A 1.20-Meter Cyclotron With a Magnetic Pole Diameter   _ SQV/89-7-2-8/24

Basargin. The magnetic quadrupole lenses of N. A. Ostrovskiy and N. I. Konovalova were used in this system. The cyclotron produces 13.7 mev of deuterons while the extreme route of the particle flux can be up to 1 ma. There is a guided beam of 100-200 μa at disposal for normal work and the beam is focussed to a plane of 15.20 mm^2. The control desk, signal equipment and the special electrical installations were designed by V. S. Lyublin, N. B. Nevrov, P. S. Gornikel' working under the guidance of G. S. Gordeychik. Similar cyclotrons, constructed in the USSR, are in operation in Romania, China, Poland and GDR. In the near future a cyclotron of a similar type will be completed in the CSR. The first cyclotron of this type was tested in 1956 by L. N. Baulin, R. N. Letunovskiy, Yu. G. Basargin, A. V. Stepanov, G. A. Nalivayko, M. D. Veselov, V. A. Suslov and A. I. Antonov from the Scientific Research Institute for Electrophysical Apparatus and I. I. Afanas'yev, A. A. Arzumanov and R. A. Meshcherov from the Institute for Atomic Energy of the AS USSR. The magnetic quadrupole lenses were tested at the cyclotron of the AN USSR (AS UkrSSR) with the participation of V. A. Kovtun. The fabrication of the cyclotron was supervised by A. V. Kozalevskiy,

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A 1.20-Meter Cyclotron With a Magnetic Pole Diameter   SOV/89-7-2-8/24

L. N. Fedulov, V. V. Romanov and K. A. Asriyev . Ye. G. Komar gave valuable advice. F. K. Arkhangel'skiy aided the testing of the first cyclotron. Problems concerning the planning of the cyclotron were discussed with D. G. Alkhazov. There are 10 figures and 5 Soviet references.

SUBMITTED: March 12, 1959

Card 4/4

AUTHORS: Bagdyk'yants, G. O., Alekseyev, A. G.   SOV/48-23-6-26/28

TITLE: The Measurement of the Intensity and the Elimination of the
            Background of Dispersed Electrons in Electronographical
            Investigations (Izmereniye intensivnosti i ustraneniye fona
            rasseyannykh elektronov pri elektronograficheskikh
            issledovaniyakh)

ABSTRACT: The quality of the electronic image depends on the electron-
              optical properties of the imaging system and on electron dispersion.
              The latter influences the resolving power. In the introduction
              measurement of the distribution of dispersed electrons and
              their energy after interaction with the electrostatic potential
              of the particles is dealt with and it is shown that recording
              by means of a photographic emulsion cannot be carried out in
              practice. Other investigations, in which measurements were
              carried out by means of Geiger-Müller counters and
              semiconductors, are mentioned (Refs 1, 2, 3). The method of
              direct measurement by means of a secondary electron

Card 1/2   amplifier worked out by the authors, the amplification

The Measurement of the Intensity and the Elimination   SOV/48-23-6-26/28
of the Background of Dispersed Electrons in Electronographical Investigations

coefficient of which is about 10^9, is then discussed and
supplemented by two drawings (Fig 1). Figure 2 shows under a) the
electron dispersion intensity of a polycrystalline sample
(NaCl) recorded by means of this device, and under b) the
same curve after filtration of the non-coherent dispersed
electrons. In conclusion, the fluctuation of the curve,
caused by unstable emission- and ionic current and by an
insufficiently high vacuum is investigated, and in a diagram
intensity fluctuation with and without stabilization of the
electronograph is shown. The authors thank A. A. Lebedev for
his interest and discussions. There are 3 figures and
6 references, 2 of which are Soviet.

Card 2/2

S/120/62/000/004/032/047
E140/E420

AUTHORS: Alekseyev, A.G., Veselov, M.D., Mozalevskiy, I.A.,
Rozhdestvenskiy, B.V., Trokhachev, G.V.

TITLE: Magnetic measurements at the factory on the
electromagnet blocks of the proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 172-178

TEXT: To obtain more precise experimental data than were
available from models and to check the production, factory
measurements were carried out on the electromagnet blocks in
groups of three in conditions approximating to the working cycle.
Reproducibility of the wavefront and maximum current in the test
set-up was about 2%.   In the first measurements, two C-blocks
(focusing and defocusing) and one X-block were studied for the
basic characteristics of the magnetic field — the distribution of
induction and gradient in azimuth, nonlinearity, decay index as
a function of induction, etc.   The remaining blocks were only
subjected to calibration tests, which permitted the scatter in
mean magnetic field characteristics to be determined and
defective blocks to be rejected.   The article describes the
Card 1/2.

Magnetic measurements ...   S/120/62/000/004/032/047
                                          E140/E420

equipment and gives typical results on precision of measurement and scatter of characteristics measured: e.g. the mean square deviation of the dynamic component of the field at 55 gauss was 0.26%, at 2500 gauss 0.1% and at 8550 gauss 0.24%.   Control measurements on the assembled electromagnet showed that the effect of adjacent blocks (excluding X-blocks) did not produce a. significant change in the factory measurements.   There are 16 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut elektrofizicheskoy
             apparatury GKAE (Scientific Research Institute for
             Electrophysical Apparatus GKAE)

SUBMITTED: April 10, 1962

Card 2/2

$\langle$ — $\rangle$

24,6800,

40756
S/120/62/000/004/033/047
E192/E382

AUTHORS: Alekseyev, A.G., Gorelkin, A.S., Mozalevskiy, I.A., Mozin, I.V., Tarasov, B.I. and Trokhachev, G.V.

TITLE: The use of permalloy pick-ups for mass magnetic measurements on the proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no. 4, 1962, 179 - 184

TEXT: Measurement of the relative magnetic fields at injection fields of H = 90 Oe is effected by means of permalloy pick-ups with magnetizing coils (Giordano, S., Green, G.K. and Rogers, E.J. Rev. Scient. Instrum., 1953, 24, 848). The magnetizing coil is supplied with DC and is connected in such a way that the direction of the magnetic field H_K of the coil and that of the measured field are in opposition. When the magnetic field reaches the value H_K, a signal coil of the pick-up produces a voltage pulse. The field H_i at the point where the pick-up is situated is evaluated from the formula:

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The use of permalloy pick-ups...

S/120/62/000/004/033/047
E192/E382

$$H_t = H_{i0} + \dot{H}_{it} \cdot \Delta T_i ,$$

where H_{i0} is the field due to the magnetizing coil,

H_{it} is the rate of rise of the field at the point i, and

ΔT_i is the time interval between the pulses obtained from the reference and the measuring pick-ups.

The quantity H_i can also be expressed as

$$H_i = k_i \left[I_i + (\Delta I/\Delta t)_i \Delta T_i \right] ,$$ where k is a constant which is determined from $H = kI$ and I is the current. The equipment for the measurement of the field in a block (unit) consists of 19 pick-ups which were situated along the arc of an equilibrium orbit at distances of 100 mm from each other. A pick-up has the form shown in Fig. 2 and consists of a permalloy strip 5 having transverse dimensions of 10×100 mm^2 and correcting rods 2 made of the same material; the pick-up also contains a magnetizing coil 3 and an induction winding 5. For measuring the rate of rise of the magnetic field the magnetizing current of the
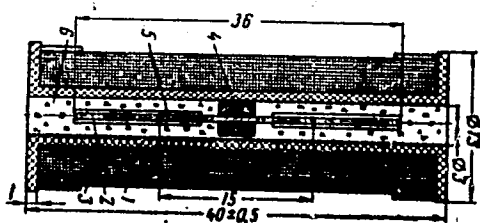
Card 2/4

The use of permalloy pick-ups ...   S/120/62/000/004/033/047
E192/E382

ASSOCIATION: Nauchno-issledovatel'skiy institut elektro-
fizicheskiy apparatury GKAE (Scientific
Research Institute of Electrophysical
Equipment, GKAE)

SUBMITTED: April 10, 1962

Fig. 2:

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40763
S/120/62/000/004/044/047
E192/E382

AUTHORS: Alekseyev, A.G., Vasil'yev, M.P. and Mozin, I.V.

TITLE: An instrument for measuring the rate of change of the magnetic field of the proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no. 4, 1962, 236 - 239

TEXT: The instrument was designed for the 7 GeV proton synchrotron and it permits measurement of the reproducibility of the field-change rate and its absolute magnitude with an accuracy of 0.1%. The device is based on the potentiometric measurement of the e.m.f:

$$E = - kdB/dt$$

induced in the measuring coil. The measuring coils consists of a number of series-connected turns situated in the yokes of the electromagnets. The voltage U_K from the coil is applied to the input device 1 (see Fig. 1, which shows a block diagram of the instrument), where the signal is compared with the voltage of a reference element 2 . The comparison is performed

Card 1/3

An instrument for ....

S/120/62/000/004/044/047
E192/E382

during the whole time interval occupied by the induced pulse, the duration of the pulse being proportional to the rate of rise of the magnetic field. The switching device 4 selects the duration and instant of the measurement and transmits the difference signal through the amplifier 3 to the recorder 5 . The switching device is actuated by the cycle initiation pulse U_u .

The input circuit of the system consists of a filter, a reference-voltage source and a voltage divider. The switching device 4 receives the initiation pulse from a permalloy pick-up situated in the electromagnet. The pulse is amplified, then applied to a phantastron delay circuit. The trailing edge of the phantastron pulse determines the instant of commencing the measurement. The delay can be varied from 10 μs to 1.5 sec. The indicating device of the instrument is in the form of a simple vacuum-tube voltmeter. There are 4 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury GKAE   (Scientific Research Institute of Electrophysical Equipment GKAE)

SUBMITTED: April 10, 1962
Card 2/3

L 20552-65   EPA(w -2 EWT(m)/EWA(m) - Pt-10 Pab-10

ACCESSION NR:

AUTHORS: Alekseyev, A. G.; Mozin, I. V.; Smirnov, V. P.

TITLE: Method and apparatus for magnetic measurements in an electron

Oersted

SOURCE: Moscow. Nauchno-issledovatel'skiy institut elektrofiziches-

no. 2, 1964, 90-103

TOPIC TAGS: electron synchrotron, hard focusing, magnetic field, magnetic measurement

ABSTRACT: In view of the close tolerances that the magnetic field of a 6-BeV synchrotron with hard focusing must satisfy, apparatus and a test measurement procedure were developed to measure the magnetic field with the required accuracy. The measurements consist

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L 26662-65
ACCESSION NR: AT5002708

of determining the distortion in the distribution of the field and
the gradient along the equilibrium orbit, measurement of the distor-
tion and distribution of the gradient along the radius of the magnet,
measurement of the relative gradient on the equilibrium orbit in the
...... of the electromagnet. The pr.. ....
consists of integrating the voltage from coils placed in the time-
varying magnetic field. The theoretical premises underlying the
different measurements are developed, after which the design of the
measuring coils is described and the circuitry of the electronic in-
tegrator is described. A circuit for selecting the level of the
measured field is described and the measurement accuracy discussed.
Orig. art. has: 5 figures and 31 formulas.

ASSOCIATION: None

SUBMITTED: 00   ENCL: 00   SUB CODE: NP, EM

NR REF SOV: 000   OTHER: 003

Card   2/2

L 2273-66   EWT(m)/EPA(w)-2/EWA(m)-2   IJP(c)   GS
ACCESSION NR: AT5007942   UR /0000/64/000/000/0600/0603

AUTHOR: Alekseyev, A. G.; Basargin, Yu. G.; Zhukov, I. F.; Lavrent'yev, Yu. K.;
Litunovskiy, R. N.; Malyshev, I. F.; Nevrov, N. P.; Stepanov, A. V.; Tuzov, I. V.

TITLE: Basic characteristics of the isochronous cyclotron with variable particle
energy

SOURCE: International Conference on High Energy Accelerators, Dubna, 1963.
Trudy. Moscow, Atomizdat, 1964, 600-603

TOPIC TAGS: high energy accelerator, ion beam, cyclotron

ABSTRACT: At the Scientific Research Institute of Electrophysical Equipment im.
D. V. Yefremov, a 2.4-meter cyclotron is being developed with a magnetic field hav-
ing 3-dimensional variation. This cyclotron is intended to accelerate particles
with Z/A equal to 0.125-1 in a wide range of energies. The limits of energy varia-
tion, in Mev, are: 7.5-100 (protons); 5-60 (deuterons), 10-120 (alpha-particles),
and 10-145 (nitrogen ions). The device is designed to obtain relatively large ion
currents, which will make it possible to realize experiments with beams against in-
ternal and remote targets. The principal parameters of the cyclotron include:
pole diameter, 2400 mm; magnetic structure, tri-sector and weakly spiral; gaps,
230 mm (hill) and 960 mm (valley); magnetic field in center, 4000-17,000 oersteds;

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L 2273-66

ACCESSION NR: AT5007942

total electromagnetic power, 2800 kilowatts; electromagnet's weight, 720 tons; frequencies of resonance system, 5-22 megahertz; accelerating voltage in Dee, 125 kilovolts; Dee gap, 50 mm; high-frequency load, 600 kilowatts; stability, 10^{-4} (winding currents), 10^{-5} (frequency of accelerating voltage), and 10^{-3} (its amplitude). After deflection the beam is directed into a commutating magnet by which the beam can be directed against targets set up in three experimental rooms: (I) high-intensity beams, (II) neutron time-of-flight experiments, and (III) nuclear precision spectroscopy with electromagnetic monochromator. Ion-optical channeling, focusing and commutating of the beam are done by six pairs of quadrupolar lenses, two identical rotary electromagnets, a monochromator electromagnet, and two small electromagnets for correction of the beam in the vertical direction. The resonance system is a quarter-wave coaxial line ending with the 180-degree Dee. The resonant frequency is reset by remote displacement of a plate without disrupting the vacuum. The frequency is established with an accuracy of 5-18 kc plus or minus. Smooth high-frequency regulation is provided by two trimmers, permitting regulation of frequency to 2-4%. The high-frequency oscillator has a capacitative connection with the resonance system. A connecting rod is used, without disruption of the vacuum, to shift the Dee in the vertical and horizontal planes, and also along its own axis. The accelerator chamber consists of two sections: a high-vacuum chamber able to exhaust, along with the resonant line, the magnetic gap; and a fore-vacuum section

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ACCESSION NR: AT5007942

installed in the electromagnet poles. Remotely controlled measuring probes and
targets for operating with the internal beam are installed in the chamber. Place-
ment of the ion source is also done remotely; moreover, it is possible, without
disruption of the vacuum, to shift the cathode and also the source as a whole.
The magnetic field was modelled with an electromagnet having a pole diameter of 342
mm, on which several alternative magnetic systems were investigated; and also with
an electromagnet having a pole diameter of 685 mm, which was used to investigate
in detail modifications in the weakly-spiral structure. On the basis of the elec-
tromagnet with poles 685 mm in diameter, a start has been made at the present time
on a cyclotron with three-dimensional variation of the magnetic field, with the
magnetic system of a type described in the present report. The current cyclotron
will accelerate protons up to 8 Mev and deuterons up to 4 Mev, which will permit
investigations into various alternative systems for yielding beams. Orig. art.
has: 6 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury
imeni D. V. Yefremova GKAE SSSR (Scientific Research Institute of Electrophysical
Equipment, GKAE SSSR)

SUBMITTED: 20May64   ENCL: 00   SUB CODE: EL, NP
NO REF SOV: 000   OTHER: 001

Card 3/3

Card

GIRSHOVICH, N.G., doktor tekhn.nauk; IOFFE, A.Ya., kand.tekhn.nauk; ALEKSEYEV, A.G., inzh.

Effect of shape on the shrinkage defects and the accuracy of iron castings. Lit. proizv. no.7:29-32 Jl '65.

(MIRA 18:8)

ALEKSEYEV, A.G.; SIMONENKOV, Ye.A.; CHICHERIN, Yu.G.

Knurling key gaps in toothed clutches. Mashinostroitel'
no.12:27-28 D '63.   (MIRA 17:1)

Hletheyev, A. G.

AUTHOR:

TITLE: 3rd All-Union Conference on the Vitreous State

PERIODICAL: Steklo i keramika, 1960, Nr 3, pp 43-46 (USSR)

ABSTRACT:

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PHASE I BOOK EXPLOITATION   SOV/5055

Vsesoyunoye soveshchaniye po stekloobraznomu sostoyaniyu. 3d, Leningrad, 1959.

Stekloobraznoye sostoyaniye; trudy Tret'yego vsesoyuznogo soveshchaniya Leningrad, 16-20 noyabrya 1959 (Vitreous State; Transactions of the Third All-Union Conference on the Vitreous State, Held in Leningrad on November 16-20, 1959) Moscow, Izd-vo AN SSSR, 1960. 534 p. Errata slip inserted. 3,200 copies printed.
(Series: Its: Trudy)

Sponsoring Agencies: Institut khimii silikatov Akademii nauk SSSR. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I. Mendeleyeva and Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova.

Editorial Board: A.I. Avgustinik, V.P. Barzakovskiy, N.A. Bezborodov, O.K. Botvinkin, V.V.Vargin, A.G. Vlasov, K.S. Yevstrop'yev, A.A. Lebedev, M.A. Matveyev, V.S. Molchanov, R.L. Myuller, Ye.A. Porey-Koshits, Chairman, N.A. Toropov, V.A. Florinskaya, A.K. Yakhkind; Ed. of Publishing House: I.V. Suvorov; Tech. Ed.: V.T. Bocharev.

PURPOSE: This book is intended for researchers in the science and technology of glasses.

COVERAGE: The book contains the reports and discussions of the Third All-Union Conference on the Vitreous State, held in Leningrad on November 16-19, 1959. They deal with the methods and results of studying the structure of glasses, the relation between the structure and properties of glasses, the nature of the chemical bond and glass structure, and the crystallochemistry of glass. Fused silica, mechanics of vitrification, optical properties and glass structure, and the electrical properties of glasses are also discussed. A number of the reports deal with the dependence of glass properties on composition, the tinting of glasses and radiation effects, and mechanical, technical, and chemical properties of glasses. Other papers treat glass semiconductors and soda borosilicate glasses. The Conference was attended by more than 300 delegates from Soviet and East German scientific organizations. Among the participants in the discussions were N.V. Solomin, Ye. V. Kuvshinskiy, Yu.A. Gaster, V.P. Pryanishnikov, Yu. Ya. Gotlib, O.P. Mchedlov-Petrosyan, G.P. Mikhaylov, B.M. Petrov, A.N. Lazarev, D.I. Levin, A.V. Shashlov, N.F. Ploshchinskiy, A.Ya. Kuznetsov, E.V. Dostyareva, G.V. Byurganovskaya, A.A. Faleev, N.M. Skornyakov, P.Ya. Bokin, E.K. Keller, Ya.A. Kunetsov, V.P. Pozdnev, R.S. Shevelevich, Z.G. Pinsker, and O.S. Molchanova. The final session of the Conference was addressed by Professor I.I. Kitaygorodskiy, Honored Scientist and Engineer, Doctor of Technical Sciences. The following institutes were cited for their contribution to the development of glass science and technology: Gosudarstvennyy opticheskiy institut (State Optical Institute), Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, AS USSR), Fizicheskiy institut AN SSSR (Physics Institute AS USSR), Fiziko-tekhnicheskiy institut AN SSSR (Physicotechnical Institute AS USSR), Institut fiziki AN BSSR, Minsk (Institute of Physics, Academy of Sciences, Belorusskaya SSR, Minsk), Laboratory of Physical Chemistry of Silicates of the Institut obshchey i neorgan-icheskoy khimii AN SSSR, Minsk (Institute of General and Inorganic Chemistry, Academy of Sciences, Belorusskaya SSR, Minsk), Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High Molecular Compounds, AS USSR), Gosudarstven-nyy institut stekla (State Institute for Glass), Gosudarstvennyy institut stek-lovolokna (State Institute for Glass Fibers), Gosudarstvennyy institut elektrotekh-nicheskogo stekla (State Institute for Electrical Glass), Sibirskiy fiziko-tekhnicheskiy institut, Tomsk (Siberian Physicotechnical Institute, Tomsk),Leningrad-skiy gosudarstvennyy universitet (Leningrad State University), Moskovskiy khimiko-tekhnologicheskiy institut imeni (Moscow Institute of Chemical Technology),Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institut imeni Lensovet), Belorusskiy politekhnicheskiy institut, Minsk (Belorussian Polytechnic Institute, Minsk), Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute), and Sverdlovskiy politekhnicheskiy institut (Sverdlovsk Polytechnic Institute). The Conference was sponsored by the Institute of Silicate Chemistry AS USSR (Acting Director - A.S. Gotlib), the Vsesoyuznoye khimicheskoye obshchestvo im. D.I. Mendeleyeva (All-Union Chemical Society imeni D.I. Mendeleyev), and the Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova (State "Order of Lenin" Optical Institute imeni S.I. Vavilov). The 15 resolutions of the Conference include recommendations to organize a Center for the purpose of coordinating the research on glass, to publish a new periodical under the title "Fizika i khimiya stekla" (Physics and Chemistry of Glass], and to join the International Committee on Glass. The Conference therein A.A. Lebedev, Academician, Professor, and Chairman of the Organization of Committee; Ye.A. Porey-Koshits, Doctor of Physics and Mathematics, Member of the Organizational Committee; and R.L. Myuller, Doctor of Chemical Sciences, Member of the Organizational Committee. The editorial board imeem G.M. Bartenev, N.V. Vol'kenshteyn, L.I. Demkina, D.P. Dobychin, S.F. Dubrovo, V.A. Ioffe, and B.F. Kolomiyets. References accompany individual reports.

28033
S/081/61/000/015/094/139
B104/B110

15.2600

AUTHORS: Bagdyk'yants, G. O., Alekseyev, A. G.

TITLE: Electron diffraction study of vitreous silicon dioxide and of lead-silicate glasses

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 15, 1961, 367, abstract 15K277 (Sb. "Stekloobrazn. sostoyaniye". M.-L., AN SSSR, 1960, 226-230. Diskus., 238-242)

TEXT: For the purpose of obtaining sufficiently exact curves of electron scattering by glass, the experimental technique has been improved. Powder preparations were made in a noble-gas atmosphere, some of them as very thin films. Vitreous silicon dioxide required was prepared from fine-disperse powder of fused silicon dioxide. The curve for the intensity of electron scattering from molecules in fused silicon oxide agreed with the analogous intensity curve of X-rays. Sufficiently good agreement was also found between experimental and theoretical curves obtained for a disordered lattice and for the crystallites of the elementary cells. Lead-silicate

Card 1/2

S/076/62/036/008/003/011
B101/B144

AUTHOR: Alekseyev, A. G.

TITLE: Studies of crystallization products of quartz glass. II.
            X-ray diffraction study

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 8, 1962, 1747 - 1748

TEXT: IR spectroscopic studies of Heraeus quartz glass devitrified by
heating showed the formation of different SiO_2 modifications at 620 - 1425°C
(V. A. Florinskaya, R. S. Pechenkina, Tr. III Vsesoyuznogo soveshchaniya
po elektrokhimii (Papers at the 3rd All-Union Conference on Electrochemistry
1959)). The same specimens have now been studied by X-ray diffraction.
Results: (1) At 620°C, α-quartz had formed after 755 hrs. (2) At medium
and high temperatures (900 - 1425°C), α-cristobalite with differently
distorted lattice was formed. The cristobalite comprised small admixtures
of other SiO_2 modifications which could not be identified subject to known
modifications. There is 1 figure. The English-language reference is:
W. Eitel, Amer. Ceram. Soc. Bull., 36, 4, 1957.

Card 1/2

Studies of crystallization products...   S/076/62/036/008/003/011
                                            B101/B144

SUBMITTED: October 24, 1960

Card 2/2

ACCESSION NR: AT4019291   S/0000/63/003/001/0084/0087

AUTHOR: Alekseyev, A. G.; Fedorova, L. A.

TITLE: X-ray investigation of catalyzed glass crystallization

SOURCE: Simpozium po stekloobraznomu sostoyaniyu. Leningrad, 1962.
Stekloobraznoye sostoyaniye, vy*p. 1: Katalizirovannaya kristallizatsiya stekla
(Vitreous state, no. 1; Catalyzing crystallization of glass). Trudy* simpoziuma, v. 3,
no. 1. Moscow, Izd-vo AN SSSR, 1963, 84-87

TOPIC TAGS: glass, titanium glass, glass crystallization, catalyzed crystallization,
X-ray diffraction, glass 13

ABSTRACT: Glass 13, containing TiO_2 (5% by weight) as a catalyst and small amounts
of the oxides of the elements of groups I, II and III of the periodic table, was subjected
to X-ray investigation. The presence of oxides did not affect the phase composition,
but TiO_2 is apparently an initiator of crystallization. The effect of thermal treatment on
crystallization was studied on a 170 x 20 x 5 mm glass plate heated at 530-950 C for 24
hours. The results are plotted for glasses of different compositions (euoryptite,
spodumene, petalite) heated at low and high temperatures. Crystallization maxima ap-
peared in the X-ray patterns obtained from zones heated at about 700 C. Crystallization

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ACCESSION NR: AT4019291

was found to increase over a narrow temperature range, but on further heating only a slight increase was obtained. The amount of the crystal phase found by X-ray was 60-70%. Up to 800 C, the glass remained transparent; at higher temperatures it became opaque. The X-ray patterns obtained from glasses composed of petalite and eucryptite showed regularities which are characteristic for solid solutions. The conversion from the glassy state to the crystalline state can also be investigated by X-ray. The X-ray pictures at first remained unchanged with increasing temperature and time, but later a sharp qualitative change occurred. On the diffuse curve of X-ray scattering, sharp peaks appeared which are typical for crystals. No noticeable widening of the crystalline maxima was observed in any case. It may be assumed that nucleation of crystals occurs spontaneously at a higher rate than crystal growth, but that the dimensions of the formed crystals are not less than 100 A. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 17May63   DATE ACQ: 21Nov63   ENCL: 00

SUB CODE: MA   NO REF SOV: 000   OTHER: 000

Card   2/2

ALEKSEYEV, A. G.; VERTSNER, V. N.; ZHUKOVSKAYA, O. V.: PODUSHKO, Ye. V.; TIKHOMIROV, G.P.

"The structure of some glasses of LiO_2-Al_2O_3-SiO_2-TiO_2 system and its variation in thermal treatment over the wide temperature range."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

ACCESSION NR: AP4010759   S/0020/64/154/001/0178/0180

AUTHORS: Aleksayev, A. O.; Vertsner, V. N.; Kondrat'yev, Yu. N.;
Podushko, Ye. V.; Tikhomirov, G. P.

TITLE: Investigation of catalyzed crystallization of glass

SOURCE: AN SSSR. Doklady*, v. 154, no. 1, 1964, 178-180

TOPIC TAGS: glass crystallization, catalyzed crystallization,
glass opacity, spodumene, glass thermal treatment, $Li_2O-Al_2O_3-SiO_2$ Glass, TiO_2 catalyst

ABSTRACT: Glasses of the systems $Li_2O-Al_2O_3-SiO_2$ (similar in
composition to that of spodumene) with 5% addition of TiO_2 as a
catalyst were studied. Structural analysis was performed by
electron- and X-ray diffraction. In addition, changes in light
absorption were measured. Specimens were heat treated in air for
25 hrs in the temperature range between 600 and 1000°. There was
no noticeable structural change in glass up to 625°. In the range
from 625 to 700°, small crystals in some parts of the specimens
appear. Above 700°, small-crystalline phase in the whole volume

Card   1/2

ACCESSION NR: AP4010759

is formed. The crystals remain small up to 830°. Above this temperature large size crystals are formed, and the glass becomes opaque. Orig. art. has: 3 Figures.

ASSOCIATION: None

SUBMITTED: 06Jun63

SUB CODE: CH

DATE ACQ: 10Feb64

NR REF SOV: 001

ENCL: 00

OTHER: 002

Card 2/2

ALEKSEYEV, A.G.; VARGIN, V.V.; VERTSNER, V.N.; KIND, N.Ye.;
KONDRAT'YEV, Yu.N.; PODUSHKO, Ye.V.; SEREBRYAKOVA, M.V.;
TIKHOMIROV, G.P.; TUDOROVSKAYA, N.A.; FLORINSKAYA, V.A.;
LIBERMAN, N.R., red.

[Controlled catalyzed crystallization of glasses of the
lithium aluminosilicate system] Katalizirovannaia regu-
liruemaia kristallizatsiia stekol litievoaliumosilikatnoi
sistemy. Leningrad, Khimiia. Pt.1. 1964. 119 p.
(MIRA 18:4)

L 12882-66   EWP(e)/EWT(m)/EWP(b) . WH

ACC NR: AT6000502   SOURCE CODE: UR/0000/65/000/000/0348/0351

AUTHOR: Alekseyev, A. G.; Zasolotskaya, M. V.

ORG: None

TITLE: Some crystalline phases appearing in Li2O-Al2O3-SiO2 glasses with small TiO2 admixtures

SOURCE: Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 4th, Leningrad, 1964. Stekloobraznoye sostoyaniye (Vitreous state); trudy soveshchaniya, Leningrad, Izd-vo Nauka, 1965, 348-351.

TOPIC TAGS: silicate glass, lithium glass, solid solution, catalized crystallization, aluminum silicate

ABSTRACT: Existing scientific literature concerning the state diagram of the LiO-Al2O3-SiO2 system refers to the Li2O-Al2O3-SiO3 cut only and cannot yield information on phase transitions. The present author carried out x-ray studies of crystal glasses along the Li2O·1.16Al2O3-SiO2 cut. X-ray spectra were recorded for glasses without and with a 5% admixture of TiO2. Changes in the parameters of the elementary cell and in the density are shown in Figures 1 and 2, respectively. The results show that in devitrified titanium-containing lithia-aluminosilica glasses the eucryptic series of solid solutions (O-series) begins with a crystalline phase the lattice and properties of which are different from those of the β -eucryptite. The series of solid solutions is stable within a wide range of temperatures up to a composition

Card 1/3

L 12882-66

ACC NR: AT6000502
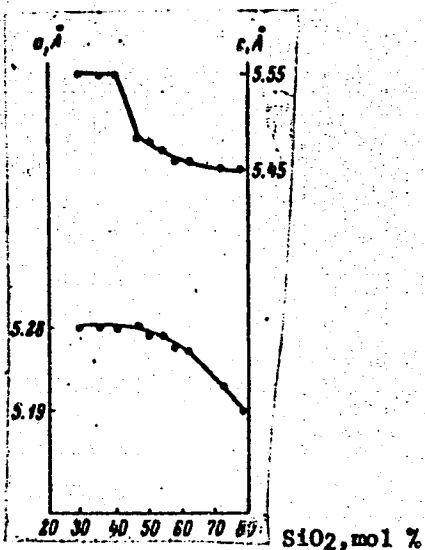
Fig. 1. Changes in the parameters of the elementary cell of β-eucryptite as a function of SiO_2 content.
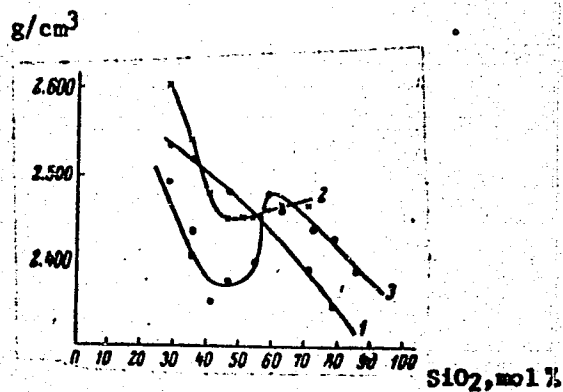
Fig. 2. Change in density with the increase in SiO_2 content
1 - Starting material;
2 - glass crystallized at 830C;
3 - at 1200C.

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L 12882-66

ACC NR: AT6000502

having approximately 62% of SiO_2. In samples with a still higher content of SiO_2 at temperatures above 1060—1180C the substance goes over into the spodumene series of solid solutions. Orig. art. has: 3 figures.

SUB CODE: 11, 20 / SUBM DATE: 22May65 / ORIG REF: 001 / OTH REF: 003

Card 3/3

L 11869-66   EWT(m)/EWP(e)/EWP(b)   GS/WH

ACC NR: AT6000503

SOURCE CODE: UR/0000/65/000/000/0351/0356

AUTHOR: Alekseyev, A. G.; Vertsner, V. N.; Zhukovskaya, O. V.; Podushko, Ye. V.;
Tikhomirov, G. P.

ORG: None

TITLE: The changes in the properties and structure of $Li_2O-Al_2O_3-SiO_2-TiO_2$ glasses
during heat treatment in a wide range of temperatures

TOPIC TAGS: lithium glass, silicate glass, aluminum silicate, solid solution,
catalized crystallization, crystal

ABSTRACT: The properties and structure of lithia-aluminosilica glasses catalyzed by
TiO_2 and treated within a wide range of temperatures have been investigated.
Special attention was paid to glasses the composition of which was close to spodumene
(SiO_2 - 60.5; Al_2O_3 - 28.0; Li_2O - 6.5; TiO_2 - 5.0 weight %). The results cover the
dependence of the index of refraction and glass density on the duration of treatment,
the comparative x-ray and infrared reflection spectra for glasses treated at dif-
ferent temperatures, and the dependence of the index of refraction and glass density
on treatment temperature. Curves of the differential thermal analysis are also
given. The results show that at temperatures of 700 to 800C the resulting crystals

Card 1/2

L 11869-66

ACC NR: AT6000503

belong basically to the eucryptite-like solid solution. By their chemical composi-
tion these crystals are close to spodumene. At 890C, the basic crystalline phase
becomes apparently identical to the β modification of spodumene, and the solid
solution is now of the spodumene type. Orig. art. has: 6 figures.

SUB CODE: 11, 20 / SUBM DATE: 22May65 / OTH REF: 002

Card   2/2   jw

ACC NR: AP6035633

SOURCE CODE: UR/0089/66/020/005/0429/0430

AUTHOR: Alekseyev, A. G.; Barkovskiy, V. N.; Basargin, Yu. G.; Vasil'yev, V. N.; Litunovskiy, R. N.; Minyayev, O. A.; Nikolayev, V. N.; Stepanov, A. V.

ORG: none

TITLE: 68.5 cm sector-focused cyclotron

SOURCE: Atomnaya energiya, v. 20, no. 5, 1966, 429-430

TOPIC TAGS: cyclotron, deuteron, proton

ABSTRACT: A sector-focusing cyclotron that can deliver protons of 7.5 to 100 Mev and deuterons of 0.5 to 4.0 Mev is described. The acceleration of molecular H_2^+ ions underscores the essential role of the process of proton dissociation. Under certain conditions intrinsic to the sector-focusing cyclotron where the ions achieve several hundred revolutions, this process can interfere with obtaining the intensity of the ion beam at finit energies, if the vacuum in the accelerator chamber is less than 1.10^{-5} mm Hg cm^{-1}. Orig. art. has: 3 figures. [NM]

SUB CODE: 20 / SUBM DATE: 04 Sep 65 / ORIG REF: 002 / OTH REF: 001

Card 1/1 fv

UDC: 621.384.611

ALEKSEYEV, A. G.; BEL'FER, A. S.; VARUKHINA, A. A.; KUZINA, V. K.; CHERNOMORDIK, R. M.;

" A Study of the Initial Manifestations of Coronary Insufficiency on the Basis of Polyclinical Records."

ALEKSEYEV, A. I., NAYMARK, L. E., KALININ, S.K. and YAVNEL, A. A.

Atlas Spektral'nykh Liniy (Atlas of Spectral Lines), Moscow,
Gostekhizdat, 1952

ALEKSEYEV, A-I.

SUBJECT	USSR / PHYSICS	CARD 1 / 2	PA - 1464
AUTHOR	ALEKSEEV,A.I.		
TITLE	The Annihilation Probability of the Parapositronium in Consideration of the first Radiative Corrections.		
PERIODICAL	Žurn.eksp.i teor.fis, 31,fasc.1, 164-166 (1956)		
	Issued: 9 / 1956 reviewed: 11 / 1956		

It is of particular interest to compute the first radiative corrections concerning the probability of two-photon annihilation, for in the following approximation the life of the parapositronium is determined just by these radiation corrections and does not depend on four-photon approximation. The probability of the positronium in consideration of radiation corrections of any order is connected with the probability of annihilation W_{fr} of free particles with the velocity zero by means of the following relation:

$$W = \left[(\bar{\Psi}^{E\sigma}(0)\Psi^{E\sigma}(0))/(\bar{\Psi}^{\ell\sigma}_{fr}(0)\Psi^{\ell\sigma}_{fr}(0)) \right] W_{fr}.$$

Here $\Psi^{E\sigma}(x)$ denotes a wave function satisfying the equation of the BETHE-SALPETER type (taking account of possible annihilation), $\Psi^{\ell\sigma}_{fr}(x)$ - the wave function of free particles which is an eigenfunction of the same complete set as also $\Psi^{E\sigma}(x)$. σ characterizes the spin state. In the above formula $(\bar{\Psi}^{E\sigma}(0)\Psi^{E\sigma}(0))$ must be computed with the same accuracy as W_{fr}. The computation of this expression furnishes : $(\bar{\Psi}^{E\sigma}(0)\Psi^{E\sigma}(0)) = \Psi_{nr}(0)^2$ in the desired approximation. The wave function $\Psi^{\ell\sigma}_{fr}(x_1 x_2)$ of the free particles,

ALEKSEEV, A.I.

SUBJECT	USSR / PHYSICS	CARD 1 / 2	PA - 1924.

AUTHOR   ALEKSEEV, A.I.

TITLE   The Cross Section of the Photoproduction of Positronium in an Exterior Field in Consideration of Radiation Correction Terms.

PERIODICAL Zurn. eksp. i teor. fis, 31, fasc. 5, 909-910 (1956)
            Issued: 1 / 1957

The differential cross section $d\sigma$ of this photoproduction depends, if the radiation correction terms of any order are taken into account, as follows on the differential cross section of the photoproduction of free particles with the relative velocity zero: $d\sigma = \left[(\overline{\Psi}(0) \Psi(0))/(\overline{\Psi}_{fr}(0)\Psi_{fr}(0)) \right] d\sigma_{fr}$. Here $\Psi(x)$ denotes the ground state of the positronium (with the energy E), which satisfies an equation of the BETHE-SALPETER type (which takes the possibility of the annihilation of particles into account); $\Psi_{fr}(x)$ - the wave function of the free particles, which is a wave function of the same complete set as $\Psi(x)$. If only the first radiation correction terms are taken into account, the factor $(\overline{\Psi}(0)\Psi(0))$ must be replaced by its nonrelativistic value, and for the production of the positronium in the ground state it is possible to put $(\overline{\Psi}_{fr}(0)\Psi_{fr}(0))=1$.

Thus the computation of the cross section mentioned above is reduced, if the first radiation correction terms are taken into account, to the determination of the cross sections of either the photoproduction of free particles or of the bremsstrahlung in an exterior field.

Because of the very difficult and complicated computation of $d\sigma_{fr}$, the author,

56-4-27/52

AUTHOR   ALEKSEYEV, A.I.

TITLE   A Covariant Equation for Two Particles Annihilating Each Other
(Kovariantnoye uravneniye dvukh annigiliruyushchikh chastits. Russian)

PERIODICAL   Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 4, pp 852 - 862
(U.S.S.S.)

ABSTRACT   First of all the paper under review comments on the state of investigations with respect to the above problem and refers to some relevant rpeviously published papers. In dealing with the problem under consideration, the paper applies the technique of the functional derivations to the solution of the problem of annihilation (or creation) of particles in interaction with each other which may also be in the coupled state. Ansatzes of the functional equations are made in the paper under review for the probability amplitudes (for the Green's functions) describing the annihilation or the creation of particles. Starting out from them, also the wave equation of the positrenium with consideration of a possible annihilation of the electron and of the positron is obtained. First of all, the author derives the Green's function of two particles at the annihilation of which two quanta are created. The paper follows the computations step by step. The expression obtained for the interaction operator I is given with an accuracy that includes e^4. This interaction operator contains two groups of terms - The one group is caused by the effects of the exchange of one or of two virtual quan-

Card 1/2
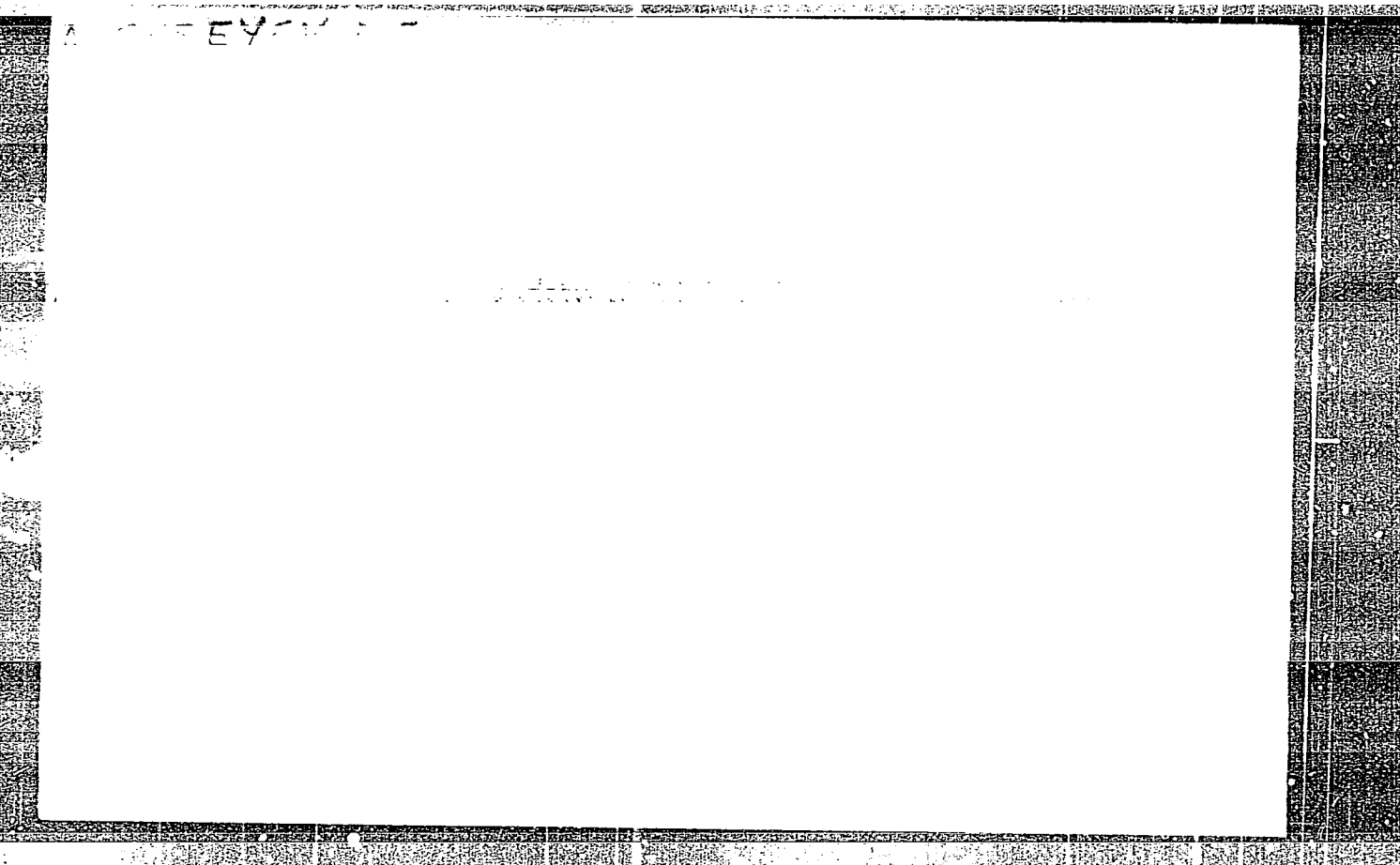
ALEKSEYEV, A.I., red.

[Problems in theoretical physics; a collection of articles]
Nekotorye voprosy teoreticheskoi fiziki; sbornik statei. Moskva,
Izd-vo Glav.upr.po ispol'zovaniiu atomnoi energii, 1958. 185 p.
(MIRA 13:4)

1. Moscow. Inzhenerno-fizicheskiy institut.
           (Physics)

AUTHOR: Alekseyev, A. I.   89-4-5-9/26

TITLE: Bremsstrahlung in Nuclear Fission (Tormoznoye izlucheniye
                 pri delenii yader)

PERIODICAL: Atomnaya Energiya, 1958, Vol. 4, Nr 5,
                 pp. 465 - 466 (USSR)

ABSTRACT: The Coulomb interaction between the nuclei of fission pro-
                 ducts inevitably leads to electromagnetic radiation in the
                 decay of the nucleus. The computation of the bremsstrahlung
                 is simplified by assuming that the electromagnetic radiation
                 is most intensive if the nuclei move in the dimension of the
                 Bohr radius of the parent nucleus. For the case $\omega \ll \omega_0$ and
                 $\omega \gg \omega_0$ (ω =frequency of the bremsstrahlung) $d\mathcal{E}(\omega)$ is
                 derived. $d\mathcal{E}(\omega)$ represents the amount of energy that is
                 emitted as a wave with frequencies in the range of $d\omega$ during
                 the motion of the fission product. From that, results for the
                 total electromagnetic energy of the bremsstrahlung $\mathcal{E}$ of the
Card 1/2   fission products are:

Bremsstrahlung in Nuclear Fission

$$\mathcal{E} = \frac{16}{45} \left(\frac{z_1}{A_1} - \frac{z_2}{A_z} \right)^2 \left(\frac{2A_1A_2}{A_1 + A_2} \right)^{1/2} \left(\frac{E}{mc^2} \right)^{5/2} \frac{mc^2}{z_1 z_2}$$

A numerical estimation shows that the electromagnetic energy can reach some ten thousend eV. If the e/m ratio in fission product nuclei is about equal, the dipole radiation is strongly decreased. In this case it is necessary to consider the quadrupole radiation, too. There are 3 references, 2 of which are Soviet.

SUBMITTED: December 18, 1957

AVAILABLE: Library of Congress

1. Bremsstrahlung   2. Nuclear reactions   3. Fission fragments
—Electromagnetic properties   4. Nuclei—Decay

Card 2/2

AUTHOR: Alekseyev, A. I.   SOV/56-34-5-20/61

TITLE: Two-Photon Annihilation of Positronium in the P-State
               (Dvukhfotonnaya annigil'yatsiya pozitroniya v P-sostoyanii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
               Vol. 34, Nr 5, pp. 1195-1201 (USSR)

ABSTRACT: As in this paper the radiation corrections are not considered,
               the amplitude of the two-quanta annihilation of the posi-
               tronium may be found by the immediate summation of the graphs.
               The author first gives an expression for this amplitude A of
               the probability of the annihilation of free particles in the
               lowest approximation. A figure shows the graph corresponding
               to this expression for A_{free}. But the graphs for the specif-
               ic exchange interaction of the electron and the positron,
               which corresponds to their one-photon virtual annihilation,
               are omitted. The infinite sum in the expression for A_{free}

               amplitude A of the probability of two quantum annihilation is
               a solution of the Bethe (Bete)-Salpeter (Sal'peter) equation
Card 1/3   derived by the method of successive approximations. The

Two-Photon Annihilation of Positronium   SOV/5£-34-5-20/61
in the P-State

second part of this paper derives a non-relativistic approxi-
mation for the amplitude. The velocity v of the relative motion
of the particles in the atom ($v \sim c^2$) is assumed to be small
and all terms with the order of magnitude of v^2 and higher are
neglected. Next, formulae are derived for the amplitude and
for the probability of the two-photon annihilation of the
positronium in the S-state. The expression for A, which was
derived in the first section of this paper, makes it possible
to calculate the probability of the two-photon annihilation
of the positronium in any excited state. The last section of
this paper specializes this expression for the annihilation of
the positronium in the P-state. The life of the positronium
with respect to the annihilation in the P-state is high enough
to make the observation of its optical spectrum possible.
There are 3 figures and 9 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Institute
              of Engineering and Physics)

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Two-Photon Annihilation of Positronium   SOV/56-34-5-20/61
in the P-State

SUBMITTED: December 4, 1957

              1. Particles--Theory 2. Electrons--Exchange reactions
              3. Positrons--Exchange reactions   4. Approximate computation
              --Applications

Card 3/3

24(5)

SOV/56-36-5-19/76

AUTHOR: Alekseyev, A. I.

TITLE: The Nonrelativistic Solution of the Bethe-Salpeter Equation
            (Nerelyativistskoye resheniye uravneniya Bete-Sal'petera)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
            Vol 36, Nr 5, pp 1435-1437 (USSR)

ABSTRACT: The Bethe-Salpeter equation for two equal charged particles
            with the mass m and the charge e in the momentum space

$$(\tfrac{1}{2}\hat{K}^a + \hat{p}^a - m)(\tfrac{1}{2}\hat{K}^b - \hat{p}^b - m)\psi(p) = \frac{ie^2}{4\pi^3}\int \frac{\gamma_\nu^a \gamma_\nu^b}{k^2}\psi(p-k)d''k;\ (\hbar = c = 1)$$

            (cf. Ref 1) is first transformed to a system of coordinates,
            in which the particles are at rest as a whole. In the
            relativistic case, i.e. if $E/m \ll 1$, and the wave function $\psi(p)$
            within the range of small momenta $(|p/m| = v \ll 1$, v = relative
            particle velocity) and small p_0-values differ essentially from
            zero, a solution $\psi(\vec{p}, t)$ is derived in consideration of
            terms of the first order in v. The solution is

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The Nonrelativistic Solution of the
Bethe-Salpeter Equation

SOV/56-36-5-19/76

$$\psi(\vec{p}, t) = \begin{pmatrix} \varphi^{\sigma}(\vec{p}) & -\frac{(\vec{\sigma}^{b}\vec{p})}{2m} \varphi^{\sigma}(\vec{p}) \\ \frac{(\vec{\sigma}^{a}\vec{p})}{2m} \varphi^{\sigma}(\vec{p}) & 0 \end{pmatrix} \exp\left\{-i(\frac{E}{2} + \frac{\vec{p}^2}{2m})t\right\} (14)$$

With $t < 0$ the sign in the exponent changes. The two-row
4-component function $\varphi^{\sigma}(p)$ satisfies the Schrödinger equation
and also describes the eigenfunctions of the operators of the
total momentum of the system, i.e. $\varphi^{\sigma}(p)$ satisfies also the
operator equations of non-relativistic quantum mechanics.
(14) applies also to the mesonic interaction of nucleons, but
in that case it is necessary that in the Schrödinger equation
(12) used for the derivation of (14), the Yukawa potential or
its generalization be used instead of the Coulomb potential.
Knowledge of (14) also makes it possible to calculate the
probability of the annihilation of bound particles (positronium)
in the P state; it is further possible thereby to take the
Coulomb interaction between electron and positron in the

Card 2/3

The Nonrelativistic Solution of the   SOV/56-36-5-19/76
Bethe-Salpeter Equation

        photoproduction of pairs into account, in which case the
        formula for the differential cross section contains terms of
        the order of magnitude of the relative velocity of pair-
        particles. There are 6 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut
            (Moscow Institute of Physics and Engineering)

SUBMITTED: November 5, 1958

Card 3/3

24(5)

AUTHOR: Alekseyev, A. I.   SOV/56-36-6-30/66

TITLE: Three-photon Annihilation of the Positronium in the P-state
               (Trekhfotonnaya annigilyatsiya pozitroniya v P-sostoyanii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36,
               Nr 6, pp 1839 - 1844 (USSR)

ABSTRACT: According to the charge parity of the state, positronium may decay
               into two or three photons (a larger number of photons is less probable).
               The two-photon annihilation of the positronium in the S-state was
               calculated by Pomeranchuk (Ref 1), and the three-photon annihilation
               in the S-state of Ore and Powell. It is, however, not possible to use
               the methods employed in these papers for the purpose of calculating
               probabilities of the annihilation of positronium in excited states.
               The author of the present paper in an earlier of his papers (Ref 3)
               suggested a method of determining the amplitudes of the annihilation
               of positronium by the summation of an infinite number of Feynman
               diagrams, which makes it possible to calculate the annihilation
               probability of positronium in any excited state. In the aforementioned
               earlier paper the author calculated the probability of two-photon
               annihilation of positronium in the P-state, and in the present paper
               the probability of the three-photon annihilation of positronium in the

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Three-photon Annihilation of the Positronium in the P-state SOV/56-36-6-30/66

P-state is calculated by means of the technique of graph-summation, and the selection rule for this process is determined. By using the (infinitely large number of) graphs of the "ladder type" (Fig 2) and the amplitude equation deduced in reference 3, a relativistically invariant expression is obtained for the probability amplitudes of three-photon annihilation, and the annihilation probabilities of positronium in the P-state and the selection rules are deduced in nonrelativistic approximation. The amplitude of the three-photon annihilation in the P-state is different from zero only for a state with the spin $s = 0$ (parapositronium). In the case of $s = 1$ (orthopositronium) this probability is equal to zero. Thus, a calculation of W for parapositronium at $n = 2$ results in $W = 0.3 \cdot 10^{3} \text{sec}^{-1}$. This value is far below the probability for an optical transition in the S-state with following two-photon annihilation (10^{8}sec^{-1}). The author   thanks V. A. Mashinin for verifying several calculations. There are 2 figures and 8 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Physics and Engineering Institute)

SUBMITTED: December 27, 1958

Card 2/2

ALEKSEYEV, A.I., dotsent (Moskva)

How may one explain changes in the velocity of the propagation
of light in different media, if light is regarded as movement
of photons? Fiz.v shkole 20 no.1:104 Ja-F '60.   (MIRA 14:10)
                    (Light--Speed)

ALEKSEYEV, A. I., dotsent (g.Moskva); BRONSHTEN, V.A. (g.Moskva)

Correspondence with readers. Fiz. v shkole 20 no.3:101-103 My-Je '60.
(MIRA 13:11)
(Physics--Study and teaching)

S/053/61/073/001/002/004
B006/B056

AUTHOR: Alekseyev, A. I.

TITLE: Application of Methods of the Quantum Field Theory in
              Statistical Physics

PERIODICAL: Uspekhi fizicheskikh nauk, 1961, Vol. 73, No. 1, pp. 41 - 88

TEXT: In the present article, the author gives a detailed survey of the
most important methods in the quantum field theory and of its possible
application for describing systems consisting of a large number of inter-
acting particles. Above all, the method of the Green functions is dealt
with, which has been successfully applied to the field of the manybody
problem, especially by Soviet scientists. The paper consists, apart from
introduction and appendix, of four paragraphs. In § 1, a new thermodynamic
perturbation theory is explained on the basis of the methods of the
quantum field theory, and in this connection, the most essential methods
of applying the mathematical apparatus of the quantum field theory in
statistical physics is studied. From what is shown here it follows that
a new thermodynamic perturbation theory offers a number of advantages.

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Application of Methods of the Quantum Field   S/053/61/073/001/002/004
Theory in Statistical Physics   B006/B056

Whereas, in the old thermodynamic perturbation theory progress is not
possible beyond the first (one or two) approximations with respect also
of particle interaction because of mathematical complexity, it is possible,
in the new formulation of the theory, by using the technique of diagrams,
in perturbation-theoretical development in series, to carry out any
desired number of summations, also over an infinite number of terms. Such
an arbitrary summation leads to a physical approximation, which extends
beyond the framework of the perturbation theory. In § 2 a calculation is
carried out on the basis of the thermodynamical Green functions, without
the perturbation theory being used. Particular stress is laid upon the
technique of the work with Green functions, without concrete examples
being dealt with. § 3 deals with the time- and temperature-dependent
Green functions. The analytical properties of the Green time functions
are individually discussed, and further the determination of the energy
spectrum of the system, the energy spectra of a superconductor, and the
interrelation between the Green time functions and the thermodynamic
characteristics of the system are discussed. In § 4, several applications
to concrete kinetic problems are finally discussed. A neutral system

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Application of Methods of the Quantum Field   S/053/61/073/001/002/004
Theory in Statistical Physics   B006/B056

consisting of ions and electrons, which is in thermodynamic equilibrium
and the slowing down of particles penetrating this plasma is studied. A
general formalism may easily be applied also to similar problems as
bremsstrahlung, pair formation, plasma radiation, slowing down of electrons
in metal etc. In the appendices, differentiation problems and the summation
of series with quantum-field-theoretical methods are discussed. The
following Soviet scientists are mentioned: A. B. Migdal, V. M. Galitskiy,
L. D. Landau, S. T. Belyayev, L. P. Gor'kov, V. L. Bonch-Bruyevich,
A. A. Abrikosov, I. Ye. Dzyaloshinskiy, Ye. S. Fradkin, L. P. Pitayevskiy,
I. A. Akhiyezer, S. V. Peletminskiy, Ye. M. Lifshits, N. N. Bogolyubov,
S. V. Tyablikov, Sh. M. Kogan, A. I. Larkin, A. A. Vedenov, S. I. Drozdov,
and I. Khalatnikov. There are 5 figures and 63 references: 43 Soviet,
15 US, 1 German, 1 Dutch, 1 British, 1 Italian, and 1 Japanese.

Card 3/3

LEVICH, Veniamin Grigor'yevich; ALEKSEYEV, A.I., red.; LIVSHITS, B.L.,
red.; BRUDNO, K.F., tekhn. red.

[Course in theoretical physics]Kurs teoreticheskoi fiziki. Mo-
skva, Fizmatgiz. Vol.1. [Electromagnetic field theory. Relativity
theory. Statistical physics]Teoriia elektromagnitnogo polia. Teo-
riia otnositel'nosti. Statisticheskaia fizika. 1962. 695 p.
(MIRA 15:12)

(Physics)

ALEKSEYEV, A.I., red.; NIKITINA, T.K., red.; MAZEL', Ye.I.,
tekhn. red.

[Application of methods of quantum field theory to
problems of many bodies] Primenenie metodov kvantovoi
teorii polia k zadacham mnogikh tel. Moskva, Gos-
atomizdat, 1963. 133p.   (MIRA 16:7)
              (Quantum field theory)
              (Problem of many bodies)

ALEKSEYEV, A. I.

A. I. Alekseyev, Yu. A. Vdovin, and V. M. Galitskiy, "Collective Radiation
of Impurity Atoms in Crystals."

report submitted for the Conference on Solid State Theory, held in Moscow,
December 2-12, 1963, sponsored by the Soviet Academy of Sciences.

ACCESSION NR: AT3012800   S/2964/63/000/000/0065/0082

AUTHOR: Alekseyev, A. I.

TITLE: Deceleration of a relativistic particle in a plasma

SOURCE: Primeneniye metodov kvantovoy teorii polya k zadacham mnogikh tel. Moscow, 1963, 65-82

TOPIC TAGS: plasma, particle motion in plasma, particle decelera-tion in plasma, particle energy loss, relativistic particle, non-relativistic particle, multicomponent plasma, Green's function, Feynman diagram, particle polarization

ABSTRACT: General formulas are derived for the energy loss of a charged particle passing with any velocity through a multicomponent plasma of arbitrary temperature. The method used, employing Green's functions and Feynman diagrams, was originally developed by A. I. Larkin (Zh. eksperim. i teor. fiz. v. 37, 264, 1959), who confined

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ACCESSION NR: AT3012800

himself only to the nonrelativistic region. The method is extended
to include arbitrary velocity of particles passing through a multi-
component plasma. The modification of the method can be readily
applied to other problems such as bremsstrahlung and pair production
when charged particles pass through a plasma, plasma radiation, or
bremsstrahlung of charged particles in media. The probability of
particle scattering in the plasma and the particle polarization
operator are first obtained by correlation analysis, and the result
leads to the polarization losses. The deceleration of a charged
particle in matter is also considered briefly from the quantum-
field-theory point of view. "The author is grateful to V. M.
Galitskiy for a discussion of some problems concerning this work."
Orig. art. has: 69 formulas.

ASSOCIATION: None

SUBMITTED: 00   DATE ACQ: 07Oct63

SUB CODE: PH   NO REF SOV: 009   ENCL: 00

Card   2/2   OTHER: 003

ACCESSION NR: AT3012801   S/2964/63/000/000/0083/0093

AUTHORS: Alekseyev, A. I.; Troitskiy, M. A.

TITLE: Radiation of a high temperature plasma

SOURCE: Primeneniye metodov kvantovoy teorii polya k zadacham
mnogikh tel. Moscow, 1963, 83-93

TOPIC TAGS: plasma, high temperature plasma, plasma bremsstrahlung,
plasma cyclotron radiation, recombination radiation, line spectrum
radiation, Coulomb screening, magnetized plasma

ABSTRACT: Because of the possibility that new statistical-physics
methods can give more accurate results on the bremsstrahlung of a
high temperature plasma and on recombination and line-spectrum radi-
ation of low-temperature plasma, quantum field theory methods of
statistical physics are used to determine the spectral expansion of
bremsstrahlung intensity per unit volume of a plasma, with allowance

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ACCESSION NR: AT3012801

of the screening of the Coulomb field of the ions. The solution is claimed to be of methodological interest in view of the application of analogous procedures to other problems. The formalism developed can be extended readily to low temperatures where account of the discrete levels of the ions is important, and also to radiation from a magnetized plasma. A general cyclotron radiation formula is obtained for a plasma situated in a cosmic magnetic field, and some limiting cases are considered. Orig. art. has: 1 figure and 15 formulas.

ASSOCIATION: None

SUBMITTED: 00   DATE ACQ: 07Oct63   ENCL: 00

SUB CODE: PH   NO REF SOV: 006   OTHER: 001

Card 2/2

MATVEYEV, Aleksey Nikolayevich; ALEKSEYEV, A.I., red.

[Electrodynamics and the theory of relativity] Elektrodina-
mika i teoriia otnositel'nosti. Moskva, "Vysshaia shkola,"
1964.   424 p.   (MIRA 17:ɔ)

ACCESSION NR: AP4012560   S/0056/64/046/001/0320/0330

AUTHORS: Alekseyev, A. I.; Vdovin, Yu. A.; Galitskiy, V. M.

TITLE: Oscillations of photon density in a resonant medium

SOURCE: Zhurnal eksper. i teoret. fiz., v. 46, no. 1, 1964, 320-330

TOPIC TAGS: photon density, photon density oscillation, resonant medium, two level molecule, resonant emission, resonant absorption, stimulated collective emission, laser, ruby laser

ABSTRACT: Quantum electrodynamics is used to investigate the evolution of resonant emission and absorption and the oscillations of photon density in a resonant medium (an aggregate of identical two-level molecules) for the case when there are no quanta at the initial instant of time, and the distribution of the molecules by levels is fixed. Photon losses are neglected. It is found that at the start of the process the molecules radiate independently, in agree-

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ACCESSION NR: AP4012560

ment with perturbation theory, but after some time the stimulated
collective emission causes the process to develop in a fashion other
than called for by perturbation theory or the balance equation.
Eventually all molecules begin to vibrate collectively, with the
time during which the emission occurs is several orders of magnitude
smaller than the lifetime of the isolated molecule. The period of
the oscillations and the maximum photon density are determined, and
the reduction in the width of the spectral line with increasing pho-
ton density is explained. The equations derived are applied to a
ruby laser and the results compared with experiment. "The authors
are grateful to N. G. Basov for a discussion of the results." Orig.
art. has: 25 formulas.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow
Engineering-Physics Institute)

Card 2/3

I 16517-65   EWA(k)/EWT(1)/EEC(k)-2/T/EEC(b)-2/EWP(k)/EWA(m)-2   Po-4/Pf-4/

TITLE: Dielectric constant of resonant ...

over the levels is fixed. In the present ... the authors con-
sidered the general case of a specified initial number of quanta

Card 1/3

L 19517-65
ACCESSION NR: AP5000349

... of the molecules over the levels. A

... system of equations for the vector ...

... resonant ... the ... ... are ... are sometimes
are studied in ... ... the ... ... it is
more convenient to describe the electromagnetic ... in
... terms of the closed system of equations for the vector poten-

... laxation losses. The natural oscillations ...
are obtained for weak and strong fields. The authors thank Yu. A.
Vdovin for a discussion of this work. ... ...

Card   2/3

ACCESSION NR: AP5000349

TRANSLATION: M____, _____ Institute (Moscow Engineering-Phys___ Institute)

SUBMITTED: 16May64

SUB CODE: EC, OP   NR REF SOV: 006   OTHER: 005

Card   3/3

L 16506-66   EWT(1)/T   IJP(c)   SOURCE CODE: UR/0141/65/008/004/0826/0828

ACC NR: AP5022808

AUTHOR: Alekseyev, A. I.

ORG: Moscow Engineering and Physics Institute (Moskovskiy inzhenerno-fizicheskiy institut)

TITLE: Variation of photon density in a resonant medium

SOURCE: IVUZ. Radiofizika, v. 8, no. 4, 1965, 826-828

TOPIC TAGS: photon emission, photon density

ABSTRACT: The variation of photon density in a resonant medium consisting of two-level molecules was considered in   earlier author's articles (ZhETF, 46, 320, 1964; 47, 1893, 1964). The present article generalizes the previous formulas covering the case when identical two-level molecules are random scattered in a medium having a definite dielectric constant; in addition, the magnetic-dipole and quadrupole radiation (or absorption) of molecules is taken into account. It is shown that, by studying the degree of polarization of a generated light beam, it is possible to determine the nature of optical transitions and the orientation of individual impurity-type molecules in the medium. Orig. art. has: 10 formulas.

SUB CODE: 20 / SUBM DATE: 15Sep64 / ORIG REF: 002

UDC: 538.3

Card 1/1 SM

SOURCE: Zhurnal eksperimental'noy i teor...

979-889

TOPIC TAGS: electromagnetic oscillation, ... density

Card   1/2

method may be useful for studying the generalized case with relaxation losses and pumping. Since only general laws of quantum electrodynamics are used in solving this problem, the results are also theoretically important in that they may be used for determining the validity of other methods, e.g., balance equations. The

ACCESSION NR:

EN

CODE

NO REF SOV:

L 59526-65   EWT(1)

ACCESSION NR: AP5016561

SYNCE: Churna. eksperimenta nov teoret...

quantum electrodynamics, field qu...
Cerenkov radiation

is extended to include anisotropic media. Atomic radiation in anisotropic media is
of great practical interest for such applications as solid-state lasers and emission
from luminescent crystals. It is pointed out that earlier analyses of radiation in
an anisotropic medium, considered in connection with Cerenkov radiation or with the
investigation of electromagnetic phenomena in a magnetoactive plasma, were based on
classical electrodynamics. In the present study.

L 59526-65
ACCESSION NR: AP5016561

... electromagnetic field within an isotropic medium in a general form that is ... various electrodynamic problems, and specifically to ... are consid-

... transparent anisotropic medium, ... the polarization of radiation from a laser ... which have contributed to re-

for a discussion of the ...

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering ... Institute)

SUBMITTED: 09Jan65   ENCL: 00   SUB CODE: NP, GP

                       OTHER: 001   ATT PRESS: 4053

NO REF SOV: 014

... 2/2

L 4971-66   EWT(1)/EPF(c)   IJP(c)   WH/GG

ACC NR: AP5026603

AUTHOR: Alekseyev, A. I.; Galitskiy, V. M.

SOURCE CODE: UR/0056/65/049/004/1109/1117

ORG: Moscow Engineering Physics Institute (Moskovskiy inzhenerno-fizicheskiy in-stitut)

TITLE: Emission from a system of resonant molecules with a spread of energy levels

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 4, 1965, 1109-1117

TOPIC TAGS: molecular spectroscopy, quantum resonance, excitation energy, emission spectrum

ABSTRACT: A method previously derived for the case of exact resonance (ZhETF v. 46, 320, 1964) is used to determine the emission from a macroscopic system of iden-tical two-level molecules when the supposedly identical energy levels of the mole-cules deviate slightly from exact resonance, for example, as a result of the Stark or the Doppler effects. The limiting cases of large and small spreads of the lev-els are investigated. For a small spread (narrow resonance) the molecular emis-sion has a collective nature and the usual equations no longer hold. For a large spread (broad resonance), quantum-number and population-level regions are

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0701   1233

L 4971-66

ACC NR: AP5026603

found in which the emission law is the same as calculated by perturbation theory and the usual equations are valid. The question of complete de-excitation of the initially excited molecules is discussed and the limits of applicability of the linear approximation in problems involving the interaction between radiation and resonant molecules are determined. The relation between these limits and the initial relative populations of the levels is discussed. Although the analysis is confined to a two-level system with fixed level distribution and no emission at the initial instant of time, the analysis is valid for arbitrary boundary conditions. The authors thank Yu. A. Vdovin and A. M. Golovin for a discussion of some pertinent problems. Orig. art. has: 27 formulas.

[02]

SUB CODE: EM, NP/   SUBM DATE: 12Feb65/   ORIG REF: 010/   ATD PRESS: 4/38

Card 2/2

L 21431-66   FBD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(h)   IJP(c)   MG

AUTHOR: Alekseyev, A. I.; Tarasov, Yu. A.

ORG: Moscow Engineering Physics Institute (Moskovskiy inzhenerno-fizicheskiy institut)

TITLE: Steady-state oscillation regime in a laser

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 696-704

TOPIC TAGS: laser, pump power, solid state laser, laser theory

ABSTRACT: A system of equations for the vector potential, polarization current, and overpopulation of levels suggested earlier by one of the authors (Zh. ETF, v. 48, 1965, p. 879) is used to investigate the electromagnetic oscillations in a solid state laser operating near the steady-state regime. The analysis includes all of the possible modes. The frequency and the intensity of emission in a steady-state regime are determined for the case when the pump power is large and the condition for stability of oscillations is established. It is shown that the laser oscillator equations (W. Kaiser et al., Phys. Rev. v. 123, no. 3, p. 766) describing kinetics of the emission process and photon absorption by resonance two-level molecules in the presence of continuous pumping and losses follow from the initial system of equations. The laser oscillator equations apply only when there is a sufficiently large devia-

Card 1/2

L 21431-66

ACC NR: AP6009645

tion of energy levels of molecules from the exact resonance. In the case of narrow resonance even emission of a photon becomes a collective phenomenon and the usual laser oscillator equations no longer apply. Orig. art. has: 38 formulas. [CS]

SUB CODE: 20/ SUBM DATE: 15Jul65/ ORIG REF: 008/ OTH REF: 012/ ATD PRESS:
4221

Card 2/2

L 33154-66   EWT(1)   GG
ACC NR:AP6014031   SOURCE CODE: UR/0056/66/050/004/0915/0925

AUTHOR: Alekseyev, A. I.; Nikitin, Yu. P.

ORG: Moscow Engineering Physics Institute (Moskovskiy inzhenerno-fizicheskiy institut)

TITLE: Quantization of an electromagnetic field in a dispersive medium

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 4, 1966, 915-925

TOPIC TAGS: electromagnetic field, anisotropic medium, isotropic plasma, Green function

ABSTRACT: A free macroscopic electromagnetic field in a homogeneous, transparent, nonmagnetic, dispersive, anisotropic medium has been quantized by taking into consideration all types of waves excited in a medium. The Green function and the delayed Green function of the electromagnetic field were obtained. The radiation of an impurity atom in an anisotropic dispersive medium was determined on the basis of the method developed. Selection rules for the emission of a longitudinal quantum were derived. The probability of long-wave emission of a transverse and a longitudinal quantum was calculated for an impurity molecule located in an homogeneous

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L 33154-66   3
ACC NR: AP6014031

isotropic plasma with the spacial dispersion. The authors thank V. M. Galitskiy,
V. I. Kogan, and M. I. Ryazanov for their discussions of the results. Orig. art.
has: 30 formulas. [Based on authors abstract]   [NT]

SUB CODE: 20/ SUBM DATE: 15Jun65/ ORIG REF: 013/ OTH REF: 002

LS

Card 2/2

ACC NR: AP6037087   SOURCE CODE: UR/0056/66/051/005/1569/1574

AUTHOR: Alekseyev, A. I.; Yakimets, V. V.

ORG: Moscow Engineering Physics Institute (Moskovskiy inzhenerno-fizicheskiy institut)

TITLE: Electromagnetic radiation in an absorbing medium

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 5, 1966, 1569-1574

TOPIC TAGS: electromagnetic radiation, laser radiation, electromagnetic wave absorption, magnetic dipole, dipole interaction

ABSTRACT: The authors point out that most existing investigations of electromagnetic radiation are limited to types of radiation (Cerenkov, transition, diffraction), which is characterized by the fact that it disappears in the absence of a medium. They consequently consider radiation that a charged system can produce in vacuum as well as in a medium, where the presence of the surrounding medium either alters the intensity of the source or leads to radiation of specific waves which are not produced in a vacuum. The effects of absorption by the medium on the radiation is analyzed for both classical and quantum emitters. The absorbing media are assumed to be in thermodynamic equilibrium. Dipole, magnetic dipole, and quadrupole radiation is

Card 1/2

Communications

L 30005-65   EEC-2(FWD-a)/FSS-2/EEC-4/EEC(t)/FED-2   Pb-4/Pn-4/Pp-4/

AUTHOR: Alekseyev, A. I.

TITLE: Investigation of the joint effect of synchronization instability and
Gaussian noise upon the reliability of transmission

SOURCE: Elektrosvyaz' no. 11, 1964, 54-62

TOPIC TAGS: information transmission, Gaussian noise, information
transmission reliability

ABSTRACT: The joint effect of sync instability and Gaussian noise upon the
reliability of reception of the message transmitted was determined

Card 1/2

ACCESSION NR: AP404973.

... which shifts the carrier-frequency wave ...

ASSOCIATION: none

SUBMITTED: 09Nov63   ENCL: 00

SUB CODE: EC   NO REF SOV: OTHER:

Card 2/2

SIMONOV, Yu.L.; ALEKSEYEV, A.I.

Calculation of shot noise of tunnel diodes with large harmonic signals.
Radiotekh. i elektron. 9 no.9:1727-1729 S '64.

(MIRA 17:10)

AUTHOR: Alekseyev, A. I. (Active member)

TITLE: Selecting signals for transmitting discrete information. Reported at the

SOURCE: Radiotekhnika, v. 20, no. 6, 1965,

TOPIC TAGS: information transmission, information transmission signal

OTHER

Cod 2/2

L 2186-66

ACCESSION NR: AP5020759

UR/0108/65/020/008/0006/0010
621.396.626

AUTHOR: Alekseyev, A. I. (Active member)

TITLE: Potential interference stability of noise-like signals α, 44

SOURCE: Radiotekhnika, v. 20, no. 8, 1965, 6-10

TOPIC TAGS: signal interference, signal transmission, signal reception, white noise, noise signal

ABSTRACT: The recent interest in Hoffman codes is apparently due to their simplicity of generation and their favorable correlation properties. The present author investigates the potential interference stability of such nonorthogonal signals during the symbol-to-symbol reception and reception as a whole. The interference stability criterion is expressed as

$$\alpha = \frac{ST_0}{N_0} .$$

where S is the average power of the signal, T_0 is time for the transmission of a single binary information unit, and N_0 is spectral density of the white Gaussian noise (two-sided spectrum). The results of the calculations of the interference

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L 2186-66
ACCESSION NR: AP5020759

stability of channels with passive pause are given together with a comparison of various discrete information transmission systems. The comparison is summarized in Fig. 1 of the Enclosure. "The author thanks Doctor of Technical Sciences, Professor A. V. Soldatov, for his interest in the investigation." Orig. art. has: 7 formulas and 7 figures.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi (Scientific-Technical Society of Radio Engineering and Electrocommunication)
SUBMITTED: 22Aug63   ENCL: 01

NO REF SOV: 001   SUB CODE: EC

                                OTHER: 001

Card 2/3

L 2186-66
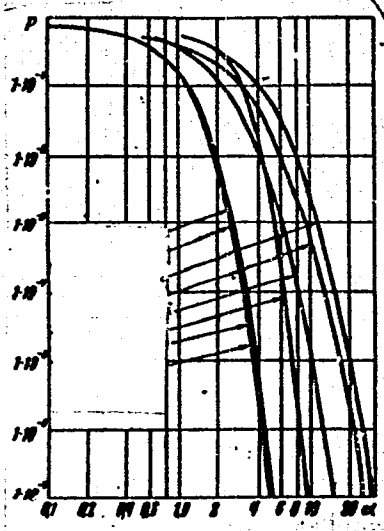ACCESSION NR: AP5020759

ENCLOSURE: 01

Fig. 1. Comparison of the interference
stability of various discrete information
transmission systems.
Legend (from top to bottom): Orthogonal
channel, M-sequence, binary with pause,
ternary with pause, binary ordinary,
M-sequence symbol-by-symbol, optimum
channel, biorthogonal channel; p-
probability of distortion of an individual
element of the code combination.

Card 3/3 DP

RODIGIN, N.M.; ALEKSEYEV, A.I.; DUGINA, N.A., tekhnicheskiy redaktor

[New method of preheating metal before welding] Novyi sposob
podogreva metalla pered svarkoi. Moskva, Gos. nauchno-tekhn. izd-
vo mashinostroit. i sudostroit. lit-ry, 195 27 p.   (MLRA 7:8)
       (Electric welding)

ALEKSEYEV, A. I.   262T18

USSR/Engineering - Construction, Low-   Jan 53
                    Temperature Welding

"Assembly Welding of Steel Constructions at Minus
Temperatures With Induction Preheating," Engrs I. P.
Olesov, A. I. Alekseyev, N. M. Rodigin

Stroi Prom, No 1, pp 16-18

States that in order to eliminate seasonal interrup-
tions of construction welding due to welding flaws
occurring at low air temps, the Uralstal'konstruktsiya
Trust, along with the Ural branch of Acad Sci USSR,
worked out (1950-1952) and introduced a method of in-
duction preheating of constructions which permitted

                                           262T18

welding at temps of minus 35 to minus 45°. The con-
struction, principle of action, speed of action, and
method of use of the induction preheater are given.
It has been used on metal up to 32 mm thick. Cur-
rent is supplied from ordinary welding transformer.

ALEKSEYEV, A. I.

1. A. I. ALEKSEEV, Eng., N. E. GORCZHANINOV, Eng.

2. USSR (600)

4. Blast Furnaces

7. From the experience of welding the shell of a blast furnace under low temperatures. Biul. stroi. tekh. 10 no. 1. 1953.

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

1. OLESOV, I. P., Eng.; ALEKSEYEV, A. I., Eng.; RODIGIN, N. V., Eng.

2. USSR (600)

4. Welding

7. Using induction preheating in assemblh welding of steel strudtural
   units at temperatures below freezing, Stroi. prom., 31, No. 1, 1953.

9. Monthly Lists of Russian Accessions, Library of Congress, April,
   1953, Uncl.