4530. (946) BOGDANIKOWA B. and CHMIEL J. III. Klin. Chor. Wewnęt. A.M., Wroclaw; III. Klin. Chir. A.M., Wroclaw. *Badania porównawcze nad zachowaniem sie bialek surowicy krwi we wstrzasie pourazowym i pooperacyjnym. Comparative investigations on the behaviour of blood serum proteins in post-traumatic and post-operative shock POL. TYG. LEK. 1956, 11/28 (1246-1252) Graphs 6 Tables 2 Illus. 1

Sixty-two cases of post-traumatic and postoperative shock were examined and determinations of whole protein level and paper electrophoresis of the blood serum proteins made. A decreased blood protein level was found only in exceptionally severe cases. The average level was normal. In 80% of the cases there appeared a decrease of the albumin level and an increase of the $\alpha$-globulin level. In 33% of the cases an increase of the $\beta$-globulin level, and in 21% of cases a decrease of the $\gamma$-globulin level below the lower limit of the norm was found. These lesions are explained in the following way: a low albumin level follows from the loss of blood in connection with trauma or operation. The high $\alpha$-globulin level is a manifestation of the absorption of necrotic globulins from the destroyed tissues and extravasated blood, with a simultaneous impairment of efficiency of the RES, which normally removes them from the blood. The high $\beta$-globulin level appeared especially in the cases of bone traumas, and so it was probably connected with the penetration of fatty substances from the bone marrow to the blood circulation. The

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decrease of γ-globulin level, appearing with especial distinctness in severe forms of trauma, points to a transient failure of the RES, induced by the trauma. Transfusion prevents the appearance of the described changes in the blood protein.

(IX, 5)

EXCERPTA MEDICA Sec. 6 Vol. 11/8 Aug. 57

BOGDANIKOWA B.

4949. BOGDANIKOWA B. III Klin. Chor. Wewnętr. A.M., Wrocław. O niedoborze globulin gamma we krwi. Deficiency of gamma globulin in blood serum PRZEGL. LEK. 1956, 12/9 (274-277) Graphs 2 Tables 2

In 400 electrophoretic estimations of the γ-globulin content of serum in adults hypogammaglobulinaemia under 13.4% was found in 6 cases (1.5%). The deficiency seems to be a reversible phenomenon. Mikułowski - Cracow

BOGDANIKOWA, B.

SZCZEKLIK, E.; HANO, J.; BOGDANIKOWA, B.; MAJ, J.

Treatment of arterial hypertension with Vinca minor L.
Polski tygod. lek. 12 no.4:121-125 21 Jan 57.

1. (Z III Kliniki Chorob Wewnetrznych A.M. we Wroclawiu; kierownik prof. dr. E. Szczeklik i z Zakladu Farmakologii A.M. we Wroclawiu; kierownik: prof. dr. J. Hano). Adres: Wroclaw, ul. Pasteura 4.

(HYPERTENSION, ther.
Vinca minor L. extract (Pol))
(PLANTS, extracts
Vinca minor L., ther. of hypertension (Pol))

SZCZEKLIK, Edward; JANIAKOWA, Alina; ORLOWSKI, Marian; BOGDANIKOWA, Beata

Biochemical bases of the early diagnosis of atherosclerosis. II. Behavior of various coagulation factors & serum proteins in artherosclerosis. Polski tygod. lek. 13 no.21:781-788 26 May 58.

1. (Z III Kliniki Chorob Wewnetrznych Akademii Medycznej we Wroclawiu; kierownik Kliniki: prof. Dr Edward Szczeklik) Adres: Wroclaw, ul. Pasteura 4.

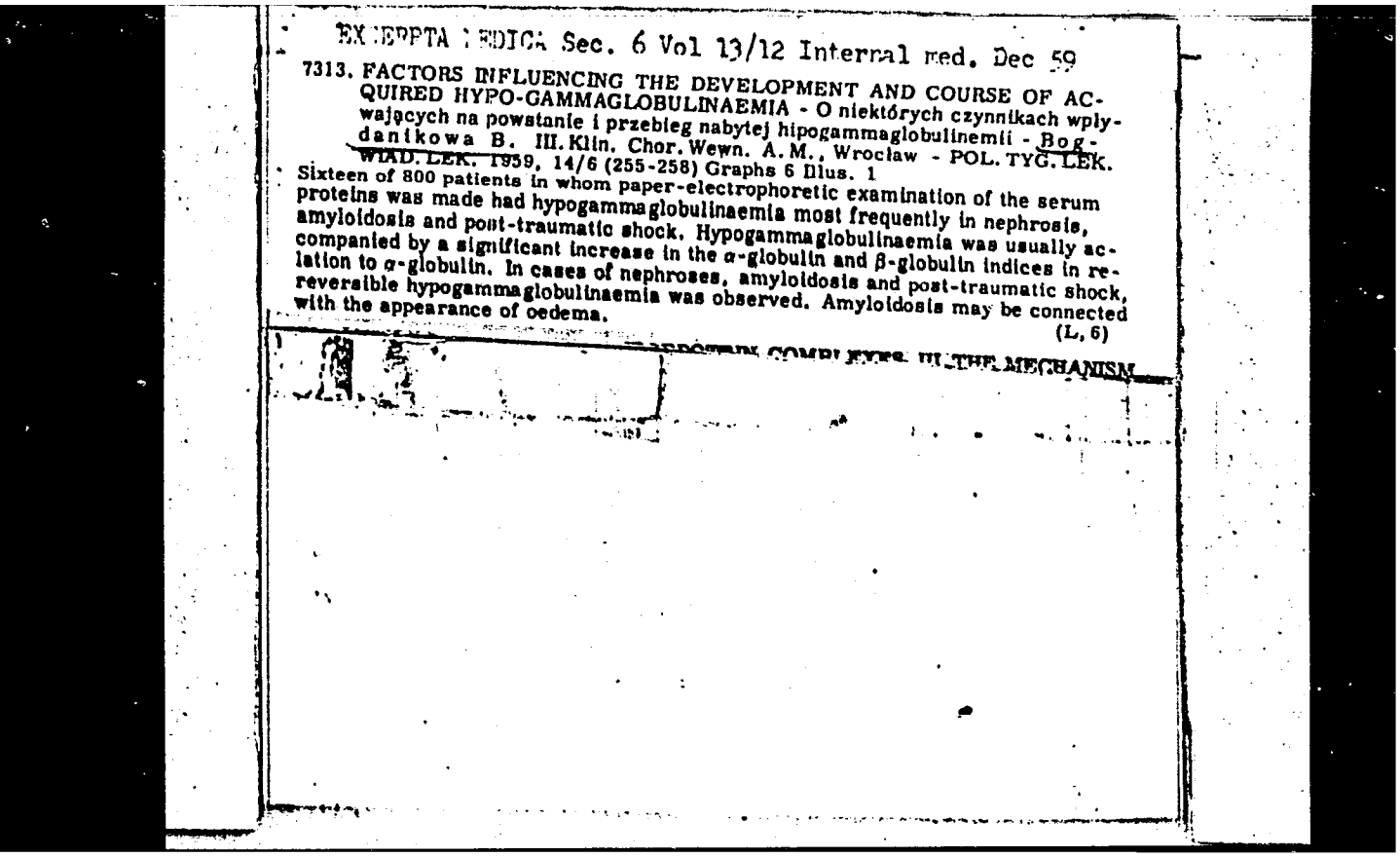
(ARTERIOSCLEROSIS, blood in
coagulation factors & blood proteins, diag. value (Pol))
(BLOOD COAGULATION
factors in arteriosclerosis, diag. value (Pol))
(BLOOD PROTEINS, in various dis.
arteriosclerosis, diag. value (Pol))

BOGDANIKOWA, Beata

Use of paper electrophoresis in various kidney diseases. Polski. tygod.lek. 13 no.22:832-835 2 June 58.

1. Z III Kliniki Chorob Wewnetrznych A.M. we Wroclawiu; kierownik: prof. dr E. Szczeklik. Adres: Wroclaw, ul. Traugutta 57. III Klin. Chor. Wewn. A.M.

(KIDNEY DISEASES, blood in
proteins, diag. value (Pol))
(BLOOD PROTEINS, in various dis.
kidney dis., diag. value (Pol))



EXCERPTA MEDICA Sec. 6 Vol 13/12 Internal med. Dec 59

7313. FACTORS INFLUENCING THE DEVELOPMENT AND COURSE OF ACQUIRED HYPO-GAMMAGLOBULINAEMIA - O niektórych czynnikach wpływających na powstanie i przebieg nabytej hipogammaglobulinemii - Bogdanikowa B. III. Klin. Chor. Wewn. A. M., Wrocław - POL. TYG. LEK. WIAD. LEK. 1959, 14/6 (255-258) Graphs 6 Illus. 1

Sixteen of 800 patients in whom paper-electrophoretic examination of the serum proteins was made had hypogammaglobulinaemia most frequently in nephrosis, amyloidosis and post-traumatic shock. Hypogammaglobulinaemia was usually accompanied by a significant increase in the $\alpha$-globulin and $\beta$-globulin indices in relation to $\alpha$-globulin. In cases of nephroses, amyloidosis and post-traumatic shock, reversible hypogammaglobulinaemia was observed. Amyloidosis may be connected with the appearance of oedema.

(L, 6)

[illegible] COMPLEXES IN THE MECHANISM

BOGDANIKOWA, Beata

Beta-2 hyperglobulinemia. Polski tygod.lek. 15 no.42:1599-1603 17 O '60.

1. Z III Kliniki Chorob Wewnetrznych A.M. we Wroclawiu; kierownik: prof.dr E.Szczeklik.
(SERUM GLOBULIN) .

BOGDANIKOWA, Beata

Behavior of blood lipoproteins in coronary disease. Polskie arch. med.wewn. 30 no.7:978-981 '60.

1. Z III Kliniki Chorob Wewnetrznych A.M. we Wroclawiu Kierownik: prof. dr med. E.Szczeklik
(CORONARY DISEASE blood)
(LIPOPROTEINS blood)

BOGDANIKOWA, Beata; GALAZKOWA, Zofia

Relation of the CRP reaction to other inflammatory indices in certain internal diseases. Polski tygod. lek. 16 no.6:207-211 6 F '61.

1. Z III Kliniki Chorob Wewnetrznych A.M. we Wroclawiu; kierownik: prof. dr E. Szczeklik.

(C-REACTIVE PROTEIN) (INFLAMMATION diag)

SZCZEKLIK, Edward; BOGDANIKOWA, Beata

Behavior of blood glycoproteins in cases of myocardial infarction. Polski tygod. lek. 16 no.27:1021-1025 3 Jl '61.

1. Z III Kliniki Chorob Wewnetrznych A.M. we Wroclawiu; kierownik: prof. dr E. Szczeklik.

(MYOCARDIAL INFARCT blood) (GLYCOPROTEINS blood)

BOGDANIKOWA, Beata; STANKOWSKA, Karmena

Sensitization to cold in multiple myeloma. Polski tygod. lek. 16 no.38:1460-1463 18 S '61.

1. Z III Kliniki Chorob Wewnetrznych A.M. we Wroclawiu; kierownik: prof. dr med. E. Szeszeklik.

(MYELOMA PLASMA CELL compl) (ALLERGY) (COLD)

SZCZEKLIK, Edward; BOGDANIKOWA, Beata

Buccal micromolecular syndrome in acute coronary insufficiency. Pol. tyg. lek. 17 no.7:241-245 12 F '62.

1. Z III Kliniki Chorob Wewnetrznych AM we Wroclawiu; kierownik: prof. dr E. Szczeklik.

(CORONARY DISEASE blood) (BLOOD PROTEINS)

SZCZEKLIK, Edward; BOGDANIKOWA, Beata; GALAZKOWA, Zofia

Behavior of lipoprotein T fractions in arteriosclerosis. Polskie arch. med. wewn. 32 no.3:381-390 '62.

1. Z III Kliniki Chorob Wewnetrznych AM we Wroclawiu Kierownik: prof. dr med. E.Szczeklik.
(LIPOPROTEINS blood) (ARTERIOSCLEROSIS blood)

BOGDANIKOWA, Beata

Enteropathia exsudativa. Pol. tyg. lek. 17 no.33:1314-1317 13 Ag '62.

1. Z I Kliniki Chorob Wewnetrznych AM w Bialystoku; kierownik: doc. dr Beata Bogdanikowa.
(INTESTINAL DISEASES)

BOGDANIKOWA, Beata

Attempted quantitative approach to a typical blood protein picture. Pol. tyg. lek. 18 no.15:537-539 8 Ap '63.

1. Z I Kliniki Chorob Wewnetrznych AM w Bialymstoku; kierownik: doc. dr Beata Bogdanikowa.
(BLOOD PROTEINS) (INFLAMMATION)
(LIVER CIRRHOSIS) (NEPHROSIS)

POLAND

BOGDANIKOWA, Beata, SAGANEK, Barbara, and BROZD, Jadwiga; First Clinic of Internal Diseases (I Klinika Chorob Wewnetrznych), AM [Akademia Medyczna, Medical Academy] in Bialystok (Director: Docent, Dr. Beata BOGDANIKOWA)

"Effect of Treatment with Penicillin on Paraproteinemia."

Warsaw, Polski Tygodnik Lekarski, Vol 18, No 21, 20 May 63, pp 757-759

Abstract: [Authors' English summary] Authors administered crystalline penicillin G to a patient with beta2 myeloma and studied blood protein fractions before, immediately after, and four weeks after treatment. Penicillin G, or rather the penicilamine formed, caused marked decrease of the pathologic fraction. Administration had to be stopped because of patient's complaints of pains in the bones. Incubation of the patient's blood with penicillin in vitro did not cause any changes in the pathologic fraction. There are eight (8) references, all Western.

1/1

BOGDANIKOWA, Beata.

Genetic dysproteinemias. Pol. tyg. lek. 19 no.31:1177-1178 3 Ag'64

1. Z I Kliniki Chorob Wewnetrznych Akademii Medycznej w Bialymstoku; kierownik: doc. dr. B. Bogdanikowa.

BOGDANIKOWA, Beata; MURAWSKI, Krzysztof

The picture of proteins and glycoproteins in multiple myeloma. Pol. arch. med. wewnet. 34 no.2:119-127 '64

1. Z I Kliniki Chorob Wewnetrznych AM w Bialymstoku (kierownik: doc.dr.med. B.Bogdanikowa) oraz z Instytutu Hematologii w Warszawie, Zaklad Biochemii (kierownik: dr.med. K.Murawski).

*

BOGDANIKOWA, Beata

In the area of paraproteinemias. Pol. arch. med. wewnet. 34 no.6:749-75[illegible] '64

1. Z I Klinik[illegible] Chorob Wewnetrz[illegible] Akademii Medycznej w Bialymstoku ( Kierownik: doc. dr. med. B. Bogdanikowa).

BOGDANIKOWA, Beata, doc. dr.; SAWICKI, Andrzej

On favorable effects of methandrostenolone in diabetes insipidus. Pol. arch. med. wewnet. 34 no.12:1533-1538 '64.

1. Z I Kliniki Chorob Wewnetrznych Akademii Medycznej w Bialymstoku (Kierownik: doc. dr. B. Bog..anikowa).

BOGDANIKOWA, Beata; DROZD, Jadwiga

Attempts of quantitative interpretation of immunoelectrophoresis. Pol. tyg. lek. 20 no.32:1211-1212 9 Ag '65.

1. Z I Kliniki Chorob Wewnetrznych AM w Bialymstoku (Kierownik: doc. dr. B. Bogdanikowa).

BOGDANIKOWA, Beata; DROZD, Jadwiga; BERNACKA, Krystyna

Immunoelectrophoresis of se um proteins soluble in perchloric acid. Pol. arch. med. wewnet. 35 no.7:939-943 '65.

1. Z I Kliniki Chorob Wewnetrznych AM w Bialymstoku (Kierownik: doc. dr. med. B. Bogdanikowa).

BOGDANIKOWA, Beata; BERNACKA, Krystyna; DROZD, Jadwiga

Immunoelectrophoresis of serumucoids in patients with progressive chronic polyarthritis. Pol. arch. med. wewnet. 35 no.9:1319-1324 '65.

1. Z I Kliniki Chorob Wewnetrznych AM w Bialymstoku (Kierwonik: doc. dr. B. Bogdanikowa).

BOGDANIKOWA, Beata

On the pathogenesis of some hemoglobinopathies. Pol. arch. med. wewnet.33 no.11: 1321-1328 '63.

1. Z I Kliniki Chorob Wewnetrznych AM w Bialymstoku. Kierownik: doc.dr med. B.Bogdanikowa.

BOGDANKEVICH, L. S.

56-6-19/56

AUTHOR: BOGDANKEVICH, L.S., BOLOTOVSKIY, B.M.

TITLE: Movement of a Charge Parallel to the Axis of a Cylindrical Channel in a Dielectric. (Prokhozhdeniye zaryada parallel'no osi tsilindricheskogo kanala v dielektrike, Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol 32, Nr 6, pp 1421-1428 (U.S.S.R.)

ABSTRACT: Theoretically the field equations for a charge moving parallel to the axis of a cylindrical channel in a dielectricum are derived. The energy loss of the charge is also calculated for various states of the dielectricum. The derived equations can be used for the following problems: Focussing of charged particles in a cylindrical channel, explanation of the theory of the CERENKOV counter, forming of electromagnetic radiation. (With 5 Slavic References).

ASSOCIATION: Physical Institute "P.N.LEBEDEV" of the Academy of Science of the U.S.S.R.

PRESENTED BY:
SUBMITTED: 14.7.1956/21.7.1956
AVAILABLE: Library of Congress

Card 1/1

AUTHOR: Bogdankevich, L. S. SOV/57-28-7-23/35

TITLE: Motion of a Charged Particle in a Rectangular Waveguide Filled With an Anisotropic Dielectric (Dvizheniye zaryazhennoy chastitsy v pryamougol'nom volnovode, zapolnennom anizotropnym dielektrikom)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Vol. 28, Nr 7, pp.1505-1509 (USSR)

ABSTRACT: The energy losses of a charged particle are calculated for two cases. The optical axis of the crystal filling the wave guide is parallel and vertical to the axis of the wave guide along which the charged particle moves. Kaganovich (Ref 3) determined the losses for the first case. The calculation of the losses for the second case is mathematically very difficult. This problem is solved for a wave guide of rectangular cross section. Such an infinite wave guide filled with an anisotropic dielectric is investigated. The author investigates the special case where the mono-axis crystal is characterized by the fact that the dielectric constant along the optical axis $\varepsilon_{ax}$ differs from that in the vertical di-

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Motion of a Charged Particle in a Rectangular Waveguide Filled With an Anisotropic Dielectric

rection $\varepsilon_\perp$ . A coordinate system is introduced which coincides with the main axis of the polarization ellipsoid in the crystal. Then an equation is written down and transformed for the potentials of the electromagnetic field in this system. Then the energy losses of the charged particle due to the Cherenkov radiation are determined for two cases. In the first case only extraordinary waves can be emitted. When the filling does not show any dispersion the corresponding equation becomes more simple. In the second case ordinary and extraordinary waves can be emitted. The formulae (10) for the losses in the emission of extraordinary waves and ordinary waves are written down. - The polarization losses in the motion of the particles in a wave guide filled by an anisotropic dielectric are calculated from the equation (15). B. M. Bolotovskiy posed the problem and assisted in the work. There are 1 figure and 3 Soviet references.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Moskva (Institute of Physics imeni P.N. Lebedev, Moscow)

SOV/57-28-7-23/35

Motion of a Charged Particle in a Rectangular Waveguide Filled With an Anisotropic Dielectric

SUBMITTED: March 28, 1957

1. Wave guides--Dielectric properties 2. Particles--Motion

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24(3),21(7)
AUTHOR: Bogdankevich, L. S. SOV/56-36-3-27/71

TITLE: The Radiation of a Current Ring Moving Uniformly in a Plasma Located in a Magnetic Field (Izlucheniye kol'tsa s tokom, ravnomerno dvizhushchegosya v plazme v magnitnom pole)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 835-838 (USSR)

ABSTRACT: The possible occurrence of the Cherenkov effect (described as Vavilov-Cherenkov effect in Russian publications) in a plasma located in a magnetic field is well-known. A. A. Kolomenskiy (Refs 1, 2) already investigated the problem of the radiation of a charge moving in a magnetized plasma. In connection with the coherent method of the acceleration of charged particles, the investigation of the radiation of current carrying plasma columns in an active anisotropic medium is of interest (cf. V. I. Veksler, Ref 3). A. I. Morozov (Ref 4) already investigated the radiation of an infinite current in a plasma located in a magnetic field, and the author of the present paper does the same for a ring current. He assumes that in the magnetized plasma an ideally conductive ring having the

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The Radiation of a Current Ring Moving Uniformly in a Plasma Located in a Magnetic Field

SOV/56-36-3-27/71

radius a moves with a current $I_0$. The direction in which the ring moves is assumed to be vertical to the ring plane and parallel to the direction of the external magnetic field (= z-axis). The external magnetic field is assumed to be considerably larger than the ring's own field, so that the electron plasma can be treated as a gyrotropic crystal, the properties of which are given by the tensor of the dielectric constant. For $\mathrm{div}(\hat{\varepsilon}\vec{A}) = 0$ an integral equation is derived by basing on the potential equations for the energy losses due to Cherenkov radiation $P = 2\pi a I_0 E_\varphi \big|_{r=a,z=vt}$. This equation is integrated for the frequency range for which it holds that $n^2_{1,z}(\omega)\beta^2 > 1$ ($n_{1,2}$ = refraction index in the plasma). Finally, the paper gives explicit formulae for various conditions for energy losses in the case of a relativistic motion of the ring; thus, for $\omega_0 a/c \gg 1$ one obtains

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The Radiation of a Current Ring
Moving Uniformly in a Plasma Located in a Magnetic Field

$$P = \pi^2 a^3 I_o^2 \omega_H^2 \omega_o / o^4$$

The author finally thanks Academician V. I. Veksler for suggesting the subject, and B. M. Bolotovskiy for his advice. There are 5 Soviet references.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences, USSR)

SUBMITTED: September 2, 1958 (initially) and December 22, 1958 (after revision)

BOGDANKEVICH, L. S., Cand Phys-Math Sci -- (diss) "Cerenkov radiation of charges, dipolar moments, and current circuits in the presence of bounds." Moscow, 1960. 7 pp; (Moscow State Pedagogical Inst im V. I. Lenin); 150 copies; price not given; bibliography at end of text (15 entries); (KL, 26-60, 130)

9,1310 (also 1130)
26.2331 also 4216

20923
S/057/61/031/003/007/019
B125/B202

AUTHOR: Bogdankevich, L. S.

TITLE: Radiation of a current ring which moves uniformly in a gyrotropic waveguide

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 3, 1961, 311-314

TEXT: The author studies the field strength and the energy losses to Cherenkov radiation of a current ring moving in a gyrotropic waveguide.

$$\tilde{\varepsilon} = \begin{vmatrix} \varepsilon & i\eta & 0 \\ -i\eta & \varepsilon & 0 \\ 0 & 0 & \varepsilon_z \end{vmatrix}$$ (1) holds for the tensor of the medium filling this waveguide. V. I. Veksler, Atomnaya energiya, 2, 427, 1957 suggested a new variant of accelerating charged particles, i.e., acceleration by a medium. A ring with an amperage $I_0$ and the radius a is assumed to move perpendicular to its plane along the axis of a metallic semiconductor with the radius R. This movement is uniform and has the velocity $\vec{v}$. The field of the ring is obtained from the solution of the equation for the vector

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potential $\Delta\vec{A} - \frac{\partial^2 \vec{A}}{\partial t^2} - \text{grad div}\vec{A} = -\frac{4\pi}{c}\vec{j}$; $\text{div}\vec{A} = 0$ by taking account of the boundary conditions. The gyrotropic medium contained in the waveguide leads to the fact that all components of the vector potential differ from zero: $\vec{A} = \frac{2aJ_0}{cv}\int \frac{\vec{A}_\omega e^{i\frac{\omega}{v}(z-vt)}}{n_1^2 - n_2^2} d\omega$. For $\omega > 0$,

$$
\left.
\begin{aligned}
&\text{для } \omega>0\\
&A_{\varphi\omega} = -(n_1^2-n_0^2) I_1\left(\tfrac{|\omega|}{v} a\varkappa_1\right)\left[K_1\left(\tfrac{|\omega|}{v} r\varkappa_1\right) + \lambda_1 I_1\left(\tfrac{\omega}{v} r\varkappa_1\right)\right] + \\
&\quad + (n_2^2-n_0^2) I_1\left(\tfrac{|\omega|}{v} a\varkappa_2\right)\left[K_1\left(\tfrac{|\omega|}{v} r\varkappa_2\right) + \lambda_2 I_1\left(\tfrac{|\omega|}{v} r\varkappa_2\right)\right];\\
&A_{r\omega} = \tfrac{i\eta}{\varepsilon}\left(n_1^2 - \varepsilon_z - \tfrac{1}{\beta^2}\right) I_1\left(\tfrac{|\omega|}{v} a\varkappa_1\right)\left[K_1\tfrac{|\omega|}{v} r\varkappa_1\right) + \lambda_1 I_1\left(\tfrac{|\omega|}{v} r\varkappa_1\right)\right] - \\
&\quad - \tfrac{i\eta}{\varepsilon}\left(n_2^2 - \varepsilon_z - \tfrac{1}{\beta^2}\right) I_1\left(\tfrac{|\omega|}{v} a\varkappa_2\right)\left[K_1\left(\tfrac{|\omega|}{v} r\varkappa_2\right) + \lambda_2 I_1\left(\tfrac{|\omega|}{v} r\varkappa_2\right)\right];\\
&A_{z\omega} = -\tfrac{\eta}{\varepsilon\beta^2}\varkappa_1 I_1\left(\tfrac{|\omega|}{v} a\varkappa_1\right)\left[K_0\left(\tfrac{|\omega|}{v} r\varkappa_1\right) - \lambda_1 I_0\left(\tfrac{|\omega|}{v} r\varkappa_1\right)\right] + \\
&\quad + \tfrac{\eta}{\varepsilon\beta^2}\varkappa_2 I_1\left(\tfrac{|\omega|}{v} a\varkappa_2\right)\left[K_0\left(\tfrac{|\omega|}{v} r\varkappa_2\right) - \lambda_2 I_0\left(\tfrac{|\omega|}{v} r\varkappa_2\right)\right];\\
&\varkappa_1 = \sqrt{1-n_1^2\beta^2}; \quad \varkappa_2 = \sqrt{1-n_2^2\beta^2}; \quad n_0^2 = \varepsilon_z + \frac{1}{\beta^2} - \frac{\varepsilon_z}{\varepsilon\beta^2};
\end{aligned}
\right\} \quad (3)
$$

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holds, where $n_{1,2}$ the refractive indices for the extraordinary and the ordinary wave in the direction of emission: $n^2_{1,2} = \frac{1}{2\varepsilon}\left\{\varepsilon\varepsilon_z + \frac{\varepsilon-\varepsilon_z}{\beta^2} + \varepsilon^2 - \eta^2 \pm \sqrt{\left(\varepsilon\varepsilon_z + \frac{\varepsilon-\varepsilon_z}{\beta^2} + \varepsilon^2 - \eta^2\right)^2 + 4\varepsilon\left[\frac{\varepsilon\varepsilon_z}{\beta^2} + (\eta^2-\varepsilon^2)\left(\varepsilon_z + \frac{1}{\beta^2}\right)\right]}\right\}$ (4). For the coefficients $\lambda_1$, $\lambda_2$ the abbreviated designations

$$I_{\varkappa_{1,2}} = I_1\left(\frac{|\omega|}{v}a\varkappa_{1,2}\right); \quad I_{1,2} = I_1\left(\frac{|\omega|}{v}R\varkappa_{1,2}\right); \quad K_{1,2} = K_1\left(\frac{|\omega|}{v}R\varkappa_{1,2}\right).$$

Тогда

$$\left.\begin{aligned}
\lambda_1 &= \frac{1}{DI_{\varkappa_1}}\left[\frac{v}{\omega R}I_{\varkappa_1}K_1I_2(n_2^2-n_1^2) + \frac{v}{\omega R}I_{\varkappa_1}(n_2^2-n_0^2) + \right.\\
&\quad \left. + \varkappa_1 I_{\varkappa_1}K_1'I_2(n_2^2-n_0^2) + \varkappa_2 I_{\varkappa_1}I_2'K_1(n_0^2-n_1^2)\right];\\
\lambda_2 &= \frac{1}{DI_{\varkappa_2}}\left[\frac{v}{\omega R}(n_2^2-n_1^2)I_1K_2 - \frac{v}{\omega R}I_{\varkappa_2}(n_1^2-n_0^2) + \right.\\
&\quad \left. + \varkappa_2 I_1K_2'(n_0^2-n_1^2) + \varkappa_1 I_1'K_2(n_2^2-n_0^2)\right];\\
D &= \frac{v}{\omega R}I_1I_2(n_1^2-n_2^2) + \varkappa_1 I_1'I_2(n_0^2-n_2^2) + \\
&\quad + \varkappa_2 I_2'I_1(n_1^2-n_0^2).
\end{aligned}\right\} \quad (5)$$

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are introduced. For $\omega < 0$ the conjugate complex expressions are taken. The power of the energy losses of the current ring to Cherenkov radiation is $P = 2\pi a I_0 E_\zeta \Big|_{\substack{r=a \\ z=vt}}$; then

$$P = \frac{8\pi a^2 I_0^2}{c^2 v} \operatorname{Re}\left\{ \int \frac{n_1^2 - n_0^2}{n_1^2 - n_2^2} I_1\left(\frac{|\omega|}{v} a\varkappa_1\right)\left[K_1\left(\frac{|\omega|}{v} a\varkappa_1\right) + \lambda_1 I_1\left(\frac{|\omega|}{v} a\varkappa_1\right)\right] i\omega d\omega + \right.$$

$$\left. + \int \frac{n_2^2 - n_0^2}{n_1^2 - n_2^2} I_1\left(\frac{|\omega|}{v} a\varkappa_2\right)\left[K_1\left(\frac{|\omega|}{v} a\varkappa_2\right) + \lambda_2 I_1\left(\frac{|\omega|}{v} a\varkappa_2\right)\right] i\omega d\omega \right\}. \quad (6)$$

holds. The frequencies at which the energy losses occur must satisfy one of the conditions $n_1^2(\omega)\beta^2 > 1$ or $n_2^2(\omega)\beta^2 > 1$. If the medium contained in the ring is a plasma with a magnetic field applied along the axis of waveguide $\zeta$, $\eta$, $\zeta_z$ are known functions of the quantities $\omega$, $\omega_0 = \frac{4\pi e^2 N}{m}$, $\omega_H = \frac{eH}{mc}$. Furthermore

$$n_{1,2}^2 = \frac{h^2(1-\beta^2+2\beta^2u^2) - 2\beta^2(u^2-1)^2 \pm h\sqrt{h^2(1-\beta^2)^2 + 4\beta^2(u^2-1)}}{2u^2\beta^2(h^2+1-u^2)} \quad (7)$$

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holds with $h = \frac{\omega H}{\omega_0}$, $u = \frac{\omega}{\omega_0}$, $\beta = \frac{v}{c}$. The loss integral (6) is the complete expression for the energy losses to the so-called remote collisions. In the following the author studies the relativistic motion of a current ring. With $\beta \longrightarrow 1$ only extraordinary waves are emitted, i.e., $n_1^2(\omega) > 1$; the ordinary waves cannot be emitted at $n_2^2(\omega)$. The actually emitted frequencies are obtained from the dispersion relation $D = \frac{v}{\omega R} J_1 I_2 (n_1^2 - n_2^2) + S(n_o^2 - n_2^2) J_1' I_2 + \varkappa_2 (n_1^2 - n_o^2) J_1 I_2' = 0$ (8) with $S = \sqrt{n_1^2 - 1}$, $J_1 = J_1(\frac{|\omega|}{c} RS)$. The condition $n_1^2(\omega_n) > 1$ furnishes the region of the emitted frequencies $\omega_0 < \omega_n < \sqrt{\omega_H^2 + \omega_0^2}$. The integral of the losses is calculated for the two limiting cases $R \ll \frac{c}{\omega_0}$ and $R \gg \frac{c}{\omega_0}$. If the plasma wavelength is considerably longer than the radius of the waveguide, $I_2$ in (8) for small arguments ($\frac{\omega_0 R}{c} \ll 1$) can be expanded into a series. The energy losses and the dispersion relation are considerably reduced in

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B125/B202



this

$$P=\frac{8\pi^2a^2I_0^2}{c^3}\omega_H^2\left(\frac{\omega_0R}{c}\right)^2\sum_{n=1}^{\infty}\frac{J_1^2\left(\frac{a}{R}z_n\right)-\frac{a}{R}J_1\left(\frac{a}{R}z_n\right)J_1(z_n)}{\left|\frac{dD}{dz}\right|_{z=z_n}z_n^2}; \qquad (9)$$

$z_n=\frac{\omega_nR}{c}\sqrt{n_1^2(\omega_n)-1}$ denotes the roots of the dispersion equation $D = zJ_0(z) - 2J_1(z) = 0$. Series (9) rapidly converges. The most intense frequency $\omega_1$ corresponds to the first root of the dispersion relation. $\omega_1$ lies near the upper cutoff frequency $\omega_{gr}=\sqrt{\omega_H^2+\omega_0^2}$. The energy losses are considerably lower than the losses of a current ring in an infinite medium. In the other limiting case $\omega_0R/c \gg 1$ (i.e., in the dense plasma and with waveguides with long radius)

$$P=\frac{8\pi^2a^2I_0^2}{c^3}\omega_H^2\sum_{n=1}^{\infty}\frac{z_n^2J_1^2\left(\frac{a}{R}z_n\right)}{\left[\left(\frac{\omega_0R}{c}\right)^2+z_n^2\right]^{1/2}\left|\frac{dD}{dz}\right|_{z=z_n}};$$

holds for the energy losses. In this case the intense frequencies lie near the frequency $\sim \sqrt{(\omega_H^2/4) + \omega_0^2}$. With $\omega_0 R/c \gg 1$ the losses differ only little from the losses of a ring in an infinite medium. In the case of a nonrelativistic motion of a ring also ordinary waves can be emitted. The author thanks V. I. Veksler for suggesting the topic and B. M. Bolotovskiy and M. S. Rabinovich for the discussion of the results. There are 4 Soviet-bloc references. The reference to the English-language publication reads as follows: V. I. Veksler, CERN Symposium on High Energy Accelerators and Pion Physics, Proceedings 1, Geneva, 1956.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: May 19, 1960

L.

BOGDANKEVICH, D.S.; RUKHADZE, A.A.; SILIN, V.P.

Fluctuation of an electromagnetic field in a nonequilibrium plasma. Izv.vys.ucheb.zav.; radiofiz. 5 no.6:1093-1103 '62. (MIRA 16:2)

1. Fizicheskiy institut imeni P.N. Lebedeva AN SSSR.
(Plasma (Ionized gases)) (Electromagnetic waves)

35362
S/057/62/032/003/009/019
B108/B104

26.7777

AUTHORS: Bogdankevich, L. S., and Rukhadze, A. A.

TITLE: Electromagnetic waves in a plasma in the range of ion cyclotron resonance

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 3, 1962, 322-328

TEXT: Electromagnetic waves in the range of ion cyclotron resonance, i. e., $\omega \sim m\Omega_i = m\frac{e_i H_0}{Mc}$ (M = 1, 2, ....), arising in a magnetoactive plasma are studied assuming the plasma particle collisions to be negligible. The refractive index n and the absorption coefficient $\varkappa$ are determined from the dispersion relation $n^2\delta_{ij} - n_i n_j - \varepsilon_{ij}(\omega,\vec{k}) = 0$. In the case of weak spatial dispersion of the dielectric constant, the components of the anti-Hermitian part of $\varepsilon_{ij}$ are exponentially small as compared with the Hermitian part. In the opposite case, i. e., near the frequencies $\omega = m\Omega_i$ where the spatial dispersion of $\varepsilon_{ij}$ is considerable, the first

C Card 1/2

ACCESSION NR: AP4041991 S/0057/64/034/007/1175/1182

AUTHOR: Bogdankevich, L.S.; Rukhadze, A.A.

TITLE: On the cyclotron oscillations of a nonuniform plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.7, 1964, 1175-1182

TOPIC TAGS: plasma, nonuniform plasma, cyclotron resonance

ABSTRACT: The frequency spectra and damping constants of the normal oscillations of a nonuniform plasma are calculated in the neighborhood of the electron and ion Larmor frequencies and their second harmonics. It is assumed that the plasma is magnetized parallel to the z axis of a rectangular Cartesian coordinate system x,y,z and that its properties are functions of x, but the authors assert that their results can be easily transformed to apply to a racially nonuniform cylindrical plasma. It is also assumed that drift effects can be neglected, so that the dielectric tensor has the same form as for a uniform plasma. The authors assert that this assumption is justified in the case of the long wavelength cyclotron oscillations that they treat. The eikonal equation is then simply the dispersion equation in its usual form but with coefficients that are functions of x (in analogy with the Bohr-Sommerfeld

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ACCESSION NR: AP4041991

quantum conditions) the integral over the transparent portion of the plasma of the real part of the wave number obtained by solving the eikonal equation. The corresponding damping constant is the appropriately normalized integral of the imaginary part of the wave number. These integrals are written explicitly for frequencies near the second harmonic of both the electron and ion Larmor frequencies, and for frequencies near, but not too near, the Larmor frequencies themselves. The integrals (except for those pertaining to the second harmonic of the electron Larmor frequency, which are very cumbersome) are evaluated for a plasma of which the density, N(x), is given by

$$N(x)=N(0)\left[1-\left(\frac{x}{d}\right)^2\right],$$

and the results are discussed briefly. In each of the four cases there are two kinds of oscillation, corresponding to the ordinary and extraordinary waves, of which one is confined to the surface region and the other is not. Orig.art.has: 34 formulas.

ASSOCIATION: Fizicheskiy institut im.B.N.Lebedeva AN SSSR (Physical Institute, ANSSR)

SUBMITTED: 19Aug63 ENCL: 00

SUB CODE: ME NR REF SOV: 003 OTHER: 000

2/2
Card

L 11419-67 EWT(1) IJP(c)
ACC NR: AP6031267

SOURCE CODE: UR/0057/66/036/009/1639/1648

AUTHOR: Bakanov,S.P.; Bogdankevich,L.S.; Rukhadze,A.A.

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

50
49

TITLE: On the excitation of electromagnetic oscillations in a plasma beam bounded by plane conducting walls

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 9, 1966, 1639-1648

TOPIC TAGS: plasma stability, plasma oscillation, plasma electromagnetic wave, plasma magnetic field, betatron, uhf amplifier, extreme high frequency

ABSTRACT: The authors discuss the stability of a plasma uniformly filling most of the space between two plane parallel conducting walls and carrying an electron current in the direction of an applied magnetic field that is parallel to the walls. The calculations were undertaken because of their practical interest in connection with negative absorption amplifiers and plasma betatrons. The walls were assumed to be plane and parallel to facilitate the calculations; it is presumed that the results are qualitatively valid for the technically interesting case of a plasma beam in a cylindrical enclosure with conducting walls. The calculations are based on a dielectric tensor derived by linearizing hydrodynamic equations for the electron motion, which include the self consistent field and the effects of collisions. The calculations are therefore valid for waves whose phase velocities are high compared with the electron thermal

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UDC: 533.9

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ACC NR: AP6031267

velocities. Dispersion equations are derived for the limiting cases of weak and strong external magnetic field, and the logarithmic increments of the oscillations are calculated. It is found that in a rarefied plasma in a weak magnetic field there develops a periodic convective instability that is carried by the electron current, and that such a system can amplify. The instability persists in a weakly ionized dense plasma, in which collision effects are predominant, and a strong external longitudinal magnetic field reduces the logarithmic increment in a collision-free plasma but does not stabilize it. The frequency band that can be amplified increases in width with increasing wall conductivity, but the length of the tube required for a given gain also increases. It is concluded that the optimum wall conductivity for a negative absorption amplifier is $10^{13}$ or $10^{14}$ $sec^{-1}$ and the optimum plasma density is such as to provide a collision frequency of $10^{12}$ or $10^{13}$ $sec^{-1}$. Under these conditions frequencies up to about $10^{12}$ Hz can be amplified. It is found that under the conditions of the plasma betatron experiments of A.M.Stefanovskiy (Yadernyy sintez, 5, 215, 1965), the instability discussed here develops during the course of several microseconds. This time is much longer than the observed acceleration times and is also longer than the time that would be required for acceleration of the electrons if the acceleration were not interrupted. It is therefore concluded that the instability associated with wall conductivity cannot explain the observed interruption of acceleration in the plasma betatron and will not in itself prevent the operation of such an accelerator. The authors thank V.P.Silin, who instigated the work. Orig. art. has: 31 formulas and 1 figure.

SUB CODE: 20 SUBM DATE: 28Jun65 ORIG. REF: 006 OTH REF: 001

Card 2/2 bab

L 05784-67 EWT(1) IJP(c) AT

ACC NR: AP6031452 SOURCE CODE: UR/0056/66/051/002/0628/0638

47
B

AUTHOR: Bogdankevich, L. S.; Rukhadze, A. A.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Drift-cyclotron oscillations of a collision plasma propagating across a magnetic field

SOURCE: Zh eksper i teor fiz. v. 51, no. 2, 1966, 628-638

TOPIC TAGS: cyclotron, external magnetic field, particle collision, particle spectrum, plasma wave, Larmor radius, plasma temperature

ABSTRACT: An attempt has been made to investigate the drift-cyclotron oscillations of a spatially inhomogeneous low-pressure plasma with collisions propagating on an external magnetic field. Particle collisions are taken into account by the Landau collision integral [L. D. Landau, ZhETF, 7, 206, 1936]. Short-wave oscillations with a wavelength smaller than the Larmor ion radius but larger than the Larmor electron radius are examined. The analysis of oscillation spectra are carried out in the geometric and optical approximation. Dispersion relations are obtained for

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ACC NR: AP6031452

determining the local spectra and growth increment of drift-cyclotron oscillations of an inhomogeneous plasma. It is shown that in the growth of particle collision frequency, the drift-cyclotron oscillations of a collisionless plasma go over to drift-dissipative oscillations, which are only characteristic of a collision plasma. The stability of such oscillations depends on the nonuniformity of the plasma particle temperature. Orig. art. has: 28 formulas. [Based on authors' abstract]

SUB CODE: 20/ SUBM DATE: p6Mar66/ ORIG REF: 013/ OTH REF: 001/

Card 2/2

BOGDANKEVICH, O.V.

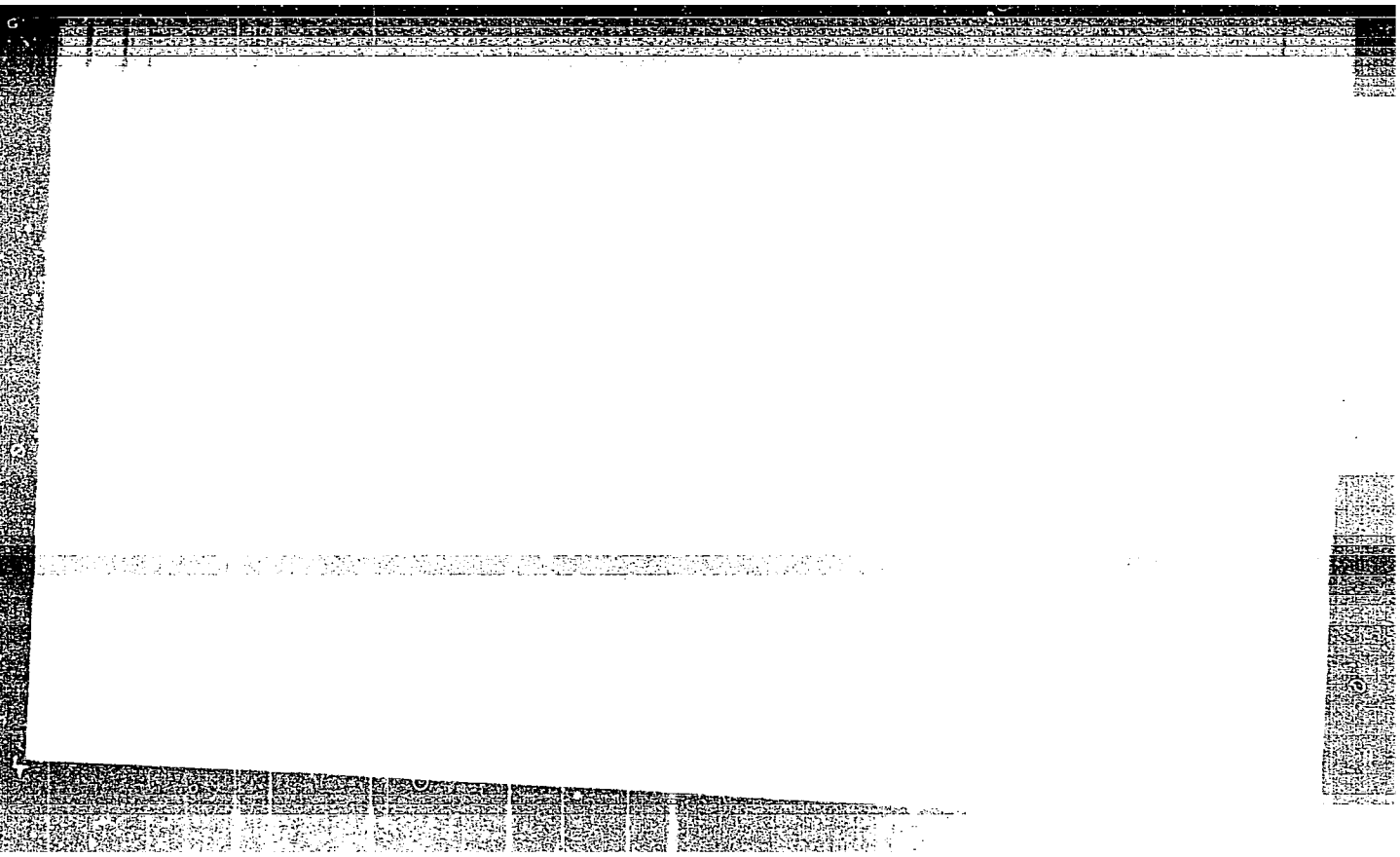
SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1648
AUTHOR BOGDANKEVIČ,O.V., LAZAREVA,L.E., NIKOLAEV,F.A.
TITLE The Non-Elastic Scattering of Photons by the Nuclei of Indium 115
PERIODICAL Žurn.eksp.i teor.fis,31, fasc.3, 405-412 (1956)
ISSUED: 12 / 1956

The yield of the reaction $In^{115}(\gamma, \gamma')\ In^{115}$ was measured in a 30 MeV synchrotron at the maximum energy $E_{max}$ of X-rays of from 5-27 MeV. The number of isomeric states of $In^{115m}$ produced after irradiation was measured by means of a scintillation counter which measures the $\gamma$-radiation emitted on the occasion of transition from a metastable level to the ground level ($h\nu$ =334 keV, T=4,5 hours). If the conversion coefficient is not very large, the method of registering metastable states chosen in this case is probably more effective than measuring reduced activity by means of the soft conversion electrons. The obtained cross sections of the photoexcitation of the metastable state of $In^{115m}$ indicate the lowest limit of the cross section of the reaction $In^{115}$ $(\gamma, \gamma')$. When dealing with the decay curves of $\gamma$-activity occurri ; in the indium sample, also the curve of the yield of reaction $In^{115}(\gamma, 2n)\ In^{113m}$ was determined. For the purpose of comparing the radiation- and neutron yields, the yields of neutrons on the occasion of the photo spallation of indium were measured simultaneously at various X-ray energies.

Zurn.eksp.i teor.fis,31, fasc.3, 405-412 (1956) CARD 2 / 2 PA - 1648

The curve of the yield of the reaction $In^{115}(\gamma,\gamma')In^{115m}$: The indium sample (95,8% $In^{115}$, 4,2% $In^{113}$) which had a thickness of 2,55 $g/cm^2$, was irradiated from a distance of 60 cm from the target of the synchrotron. The flux of $\gamma$-quanta impinging upon the sample was measured by means of an ionization chamber with thick walls. On the occasion of the decay of $In^{115m}$, 94,5% of the nuclei pass over into the ground state $In^{115}$, and 5,5% are subjected to a β-decay ($E_{lim}$ = 0,84 MeV). The average value of the conversion coefficient is $\alpha$ = 0,98. For purposes of control the absolute yield of the reaction $In^{115}(\gamma,\gamma')In^{115m}$ was measured at the maximum energy $E_{max}$ = 15,75 MeV also with the help of the electrons of the interior conversion. - The curve of the yield of photo neutrons: When measuring this curve the indium sample was fitted in the center of a paraffin block. The absolute yield of neutrons was determined from the ratio (number of neutrons registered on the occasion of the irradiation of the sample / number of neutrons of a gauged radiation source) ($Ra_\alpha$+Be). The curve of the yield found here refers practically to $In^{115}$. In the same diagram the yield curve for the reaction $In^{115}(\gamma, 2n)In^{113m}$ is shown. - In conclusion the cross sections of the investigated reactions are discussed in detail.

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



S/056/60/039/005/008/05?
B029/B077

AUTHORS: Bogdankevich, O. V., Lazareva, L. Ye., Moiseyev, A. M.

TITLE: Inelastic Scattering of Photons by $Rh^{103}$ Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 5(11), pp. 1224-1228

TEXT: The authors measured the yield of the reaction $Rh^{103}(\gamma,\gamma')Rh^{103m}$ on the synchrotron of FIAN (Physics Institute of the Academy of Sciences USSR) at different maximum bremsstrahlung energy, from 5.9 to 25.5 Mev in intervals of about 1 Mev. The number of isomeric nuclei of $Rh^{103m}$ ($T = 56 \pm 1$ min, $E_\gamma = 40 \pm 0.5$ kev) was determined from decay curves of the induced activity. These measurements were made with specimens of metallic rhodium (purity of 99.9%) 20 and 50$\mu$ thick (24.8 and 62 mg/cm$^2$). The decay of $Rh^{103m}$ nuclei is characterized by the following quantities: transition energy, 40 kev; conversion coefficient $\alpha_K$ from the K-shell, 40; ratio of the conversion coefficients on the K-shell and L-shell, $0.09 \pm 0.01$, and on the L-shell and M-shell, $7 \pm 1$. The yield of the $Rh^{103}(\gamma,\gamma')$ $Rh^{103m}$

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Inelastic Scattering of Photons by $Rh^{103}$ Nuclei

S/056/60/039/005/008/051
B029/B077

reaction was measured with a scintillation counter. X-ray bombardment of rhodium with a maximum energy of up to 25.5 Mev produces radioisotopes in different reactions. The most important reactions with a fraction of about 90% of all decaying rhodium nuclei are $(\gamma,n)$ and $(\gamma,2n)$. It was possible to excite the metastable states of rhodium $Rh^{103m}$ not only by the $(\gamma,\gamma')$ reaction but also by inelastic scattering of photoneutrons when irradiating the rhodium specimens in the synchrocyclotron. The $\sigma(E)$ curve has two maxima. The position of the first maximum falls within the experimental accuracy and agrees with the threshold of the $(\gamma,n)$ reaction. The second maximum is at about 20 Mev; this is 3 to 4 Mev higher than the energy corresponding to the maximum cross section of nuclear absorption of photons (16 Mev). In the range of the second maximum, the cross section cannot be determined as accurately as in the range of the first one. The calculated cross section of the $Rh^{103}(\gamma,\gamma')Rh^{103m}$ reaction gives the lower limit of inelastic nuclear scattering by rhodium. In order to find the total cross section for this reaction it is necessary to know the relative production probability of the isomeric state when the protons are scattered inelastically; if the cross section for the $(\gamma,\gamma')$ reaction

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Inelastic Scattering of Photons by $Rh^{103}$ Nuclei

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is known, then it is possible to estimate the radiation width $\Gamma_\gamma$ for different excitation energies. Starting from the threshold of the $(\gamma,n)$ reaction, the neutron width $\Gamma_n$ increases rapidly, and the cross section for the $(\gamma,\gamma')$ reaction decreases accordingly. The ratio of the cross sections $\sigma(\gamma,\gamma')/\sigma_n$ remains almost constant ($\sim$0.01) up to 16 Mev. At higher energies, the relative probability of inelastic scattering increases, and amounts to about 10% at 20 Mev. At energies of 20-22 Mev, the radiation of rhodium is 25-30% of the neutron width. I. V. Shtranikh is mentioned. There are 2 figures, 2 tables, and 16 references: 3 Soviet, 11 US, 1 Canadian, and 1 French.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Institute of Physics imeni P. N. Lebedev, Academy of Sciences USSR)

SUBMITTED: June 23, 1960

Card 3/3

UILKINSON, D. [Wilkinson, D.]; BOGDANKEVICH, O.V.[Translator]

Photodisintegration of nuclei.[translated from the English]. Usp. fiz.nauk 72 no.1:75-98 S '60. (MIRA 13:8)
(Nuclei, Atomic)

33965
S/089/62/012/003/002/013
B102/B108

24.6800

AUTHOR: Bogdankevich, O. V.

TITLE: Synchrotron energy stabilization circuit with variable level of fundamental voltage

PERIODICAL: Atomnaya energiya, v. 12, no. 3, 1962, 198 - 203

TEXT: A method of measuring the yield of photonuclear reactions is proposed in which a multi-channel recording system is used which eliminates the effect of sensitivity drift of the recording apparatus. The method was elaborated for the synchrotron of the FIAN with an electron energy of 30 Mev for photoneutron yield measurements, it can be applied, however, to all betatron or synchrotron-type accelerators. The so-called yield curve, $Y(E_{\gamma max})$ was determined from $E^{n}_{\gamma max}-E^{1}_{\gamma max}$ for a measuring system with n channels. $E_{\gamma max}$ is the maximum bremsstrahlung energy of the accelerator. For the necessary measurements an electronic circuit was designed.

Card 1/0 4

Synchrotron energy stabilization...

33965
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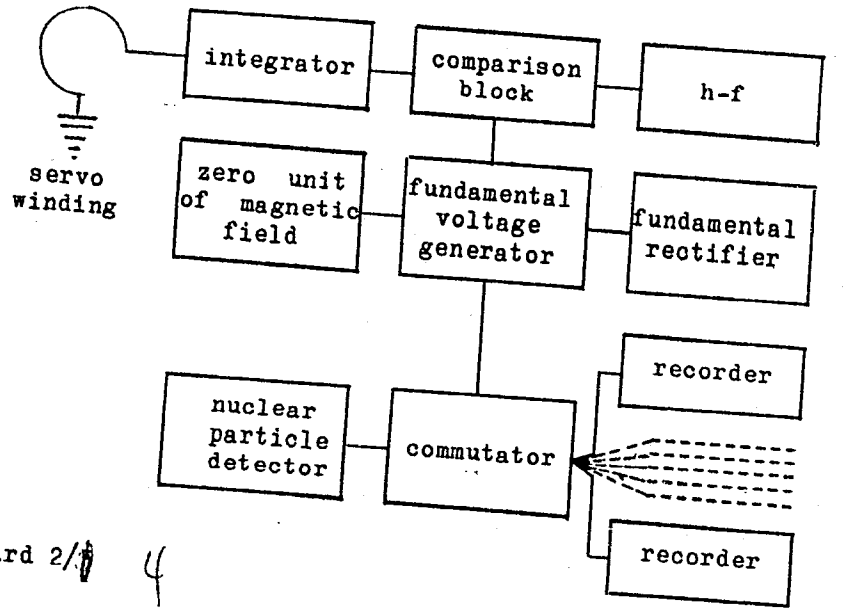
B102/B108

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Synchrotron energy stabilization...

The servo system was placed under the accelerator chamber at the radius of the equilibrium orbit. The circuit diagram of the fundamental voltage generator is shown in Fig. 2. Its voltage is compared with the voltage v(t) obtained from the integrator and regulated by varying the electromagnetic field in the synchrotron gap. The accuracy of the generator was experimentally checked with a MCB (MSV) divider and a high-resistance P-345 (R-345) potentiometer. These measurements were carried out for the upper (all tubes blocked) and the lower levels (all tubes open). The instability of the generator was nearly equal at both levels (± 0.07%). The operation of the whole arrangement was checked by measurement of the photoneutron yield curves for Cu, Rh, and Ag nuclei. The energy scale was graduated and tested to its linearity from the $(\gamma,n)$ reaction thresholds in Pb, Al, and $O^{16}$, in the range 9-17 Mev. The accuracy with which $E_{\gamma max}$ was kept constant is as good as in the usual stabilization methods. This method, however, has several advantages as relative yield measurements, sensitivity drift elimination, and largely automatic measurement. Engineer V. A. Zapevalov is thanked for discussions, M. I. Sukhomyasov and B. I. Goryachev for help. There are 5 figures, 1 table, and 9 references;

Card 3/4

Synchrotron energy stabilization...

2 Soviet and 7 non-Soviet. The four most recent references to English-language publications read as follows: L. Katz et al. Phys. Rev. 95, 464 (1954); B. Spicer, A. Penfold. Rev. Scient. Instrum. 26, 952 (1955); D. Jamnik. Nucl. Instrum. 1, 324 (1957); K. Okamoto. Phys. Rev. 110, 143 (1958).

SUBMITTED: June 17, 1961

Fig. 2. Fundamental voltage generator.

Legend: (1) starter, (2) on matrix, (3) output.

S/056/62/042/006/016/047
B104/B102

AUTHORS: Bogdankevich, O. V., Goryachev, B. I., Zapevalov, V. A.

TITLE: The splitting of the giant resonance in medium nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1502-1514

TEXT: The yield of photoneutrons from $Rh^{103}$, $Ag^{107}$, $In^{115}$, $Tb^{159}$, and $Ta^{181}$ in the region of $E_\gamma^{max}$ between the threshold energy of the $(\gamma,p)$ reaction and 23 Mev was measured with the help of the 30-Mev synchrotron of the FIAN. The method of measurement adopted (Fig. 1) very largely eliminated instrument drift and simplified the experiment. The absorption cross sections of the quanta are computed from the measured yield (Fig. 10). A splitting of the giant resonance of Rh, In, Tb, and Ta nuclei was detected; it is explained as being due to the deviation of the nuclei from spherical symmetry. Indications of a possible nonaxiality of the $Tb^{159}$ nuclei were also found. There are 11 figures and 3 tables.

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The splitting of the giant ... S/056/62/042/006/016/047
B104/B102

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: February 4, 1962

Fig. 1. Experimental arrangement.
Legend: (1) synchrotron, (2) target, (3) paraffin, (4) concrete, (5) monitor, (6) $BF_3$ counter, (7) sample, and (8) photomultiplier.

Fig. 10. $\gamma$-ray absorption cross section of $Tb^{159}$.
Legend: (1) millibarn.

Card 2/4 2

BOGDANKEVICH, O.V.

Relative method of measuring the yield curves of photonuclear reactions. Trudy Fiz. Inst. 19:167-186 '63. (MIRA 16:8)

(Photonuclear reactions)

BASOV, N.G., BOGDANKEVICH, O.V.

Recombination luminescence of GaAs and Ge following excitation by fast electrons. Zhur. eksp. i teor. fiz. 44 no.3:1115-1116 Mr '63. (MIRA 16:3)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR.
(Gallium arsenide) (Germanium) (Quantum electronics)

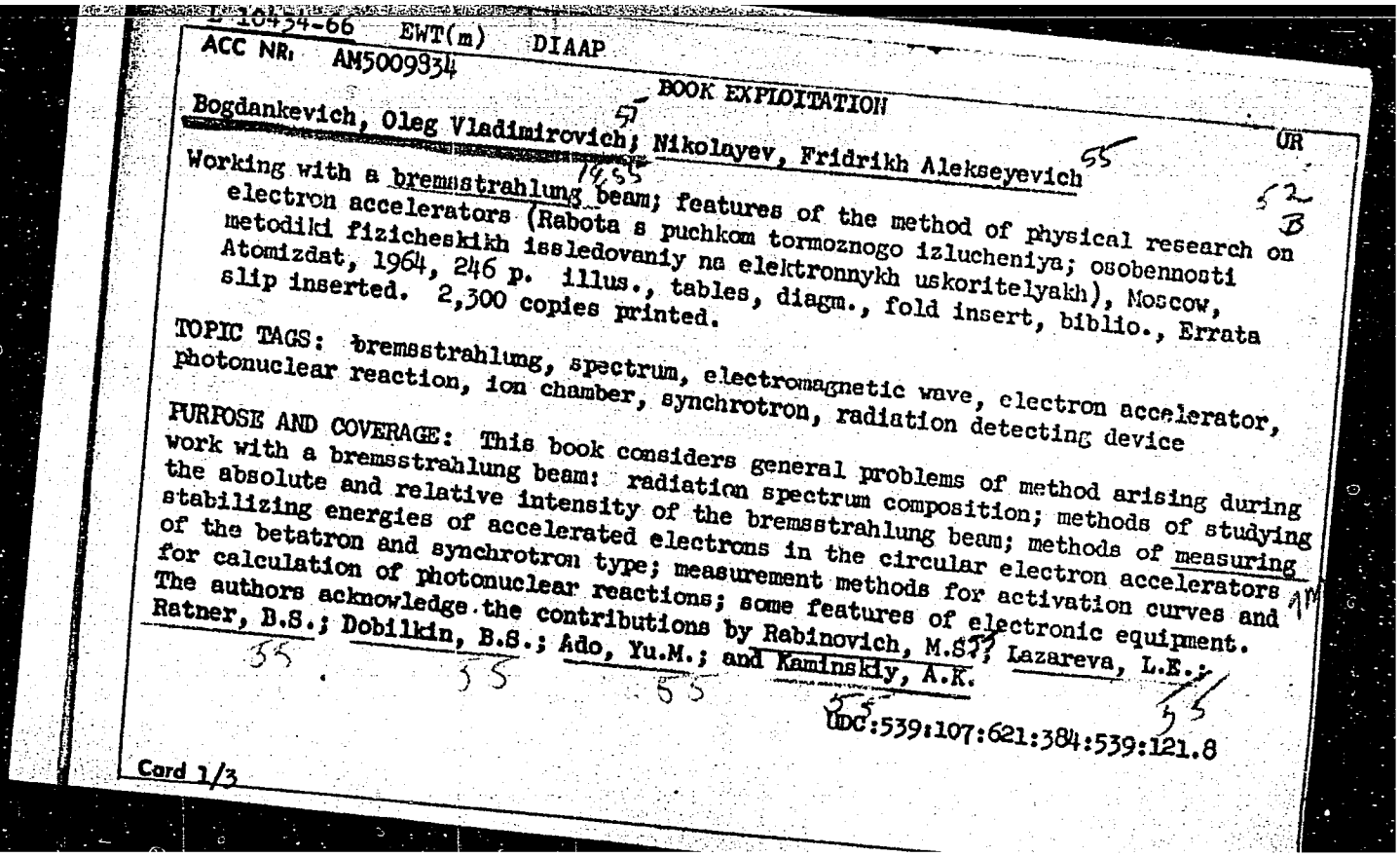
BOGDANKEVICH, O.V.; DOLBILKIN, B.S.; LAZAREVA, L.Ye.; NIKOLAYEV, F.A.

Inelastic scattering of gamma quanta on $Ag^{107}$ nuclei. Zhur. eksp. i teor. fiz. 45 no.4:882-891 O '63. (MIRA 16:11)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR.

BASOV, N. G.; BOGDANKEVICH, O. V.; DEVYATOV, A. G.

"Excitation of the semiconducting quantum oscillator by a beam of fast electrons." paper presented at the Symp on Radiative Recombination in Semiconductors [Intl Conf on Semiconductor Physics], Paris, 27-28 Jul 64.



L 10434-66 EWT(m) DIAAP

ACC NR: AM5009934 BOOK EXPLOITATION UR

Bogdankevich, Oleg Vladimirovich; Nikolayev, Fridrikh Alekseyevich

Working with a bremsstrahlung beam; features of the method of physical research on electron accelerators (Rabota s puchkom tormoznogo izlucheniya; osobennosti metodiki fizicheskikh issledovaniy na elektronnykh uskoritelyakh), Moscow, Atomizdat, 1964, 246 p. illus., tables, diagm., fold insert, biblio., Errata slip inserted. 2,300 copies printed.

TOPIC TAGS: bremsstrahlung, spectrum, electromagnetic wave, electron accelerator, photonuclear reaction, ion chamber, synchrotron, radiation detecting device

PURPOSE AND COVERAGE: This book considers general problems of method arising during work with a bremsstrahlung beam: radiation spectrum composition; methods of studying the absolute and relative intensity of the bremsstrahlung beam; methods of measuring stabilizing energies of accelerated electrons in the circular electron accelerators of the betatron and synchrotron type; measurement methods for activation curves and for calculation of photonuclear reactions; some features of electronic equipment. The authors acknowledge the contributions by Rabinovich, M.S.; Lazareva, L.E.; Ratner, B.S.; Dobilkin, B.S.; Ado, Yu.M.; and Kaminskiy, A.K.

UDC:539:107:621:384:539:121.8

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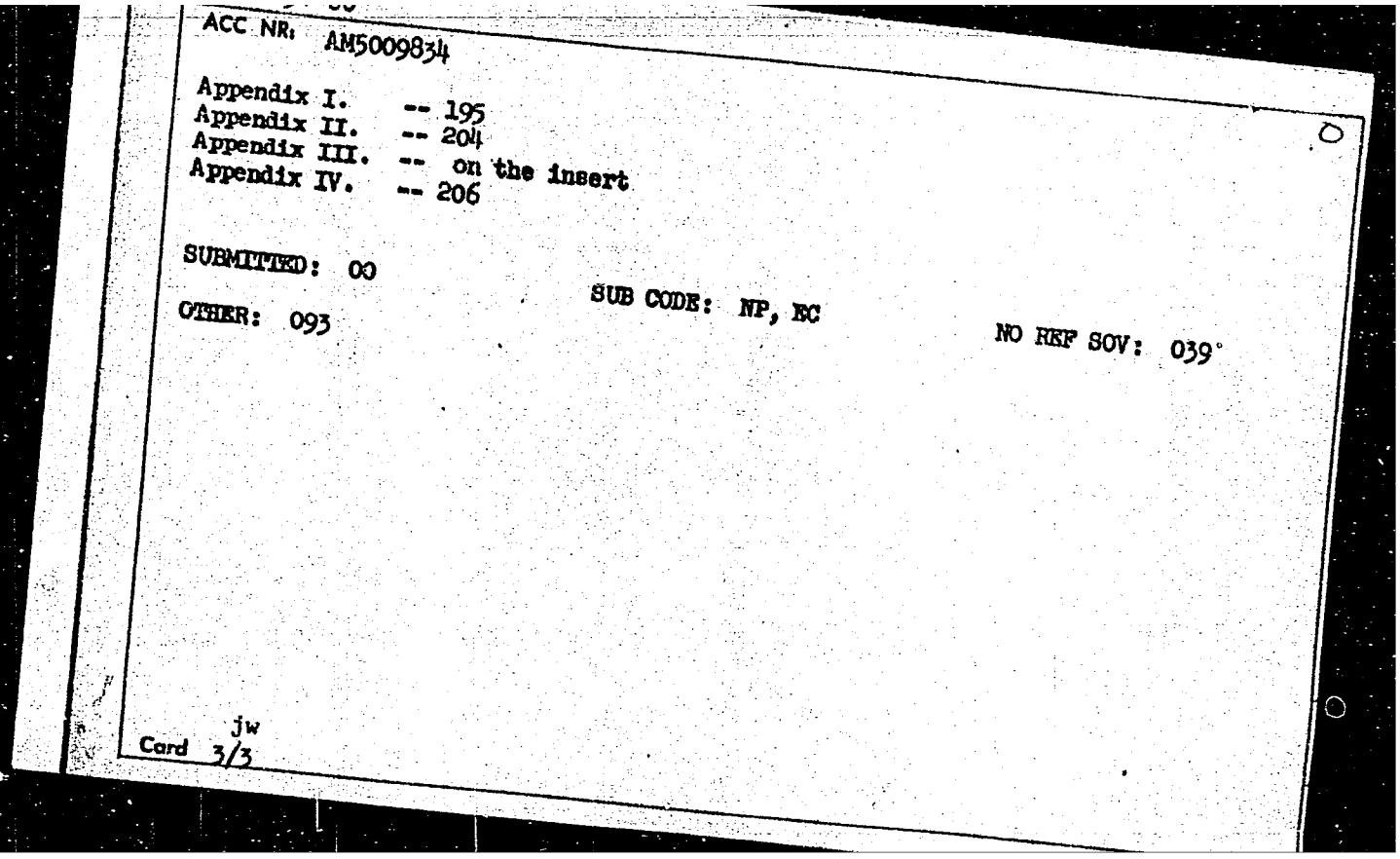
The monograph is expected to be of interest to a wide circle of scientific workers, engineers, aspirants, and students working with electronic accelerators.

TABLE OF CONTENTS [abridged]:



ACC NR: AM5009834

Appendix I. -- 195
Appendix II. -- 204
Appendix III. -- on the insert
Appendix IV. -- 206

SUBMITTED: 00

SUB CODE: NP, EC

OTHER: 093

NO REF SOV: 039

jw
Card 3/3

ACC NR: AP5028320 EWG(m)/EPA(w)-2/T/EWP(k)/EWP(b)/EWA(m)-2/EWA(h)/ETC(m) SOTB/IJP(c)
WG/WW/GG/AT/WH SOURCE CODE: UR/0057/65/035/011/2052/2053

AUTHOR: Bogdankevich, O. V.; Sudzilovskiy, V. Yu.; Lozhnikov, A. A.

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

TITLE: On the possible use of a laser beam in producing a powerful source of electrons

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 11, 1965, 2052-2053

TOPIC TAGS: current pulse, electron drawing, ruby laser, laser beam, laser heating, plasma

ABSTRACT: Powerful pulses can be produced by drawing the electrons out of a plasma bunch created during the heating of a cathode by a laser beam. The experimental setup capable of producing these bunches is shown in Fig. 1. An evacuated glass chamber 9 contains a tantalum cathode 1, an anode 2, a graphite collector 3, a right-angle prism with a total internal reflection 6, and a fixed short-f lens 7. A 0.3-j, 60—80-nanosec ruby laser beam 4, prefocused by a long-f lens 5, is passed through a slit in a collector rotated by the prism. The beam is then focused by lens 7, and passed through a 6-mm aperture in the anode onto the cathode (screened by a metallic chamber 8 with a 2-mm-diameter hole), where it generates plasma. The dependence of the amplitude of a generated current pulse on the potential difference between the anode and cathode, and on the laser output power at a charging voltage of 6 kV results in the

Card 1/3

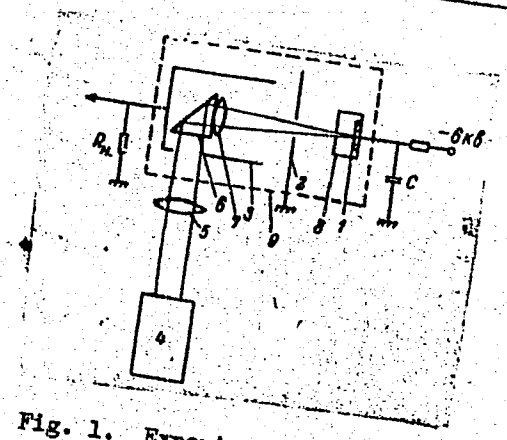



Fig. 1. Experimental setup

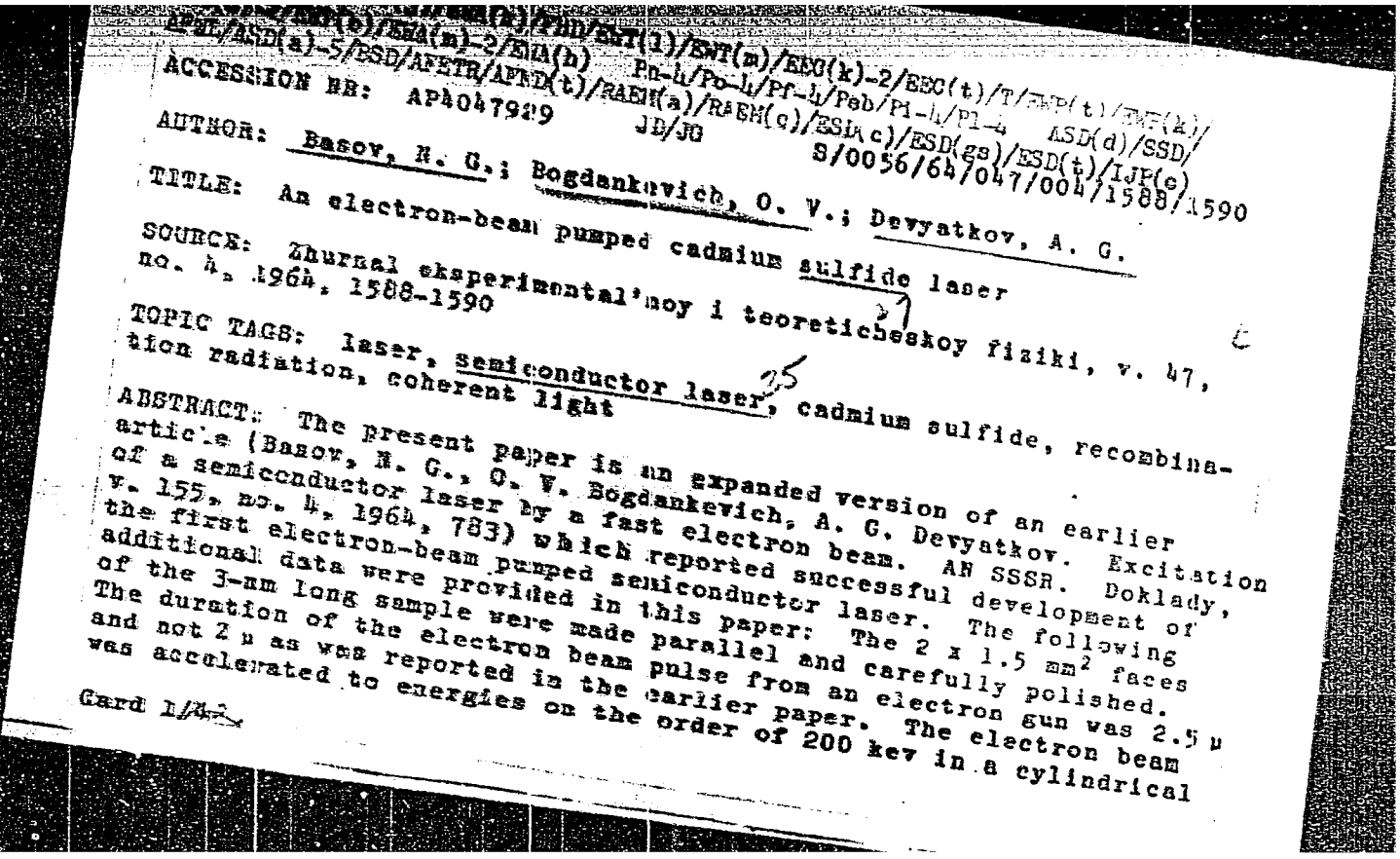
L 7692-66
ACC NR: AP5028320

generation of 500-amp, 80-nanosec current pulses, corresponding to a current density of 1800 amp/cm$^2$ at the anode. Although the physical aspects of the processes occurring in this case are not fully understood and thus call for additional experiments, the amplitude and shape of the current pulses obtained are far more stable than those obtained in a spark discharge, as demonstrated elsewhere (I. V. Kozhukhov et al, Use of a plasma gun for generating high-density electron fluxes. Preprint, OIYaI, Dubna, 1740, August 1964). No visible cathode damage was noticed after ~ 1000 bombardments, which seems to indicate that with improvements such an injector would be capable of delivering even higher current pulses at increased repetition rates. Orig. art. has: 3 figures.

SUB CODE: EC/ SUBM DATE: 13Mar65/ ORIG. REF: 001/ OTH REF: 003/ ATD PRESS: 4142

[YK]

Card 3/3



APWL/ASD(a)-5/BSD/AFETR/APTD(t)/RAEM(a)/RAEM(c)/ESD(c)/ESD(gs)/ESD(t)/IJP(c)
JD/JG

ACCESSION NR: AP4047929 S/0056/64/047/004/1588/1590

AUTHOR: Basov, N. G.; Bogdankevich, O. V.; Devyatkov, A. G.

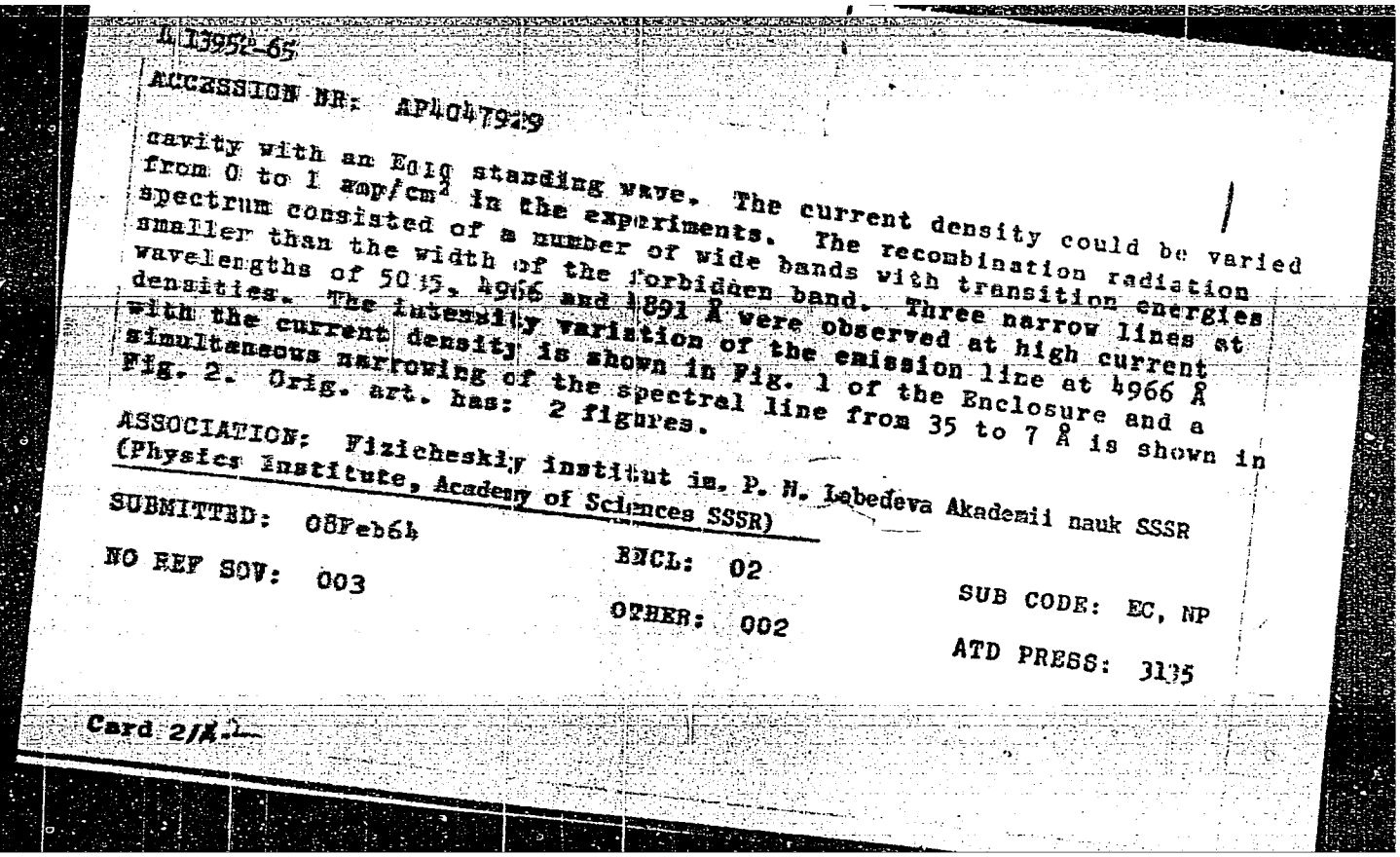
TITLE: An electron-beam pumped cadmium sulfide laser

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 4, 1964, 1588-1590

TOPIC TAGS: laser, semiconductor laser, cadmium sulfide, recombination radiation, coherent light

ABSTRACT: The present paper is an expanded version of an earlier article (Basov, N. G., O. V. Bogdankevich, A. G. Devyatkov. Excitation of a semiconductor laser by a fast electron beam. AN SSSR. Doklady, v. 155, no. 4, 1964, 783) which reported successful development of the first electron-beam pumped semiconductor laser. The following additional data were provided in this paper: The 2 x 1.5 mm$^2$ faces of the 3-mm long sample were made parallel and carefully polished. The duration of the electron beam pulse from an electron gun was 2.5 μ and not 2 μ as was reported in the earlier paper. The electron beam was accelerated to energies on the order of 200 kev in a cylindrical

Card 1/2



L 13952-65

ACCESSION NR: AP4047929

cavity with an E01Q standing wave. The current density could be varied from 0 to 1 amp/cm² in the experiments. The recombination radiation spectrum consisted of a number of wide bands with transition energies smaller than the width of the forbidden band. Three narrow lines at wavelengths of 5015, 4966 and 1891 Å were observed at high current densities. The intensity variation of the emission line at 4966 Å with the current density is shown in Fig. 1 of the Enclosure and a simultaneous narrowing of the spectral line from 35 to 7 Å is shown in Fig. 2. Orig. art. has: 2 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 08Feb64 ENCL: 02 SUB CODE: EC, NP

NO REF SOV: 003 OTHER: 002 ATD PRESS: 3135

Card 2/2

ACCESSION NR. AP4030780 S/0020/64/155/004/0783/0783

AUTHOR: Basov, N. G. (Corresponding Member, AN SSSR); Bogdankevich, O. V.; Devyatkov, A. G.

TITLE: Excitation of a semiconductor laser by a fast electron beam

SOURCE: AN SSSR. Doklady*, v. 155, no. 4, 1964, 783

TOPIC TAGS: laser, semiconductor laser, junction laser, electron beam laser, cadmium sulfide laser

ABSTRACT: This article reports the first successful results of experiments in which stimulated emission of radiation was achieved from CdS monocrystals in pulsed operation by means of an electron beam. Intense radiation in the green part of the spectrum ($\lambda$=4966Å) was observed during irradiation of CdS monocrystal, placed in a helium cryostat, by a beam of ~200 Kev electrons. The intensity of fluorescence increased sharply with current density. A three-fold increase of the current density above the threshold resulted in a two-order increase in the intensity of radiation and a simultaneous

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ACCESSION NR. AP4030780

narrowing of the emission line from 35 to 7 Å. The threshold current was observed to depend strongly on the quality of the crystals used. The duration of the current pulses was 2 μsec and the repetition frequency was several tens of cps. At small current densities, the duration of emission after the end of the pulse was 2 μsec. At the maximum current densities, the light pulse was synchronous with the pulse.

ASSOCIATION: none

SUBMITTED: 12Feb64 DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 002 OTHER: 000

Card 2/2

EWA(m)/EWP(b)/T/EWA(m)-2/EWP(t) IJP(c) RDW/AT/WG/JD/JG ACCESSION NR: AP5011524 UR/0020/65/161/005/1059/1059

AUTHOR: Basov, N. G. (Corresponding member, AN SSSR); Bogdankevich, O. V.; Pechenov, A. N.; Abdulayev, G. B.; Akhundov, G. A.; Salayev, E. Yu.

TITLE: Stimulated emission in a monocrystal of GaSe excited by fast electrons

SOURCE: AN SSSR. Doklady, v. 161, no. 5, 1965, 1059

TOPIC TAGS: laser, semiconductor laser, stimulated emission, gallium selenide, electron beam laser, coherent light

ABSTRACT: Achievement of laser action in a III-VI semiconductor (GaSe) pumped by an electron beam is reported. Samples of p-type GaAs with a carrier concentration of $5 \times 10^{15}$ $cm^{-3}$ and resistivity of ~200 ohm/cm at 300K were cleaved to form two plane-parallel faces. Monocrystalline samples 1 mm thick or less, cooled by liquid nitrogen, were bombarded with a 2-usec 200-kev electron beam directed to the cleaved surface at an angle of 70 degrees. Emission observed in the direction perpendicular to the surface was recorded by a spectrograph. The emission spectrum extending between 5870 Å and 6150 Å showed four peaks. The maximum was observed at 5925 Å, indicating that laser action is generated by interband recombination (the forbidden gap of GaAs at 77K is 2.09 ev). Fig. 1 of the Enclosure shows that the

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L 43907-65

ACCESSION NR: AP5011524

line at 5925 Å narrows with increasing current density of the beam. The displacement of the line toward the long wavelength region at high current densities was attributed to heating. When the cleaved surfaces were silvered, the line width of the peak decreased to one-half its value and additional peaks appeared at 5960 Å and 5983 Å. Orig. art. has: 1 figure. [CS]

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR); Institut fiziki Akademii nauk AzSSR (Physics Institute, Academy of Sciences AzerbSSR)

SUBMITTED: 21Aug64 ENCL: 01 SUB CODE: SS

NO REF SOV: 002 OTHER: 002 ATD PRESS: 3248

Card 2/3

ACC NR: AP5027406 SOURCE CODE: UR/0181/65/007/011/3289/3293

AUTHOR: Basov, N. G.; Bogdankevich, O. V.; Popov, Yu. M.

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

TITLE: Generation of short-wavelength radiation and lifetimes with respect to spontaneous emission in semiconductors

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3289-3293

TOPIC TAGS: semiconductor, semiconductor laser, electron beam laser

ABSTRACT: The possibility of fabricating electron-beam-pumped semiconductor lasers generating in the ultraviolet spectral range is discussed. The analysis is limited to direct interband transitions and does not include the case when carriers must be treated as polarons. It is shown that the lifetime of excess carriers with respect to interband transitions accompanied by emission of a photon is inversely proportional to the energy width of the forbidden gap. The lifetime of radiationless transitions is thus neglected in the analysis. Expressions are derived for the minimal pump power and the optimal duration of the excitation pulse. It is suggested that high-purity ZnS, aluminum and boron phosphides, corundum, and other wide-gap semiconductors should be tested for laser action in the ultraviolet by means of electron beam excitation. Orig. art. has: 11 formulas.

SUB CODE: 20/ SUBM DATE: 28May65/ ORIG REF: 008/ OTH REF: 005/ ATD PRESS: 4132

[CS]

Card 1/1

L 21412-66 EWP(e)/EWT(m)/ETC(f)/EWG(m)/EWP(t) IJP(c) JD/JG/AT/WH

ACC NR: AP6009664 SOURCE CODE: UR/0181/66/008/003/0802/0804

AUTHOR: Basov, N. G.; Bogdankevich, O. V.; Devyatkov, A. G.

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

TITLE: Recombination radiation of α-SiC excited by electrons

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 802-804

TOPIC TAGS: silicon carbide, recombination radiation, semiconductor

ABSTRACT: The recombination radiation of 1 x 2 x 3 mm samples of α-SiC with polished sides excited by a beam of 200-kev electrons was investigated at a temperature of 60K. The electron beam was either perpendicular to the large face of the sample or at a 45° angle to it. The beam's penetration depth was determined to be ~120 μ. The emission spectra of three of the samples are shown in Fig. 1. A detailed spectrum observed in the region between 4700—4850 Å is shown in Fig. 2. The energy difference between the lines in the 4700—4850 Å region, indicating some kind of

Card 1/4

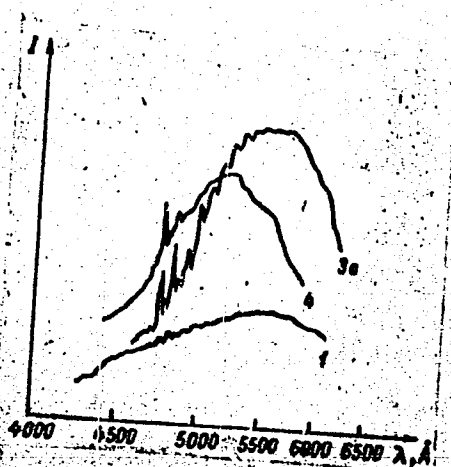


Fig. 1. Emission spectra of α-SiC at 60K and at a current density j = 140 ma/cm$^2$. The numbers indicate samples: 1 - bluish-greenish industrial-type crystal; 3a - colorless compensated p-type crystal doped with about $10^{17}$ impurity atoms per cm$^3$; 4 - purest sample with an impurity concentration of $7 \times 10^{16}$/cm$^2$.

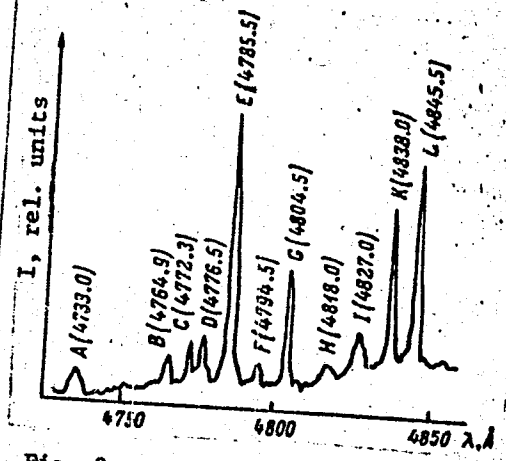


Fig. 2. The emission spectrum of sample No. 4 in the spectral region 4700—4850 Å. (T = 60K, j = 140 ma/cm$^2$)

| | | | |
|---|---|---|---|
| D—F | 0.0049 | F—I | 0.0174 |
| E—F | 0.0049 | G—K | 0.0178 |
| H—I | 0.0048 | A—G | 0.0390 |
| A—B | 0.0175 | B—K | 0.0393 |
| C—G | 0.0174 | C—L | 0.0392 |
| E—H | 0.0175 | | |

Table 1. Energy difference between emission lines (ev)



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L 21412-66
ACC NR: AP6009664

connection between the lines, is tabulated in Table 1. No stimulated emission was observed in the experiments. Orig. art. has: 3 figures and 1 table. [CS]

SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 003/ OTH REF: 003/ ATD PRESS: 4221

Card 4/4 UVR

EWT(l)/EWT(m)/EEC(k)-2/T/EWP(k)/EWA(h) IJP(c) WG/JD/JG

ACC NR: AP6015448 SOURCE CODE: UR/0181/66/008/005/1341/1342

AUTHOR: Basov, N. G.; Bogdankevich, O. V.; Yeliseyev, P. G.; Lavrushin, B. M.

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

TITLE: A solid solution $GaP_xAs_{1-x}$ laser excited by a beam of fast electrons

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1341-1342

TOPIC TAGS: laser, semiconductor laser, coherent radiation, gallium phosphide, gallium arsenide

ABSTRACT: Laser action at nitrogen temperature is reported in n-type $GaP_xAs_{1-x}$ excited by a beam of 50-kev electrons. The GaP concentration was about 20% and that of uncontrolled donor impurities, $\sim 10^{17}$ $cm^{-3}$. The $GaP_xAs_{1-x}$ samples were obtained by epitaxial growth through gas transport reactions. The dimensions of the sample were 0.48 x 0.75 x 2.5 mm. The Fabry-Perot cavity (cavity length 0.48 mm) was prepared by polishing the sides of the sample. The experimental arrangement was similar to that used in electron beam excitation of GaAs (Fizika tverdogo tela, v. 8, no. 1, 1966, p. 21) except that a monochromator with a resolving power of 3 Å was used instead of the spectrometer. The pulse duration and the repetition rate were 2 μsec and 60 pps, respectively. At current densities (j) less than 0.3 amp/$cm^2$ spontaneous emission peaked at a wavelength of 8300 Å (half-width of about 1000 Å).

Card 1/2

ACC NR: AP6015448

Above j = 0.3 amp/cm$^2$ a second peak appeared at approximately 7000 Å. The intensity of the peak at 7000 Å increased much faster than that at 8300 Å, so that at j = 1 amp/cm$^2$ the intensity of the former peak was 10 times greater than that of the peak at 8300 Å. Fig. 1. shows the emission spectrum at different values of j. The smallest value of half-width obtained was 12 Å. The divergence in the plane exposed to the electron beam was 14—15°. Depending on the quality of the resonator the

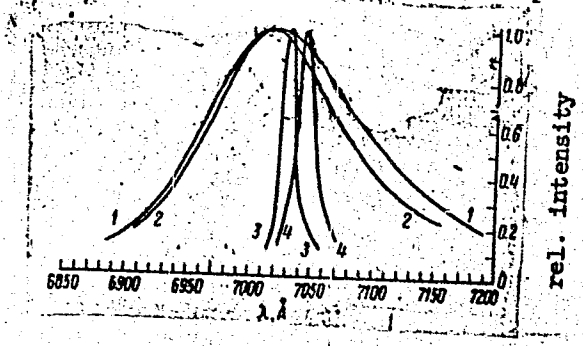


Fig. 1. The emission spectrum of $GaP_{0.2}As_{0.8}$

j, amp/cm$^2$: 1 - 0.5; 2 - 0.75; 3 - 2.5; 4 - 3.5.

oscillation threshold varied between j = 1.5—2.5 amp/cm$^2$. The duration of the laser pulse was not greater than 100 nsec. Orig. art. has: 3 figures. [CS]

SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 002/ OTH REF: 002/ ATD PRESS: 4259

Card 2/2

L 39758-66 EWT(l)/EWT(m)/EEC(k)-2/FBD/T/EWP(k)/EWA(h)/EWP(t) IJP(c) WW/
ACC NR: AP6015476 SOURCE CODE: UR/0181/66/008/005/1536/1538
JD/GD-2

AUTHOR: Basov, N. G.; Bogdankevich, O. V.; Devyatkov, A. G. 21 B

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

TITLE: Certain characteristics of emission generated in CdS by electron excitation 27

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1536-1538

TOPIC TAGS: laser, semiconductor laser, cadmium sulfide, coherent emission

ABSTRACT: The present paper is an extension of an earlier work (N. G. Basov, et al. Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 4(10), 1964, 1588) in which laser action was reported in CdS excited by a beam of electrons. The 0.5 x 0.85 x 1.5 mm sample was prepared by polishing. The Fabry-Perot cavity was formed by the 0.85 x 1.5 mm faces. The beam of 50-kev electrons was incident on the 0.5 x 1.5 mm face of the crystal cooled to the liquid nitrogen temperature. The pulse duration and the repetition frequency were ~2 μsec and 50 cps, respectively. Fig. 1 shows the emission spectrum of CdS at different current densities (j). At j = 100 mamp/cm$^2$ recombination radiation with a half-width ~70 Å peaked at 4960 Å. Although line narrowing was observed at j = 1.5 amp/cm$^2$, the oscillation threshold was at 5 amp/cm$^{-2}$. The divergence at the threshold was 13° in the plane of the beam and 9° in the plane

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L 39758-66

ACC NR: AP6015476

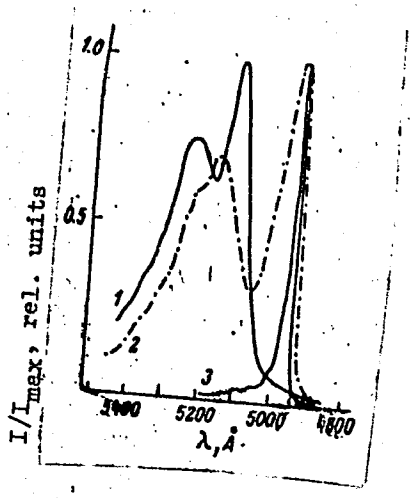


Fig. 1. The emission spectrum of CdS at different current densities

j in amp/cm$^2$: 1 - 0.18; 2 - 0.52; 3 - 8.5. (T = 80K).

perpendicular to it. The quantum efficiency, defined as the ratio of the radiated power to the power of the electron beam, exceeded 1%. Orig. art. has: 4 figures. [CS]

SUB CODE: 20/ SUBM DATE: 15Nov65/ ORIG REF: 001/ ATD PRESS: 4259

Card 2/2

ACC NR: AP6030950 SOURCE CODE: UR/0181/66/008/009/2547/2548

AUTHOR: Bogdankevich, O. V.; Zverev, M. M.; Pechenov, A. N.; Sysoyev, L. A.

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

TITLE: Recombination radiation of ZnS single crystals excited by fast electrons

SOURCE: Fizika tverdogo tela, v. 8, no. 9. 1966, 2547-2548

TOPIC TAGS: solid state laser, zinc sulfide, ultraviolet laser, recombination radiation, electron beam pumping, ELECTRON BEAM

ABSTRACT: Laser action was reported in electron-beam-pumped ZnS single crystals with a large forbidden gap. High-purity hexagonal ZnS specimens were soldered with indium to a copper heat sink kept at liquid N temperature (except in the case of some experiments conducted at room temperature). The electron beam was focused on the polished surface of the specimen at right angles to the two polished ends. The emission recorded by a ZMR-3 monochromator and an FEU-18A photomultiplier was observed in the direction perpendicular to the incident beam. Recombination radiation was observed in the ultraviolet region when ZnS was excited by a pulsed beam of 50-kv electrons at current densities up to 6 amp·cm$^{-2}$. At increased current densities (6 amp·cm$^{-2}$ and up) and 80K, emission of a line (14 Å wide) at 3300 Å was predominant. The shapes of the light and current pulses were coincident, which would seem to indicate that the life-

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Card 2/2

L 34380-66 FBD/EWT(l)/EWT(m)/EEC(k)-2/T/EWP(t)/ETI/EWP(k) IJP(c)

ACC NR: AP6023202 WG/JD/JG SOURCE CODE: UR/0020/66/168/006/1283/1286

AUTHOR: Basov, N. G. (Corresponding member AN SSSR); Bogdankevich, O. V.; Goncharov, V. A.; Lavrushin, B. M.; Sudzilovskiy, V. Yu.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: A GaAs laser with a plane resonator

SOURCE: AN SSSR. Doklady, v. 168, no. 6, 1966, 1283-1286

TOPIC TAGS: semiconductor laser, gallium arsenide laser, plane resonator, electron beam pumping

ABSTRACT: Generation in a system with a plane resonator in which the mirror area S is much greater than $L^2$ (L is the distance between mirrors) is described. Experiments were carried out on an n-type GaAs sample with an impurity concentration of $2 \cdot 10^{16}$ $cm^{-3}$ and a mobility of 5200 $cm^2/v \cdot sec$ at 300K. The sample was prepared in the form of a polished plane-parallel plate 100 μ thick and several mm in diameter, and was pumped by ~150-kev electron pulses with a duration of $150 \cdot 10^{-9}$ sec and a repetition frequency of 10 cps. When L was equal to 100 μ, generation occurred at a current density of 5 $amp/cm^2$. The values of minimum gain necessary to achieve generation exceeded the experimentally measured value of the absorption coefficient at the generation wavelength by one order of magnitude. The magnitude of the discrepancy rules

Card 1/2 UDC: 535.89+535.14

L 34380-66

ACC NR: AP6023202

out experimental error and can be attributed to narrowing of the forbidden gap of the excited crystal. The narrowing (by $8 \cdot 10^{-3}$ ev) can be due to the screening effect of the crystalline field by free carriers and their interactions. Expressions are given for the dependence of the width of the forbidden gap on the free carrier concentrations. Orig. art. has: 3 figures and 8 formulas. [YK]

SUB CODE: 20/ SUBM DATE: 05Feb66/ ORIG REF: 005/ OTH REF: 005/ ATD PRESS: 5034

Card 2/2

ACC NR: AP7003904 SOURCE CODE: GE/0030/67/019/001/K005/K006

AUTHOR: Bogdankevich, O.V.; Zverev, M.M.; Krasilnikov, A.I.; Pechenov, A.N.

ORG: Physical Institute, Academy of Sciences of the USSR, Moscow

TITLE: Laser emission in electron-beam-excited ZnSe

SOURCE: Physica status solidi, v. 19, no. 1, 1967, K5-K6

TOPIC TAGS: semiconductor laser, electron beam, ~~pumped laser~~, zinc compound, selenide, LASER EMISSION, LASER PUMPING

ABSTRACT:

Laser action in electron-beam-pumped ZnSe at 4600 Å was observed experimentally. The ZnSe crystals were prepared under high-pressure, gas-phase reaction and subsequent crystallization. The samples were 3 [sic] x 0.5 x 0.8 mm, and the spacing between the cavity mirrors was 0.8 mm. The operating temperature was 100K, rising to 150K during pumping. The experimental samples were pumped by 150-nanosec 45—150 keV electron pulses. Red-light emission was observed at small current densities; blue-line emission at 4570 Å was observed at current densities greater than several amp/cm$^2$.

Card 1/2

ACC NR: AP7003904

Further increases in the current density (threshold value 20 amp/cm$^2$) resulted in a sharp rise in the line (4600 Å) intensity (by a factor of 10), a sharp narrowing of its width (from 70 to 11 Å), and a directional effect. Although the mode structure was not resolved, various radiative directions, with a 7° beam aperture, could be identified. The results indicate that the large threshold densities may be caused by the crystal inhomogeneity and/or a high spontaneous recombination cross section. [JM]

SUB CODE: 20/ SUBM DATE: 21Nov66/ ORIG REF: 002/ OTH REF: 001/
ATD PRESS: 5114

Card 2/2

ACC NR: AP7003904 SOURCE CODE: GE/0030/67/019/001/K005/K006

AUTHOR: Bogdankevich, O.V.; Zverev, M.M.; Krasilnikov, A.I.; Pechenov, A.N.

ORG: Physical Institute, Academy of Sciences of the USSR, Moscow

TITLE: Laser emission in electron-beam-excited ZnSe

SOURCE: Physica status solidi, v. 19, no. 1, 1967, K5-K6

TOPIC TAGS: semiconductor laser, electron beam, ~~pumped laser~~, zinc compound, selenide, LASER EMISSION, LASER PUMPING

ABSTRACT:

Laser action in electron-beam-pumped ZnSe at 4600 Å was observed experimentally. The ZnSe crystals were prepared under high-pressure, gas-phase reaction and subsequent crystallization. The samples were 3 [sic] x 0.5 x 0.8 mm, and the spacing between the cavity mirrors was 0.8 mm. The operating temperature was 100K, rising to 150K during pumping. The experimental samples were pumped by 150-nanosec 45—150 keV electron pulses. Red-light emission was observed at small current densities; blue-line emission at 4570 Å was observed at current densities greater than several amp/cm$^2$.

Card 1/2

ACC NR: AP7003904

Further increases in the current density (threshold value 20 amp/cm$^2$) resulted in a sharp rise in the line (4600 Å) intensity (by a factor of 10), a sharp narrowing of its width (from 70 to 11 Å), and a directional effect. Although the mode structure was not resolved, various radiative directions, with a 7° beam aperture, could be identified. The results indicate that the large threshold densities may be caused by the crystal inhomogeneity and/or a high spontaneous recombination cross section. [JM]

SUB CODE: 20/ SUBM DATE: 21Nov66/ ORIG REF: 002/ OTH REF: 001/
ATD PRESS: 5114

Card 2/2

BOGDANKEVICH, V.V.; LUR'YE, B.R.

Construction of the Kaushany Canning Plant. Kons. i ov. prom. no.7:15-17 Jl '63. (MIRA 16:9)

1. Gosudarstvennyy soyuznyy proyektnyy institut po proyektirovaniyu predpriyatiy pishchevoy promyshlennosti.

BOGDANKEVICH, V.V.

Developing the parametric series for the technological lines and equipment in the canning industry. Kons. i ov.prom. 18 no.4:7-9 Ap '63. (MIRA 16:3)

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1. Section for the Organization of Industrial Enterprises at the Karl Marx Higher Institute of Economics, Sofia (for Bogdanov). 2. Assistant Director, Section for Economic Problems of the "Proletariil" United Industrial Enterprise, Sofia (for Nanov).