24(4)

AUTHOR: Korolev, F.A.

SOV/55-58-3-14/30

TITLE: High-Monochromatic Interference Light Filters and Their Application in Technics (Interferentsionnyye svetofil'try vysokoy monokhromatichnosti i ikh primeneniye v tekhnike)

PERIODICAL: Vestnik moskovskogo universiteta, Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 3, pp 97-116 (USSR)

ABSTRACT: The author develops a theory of the ordinary interference light filters which allows to calculate in advance the width of the pass band, the distance between the single pass bands, the transmission coefficient in the maximum of the band, the contrast factor, the aperture etc. A method for the production of the considered light filters is proposed; dielectric mirrors were applied instead of metallic ones whereby a 3-4 times improvement of the results was obtained. Furthermore a theory of the multiplex light filters is established in 3 cases (filters of different thickness, equal thickness, almost equal thickness); on the basis of the theory all the filter parameters can be calculated in advance. High-monochromatic multiplex light filters with dielectric mirrors are experimentally realized. All the theoretical results are confirmed by the ex-

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High-Monochromatic Interference Light Filters and Their Application in Technics SOV/55-58-3-14/30

periments carried out. The following Soviet researchers are mentioned A.V. Gil'varg, A.B. Severnyy, S. Baranov, N. Melankholin.

There are 7 figures, and 101 references, 14 of which are Soviet, 49 American, 9 French, 9 English, 7 German, 5 Czech, 5 Japanese, 2 Italian, and 1 Brazilian.

ASSOCIATION: Kafedra optiki (Chair of Optics)

SUBMITTED: July 6, 1957

Card 2/2

KOROLEV, F.A.; AKIMOV, Ye.M. [deceased]; MARKOV, V.S.; KULIKOV, O.F.

Experimental investigation of optical emission by electrons in a synchrotron with an energy of up to 270 Mev. Fiz.sbor. no.4: 24-28 '58. (MIRA 12:5)

1. Fizicheskiy fakul'tet Moskovskogo ordena Lenina i ordena Trudovogo Krasnogo Znameni gosudarstvennogo universiteta imeni M.V.Lomonosova.
(Electrons) (Synchrotron)

68876

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S/139/59/000/05/021/026
E201/E191

AUTHORS: Korolev, F.A., and Zheyenbayev, Zh.

TITLE: Use of a High-Frequency Discharge with Hydrodynamic Compression as a Light Source for Spectroscopic Analysis of Solutions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 5, pp 134-138 (+ 1 plate) (USSR)

ABSTRACT: A new light source (Fig 2) is described; it can be used continuously for long periods, producing spectra of conducting and non-conducting solutions. The light source uses an 11.2 Mc/s single-electrode ("jet") discharge; the high-frequency oscillations are produced by means of an oscillator UKV based on a GK-3000 tube (circuit in Fig 1). A quarter-wave two-conductor line is coupled to the oscillator circuit and the high-frequency discharge occurs at one end of this line. To stabilise the discharge, to raise its temperature and to ensure long working periods, air and the evaporation products are pumped away through a channel bored in the electrode. This produces a concentric flow of ambient air towards the discharge axis (Fig 3). The resultant

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S/139/59/000/05/021/026
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Use of a High-Frequency Discharge with Hydrodynamic Compression as a Light Source for Spectroscopic Analysis of Solutions

compression of the discharge zone raises its temperature and luminance very considerably. The electrode is cooled by means of running water (Fig 4) and this means that the source can be used continuously for long periods. A solution or other substance (for example a powdered ore, sand, etc) is placed in a Plexiglas vessel (Fig 5) in which an auxiliary electrode E is located. The auxiliary electrode E is fully immersed in the solution, ore or sand, and it serves to concentrate the discharge. The discharge power can be regulated within wide limits so that the most convenient discharge conditions can be used. Fig 6 shows the form of the discharge under various conditions, and Figs 7-9 are the spectrograms obtained with a DFS-2 spectrograph using 0.1-10-7% solutions of sodium (Fig 7), 0.1-10-6% solutions of lithium (Fig 8) and 0.01-10-6% solutions of potassium (Fig 9). The results shown in the spectrograms are summarized in Table 1, which shows that the sensitivity obtainable with the source described here is

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Use of a High-Frequency Discharge with Hydrodynamic Compression as a Light Source for Spectroscopic Analysis of Solutions

higher than that of analyses using flames or carbon arcs. Acknowledgement is made to G.S. Solntsev for his advice.
There are 9 figures, 1 table and 17 references, of which 13 are Soviet and 4 English. (There are also 4 Soviet references in footnotes on p 138)

Card 3/3

ASSOCIATION: Moskovskiy gosuniversitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: February 16, 1959

SOV/51-6-5-2/34

24(7), 21(1)

AUTHORS: Korolev, F.A., Kozlov, B.A. and Odintsov, A.I.

TITLE: On the Shape of the Line Profile in an Atomic Beam (K voprosu o forme kontura linii v atomnom puchke)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 5, pp 576-579 (USSR)

ABSTRACT: The spectral line profile produced by excitation (e.g. by electrons) of an atomic beam was discussed theoretically by Minkowski and Bruck (Ref 1). They obtained an expression for the intensity distribution in the line assuming that the exit slit of the furnace which produced the atomic beam was parallel to the line of observation and that the width of this slit was small. Odintsov showed recently (Ref 2) that in order to obtain intense atomic beams it is necessary to place the exit slit of the furnace at right-angles to the line of observation. The present paper follows up Odintsov's work by deriving an approximate equation (Eq 2) for the line shape produced in an excited atomic beam; it is assumed that $(s_1/2\ell)^2 \ll 1$, where s_1 is the dimension of the furnace slit in the direction at right-angles to the line of observation i.e. its length, and ℓ is the distance from the furnace slit to the line of observation. Eq 2 involves s_1 and s_2 which are the dimensions of the furnace slit and the slit in a diaphragm outside the furnace

Card 1/2

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SOV/51-7-6-1/38

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AUTHORS: Korolev, F.A., Kozlov, B.A. and Odintsov, A.I.

TITLE: Investigation of the Contour of the Cadmium Red Line, Using an Atomic Beam

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, No 6, pp 721-724 (USSR)

ABSTRACT: The red line of cadmium at 6438 Å is used as a wavelength standard and consequently knowledge of its true contour is of great importance. In 1935 Minkowski and Bruck (Ref 4) used an atomic beam source to find that the half-width of the 6438 Å line was $16.4 \times 10^{-3} cm^{-1}$. This value is much greater than the sum of the apparatus and Doppler half-widths, i.e. the red line of cadmium has complex structure and a considerable width. The present authors used an improved version of Minkowski and Bruck's method to study further the contour of the 6438 Å line of naturally occurring cadmium (a mixture of Cd^{106}, Cd^{108}, $Cd^{110-114}$, Cd^{116} isotopes). An atomic beam, described earlier by Odintsov (Ref 6) was used to excite the line. A Fabry--Perot etalon was used: it had 15 cm separation between the plates and the reflectivity of the dielectric mirrors was 90%. The apparatus half-width of the etalon was $1.5 \times 10^{-3} cm^{-1}$ (Minkowski and Bruck's etalon had a separation between plates of 11 cm and an apparatus half-width of $3 \times 10^{-3} cm^{-1}$). An ISP-51 spectrograph with a UF-84 camera (f = 800 mm) served as a

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Investigation of the Contour of the Cadmium Red Line, Using an Atomic Beam

monochromator. The interferograms were scanned with an MF-2 micro-photometer; the contour of the 6438 Å line shown in Fig 1 is the mean of the results obtained from four interferograms. Fig 1 shows that the contour of the red line of cadmium is strongly asymmetric, indicating unresolved fine structure, and its half-width is $(11.8 \pm 0.5) \times 10^{-3} cm^{-1}$. The latter value differs appreciably from $16.4 \times 10^{-3} cm^{-1}$, given by Minkowski and Bruck (Ref 4); the lower value reported above is due to the higher resolution of the apparatus used by the present authors. The empirical contour (continuous curve) is compared with a theoretical one in Fig 2. The theoretical (dashed) curve is the result of superposition of the isotopic components of the cadmium line, each of which has a natural half-width of $2.6 \times 10^{-3} cm^{-1}$; in derivation of the theoretical contour the apparatus and the Doppler half-widths were also allowed for. The theoretical contour agrees quite well with the empirical one and an even better coincidence can be obtained by displacing "the centres of gravity" of the odd isotopic components towards lower frequencies by $\sim 0.7 \times 10^{-3} cm^{-1}$. The large natural width of the components of the 6438 Å line places a theoretical

ACCESSION NR: AR4034724 S/0124/64/000/003/B010/B010

SOURCE: Ref. sh. Mekhan., Abs. 3B69

AUTHOR: Korolev, F. A.; Zheyenbayev, Zh.

TITLE: High-frequency discharge with hydrodynamic compression for the purpose of excitation of spectra and for spectral analysis

CITED SOURCE: Dokl. Mezhvus. Nauchn. konferentsii po spektroskopii i spektr. analizu. Tomsk, Tomskiy un-t, 1960, 41-42

TOPIC TAGS: plasma physics, high-frequency discharge, high-temperature physics

TRANSLATION: Results are given of research on high-frequency discharge with hydrodynamic compression of plasma as a source of excitation for emission spectral analysis. The effect of compression is attained by using exhausting of gases from the discharge gap through a narrow duct of one of the electrodes. The temperature of the plasma is within the range of $(7-8 \cdot 10^4)^\circ$ K. High stability of radiation, the excitation of incandescence of lines with high energy of the upper levels, and other features of this type of discharge that are advantageous for practical purposes are noted.

Card 1/2

KOROLEV, F.A.; KUKANOV, A.B.

Producing short (on the order of 3.10^{-7} sec.) light pulses by means of a spark discharge and an oscilloscope. Izv.vys.ucheb. zav.;fiz. no.2:44-47 '60. (MIRA 13:8)

1. Moskovskiy gosuniversitet im. M.V.Lomonosova.
(Electric discharge lighting)

69967

S/170/60/003/01/09/023
B022/B007

24,3200

AUTHORS: Korolev, F. A., Klement'yeva, A. Yu., Meshcheryakova, T. F.

TITLE: Dielectric Multilayered Interference Light Filters for the Visual and Near Infrared Region of the Spectrum

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 1, pp. 55 - 61

TEXT: In the present paper the method of producing dielectric interference light filters having a position of the maximum of the light transmissivity band λ_m of the light filter given with an accuracy of $\pm$ 10 A and a sample surface uniformity of the order of 5 - 10 A, as well as the apparatus used, is described. The device for the production of dielectric coatings consists of a metal plate, the pre-vacuum pump RVN-20 the high-vacuum unit VA-05-01 and the diffusion pump of the type VN-5 The vacuum is measured by means of manometer tubes of the types LT-2 and LM-2 and the standard vacuometer of the type VIT-1 Also the motor of the type UMT-20 is used. Control of the multilayer light filter with respect to transmissivity is carried out by means of the device schematically represented (Fig. 1), where, among other things, a type PS-1.01 galvanometer with scale, having a sensitivity of 10^{-9} a/mm, is used. For the determination of the

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S/188/60/000/005/006/010
B019/B056

3. 1250 (1062, 1163, 1168)

AUTHORS: Korolev, F. A., Kireyev, P. S.

TITLE: Fabry-Pérot Standard From Quartz Crystals

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya 3, fizika, astronomiya, 1960, No. 5, pp. 53 - 59

TEXT: For the production of spectroscopes with a resolution of from $R = 5 \cdot 10^7$ to $5 \cdot 10^8$, the Fabry-Pérot standards with large interspacing between the mirrors and a high reflection capacity of the mirrors are necessary. For this purpose quartz crystals are especially well suited, but they have the disadvantage of birefringence. In a voluminous mathematical calculation, such conditions are endeavored to be found at which birefringence and the rotation of the polarization plane of light through the quartz have no influence. On the basis of the results obtained the authors find it possible to use quartz crystals in a spectroscope with high resolution; in this case the angle of inclination of the two quartz plates must be roughly 10^{-2}. According to the orientation of the plates

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Fabry-Pérot Standard From Quartz Crystals

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B019/B056

with respect to the optical axis of the crystal, $R \sim 10^6$ to 10^8 may be obtained. If the spectroscope consists of plane-parallel plates, birefringence and rotation of the polarization plane exert no influence upon the resolution. Standards in form of plane-parallel layers, which were covered on two sides with layers of mirror, permitted a resolution of $R = 10^4$. The testing of such standards in fine-structure investigations of spectral lines within the visible and ultraviolet spectral range showed very good results. There are 2 figures and 4 Soviet references.

ASSOCIATION: Kafedra optiki (Department of Optics)

SUBMITTED: February 26, 1960

68306

24,6600

SOV/51-8-1-1/40

AUTHORS: Korolov, F.A. and Kulikov, O.F.

TITLE: Investigation of the Ratio of Intensities of the Polarized Components of Radiation Emitted by a "Luminous" Electron

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 1, pp 3-7 (USSR)

ABSTRACT: Electromagnetic radiation of electrons accelerated (e.g. in synchrotrons) was considered theoretically by Ivanenko and Pomeranchuk in 1944 (Ref 1). Classical theory predicted that the spectrum of radiation emitted by accelerated electrons consists of closely spaced lines with frequencies $\omega_n = nc/R$, where n is an integer, c is the electron velocity along an orbit in an accelerator and R is the radius of that orbit. The amount of energy radiated by such an electron in a unit time is proportional to the fourth power of its kinetic energy. The frequency at which a maximum in the spectrum occurs is proportional to the third power of the kinetic energy. For electron energies greater than 30-50 MeV the frequency at which the maximum occurs, lies in the visible region, i.e. the radiation can be observed visually (hence the name: "luminous" electrons). The electron radiation is polarized, i.e. the electric vector is either parallel to the magnetic field and perpendicular

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Investigation of the Ratio of Intensities of the Polarized Components of Radiation Emitted by a "Luminous" Electron

to the electron velocity (π-component) or it is perpendicular to both the magnetic field and the electron velocity (σ-component). Each of these components has a characteristic angular distribution of intensity. The total intensity of the σ-component is greater than the total intensity of the π-component; the ratio of these total intensities should be equal to 7 (Ref 16). The present authors measured the ratio of intensities of the polarized components as a function of wavelength between 6000 and 4000 Å using 150, 200 and 250 MeV electrons. The electrons were accelerated in a synchrotron at the Physics Institute of Ac. Sc. U.S.S.R. (FIAN SSSR) which could produce electrons with energies up to 280 MeV. The optical part of the apparatus (Fig 1) consisted of a quartz spectrograph ISP-22 with a Wollaston prism (B) placed between a collimator mirror (O_2) and a Cornu prism (Π) of the spectrograph. A typical spectrogram is given in Fig 2, where 1 denotes the iron spectrum used for wavelength calibration, 2 denotes the spectrum of an incandescent lamp used for intensity calibration, 3 and 4 denote the spectra of the π- and σ-components of 250 MeV electrons. Because of its low dispersion the optical system failed to resolve individual lines and, therefore, radiation of "luminous" electrons appears as a continuous spectrum in Fig 2. Spectrograms were analysed

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9,5320

S/051/60/009/005/011/019
E201/E191

AUTHORS: Korolev, F.A., Klement'yeva, A.Yu., and Meshcheryakov, T.F.

TITLE: Interference Light Filters with a Transmission Band of 1.5 Å Width

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.5, pp 648-652

TEXT: Interference filters with a narrow transmission band (20-30 Å) were reported in earlier papers (Refs 1, 2). Later the transmission band was narrowed down to 8-10 Å in the middle of the visible region. In some applications an even narrower transmission band is required. The present paper gives a theoretical design calculation for interference filters with very narrow (1-3 Å) transmission bands. This theory was employed to produce multilayer dielectric light filters with transmission bands from 13 Å (55% transmission) to 1.5 Å wide (15% transmission). The transmission maxima occurred in the region 5600-5900 Å. These filters were made by alternate evaporation of ZnS and cryolite in vacuum. Their structure is given in column 2 of Tables 1 and 2, where H denotes a $\lambda/4$ layer with a high refractive index

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KOROLEV, F.A.; KIREYEV, P.S.

Fabry-Perot etalon made from crystalline quartz. Vest. Mosk. un. Ser. 3: Fiz., astron. 15 no.5:53-59 S-O '60. (MIRA 14:2)

1. Moskovskiy gosudarstvennyy universitet, kafedra optiki.
(Quartz crystals)

KOROLEV, F.A.

S/020/60/133/03/03/013
B019/B056

AUTHORS: Yershov, A. G., Korolev, F. A., Kulikov, O. F., Shkurskiy, B. I.

TITLE: Experimental Investigations of the Compression of the Electron Cluster in a 280-Mev Synchrotron /9

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 3, pp. 554 - 557

TEXT: In the present paper, a new method of studying the cross section of the electron cluster in acceleration is suggested, and several experimental results concerning the compression of the electron cluster are given. The experiments were carried out on the synchrotron of the Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Institute of Physics imeni P. N. Lebedev of the AS, USSR). Several formulas for calculating the betatron oscillations are mentioned and discussed. When carrying out the experiments the electron radiation in a porcelain chamber was observed through a window and photographed by means of a motion-picture camera. The blackening of the pictures was measured by means of a microphotometer,

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Experimental Investigations of the Compression of the Electron Cluster in a 280-Mev Synchrotron

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B019/B056

and Fig. 1 shews the photograph of an electron cluster and the results of measurement. The elliptical shape of the cluster corresponds to the cross section of the chamber of the accelerator. In Fig. 2 the experimental results are compared with the theoretical calculations of the dependence of the relative amplitudes of the oscillation types on the duration of acceleration. It is found that the radial dimension of the cluster of the accelerated electrons decreases rapidly according to the adiabatic law. Besides, the center of the cluster is compressed more rapidly than the peripheral parts. The perpendicular diameter of the cluster decreases approximately according to the adiabatic law. Further experiments showed that the compression of the electron cluster in a progressive electron drift is the same as when no premeditated drift of the electrons exists. The authors thank M. S. Rabinovich, Doctor of Physical and Mathematical Sciences, and Professor P. A. Cherenkov for making work on the accelerator possible. There are 2 figures and 7 references: 6 Soviet and 1 American.

VC

Card 2/3

KOROLEV, F.A.; YERSHOV, A.G.; KULIKOV, O.F.

Experimental study of electron oscillations in cyclic accelerators.
Dokl.AN SSSR 134 no.2:314-317 S '60. (MIRA 13:9)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavleno akad. N.N.Bogolyubovym.
(Electrons) (Particle accelerators)

5.5800 1043, 1273, 1136

S/051/61/010/003/004/010
E032/E514

AUTHORS: Korolev, F. A. and Kvaratskheli, Yu.K.

TITLE: The Plasmatron as a Light Source for Spectroscopic Investigations

PERIODICAL: Optika i spektroskopiya, 1961, Vol.10, No.3, pp.398-402

TEXT: The plasmatron employed is shown schematically in Fig.1. It takes the form of a closed chamber formed by metal rings 1 and 2 and the insulator 3. The arc is excited between the anode 5 and a graphite cathode 4 which is in the form of a washer. When argon is introduced into the chamber at a pressure of 0.3 to 0.5 atm, the discharge takes the form of the jet I, which is joined to the cathode by the thin conducting loop II and is surrounded by a corona made up of vapours of volatile substances III. A study was made of the possibility of exciting a spectrum of high melting point materials and also materials which are difficult to excite. The specimens to be investigated were in the form of slag powders mixed with Co_2O_3 and graphite powder. These were inserted into the aperture in the anode and the distance between the electrodes was chosen to be 3 mm. The spectra were

photographed in the ИСП-22 (ISP-22) spectrograph. A detailed description of the design of the plasmatron and its operation is given in Ref.13. Figs. 2 а, б and в show the external characteristics of the discharge (a - dependence of length ℓ and diameter d of the plasma on the current I at 0.7 atm and washer diameter 1.6 mm; б - dependence of ℓ and d on the diameter D of the aperture in the washer at 20 A and 0.7 atm; в - dependence of ℓ on the pressure p. These graphs show that temperature equilibrium exists throughout the plasmatron jet. The temperature was measured using the FeI and FeII lines for which the transition probabilities have been given by N. N. Sobolev (Ref.14). It was found that the temperature is very dependent on the gas pressure. Inspection of Figs. 2 to 4 will indicate that the plasmatron can be used for the spectral analysis of a wide class of high melting point materials and, in particular, slags. The plasmatron can also be used to determine the relative oscillator strengths. There are 7 figures, 2 tables and 16 references: 7 Soviet and 9 non-Soviet.

SUBMITTED: May 5, 1960
Card 2/4

KOROLEV, F.A.; YERSHOV, A.G.; KULIKOV, O.F.

Investigating variations in the axial and radial dimensions of an electron cluster in synchrotron acceleration. Zhur. eksp. i teor. fiz. 40 no.6:1644-1652 Je '61. (MIRA 14:8)

1. Moskovskiy gosudarstvennyy universitet.
(Photogrammetry)
(Electron beams)
(Synchrotron)

KOROLEV, Fedor Andreyevich; DROZHZHIN, Yu.N., red.; TATURA, G.L., tekhn. red.; KREYS, I.G., tekhn. red.

[Physics couse; optics, atomic and nuclear physics] Kurs fiziki; optika, atomnaia i iadernaia fizika. Moskva, Uchpedgiz, 1962. 503 p. (MIRA 15:6)

(Physics)

BABUSHKIN, Aleksandr Afanas'yevich, dots.; BAZHULIN, Pavel Alekseyevich, prof.; KOROLEV, Fedor Andreyevich, prof.; LEVSHIN, Leonid Vadimovich, prof.; PROKOF'YEV, Vladimir Konstantinovich, prof.; STRIGANOV, Arkadiy Romanovich, doktor fiziko-matem. nauk; GOL'DENBERG, G.S., red.; GEORGIYEVA, G.I., tekhn. red.

[Spectrum analysis methods]Metody spektral'nogo analiza. [By] A.A.Babushkin i dr. Pod red. V.L.Levshina. Moskva, Izd-vo Mosk. univ., 1962. 508 p. (MIRA 16:2)
(Spectrum analysis)

S/908/62/000/000/008/008
B163/B180

AUTHORS: Korolev, F. A., Yershov, A. G., Kulikov, O. F.

TITLE: Experimental investigation of the electron oscillations in the 680 Mev synchrotron

SOURCE: Uskoritel' elektronov na 680 Mev; sbornik statey. Ed. by Z. D. Andreyenko. Moscow, Gosatomizdat, 1962. 75-87

TEXT: The radiation of relativistic electrons with energies above 100 Mev can be directly observed or photographed, through an optical sight glass in the vacuum chamber. The system uses a mirror inside the chamber, for observation in the direction of the beam axis. With the high-speed camera СКС-1 (SKS-1), 150 to 4000 frames can be shot per second. A series of photographs, shows that at 100 Mev the beam has a slightly elliptic cross section with the major axis in the radial direction. When about 185 Mev is reached the second acceleration stage begins, and strong radial synchrotron oscillations appear, greatly increasing the radial major axis, while the beam cross section becomes dumbbell-shaped rather than elliptic. With increasing energy, the damping of synchrotron and betatron

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oscillations causes contraction, and the minimum radial cross section is found at 433 Mev, and 506 Mev for the vertical cross section. In the last stage the beam cross section is slightly increased again. The mean square radial and axial oscillation amplitudes were determined from the photographs, and compared with theoretical predictions. The theory of Kolomenskiy and Lebedev, which takes radiation damping into account, is found to be in good agreement with the experiment. Slight deviations are due to the experiments being made in a real synchrotron, while the theory assumes an ideal one. One reason for the undamped axial oscillations may be the warping of the magnetic symmetry plane in the real synchrotron with consequent amplification of axial oscillations under the influence of the quantum excitation of radial oscillations. Synchrotron oscillations appearing in between the first and second acceleration stages are damped more slowly than predicted. This may be because the theory assumes small amplitudes, while they are actually comensurate with the range of stability. The predicted radiation damping of electron oscillations and excitation of radial synchrotron and betatron oscillations by quantum fluctuations of the electron radiation at high energies are at any rate confirmed experimentally. There are 8 figures.

S/056/62/043/005/014/058
B102/B104

AUTHORS: Korolev, F. A., Kulikov, O. F., Yarov, A. S.

TITLE: Investigation of polarization properties of synchrotron radiation from high-energy electrons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 5(11), 1962, 1653-1656

TEXT: The synchrotron radiation emitted by electrons from the 680-Mev electron accelerator of the FIAN was investigated cinematographically (СКС-1 (SKS-1) camera, 500 frames per sec). The relative intensities and the angular distributions of the radiation were determined for both polarization components (σ,π) of the radiating electrons. The latter were obtained after microphotometric treatment of the pictures from representations of both components in a direction corresponding to the vertical (the angular distributions in the horizontal plane were very much distorted). The experimental results were compared with theoretical data from Sokolov's formulas (cf. A. A. Sokolov, Vvedeniye v kvantovuyu elektrodinamiku - Introduction to quantum electrodynamics-, Fizmatgiz,
Card 1/3

1958, (28) and agreed well except for the π-component at small electron energies (cf. Fig. 1): the 90° minimum that should exist according to theory was not observed, and in no case did the minimum reach zero as it should. As could be shown by measurements of the intensity ratios $I_{\pi}^{min}/I_{\pi}^{max}$ over the whole cycle, the absence of a zero minimum can be attributed to axial vibrations of the electrons. The angular distributions as well as the polarization characteristics observed agree with those found by A. A. Sokolov and I. M. Ternov (ZhETF, 31, 473, 1956). There are 3 figures and 1 table.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: June 21, 1962

Fig. 1. Angular distributions of intensities of σ- and π-components of radiation at different instants of acceleration for $\lambda = 4360\text{Å}$.
Solid lines: calculations according to Sokolov; I given in relative units.

ACCESSION NR: AP3005668 S/0168/63/000/004/0014/0017

AUTHOR: Korolev, F. A.; Gridnev, V. I.

TITLE: Optical and radio-frequency characteristics of a multiray interferometer with diffraction mirrors on thin dielectric plates

SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 4, 1963, 14-17

TOPIC TAGS: interferometer, diffraction mirror, metallic film diffraction mirror

ABSTRACT: A new type of Fabry-Perot interferometer with metallic film diffraction mirrors has been developed. The mirrors are mica plates 50 μ thick, coated with a silver film 200-300 Å thick. Such mirrors ensure total reflection of electromagnetic waves from 4 to 32 mm. The film is in the form of a diffraction grating. The resolving power (quality factor) of this interferometer with a mirror 70 mm in diameter, measured at 8 and 4 mm wavelengths, was approximately 200, almost 3 times as high as for a diffraction grating. For a mirror of the same diameter as a diffraction grating, the resolving power will be 50 times greater than that of the diffraction grating. The dependence of resolving power on the ratio of the mirror diameter to the wavelength and on the transmission coefficient of mirrors is shown, and the values

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ACCESSION NR: AP3005668

for the transmission coefficient of the interferometer depending on the transmission coefficient of the mirrors are measured. Orig. art. has: 2 figures, 7 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 10Nov62 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 002 OTHER: 002

Card 2/2

KOROLEV, F.A.; KROMSKIY G.I.; SKOKOV, I.V.

Use of the phase met od of multiwave interferometry for measuring low gas densities. Izv. vys. ucheb. zav.; fiz. no.5:61-63 '63.
(MIRA 16:12)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.

L 12932-63 BDS

ACCESSION NR: AP3004382 S/0109/63/008/008/1480/1483

AUTHOR: Korolev, F. A.; Gridnev, V. I. 46

TITLE: Multibeam interferometer used as a high-Q resonator

SOURCE: Radiotekhnika i elektronika, v. 8, no. 8, 1963, 1480-1483

TOPIC TAGS: multibeam interferometer, high-Q resonator, reflector diffraction grating, resonator, interferometer, diffraction grating

ABSTRACT: In order to build resonators with a high Q factor based on multibeam interferometers, interferometer reflectors were produced by the deposition of thin silver films on dielectric surfaces. These films were transparent to visible light but reflected longer waves. In order to obtain a quantity of interference beams, gratings with widths of 20 to 100 μ placed 1 to 5 mm apart were made on the films. The following conclusions were reached: 1) An interferometer with such reflectors represents an effective electromagnetic wave resonator in various spectral ranges. 2) The interferometer Q factor increases proportionally to the square of the ratio of reflector diameter to wavelength. 3) The interferometer permits optical adjustment of the beam and observation of the beam

Card 1/2

L 12932-63
ACCESSION NR: AP3004382

as the reflectors are shifted. 4) The energy transmitted by the interferometer-resonator depends on the ratio of the width of the reflector grating to the distance between individual lines. This same value determines the reflector transmission coefficient, which is proportional to this ratio, thereby determining the value of the Q factor. 5) The Q factor and other parameters may be varied within a wide range. Orig. art. has: 3 figures and 7 formulas.

ASSOCIATION: none

SUBMITTED: 09Nov62 DATE ACQ: 20Aug63 ENCL: 00

SUB CODE: GE NO REF SOV: 002 OTHER: 002

Card 2/2

KOROLEV, F.A.; KROMSKIY, G.I.; SKOKOV, I.V.

Amplitude method of multiple-beam interferometry. Opt. i spektr. 14 no.3: 416-418 Mr '63. (MIRA 16:4)
(Interferometry)

KOROLEV, F.A.; D'YAKOVA, S.M.; GRIDNEV, V.I.

Identification of radiations in the far infrared region using the method of residual rays. Vest. Mosk. un. Ser. 3: Fiz., astron. 18 no.3:3-5 My-Je '63. (MIRA 16:10)

1. Kafedra optiki Moskovskogo universiteta.

KOROLEV, F.A.; GRIDNEV, V.I.

Optical and radiofrequency characteristics of a multiwave interferometer with diffraction mirrors mounted on thin dielectric bases. Vest. Mosk. un. Ser. 3: Fiz., astron. 18 no.4:14-17 Jl-Ag '63. (MIRA 16:8)

1. Kafedra optiki Moskovskogo universiteta.
(Interferometer)

S/0051/64/016/002/0335/0340

ACCESSION NR: AP4020939

AUTHOR: Korolev, F.A.; Gridnev, V.I.

TITLE: Fabry-Perot interferometer with diffraction mirrors

SOURCE: Optika i spektroskopiya, v.16, no.2, 1964, 335-340

TOPIC TAGS: interferometer, Fabry-Perot interferometer, diffraction mirror interferometer, millimeter wave interferometer, far infrared interferometer, millimeter spectroscopy, far infrared spectroscopy

ABSTRACT: Prism type spectrographs are entirely unsuitable for working in the submillimeter and millimeter range; echelette type grating instruments can cover this range, but are inherently limited as regards resolution. Hence it was deemed of interest to develop a Fabry-Perot type interferometer for the millimeter range. In the present paper an interferometer employing reflectors in the form of multiple-gap metallic mirrors, prepared by vacuum evaporation onto quartz (or other) substrates, is described. The reflecting bands are silver films 200 to 300 Å thick. The apparatus is diagramed in the Enclosure. Some of the parameters (dispersion, effective dispersion region and resolution) of the experimental setup are given. A

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ACC.NR: AP4020939

resolution of 2160 for 8-mm waves with a separation of 108 mm between the reflectors was obtained. Thus, the potential resolution of such interferometers is tens or hundreds of times greater than the best resolution of diffraction instruments. The resolution increases in proportion to the square of the ratio of the reflector diameter to the wavelength. The resolution increases with separation between the reflectors and with increase of the reflection coefficient. In the case of the test apparatus, the transmission factor was 40-50% for a reflection coefficient of 95%. Orig.art.has: 11 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 16Nov62 DATE ACQ: 02Apr64 ENCL: 01

SUB CODE: PH,SD NR REF SOV: 000 OTHER: 002

Card 2/2

S/0051/64/016/004/0555/0558

ACCESSION NR: AP4032861

AUTHOR: Korolev, F.A.; Odintsov, V.I.; Fursova, Ye.V.

TITLE: Determination of the transition probability for the 736 Angstrom resonance line of neon

SOURCE: Optika i spektroskopiya, v.16, no.4, 1964, 555-558

TOPIC TAGS: optical transition probability, level width, oscillator strength, resonance line, neon, atomic spectrum

ABSTRACT: The transition probability for the 736 Å resonance line of neon was determined earlier by W.Schutz (Ann.Phys.18,705,1933) and H.Schillback (Ibid.18,721, 1933). They obtained a value of $(8 \pm 4) \times 10^8$ sec^{-1}, which corresponds to an oscillator strength $f = 0.2 \pm 0.1$. However, in view of the procedure employed, the reliability of this result is not sufficient for verifying the theoretical calculations of A.Gold and R.S.Knox (Phys.Rev.113,834,1959). Accordingly, the present measurements were undertaken to obtain a more reliable and accurate value. The transition probability for the Ne 736 Å line was determined with reference to the width of the departure level: $3s'[1/2]^0_1$. The natural width of this upper level was found by in-

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ACCESSION NR: AP4032861

vestigating the contours of several visible lines, specifically, the 6717 & 6266 and 6598 & 6163 Å pairs, all associated with transitions feeding this level and each pair departing from the same 3p level. The source was an atomic beam, which has the advantage that it allows of obtaining lines with a very small Doppler width. The spectroscopic equipment consisted of a sealed Fabry-Perot etalon and an ISP-51 spectrograph (the monochromator); the radiation was detected by means of a photomultiplier viewing an electron-optical image converter. The final average value obtained for the natural width of the $3s'[1/2]^0_1$ level is $(3.5 \pm 0.3) \times 10^{-3}$ cm^{-1}, which corresponds to a value of $(6.6 \pm 0.6) \times 10^8$ cm^{-1} for the transition probability and $f = 0.16 \pm 0.014$ for the oscillator strength. The corresponding theoretical values of Gold and Knox are 4.5×10^8 sec^{-1} and $f = 0.11$, i.e., somewhat lower. Orig.art.has: 3 figures.

ASSOCIATION: none

SUBMITTED: 15Jul63 DATE ACQ: 07May64 ENCL: 00

SUB CODE: OP NR REF SOV: 002 OTHER: 003

Card 2/2

L 43006-65 EWT(l)/EPA(s)-2/EEC(k)-2/EEC(t) Pt-7/Pl-4 IJP(c) GG

ACCESSION NR: AP5010113 UR/0109/65/010/004/0767/0768

AUTHOR: Korolev, F. A.; Gridnev, V. I.

TITLE: Radio-optical multibeam interferometer with diffraction mirrors on thin dielectric films

SOURCE: Radiotekhnika i elektronika, v. 10, no. 4, 1965, 767-768

TOPIC TAGS: interferometer, diffraction mirror, radio optical interforemeter

ABSTRACT: An improvement of the authors' interferometer described elsewhere is briefly reported. Instead of quartz or mica, a 100-μ plexiglas film is used as a backing for the silver diffraction mirror. A maximum transmission factor of 90% in the first order was obtained under these conditions: wavelength, 8 mm; mirror slot width, 0.1 mm; slot spacing, 4 mm, reflector diameter, 100 mm. A transmission-factor/mirror-spacing plot and theoretical considerations are supplied. Orig. art. has: 1 figure and 2 formulas. [03]

ASSOCIATION: none

SUBMITTED: 08May64 ENCL: 00 SUB CODE: OP,EM

NO REF SOV: 003 OTHER: 000 ATD PRESS: 3238

Card 1/1 mc

L 45641-65 EEC(b)-2/EWG(r)/EEC(k)-2/EWA(h)/EWA(k)/EWP(k)/EWT(l)/EWT(m)/EEC(t)/T/
FBD/EWP(i)/EWA(m)-2/EWP(e) Pf-4/Pi-4/Pl-4/Pm-4/Pn-4/Po-4/Peb SOTB/IJP(c) 25/
WH

ACCESSION NR: AP5011500 UR/0188/65/000/002/0035/0039

AUTHOR: Korolev, F. A.; Mamedzade, S. M.;

TITLE: The emission spectrum of a ruby laser and its dependence on the resonator properties

SOURCE: Moscow. Universitet. Vestnik. Seriya 3. Fizika, astronomiya, no. 2, 1965, 35-39

TOPIC TAGS: ruby laser, Fabry Perot interferometer, multiplex, resonator model

ABSTRACT: A study was made of the emission spectrum of a ruby laser (around λ = 6943 Å) as a function of the properties of the resonator. The experimental equipment (multiplex) is shown in Fig. 1 of the enclosure. The multiplex consisted of two simple Fabry-Perot etalons with expansion rings (one variable, the other a constant 2.3 mm) operating in the crossed and V-shaped modes. For a given position of the objective (L_{eff} = 300 mm), an interference pattern was set up at a point where the two interference bands cross. A hyperfine structure corresponding to various modes in the resonator was observed at these

Card 1/2

L 45641-65

ACCESSION NR: AP5011500

points. The observations were made by means of cameras using A-700 astronomical film. The ruby crystal was 11.8 mm in diameter and 120 mm long. The resonator consisted of two external dielectric mirrors mounted in special holders. The transmissivity of one mirror was 17% while the other mirror was opaque. The coefficient of reflection of the interferometer mirrors was 93—95% for the wavelength under investigation. The experiments were conducted when the pumping energy exceeded the threshold energy 2 times. The experimental data show that the spectral composition of stimulated emission from a ruby depends on the structure of the resonator. Thus, spectral lines obtained at various thicknesses of a V-shaped crossed multiplex (viz. 2.3 and 4 mm; 2.3 and 10 mm; 2.3 and 30 mm) were separated by 0.024, 0.023, and 0.008 cm^{-1}, respectively. These dispersions corresponded to resonators with lengths of 20.5, 21.12, and 62.12 cm, respectively. Orig. art. has: 6 figures. [YK]

ASSOCIATION: Kafedra Optiki, Moskovskiy gosudarstvennyy universitet (Chair of Optics, Moscow State University)

SUBMITTED: 21Feb64 ENCL: 01 SUB CODE: EC
NO REF SOV: 005 OTHER: 008 ATD PRESS: 3244

Card 2/3

L 4209-66 EWA(k)/FBD/EWT(1)/EWP(e)/EWT(m)/EEC(k)-2/EWP(1)/T/EWP(k)/EWA(m)-2/EWA(h)
SCTB/IJP(c) WG/WH

ACCESSION NR: AP5025163 UR/0188/65/000/005/0091/0092
621.378.32

AUTHOR: Korolev, F. A.; Mamedzade, A. M.

TITLE: Narrowing the emission band of a ruby laser with a complex resonator

SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 5, 1965, 91-92

TOPIC TAGS: ruby laser, laser, light interference, light filter, luminescence quenching

ABSTRACT: It is shown that multiple interference color filters made up of two single filters with nearly equal effective thicknesses can be used for narrowing the emission band in a ruby laser with a multiplex resonator. When the incident light is normal to the reflecting surfaces of the mirrors, fulfillment of the condition

$$\frac{n_1 h_1}{n_2 h_2 - n_1 h_1} = m,$$

results in quenching of m excess emission maxima in each of the light filters, where $m \leq 10$, n_1, n_2 and h_1, and h_2 are the indices of refraction and geometric thicknesses re-

Card 1/2

L 13651-66 EWT(1) WG

ACC NR: AP6002084 SOURCE CODE: UR/0139/65/000/006/0075/0079

50 B

AUTHOR: Korolev, F. A.; Fan Van Tkhik

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Measurement of the coefficients of coherent intensification of neon lines in a helium-neon mixture 21,44,55

SOURCE: IVUZ. Fizika, no. 6, 1965, 75-79

TOPIC TAGS: laser emission coherence, helium, neon, emission line, stimulated emission

ABSTRACT: The authors investigated the selective excitation of neon atoms at levels close to the 2^1s level of metastable helium atoms, energy transfer from which to normal neon atoms results in population inversion of many neon 2s levels investigated by others (R. A. Macfarlane et al. Proc. IRE v. 50, 2111, 1962, and earlier papers). The study was undertaken because the earlier results have shown that in addition to the 6328 Å line, which is very strongly amplified in the presence of helium, other lines with upper levels $3s_3$, $3s_4$, $3s_5$, and $4d_3$ are also amplified. The authors then investigated the populations of the lower levels 2p in the presence of helium. To check on the assumption that other lines with upper levels 3s and 4d should have an population inversion, the authors developed a new method, in which the line-intensity ratio is determined while varying the length of the luminescent column inside a Fabry-Perot interferometer. The method is briefly described. A tube filled

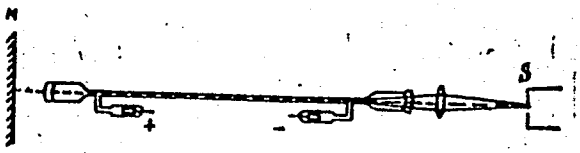
Card 1/2

2

L 13651-66

ACC NR: AP6002084

with a helium-neon mixture at ~2 mm Hg, with confocal mirrors of radius of curvature approximately 1 meter, was used. The mirror served simultaneously as the entrance and exit windows of the tube. The tube diameter was approximately 5 mm. To check on the amplification of certain lines under conditions when the 6328 Å line is at the threshold of coherent generation, an additional mirror M was employed (Figure). The pressure and current were chosen such that coherent generation of the 6328 Å line started only when the mirror M was operating, and when the latter was covered with black paper, the generation ceased. In this experiment this occurred at pressures ~2 mm Hg and current ~10 ma. The radiation from the tubes was focused on the slit of a spectrograph (DFS-3) and photographed on film. Results were obtained for 43 lines corresponding to the various transitions. In the case of the 2p--1s transitions no amplification was obtained. In the case of the lines with 3s--4p and 4d--3p transition, the amplification is obtained, in agreement with earlier data by the authors. The amplification coefficients for the different lines were compared under conditions when no generation occurred at any lines. It is pointed out in the conclusion that the population can differ greatly if generation occurs at any of the lines. Orig. art. has: 1 figure, 7 formulas, and 2 tables. [02]



SUB CODE: 20/ SUBM DATE: 07Mar64/ ORIG REF: 001/ OTH REF: 007/ ATD PRESS 4187

Card 2/2 HW

KOROLEV, F.A.; KULIKOV, O.F.; YAROV, A.S.

Studying the emission and acceleration of electrons in a synchrotron by means of high-speed motion-picture phogography. Usp.nauch.fot. 9:192-197 '64.

(MIRA 18:11)

KOROLEV, F.A.; FAN-VAN-TKHIK

Measuring the coefficients of coherent intensification of the neon line in a helium - neon mixture. Izv. vys. ucheb. zav.; fiz. 8 no.6:75-79 '65. (MIRA 19:1)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova. Submitted March 7, 1964.

L 1729-66 EWT(m)/EWP(i)/EWP(t)/EWP(b) IJP(c) JD

ACCESSION NR: AP5022440 UR/0109/65/010/009/1718/1719
539.216.22:535.669.22

AUTHOR: Korolev, F. A.; Gridnev, V. I.

TITLE: Transmission of electromagnetic waves by thin silver films

SOURCE: Radiotekhnika i elektronika, v. 10, no. 9, 1965, 1718-1719

TOPIC TAGS: microwave technology, EM wave generation, silver, semiconductor thin film, microwave transmitter

ABSTRACT: The transmission coefficients of thin silver films were studied for the 0.8-, 1.2-, and 3.2-cm waves. The films were vacuum deposited on mica and fused quartz substrates. Film thickness varied from 10 to 300 Å. The results indicated that the experimental transmission coefficients were higher than the theoretical for smaller film thicknesses and lower for larger thicknesses (see Fig. 1 of Enclosure). Orig. art. has: 1 figure and 5 formulas. [TS]

ASSOCIATION: none

SUBMITTED: 08Dec64 ENCL: 01 SUB CODE: SS, EC
NO REF SOV: 003 OTHER: 006 ATD PRESS: 4096

Card 1/2

L 1729-66

ACCESSION NR: AP5022440 ENCLOSURE: 01

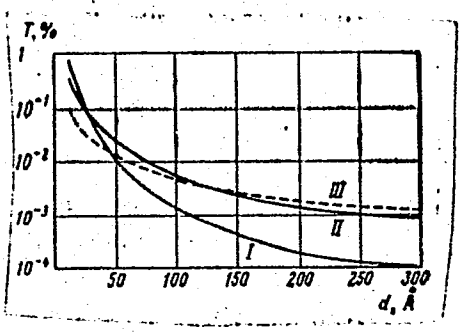


Fig. 1. Transmission coefficient (T) of silver films for microwaves as a function of film thickness (d)

I - Experimental curve; II and III - theoretically determined curves.

Card 2/2

L 2828-66 EWT(1)/EWT(m)/EPF(c)/EFA(w)-2/EWP(t)/EWP(b)/EWA(m)-2 IJP(c)

ACCESSION NR: AP5016168 JD/AT

UR/0051/65/018/006/0968/0973
535.338:546.291

AUTHOR: Korolev, F. A.; Odintsov, V. I.

TITLE: Investigation of the width of helium spectral lines with electron excitation in an atomic beam

SOURCE: Optika i spektroskopiya, v. 18, no. 6, 1965, 968-973

TOPIC TAGS: helium, line broadening, excitation spectrum, line width, Doppler effect, hyperfine structure

ABSTRACT: The widths of several isolated helium lines emitted by an atomic beam were investigated experimentally. The apparatus employed was described elsewhere (Opt. i spektr. v. 10, 403, 1961). The results disclosed an appreciable Doppler broadening of the lines, due to collisions between the atoms and the exciting electrons. This broadening was calculated theoretically for the helium lines 4922 A (2^1P_1--4^1D_2), 5016 Å (2^1S_0--3^1P_1), 5047 Å (2^1P_1--4^1S_0), 6678 Å (2^1P_1--3^1D_2), 7281 Å (2^1P_1--3^1S_0), and for all the components of the H_α line. The natural width of the 2^1P_1 level was determined, together with the associated transition probability for the helium 5804 Å resonant line. The value of the width was found to be $(9.8 \pm 0.5) \times 10^{-3}$ cm^{-1}. The transition probability was found to be (1.85 ±

Card 1/2

L 2828-66

ACCESSION NR: AP5016168

0.10) x 10^9 sec^{-1}, corresponding to an oscillator strength of 0.28 ± 0.02. For the 6678 Å line of He^4, the corresponding quantities are 8.9 x 10^{-3} cm^{-1}, 1.68 x 10^9 sec^{-1}, and 0.26 ± 0.012. The hyperfine structure is estimated to be 10 x 10^{-3}, 3 x 10^{-3}, and 10 x 10^{-3} cm^{-1} for the 5047, 6678, and 7281 Å lines of He^3, respectively. Allowance for the hyperfine structure reduces the natural width by as much as 25%. Orig. art. has: 2 formulas and 2 tables.

ASSOCIATION: None

SUBMITTED: 11May64 ENCL: 00 SUB CODE: OP

NR REF SOV: 002 OTHER: 013

BVK

Card 2/2

KOROLEV, F.A.; ODINTSOV, A.I.; MITSAY, V.N.

Some characteristics of a helium-neon laser. Opt. i spektr. 19 no.1:71-77 Jl '65. (MIRA 18:8)

KOROLEV, F.A.; MAMEDZADE, S.M.

Narrowing of the emission band of a ruby laser with a complex resonator. Vest. Mosk. un. Ser. 3: Fiz., astron. 20 no.5:91-92 S-O '65. (MIRA 18:11)

1. Kafedra optiki Moskovskogo universiteta. Submitted February 25, 1965.

L 26680-66 FBD/EWT(l)/EWT(m)/EEC(k)-2/T/EWP(k)/EWA(h) IJP(c) WH/WG

ACC NR: AP6007177 SOURCE CODE: UR/0188/66/000/001/0105/0109

AUTHORS: Korolev, F. A.; Mamedzade, S. M. 66 B

ORG: Department of Optics, MGU (Kafedra optiki MGU)

TITLE: Separation of monochromatic ruby laser radiation with the aid of a wedge shaped multiplex interferometer with 'opposing dispersion'

SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 1, 1966, 105-109

TOPIC TAGS: ruby laser, laser radiation, spectrum analysis, line spectrum, continuous spectrum, interferometer, emission spectrum

ABSTRACT: The wedgelike multiplex interferometer with 'opposing dispersion' was originally described by one of the authors (Korolev, Vestn. Mosk. un-ta no. 8, 101, 1953) and consists of two simple Fabry-Perot interferometers in tandem. The method of separating a radiation component by means of such a system (Fig. 1) is explained and its theoretical basis and operation are briefly described. It was used to investigate the emission spectrum from a ruby laser and to separate

Card 1/2 UDC: 535.854:621.378.325.0014

L 26680-66

ACC NR: AP6007177

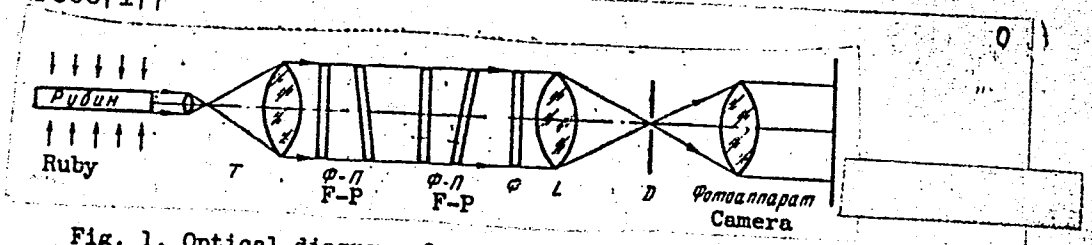


Fig. 1. Optical diagram of setup with wedge multiplex-interferometer

monochromatic components from its radiation as well as from the radiation of a mercury lamp. The ruby-laser radiation components were separated both in the case when the resonator was made up of the mirror end faces of the crystal ruby itself (from the continuous spectrum) and when the mirror was made up of surfaces of specially prepared glass cylinders (line spectrum). A check has shown that the separated component does not contain extraneous frequencies and it is concluded that the procedure described is suitable for the separation of monochromatic radiation from either a continuous or a line spectrum. Orig. art. has: 6 figures and 2 formulas.

SUB CODE: 20/ SUBM DATE: 31Oct64/ ORIG REF: 006/

Card 2/2 BLG

L 33392-66 EEC(k)-2/EWP(k)/EWT(l)/EWT(m)/FBD/T/EWP(e) IJP(c) WH/WG

ACC NR: AP6011541 SOURCE CODE: UR/0105/66/000/004/0001/0011

AUTHOR: Korolev, F. A.

63
B

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Generators and amplifiers of coherent light

SOURCE: Elektrichestvo, no. 4, 1966, 1-11

TOPIC TAGS: laser, gas laser, ruby laser, laser theory

ABSTRACT: A general description based on well-known published sources and intended to familiarize engineers with laser problems covers the following points: invention of laser; principle of operation; conditions for generation of coherent radiation; laser types (solid-state, gas, semiconductor); characteristics of ruby lasers; characteristics of gas lasers; characteristics of semiconductor lasers; laser resonators; laser-generated modes; laser amplifiers and their excitation; high-power pulsed laser; laser uses. Principal sketches, diagrams, photographs, and formulas are given. Orig. art. has: 16 figures and 37 formulas.

SUB CODE: 09,20/SUBM DATE: 04May65 / ORIG REF: 03

Card 1/1 UDC: 535.14

ACC NR: AP7007041 SOURCE CODE: UR/0202/66/000/004/0016/0022

AUTHOR: Korolev, F. A.; Odintsov, A. I.; Kelov, K.

ORG: Physico-Technical Institute, AN TurkSSR (Fiziko-tekhnicheskoy institut AN TurkSSR)

TITLE: Influence of resonator misalignment on the output power of a neon-helium laser

SOURCE: AN TurkSSR. Izvestiya. Seriya fiziko-tekhnicheskikh, khimicheskikh, i geologicheskikh nauk, no. 4, 1966, 16-22

TOPIC TAGS: gas laser, laser R and D

SUB CODE: 20

ABSTRACT: An investigation of the extent to which disruption of ideal alignment of a laser resonator mirror system influences the properties, primarily the output power, of the oscillation. A neon-helium laser generating in the visible light at 6328Å was investigated. The experimental setup consisted of a laser, a device for measuring small inclination angles of the mirror, a vacuum system and a power supply. The discharge tube of the laser was 4 millimeters in diameter and 88 centimeters long. The generator power as a function of inclination of one of the mirrors was investigated with various lengths of laser resonator. The least length was 133 centimeters. It was determined that the requirements for alignment of mirrors in a laser with spherical mirrors varies considerably. In the case of generation of many transverse types of oscillation, considerable (up to 3 minutes of arc) misalignment of the mirrors can be tolerated. In other cases, the maximum tolerable misalignment may be less than one minute. The limiting angle decreases with decreasing generator power and with

Card 1/2 UDC: 621.375.9:535

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ACC NR: AP7007041

increasing resonator length. Misalignment is much more critical in a resonator with plane parallel mirrors. Orig. art. has: 5 figures and 6 formulas. [JPRS: 38,330]

Card 2/2

L 9192-66 EWT(l)/EWT(m)/EWP(b)/EWP(t) IJP(c) JD

ACC NR: AR6000110 SOURCE CODE: UR/0058/65/000/008/D023/D023

SOURCE: Ref. zh. Fizika, Abs. 8D179

AUTHORS: Korolev, F. A.; Odintsov, V. I.; Fursova, Ye. V.

ORG: none

TITLE: Determination of the probability of transition from the $1s_2$ level of neon to the ground state from the natural width of the spectral lines

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, t. 2, vyp. 1, 1964, 273-280

TOPIC TAGS: line width, spectral line, transition probability, neon, electron bombardment

TRANSLATION: An investigation was made of the contours of several spectral lines of neon and the probability of transition from the $1s_2$ level to the ground state was estimated from the natural width of the spectral lines. The light source was an atomic beam of neon, excited by electron bombardment. The high-resolution instrument was a Fabry-Perot etalon. The glow was recorded with the aid of an electrooptical converter. The natural width of the $1s_2$ level was found to be 4×10^{-3} cm^{-1}, corresponding to a transition probability 0.75×10^9 sec^{-1}.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000

Card 1/1

KOROLEV, F.F.

BULATOV, N.P., redaktor; VOVSI, I.I., redaktor; KOROLEV, F.F.; MALYSHEV, [illegible] MEL'NIKOV, M.I.; SKATKIN, M.N.; STAVROVSKIY, A.Ye., SHIBANOV, A.A.; SHCHUKIN, S.V.; GONCHAROV, N.K.; redaktor; TITKOV, P.V., redaktor; BARULIN, V.P., tekhnicheskiy redaktor.

[General technical training in secondary schools; work practice of city and rural schools] Politekhnicheskoe obuchenie v srednei shkole; iz opyta raboty gorodskikh i sel'skikh shkol. Moskva, 1956. 279 p. (MLRA 9:5)

1.Akademiya pedagogicheskikh nauk RSFSR, Moscow.
(Technical education)

KOROLEV, FEDOR FILIPPOVICH

N/5
830
.K6

USPEKHI NARODNOGO OBRAZOVANIYA V SSSR ZA 40 [I. E. SOROK] LET [PROGRESS OF PUBLIC EDUCATION IN THE USSR FOR 40 YEARS] MOSKA, "ZNANIYE", 1957.

46 P. (VSESOYUZNOYE OBSHCHESTVO PO RASPROSTRANENIYU POLITICHESKIKH I NAUCHNYKH ZNANIY, SER. 2, NO. 30)

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KOROLEV, F F

Novaya sistema narodnogo obrazovaniya v SSSR: Sbornik dokumentov I statey. Ot. red. N.K. Goncharov I F.F. Korolev. Moskva, Izd-vo APN RSFSR, 1960.
602 p.
On flyleaf: Akademiya Pedagogicheskikh Nauk RSFSR.

L 35537-65 EWT(d)/EWT(l)/EWT(m)/EPF(c)/EWG(v)/EWP(c)/EWP(v)/EPR/T/EWP(t)/EWP(k)/
EPA(bb)-2/EWP(b)/EWP(l) Pe-5/Pf-4/Pr-4/Ps-4 IJP(c) JD/WW

ACCESSION NR: AP5008221 S/0286/65/000/005/0085/0085

AUTHORS: Tret'yakov, V. M.; Korolev, F. F.; Yevteyev, B. I.; Sankovskiy, A. A. 50

TITLE: A method of testing products for hermetic seal/ Class 42, No. 168925 B

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 5, 1965, 85

TOPIC TAGS: sealing, hermetic sealing, leak detector, helium, glow discharge

ABSTRACT: This Author Certificate presents a method of testing products for hermetic seal with helium under high pressure. For more accurate determination of leakage in a product, a glow-discharge is produced in the helium molecules leaking through the openings in the product (with the help of an electric field). The glow discharge produces a luminescence which indicates the presence of leaks.

ASSOCIATION: Organizatsiya gosudarstvennogo komiteta po aviatsionnoy tekhnike SSSR (Enterprise of the State Committee for Aviation Technology, SSSR)

SUBMITTED: 14Jun63 ENCL: 00 SUB CODE: IE

NO REF SOV: 000 OTHER: 000

Card 1/1

KOROLEV, F. I.

Wire Rope

Reconditioning tying wire for log rafts. Les. prom. 12 no. 3 1952.

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

0401 1601

L 5098-66 EWT(d)/EWP(c)/EWP(w)/T/EWP(k)/EWP(h)/EWP(l)/ETC(m) WW

ACC NR: AP5025311 SOURCE CODE: UR/0193/65/000/009/0025/0026

AUTHOR: Lysenkov, Yu. I.; Korolev, F. I.

ORG: none 44 55 44 55

32
B

TITLE: UKP-2 ultrasonic flaw detector for small-diameter steel wire 44 55 14 17

SOURCE: Byulleten' tekhniko-ekonomicheskoy informatsii, no. 9, 1965, 25-26

TOPIC TAGS: wire, steel wire, wire flaw, flaw detection, flaw detector, ultrasonic flaw detector

ABSTRACT: The UKP-2 ultrasonic tester for evaluating the structural homogeneity of and detecting surface defects in steel wires 0.5—3.0 mm in diameter and 1000—5000 mm long has been developed. The wire is irradiated through a liquid medium obliquely to its axis with longitudinal, transverse, and torsional-ultrasonic waves causing so-called "wire waves", which are very sensitive to surface and inner defects in the wire. The waves reflected from the defects produce impulses on the detector screen. The UKP-2 makes it possible to detect surface defects as shallow as 0.01 mm and small inclusions and to root out defective wire during processing. Orig. art. has: 1 figure. [WW]

SUB CODE: IE,GP/SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000/ ATD PRESS: 4134

Card 1/1 Hd

UDC: 681.2-868.6:621.9-422

0901 0643

KOROLEV, F. K.

Korolev, F. K. "Rated stresses in the links of link gears used in [metal-working] machines," Nauch. zapiksi Khar'k mekhan.- Mashinostroit. in-ta, Vol.IX, Issue 1, 1948, p. 99, 116 ---Bibliog: 7 items

SO: U-3566, 15, March, 53 (Letopis 'Zhurnal 'nykh Statey, No. 14, 1949).

KOROLEV, F.K., dotsent, kandidat tekhnicheskikh nauk; BONDAR', M.P., kandidat tekhnicheskikh nauk, redaktor; GAL'PERIN, Ye.I., inzhener, retsenzent; KHAYMOVICH, Ye.M., professor, doktor tekhnicheskikh nauk, retsenzent; NESTERENKO, D.M., tekhnicheskiy redaktor

[Calculations for transverse planing machines] Raschet poperechno-strogal'nykh stankov. Kiev, Gos. nauchno-tekhn. izd-vo mashino-stroit. lit-ry, 1952. 100 p. [Microfilm] (MLRA 7:10)
(Planing machines)

KOROLEV, F.K.

Theory of the turning of a multiposition table of a machine-tool unit. Trudy KhPI, Ser.mash. 19 no.5:61-74 '59. (MIRA 14:9)
(Machine tools)

KOROLEV, F.K.; TSYMBAL, I.L.

Modernizing multiple-position swivel table of semiautomatic machine-tool units. Stan.i instr. 31 no.12:24-25 D '60. (MIRA 13:11)
(Machine tools)

KOROLEV, F.K.; PESTUNOV, V.M.

Device for measuring the acceleration of rotating shafts.
Mashinostroenie no.4:116 Jl-Ag '62. (MIRA 15:9)
(Shafting) (Electronic instruments)

KOROLEV, F. K.; PESTUNOV, V. M.

Causes for the breakdown of drills in machining with power heads. Mashinostroitel' no.10:25 O '62. (MIRA 15:10)

(Drilling and boring)

GRISHKO, Yu.A.; KAS'YANOV, O.N.; KOROLEV, F.E.

How to prevent the breakdown of drills and power packs.
Mashinostroitel' no.7:32-33 Jl '64. (MIRA 17:8)

KOROLEV, F.L., gvardii polkovnik meditsinskoy sluzhby; LITVINENKO, N.M., podpolkovnik meditsinskoy sluzhby; SHLYAKHOVOY, B.Ye., mayor meditsinskoy sluzhby; NATSVLISHVILI, G.A., starshiy leytenant meditsinskoy sluzhby.

Effect of necrectomy on the course of thermal burns; experimental studies. Voen-med. zhur. no.2:23-27 F '56 (MLRA 10:5)
(BURNS, experimental,
eff. of nephrectomy) (Rus)
(KIDNEYS, effect of excision,
on exper. burns) (Rus)

KOROLEV, Fadey Petrovich; YEMEL'YANOV, V.T., polkovnik, red.; VOLKOVA, V.Ye., tekhn.red.

[Reconnaissance by observation] Razvedka nabliudeniem. Moskva, Voen.izd-vo M-va obor.SSSR, 1959. 114 p. (MIRA 13:5)
(Military reconnaissance)

KOROLEV, K.P., doktor tekhn.nauk; SLOMYANSKIY, A.V., doktor tekhn.nauk

Requirements for the new high-speed locomotives. Zhel.-dor.transp. 45 no.12:33-39 D '63. (MIRA 17:2)

SOV/129-59-2-1/16

AUTHORS: Kuritsyna, A.D., Candidate of Technical Sciences, Korolev, F. V. and Korsunskaya, K.N., Engineers

TITLE: Diffusion Processes in the Bimetal "Steel-Aluminium Alloys" During Heat Treatment (Diffuzionnyye protsessy v bimetalle "stal'-alyuminiyevyye splavy" pri termicheskoy obrabotke)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 2, pp 2-7 (USSR)

ABSTRACT: Anti-friction bimetal, used for producing liners of bearings of I.C. engines, is manufactured by rolling with high rates of reduction (50-60 to 80%) at room temperature and also at 250-300°C, i.e. at temperatures below the hot working temperature of steel. As a result of this technological process the steel base of this bimetal strip becomes considerably hardened and, as can be seen from the graph, Fig 1, assumes a high anisotropy of its mechanical properties. This complicates considerably processes of stamping of bearing liners from such strip. Experience has shown that in order to re-establish the normal stamping properties of the liners, the bimetal strip should be annealed at a

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temperature which ensures full recrystallization of the steel and complete re-establishment of its mechanical properties. However, such heat treatment would result in a loss of the adhesion between the steel and the aluminium alloy. Therefore, it is necessary to select the chemical composition of the sub-layer in such a way that annealing of the bimetallic strip is practicable. The authors investigated the progress of diffusion at the boundary between the steel and the aluminium alloy and its dependence on external factors, i.e. temperature and duration of holding at a given temperature and also the composition of the metals in contact. These studies were carried out at junction zones of Steel 08 with the alloy ASS-6-5 and of Steel 08 coated with aluminium AV00 and the alloy ASS-6-5, the latter being a new aluminium base anti-friction alloy. In the second case the diffusion processes were studied at the boundary between the steel and the aluminium as well as at the boundary of the aluminium and the alloy ASS-6-5. The latter

studies were necessary for establishing the minimum permissible thickness of the intermediate aluminium layer. Furthermore, the possibility was studied of applying high speed heat treatment regimes which exclude the second stage of diffusion, namely, volume diffusion; the first stage being surface diffusion. It was thereby assumed that the forming very thin intermediate layer of iron aluminides, which are located on a plastic base, will not affect appreciably the flaking off of the aluminium alloy from the steel. On the basis of the carried out experiments, it was concluded that the processes of diffusion at the area of contact of the bimetallic strip and the aluminium alloy ASS-6-5 depends on the temperature and the heating time and consists of various stages. During the first (low temperature) stage an intermediate layer forms as a result of very small displacements of atoms of iron and aluminium, caused by the transition from the random distribution of the atoms along the surface of contact towards an ordered distribution.

This results in the formation of an intermediate point-shaped layer of the reaction phase of a small thickness which depends on the non-uniformity of the real processes of plastic deformation. The second stage is characterized by the formation of additional interaction zones, which form as a result of an increase in the holding time or the temperature and a consequent slightly larger displacement of the atoms than in the first stage; this brings about formation of phases of iron aluminides in the form of a thin layer covering almost the entire surface of contact between the steel and the alloy (Fig 4). A further increase in temperature (550 to 600°C for the Steel 08-alloy ASS-6-5 and for Steel 08-pure aluminium) brings about the third stage of the process, which is associated with the higher speed of diffusion of aluminium in the layer of the new intermediate phase, whereby, in the aluminium layer there will be a relatively wide zone of loosened sections caused by unilateral diffusion and

Diffusion Processes in the Bimetal "Steel-Aluminium Alloys" During Heat Treatment

it is this which produces the separation of the aluminium alloy from the iron aluminides which form as a result of diffusion. The fourth stage of the diffusion phenomena at the boundary steel-aluminium takes place at temperatures of 650°C and higher; at these temperatures there is a mutual diffusion between aluminium and iron but the diffusion of the aluminium is higher than the diffusion of the iron and the growing phase penetrates deep into the steel. The authors of this paper established experimentally that the speed of "reactive" diffusion at the contact zone iron-aluminium is influenced by silicon and antimony; antimony speeds up the reaction by reducing the initial temperature of the process to 510°C, whilst Si slows down the process. The authors also studied the influence on the speed of the diffusion processes of metals of the transient group (Ni, Mn, Co etc.), i.e. metals with variable valency in the alloys. In selecting alloying elements for increasing the critical temperature of formation of aluminides at the boundary of the two-phase region, the hypothesis of A. A. Bochvar (Ref 8) was taken into

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consideration, according to which diffusion processes will be the slower the more complex the composition and the structure of the rejected phases and the more these differ in composition and structure from the initial solid solution. For studying the relations governing diffusion the following additions to the aluminium were chosen: Mn, Mg, Cu, Ni, Fe, Si and the combinations of Si + Mn and Si + Co in various quantity ratios. These materials were cast, chemically analysed and, following that, the ingots were rolled into strip. Strip made of the Steel 08 was clad with these alloys and the cladded metals were heat treated. During heating to 525°C for a duration of 30 mins flaking off of the aluminium layer occurred in the case of it being alloyed with Mn, Mg, Cu, Ni and Fe. If the heat treatment was effected at 575°C for 30 mins, flaking off was observed only for the alloys containing Si. Heat treatment at 575°C for four hours led to the formation of a layer in

 the case of the alloys Al-Si-Mn and, to a very slight

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extent, in the case of alloys of aluminium with Si and Co. During 1956-1958 the authors repeatedly verified the influence of heat treatment on bimetal consisting of steel with a base of the following chemical composition: 0.5% Mn, 0.5% Si, rest Al. This bimetal strip was produced by cladding a strip of 10 + 0.1 mm thick ASS-6-5- alloy on one side with a 1 mm thick (steel) layer. This combination of a total thickness of 11 mm was rolled to obtain a final combined thickness of 2 and 2.5 mm respectively. The first pass, with a reduction of 40% was effected in the cold state, the subsequent second and third passes down to the final dimension were effected after a re-heat to 250°C. The bimetallic strip produced by this method was investigated from the point of view of presence of an intermediate layer of a hard and brittle phase of iron aluminides. Metallographic investigation of the zone of contact and of the sub-zone at an amplification of 1250 times showed complete absence of aluminides; diffusion of antimony

 intc the sub-layer could not be detected either. Results

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obtained in testing the strength of the joint between the steel and the alloy after annealing confirmed the high quality of the strip produced by this method. There are 7 figures and 8 references, 7 of which are Soviet, 1 English.

ASSOCIATION: Institut Mashinovedeniya AN SSSR (Institute of Mechanical Engineering, Ac.Sc., USSR) and Moskovskiy metalloprokatnyy zavod (Moscow Metal Rolling Works)

S/122/60/000/012/003/018
A161/A130

AUTHORS: Rudnitskiy, N. M.; Kuritsyna, A. D., Candidates of Technical Sciences; Korolev, F. V., and Korsunskaya, K. N., Engineers

TITLE: Investigation of steel - high-Sn aluminum alloy bimetal

PERIODICAL: Vestnik mashinostroyeniya, no. 12, 1960, 33 - 35

TEXT: The aluminum-base bearing alloy most-used in the USSR is AOM(ASM) that, like other of this kind, is comparatively cheap, has high resistance to fatigue pitting and corrosion, but can only be used for low-speed shafts because of scoring at insufficient lubrication. The ASM is used for tractor engine crankshaft bearings with 2,000 rpm, and was a failure in automobile crankshafts. The authors point out that the problem can be solved by coating aluminum alloy with a special "work-in" 15 - 20 micron layer of an alloy of lead with tin or with indium, or simply pure tin, as is practiced by General Motors, U.S.A. Bearings with bushings coated with aluminum alloy with 20 and 30% Sn had been tested in 1959 on "Pobeda" cars, and wear of crankshaft journals was same as in work with babbit-lined bearings, but the bond of lining with the base was poor and the coating layer separated after 20 - 40 thousand km, despite an interlayer of AMK(AMK) al-

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Investigation of steel - high-Sn aluminum alloy bimetal

loy. The AMK alloy contains (%): 0.5 - 1.0 Si; 0.5 - 1.0 Mn, the rest is Al. It was stated in experiments that rolling with 60 - 80% reduction practically did not have any effect on the bond, and rolling with higher reduction destroyed bimetal; annealing of bimetal with Sn in aluminum antifriction alloy weakened bond. Raised Sn content in antifriction alloy had a strong negative effect on the bond. The experimental data demonstrated that bond between high-Sn aluminum and base can be considerably improved by reducing the Sn content in the surface of blanks preliminarily to rolling together with base. The authors have developed a method for squeesing liquid Sn out of about 1 mm deep surface layer of high-Sn aluminum alloy at 300 - 400°C. The result is Sn content in the surface reduced from 20 - 30% to 2 - 3%, and Sn distribution in metal as shown in Fig. 3. This alloy contained 20% Sn, the curve shows Sn distribution in 1 mm depth on the surface. Annealing at 550°C needed for recrystallization of steel band improved bond very much when the high-Sn layer was so treated, and mechanical strength in the joint was higher than of the antifriction alloy. Blanks of high-Sn aluminum alloy with a layer of AMK coated on were annealed at 350°C and rolled together with armco iron with about 60% reduction. Bimetal bands were subsequently finally rolled to gage and annealed at 500 - 570° to recrystallize steel. It is expected that the method will make aluminum antifriction alloys applicable for a wider range of friction couples.

Card 2/3

89421

S/136/61/000/002/002/006
E021/E335

18.1200

AUTHORS: Kuritsyna, A.D., Korolev, F.V., Korsunskaya, K.N. and Rudnitskiy, N.M.

TITLE: The Technology of the Production of a Bimetal of Aluminium Antifriction Alloys and Steel

PERIODICAL: Tsvetnyye metally, 1961, No. 2, pp. 66 - 68

TEXT: The technology of the process of producing bimetals of steel and high-tin aluminium alloys was investigated and a comparison of the technological properties of antifriction aluminium and intermediate alloys was given.
A semicontinuous method of casting was tried. The table gives the compositions and conditions used. Melting was carried out in a high-frequency furnace. The weight of the melt was 70 - 80 kg and billets 70 x 260 mm were cast. The rate of casting was 10 - 13 m/h except for pure aluminium which had a rate of 3 m/h. The billets were water-cooled. Pouring was carried out through a funnel with a 12 mm diameter hole. From the results it was shown that the high-tin alloys and the Moren 400 alloys had good casting properties and a low

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The Technology of ....

temperature of casting. The billets were rolled to 10 mm strip. The surface had no porosity or cracks before rolling. Alloys with 20 and 30% tin were cold-rolled. Reduction of the first pass was 10% and on subsequent passes - 15%. The remaining alloys were hot-rolled after holding at 450 °C for two hours. Moren 400 alloy exhibited hot shortness during hot rolling, and deep cracks when cold-rolled.
It was shown that to produce a good joint in the bimetal, the tin content on the surface of the high-tin alloys should be decreased. The alloys were hot-rolled with AMK alloy with reduction of 70% on the first pass and 28% on the second pass to give a good joint, and subsequently rolled to 2 mm.
The strength of the joint between the alloy and AMK alloy was tested before forming a bimetal with steel by heating to 550 °C for 30 minutes. Steel strip 6 mm thick was used for the bimetal. The joint between the steel and the AMK alloy was produced by a first pass in the cold state with 60% reduction, a second pass with 30% reduction, and then it was cold-rolled to 1.9 mm. The joint was tested by heating

The Technology of ....

to 550-570 °C for 10-30 minutes. The strip produced in this way was used for the production of bushings for bearings in experimental ГАЗ (GAZ) and ЗИЛ (ZIL) motors.
There are 1 table and 2 Soviet references.

Table: The Composition of Alloys and the Regime of Casting of Aluminium Alloys

Name of Alloy	Chemical Composition		Casting temperature, °C	Rate of drop of billet, m/h	Pressure of cooling water, atm.
	Charge	Billet			
Pure Al АВ000 (AV000)	-	Cu-0.0016 Fe-0.04 Si-0.04 Al- rest	800	3	0.8
High-tin alloy	Sn-20 Al-rest	Sn-17.32 Al-rest	740	13	0.8

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S/136/61/000/002/002/006
E021/E335

The Technology of ....

High-tin alloy Moren 400	Sn-30 Al-rest Si-4 Cd-0.5 Al-rest	Sn-26.3 Al-rest Si-4.26 Sn-0.13 Cd-0.50 Al-rest	740	10	0.8
AMK	Mn-0.5 Si-0.5 Al-rest	Mn-0.5 Si-0.8 Al-rest	780	9-10	0.8
ACC 6-5 (ASS 6-5)	Sb-6 Pb-5 Mg-0.5 Al-rest	Sb-4.57 Pb-4.52 Mg-0.94 Al-rest	920*	9-10	0.9
Moren 400 (Moren 400)	Si-4 Al-rest	Si-3.8 Al-rest	800	10	0.9

* Antimony added to aluminium heated to 1 000 °C.

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36939
S/136/62/000/004/004/004
E021/E435

18.1Y1N

AUTHORS: Pogodin-Alekseyev, G.I., Gavrilov, V.M., Korolev, F.V.

TITLE: The use of low-frequency vibrations in continuous casting of beryllium bronze

PERIODICAL: Tsvetnyye metally, no.4, 1962, 69-73

TEXT: Vibrations were used in order to try and eliminate the columnar structure in the billets, which makes subsequent rolling more difficult. The metal was melted in a high-frequency furnace with a graphite crucible of 60 kg capacity. The billets produced were up to 400 mm long. Vibrations were produced from an eccentric vibrator. The frequency could be varied from 0 to 100 c/s and the amplitude from 0 to 2 mm. The temperature of the molten metal was held at 1050 to 1060°C and that of the pouring funnel at 650 to 750°C since freezing occurred in the funnel at lower temperatures. With amplitudes of 0.7 to 0.8 mm and frequencies of 25, 50 and 75 c/s the vibration arrangement worked satisfactorily. With this amplitude drops of liquid metal were ejected at 100 c/s; at higher amplitudes ejection occurred

Card 1/2

S/129/62/000/010/001/006
E193/E383

AUTHORS: Kuritsyna, A.D., Candidate of Technical Sciences, Rudnitskiy, N.M., Korolev, F.V. and Korsunskaya, K.N., Engineers

TITLE: Influence of the treatment of certain bimetallic materials on the bond strength

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no. 10, 1962, 8 - 11

TEXT: The object of the present investigation was to study the effect of annealing on the strength of bond between the components of various bimetallic strips fabricated by the usual pressure-welding (cold-rolling) method. The following were included in the experimental materials: pure aluminium; alloy AMK (Al-0.5% Si-0.5% Mn); Al-20% Sn alloy: Moren-400 (Al-4% Si); [illegible]-6-5 (ASS-6-5) alloy (Al-6% Sb-5% Pb-0.5% Mg). In the first series of experiments the Al/Al, Al/Al-20% Sn and Al-20% Sn/AMK bimetal strips were studied, the last of these being fabricated with and without a treatment which entailed tinning of the Al-20% Sn alloy surface with tin squeezed out of the alloy itself.

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Influence of the treatment ....

Wedge-shaped sandwiches were used in every case so that the reduction in the first rolling-pass varied from 40% at one end of the strip to 80% at the other, a uniform reduction of 36% being given in the second pass. Shear-strength tests were carried out on suitably prepared bimetal specimens, both in the as-rolled condition and after 30 min annealing at 350, 450 and 550 °C. The shear strength of each individual metal given similar treatment was also determined. The results can be summarized as follows: 1) the shear-strength of cold-worked pure aluminium was not affected by the annealing, that of the AMK alloy increased from 8.3 kg/mm^2 after rolling, to 11 kg/mm^2 after annealing at 550 °C, the corresponding figures for the Al-20% Sn alloy being 7 and 5 kg/mm^2; 2) the shear strength of the bond in bimetal specimens after any given treatment corresponded to the strength of the weaker component given similar treatment; the AMK/Al-20% Sn bimetal strip prepared without surface-tinning treatment was an exception, its strength falling rapidly with increasing annealing temperature (8.4 kg/mm^2 after rolling, 2.8 kg/mm^2 after annealing at 550 °C); 3) the bond strength of the bimetal specimens was not

Card 2/3

POGODIN-ALEKSEYEV, G.I.; GAVRILOV, V.M.; KOROLEV, F.V.

Use of low-frequency vibrations during the continuous casting of of beryllium bronze. TSvet. met. 35 no.4:69-73 Ap '62. (MIRA 15:4)

(Beryllium bronze) (Continuous casting)

ACCESSION NR: AP4005832 S/0129/63/000/012/0039/0041

AUTHOR: Kuritsy*na, A. D.; Rudnitskiy, N. M.; Korolev, F. V.; Korsunskaya, K. N.

TITLE: Structure and properties of heat-treated aluminum-tin aniifriction alloy

SOURCE: Metalloved. i termich. obrab. metallov, no. 12, 1963, 39-41

TOPIC TAGS: aluminum tin alloy, antifriction aluminum alloy, antifriction alloy, alloy structure, alloyproperty

ABSTRACT: Sully's study (A. Sully, "Journal of Institute of Metals", 1949, v. 76) pertaining to the structure and properties of heat-treated aluminum tin antifriction alloys which has applications in bearing for carburetor-type engines was reexamined. The microstructure examination showed that cast structure fails in proportion to increase in shrinkage which produced a very fine stannous eutectic. Obsertion with respect to sweating indicates that tin

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ACCESSION NR: AP4005832

sweating decreases parallel to the increase of shrinkage during annealing. A vigorous sweating of tin with large droplet formation can be observed with weakly deformed cast samples during annealing at 350C and holding time of 30 minutes. Alloys with 99% shrinkage can be annealed at 550-570C without high tin losses. Mechanical properties of alloys with 20 and 30% Sn have a high ductility after final shrinkage (99%) which increases after annealing at 350C (the aluminum grain recrystallization temperature). Application of high degrees of deformation (99%) for Al alloys containing more than 20% Sn assures a discrete distribution of the stannous phase after annealing at 550-570C with a holding time of 30 minutes. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 09Jan64 ENCL: 00

SUB CODE: ML, MA NO REF SOV: 000 OTHER: 001

Card 2/2

LYUBESHKIN, V.A.; KOROLEV, F.V.; KORSUNSKAYA, K.N.

Effect of deoxidizers on the mechanical properties of lead-containing nickel silver. TSvet. met. 36 no.1:61-66 Ja '63. (MIRA 16:5)
(Copper-nickel-zinc alloys--Metallurgy)

L 21206-65 EWT(m)/EWA(d)/EWP(v)/EPR/T/EWP(t)/EWP(k)/EWP(b) Pf-4/Ps-4
ACCESSION NR: AP5000947 IJP(c) MJW/JD/HM S/0136/64/000/012/0083/0085

AUTHOR: Tikhonov, B.S., Korolev, F.V., Korsunskaya, K.N.

TITLE: Sheets and strips of brand 34A solder for soldering aluminum and its alloys

SOURCE: Tsvetnyye metally, no. 12, 1964, 83-85

TOPIC TAGS: aluminum, aluminum solder, aluminum alloy soldering, solder rolling, aluminum soldering, silumin/solder 34A

ABSTRACT: Solder 34A is a common material for soldering aluminum and its alloys but it is difficult to use since it cannot be produced in the form of wire or foil owing to its low ductility. Therefore a method was devised for producing the solder in the form of a three-layer foil which forms a ternary eutectic (6% Si, 28% Cu, 66% Al) on melting. Hypoeutectoid 8% silumin (Si-Al alloy) and highly pure copper (99.99%) were used to produce the 34A solder as a three-ply rolled foil. The ratio of these starting materials was calculated on the basis of the parameters of the equipment and chemical composition of 34A solder (26-30% Cu, 4.5-7.0% Si, balance Al) for assembling the pack for rolling. From this calculation, a thickness of 13 mm (12 mm silumin and 1 mm copper) was selected. Good welding together of the two metals during hot rolling was possible only if the contacting surfaces did not oxidize during heating. The copper, which oxidized at

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L 21206-65
ACCESSION NR: AP5000947

100C was covered on both sides with a thin layer of aluminum foil to protect the surface. The packs were preheated to 430-450C, hot rolled on a two-high mill, and reduced 65-70% in the first pass. A microinvestigation of the joint after cold rolling to 0.1 mm demonstrated that the heating and rolling conditions were proper since the weld was strong and the copper layer was not destroyed in spite of up to 98% deformation. The solder had maximum ductility (δ = 21%) after annealing at 300C and holding for 30 min. Orig. art. has: 1 table and 2 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: IE, MT

NO REF SOV: 000 OTHER: 000

Card 2/2

L 61902-65 EWA(k)/FBD/EWG(r)/EWT(l)/EWT(m)/EPF(c)/EEC(k)-2/EPF(n)-2/T/EWP(t)/EEC(b)-2/EWP(k)/EWP(b)/EWA(m)-2/EWA(h) Pm-4/Pn-4/Po-4/Pf-4/Pr-4/Ps-4/Peb/Pi-4/Pu-4/Pl-4 SCTB/IJP(c) WG/JD

ACCESSION NR: AP5017894 UR/0051/65/019/001/0071/0077 621.375.9:535

AUTHOR: Korolev, F. A.; Odintsov, A. I.; Mitsay, V. N. 44

TITLE: Investigations of certain characteristics of a helium-neon laser

SOURCE: Optika i spektroskopiya, v. 19, no. 1, 1965, 71-77

TOPIC TAGS: helium neon laser, laser, gas laser, multimode operation, helium, neon

ABSTRACT: The authors investigated the dependence of the power generated at 6328 Å ($3s_2$--$2p_4$ transition) on the discharge current, the pressure mixture, and the partial pressures of He and Ne (in the He/Ne concentration interval from 2:1 to 15:1), in a laser excited with a dc discharge and having external spherical mirrors with dielectric coatings of 99% reflectivity. The investigation was carried out with nearly confocal geometry and with simultaneous generation of many oscillation modes. The generation power was measured with a photocell in conjunction with a galvanometer. The results showed that the generation power has a maximum with respect to either the current, the mixture pressure, or the partial pressures. The position and magnitude of the maximum depend on the values of the other parameters. The effect of varying the distance between mirrors, with the discharge length constant,

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L 32738-66 EWT(m)/EWP(v)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HM

ACC NR: AP6016334 (N) SOURCE CODE: UR/0149/65/000/006/0106/0113

AUTHORS: Zakharov, M. V. (Professor); Korolev, F. V.; Chizhov, S. I.; Tikhonov, B. S.; Stepanova, M. V.; Sliozberg, S. K.

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TITLE: New transmission copper alloys, their alloying principles, properties, and uses

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 6, 1965, 106-113

TOPIC TAGS: METAL HEAT TREATMENT, WELDING, THERMAL STABILITY, copper alloy, nickel containing alloy, chromium containing alloy / Br.NBT copper alloy, Mts-5A copper alloy

ABSTRACT: The alloying techniques, properties at different temperatures, and stability under contact welding of a number of transmission copper alloys were investigated. The investigation supplements the results of V. M. Glazov, M. V. Stepanova, and M. V. Chuprakova (Izv. AN SSSR, OTN, No. 3, 1962). The experimental results are summarized in graphs and tables (see Fig. 1). It was found that the most thermostable transmission alloys are Mts-5A and Br.NBT, situated on the quasi-binary sections of Cu--Cr_2Zr

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L 32685-66 EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HW/JG

ACC NR: AP6012729 SOURCE CODE: UR/0136/66/000/004/0074/0076

AUTHOR: Kucherov, V. I.; Zakharov, M. V.; Chizhov, S. I.; Korolev, F. V.; Tikhonov, B. S.; Ryabova, F. S.

ORG: none

TITLE: Mechanical properties of the alloy Br.NBT at various temperatures

SOURCE: Tsvetnyye metally, no 4, 1966, pp 74-76

TOPIC TAGS: beryllium bronze alloy, copper alloy, welding electrode, mechanical property, cold working, metal heat treatment/Br.NBT beryllium bronze alloy, Mts2 copper alloy, Mts3 copper alloy

ABSTRACT: This alloy, produced from the wastes of beryllium bronzes, is designed for use as electrode material for the spot, seam and butt welding of stainless and high-temperature steels with low heat conductivity and high strength. It differs from the Mts3 copper alloys (also used as electrode materials) in that it has a higher content of Ni (1.4-1.6%) and Be (0.2-0.4%) and contains Ti (0.05-0.15%) instead of Mg. The article presents data on the mechanical properties of the Br.NBT at room and elevated temperatures as a function of four different cold and hot working regimes of specimens of this alloy (regime 1 -- semicontinuous casting combined with quenching, tempering

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at 500°C, 3 hr; regime 2 -- as above, followed by cold forging to 50% and tempering at 450°C, 3 hr; regime 3 -- semicontinuous casting, hot rolling at 800-900°C with 90% reduction in area, quenching from 900-920°C and tempering at 470°C, 3 hr; regime 4 -- as above, with 80% reduction in area, and with quenching followed by cold rolling with 50% reduction in area and tempering at 430°C, 3 hr). Findings: regimes 3 and 4 appear to be optimal, since then ultimate strength σ_B of the specimens increases by an average of 5-8 kg/mm^2 in the 20-600°C temperature range and is not accompanied by a decrease in the indicators of plasticity; the Br.NBT specimens thus treated acquire a strength (σ_B = ~75 kg/mm^2) that exceeds the strength of Cu-Co-Be, Mts2 and Mts3 alloys at elevated temperatures (σ_B = ~55 kg/mm^2). Its high strength at temperatures as high as 600°C, combined with its moderate electrical conductivity (45-50% of the electrical conductivity of pure annealed copper) and comparatively low cost, make the alloy Br.NBT an excellent material for the electrodes used in the welding of stainless steels and high-temperature alloys. Orig. art. has: 1 figure, 2 tables.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 002

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30(12) SOV/25-59-7-21/53

AUTHOR: Korolev, F.Ye., Member (Magadanskaya Oblast')

TITLE: Pro or Con? (A Letter to the Editor)

PERIODICAL: Nauka i zhizn', 1959, Nr 7, p 58 (USSR)

ABSTRACT: The article gives a review on the new book, the "Novgorodtsy", by B.M. Prilezhneva-Barskaya containing 127 pages and published in 1957 by the Leningrad Section of the Detgiz Publishing House for children of medium age and elder. The author severely criticizes this historic novel for the glorification of monks during the period when Novogorod was an independent republic (XIII-XV century); he then states the opinion that this book might exercise a bad influence on the young Communist blood who should be educated in a strictly atheistic spirit. In conclusion, the author expresses surprise that V.N. Bernadskiy, Doctor of Historical Sciences and scientific editor of this book, failed to furnish

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