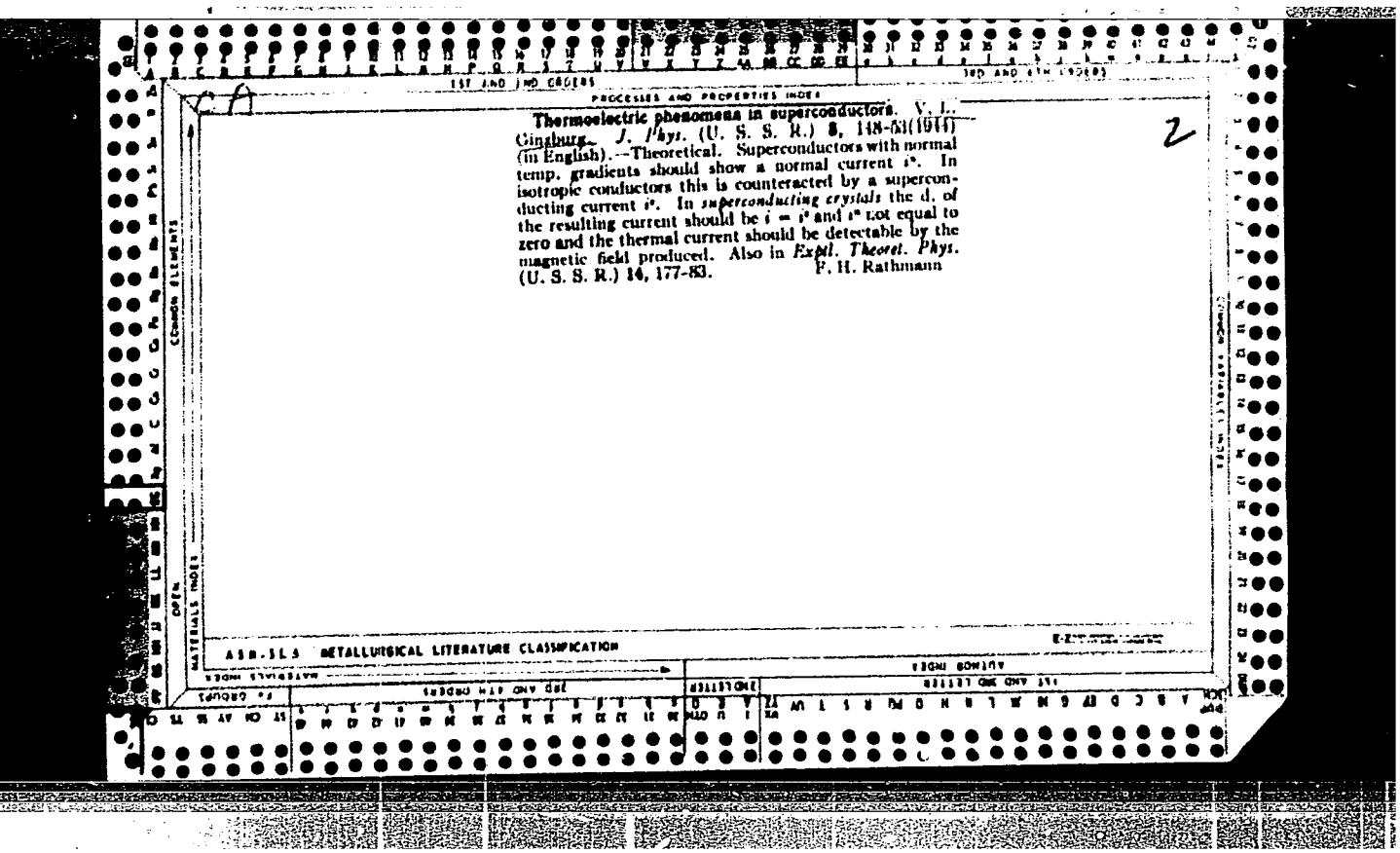
Problem of the index of refraction for an ionized gas (ionosphere). V. L. Ginsburg. *Bull. acad. sci. U. R. S. S., Sér. phys.* 8, No. 2, 76-81(1944)(in Russian). Theoretical-math.
F. H. Rathmann

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

W E

621.396.11 : 551.51.053.5 2287

On the Absorption of Radio Waves and the Number of Collisions in the Ionosphere.—V. Ginsburg. (*J. Phys., U.S.S.R.*, 1944, Vol. 8, No. 4, pp. 253–256.) "The measurement of the absorption of radio waves in the ionosphere enables one to determine the effective number of collisions in some of its regions. On the other hand, it is possible with the help of the usual method of kinetic equation to evaluate the number of collisions effective for the process of absorption of radio waves. Both the electrons' collisions with the molecules and their collisions with the ions can be thus calculated. The cross section for the latter process under conditions prevailing in the ionosphere is about a million times larger than for collisions with the molecules. In this connexion the concentration of ions and molecules in the ionosphere, as derived from radio measurements, is discussed."



PROCESSES AND PROPERTIES INDEX

Thermoelectric phenomena in superconductors. V. L. Ginzburg. *J. Phys.* (U. S. S. R.) **8**, 148-53(1944) (In English).—Theoretical. Superconductors with normal temp. gradients should show a normal current i^n. In isotropic conductors this is counteracted by a superconducting current i^s. In *superconducting crystals* the d. of the resulting current should be $i = i^n$ and i^n not equal to zero and the thermal current should be detectable by the magnetic field produced. Also in *Exptl. Theoret. Phys.* (U. S. S. R.) **14**, 177-83. P. H. Rathmann

2

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GINSBURG, V. L.

"Optical Method for the Investigation of Stresses," Zhur. Tekh. Fiz., 14, No.3, 1944

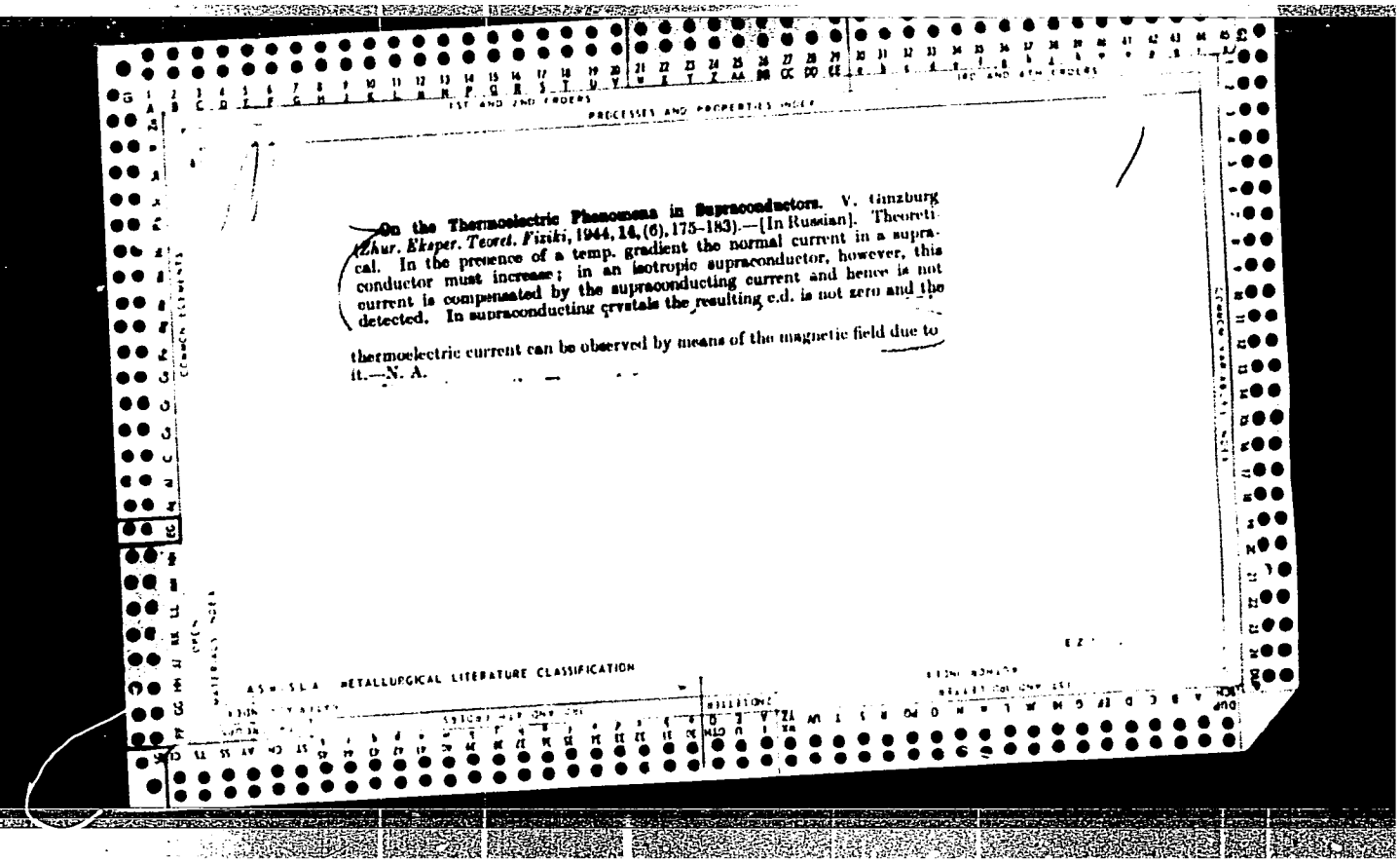
Physical Instl im. Lebedev, AS USSR

GINZBURG V.

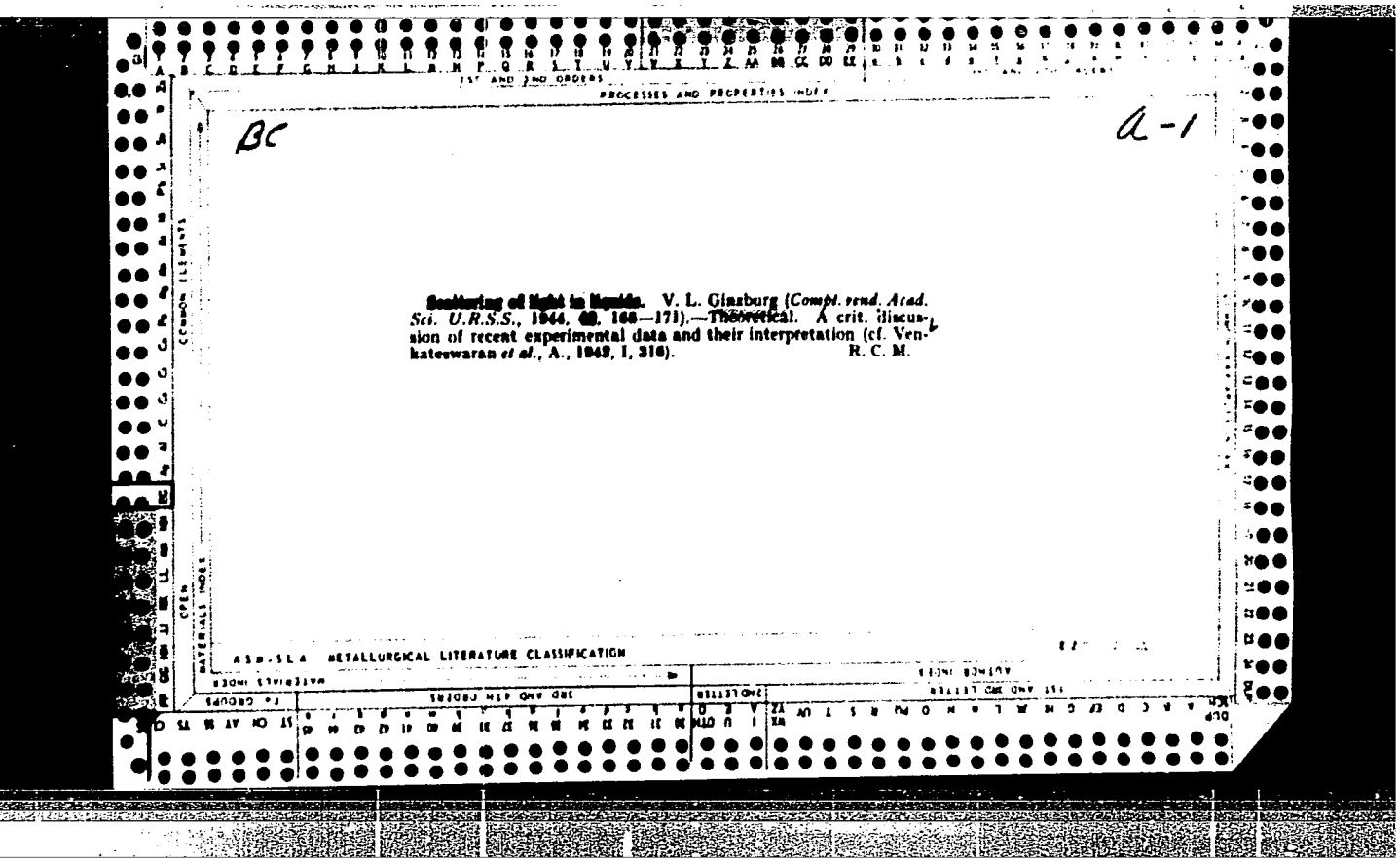
1/11

Observations on the Theory of Supraconductivity. V. Ginzburg. (*Zhur. Eksper. Teoret. Fiziki*, 1944, 14, (5), 134–161).—[In Russian]. The general state of the theory of supraconductivity and a number of questions relating to it are discussed in the light of the latest experimental and theoretical investigations.—N. A.

Physics Inst. im. Lebedev AS USSR



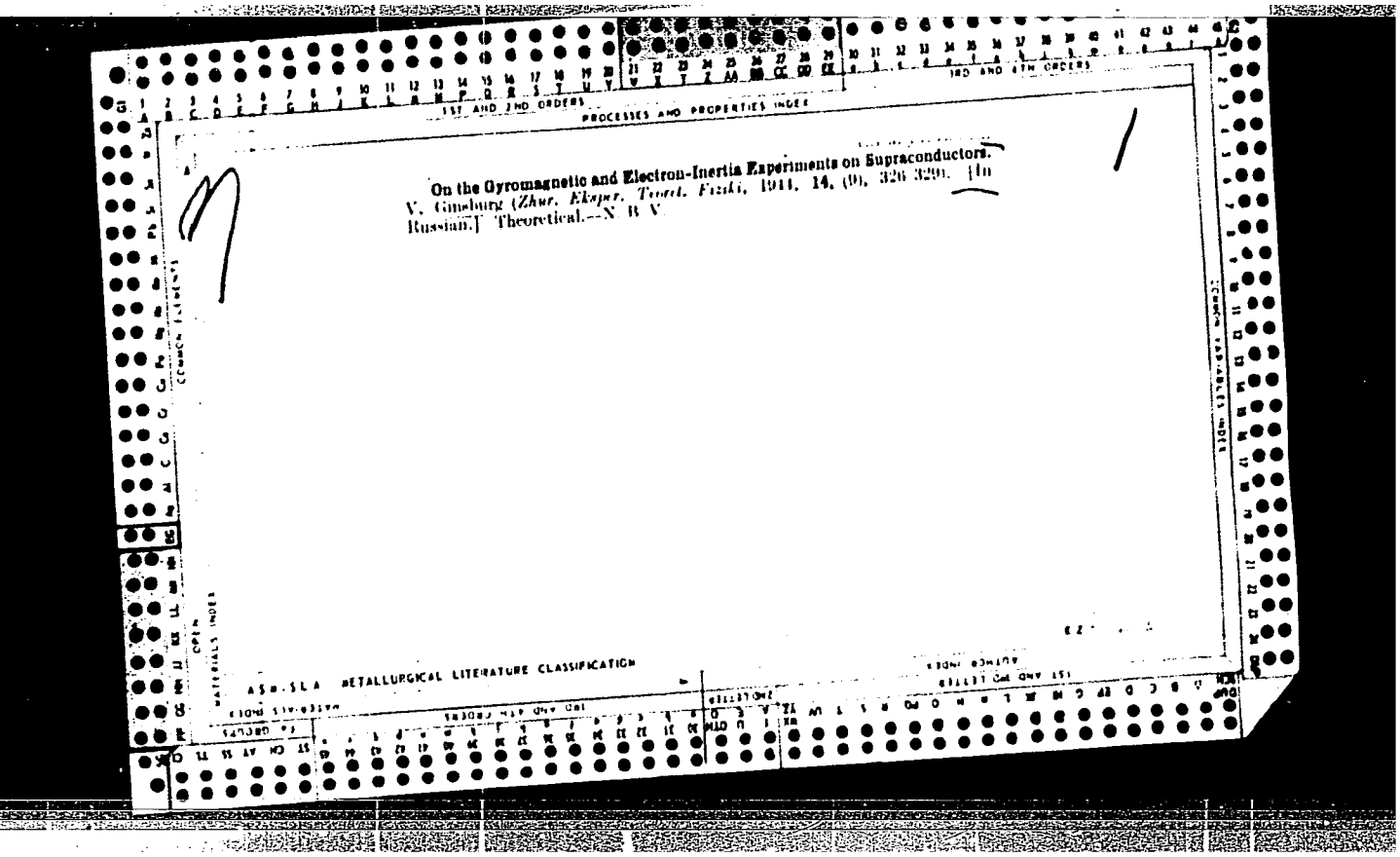
On the Thermoelectric Phenomena in Supraconductors. V. Ginzburg (*Zhur. Eksper. Teoret. Fiziki*, 1944, 14, (6), 175–183).—[In Russian]. Theoretical. In the presence of a temp. gradient the normal current in a supraconductor must increase; in an isotropic supraconductor, however, this current is compensated by the supraconducting current and hence is not detected. In supraconducting crystals the resulting e.d. is not zero and the thermoelectric current can be observed by means of the magnetic field due to it.—N. A.



BC

a-1

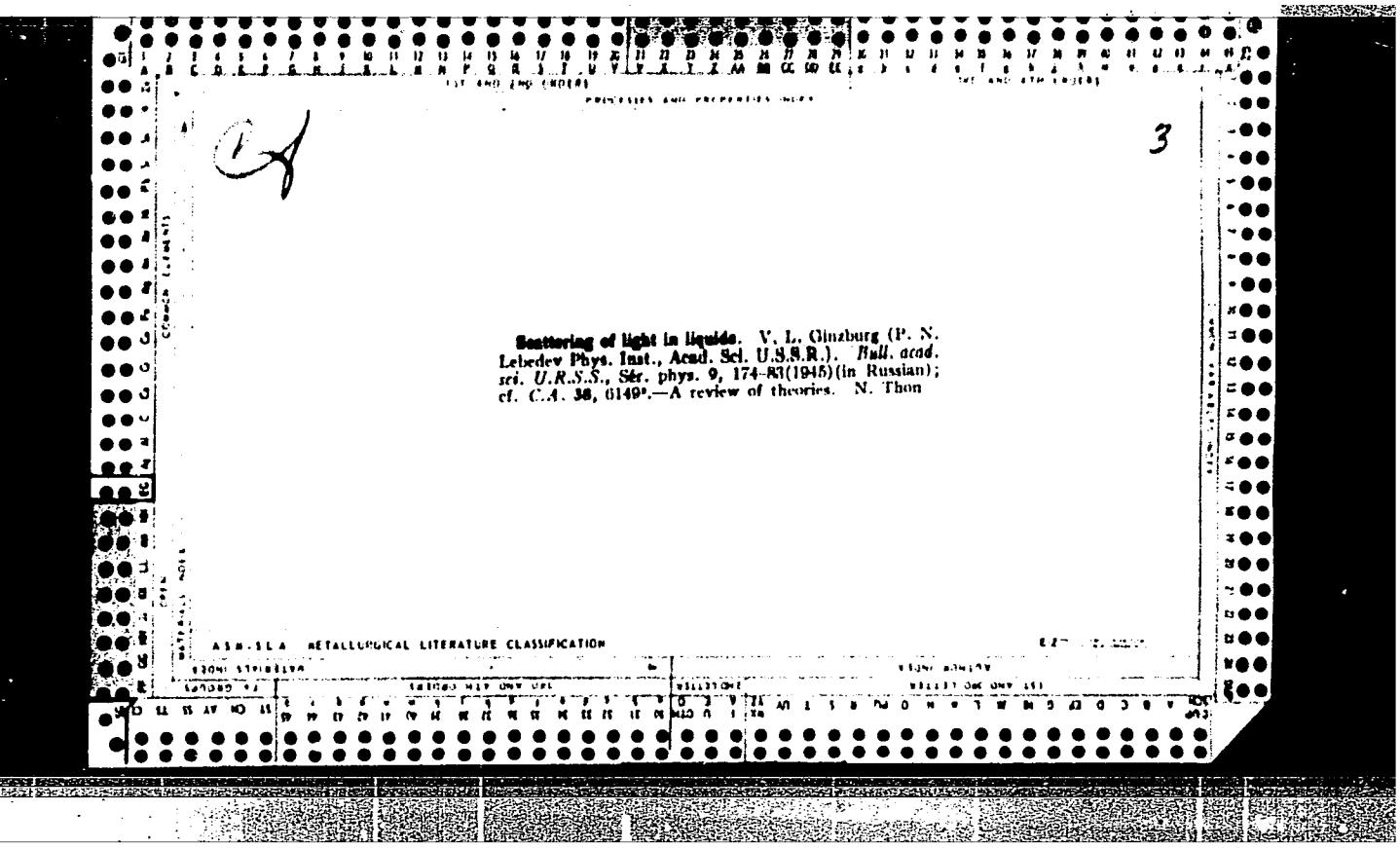
Scattering of Light in Liquids. V. L. Ginzburg (*Compt. rend. Acad. Sci. U.R.S.S.*, 1944, **42**, 165—171).—Theoretical. A crit. discussion of recent experimental data and their interpretation (cf. Venkateswaran *et al.*, A., 1943, I, 316). R. C. M.



On the Gyromagnetic and Electron-Inertia Experiments on Supraconductors.
V. Ginsburg (*Zhur. Eksper. Teoret. Fiziki*, 1944, 14, (9), 326-329. [In Russian.] Theoretical.—N. B. V.

PROCESSES AND PROPERTIES INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



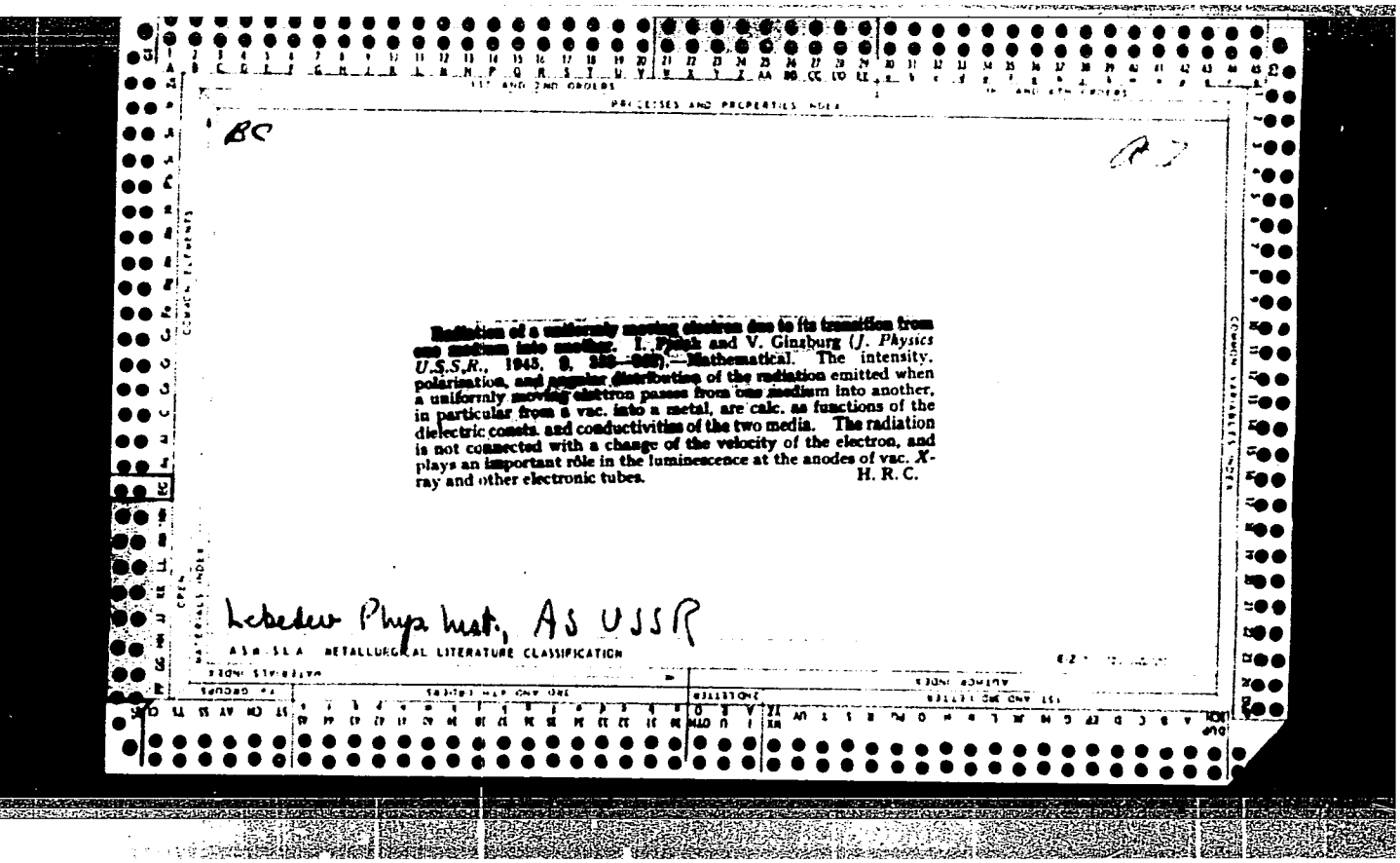
Scattering of light in liquids. V. L. Ginzburg (P. N. Lebedev Phys. Inst., Acad. Sci. U.S.S.R.). *Bull. acad. sci. U.R.S.S., Sér. phys.* 9, 174–83(1945)(in Russian); cf. *C.A.* 38, 6149⁹.—A review of theories. N. Thon

GINSBURG V.

ON THE SURFACE ENERGY AND THE BEHAVIOUR OF SUPRACONDUCTORS OF SMALL DIMENSIONS. V. GINSBURG (J. PHYSICS (U.S.S.R.), 1945, 9, (4), 305-311) (In English.) Theoretical. The depth of penetration of a magnetic field into a supraconductor is discussed, and the effect of the surface energy at the boundary between a supraconductor and a vacuum or a metal in the normal state is stressed. It is pointed out that bad agreement between the previous theories and the measured values of the critical fields for supraconduction films and massive specimens is due to neglect of the surface-energy factor. The relation between the critical field and the thickness of the film is developed taking this factor into account, and fair agreement with experiment is obtained. GVR.

SM.SLA METALLURGICAL LITERATURE CLASSIFICATION

COMMON VARIABLES INDEX



BC

Radiation of a uniformly moving electron due to its transition from one medium into another. I. Frank and V. Ginzburg (*J. Physics U.S.S.R.*, 1945, **9**, 353–362).—Mathematical. The intensity, polarisation, and angular distribution of the radiation emitted when a uniformly moving electron passes from one medium into another, in particular from a vac. into a metal, are calc. as functions of the dielectric consts. and conductivities of the two media. The radiation is not connected with a change of the velocity of the electron, and plays an important rôle in the luminescence at the anodes of vac. *X*-ray and other electronic tubes. H. R. C.

Lebedev Phys Inst., AS USSR

A1a-5 L A METALLURGICAL LITERATURE CLASSIFICATION

GINSBURG, V. L.

USSR/Chemistry - Barium Titanate 1945
Chemistry - Dielectric Constants

"The Dielectric Properties of Crystals of Seignetto-electric Substances and of Barium Titanate," V. Ginzburg, Institute of Physics imeni P. N. Lebedev, Academy of Sciences of the USSR, 10 pp

"Zhur Eksper i Teor Fiz" Vol XV, 739-49

Review of previous work on the behavior of the dielectric constant around the Curie point. Article is reprinted in the Journal of Physics of the USSR, Vol X, 107-15.

LC 31T3

Superconductivity
Moskva, Izd-vo Akademii nauk SSSR, 1946. 204 p.
(Akademiia nauk Soiuza SSR. Nauchno-populiarnaia seriia)
(49-58139)

QC611.G5

GINZBURG, V. L.

"Theory of the Propagation of Radiowaves in the Ionosphere". Uspekhi Fiz Nauk, No 2-3. 1946 (155-201).
(Meteorologiya i Gidrologiya, No 6 Nov/Dec 1947)

SO: U-3218, 3 Apr 1953

GINZBURG, V.L.

3
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1
Phil

1 The theory of excited spin states of elementary particles. V. L. Ginzburg. *Trudy Fiz. Inst., Akad. Nauk S.S.S.R.*, ~~Phys. Inst. Ac. P~~ *N. Lebedeva* 3, No. 2, 163–232(English summary, 232–3)(1946)(A dissertation).—The usual theory leads to an effective cross section for the scattering of mesons by heavy particles that increases with energy; this contradicts the exptl. findings. This is due to the fact that the reaction of the field of the magnetic or quasimagnetic moment of the scattering particle on the motion of this moment has been neglected. Accounting for the proper field in the quantum region leads to the necessity of assuming that the proton and the neutron possess an excited state with a spin of 3/2 or higher. In the case of the meson the assumption of the existence of states with a spin of 2, etc., arises. In this investigation the relativistic theory of the particle capable of being in a state with a spin of 1/2 and rest mass $m^{(1/2)}$ and in a state with spin 3/2 and rest mass $m^{(3/2)}$ is developed. It is shown that the cross section for the scattering of light (of mesons) on the magnetic (quasimagnetic) moment of such a particle at first increases with the energy as in the usual theory, but then for proton energies $h\nu \gg (m^{(3/2)} - m^{(1/2)})c^2$ it becomes const. (the recoil of the heavy particle being neglected). Thus, the introduction of higher spin states, which is adequate to account for the proper field of the particle moment, leads to the cutting off of the cross section for scattering and to the possibility of the interaction of the heavy particle's moment with the radiation and meson field. The relativistic theory of a particle having, in one state, a spin of unity and mass m_1 and in another state a spin of 2 and mass m_2 has also been developed. The scattering of light by this model of a meson has not yet been calcd. [illegible] Leach

U. S. S. R.

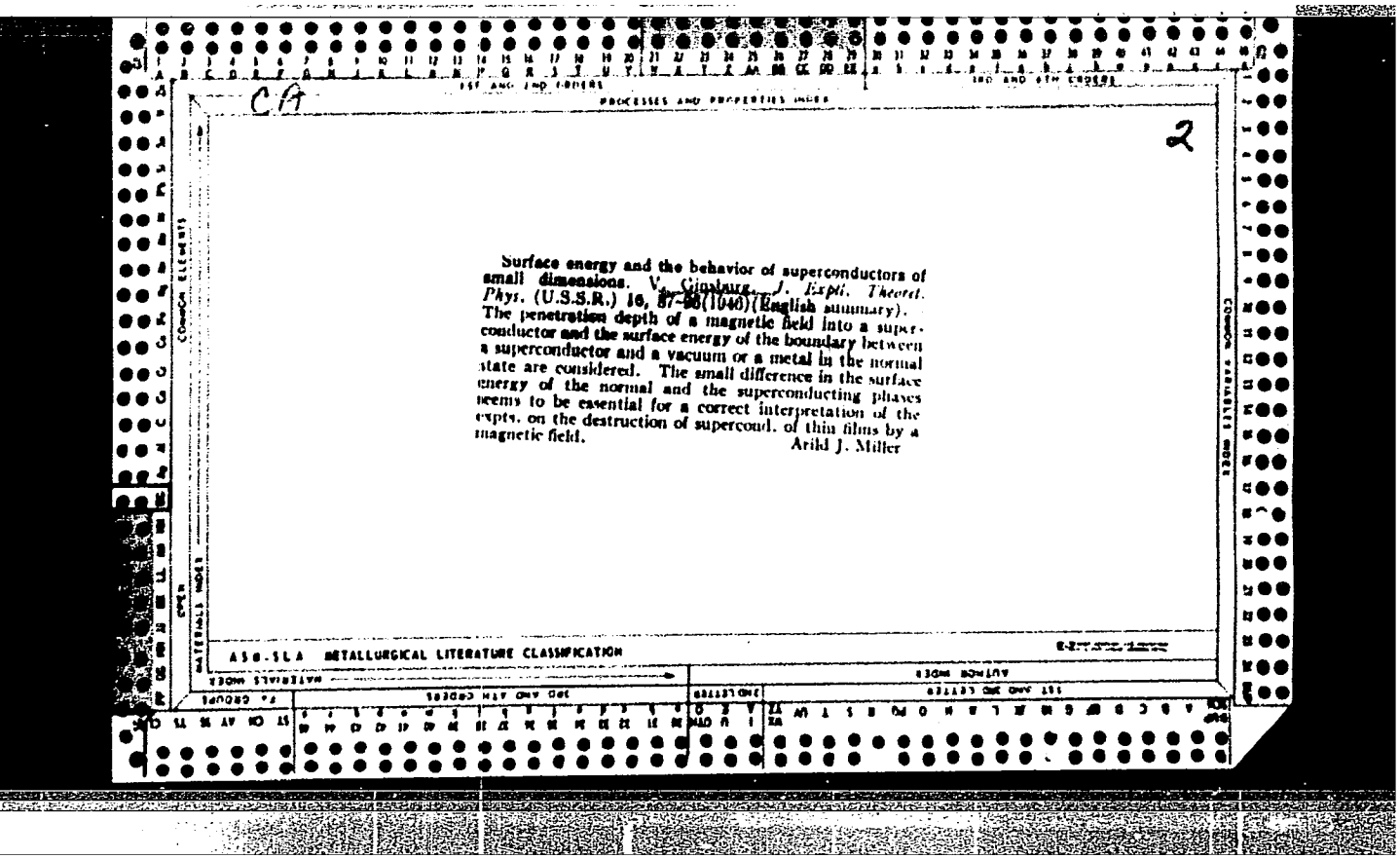
Phys.

818. ON THE DIELECTRIC PROPERTIES OF FERROELECTRIC CRYSTALS AND BARIUM TITANATE.—V. Ginsburg (*J. Physics, U.S.S.R.*, **10**, No. 2, 107, 1946). The properties of ferroelectric crystals and of barium titanate are discussed in connection with the thermodynamical consideration of a phase transition from a non-pyroelectrical into a pyroelectrical crystal. Experimental data show that transition in ferroelectric crystals is really of the continuous type, the value of ϵ tending to infinity by approaching the Curie point from either side of this point. Below the transition point (where $T<\theta$) the behaviour of ferroelectric crystals is complicated, as they split into domains the dimensions of which are determined by the condition of the minimum free energy. It is a physical peculiarity of these substances that reversal of the direction of polarisation may be attained in comparatively weak fields which do not exceed a few thousand volt./cm. The characteristic splitting into domains at a given temperature and the physical properties of ferroelectric crystals are determined by the shape of the specimen and the conditions on its boundaries. The problem of saturation, however, remains ambiguous. The large value for ϵ for lattices of the perovskite type accounts for the presence of a small value of Born's frequency, *i.e.* a certain " looseness " of the lattice, which increases with increasing weight of the metal producing the titanate, and is especially great in the case of Ba, thus contributing to the appearance of pyro-modification. The properties of symmetry of this lattice exclude the possibility of pyro- and piezo-electric phenomena. In $BaTiO_3$, the Curie point is simultaneously the transition point of a non-piezoelectric into a piezoelectric state. With such transition there should also occur orientational twinning rendering the whole crystal non-piezoelectric. This is known to happen at 573°C. when the transition to β-quartz takes place, its modulus being zero, but unfortunately the phase transition in quartz is of the first type in which ϵ changes by jump but does not possess a sharp temperature dependence. Cooling barium titanate in the absence of an electric field and external stress should lead to a non-piezoelectric state, because of the occurrence of orientational twinning.

GINSBURG, V.L.

"On Nuclear Scattering of Mesotrons," Zhur. Fiz., 10, No.3, 1946

Lebedev Phys. Inst., AS USSR



CA

2

Surface energy and the behavior of superconductors of small dimensions. V. Ginzburg. *J. Expti. Theoret. Phys.* (U.S.S.R.) 16, 87-96(1946)(English summary). The penetration depth of a magnetic field into a superconductor and the surface energy of the boundary between a superconductor and a vacuum or a metal in the normal state are considered. The small difference in the surface energy of the normal and the superconducting phases seems to be essential for a correct interpretation of the expts. on the destruction of supercond. of thin films by a magnetic field.

Arild J. Miller

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Ginsburg, V.L.

Ginsburg, V., Landau, L., Leontovitsh, M., and Fock, V.
On the failure of A. A. Vlasov's papers on generalized theory of plasma and theory of solid state. [Russian] Zhurnal Eksper. Teoret. Fiz. 16, 241–[illegible]. [Russian. English summary]

The authors criticize Vlasov's papers in Bull. Acad. Sci. URSS. Sér. Phys. [Izvestia Akad. Nauk SSSR] 8, 248–266 (1944); Acad. Sci. URSS. J. Phys. 9, 25–40, 130–138 (1945); Uchenye Zapiski Moskov. Gos. Univ. Fizika 77, 3–29, 30–42 (1945); these Rev. 6, 222; 7, 104, 183.

Source: Mathematical Reviews, Vol 8 No. 9

GINSBURG V. L.

523.72 : 523.755 502

On solar radiation in the radio-spectrum. GINSBURG, V. L. *C.R. Acad. Sci. URSS*, 52 (*No.* 6) 487–90 (1946).—The propagation of radio-waves in the sun's corona is examined, and it is shown that the study of solar radiation in the radio-spectrum gives a means for ascertaining the temperature of the corona. Recent experimental results and deductions from these [Abstr. 2112, 2861 (1945), 2450 (1946)] are criticized. L. S. G.

P.N. Lebedev Phys. Inst., AS USSR
Gor'kiy State U.

USSR/Electronics Jan 1947
Superconductivity
Electromagnetism

"On the Nonlinearity of Electromagnetic Processes in Superconductors," V. Ginsburg, Institute of Physics imeni P. N. Lebedev, Academy of Sciences of the USSR, 1 p

"Journal of Physics" Vol XI, No 1

A general discussion is given of the relationship between the number of electrons n and velocity v in a superconductor and of the equation for the penetration depth d in terms of n,v,c,e, and m.
BS 26T11

GINSBURG, V. L.

PA 8T114

USSR/Radio Waves - Absorption Feb 1947
Radio waves - Propagation SHF

"On the Emission of Microradio Waves and Their Absorption in the Air," V. L. Ginsburg, 18 pp

"Izv Ak Nauk Fiz" Vol XI, No 2

Analysis of new methods for generating microradio waves of less than 1-cm wave-length, and discussion of the absorption of microradio waves in air.

8T114

Physics E&M t

Behavior of ferromagnetic substances in the vicinity of the Curie point. V. L. Ginzburg (Acad. Sci. U.S.S.R., Moscow). *Zhur. Eksptl. Teoret. Fiz.* 17, 833-6(1947).—Since the ferromagnetic transition near the Curie point θ is a phase transition of the 2nd kind (i.e. without latent heat and with a discontinuous change of the heat capacity), it can be treated in analogy to the previous treatment of the seignetto-elec. transition (cf. *C.A.* 40, 5968[9]). This treatment is free from the arbitrary assumptions underlying the theory of Weiss. From the condition of min. of the thermodynamic potential, the spontaneous magnetization M_s at $T \leq \theta$ is $M_s^2 = -\alpha/\beta = -\alpha'_\theta (T - \theta)/\beta_\theta$, where α and β are functions of the pressure p and of T; $\alpha'_\theta = (\partial\alpha/\partial T)_{T=\theta}$; $\beta_\theta = \beta(p, \theta)$; and $dM_s^2/dT = \alpha'_\theta/\beta_\theta$. In the presence of a field $H = 2\alpha M + 2\beta M^3$, $(\partial M/\partial H)_T = 1/(2\alpha + 6\beta M^2)$, and the initial susceptibility χ, near the Curie point $\chi = 1/2\alpha'_\theta (T - \theta)$ or $\chi = 1/4\alpha'_\theta(\theta - T)$, at $T > \theta$ or $T < \theta$, resp., i.e. at the same $|T - \theta|$, the susceptibility in the ferromagnetic range is half that in the paramagnetic range. For the heat capacity C_M (at const. M) at $T > \theta$, $C_M dT = T\alpha' d(M^2) = (T/2)[d(1/\chi)/dT]d(M^2)$, and, in the vicinity of the Curie point in a weak field (both at $T > \theta$ and $T < \theta$) $C_0 dT = T\alpha'_\theta d(M^2)$. Contrary to the Weiss theory, this formula is valid only in the vicinity of θ; farther from θ, the magnitude α'_θ depends on T. Consequently, α'_θ can be detd. only from the slope of $1/\chi$ in close vicinity θ.

N. Thon

Physics Inst. im. P.N. Lebedev, AN SSSR.

GINSBURG, V.L.

Ginsburg, V. L., and Tamm, I. E. On the theory of spin. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 17, 227–237 (1947). (Russian)

In a relativistic theory, the state of a particle of spin s is ordinarily given by $2(2s+1)$ wave functions, and the particle, therefore, may be said to possess "internal" degrees of freedom which are characterized by discrete variables. The authors investigate theories in which the internal degrees of freedom are described by continuous variables.

(I) As a first example, they treat the case where these variables are the components u_i of a space-like four-vector of constant length r. Let x_i $(1 \leq i \leq 4)$ denote the space-time variables $(x_4 = ict)$, set $\partial_i = \partial/\partial x_i$, $M_{ik} = u_k\partial/\partial u_i - u_i\partial/\partial u_k$, and $L_1 = \frac{1}{2}M_{ik}M_{ik}$. The following equation is suggested:

$$(1) \qquad (\Box - \kappa^2 + \beta L_1)\psi(x_i, u_i) = 0,$$

where $\Box = \sum_i \partial_i^2$, β and κ are numerical constants and ψ is assumed to be a scalar function. Product solutions of the form $\psi(x_i, u_i) = \psi(x_i)\varphi(u_i)$ lead to the equations

$$(2) \qquad (\Box - \kappa^2 + \lambda\beta)\psi(x_i) = 0, \quad L_1\varphi = \lambda\varphi.$$

The parameter λ determines the rest mass of the particle, since $m_0^2c^2 = \hbar^2\kappa^2 - \lambda\beta$. On the hyperboloid $\sum_i u_i^2 = r^2$, polar coordinates χ, θ, ϕ $(-\infty < \chi < \infty,\ 0 \leq \theta \leq \pi,\ 0 \leq \phi \leq 2\pi)$ are introduced: $u_1 = r\cosh\chi\sin\theta\cos\phi$, $u_2 = r\cosh\chi\sin\theta\sin\phi$, $u_3 = r\cosh\chi\cos\theta$, $u_4 = ir\sinh\chi$. Then

$$dS = \cosh^2\chi\sin\theta\, d\chi\, d\theta\, d\phi$$

is a Lorentz invariant volume element. To study the second equation (2) the authors determine the square integrable solutions (with respect to dS) of the form $\varphi(\chi, \theta, \phi) = R(\chi)\ Y_{lm}(\theta, \phi)$ (where Y_{lm} is a spherical harmonic). For each $l \geq 1$, a sequence of functions R_{jl} is obtained such that (3a) $\lambda = 1 - j^2$, $j = 1, 2, \cdots$; (3b) $l = j, j+1, \cdots$, and the functions $R_{jl}Y_{lm}$ are orthogonal and normalized. If a square integrable function $\psi(\theta, \phi, \chi)$ may be expanded in a series (4) $\psi = \sum_{lmj} a_{lmj} Y_{lm}R_{jl}$, then $\int|\psi|^2 dS = \sum_{lmj}|a_{lmj}|^2$. The Lorentz transformed function is then of the same form, and its square integral remains invariant, i.e., these functions transform according to a unitary infinite dimensional

Source: Mathematical Reviews, 1/3 1/5, Vol 9 No. 9

VLG, IET

representation of the Lorentz group. [Reviewer's note. The authors neglect the positive continuous spectrum of the operator L_1 and make the erroneous assertion that every square integrable function orthogonal to Y_{l}'s of the form (4). This oversight, however, hardly affects the main arguments of the discussion.] Since the equation (1) admits infinitely many values of the spin the authors postulate the additional equation (5) $(M_{il}M_{ik}\partial_l\partial_k-(j_0+1)\square)\psi=0$, j_0 being a constant. In the particle's rest system the equation (6) $l^2+l-j^2-j_0=0$ is shown to hold for a fixed value of the angular momentum. The possible spin values are those integers l which satisfy (6) and the condition $l\geq j$ [cf. (3)]. Consequently, j_0 must be an integer. For a given j_0, the solution $l=j=j_0$ always exists. If $j_0\geq 5$, a finite number of additional solutions may be found.

(II) The foregoing discussion may be considerably generalized by using the results of I. M. Gelfand and M. A. Neumark on the unitary (infinite dimensional) representations of the Lorentz group. [These results have meanwhile been published [Acad. Sci. USSR. J. Phys. 10, 93–94 (1946); Izvestiya Akad. Nauk SSSR. Ser. Mat. 11, 411–504 (1947); these Rev. 8, 132; 9, 495]. Cf. also Harish-Chandra, Proc. Roy. Soc. London. Ser. A. 189, 372–401 (1947); V. Bargmann, Ann. of Math. (2) 48, 568–640 (1947); these Rev. 9, 132, 133.] The irreducible unitary representations are characterized by the equations

$$(7)\quad \begin{cases} L_1\varphi=\tfrac{1}{2}M_{ik}M_{ik}\varphi=\lambda_1\varphi, \\ L_2\varphi=-i(M_{23}M_{14}+M_{31}M_{24}+M_{12}M_{34})\varphi=\lambda_2\varphi \end{cases}$$

$$(7a)\quad \lambda_1=1-j^2+\alpha^2,\quad \lambda_2=-\alpha j,$$

which hold for every vector φ in the representation space. The operators M_{ik} are the corresponding infinitesimal gen-

Source: Mathematical Reviews, VLG; IET 4/3 Vol 9 No. 9

CA

3A

Creation of mesotrons and "stars" in cosmic rays. V. L. Ginsburg. *Zhur. Eksptl. Teoret. Fiz.* 17, 943-4(1947); cf. Alikhanyan, *et al.*, *C.A.* 41, 0855i.—A comparison of the production of mesotrons and "stars" indicates that they are generated by the same neutral components of cosmic rays. The no. of "stars" is also nearly the no. of acts of creation of mesotrons per unit time. F. H. Murray

Physics Inst. im. P.N. Lebedev, AN SSSR.

erators of the Lorentz group; their precise form depends on the particular realization which has been chosen, e.g., in terms of vector or spinor quantities. In (7a), α may be any real number, j is integral or half integral (including $j=0$). The equation (3b) remains valid; l characterizes the irreducible representations of the rotation group which occur. Two different sets of j, α lead to inequivalent representations. For the case discussed above, $\alpha=0$. [Reviewer's note. There exist also representations for $\lambda_2=0$, $0<\lambda_1<1$, which cannot be expressed in the form (7a).] If the equations (1) and (5) are retained, one obtains in the rest system $l^2+l-j^2-\delta=0$, [illegible] α^2. Here δ is positive and integral or half integral [illegible] as l (or j) is integral or half integral. Hence [illegible] a finite number of α- and j-values, and consequently only a finite number of spin values appear.

After briefly discussing possible variants of the equations (1) and (5) the authors mention a serious difficulty of the theory proposed. As shown by Fierz and Pauli [Proc. Roy. Soc. London. Ser. A. 173, 211–232 (1939); these Rev. 1, 190] the interaction with the electromagnetic field cannot be described by simply replacing $\partial/\partial x_k$ by the operator $\Pi_k=\partial/\partial x_k-(ie/\hbar c)A_k$ (A_k the components of the four-vector potential) if the spin of the particle is greater than one. Additional wave functions must be introduced, which vanish in the absence of the electromagnetic field. A similar difficulty arises here, and the authors have not yet succeeded in treating the interaction with the electromagnetic field in a satisfactory way. *V. Bargmann* (Princeton, N. J.).

Source: Mathematical Reviews, Vol 9 No. 7

1307. Theory of Mesotrons and Nuclear Force, by V. L. Ginsburg, *Uspekhi Fizicheskikh Nauk* 31, No. 2, April 1947. 36 p. (In Russian)

This article is divided into four main sections: Introduction, the wave equations for mesotrons, nuclear force, and difficulties which arise from the present theories. Under the section on wave equations for mesotrons, the author discusses the relation of mesotrons to electromagnetic poles.

GINSBURG, V. L.

"Solar and Galactic Radium Radiation," Usp. Fiz. Nauk, 32, No.1, 1947

GINZBURG, V. L. PA 34T88

USSR/Physics Apr 1947
Electrons
Dielectrics

"The Radiation of an Electron Moving near a Dielectric," V. L. Ginzburg, 4 pp

"Doklady Akademii Nauk SSSR" Vol LVI, No 2

The author shows the possibility of obtaining the same radiation effect from nonrelativistic waves as from relativistic waves moving in the field of a dielectric.

ID 34T88

621.396.11 1132

On the Use of Cherenkov's Effect for the Propagation of Radio Waves.—V. L. Ginzburg. (*C. R. Acad. Sci. U.R.S.S.*, 21st April 1947, Vol. 56, No. 3, pp. 253–254. In Russian.)