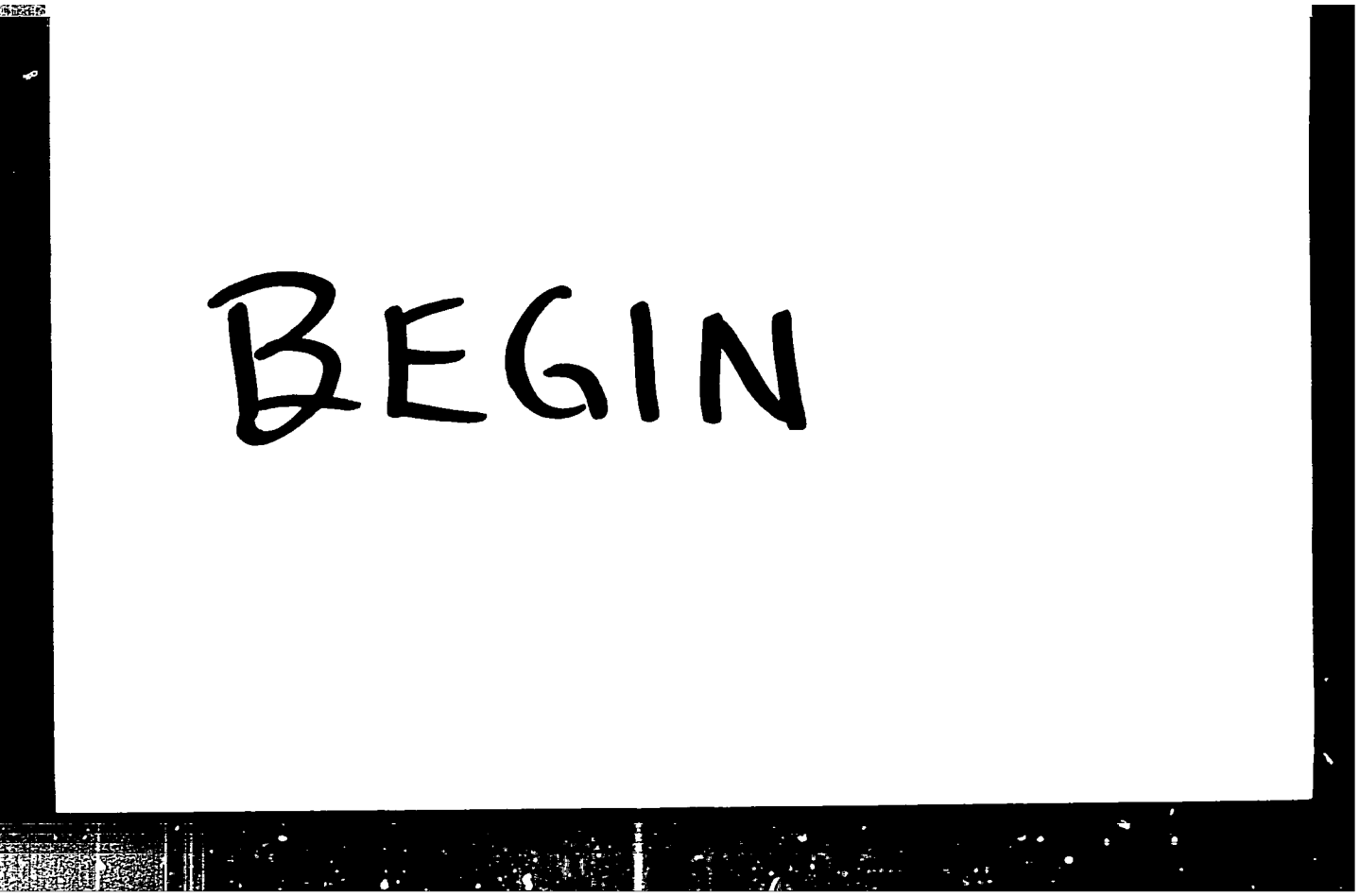
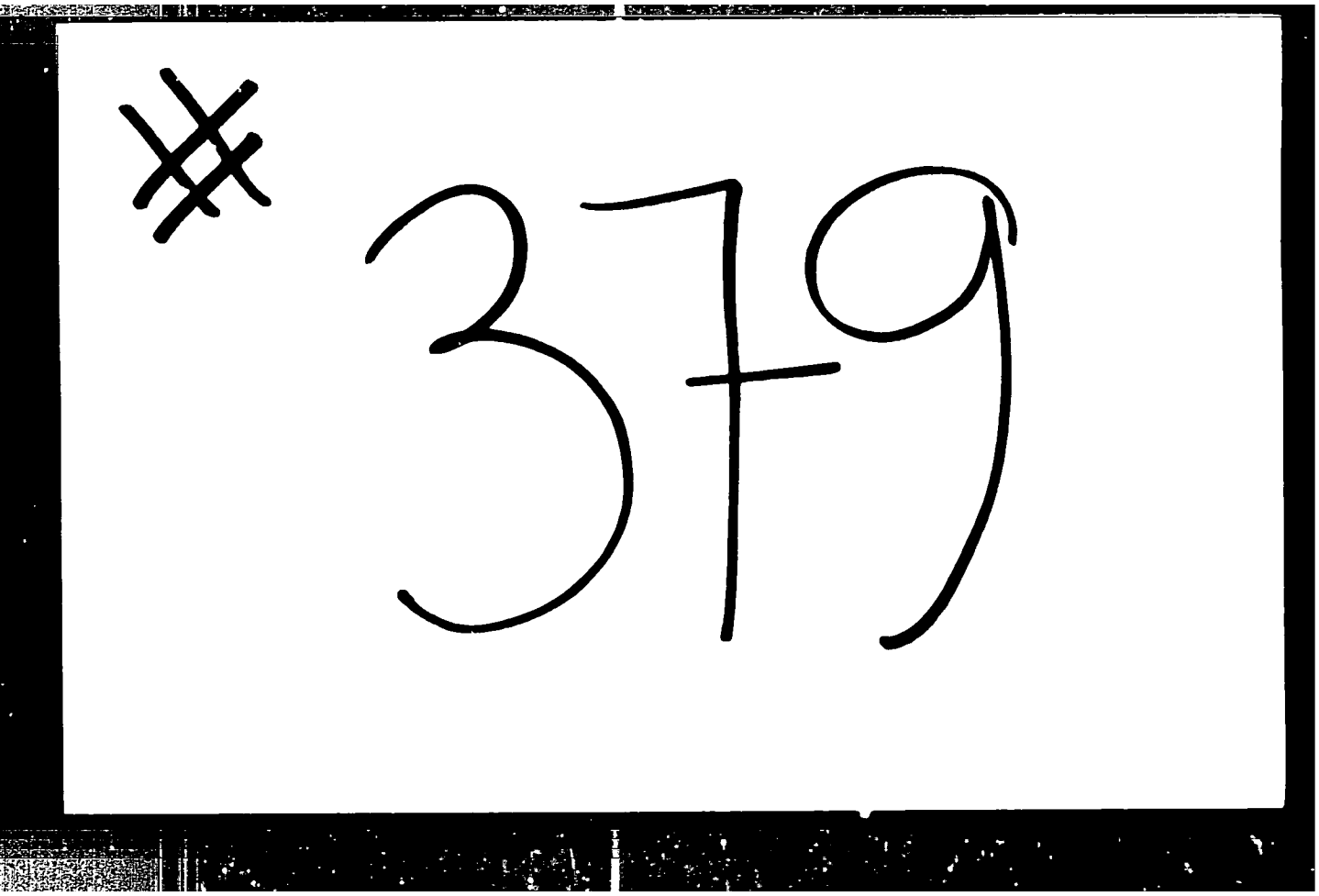




NAZAROV, M.S.

Odontoma. Stomatologiia 42 no.2:104-106 Mr-Ap'63 (MIRA 17:3)

1. Iz kafedry khirurgicheskoy stomatologii (zaveduyushchiy dotsent M.M. Slutskaya) Stavropol'skogo meditsinskogo inst tuta.

NAZAROV, [illegible]

2805. NAZAROV, M. V.--[illegible] A. A. [illegible] A. G. [illegible] Gor'kiy, [illegible] 12 [illegible] 4 [illegible]
[illegible] s 9-yu [illegible]
(55-3953) [illegible] 636.2. [illegible].22 st [illegible]

SO: Knizhnaya Letopis', [illegible]

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00113[illegible]

NAZAROV, M. V.

"Theory of Signal Separation." Cand Tech Sci Faculty of Radio Communications and Radio Broadcasting, Moscow Electrical Engineering Inst of Communications, 1953-1954. (VS, Jan 55) [Brief abstract available]

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)

SO: SUM No. 556, 24 Jun 55

KAZARYAN, Rafael' Avetisovich; KUVSHINOV, Boris Ivanovich; NAZAROV, Mikhail Vasil'yevich; BERG, A.I., redaktor; DZHIGIT, I.S., redaktor; KULIKOVSKIY, A.A., redaktor; SMIRNOV, A.D., redaktor; TARASOV, F.I., redaktor; TRAMM, B.F., redaktor; CHECHIK, P.O., redaktor; SHAMSHUR, V.I., redaktor; KHARKEVICH, A.A., redaktor; MEDVEDEV, L. Ya., tekhnicheskiy redaktor

[Elements of the general theory of communications] Elementy obshchei teorii sviazi. Moskva, Gos. energ. izd-vo, 1957. 94 p. (Massovaia radiobiblioteka, no.263) (MLRA 10:4)
(Telecommunication)

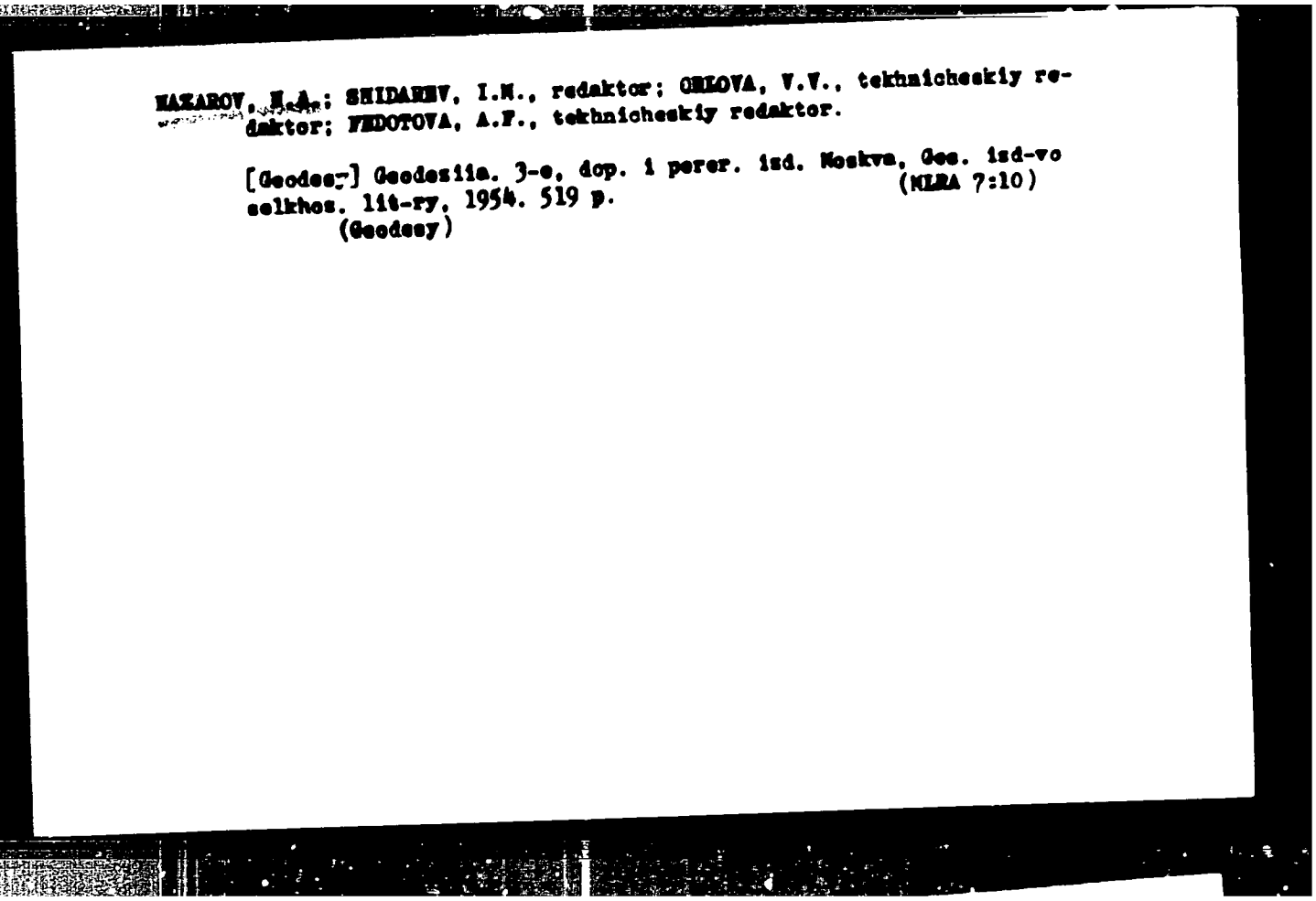
PIROGOV, Andrey Andreyevich; NAZAROV, M.V., retsenzent; LEV, A.Yu., retsenzent; OBRAZTSOVA, Ye.A., red.; TRISHINA, L.A., tekhn. red.

[Synthetic telephony] Sinteticheskaia telefoniia. Moskva, Svi[illegible]'izdat, 1963. 118 p. (MIRA 16:7)
(Telephone) (Speech)

NAZAROV, M.Z.

Conditions of the formation of concretion loesses in some regions in Uzbekistan. Vop. geol. Uzb. no.3:187-194 '62. (MIRA 16:6)

(Uzbekistan—Loess)



NAZAROV, N.A.; SHIDARIV, I.M., redaktor; OBLOVA, V.V., tekhnicheskiy redaktor; FEDOTOVA, A.F., tekhnicheskiy redaktor.

[Geodesy] Geodesiia. 3-e, dop. i perer. izd. Moskva, Geo. izd-vo selkhoz. lit-ry, 1954. 519 p. (MLRA 7:10)
(Geodesy)

NAZAROV, N.A.

Neutraliza[illegible]
wood [illegible]
Nazarov [illegible]
tralisation is done with [illegible] in the columns, freshly pptd. crystal-
lization of gypsum in the hydrolyzate. The cryst. of
$CaSO_4 \cdot 2H_2O$ are added to the milk of lime a soln. of $(NH_4)_2$
are obtained by adding to the milk of lime a soln. of $(NH_4)_2$-
SO_4 or a mixt. of $(NH_4)_2SO_4$ and Na_2SO_4. M. Hosch

APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R00113[illegible]

NAZAROV, N.A.

Increasing profitableness of industrial hydrolysis. Gidroliz. i lesok lesokhim. prom. 9 no.7:25-26 '56. (MIRA 12:3)

1.Glavnyy inzhener Biryusinskogo gidroliznogo zavoda.
(Hydrolysis)

NAZAROV, M.A.; BAZHAYEVA, A.N.

Results of the introduction of the flotation method for separating yeast. Gidrolis. i lesokhim. prom. 11 no.4:15-17 '58. (MIRA 11:6)

1. Biryusinskiy gidroliznyy zavod. (Yeast) (Flotation)

NAZAROV, N.A.

Lowering the cost of alcohol at the Biriusa Hydrolysis Plant. (MIRA 14:3)
Gidroliz. i lesokhim.prom. 14 no.2:18-19 '61.

1. Biryusinskiy gidrolizny zavod.
(Noroy--Alacohol)

NAZAROV, Nikolay Aleksandrovich; GLADILINA, Ye.F., prepodavatel', retsenzent; SHARUPICH, S.G., dots., spets. red.; KAREYSHO, Ye.G., red.; SOKOLOVA, N.N., tekhn. red.

[Surveying] Geodesiia. 4. izd. perer. i dop. Moskva, Sel'khozizdat, 1962. 422 p. (MIRA 16:5)

1. Brasovskiy sel'skokhozyaystvennyy tekhnikum (for Gladilina).
(Surveying)

ACCESSION NR: AR4041549 S/0124/64/000/005/V013/V013

SOURCE: Ref. zh. Mekhanika, Abs. 5V89

AUTHOR: Nazarov, N. A.

TITLE: Design of shallow shells reinforced by ribs

CITED SOURCE: Sb. tr. Leningr. inzh.-stroit. in-t, vy*p. 42, 1963, 51-66

TOPIC TAGS: shallow shell, rib reinforcement, rib

TRANSLATION: Considers design of a panel of a shallow shell of rectangular form in a plan, reinforced by a widely-spaced grid of ribs, using properties of delta-functions. About the ribs there are made the following assumptions: action of ribs are concentrated on lines coinciding with coordinate lines of the middle surface; rigidities of bend in the tangential plane and torsion of ribs will be disregarded; joining of the shell with ribs is carried out so that conditions of compatibility of deformations are satisfied. Differential equations of equilibrium

Card 1/2

ACCESSION NR: AR4041549

are derived from variational equation delta V = 0, where V is a force function, consisting of the potential energy of the shell and ribs, and also work of external forces. For the case of nontensile ribs there are derived two differential equations for the function of tension and sag. Here it is assumed that external load is distributed normally to the middle surface. Further there are derived boundary conditions and the obtained differential equations are solved by Bubnov's method for panel with hinged mobile edges, with pinched edges with different quantities of ribs. There are given numerical values of sags in the middle of the panel and analysis of the influence of ribs on its state of strain. There is determined rational location of ribs for panels with different relationship of sides. Bibliography: 5 references.

ENCL: 00

SUB CODE: AS

Card 2/2

NAZAROV, N. A. [Nazarov, M. O.] (Leningrad)

Natural vibrations of a circular cylindrical shell and of shallow shells reinforced with a rib net. Prykl. mekh. 9 no.3:249-258 '63. (MIRA 16:4)

1. Leningradskiy tekhnologicheskiy institut.

(Elastic plates and shells—Vibration)

L 45077-65 EWT(d)/EWP(w)/EWT(m)/EWA(d)/EWP(v)/EWP(k)/EWA(h) Pf-4/Peb EM

ACCESSION NR: AR5008039 UR/0124/65/000/001/V012/V012

28
B

SOURCE: Ref. zh. Mekhanika, Abs. 1V81

AUTHOR: Nazarov, N. A.

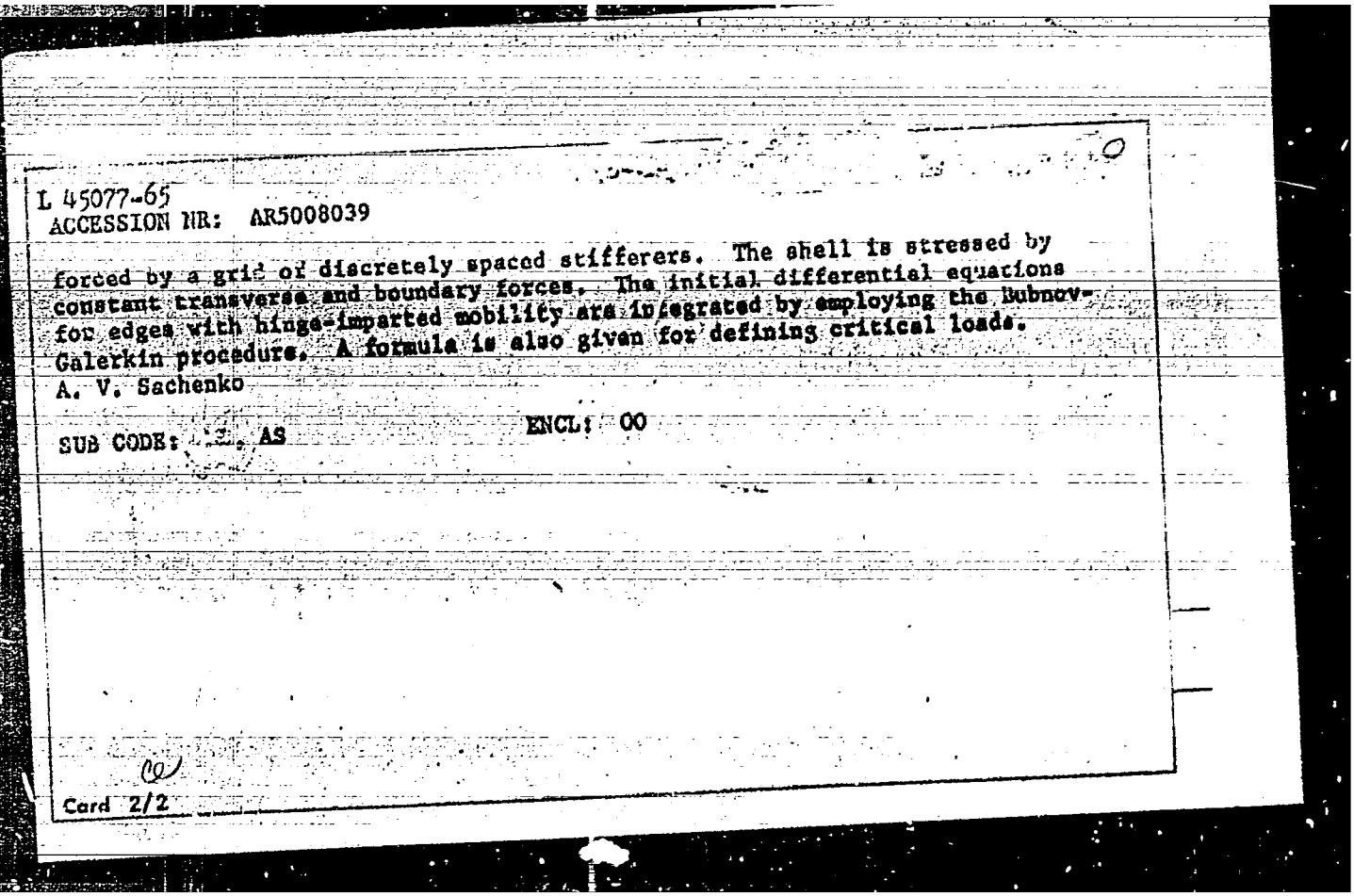
TITLE: The stability of smooth and ribbed shallow shells

CITED SOURCE: Sb. Teor. mekhan., soprotivl. materialov, stroit. mekhan. L., 1964, 35-38

TOPIC TAGS: shallow cylindrical shell, ribbed shell, smooth shell, shell stability, hinged edge mobility

TRANSLATION: A system of differential equations for the state of neutral equilibrium is reduced to one integro-differential equation which transforms, for a rigid shape, into Fredholm's integral equation of the first order. It is noted that the latter was solved for a shallow shell with hinge-imparted mobility, compressed uniformly from two sides. Values of critical loads for a plate, a cylindrical dome and a double curvature shell are given in tabular form. The method of solving the problem in question is not illustrated. The author also considers the stability of a rectangular, plane, shallow cylindrical shell, rein-

Card 1/2



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ACCESSION NR: AR5008039

forced by a grid of discretely spaced stifferers. The shell is stressed by constant transverse and boundary forces. The initial differential equations for edges with hinge-imparted mobility are integrated by employing the Bubnov-Galerkin procedure. A formula is also given for defining critical loads.

A. V. Sachenko

SUB CODE: AS ENCL: 00

Card 2/2

NAZAR[illegible], N.A. (Leningrad)

Vibrations of [illegible]
Prikl. mekh. 1 no.3[illegible]

1. Leningradskiy tekhn[illegible]

KONSHIN, M.D.; NAZAROV, N.D.

Use of radiogeodetic RGSTs stations in the production of topographic maps. Geod.i kart. no.6:37-46 Je '62. (MIRA 15:8)
(Radar in surveying) (Aerial photogrammetry)

NAZAROV, N.D.

Methodology of forming radio geodetic nets in compiling topographic maps. Trudy TSNIIGAIK no.146:65-72 '62. (MIRA 15:11)

(Radar in surveying)

ABELEVICH, A.A.; ARTEM'YEV, Yu.N.; VLASOV, A.P.; GAL'PERIN, A.S.; YEVSIKOV, A.V.; IVANOV, G.P.; KOROLEV, N.A.; LEVITSKIY, I.S.; LIVSHITS, L.G.; MELKOV, M.P.; NAZAROV, N.I.; NOVIKOV, M.P.; POPOV, V.Ya.; TEPLOV, A.G.; BAKHAREV, A.P., insh., retsenzent; SAVEL'YEV, Ye.Ya., red. izd-va; MODEL', B.I., tekhn. red.; EL'KIND, V.D., tekhn. red.

[Technological aspects of the repair of crawler vehicles] Tekhnologiia remonta gusenichnykh mashin. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry 1960. 466 p. (MIRA 14:7)
(Crawler vehicles--Maintenance and repair)

SO [illegible]/112-59-3-4440

11(7)

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 3, p 22 (USSR)

AUTHOR: Kharitonov, G. V., Nazarov, N. I., Purikova, V. P., and Usubakunov, M.

TITLE: Chemical-Engineering Investigation of Coals of the Tuyuk and Kargash Fields, Uzgen Basin (Khimiko-tekhnologicheskoye issledovaniye ugley Tuyukskogo i Kargashinskogo mestorozhdeniy Uzgenskogo basseyna)

PERIODICAL: Tr. in-ta khimii AN KirgSSR, 1957, pp 109-127

ABSTRACT: The bulk of coal consists of a typical humus material. Yu. M. Kuzichkin and A. I. Ginsburg have isolated and studied the following petrographic types of these coals: (1) clarainous homogeneous coal consisting of vitrinite-group substances (89-95.4%, semivitrinite (0.2-5.6%), fusinite (0.4-11.8%), cutinite, resinite; (2) clarainous complex striated coal with stem-clarainous or durainous inclusions; (3) clarain-durainous or durainous complex striated coal with clarainous inclusions; (4) clarain-durainous complex

Card 1/2

11(7)

Chemical-Engineering Investigation of Coals of the Tuyuk and Kargaah Fields . . . .

striated coal; (5) durainous homogeneous coal. As far as the coal rank is concerned, A. I. Ginzburg believes that Tuyuk coals within Section 1 of the Southern area belong with the steam rich type, and those in Sections 4-6 of the Northern area, with gas-type nearing the steam rich type. The above coal fields are distinguished by a low content of hygroscopic moisture (0.94-2.43%), of sulfur (0.29-1.29% of absolutely dry fuel), and of ashes (1.47-12.03%), by a lower content of volatile matter and a lower caking capacity as compared to Donbass and Kuzbass coals of the same rank. Heat of combustion is 7,868-8,413 kilocal/kg of combustible mass. The Kargaah coal beds are actually packs of brilliant-luster complex striated coal. This coal, after a concentration with respect to ash content, can be used for a semicoking or coking and also for carbide production. The Tuyuk coal should be evaluated for coke-chemical industry purposes by its coking ability, not by its caking ability.

A. B. M.

Card 2/2

AMMOSOV, I.I.; NAZAROV, M.I.; KHARITONOV, G.V.; FURIKOVA, V.P.

Chemical composition and properties of the petrographic micro-components of coals. Trudy IGI 8:51-65 '59. (MIRA 13:1)
(Coal)

AUTHOR: None Given

TITLE: Questions of Instruction Relating to the Course in "Machine Parts" (Voprosy prepodavaniya kursa "Detali mashin")

PERIODICAL: Vestnik vysshey shkoly, 1957, Nr 5, p 33-34 (USSR)

ABSTRACT: At present the mission of the Higher Schools consists of reinforcing the basis of general instruction taught at the vtuzes. This was stated by N.I. Nazarov, Head of the Teaching Methods Administration, at a teachers' meeting of the Chair of "Machine Parts", convened in April by the Teaching Methods Administration of the Ministry of Education, USSR, and by the editorial office of the periodical "Vestnik vysshey shkoly". Nazarov pointed out that the necessity had arisen to complete the course in "Machine Parts" by elements of general instruction. This relates also to the program, lectures, manuals, designing installations and laboratory work. The Teaching Methods Administration appreciates the concrete propositions made by the teachers in these subjects. Professor N.A. Spitsyn acquainted the participants of the meeting with the fundamental positions of those who replied to his article in # 6, 1956 of the "Vestnik vysshey shkoly". Representatives of 15 chairs of "Machine Parts" of Moscow, Leningrad and other vtuzes made interesting propositions as to a more precise

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Questions of Instruction Relating to the Course in "Machine Parts"

establishment of the instruction program at machine-building and polytechnical VUZes on the basis of which every VUZ may elaborate its own working program. A number of authors proposed to exclude surplus material from the program or to double the subjects in contiguous disciplines ("The Theory of Mechanisms and Machines", "Strength of Materials", etc. A great deal of attention was paid to the question of instructive literature. The writing of manuals has to be done by teacher and author collectives. It is also necessary to supply a collective volume of problems, construction maps, posters and complexes of designs, which could serve as aids. It was also pointed out that it is necessary to raise the qualifications of teachers. For this purpose periodic seminars will be organized, as well as excursions to plants at home and abroad. The study of foreign literature will be undertaken also. Professor I.N. Beshetov (Higher Technical School imeni Baumann) dealt in his report with the course in "Machine Parts", stating that the new methods of computation are not sufficiently reflected, and that the course has to be improved. A serious effort has to be made to organize laboratories for machine parts in the VUZes. Dotsent I.V.

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Questions of Instruction Relating to the Course in "Machine Parts

Podzolov (Technological Institute of Food Industry), A.F. Tsvetkov (Institute of Automechanics), and N.I. Tseytlin (Institute of Machine Tools and Instruments) expressed their opinion relating to the connection of the course in "Machine Parts" with those of contiguous disciplines. Tsvetkov considers that lectures on the technology of metals prior to this course, do not instruct the students sufficiently in the application of materials in constructions. I.P. Podzolov believes that lectures on limits and tolerances in machine parts are imperative. Dotsent P.G. Zhitkov (Institute of Non-Ferrous Metals) explained the lack of a general line in the instruction of machine parts in VUZes, by the fact that there is no scientifico-methodic seminar where the teachers on machine parts could take part. L.P. Chasovnikov (Higher Technical School imeni Baumann) considers that great attention should be paid to instructive literature, in particular, to the appliance relating to designing. Professor Ye.M. Gut'yar (Institute of Mechanization and Electrification of Agriculture) presumes that the aim of a manual is also to teach the designing of complex machines. Dotsent V.N. Belyayev stated that the

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Questions of Instruction Relating to the Course in "Machine Parts"

Teaching Methods Administration is not interested in the efforts of the teachers to create new instructional appliances. The meeting charged Professor N.A. Spitsyn, P.N. Reshetov and Ye.M. Gut'yar to prepare an article for publication in "Vestnik vysshey shkoly" describing the results of the discussion and the propositions made.

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3-6-1/29

AUTHOR: Nazarov, N.I., Chief / Teaching Methods Administration, Ministry of Higher Education, USSR

TITLE: Open Wide the Door of the VUZ to Industrial Youths (Shiroko otkryt' dveri vuzov dlya proizvodstvennikov)

PERIODICAL: Vestnik Vysshey Shkoly, 1957, # 6, p 3-6 (USSR)

ABSTRACT: The article deals with the conditions under which industrial youths are to be admitted to higher educational institutions this year. The VUZes are to take all required measures to enroll 50 % more as freshmen. For this purpose a wide net of preparatory courses for the qualification examinations was organized. These are attended by about 200,000 workers. Experience has shown that those graduates who had practical experience and skill before they entered a VUZ become better specialists. At the present time the conditions for enrolling such youths are very favorable. The article points out that the practice of admitting students on high marks resulted in a considerable number of industrial youth failing to pass the competitive examinations. The knowledge of youths coming direct from school was fresher and better. In 1955, this led to the following re-

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Open Wide the Door of the VUZ to Industrial Youths

sults: Out of 2,125 students of the first course at the Ural Polytechnical Institute (Ural'skiy politekhnicheskiy institut) only 110 had industrial experience; at the Ural University (Ural'skiy universitet) the number was 21 out of 450; at the Moscow Agricultural Academy (Moskovskaya sel'skokhozyaystvennaya akademiya) 97 of 600; the Moscow Institute of Agricultural Mechanization and Electrification (Moskovskiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva) - 46 of 300; at the Sverdlovsk Agricultural Institute (Sverdlovskiy sel'skokhozyaystvennyy institut) out of 1800 persons admitted to the first course, 1045 had neither lived in rural surroundings nor had any experience in agriculture. Technical progress demands further improvement in training specialists, and the Ministry of Higher Education has, therefore, changed the regulations governing the admittance of students in 1957. The article deals further with the prerogatives enjoyed by war veterans, those awarded the silver and gold medals, and students who have graduated from a technical school with distinction. The duties of the Admittance and Examination Committees are also discussed.

ASSOCIATION: Teaching Methods Administration, USSR Ministry of Higher Education (Metodicheskoye upravleniye Ministerstva vysshego obrazovaniya SSSR)

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Card 2/2

[illegible] -2/34

AUTHOR: Nazarov, [illegible], Dotsent

TITLE: [illegible]

PERIODICAL: Vestnik Vysshey [illegible]

ABSTRACT: After [illegible] interest [illegible] displayed in [illegible] qualification [illegible] technical [illegible], the author emphasizes the [illegible] practical training. Many young engineers la[illegible] practical experience and [illegible] knowledge [illegible] technology, [illegible] ment. [illegible] independent [illegible] training [illegible] the [illegible] [illegible] in [illegible] instruction and [illegible] of this periodical, [illegible] that success in practical training [illegible] the site, the correct understanding [illegible] method of accomplishment [illegible] that many vuzes try to accommodate [illegible] plants whereby thousands of students are [illegible] at such plants as [illegible]

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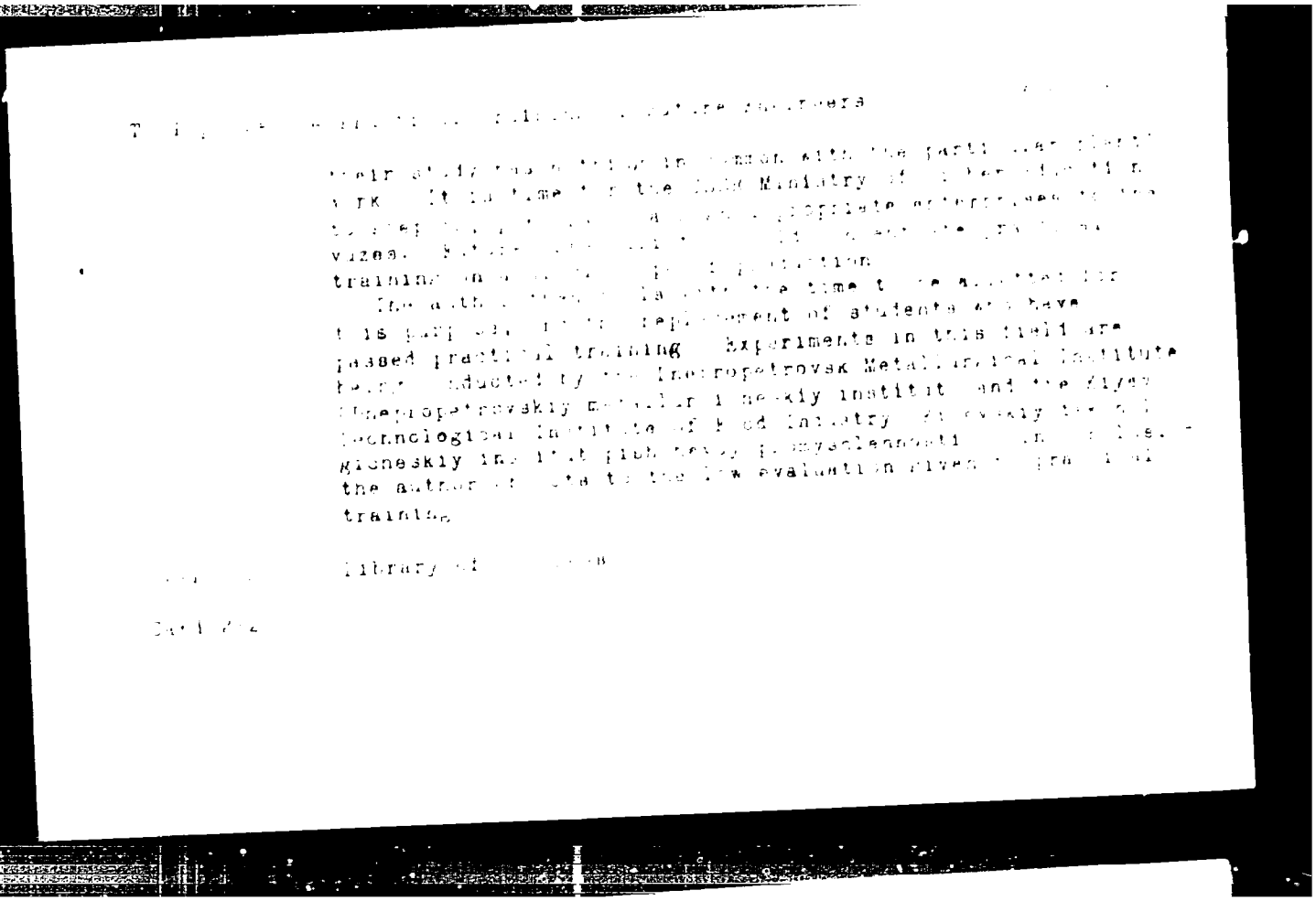


NAZAROV, N I

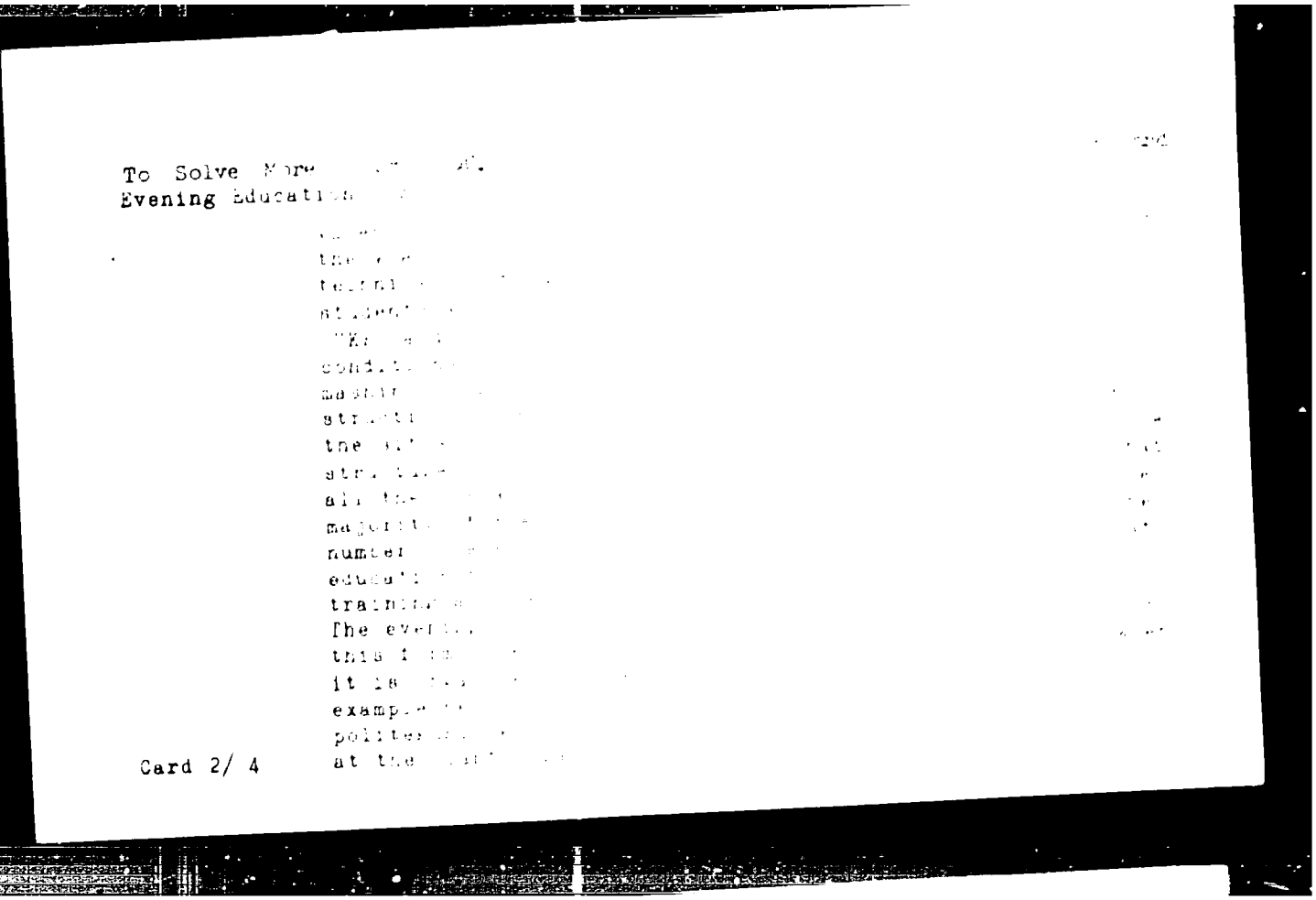
AUTHOR: Nazarov, N I.

TITLE: To Solve More Courage ... Current Questions of Correspondence and Evening ... Korenny nasushchnyye voprosy zaochnogo ... Development of ... For a Complex ... kompleksnoye razvitiye vsekh ...

PERIODICAL: Vestnik Vysshey ...

ABSTRACT: The number of st... interrupting their work, as compared ... in the field of law, 100% in ... These fi gures call for the ... development of evening and ... For this purpose a number ... realized in a short time which will help ... of this type of train ing. The ... and organization of correspondence ... correspondence daytime higher ... sections or fa... stitutes, the number ... 85,300 taught ...

Card 1/4



To Solve
Evening Education

Card 2/ 4

To Solve More Courageously the [illegible] Evening Education. For a complex [illegible] Forms of Instruction

At the Automobile [illegible] are being trained, including 89 master [illegible] plete and [illegible] designers. In 1957, there was [illegible] author then mentioned [illegible] correspondence and [illegible] by the All-Union Machine [illegible] but opposed by [illegible] (North-West Poly[illegible] should be elaborated [illegible] nical means of [illegible] Education is adopting [illegible] of the higher [illegible] the correspondence [illegible] operating [illegible] institut [illegible] Institute [illegible] small printing [illegible] vennyy ex[illegible] tute [illegible]

Card 3/4

To S[illegible]More Courageously [illegible]
Evening Education [illegible]

[illegible] of Communication [illegible]
chaniyu i televizhiyu [illegible]
Television, will begin [illegible]
gested to use the magnetophone [illegible]
picture as a means of training [illegible]
deals with the question [illegible]
just graduated from secondary [illegible]
without practical experience [illegible]
submit their graduating theses [illegible]
tical work as an engineer

AVAILABLE: Library of Congress
Card 4/4

NAZAROV N. I.

NAZAROV, N. I.: "The calculation of rectangular three-layer sheets with a light filler for transverse bending, taking into account the effect of concentrated loads." Tomsk State U imeni V. V. Kuybyshev. Tomsk, 1956. (Dissertation for the degree of Candidate in Sciences).

So: Knizhnaya Letopis', No 36, 1956, Moscow.

SOV 124-58-11 13234

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 11, p 193 (USSR)

AUTHOR: Nazarov, N. I.

TITLE: Calculation of the Temperature Fields and Stresses in Standard H beam Elements (Raschet temperaturnykh poley i napryazheniy v tipovykh dvutavrovykh elementakh)

PERIODICAL: Dokl. 7-y Nauchn. konferentsii, posvyashch. 40-letiyu Velikoy Oktyabr'sk sots. revolyutsii. Nr 2. Tomsk, Tomskiy un-t, 1957, pp 28-29

ABSTRACT: An examination of the solution of systems of differential equations which determine the nonstationary temperature field in the web and flanges of standard H-beam elements resulting from asymmetric surface heating.

Reviewer's name not given

Card 1/1

NAZAROV, N. I.

1(3); 19(10) PHASE I BOOK EXPLOITATION SOV/2606

Voprosy raschota elementov aviatsionnykh konstruktsiy; raschet trekhsloynykh paneley i obolochek. Sbornik statey, No. 1 (Problems in Calculating Aircraft Structural Elements; Calculating of Sandwich Panels and Shells. Collection of Articles, No. 1) Moscow Oborongiz, 1959. 169 p. Errata slip inserted. 2,600 copies printed.

Ed.: A.Ya. Aleksandrov, Doctor of Technical Sciences, Professor; Ed. of Publishing House: T.L. Valedinskaya; Tech. Ed.: V.P. Rozhin.

PURPOSE: This collection of articles is intended for engineers and scientific workers concerned with stress analysis of aircraft structural elements.

COVERAGE: The articles in this collection discuss problems in the structural analysis of sandwich panels with light cores, such as problems of the stability of curved panels, design of cores with consideration of transversal tension (tear-off) and the results of panel-strength tests. In addition, problems in the calculation of torsion and bending of a cylindrical shell reinforced by bulkheads are covered and the calculation of unsteady temperatures in an I-beam element is considered.

9. Nazarov, N.I., M.S. Fayarmitayn, and Ya. V. Yurlova. Calculation of Unsteady Temperatures in an I-beam Element 142
This paper presents two methods of calculating the temperature fields in an I-beam element (representing, in this particular case, a typical part of a multilongeron wing): 1) the method of direct integration of the heat-conduction equations, and 2) the method of elementary equilibrium. Cases of symmetrical and unsymmetrical heating of such elements through the outer flange surfaces are considered as well as the case of different thicknesses of flanges. Solution of the problem is given under the assumption that physical characteristics of the material and the heat-transfer coefficients do not depend on temperature variation.

3

S/179/59/000/06/017/029
E081/E141

AUTHORS: Aleksandrov, A.Ya., and Nazarov, N.I. (Moscow)

TITLE: The Stresses in Glued Joints

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1959, Nr 6, pp 121-126 (USSR)

ABSTRACT: It is known that uniform extension of joints of thin laminae with overlap (Fig 1a) or with a plate (Fig 1b) leads to very high stresses near the edges and to lower stresses in the middle parts of the joint (Refs 1-4). Scarf joints (Fig 1B) give the most uniform stress distribution (Ref 5), but their practical applicability is limited. Considerable improvement can be effected with plated joints if the plating has a high bending stiffness and relatively low extensional stiffness (Figs 1c-e). In the present paper, joints of types 1c, i.e. working within the proportional limits in uniform tension, are considered. The glue line stresses for the combination shown in Fig 2 are determined by the relative horizontal displacements of the glued-laminae and plate and by the thickness of the glue layer. Assuming that these displacements depend only on the extension of the

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E=2/K=1

The Stresses in Glued Joints

glued elements and that the shear stresses are uniformly distributed through the layer, it is found that

$$\frac{\delta_3(x)\,\tau_{xy3}(x)}{G_3} = \frac{\delta_3(\ )}{G_3}\,\tau_{xy3}(\ ) - \int_y \frac{1}{B_1(x)}\left[q - \int_x \tau_{xy3}(\ )\,d\right] dx + \int_x \frac{1}{B_2(x)}\left[\int_x \tau_{xy3}(\ )\,d\right] dx \qquad (1.1)$$

where $\tau_{xy1}(x)$, $\tau_{yz1}(x)$, $\tau_{xz1}(x)$, $\sigma_{y1}(x)$ are the shear and normal stresses of a section with abscissa x (the index i=1 corresponds with the lamina, i=2 with the plate, and i=3 with the glue layer); G_i, E_i, μ_i are the shear modulus, elasticity modulus and Poisson's ratio respectively; $\delta_i(x)$ is the thickness of the element i; $B_i(x)$ and $D_i(x)$ are the stiffnesses in extension and bending respectively per unit width, and q is the uniform load per unit width of lamina.

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The Stresses in Glued Joints

The shear stress distribution is then determined approximately by Eqs (1.1) and (1.5), and the tearing stresses by Eqs (1.3), (1.4) and (1.6), in which V_1 represents the deflection of the element 1. The behaviour of the construction shown in Fig 3, working in shear is described by Eqs (1.7)-(1.9), where t is the total shear load per unit length of the contour of the rectangle abcd (Fig 3b). The equations (1.1), (1.3) and (1.4) are solved by taking the extensional stiffness of the plate in the form (1.10), and Eq (1.2) then becomes (1.11). If the plate has large bending stiffness and $\delta_3(x)$ and $\delta_1(x)$ are constant, the first equation (1.4) and Eq (1.2) lead to Eq (1.12), the solution of which is given by Eqs (1.13)-(1.15). Assuming that the extensional stiffnesses along the joint, plate and laminae are constant, and that the bending stiffness of the plate is very large compared with the stiffness of the laminae (Fig 1c), Eq (1.1) with $\delta_1(x)$ = const and $\delta_3(x)$ = const, leads to Eq (2.1) of which the solution for the shear stress $\tau_{xy3}(x)$ is given by Eq (2.3) and for

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S/179/59/000/05/[illegible]
E[illegible]21/E1-1

The Stresses in Glued Joints

the stress $\sigma_{y3}(x)$ by Eq (2.5). Fig 5 illustrates Eqs (2.3) and (2.5) graphically for E_3 = [illegible] x 10^4 kg/cm² (glue BF-4), E_1 = 7.2 x 10^5 kg/cm² (dural), G_3 = 0.72 x 10^4 kg/cm², δ_1 = 0.4 cm, [illegible] cm, $B_2 = 3B_1$ = 2.85 x 10^5 kg/cm, δ_3 = 0.004 cm (curve 1), 0.02 cm (curve 2), 0.0[illegible] cm (curve 3), 0.1 cm (curve 4), and τ_{max} is given by the first equation on page 125. Results of calculations for a glue and plate of constant extensional stiffness are shown in Fig 6 for [illegible] = 15 cm, δ_3 = 0.02 cm, B_1 = 7.2 x 10^5 kg/cm², E_1 = 2.1 x 10^4 kg/cm², δ_1 = 0.3 cm. In the case of a plate with large bending stiffness (Fig 1d), the equations (3.1)-(3.3) apply. The profile of the plate corresponding to the condition $\tau_{xy3}(x)$ = const is given by Eq (3.4). If the thickness of the middle part of the plate is constant (Fig 7), the shear stresses in the plate are given by Eqs (3.8) and (3.11).

Card 4/4

There are 7 figures and 5 references, of which [illegible] are English and 1 is German.

SUBMITTED: May 22, 1959

ALEKSANDROV, A.Ya. (Novosibirsk); NAZAROV, N.I.(Novosibirsk)

Bending of a slant cantilever plate. Inzh. sbor. 25:37-44 '59.
(MIRA 13:2)

(Elastic plates and shells)

9.3150, 24.2120

77833
SOV/57-30-3-5/15

AUTHORS: Sinel'nikov, K. D., Tolok, V. T., Nazarov, N. I., Bakayev, I. I., Bondarev, V. A., Buday, Yu. P.

TITLE: Investigations of Ion Cyclotron Resonance in a Dense Plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 3, pp 283-286 (USSR)

ABSTRACT: The heating up of plasma under ion cyclotron resonance, where the ions acquire directly the energy of the electric field, is a process which one could hope to utilize for attaining high ionic temperatures. Theory developed by Stix (see [1]) indicated that at plasma densities of 10^{14} cm^{-3} and more, one could generate artificially so-called ion cyclotron waves. The authors, therefore, investigated the ion cyclotron resonance in hydrogen plasmas of density 10^{13}-10^{14} cm^{-3} under impulse conditions, using a device described on Fig. 1.

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Investigations of Ion Cyclotron Resonance
In a Dense Plasma

77837
SOV/57-[illegible]/12

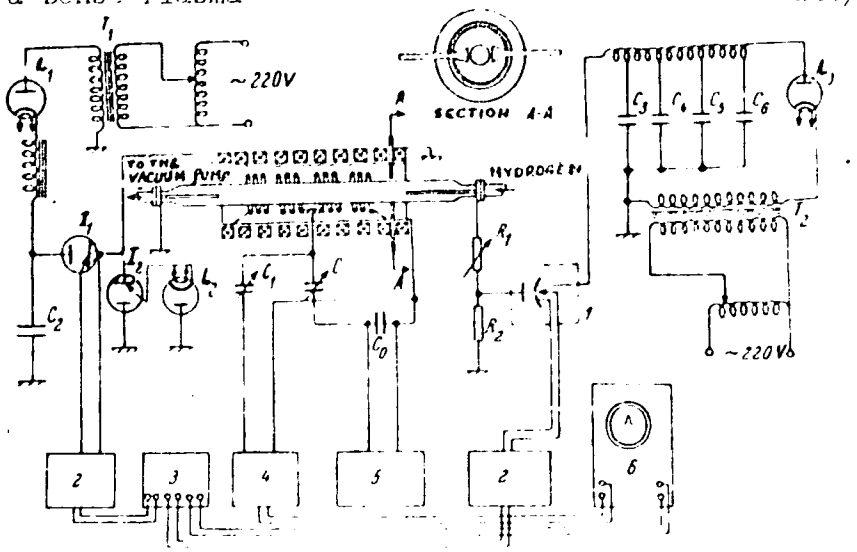

Fig. 1.
See caption on Card 3/11.

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Caption to Fig. 1. Diagram of the experimental setup: (1) discharge tube; (2) triggering device; (3) triggering scheme; (4) detector; (5) generator of 10 mc; (6) oscillograph ENO-1.

A straight discharge represents the source of the plasma inside a 60-cm-long tube, 6 cm in diam. The discharge was generated by means of 800 μsec square potential impulses. Discharge current could go up to 500 a and was regulated by means of ballast resistance R_1.

The discharge tube was along the axis of a 70-cm-long solenoid, 20 cm in diam. Its magnetic field reached the maximum value up to 10^4 oersted in $4.7 \cdot 10^{-3}$ sec. The coil was fed by means of a battery of condensers with a maximum stored energy of 40,000 Joules at potentials up to 5 kv. The uniformity of the magnetic field over a length of 45 cm was not worse than 1%. Four sections of three-turn each, connected in antiphase, served as

Investigations of Ion Cyclotron Resonance in a Dense Plasma

77839
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the coil for introducing the high-frequency power into the plasma. Axial periodicity of the electromagnetic wave was 11 cm. The inductivity (1 μH) of the coil together with the C and C_o capacitance constituted a resonance circuit with a Q-factor of 270, and was driven by a 1 kw generator supplying a continuous range of 6-12 mc oscillations. Ion cyclotron resonance was observed through the change in potential across the resonant circuit which was transmitted through the capacitance C to a germanium detector, and then to the amplifier of the vertical deflections of the oscillograph ENO-1. The triggering circuit enabled a buildup of the discharge at all values of the magnetic field. Density of the plasma was deduced by L. A. Dushin and V. I. Konenko from the condition of transmission of millimeter waves. Tests showed that the relation between the resonant peak and the generator frequency follows the law $\omega_{,1}$ - eH/me for plasma densities $n \leq 10^{12}$ cm^{-3}.

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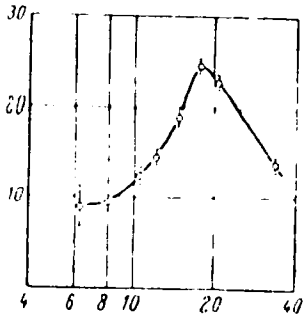
Investigations of Ion Cyclotron Resonance in a Dense Plasma

7783
SOV, 57-36-3-5/11

Figures 3 and 4 show that the optimum conditions for absorption of the high frequency power by the plasma are determined by the density of the neutral and charged particles. Measurements of the half-widths of the resonant curves show strong interactions between the accelerated ions and neutral atoms.



Card 5/11 Fig. 3. (Caption on Card 4/11)

Fig. 3. Resonant absorption of h-f power versus hydrogen pressure at constant discharge current. The abscissa represents pressure in μ Hg; the ordinate shows amplitude of resonant absorption in relative units.

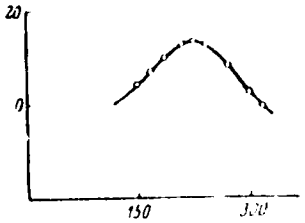


Fig. 4. Resonant absorption of h-f power versus discharge current in hydrogen at 7.[illegible] μ Hg pressure. The abscissa represents current in amperes; the ordinate is same as on Fig. 3.

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Similar results were obtained by Dubova and others (results to be published in Atomnaya energiya) at FTI AN USSR (PTI AS UkrSSR) investigating the cyclotron resonance under stationary conditions in a H$^+$ source of plasma, fed by means of a generator o a few hundredths of a milliwatt. That work showed also that the Coulomb collisions have little influence on the consumption of energy by resonant ions. The authors investigated also the relationship between the power absorption and frequency, the displacement of the resonant peak and the intensity of the discharge current, and the relationship between the resonant absorption of the power and the time after the discharge current was cut off (see Fig. 9). Since this time is related to the density of the plasma, the curve testifies that there exists an optimum density of the plasma for absorption of power.

Investigations of Ion Cyclotron Resonance in a Dense Plasma

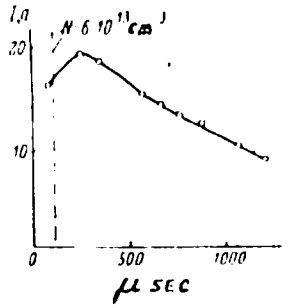
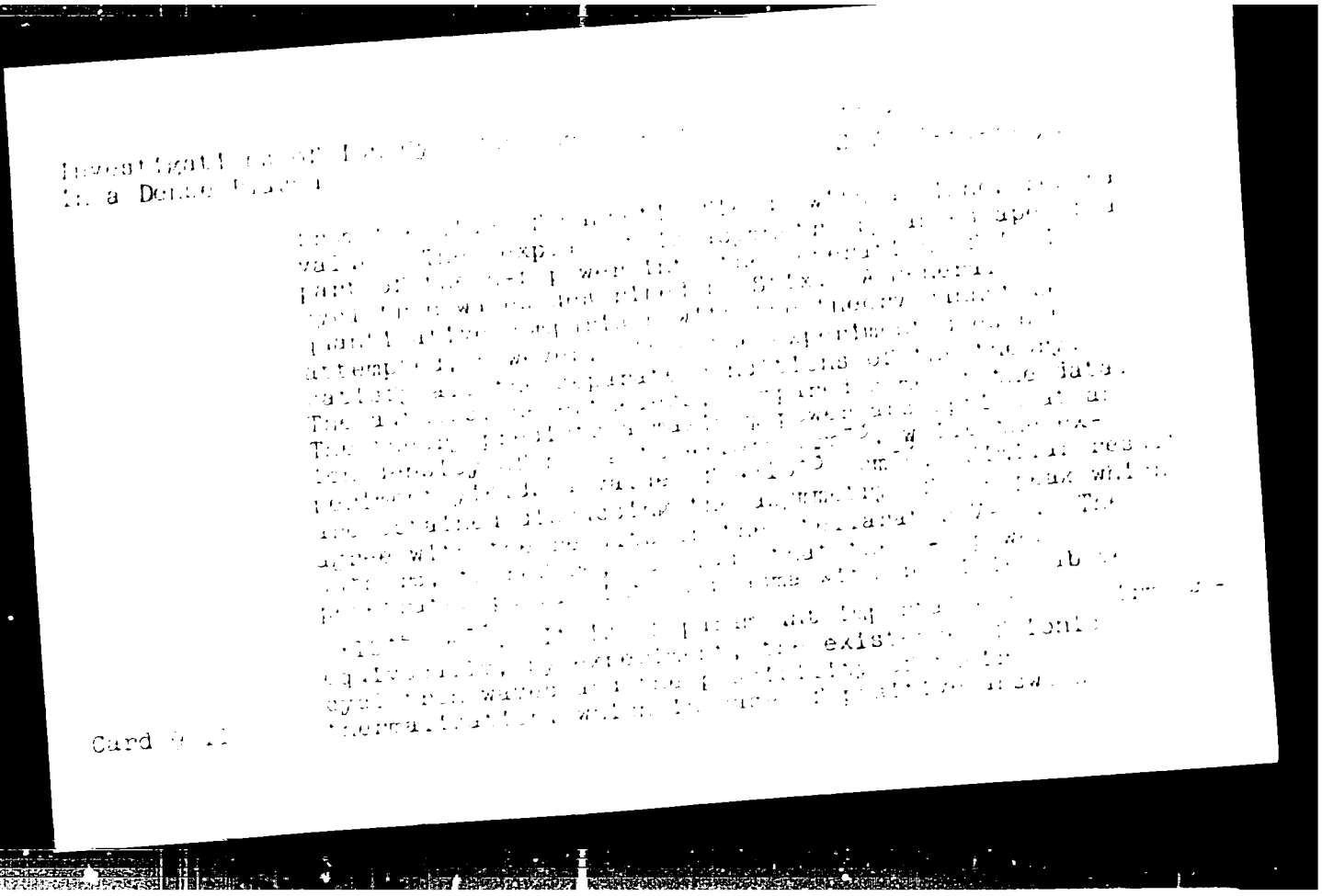


Fig. 9. Resonant absorption of h-f power versus time after cutting off discharge current. Pressure 15 μ Hg; discharge current 2[illegible] a.

At densities higher than the optimum one, the author suspects that a kind of h-f field screening effect of the plasma occurs. The authors also observed that with the increase of plasma density, an asymmetry of the resonant absorption peak appear

Card 8/ 11



Investigation
in a Dense Plasma

$$\gamma \sim \frac{\lambda}{}$$

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Investigations of Ion Cyclotron Resonance in a Dense Plasma

77839
SOV/57-30-3-5/15

Proc. Phys. Soc., 70, 446 B, 212, 1957; T. N. Stix, R. W. Palladino, Proc of 1958 Gen. Conf. A (15, p 360); T. N. Stix, Proc. of 1958 Gen. Conf. A (15, p 361).

ASSOCIATION: Physico-Technical Institute AS UkrSSR, Khar kov (Fiziko-tekhnicheskiy institut AN USSR, Khar'kov)

SUBMITTED: October 22, 1959

Card 11/11

25375
S/089/61/011/001/004/010
B102/B214

24.6731 9.4230

AUTHORS: Khizhnyak, N. A., Tolok, V. T., Chechkin, V. V., Nazarov, N.I.

TITLE: The possibility of acceleration of large pulsed currents in electron linear-accelerators

PERIODICAL: Atomnaya energiya, v. 11, no. 1, 1961, 34 - 40

TEXT: This paper presents an evaluation of the suitability of different electron linear accelerators for accelerating intensive pulsed currents since their region of application is only incompletely known as yet. The theoretical studies published here are based essentially on the work carried out over many years at the Fiziko-tekhnicheskiy institut AN USSR (Institute of Physics and Technology AS UkrSSR), Kharkov. First, the acceleration of pulsed currents in electron traveling-wave linear-accelerators is discussed. The effect of the pulsed beam on a traveling - wave accelerator ($\pi/2$ wave, $\lambda \simeq 10$ cm) and a waveguide type accelerator is studied. The most important effects are three: 1) A change of electrodynamic acceleration conditions. For $v_0 \simeq c$ the electron beam affects the electrodynamic properties very little, for $v_0 < c$ much more. With a load of a

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The possibility of ...

current of ~1a the amount of change in the phase velocity of the wave is $\Delta\beta$ = 2.6% (β =0.5), 1.3% (β =0.7), ~25% (β = 0.9); (β = v/c). 2) Effect of the energy ratios in the accelerating system. There is a displacement of the synchronous phase toward the wave peak, i.e. toward the limit of the region of phase stability. It is possible to improve the energy ratios by increasing the injection energy of the electrons of enlarging the section with an alternating phase velocity of the wave. In sections with constant phase velocity (=c), the loading of the accelerator by the electron beam leads to a decrease of the electron energy at the output of the accelerator. For example, 12 Mw are required to obtain a pulsed current with 1a and 5 Mev having a width of the energy spectrum of 10%. 3) Effect of the dynamic conditions in traveling - wave accelerators. There is an upper limit of the current; for example, at an accelerating field of $E_z \simeq$ 100 kv/cm this limit lies at 10 a. In the following the acceleration of pulsed currents in linear accelerators with standing waves is discussed in an analogous manner. An acceleration system is considered which consists of one or more connected endovibrators in standing - wave operation (π waves, $\lambda \simeq$ 2m). In the decelerating phase, the beam is screened off from

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The possibility of

the field by drift tubes For the acceleration of higher currents, this system has a number of advantages over the traveling-wave system, as there are: 1) Change of the electrodynamic conditions. When the condition $14.4 \cdot 10^{-6}(\lambda/R)^4 J < 1/Q_o + JW/Q_o D_o$ is satisfied, the change of the electrodynamic properties caused by the electron beam does not limit the accelerated current. (Q_o is the quality factor of the unloaded resonator, JW the h. f. power loss to the acceleration of the current of J amperes, D_o the h.f. power losses to the walls of the system, and R the radius of the endovibrator.) 2) Change of the electrical conditions of acceleration. There is a lowering of the pulse duration, and there is an optimal energy given by $W_{opt} = 1.44 \cdot 10^{-5} Q_o D_o$. The maximum charge that can be accelerated to W_{opt} is $Jt = 2 \cdot 10^{-4} \Delta E/E$ coulomb. This type of accelerator can accelerate much higher currents than the one mentioned before. Finally, the problem of particle dynamics in a standing wave accelerator is discussed. The longitudinal (phase) and transverse (radial) motions are separately discussed. The authors thank K. D Sinel'nikov, and Ya. B Faynberg for

Card 3/4

25375
S/089/61/011/001/004/010
B102/B214

The possibility of ...

discussions. A. I. Akhiyezer and N. P Selivanov are mentioned There are 2 figures.

SUBMITTED: July 10, 1960

Card 4/4

S/089/61/011/001/005/010
B102/B214

29.6731

AUTHORS: Tolok, V. T., Bolotin, L. I., Chechkin, V. V., Nazarov, N. I., Khizhnyak, N. A.

TITLE: A high-current electron accelerator

PERIODICAL: Atomnaya energiya, v. 11, no 1, 1961, 41 - 45

TEXT: This paper presents a description of the 5-Mev electron linear-accelerator designed, built, and studied in 1955 at the Fiziko-tekhnicheskiy institut AN USSR (Institute of Physics and Technology AS UkrSSR). The acceleration system consists of two coupled endovibrators excited to standing π waves with $f = 137.4 \cdot 10^{-6}$ cps. The accelerator is fed by 12 autogenerators each of which delivers to the endovibrators up to 100 kw with a pulse duration of 400 μsec. Each resonator is a 16-faced prism, 1100 mm long, the diameter of the inscribed circle of the prisms being 1500 mm. The prisms are made of 1 mm thick copper strips secured to a solid body. The drift tubes (100 mm diameter) form accelerating gaps, each 600 mm long. The h.f. generators work in two cycles with self excitation. The 12 modulators deliver at the anodes of the generator-tubes voltage

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pulses of up to 25 kv. The resonators are kept in a vacuum chamber maintained at a pressure of $(1-2)\cdot10^{-6}$ mm Hg by two diffusion pumps. The electron gun (with tungsten cathode in the form of a flat spiral) is placed inside the drift tube. A special modulator supplies the gun cathode with negative voltage pulses of up to 70 kv and durations of $0.2\cdot10^{-6}$ and $2\cdot10^{-6}$ sec. In normal operation the injection current is 6 a; on pulsed over-heating of the spiral it amounts to 40 a. The construction of the injector provides for the possibility of using an L - cathode. The phase difference of the π vibrations in the resonators is checked by an electron-beam phase meter, and the pulse height by a two-beam oscilloscope. The radial focusing of the beam at the output of the injector is accomplished by the radial component of the h.f. field. The elctron velocity at the output of the first acceleration gap is almost equal to the velocity of light and is not further affected by the radial component of the field. In the first gap there appears also a bunching effect which narrows the phase width of the beam from 2.2 to 1.6 radians, which value remains practically constant in the following gaps. At the exit of the accelerator the beam cross section is ~10 mm with an aureole of about 60 mm. It is focused on

A high-current electron ...

the target by means of two magnetic lenses; its diameter then becomes 3 mm. To study the possibility of obtaining the maximum current, the particle energy spectra were recorded at the output of the accelerator for different currents. The following results were obtained: A current of 8.5 a with a pulse duration of 0.2 μsec is obtained for an electron energy of 4.5 Mev. A current of 15 a with a pulse duration of 0.2 μsec and an electron energy of 3.8 Mev is yielded from the maximum of the charge that can be accelerated ($3 \cdot 10^{-6}$ coulomb). At this pulse duration a current of up to 25 a may be obtained, but the maximum electron energy is only 3 Mev and the energy spectrum is broader. To reduce this fall of energy and the consequent broadening of the spectrum it is necessary to increase the energy fed to the resonators. A further decrease of the electron energy for obtaining increased current is not convenient because for radial focusing the electron must have relativistic velocity in the first gap. The value of the time average of the current for this accelerator is up to 50 μa for 15 pulses/sec, which must be increased to 100-150 pulses/sec for increasing the average current. The authors thank K. D. Sinel'nikov, P. M. Zeydlits, and Ya. B. Faynberg for discussions. V. I. Veksler and V. V. Vladimirskiy are mentioned.

Card 3/4

25376
S/089/61/011/001/005/010
B102/B214

A high-current electron ...

There are 5 figures and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: M. Kelliher, J. Nugard, A. Gale. IRE Trans. Nucl. Sci., No. 3, 1 (1956).

SUBMITTED: July 26, 1960

Legend to Fig.1: 1) generator, 2) resonator, 3) electron gun, 4) connecting opening.

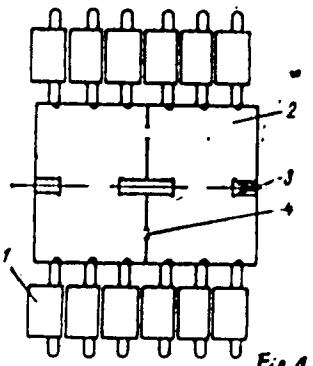

Fig.1

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39100

S/057/61/031/002/014/015
B124/B202

26.2311

AUTHORS: Nazarov, N. I., Yermakov, A. I., Tolok, V. T., and Sinel'nikov, K. D.

TITLE: Propagation of ion cyclotron waves in a plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 2, 1961, 254-255

TEXT: The experiments were made by means of a device similar to that described in Ref. 1. Gas discharge took place in a 1.6 m long glass tube with a diameter of 60 mm, in an axially magnetic field with a field intensity of up to 15 kilooersteds. The magnetic field attained its maximum value within 10^{-2} sec, it dropped by 2.7 times within $8 \cdot 10^{-2}$ sec. Hydrogen in the pressure range from 10^{-4} to 10^{-2} mm Hg served as working gas. The high-frequency energy was fed into the plasma by means of an induction coil usually used in cyclotron heating. It consisted of six parts connected in phase opposition. The axial periodicity of the h.f. magnetic field in the coil was 16 cm. The load current circuit consisting of this coil and vacuum condensers had the quality factor 310. The current circuit

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Propagation of ion cyclotron...

was fed by an h.f. generator with quartz stabilization and a power of 80 kw. The duration of pulses varied between 10^{-5} and 10^{-2} sec, the working frequency of the generator varied from 3 to 30 Mcps. The absorption of the h.f. power by the plasma in the region of ion-cyclotron resonance was determined by measuring the voltage in the current circuit as well as from the change of the electron density during discharge, and from the intensity of the hydrogen spectral line H_β. With given parameters of the h.f. current circuit about 5 kw were introduced into the plasma in the region of ion-cyclotron resonance. Owing to the resulting high degree of ionization of the gas no plasma formation by direct electrode discharge was necessary. In this case, experiments could be made also at low hydrogen pressures (up to $2 \cdot 10^{-4}$ mm Hg). The upper curve in Fig. 1 shows the change of load of the h.f. current circuit in the region of ion-cyclotron resonance, the lower curve shows the intensity of the H_β line. The duration of pulses of the h.f. generator is about 3 msec. After 0.5 msec hydrogen is intensively ionized. The upper curve of Fig. 2 shows a curve analogous to that in Table 1, the lower one shows the curve of the amplitude change of the h.f. (wave) signal at the electrode. The signal occurred only when the h.f. current circuit was loaded in the region of

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Propagation of ion cyclotron...

ion-cyclotron waves. Both figures show that the amplitude of the wave signal at the probe mainly depends on the degree of plasma ionization. The results obtained prove the penetration of h.f. energy into the plasma in the form of ion-cyclotron waves. The mentioned data also prove the results of the experiments of T. Stiks et al. in the stellarators B-65 (V-65) and B-66 (V-66) (Refs. 2, 3). Besides, also waves shorter than the cyclotron waves were observed in the magnetic fields. The working pressure in this case was 10^{-3} mm Hg. Under the experimental conditions of the authors such waves were observed only at pressures exceeding $8 \cdot 10^{-3}$ mm Hg. Their occurrence has hitherto not been explained. There are 2 figures and 3 Soviet-bloc references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR, Khar'kov (Institute of Physics and Technology of the AS UkrSSR, Khar'kov)

SUBMITTED: September 10, 1960

Card 3/4

89168

S/781/62/000/000/001/036

AUTHOR: Sinel'nikov, K. D., Tolok, V. T., Nazarov, N. I., Bukayev, I. I., Bondarev, V. A., Bugay, Yu. P., Loginov, A. S., Kononenko, V. I.

TITLE: Investigation of ion cyclotron resonance in a dense plasma

PERIODICAL: Fizika plazmy i problemy upravlyayemogo termoyadernogo sinteza; doklady I konferentsii po fizike plazmy i probleme upravlyayemykh termoyadernykh reaktsiy. Fiz.-tekh. inst. AN Ukr. SSR. Kiev, Izd-vo AN Ukr. SSR, 1962, 3-8

TEXT: Ion cyclotron resonance heating of plasma, whereby field energy is transferred to the ions directly, is a promising method of rapidly attaining high ion temperatures. The article describes investigations of ion cyclotron resonance in a plasma produced by direct discharge in a glass tube 60 cm long and 6 cm in diameter. The discharge was produced by a rectangular voltage pulse of duration up to 800 microseconds and current up to 500 amp. The discharge tube was placed in a magnetic field produced by a solenoid fed from a capacitor bank with maximum stored energy 40,000 J, charged to 5 kV. The time required for the

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Investigation of ion cyclotron resonance in . . .

magnetic field to reach maximum was 4.7×10^{-3} sec.

The experiments have shown that there exist optimum values of hydrogen pressure and discharge current for the absorption of high frequency power by the plasma. The half-width of the resonant curves increases monotonically with increasing gas pressure, indicating that the accelerating ion interacts strongly with the neutral atoms. An increase in the discharge current and consequently in the ion density in the discharge also shifts the resonant peak toward magnetic field values below the resonant field. Density measurements in the hydrogen plasma have shown that at 300 amp a plasma of $6 \times 10^{13} cm^{-3}$ density has a lifetime of 150 microseconds after the termination of the discharge. It is also noted that the resonant peak becomes asymmetrical with increasing plasma density, this being possibly due to the diversion of part of the high frequency power to the generation of ion cyclotron waves. It is also likely that at densities above optimal the screening of the plasma against the high frequency field comes into play.

There are eight figures and five references. The English language references are: K. S. W. Champion, Proc. Phys. Soc. 70, 446, B, 212 (1957), and translated articles by T. N. Stix and R. W. Palladino.

Card 2/2

37256
S/057/62/032/005/003/022
B102/B104

24.6714 (3423)
24.6740

AUTHORS: Nazarov, N. I., Yermakov, A. I., Lobko, A. S., Bondarev, V. A., Tolok, V. T., and Sinel'nikov, K. D.

TITLE: Examination of ionic cyclotron waves

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 5, 1962, 536-540

TEXT: The authors continued previous experiments (ZhTF, 31, 254, 1961) on the excitation and propagation of ionic cyclotron waves. In an apparatus schematically shown in Fig. 1, a powerful h-f discharge in hydrogen and deuterium was studied in a range near ionic cyclotron resonance, and the conditions of forced resonance excitation of ionic cyclotron waves and of their propagation along the magnetic field were determined. Polarization and attenuation of these waves was also measured. The discharge took place in a tube of molybdenum glass (2 m long, 60 mm thick) arranged in a solenoid which created a quasi-constant magnetic field. The arrangement was such that two field regions were present: one for resonance excitation and another for the damping of the ionic cyclotron waves. The overall length of the coil was

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B102/B104

Examination of ionic cyclotron waves

1.5 m. The field was created by discharging a capacitor bank with a total capacity of $2.25 \cdot 10^{-2}$ f, which could be charged up to 5 kv. The field reached 20-25 kilogauss within 5 msec. The exciting electromagnetic field had a wavelength of 16 cm. The resonance circuit had a quality factor of 400 with an 80-kw generator (3-30 Mc/sec), and the maximum voltage in the circuit was 30 kv. Hydrogen of 10^{-2}-10^{-4} mm Hg was blown through the evacuated (1.10^{-6} mm Hg) discharge tube, and after a long-time aging of the system with h-f discharges, voltage and probe-signal oscillograms were recorded. At the moment of resonance load, the generated wave starts traveling along the constant magnetic field. Its magnetic-field distribution and phase variation along the field were measured (Figs. 5, 6). The wave was found to be circularly polarized; the polarization vector rotated in the same sense as did the free ion in the magnetic field. The damping process was studied with waves traveling in a region of magnetic fields equal to that of the cyclotron waves. Damping was found to set in only at a certain distance with various field geometries, which cannot be attributed to collision damping only. At $H \approx H_{cyclotron}$, cyclotron damping becomes more effective. There are

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Examination of ionic cyclotron waves

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B102/B104

8 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR (Physicotechnical Institute AS UkrSSR) Khar'kov

SUBMITTED: June 3, 1961

Card 3/5

ACCESSION NR: AT4036054 S/2781/63/000/003/0164/0168

AUTHORS: Nazarov, N. I.; Yermakov, A. I.; Tolok, V. T.; Sinel'nikov, K. D.

TITLE: Investigation of instability in the cyclotron method of plasma heating

SOURCE: Konferentsiya po fizike plasmy* i problemam upravlyayemogo termoyadernogo sinteza. 3d, Kharkov, 1962. Fizika plazmy* i problemy* upravlyayemogo termoyadernogo sinteza (Plasma physics and problems of controlled thermonuclear synthesis); doklady* konferentsii, no. 3, Kiev, Izd-vo AN UkrSSR, 1963, 164-168

TOPIC TAGS: cyclotron resonance phenomena, plasma instability, plasma heating, plasma ion oscillation, plasma decay, microwave plasma, gyromagnetic resonance

ABSTRACT: To clarify the question of the effectiveness of plasma heating by ion cyclotron waves and to study the influence of the

Card 1/5

ACCESSION NR: AT4036054

level of the high-frequency power on the plasma heating in the ion gyroresonance region, an experiment was performed with a setup described in detail elsewhere (ZhTF v. 32, No. 5, 1962). The results of the tests indicate that there exist two distinctly different modes of plasma behavior, one in which the plasma exists for a relatively long time, and one in which the plasma begins to decay even before the termination of the high-frequency power pulse. A radical decrease in the lifetime of the plasma occurs at a definite critical power level supplied to the plasma, and the smaller the pressure the smaller the critical power. The critical power depends on the cleanliness of the system and increases for a poorly preconditioned system. This dependence on the pressure and on the purity of the system suggests that the observed instability is due to the appearance of ion currents with large directional velocities. At the present time the nature of the observed instability cannot be reconciled with the existing theory. "In conclusion the authors thank Ya. B. Faynberg and V. I. Kurilko for interest in the work and for a

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ACCESSION NR: AT4036054

discussion of the results, and also A. L. Lobko, V. A. Bondarev, and Ye. S. Khokhlov for help with the experiment. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 21May64 ENCL: 02

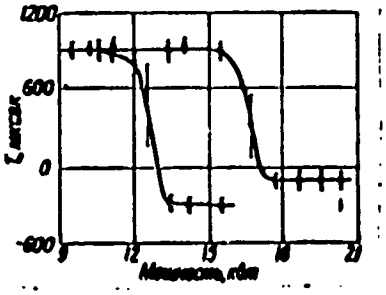
SUB CODE: ME NR REF SOV: 003 OTHER: 002

Card 3/5

ACCESSION NR: AT4036054

ENCLOSURE: 01

τ, μsec



Dependence of the lifetime τ of a plasma with n ~ 1.2 x 10^{12} cm^{-3} after termination of the high-frequency pulse, on the power, for two pressures: o - 0.997 and Δ - 0.585 n/m^2

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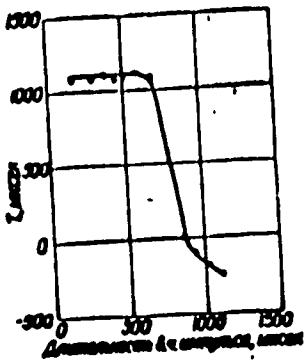
ENCLOSURE: 02

ACCESSION NR: AT4036054



Dependence of τ on the duration of the high-frequency pulse

Card 5/5

DOLGOPOLOV, V.V.; YERMAKOV, A.I.; NAZAROV, N.I.; STEPANOV, K.N.; TOLOK, V.T.

Experimental observation of Landau damping in a plasma. Zhur. eksp. i teor. fiz. 45 no.4:1260-1261 O '63. (MIRA 16:11)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

L 11939-63 EWT(1)/EWG(k)/BDS/EEC(b)-2/ES(w)-2 AFFTC/ASD/ESD-3/AFWL/
SSD Pi-4/Po-4/Pab-4/Pz-4 AT/IJP(C)

ACCESSION NR: AP3003967 S/0089/63/015/001/0003/0006

AUTHORS: Bakayev, I. I.; Zalesskiy, Yu. G.; Nazarov, N. I.; Ukrainskiy, A. M.; Tolok, V. T.

84
83

TITLE: Ion cyclotron resonance in a moving plasma

SOURCE: Atomnaya energiya, v. 15, no. 1, 1963, 3-6

TOPIC TAGS: ion cyclotron resonance, moving plasma, pinch, plasma density, Doppler effect

ABSTRACT: In the heating of a stationary plasma by means of an ion cyclotron resonance, the time required for a considerable acceleration of plasma ions is not more than 10^{-5} sec. Therefore for the pinches moving with a velocity of 10^7 cm/sec, the length of the heating section is not unreasonable (about 1m.). In the present work, the generation and absorption of ion cyclotron waves in a moving plasma pinch has been observed. The absorption of high frequency energy occured at two frequencies shifted to both sides from a certain average frequency, because of Doppler effect. "Magnetic shores" are important for the damping of ion cyclotron waves. By measuring the Doppler effect and the resonance frequencies, the average velocity of the pinch was found (6.7×10^6 cm/sec), and the plasma density (7×10^{12} cm^{-3}).

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L 11939-63

ACCESSION NR: AP3003967

"The authors express their deep gratitude to K. D. Sinel'nikov for discussion of the results". Orig. art. has: 5 figures and 3 equations.

ASSOCIATION: none

SUBMITTED: 22Sep62 DATE ACQ: 08Aug63 ENCL: 00

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

Card 2/2

L 28490-66 EPF(n)-2/EWT(l)/ETC(f)/EWG(m) IJP(c) AT

ACC NR: AP6013115 SOURCE CODE: UR/0057/66/036/004/0612/0619

62
60
B

AUTHOR: Nazarov, M.I.; Yermakov, A.I.; Tolok, V.T.

ORG: none

TITLE: High frequency heating of a high density plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 4, 1966, 612-619

TOPIC TAGS: plasma heating, hydrogen plasma, ion temperature, electron temperature, plasma magnetic field, plasma oscillation, plasma resonance, cyclotron resonance, acoustic resonance,

ABSTRACT: The authors have investigated heating of hydrogen plasmas at pressures between 0.001 and 0.004 mm Hg by ionic cyclotron and fast magnetic sound waves. The plasmas were produced in the "Snieg" machine, which has been described elsewhere by the authors and collaborators (ZhTF, 32, No.5, 536, 1962). Heating was accomplished by up to 100 kW pulses of rf power at 10 MHz; resonance with the ionic cyclotron or fast magnetic sound waves was achieved by adjusting the strength of the external (pulsed) magnetic field. Double pulses of rf power were employed; the first pulse of a pair served to produce the plasma, and the second, to heat it. The longitudinal energies of the plasma particles were determined with a multigrid probe and with the electrostatic analyzer described by A.A.Kalmykov and collaborators (PTE, 5, 142,1963). Ion masses were determined by measuring flight times in a 56 cm long drift tube. The

UDC: 533.9

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L 28490-66

ACC NR: AP6013115 2

technique employed by W.H.Hooke, M.A.Rothman, and J. Adam (Bull. Am. Phys.Soc.,ser 2, 8, 174, 1963) was used to determine the transverse energies of the plasma particles from measurements of the diamagnetic properties of the plasma. Electron temperatures were also measured spectroscopically. Plasma densities were measured with a microwave interferometer operating at wavelengths of 8.2 and 4 mm. Mean longitudinal ion energies up to 2000 eV were observed in plasmas heated at the ionic cyclotron resonance. The transverse ion energies were slightly lower; this difference is ascribed to systematic error in the measurement of the transverse energies. The mean ion energy was proportional to the square of the rf potential applied to the exciting coil. H^+, H_2^+, and H_3^+ ions were present; these ions all had the same energy. The mean ion energy remained constant throughout practically the full 300 μsec duration of the heating pulse, indicating that the losses were high. The electron temperatures in these plasmas was only 20-30 eV. The ions cooled very rapidly after cessation of the pulse, with a time constant of some 10 μsec. This rapid cooling is ascribed to charge exchange collisions with the cool neutral gas surrounding the hot plasma column. In the plasmas heated at the fast ionic sound resonance, the ion and electron temperatures were approximately the same, and equal to about 150 eV. The densities of the plasmas were not less than 10^{13} cm^{-3} in both cases. The authors thank A.A.Kalmykov for lending the electrostatic analyzer, and Academician K.D.Sinel'nikov for his support and interest in the work. Orig. art. has: 2 formulas and 15 figures.

SUB CODE: 20 SUBM DATE: 22Feb65 ORIG. REF: 004 OTH REF: 001

Card 2/2 CC

L 40920-66 EWT(1) IJP(c) AT (N) SOURCE CODE: UR/0000/65/000/000/0010/0014

ACC NR: AT6020562

AUTHOR: Nazarov, N. I.; Yermakov, A. I.; Tolok, V. T.

ORG: none

TITLE: Measurement of the perpendicular component of energy and the time of plasma breakup in high frequency heating

SOURCE: AN UkrSSR. Vysokochastotnyye svoystva plazmy (High frequency properties of plasma). Kiev, Naukovo dumka, 1965, 10-14

TOPIC TAGS: plasma decay, plasma heating, diamagnetism, plasma magnetic field, external magnetic field, electron density, plasma charged particle, pulsed magnetic field

ABSTRACT: The heating by high frequency generators and the breakup of plasma is studied by making use of the dependence of the plasma diamagnetism on the perpendicular component of particle energy. The method of measuring the diamagnetism consists of determining the magnetic field in the plasma and comparing it with the external field. The measurements were made on an experimental apparatus which used either a strong ion cyclotron wave or fast magnetosonic wave for plasma heating. The results showing the ion temperature as a function of a ratio of the external magnetic field to the plasma field (at which the gyrofrequency is 10 MHz) indicate the maximum temperature of 10 kev during the resonant excitation of the ion cyclotron wave. The density was 10^{13}

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L 40920-66
ACC NR: AT6020562

electrons/cm^3. The expected cooling time of the ions was observed to be reduced by a factor of ten down to 10 μsec owing to energy transfer to colder electrons and to charge-transfer collisions in the region of the cold plasma boundary found near the plasma vessel walls. It is suggested that removal of the walls would permit considerably higher heating of the plasma. Orig. art. has: 5 figures.

SUB CODE: 20/ SUBM DATE: 19Nov65/ ORIG REF: 003/ OTH REF: 001

Card 2/2 vmb

L 46296-66 EWT(1) IJP(c) AT/GD (N)
ACC NR: AT6020561 SOURCE CODE: UR/0000/65/000/000/0005/0009

AUTHOR: Nazarov, N. I.; Yermakov, A. I.; Tolok, V. T.

ORG: none

TITLE: Investigation of the energy of charged particles leaving magnetic traps after high frequency heating

SOURCE: AN UkrSSR. Vysokochastotnyye svoystva plazmy (High frequency properties of plasma). Kiev, Naukovo dumka, 1965, 5-9

TOPIC TAGS: plasma heating, HF plasma heating, plasma magnetic field, plasma temperature

ABSTRACT: This work describes the results of measurements of the energy of ions and electrons which are moving along the magnetic field. The heating mechanisms used in the experiments were collective excitations by ion cyclotron and fast magnetosonic waves. The characteristic waves in the plasma were excited by the spatially periodic electromagnetic fields with 10 MHz frequency. The generator power used was at the 300 kw level. The particle energy and composition was measured by the electrostatic analyzer and multigrid probes. The plasma temperature was determined by spectroscopic methods. Plasma density was determined by a microwave interferometer. It was found that three types of ions flowed out, namely, H_1^+, H_2^+, H_3^+, all of which had the same

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ACC NR: AT6020561

energy even though the resonant acceleration condition is satisfied for H_1^+ only. The ion temperature of 2 kev was reached, while the electron energy was only 30 ev. This also indicates the presence of three types of ions. In magnetosonic wave heating, both ions and electrons were found to reach a temperature of 150 ev. The various measuring methods gave consistent results. Orig. art. has: 5 figures.

SUB CODE: 20/ SUBM DATE: 19Nov65/ ORIG REF: 004

Card 2/2 afs

SOV/144-60-1-7/11

8(3)

AUTHOR: Nazarov, N. I., Engineer

TITLE: The Operation of Oil-Paper Capacitors with Non-Sinusoidal Voltage

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy: Energetika, 1960, Nr 1, pp 49 - 53 (USSR)

ABSTRACT: The article gives a series of calculations on the operation of oil-paper insulation in a capacitor with non-sinusoidal voltage and without a constant component. A relative spectral coefficient is introduced and a method of determining the average value of the non-sinusoidal function for half a period is given. The parameters of an equivalent sinusoid are determined and the influence of the relationship of paper thickness to that of the foil and the compressibility factor on specific losses in the capacitor are taken into account. A method of applying V. A. Fok's formula for the voltage of heat breakthrough to a distorted curve

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The Operation of Oil-Paper Capacitors with Non-Sinusoidal Voltage

is found. If the capacitor voltage is given in the form of a certain function u(t), it may be expressed as an infinite series:

$$u(t) = U_{M1} \sin(\omega t+\varphi_1) + U_{M2} \sin(2\omega t+\varphi_2) + \ldots$$

$$+ U_{Mp} \sin(p\omega t+\varphi_2)+ \ldots \quad (1)$$

where U_{Mp} is the amplitude of the harmonic p. The last formula gives the voltage of heat breakthrough with a non-sinusoidal dielectric voltage; the figure is expressed through the effective value of the equivalent sinusoid

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The Operation of Oil-Paper Capacitors with Non-Sinusoidal Voltage

$$U_{pr} = 70\,10 \cos\varphi_1 \left(1 + \sum_{m=1}^{m=2} \frac{a_{2m+1}}{2m+1} \cdot \frac{\cos\varphi_{2m1}}{\cos\varphi_1}\right) \sqrt{\frac{\lambda}{f \cdot \varepsilon_0 \ tg\delta_C \cdot \alpha S_3}} \cdot \varphi(c) \qquad (9a)$$

where U_{pr} is the breakthrough voltage, kv; λ - coefficient of heat conductivity of the dielectric. cal/sec cm deg; f - frequency, c; ε_0, $tg\delta_0$ - dielectric penetrance and tangent of the angle of losses before the application of voltage; α - amount characterizing the rate of increase in losses during temperature rise; φ c) - non-dimensional

Card 3/4

The Operation of Oil-Paper Capacitors with Non-Sinusoidal Voltage

function, characterizing heat take-off from the dielectric through the electrodes into the surrounding medium. There are 6 references, of which 5 are Soviet and 1 American.

ASSOCIATION: Zavod "Kondensator" ("Kondensator" Plant)

SUBMITTED: August 31, 1959, by the Kafedra elektroizolyatsionnoy i kabel'noy tekhniki (Chair of Electrical Insulation and Cable Technology)

Card 4/4

NAZAROV, M.I., inzh.; PERESELENTSEV, I.F., inzh.

Effect of pressing on the electric characteristics of a paper and oil capacitor. Vest.elektroprom. 31 no.6:55-60 Je '60. (MIRA 13:7)

(Electric capacitors)

NAZAROV, N.I., inzh.

Thermal conductivity factors of a section of oil-saturated paper capacitor. Izv. vys. ucheb. zav.; energ. 5 no.10:46-51 O '62. (MIRA 15:11)

1. Vsesoyuznyy zaochnyy energeticheskiy institut. Predstavlena kafedroy elektroizolyatsionnoy i kabel'noy tekhniki.

(Condensers (Electricity))

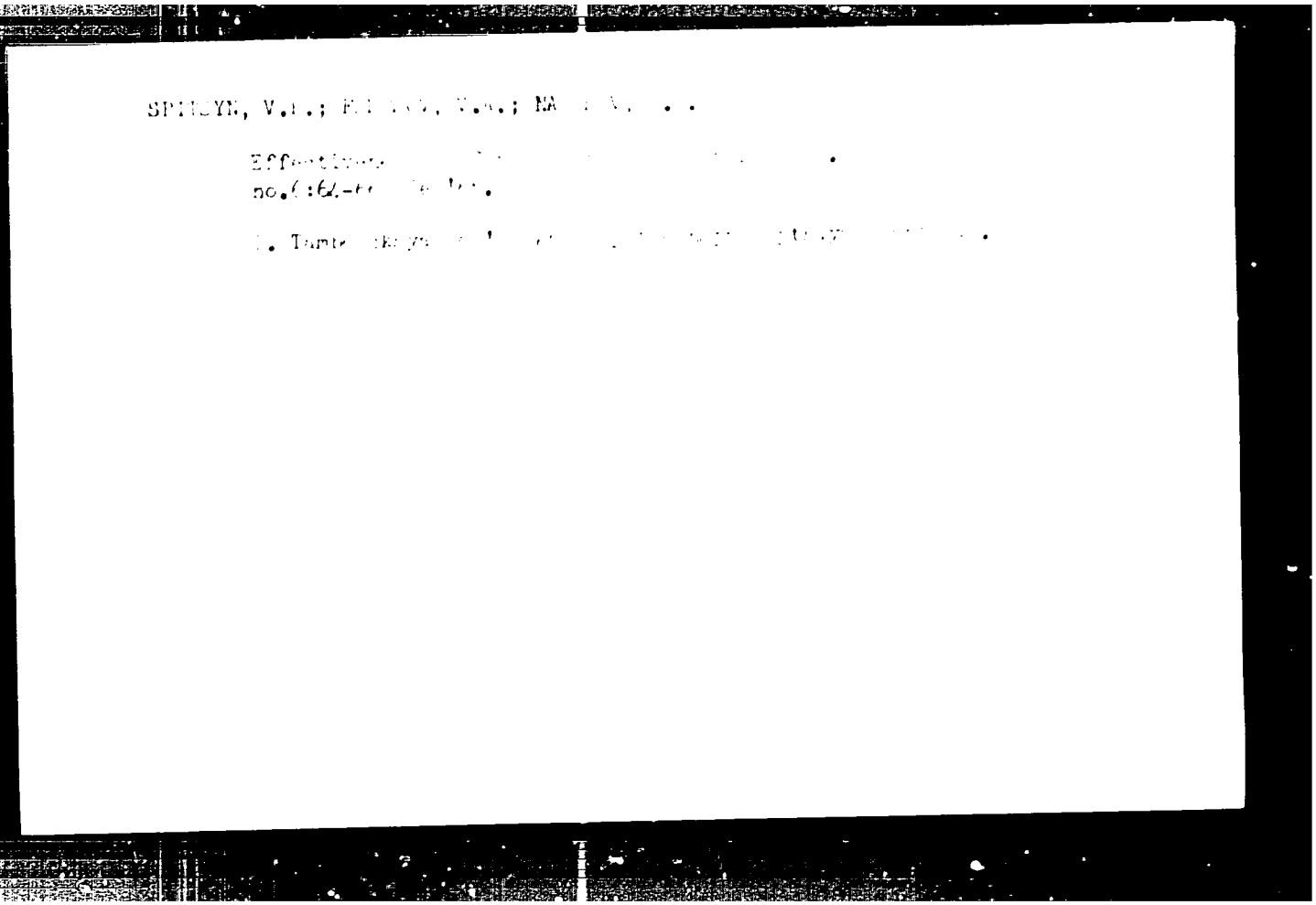
NAZAROV, N.I., inzh.

Compression factor and the reduction of losses in oil filled paper capacitors. Vest.elektroprom. 33 no.1:14-16 Ja '62. (MIRA 14:12)

(Electric capacitors)

GULEVICH, Anton Ivanovich; KIREYEV, Aleksey Petrovich; NAZAROV, N.I., nauchn. red.; SHUMILOVA, Ye.M., red.

[Manufacture of power condensers] Proizvodstvo silovykh kondensatorov. Moskva, Vysshaia shkola, 1965. 355 p. (MIRA 18:10)



SPITSYN, V.I.; [illegible]

[illegible]

[illegible]

KUTYURIN, V.M.; PUTBEKOVA, M.V.; NAZAROV, N.M.

Effect of light and oxygen on the photosynthesis and respiration of aquatic plants. Fiziol. rast. 11 no.6:965-[illegible] 1964.

(MIRA 18:1)

1. Vernadsky Institute of Geochemistry and Analytical Chemistry, Moscow.

ACCESSION NR: AP4042026 S/0020/64/157/001/0223/0226

AUTHOR: Kutyurin, V. M.; Ulubekova, M. V.; Nazarov, N. M.

TITLE: Influence of oxygen concentration on the rate of photosynthesis and respiration of algae

SOURCE: AN SSSR. Doklady*, v. 157, no. 1, 1964, 223-226

TOPIC TAGS: photosynthesis, life support, oxygen concentration, respiration, plant physiology, light intensity, Chlorella, Scenedesmus, Elodea, algae

ABSTRACT: The authors previously established (DAN, 154, no. 3, 1964) that the rate of photosynthesis in Scenedesmus obliquus decreases as oxygen concentration increases. The present investigation was designed to show what influence oxygen had upon algal photosynthesis and whether the photosynthetic rate was dependent upon the physiological state of algae and the intensity of light. Experiments were conducted on Scenedesmus obliquus at 22C, on Chlorel a pyrenoidosa at 39C, and on Elodea canadensis at 22C. All algae were cultivated in phosphate

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ACCESSION NR: AP4042026

buffer solutions (pH 5.6). Kinetic determination of the isolation and absorption of oxygen was accomplished amperometrically. The results of the tests indicated that the influence of oxygen on the observed rate of photosynthesis depends upon the physiological state of the plant and the intensity of light. Algal respiration does not intensify as a result of preliminary illumination. The respiration of algae in darkness is directly proportional to oxygen concentration and differs from respiration in light. It is doubtful whether the "true" rate of algal photosynthesis can be determined by addition of the observed rates of photosynthesis and respiration in darkness. The authors express thanks to K. S. Spektrov for contributing the Chlorella pyrenoidosa culture. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry, Academy of Sciences SSSR)

SUBMITTED: 15Aug63 ATD PRESS: 3059 ENCL: 00

SUB CODE: LS NO REF SOV: 005 OTHER: 003

Card 2/2

KUTYUKIN, V.M.; MATVEYEVA, I.V.; NAZAROV, N.A.; SMENTYNA [illegible]

Effect of light on the isotopic composition of oxygen evolved by plants. Dokl. AN SSSR 157 no.6:1474-1476 Ag '64.
(MIRA 17:8)

1. Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo AN SSSR. Predstavleno akademikom A.P. Vinogradovym.