Study of the reactions ...

the reaction $Bi^{209}(n,2n)Bi^{208m}$. It was found that the energies of gamma radiation accompanying Bi^{208m} decay were 0.88±0.02 Mev and 0.50±0.02 Mev, the half-life was 2.6 ± 0.1 msec, the reaction cross section was 0.66 ± 0.12 b. Further experiments were made in order to determine the cross section of reactions which led to the formation of a long-lived niobium isomer as well as experiments for a more accurate measurement of the Na^{24m} half-life. 10.0 ± 0.3 d was obtained for the half-life of the isomer Nb^{92g}, 0.94 ± 0.1 Mev for the energy of gamma radiation accompanying its beta decay. The reaction cross section $Nb^{93}(n,2n)Nb^{92g}$ was found to be $\sigma_{Al^{27}(n,\alpha)Na^{24m}} = 0.56 \pm 0.06$ b. The sodium isomer was produced in the reaction Y^{88m}; the Na^{24m} life time was found to be 18.3 ± 0.6 msec. The production cross section was $\sigma_m > 0.4$ b. Furthermore, the authors calculated the cross section of lead-isomer production assuming that this

Study of the reactions ...

isomer is produced only in the reaction $Pb^{208}(n,2n)Pb^{207m}$. The value obtained was compared with the one calculated from the strong-interaction theory by assuming a two-stage mechanism of neutron evaporation in the (n,2n) reaction. In this case a Pb^{207} level scheme was used which was in agreement with the shell model: $p_{1/2}$ (ground state); $f_{5/2}$, 0.570 Mev; $p_{3/2}$ 0.894 Mev; $i_{13/2}$ 1.633 Mev (metastable state); $f_{7/2}$ 2.34 Mev; $g_{9/2}$ 2.75 Mev; $i_{11/2}$ 3.60 Mev; $d_{5/2}$ 4.42 Mev; $g_{7/2}$ 4.66 Mev; $d_{3/2}$ 5.28 Mev; furthermore a level with $(15/2)^-$ and the energy ~ 5 Mev is assumed. The relative probabilities for various types of transitions are estimated from the relation between the lifetime of a nucleus in the excited state and the transition energy. The experimental and theoretical results are in good agreement. The authors thank M.V. Nikitova for assistance in the experiments. V.N. Sakharov, B.S. Dzhelepov, L.K. Peker, N.N. Flerov, V.M. Talitsyn, A.B. Migdal, L.V. Groshev and I.S. Shapiro are mentioned. There are 1 figure and 28 references: 8 Soviet-bloc and 20 non-Soviet-bloc. The 2 most recent references to English-language publications read as follows: D. Strominger, J.M. Hollander, G.T. Seaborg,

Card 3/4

S/056/61/040/003/006/031
B102/B202

Study of the reactions ...

Rev. Mod. Phys. 30, 585, 1958; V.J. Asby et al., Phys. Rev. 111, 616, 1958.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: October 7, 1960

Card 4/4

L 23593-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM

ACCESSION NR: AP5003840 S/0190/65/007/001/0180/0180

AUTHOR: Adadurov, G. A.; Barkalov, I. V.; Gol'danskiy, V. I.; Dremin, A. N.; Ignatovich, T. N.; Mikhaylov, A. M.; Tal'rose, V. L.; Yampol'skiy, P. A.

TITLE: The phenomenon of polymerization in a shock wave

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 1, 1965, 180

TOPIC TAGS: polymerization, shock wave, methacrylamide, trioxane, explosion, polyoxymethylene

ABSTRACT: A study has shown that a monomer in the condensed state can be made to polymerize by passing a shock wave through it. Powdered methacrylamide and trioxane were pelletized and subjected to the action of a shock wave with a wave front pressure of 1.5—3 x 10^4 atm abs produced by the explosion of trotyl-hexogen. The temperature in the pellet-containing capsul immediately after the explosion did not exceed 50C and dropped to room temperature in a few minutes. Methacrylamide formed a polymer decomposing at about 270C with a

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L 23593-65
ACCESSION NR: AP5003840

yield of 5% on the monomer. In trioxane the polymer yield was 3%; the polymer behaves similarly to polyoxymethylene. Studies of polymerization in a shock wave are planned for other monomers. [6M]

ASSOCIATION: none

SUBMITTED: 24Jun64 ENCL: 00 SUB CODE: GC, ME

NO REF SOV: 001 OTHER: 000 ATD PRESS: 3171

Card 2/2

ADADUROV, G.A.; BARKALOV, I.M.; GOL'DANSKIY, V.I.; DREMIN, A.N.; IGNATOVICH, T.N.; MIKHAYLOV, A.N.; TAL'ROZE, V.L.; YAMPOL'SKIY, P.A.

Polymerization of condensed monomers in a shock wave. Dokl. AN SSSR 165 no.4:851-854 D '65. (MIRA 18:12)

1. Institut khimicheskoy fiziki AN SSSR. 2. Chlen-korrespondent AN SSSR (for Gol'danskiy).

L 17629-66 EWT(m)/EWP(j)/T/EWP(k) RM

ACC NR: AP6001732 SOURCE CODE: UR/0020/65/165/004/0851/0854

AUTHOR: Adadurov, G. A.; Barkalov, I. M.; Dremin, A. N.; Ignatovich, T. N.; Mikhaylov, A. N.; Tal'roze, V. L.; Yampol'skiy, P. A.; Gol'danskiy, V. I. (Corresponding member AN SSSR)

ORG: Institute for Chemical Physics, Academy of Sciences, SSSR (Institute khimicheskoy fiziki Akademii nauk SSSR)

TITLE: Polymerization of condensed monomers in shock waves

SOURCE: AN SSSR. Doklady, v. 165, no. 4, 1965, 851-854

TOPIC TAGS: polymerization, shock wave, monomer

ABSTRACT: The shock wave polymerization of condensed monomers (trioxane, acrylamide, potassium acrylate, methacrylamide, tolane, salicilic aldehyde, stilbene, and diphenylbutadiene) was studied. The experimental technique followed that described by G. A. Adadurov i dr. (Vysokomolek. soyed., 7 No. 1, 180, 1965). The experimental results are tabulated. It is concluded that observed polymer-

UDC: 541.64; 678.744; 534.222.1

Card 1/2

L 17629-66

ACC NR: AP6001732

ization occurs directly in the shock wave and is not due to secondary effects. Orig. art. has: 1 table.

SUB CODE: 11/ SUBM DATE: 01Jun65/ ORIG REF: 008/ OTH REF: 005

Card 2/2

L 40151-66

ACC NR: AP6012182 SOURCE CODE: UR/0386/66/003/008/0309/0312

AUTHOR: Barkalov, I. M.; Gol'danskiy, V. I.; Tal'roze, V. L.; Yampol'skiy, P. A.

ORG: Institute of Chemical Physics, Academy of Sciences SSSR (Institut khimicheskoy fiziki Akademii nauk SSSR)

TITLE: Intensification of a shock wave by the polymerization energy and the feasibility of a polymerization detonation

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 8, 1966, 309-312

TOPIC TAGS: shock wave interaction, chemical explosion, plastic explosive, polymerization kinetics, detonation, monomer

ABSTRACT: This is a continuation of earlier work (Dokl. AN SSSR v. 165, 851, 1965), where polymerization of several solid monomers by a shock wave was observed, and the energy release was estimated. In the present article the authors compare this energy with the energy obtained by the substance as a result of compression by the shock wave. This is done by obtaining the dependence of the specific volume of the substance on the applied pressure from the shock adiabat of the investigated substance. The estimates are made for acryl amide, which was used in the earlier study, making use of published data on plexiglass and polystyrene, which have the

0908 2602

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ACC NR: AP6012182

same initial density and approximately equal compression coefficients. Since the passage of the shock wave left no traces of melting of the substance it is concluded that a considerable portion of the thermal energy released at the instant of polymerization is transferred to the shock wave, being converted into elastic energy of the substance. It is also shown that the energy released during polymerization is approximately equal to the energy lost by the shock wave to the compression of the monomer. Therefore the additional fraction of the energy obtained by the shock wave from the chemical processes is comparable with the total energy obtained by the substance upon compression by the shock wave. From a detailed theoretical analysis made by N. M. Kuznetsov at the authors' request (ZhETF v. 49, 1526, 1965) and from other considerations it is concluded that a detonation can occur as a result of polymerization by a shock wave. The authors thank Academician N. N. Semenov and N. M. Kuznetsov for a valuable discussion. [02]

SUB CODE: 07, 20 SUBM DATE: 17Feb66/ ORIG REF: 005/ OTH REF: 002

ATD PRESS: 4225

L 34041-66 EWT(l)/EWP(m)/EWT(m)/EWP(j) IJP(c) WW/RM

ACC NR: AP6012921 SOURCE CODE: UR/0020/66/167/005/1077/1078

AUTHOR: Barkalov, I.M.; Gol'danskiy, V.I. (Corresponding member AN SSSR); Gustov, V.V.; Dremin, A.N.; Mikhaylov, A.M.; Tal'roze, V.L.; Yampol'skiy, P.A.

ORG: Institute of Chemical Physics, Academy of Sciences, SSSR (Institut khimicheskoy fiziki Akademii nauk SSSR)

TITLE: Shock wave vulcanization of rubbers

SOURCE: AN SSSR. Doklady, v. 167, no. 5, 1966, 1077-1078

TOPIC TAGS: vulcanization, rubber, shock wave

ABSTRACT: Continuing the study of polymerization in shock waves, the authors investigated the possibility of vulcanizing rubbers by use of a shock wave. Samples of NK, SKB, "yuropren"-1500, SKS-30A, SKD, and polyisobutylene rubbers were subjected to shock waves with amplitudes from 30,000 to 100,000 atm. The percentage of the gel fraction and the molecular weight of the network were determined in each sample. No cross-linking could be detected in polyisobutylene (a rubber having no double bonds in the macromolecule); only a certain degree of degradation took place. The shock-wave-induced cross-linking reaction in SKB rubber has a definite threshold character, the threshold pressure being about 35,000 atm. The gel fraction appears above this pressure, and at 80,000 atm an almost completely cross-linked vulcanization is obtained. A partial calcination is observed above 100,000 atm. The vulcanization phenomena observed occur at the instant the shock

UDC: 541.12.034.2

Card 1/2

L 34041-66

ACC NR: AP6012921

wave passes through the rubber, i.e., in a time of the order of 10^{-5} sec. Thus, in SKB rubber (MW 80,000 — 200,000) at a pressure of 50,000 atm in the shock wave, over 10^{19} cross-links are formed per gram in 10^{-5} sec. Orig. art. has: 1 figure and 1 table.

SUB CODE: 11,07 / SUBM DATE: 16Nov65 / ORIG REF: 003 / OTH REF: 001

Card 2/2

ACC NR: AP6034092 (A) SOURCE CODE: UR/0089/66/021/004/0262/0266

AUTHOR: Yampol'skiy, P. A.; Kokovikhin, V. F.; Golubkov, A. I.; Kondurushkin, N. A.; Bolyatko, A. V.

ORG: none

TITLE: Passage of neutrons through air

SOURCE: Atomnaya energiya, v. 21, no. 4, 1966, 262-266

TOPIC TAGS: neutron radiation, radiation hazard, air, neutron interaction, neutron energy distribution, radiation dosimetry

ABSTRACT: With an aim at reducing the radiation hazard to persons operating close to neutron sources, the authors present a Monte-Carlo calculation of the neutrons from monoenergetic point-like isotropic sources in an unbounded homogeneous medium of known density. The initial neutron energies considered are 0.001, 0.025, 0.2, 0.8, 2, 5, 10, and 14 Mev. The calculation was made with an M-20 electronic computer. From 7000 to 20 000 neutron histories were traced from the specified initial energy down to 0.2 ev. All possible neutron interactions with the nitrogen and oxygen atoms in air, contributing not less than 3% to the total neutron cross section, were taken into consideration, and other impurities in the air were disregarded. The space-energy and time distributions of the neutrons are obtained for distances 10 - 1300 m from the source and are presented in the form of numerous plots. Plots are also presented of the average time necessary for the neutrons to reach a given distance for different

Card 1/2 UDC: 539.125.52

ACC NR: AP6034092

initial neutron energies, and the flux of neutrons with energies larger than 0.2 Mev in air from point sources of various energies, and the neutron dose from a point source in air. The calculated neutron dose is compared with the experimental data obtained by the authors and by others, and agree within 25%. The authors thank O. I. Leypunskiy for useful discussions. Orig. art. has: 12 figures.

SUB CODE: 18/ SUBM DATE: 18May66/ ORIG REF: 005/ OTH REF: 004

Card 2/2

YAMPOL'SKIY, P. V.

42307: YAMPOL'SKIY, P. V. - Sistemu zarplaty uvyazat' s Vypolneniyem plana po dobyche nefti. Azerbaydzh. neft. Khoz-vo, 1948, No. 10, s. 17-19.

SO: Letopis' Zhurnal'nykh Statey, Vol. 47, 1948.

YAMPOL'SKIY, S.L.

114 - 1 - 3/15

AUTHOR: Trifonov, E. V., Engineer and Yampol'ski, S. L. Eng.

TITLE: The Effect of Oil Pressure on the Load Carrying Capacity of Steam Turbine Thrust Bearings (Vliyaniye davleniya masla na nesushchuyu sposobnost' upornykh podshipnikov parovykh turbin)

PERIODICAL: ENERGOMASHINOSTROYENIYE, 1957, No. 1, pp. 8-11, (U.S.S.R.)

ABSTRACT: The article describes tests on thrust bearings of the Mitchell or Kingsbury types. The testing set-up is illustrated by drawing in Fig. 1, p. 8. Fig. 2, p. 9, shows the distribution of the metering points. Fig. 3, p. 9, illustrates the pressure epures along the radius of the thrust disc. The obtained results are described, plotted in graphs (Fig. 5, p. 10) and entered in Table 2, p. 10. On the basis of this, it is concluded that the load carrying capacity of high speed thrust bearings (u_{av} greater than 45 m/sec, n = 5,000 - 10,000 r.p.m.) is governed primarily by the oil pressure at the inlet to the thrust pads. Under actual operating

Card 1/3

TITLE: The Effect of Oil Pressure on the Load Carrying Capacity of Steam Turbine Thrust Bearings (Vliyaniye davleniya masla na nesushchuyu sposobnost' upornykh podshipnikov parovykh turbin)

conditions this factor predominates over the influences of the geometrical shape of the pads, the smoothness of the surfaces, oil temperature, etc. It is because the effect of oil pressure has not been taken into account that some bearings are of poor reliability and have a low load carrying capacity. Depending on the type of bearings and the conditions required pressures range from 0.5 to 10 kg/cm^2.

There are four figures, one graph and two tables. There are two Slavic and one Swiss reference.

ASSOCIATION:

Card 2/3

114 - 1 - 3/15

TITLE: The Effect of Oil Pressure on the Load Carrying Capacity of Steam Turbine Thrust Bearings (Vliyaniye davleniya masla na nesushchuyu sposobnost' upornykh podshipnikov parovykh turbin)

ASSOCIATION:

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

Card 3/3

YAMPL'SKIY, S. L.

TRIFONOV, Ye.V., inzhener; TSUKANOV, V.F., inzhener; YAMPOL'SKIY, S.L., inzhener.

Radial-thrust bearing for steam turbines placed with the oil pump. Energomashinostroenie 3 no.6:1-5 Je '57. (MIRA 10:7)
(Steam turbines)

AUTHOR: Trifonov, E.V., Engineer, Tsukanov, V.F., Engineer and Yampol'skiy, S.L., Engineer. 114-6-1/11

TITLE: Steam turbine support and thrust bearing combined with oil pump. (Oporno'-upornyy podshipnik parovoy turbiny sovmeshchennyy s maslyanum nasosom.)

PERIODICAL: "Energomashinostroenie" (Power Generation Machinery Construction), 1957, Vol. 3, No. 6, pp. 1 - 5 (U.S.S.R.)

ABSTRACT: Steam turbine thrust bearings are one of the most complicated and least reliable parts of the set. High speed thrust bearings are particularly unsatisfactory. The Kaluga turbine works developed and have since 1954 applied a new design of thrust and support bearing combined with the main turbine oil pump. The special features of this bearing are that: 1) the runner of the centrifugal oil pump, located on the front end of the turbine shaft, serves as the thrust disc; 2) the front support bearing of the turbine also serves as the pump gland; 3) both support and thrust bearings are lubricated by oil at high pressure, since both are located in the pressure chamber of the pump. The construction has been described in detail in an article by N.M. Taranenko. A fairly detailed description with sketches is given in this article. Special tests on a

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Steam turbine support and thrust bearing combined with oil pump. (Cont.) 114-6-1/11

pump-bearing are described. A special test rig was set up with a loading machine driven by an electric motor, oil tanks, filters and coolers and an auxiliary centrifugal oil pump. The oil supply conditions in the turbine set are carefully reproduced. Special investigations are being made into the hydraulic part of the pump-regulator and are not considered in this article. A disadvantage of the test set-up is the limited load carrying capacity of the loading bearing, therefore in making overload tests it was necessary to reduce the number of thrust pads on the bearing being tested. During the test the temperature conditions were studied. The following were measured: 1) the oil pressures in the inlet and discharge chambers and beyond the pump runner and in the thrust bearing oil film; 2) the oil temperatures in the inlet and discharge chambers, at inlet and discharge from the thrust bearing and the temperature on the thrust pad surface and in the oil film; 3) the output of the pump and the quantity of oil passing through the support bearing. The main results of the tests are given in a table and also in a graph of the temperature distribution on the surface of the bearing pads as a function of the specific load. A series of tests was made to deter-

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mine the load carrying capacity of the thrust bearing. The tests were continued to destruction of the bearing. Some tests were also made to determine the limiting load when the thrust disc was damaged. The specific loads obtained during the tests were high, evidently because in high speed thrust bearings there is a zone of local low pressure caused by the pump effect of the disc and the presence of intense turbulence. In ordinary bearings because the lubrication is at low pressure this pressure reduction can lead to the formation of vacuum zones in which bubbles can be formed. In the present type of bearings this is avoided because the oil supply is at high pressure.

The magnitude of the axial displacement of the rotor in the event of accident was investigated. The usual bearing gives considerable axial displacement when damaged. Because high oil pressure is used in the present bearings other bearing metals can be used which give less displacement than babbit in the event of accident. In particular brass proved very suitable.

The system of having the support and thrust bearing directly in the chamber of the main oil pump was found to

Steam turbine support and thrust bearing combined with oil pump. (Cont.) 114-6-1/11

ensure very reliable oil supply.

The use of combined pump and bearing gives reduced mechanical losses. Tests on turbines type AK 4-3 gave a reduction of 12.7 kW. For turbines running at a speed higher than 3 000 r.p.m. the difference was in some cases 20 kW.

The works carried out observations on the operation of bearings of this design on two turbines in service which have now worked for 6 000-9 000 hours. These sets worked under the most varied conditions including frequent water hammer and brief emergency interruption of oil supply. Inspection after a year's operation showed the bearings on both machines were in excellent condition. In addition, a large number of turbines with bearings of this type have passed acceptance tests on the works test bed. It is concluded that these bearing-pumps have the advantages of much higher and more stable load carrying capacity, reliable oil supply, higher efficiency, simpler construction and smaller size.

There are 4 figures, 1 table and 4 literature references (Slavic).

Card 4/4

AVAILABLE:

YAMPOL'SKIY, S. L.

104-3-6/45

AUTHOR: Trifonov, Ye.V. and Yampol'skiy, S.L., Engineers.

TITLE: The measurement of axial stresses in a steam turbine. (Izmereniye osevykh usiliy v parovoy turbine)

PERIODICAL: "Elektricheskiye Stantsii" (Power Stations), 1957, Vol.28, No.3, pp. 19 - 21 (U.S.S.R.)

ABSTRACT: Existing methods of measuring axial stresses in steam turbines suffer from a number of defects. Special spring supports are required in the thrust bearing if it is intended to use resistance strain gauges and so this method is mainly used for large turbine sets. The method of measuring the temperature on the bearing pads that is sometimes used is not always applicable as is demonstrated by experimental curves which show that the linear relationship between temperature and load which is usually adopted is only valid at a particular speed and over a narrow load range.

Accordingly a method was developed to measure the axial stresses in steam turbines from the pressure of the oil film in the thrust bearing. The relationship between the maximum pressure in the oil film and the thrust on the pad was calculated. It is in practice convenient to measure the pressure in the so-called "centre of pressure" of the pad. A theoretical basis for this method is given. Tests were made on two

Card 1/2

The measurement of axial stresses in a steam turbine. (Cont.)

kinds of pad. Small holes were made in the face of the pad and led to manometers through copper tubes which are sufficiently flexible to permit movement of the pad. Ordinary manometers can be used as great accuracy is not required. The results of the tests are shown in the form of a graph and show some divergence from values calculated from existing theories. Measurements made in this way may be used for other purposes such as for checking the operation of compensating devices of thrust bearings which should ensure even distribution of the load between the pads and an example of this kind is given.

The comparative simplicity of the measurements and the universality of this method for all designs of thrust bearings make it possible to use it for investigation of the operation of thrust bearings in operating conditions and for the adjustment of steam turbines in cases when the strain gauge method cannot be used for one reason or another.

There is an editorial note that until further experience has been acquired the method can only be recommended for turbines of less than 25 MW. There are 5 figures and 2 Slavic references.

AVAILABLE: Library of Congress

Card 2/2

TRIFONOV, Ye.V., inzh.; YAMPOL'SKIY, S.L., inzh.

Selection of materials for shoes in stream-turbine thrust bearings. Energomashinostroenie 4 no.3:15-19 Mr '58. (MIRA 11:5)
(Bearings (Machinery))

TRIFONOV, Ye.V., inzh.; YAMPOL'SKIY, S.L., inzh.

Temperature conditions in steam-turbine thrust bearings and dependability of their performance. Elek.sta.29 no.3:23-27 Mr '58
(Bearings (Machinery) (MIRA 11:5)

TRIFONOV, Ye.V., inzh.; YAMPOL'SKIY, S.L., inzh.

Increase in the reliability of the axial bearings of steam turbines. Elek. sta. 31 no.9:27-30 S '60. (MIRA 14:10)
(Steam turbines)

S/122/63/000/003/004/008
A004/A127

AUTHORS: Trifonov, Ye.V., Candidate of Technical Sciences, Yampol'skiy, S.L., Khomyakov, V.P., Sarapov, O.P., - Engineers

TITLE: The effect of some design parameters of segmental slide thrust bearings on their efficiency

PERIODICAL: Vestnik mashinostroyeniya, 43 no. 3, 1963, 20 - 27

TEXT: The authors give an account of experimental investigations performed at the Kaluzhskiy turbinny zavod (Kaluga Turbine Plant) on tilting-pad thrust bearings which were aimed at elucidating the dependence of their carrying power on some design parameters which are not taken into consideration by the universally adopted calculation methods. The bearings were tested at speeds of 30 - 70 m/sec, which is characteristic of steam and gas turbines. The main features of the tested thrust bearings are presented in a table. The major purpose of the tests was to determine the magnitude of the bearing breaking load under various operation conditions and of different designs of segmental thrust bearings. The following factors were investigated: effect of the number of tilting

Card 1/2

The effect of some design parameters of S/122/63/000/003/004/008
A004/A127

pads on the functioning of the thrust bearing, pad material, geometrical shape of the pads, and effect of the sliding speed on the carrying power of thrust bearings. The authors present a detailed description of the tests concerning the factors mentioned and give a number of recommendations in designing thrust bearings of the type tested. There are 7 figures and 2 tables.

Card 2/2

TRUSHLYAKOV, V.P.; BEREZHINSKIY, A.I.; SPIVAK, M.Ya.; FINOGEYEV, I.A.; LIPETS, A.U.; AYZEN, B.G.; KOSTOVETSKIY, D.L.; BOLDZHI, K.I.; YAMPOL'SKIY, S.L.; FEDOTOV, D.K.; KIRILLOV, I.I.; OSHEROV, S.Ya.; ZYSIN, V.A.; OGLOBLIN, G.A.; KANAYEV, A.A.; BULEGA, S.S.; BORUKHMAN, V.A.; IOEL'SON, V.I.

Inventions. Energ. i elektrotekh. prom. no.3:48-49 Jl-S '64. (MIRA 17:11)

YAMPOL'SKIY, S.L., inzh.

Effect of operational and design factors on the performance of the thrust bearings of turbines; methods for operational control and damage protection. Energomashinostroenie 11 no.7:17-22 Jl '65. (MIRA 18:7)

ACC NR: AP7007593 SOURCE CODE: UR/0104/66/000/008/0019/0022

AUTHOR: Yampol'skiy, S. L. (Engineer)

ORG: none

TITLE: Checking axial force in turbines by pressure in hydro dynamic layer of main bearing

SOURCE: Elektricheskiye stantsii, no. 8, 1966, 19-22

TOPIC TAGS: turbine, hydrodynamic bearing

SUB CODE: 13

ABSTRACT: The Kaluga Turbine Plant developed a method for measuring axial forces permissible for wide usage on turbines. This method is based on measurement of the hydrodynamic pressure in the main bearing, and is described in detail elsewhere. This article presents a description of experimental testing of the bydrodynamic pressure in the main bearings of three widely used types of main bearings. The experiments were performed on a special loading machine allowing the application of various loads to a bearing being tested under conditions near actual usage conditions. Graphs of the variation of pressure at the main bearing as a function of load are presented. The graphs are near linear over a wide range. Checking the hydrodynamic pressure in the main bearing is a valuable experimental means of checking usage characteristics defining the state of the operating process in the bearing, as the presence of hydrodynamic pressure in the bearing indicates fluid friction, without which the main bearing cannot operate. Orig. art. has: 3 figures and 2 formulas. [JPRS: 38,330]

UDC: 621.165

0928 1532

Card 1/1

L 2030-66 EWT(m)/EPF(c)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/ETC(m) JD/WW/DJ

ACCESSION NR: AP5018372 UR/0114/65/000/007/0017/0022

621.165.001.5

AUTHOR: Yampol'skiy, S. L. (Engineer)

TITLE: Effect of design and operational factors on the operability of turbine thrust bearings; methods of checking the operation and protecting against failure of bearings

SOURCE: Energomashinostroyeniye, no. 7, 1965, 17-22

TOPIC TAGS: thrust bearing, turbine bearing

ABSTRACT: According to various experimental data, the bearing capacity of Mitchell-type thrust bearings in high-speed (over 3000 rpm) thermal turbines depends on these factors: Design parameters; shoe (or segment) material (babbitted copper proved to be the best); oil pressure; oil flow; sliding speed; oil viscosity; alignment of bearing surfaces; bearing-surface roughness; presence of abrasive particles. Static overloads of thrust bearings, when axial load exceeds bearing capacity, can be detected, and the bearing breakdown prevented, by monitoring the temperature of the shoe metal. However, most serious causes of

Card 1/2

L 2030-66

ACCESSION NR: AP5018372

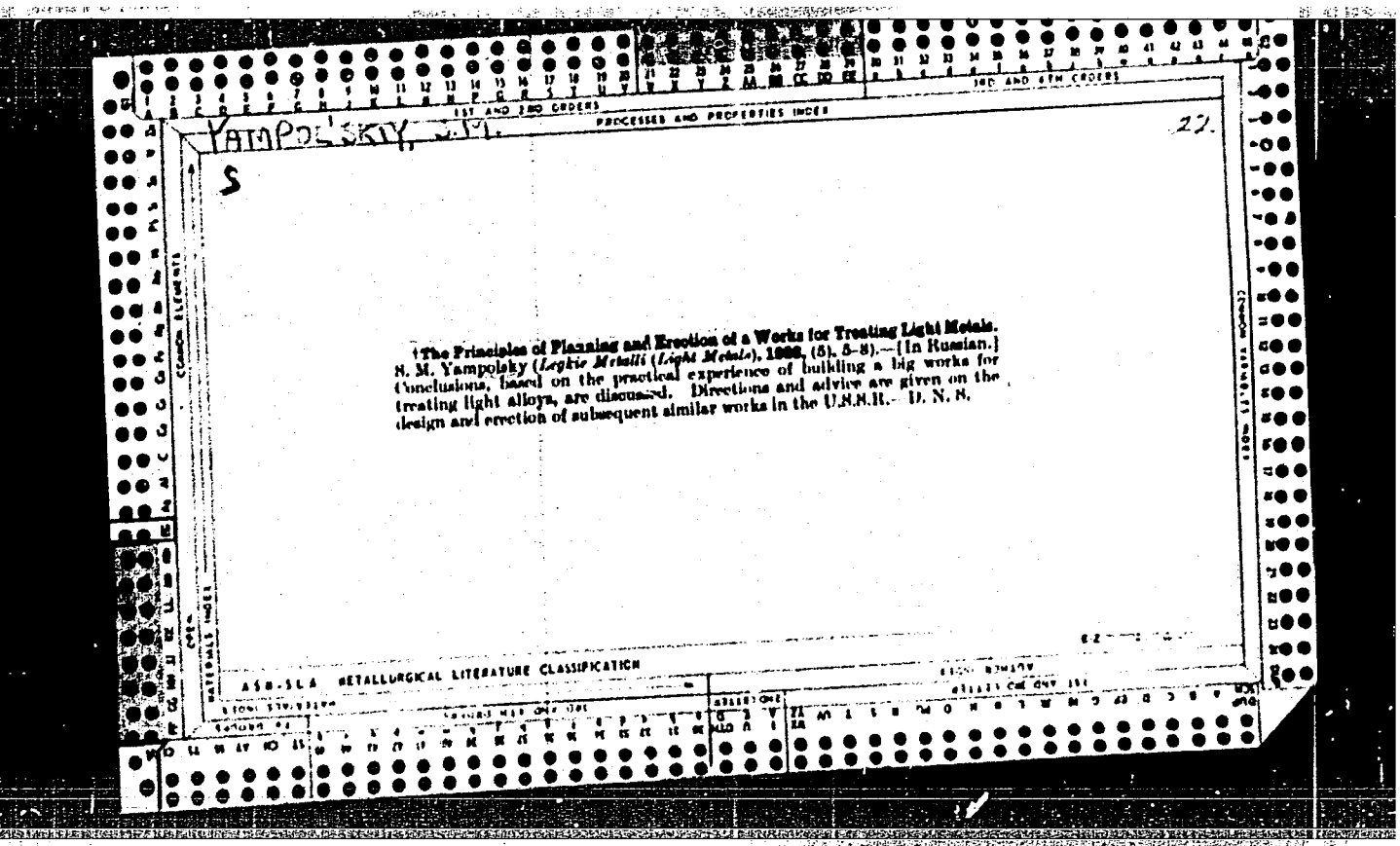
bearing failure (oil-pressure or rate-of-flow drop, air in the oil film, babbit crumbling, abrasives in oil, dynamic overload) cannot be detected by monitoring temperature; such conditions are accompanied by a collapse of the hydrodynamic pressure in the oil film. Hence, a new protective system for steam turbines has been developed which continuously measures — through a special channel in one of the shoes — the hydrodynamic oil pressure by means of a contact manometer. When the oil film in the bearing is broken, the protective system shuts down the turbine and gives off an audible signal. Orig. art. has: 5 figures and 1 formula.

ASSOCIATION: none

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

NO REF SOV: 014 OTHER: 002

Card 2/2



YAMPOL'SKY, N.M.

S

22.

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

The Principles of Planning and Erection of a Works for Treating Light Metals. N. M. Yampolsky (*Legkie Metalli* (*Light Metals*), 1938, (5), 5–8).—[In Russian.] Conclusions, based on the practical experience of building a big works for treating light alloys, are discussed. Directions and advice are given on the design and erection of subsequent similar works in the U.S.S.R.—D. N. S.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

YAMPOL'SKIY, S. M.

Voprosy skorostnogo proektirovaniia i osvoeniia novykh konstruktsii v mashinostroenii. Moskva, AN SSSR, 1944. 108 p. diagrs.

Bibliography: p. 106-107.

Problems of quick designing and the utilization of new designs in machine-building.

DLC: TJ230.I3

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

YANKOVSKIY, S.N., Docent

Techinical Education - History

History of the L'viv Polytechnical Institute. Nauk. zap. LPI No. 1, 1947

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

YAMPOL'SKIY, S. M.

Skorostnoe osvoenie novykh proizvodstv. Moskva, Mashgiz, 1949. 153 p. diagrs.

Bibliography: p. 153-154

Quick mastering of new production processes.

DLC: TS155.12

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

YAMPOL'SKIY S. M.

Increasing Labor Productivity in Machine Building (Voprosy povysheniya proiavoditel'nosti truda v mashinostroenii) Gosudarstvennoye nauch-tekh. izdat. mashinostroitel'. literatury, Moscow, 1957. 511 pp.
(Table ofContents authors follow)

This collections presents a comparative tech. and economic analysis of most effective methods and industrial processes for obtaining high labor productivity in machine building. Output may be stepped up by further standardization of machine tools, materials, and production methods; drawing on unused potentials. Covers all stages of planning and production as performed in modern plants of USSR, actual experience, and new methods are discussed.

YAMPOL'SKIY, S. M., "Utilization of Production Reserves," p. 7.

YAMPOL'SKIY, S.M.

SAKSAGANSKIY, Teodor Davidovich; YAMPOL'SKIY, S.M., kandidat ekonomicheskikh nauk, retsenzent; PARFENENKO, K.V., redaktor; PROKOF'YEVA, L.G., redaktor izdatel'stva; TIKHANOV, A.Ya., tekhnicheskiy redaktor; EL'KIN'YE, V.D., tekanicheskiy redaktor

[Organization of production in machine manufacturing plants] Kak organizovano proizvodstvo na mashinostroitel'nom zavode. Izd.2-oe, dop. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1957. 226 p. (MLRA 10:9)
(Machinery industry)

YAMPOL'SKIY, S.M.

3-58-3-7/32

AUTHOR: Yampol'skiy, S.M., Dotsent, Candidate of Technical Sciences, Director of the Odessa Polytechnical Institute

TITLE: On the Duties of a Dean (Ob obyazannostyakh dekana). The Organizer of the Department's Scientific Work. (Organizator nauchnoy raboty na fakultete)

PERIODICAL: Vestnik Vysshey Shkoly, 1958, Nr 3, pp 30-33 (USSR)

ABSTRACT: With reference to Nr 9 of 1957 and Nr 1 of 1958, this periodical, the author deals extensively with the duties of a faculty dean. The deans must direct the varied activity of the faculty, raise the students' cultural level, take an interest in their welfare, and pay special attention to their ideological education. Under present conditions, the dean is obliged to see that the chairs of his faculty coordinate their scientific work more closely with industrial needs. In the author's opinion, the deans must not only control the course of research and exert influence in raising the instructors' qualifications, but must also assume responsibility for the condition of the work. The author mentions here the L'vovskiy politekhnicheskiy institut (L'vov Polytechnical Institute) which, within a short period, succeeded

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On the Duties of a Dean. The Organizer of the Department's Scientific Work

notably in these fields, because the faculty deans, and especially the deans-professors K.B. Karandeyev, M.S. Komarov and T.P. Gubenko systematically directed the scientific work. The same can be said about a number of other vuzes. The author emphasizes that both the organization of the teaching-educational and of the scientific work of the dean are equally important. The author then compares the ideological-political education of the students as conducted at the L'vov Polytechnical Institute with that of the Odessa Polytechnical Institute, where the deans are not in contact with the social organization and have refused to assist the Komsomol and Profsoyuz committees in organizing the student activity in arts, sports, etc. The author states that the new statute of the higher educational institution must state the dean's duties and rights in plain terms. In the author's opinion the dean should be elected and not appointed and the election should be approved by the vuz director instead of by the Ministry. There is 1 Soviet reference.

ASSOCIATION: Odesskiy politekhnicheskiy institut (Odessa Polytechnical Institut)

AVAILABLE: Library of Congress

Card 2/2

YAMPOL'SKIY, S.M. [Ampol's'kyi, S.M.], prof.; VENGEROVSKIY, Ye.O. [Venherova'kyi, IE.O.], vrach; ABER, S.Ya., dotsent; SHELUD'KO, Ye.I. [Shelud'ko, IE.I.], vrach; KHODOVA, R.Z., vrach

In memory of O.M.Fedotova. Ped., akush. i gin. 23 no.6:34 '61. (MIRA 15:4)

(FEDOTOVA, OLENA MYKHAILIVNA, 1884-1960)

YAMPOL'SKIY, S.M., red.

[Use of regulated silicon rectifiers in controlled electric drives and electric traction] Primenenie upravliaemykh kremnevykh vypriamitelei v reguliruemom elektroprivode i elektrotiage; referativnyi sbornik. Moskva, TSentr. in-t nauchno-tekhn. informatsii priborostroeniia, elektrotekhn. promyshl. i sredstv avtomatizatsii, 1962. 54 p. (MIRA 17:5)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po avtomatizatsii i mashinostroyeniyu.

OLENIN, A.V.; YAMPOL'SKIY, S.M., red.; SKAKAL'SKAYA, L.N., tekhn.red.

[Use of regulated mercury rectifiers in electric locomotives] Primenenie upravliaemykh rtutnykh ventilei na elektrovozakh. Moskva, 1963. 19 p. (MIRA 17:1)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po elektrotekhnike.

YAKOBSON, N.B.; YAMPOL'SKIY, S.M.

[Use of silicon power rectifiers in electric drives; from materials of the ASEA firm] Primenenie silovykh upravliaemykh kremnievykh ventilei v elektroprivode; po materialam firmy ASEA. Referativnaia informatsiia. Moskva, Izd-vo TsINTI, 1963. 23 p. (MIRA 16:9)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po avtomatizatsii i mashinostroyeniyu.
(United States--Electric driving)
(United States--Silicon diodes)

YAMPOL'SKIY, S.M., doktor ekonomicheskikh nauk, prof.

Reliability and durability of machinery as economic factors.
Vest.mashinostr. 43 no.1:79-82 Ja '63. (MIRA 16:2)
(Machinery—Industrial capacity)

YAMPOL'SKIY, S.M., prof.; ERLIKH, L.B., prof.; SHUKHGAL'TER, L.Ya., dots., kand. tekhn. nauk, retsenzent

[Economics of mastering machinery of new design] Ekonomika osvoeniia novykh konstruktsii mashin. Moskva, Mashinostroenie, 1964. 164 p. (MIRA 18:2)

YAMPOLSKIY, T. S.

BAKHTINA, Ye. A., YAMPOLSKIY, T. S., Inzh., BAZHENOV, V. P., Inzh., VEREVIN, P.P., Inzh.

Vsesoyuznaya Kontora Tipovogo Proyektirovaniya i Tekhnicheskikh Issledovaniy (KTIS) Mintyazhstroya

Ventilyatornyye Gradirni

Page 53

SO: Collection of Annotations of Scientific Research Work on Construction, completed in 1950. Moscow, 1951

YAMPOL'SKIY, T. S.

BAKHTINA, Ye. A., Inzhener. i, YAMPOL'SKIY, T. S., Inzh., VERIN, N. F., Inzh.

Vsesoyuznaya Kontora Tipovogo Proyektirov-aniya i tekhnicheskikh issledovaniy (KTIS) Mintyazhstroya

Sistemy mesnoy kanalizatsii s polyami podzemnoy fil'tratsii (instruktsiya po prove ktirovaniyu sistme) Page 60

SO: Collection of Annotations of Scientific Research Work on Construction, completed in 1950. Moscow, 1951

ZHUKOV, A. I., YAMPOL'SKIY, T. S.

Technology

Podzemnaia fil'tratsiia stochnykh vod (Underground filtration of sewage). Moskva, Stroiizdat, 1951. 176 p.

2

9. Monthly List of Russian Accessions, Library of Congress, November 1958. Unclassified.

NEKRASOV, V.G., insh.; YAMPOL'SKIY, T.S., inzh.

Using precast reinforced concrete construction elements in building cooling towers with ventilating systems. Prom.stroi. 38 no.1:31-34 '60. (MIRA 13:5)

1. Trest Mosstroy No.4 (for Nekrasov). 2. Giprotis (for Yampol'skiy). (Cooling towers) (Precast concrete construction)

YAMPOL'SKIY, T.S.; ZOTOV, G.V.

[Catalog and handbook on cooling towers] Katalog-spravochnik po gradirniam. Moskva, 1962. 109 p. (MIRA [illegible])

1. Moscow. Gosudarstvennyy institut tipovogo i eksperimental'nogo proyektirovaniya i tekhnicheskikh issledovaniy. 2. Nachal'nik otdela promyshlennykh vodoprovodnykh sooruzheniy Gosudarstvennogo instituta tipovogo i eksperimental'nogo proyektirovaniya i tekhnicheskikh issledovaniy (for Yampol'skiy). 3. Otdel promyshlennykh vodoprovodnykh sooruzheniy Gosudarstvennogo instituta tipovogo i eksperimental'nogo proyektirovaniya i tekhnicheskikh issledovaniy (for Zotov).
(Cooling towers)

ACC NR: AP7002203 SOURCE CODE: UR/0203/66/006/006/1116/1118

AUTHOR: Yampol'skiy, V.; Rzhevtsev, V.

ORG: Omsk Pedagogical Institute, Department of Physics (Omskiy pedagogicheskiy institut, kafedra fiziki)

TITLE: Determination of velocity of low-ionosphere vertical drift

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 6, 1966, 1116-1118

TOPIC TAGS: ionosphere, ionospheric physics, IONOSPHERIC DRIFT

ABSTRACT: The velocity of vertical drift of low regions of the ionosphere was determined using spectral analysis of the field intensity of radio waves in respect to time. In order to determine vertical ionospheric drift velocity V_V while taking into account the spherical shape of the Earth, the following formula was derived:

$$V_0 = \frac{\lambda}{T}\left[\frac{h_0^2 + 4a\sin^2 0/2(h_0+a)}{\left(h_0 + 2a\sin^2\frac{0}{2}\right)^2}\right]^{1/2} = \frac{\lambda}{T}A,$$

$$V_0 = \frac{gh}{dt}$$

UDC: 550.388.2

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where λ is a wavelength of the transmitter; h_o, an initial height of reflection; a, the radius of the Earth; O, a central angle corresponding to the half arc between the transmitter and the receiver, and T, a period with which the field intensity changes at the receiving point. An experimental investigation to determine V_V was conducted during the solar eclipse on 15 Feb 1961 in four directions with various equivalent frequencies ($f_{eq.}$). To determine $f_{eq.}$ a graph of electron concentration variations (N) in the D-layer plotted on the basis of averaged daily data obtained by rockets was used. Dependencies of h_o on N computed for every direction were plotted. Computed values of V_V are shown in Fig. 1 as a function of N. Curves 1 and 2 show the values of the vertical displacement velocity of regions with various concentrations during the first half of the eclipse and curves 3 and 4 represent the second half. The assumption was made that the slight difference between curves 1 and 3, and 2 and 4 can be related to the spherical shape of the Earth, a factor which was not compensated for (curves 3 and 4 were plotted on the basis of data obtained by I. M. Vilenskiy and B. I. Podlipalin. Geomagnetizm i aeronomiya, 1964, no. 3, 417), and by the fact that V_V data were determined for various ionospheric regions separated from each other by several hundred kilometers. The general variations in the dependence of V_V on N seem to be realistic because the relative changes in electron concentration in low ionospheric layers are faster during the eclipse. Orig. art. has: 2 figures, 1 table, and 1 formula.

[WA-3]
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ACC NR: AP7002203

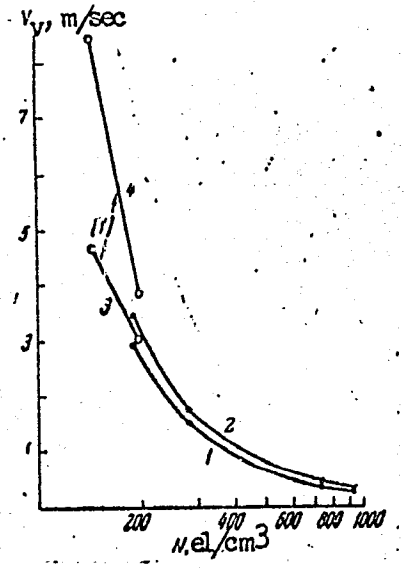

Fig. 1. V_y as a function of N

SUB CODE: 04/ SUBM DATE: 05Apr66/ ORIG REF: 002

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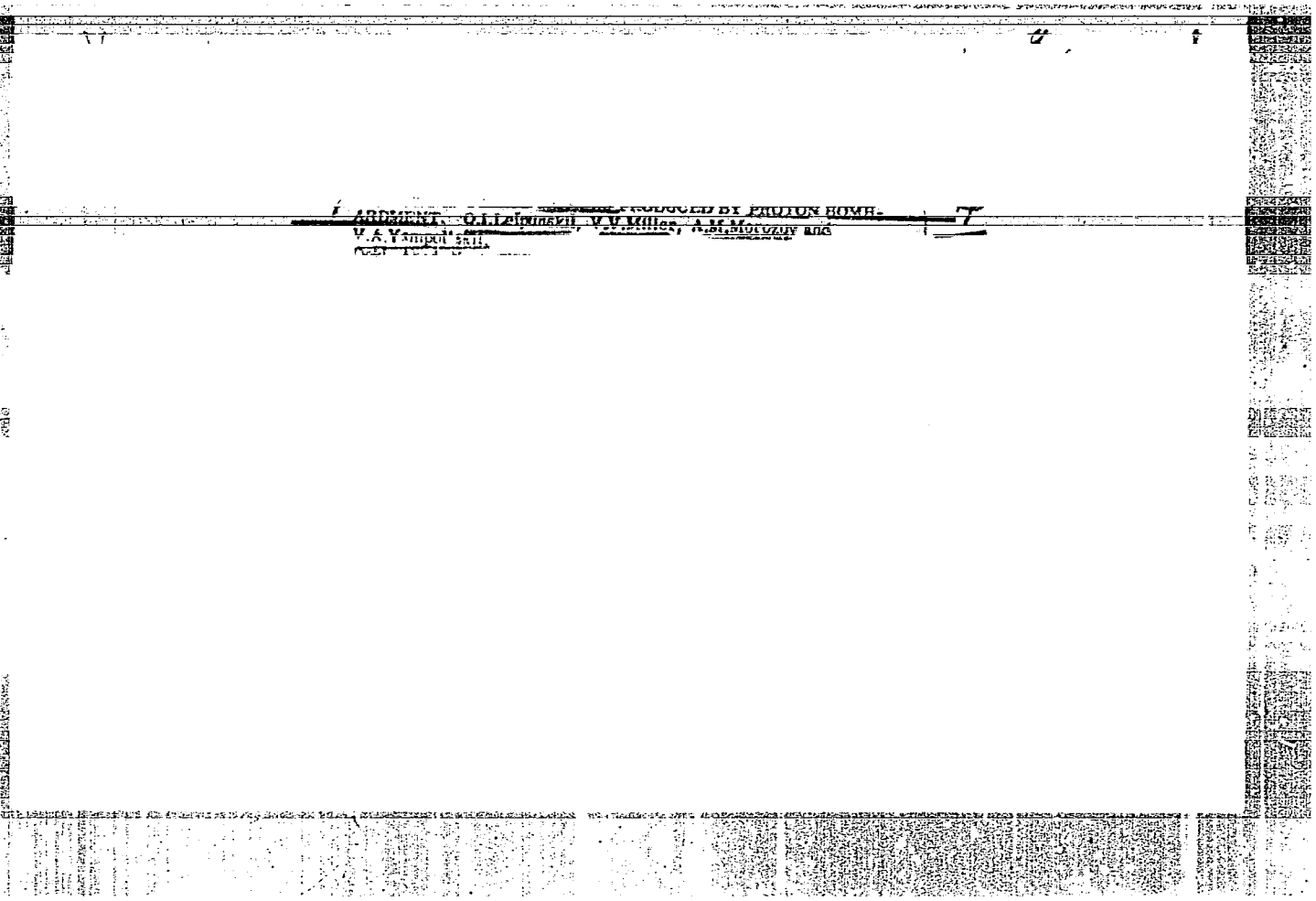


YAMPOL'SKIY, V.B.

FON-YUNG, I.Ye.; YAMPOL'SKIY, V.B.

Diagnostic significance of the examination of bronchial lavage for Koch's bacillus. Probl.tub. no.4:65-69 Jl-Ag '53. (MLRA 6:11)

1. Iz L'vovskogo oblastnogo protivotuberkuleznogo dispansera (glavnyy vrach - dotsent I.S.Bekker). (Tuberculosis)

PODSOVSKIY, V.F.; KASTORNAYA, M.A. [deceased]; YAMPOL'SKIY, V.B.

Morphological changes in the brouchi in resected lungs from patients and their relation to postoperative complications. Probl. tub. 42 no.3:70-74 '64. (MIRA 18:1)

1, L'vovskiy nauchno-issledovatel'skiy institut tuberkuleza (direktor G.I.Chemeris, nauchnyy rukovoditel' - prof. I.T. Stukalo) i L'vovskaya oblastnaya protivotuberkuleznaya bol'nitsa (glavnyy vrach V.N.Kishakevich).

YAMPOL'SKIY, V.

YABLONOVSKIY, A. V., YAMPOL'SKIY, V. G.

Geometry, Non-Euclidean

Some specific points concerning the interpretation of Lobachevskiy's plane geometry., Uch. zap. Mosk. un., no. 148, 1951.

9. Monthly List of Russian Accessions, Library of Congress, May 1952, Uncl.

FD-2538

USSR/Electronics - Antennas and Transmission Lines

YAMPOL'SKIY, V. G.

Card 1/1 Pub. 90 - 3/12

Author : Yampol'skiy, V. G.

Title : Approximation Method for Determining the Influence of Phase Distortions in the Aperture of a Spatial Antenna and its Radiation Characteristics

Periodical : Radiotekhnika, 10, 17-24, May 1955

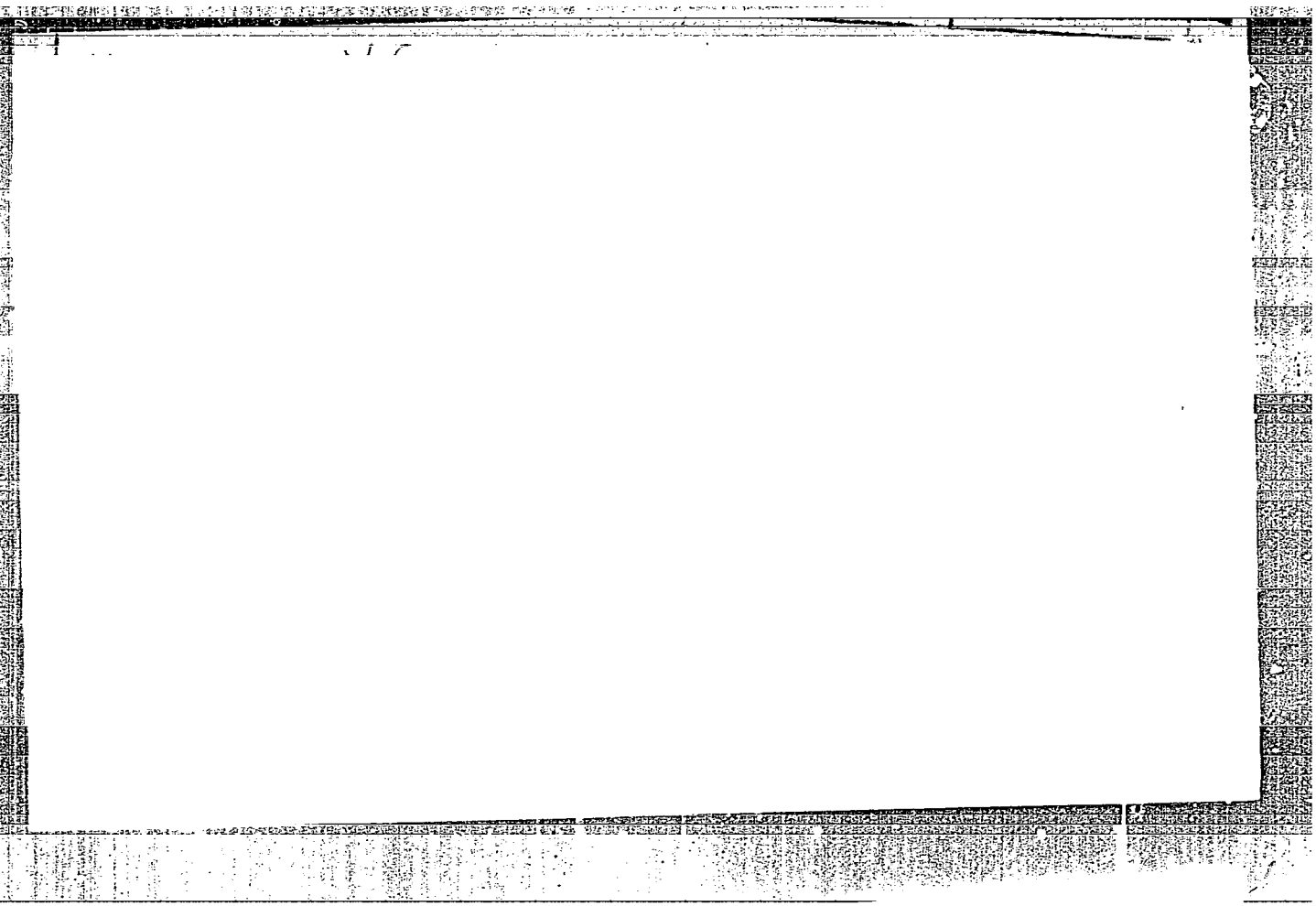
Abstract : Radiators in the form of cophasally excited surfaces (parabolic, lens, etc) in practice never possess precisely cophasal fields, due to imperfections. The author discloses a method for approximate calculation of definite integrals from the complex function of a real variable. The method gives quite accurate results for subintegral functions with a slightly varied phase. Radiation characteristics of spatial (or linear) antennas under phase and amplitude distortions in their apertures can be found by this procedure. Graphs, table. One US Reference.

Institution :

Submitted : November 18, 1954

YAMPOL'SKIY, V.G.

Inclined incidence of plain waves in a wire circuit. Radiotekhnika 10 no.9:39-48 S'55. (MLRA 9:1)
(Radio--Antennas)



APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001962030001-9"

JAMPOLSKIY, V.G.

CARD 1 / 3 PA - 1708

SUBJECT USSR / PHYSICS
AUTHOR JAMPOLJSKIJ, V.G.
TITLE The Reflection of a Plane Wave from a Wire Net at Normal Polarization.
PERIODICAL Radiotechnika, 11, fasc. 11, 33-37 (1956)
Issued: 12 / 1956

The reflection of a plane electromagnetic wave from a net consisting of wires with a round cross section and equal spacing is investigated for the case in which the vector of the electric field of the impinging wave is within the surface of the net and is vertical to the axes of the wires. The diameter of the wires of the net is assumed to be considerably smaller than the wavelength. At first the problem of the diffraction of the plane wave with normal polarization by a single conductor is dealt with. For this purpose the results obtained for a thin conductor from the works by IGNATOVSKY "Annalen der Physik, 1905, 18, fasc.3 (1905) and by A.I.POTEHIN "Sovetskoe Radio", 1948, are used. A system of polar coordinates (R,φ) is connected with the conductor. An equation is obtained from which it may be seen that the voltage of the secondary field is proportional to the square of the radius of the conductor and is very low in the case of thin conductors. Secondary radiation has a very marked character in one direction. This is explained in the following manner: The analysis of the formula for the current density $j(\varphi)$ on the surface of the conductor shows that, in the case of thin conductors ($\varrho \ll \lambda$) (ϱ is the radius of the wire) the current passing through the conductor can be separated into two components $j_1(\varphi)$ and $j_2(\varphi)$. The

Radiotechnika, 11, fasc. 11, 33-37 (1956) CARD 2 / 3

first component is the "frame current", a circular current with constant phase and amplitude, the second is a dipole current with a varying amplitude and phase along the circumference of the conductor. The uniform "frame" current is, according to the amplitude, $\frac{1}{\alpha\varrho}$ -times greater than the "dipole" currents. This circumstance, however, makes the part played by both currents commensurable on the occasion of radiation. The "frame" current has a direction-diagram in form of a circle, and the "dipole" current has a diagram in form of an octohedron. The problem itself is now solved. The wires of the net are numbered from - ∞ to + ∞, and each wire is connected to a system of polar coordinates (R_k, φ_k). The secondary field, which is caused by all the wires, is represented in a system of coordinates of the zero-conductor (R_o=R, φ_o=φ). The formulae finally obtained show that the voltage of the secondary field is different in the directions φ = o and φ = π. This may be explained by the difference in the structure of the currents. Eventually, a formula for the reflection coefficient is obtained, which shows that 1.) the reflection coefficient of the net in the case of normal polarization is usually very small (some %), 2.) like in the case of parallel polarization at d = k λ , where k is a whole number, the reflection coefficient is = 0, 3.) at $\lambda \to \infty$ ($\frac{d}{\varrho}$ = const.) the reflection

YAMPOL'SKIY, V.G.

PA - 2297

AUTHOR: YAMPOL'SKIY, V.G.

TITLE: The Influence Exercised by the dielectric layer on the Reflection Properties of a Not-Through-Going Reflector. (Vliyaniye dielektricheskogo sloya na otrazhatel'nyye svoystva nesploshnogo reflektora, Russian).

PERIODICAL: Radiotekhnika, 1957, Vol 12, Nr 2, pp 59 - 64 (U.S.S.R.)
Received: 4 / 1957 Reviewed: 4 / 1957.

ABSTRACT: The here mentioned analysis can be carried out for every and any periodically perforated surface. It is assumed that the reflector forms a system of periodically distributed thin metal stripes, where the vector E of the falling field is parallel to these stripes. The final formulae apply to a perforated reflector of general appearance, and therefor also to a wire net. For the analysis the method developed by the author in "Sbornik trudov NII MS, 1(5), 1956 is employed. A system of equations is obtained, but these equations are rather complicated. Therefor simple computation formulae are formed by approximation. The formula, from which it is possible to determine the through-coefficient through a flat reflector covered by a nonconductive layer, but on the condition that the reflector coefficient η' (reflection from the reflector) in free space is known for the wave $\lambda' = \frac{\lambda}{\sqrt{\varepsilon}}$. The case in which the thickness of the nonconductive layer is equally strong on both sides of the reflector is

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YAMPOL'SKIY, V.G.

Diffraction of plane waves by wire grids located inside dielectric layers. Radiotekh. i elektron. 3 no.12:1516-1518 D '58.
(MIRA 11:12)

(Radio waves---Diffraction)

SOV/106-59-4-5/13

AUTHOR: Yampol'skiy, V.G.

TITLE: The Vee Inclined Antenna (V-obraznaya naklonnaya antenna)

PERIODICAL: Elektrosvyaz', 1959, Nr 4, pp 41 - 48 (USSR)

ABSTRACT: Although the Vee antenna is not as effective as the rhombic or synphase antennae, it is very suitable for mobile installations where constructional simplicity is the decisive factor. This antenna consists of a single support with two inclined conductors (Figure 1). In the article, the following notation is used:

$$VH\ \frac{L}{H}\ 2\varphi_o$$

where L is the length of the antenna in metres, H - the height in metres and $2\varphi_o$ the angle between the projections of the conductors on the horizontal plane. The V-antenna radiates both a horizontally and a vertically polarised field. Assuming that the phase velocity of the current in the conductor equals the velocity of light and that the Earth behaves like an ideal reflecting surface,

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The Vee Inclined Antenna

the formulae for the horizontally-polarised directional diagram and for the vertically-polarised directional diagram are given by Eqs (1) and (3). The field components have the form given by Eq (4). The gain of the V-antenna relative to a half-wave resonator in free space, the radiation resistance, the antenna efficiency and the directional efficiency can be determined by Eqs (6), (8), (9) and (10), respectively. Eq (6) shows that for given values of H/λ and l/λ, there is an optimum value for the angle $2\varphi_{opt}$, and the antenna gain is optimum when $\varphi_o = \varphi_{opt}$. The value φ_{opt}, however, does not remain constant but varies over the wavelength band (its variation over the band 12 - 100 m is shown in Figure 2). To cover the whole band, it is necessary to use several antennae and for this purpose it is convenient to support them from a single mast. The author now considers the application of these formulae to specific antennae. Figure 4 shows the polar diagrams for an antenna VH(200/20)20 over the band 12 - 100 m. From this figure, it can be seen that the antenna is

The Vee Inclined Antenna

unsatisfactory at wavelengths greater than 25 - 30 m due to excessive side-lobes. Data on the polar diagrams and gain are produced and tabulated for antenna with the following dimensions:

VH (200/20)20 ; VH(200/20)40 ; VH(200/20)60 ;
VH (100/20)30 ; VH(100/20)60 ; VH(100/20)90 ;
VH (200/30)20 ; VH(200/30)40 ; VH(200/30)60 ;

Recommendations for various combinations are made. When the multiple antenna system is used, the mutual effect between the component parts may become important. This problem was examined both theoretically and experimentally. Laborious calculations by Engineer Z.R.Sharova showed that the amplitudes of the currents induced into passive antennae did not exceed 5-15% of the amplitudes of the currents in the active antenna. Experimental results also showed that the mutual effect is small and can be neglected.

The Vee Inclined Antenna SOV/106-59-4-5/13

There are 12 figures, 4 tables and 3 references, 2 of which are English and 1 Soviet.

SUBMITTED: April 11, 1958

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77176
SOV/108-15-1-2/13

AUTHORS: Belousov, S. P., Yampol'skiy, V. G.

TITLE: Traveling Wave One-Wire Antenna for Reception of Medium Waves

PERIODICAL: Radiotekhnika, 1960, Vol 15, Nr 1, pp 16-25 (USSR)

ABSTRACT: The paper presents a method of engineering computation of a one-wire wave antenna (beverage antenna), and gives some results of calculation. Assuming the wavelength $\lambda > 200$ m, a simplified expression for the propagation constant is derived from the first approximation of an exact expression given in previous Soviet publications. This simplified expression coincides with that obtained by D. Carson and W. Wise (see U.S. references) and is defined as:

$$\frac{\gamma}{ik} = 1 - \frac{1}{k_2^2 \ln \frac{2h}{a}} \int_0^\infty \left(\sqrt{v^2 + k^2 - k_2^2} - v\right) e^{-2hv}\, dv. \qquad (2)$$

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Traveling Wave One-Wire Antenna for Reception of Medium Waves

Here, $\gamma = B + ia$ is constant of wave propagation in the wire; k equals $2\pi/\lambda$; λ is wavelength in meters; k_2 is constant of wave propagation in the ground and equals $K\sqrt{\varepsilon - 160\lambda\sigma}$, ε being relative dielectric constant of the ground, and σ ground conductivity in mho/m; h is height of the antenna suspension and a is the wire radius. Equation (2) is transformed into Eq. (4):

$$\frac{\alpha}{\kappa} - i\frac{\beta}{\kappa} = 1 - i\frac{R}{\ln\frac{2h}{a}}, \qquad (4)$$

where

$$R = \frac{1}{s^2}\int_0^\infty (\sqrt{\omega^2 + is^2} - \omega)e^{-r\omega}d\omega,$$

$$s = \sqrt{1 + \frac{1(\varepsilon - 1)}{60\lambda^2}} = te^{i\theta}, \quad r = 12{,}6\frac{h}{\lambda}\sqrt{60\lambda\sigma}.$$

Introducing two integration intervals (from 0 to t and from t to ∞) and applying to the expression $\sqrt{w^2 + is^2}$ the Maclaurin series expansion, an approximate solution for R is obtained with an accuracy of 5-10%. Using this expression and Eq. (4), the relationship between $\alpha/k = c/v$ and is represented graphically for a wire of 3-mm diameter and for various values of h; here c is velocity of light and v is phase velocity in the wire. A graphic is given also for the relationship between β/k and λ for the same values of h. In both cases, humid and dry ground were taken into consideration. From the plotted curves the following conclusions are drawn: (1) In the medium wave range the magnitude of the propagation constant depends essentially on the ground parameters; the lower above ground the wire suspension, the stronger the dependence. (2) Dry ground has the greatest effect on the propagation constant. (3)

Traveling Wave One-Wire Antenna for Reception of Medium Waves

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The effect of humid ground on the propagation constant may be neglected for h > 5 m. Expressions are given for the radiaton pattern of the wave antenna. A number of graphs represent the radiation pattern for antennas of length L = 1,000, 2,000, and 3,000 m, and for λ = 200, 400, 800, and 2,000 m. It is seen from the radiation patterns in a vertical plane of the antenna axis that the directional properties of wave antennas suspended over humid ground are better than those of antennas over dry ground. Expressions (13) and (14) are given for parameters D and D' characterizing the noiseproof feature of the antenna. The expression for D' characterizes the noiseproof feature during the daytime when only surface waves are received.

$$D = \frac{4\pi}{3\int_0^{2\pi} d\varphi \int_0^{\frac{\pi}{2}} F^2(\Delta, \varphi) \cos\Delta \, d\Delta} \qquad D' = \frac{2\pi}{\int_0^{2\pi} F^2(\varphi)\, d\varphi}.$$

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Here Δ is angle of elevation; φ is azimuth angle; $F(\Delta, \varphi)$ is the radiation pattern. D' was calculated using numerical integration of radiation patterns. From the plotted results it may be seen that for λ = 200-2,000 the length L of the antenna should not exceed 3,000 m, because in this case the values of D' diminish within the range of shorter waves. Expressions for the amplification coefficient of the wave antenna are given for the sky wave and the surface wave. They contain the factor g(L) which depends on the antenna length L as shown by Eq. (18):

$$g(L) = \left| e^{-\beta L + ik_1 L(\alpha_1 - \cos\Delta)} - 1 \right|. \qquad (18)$$

where k_1 equals $\alpha/k = c/v$. It may be seen that an optimum antenna length L_{opt} may be obtained. An approximate formula for L_{opt} is derived from the maximum condition for g(L). There are 11 figures; and 6 references, 4 Soviet, 2 U.S. The U.S. refer-

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Traveling Wave One-Wire Antenna for Reception of Medium Waves

77176
SOV/108-15-1-2/13

ences are: D. Carson, BSTJ Nr 10, 1926; W. Wise, PIRE Nr 4, 1934.

SUBMITTED: April 11, 1958

Card 6/6

BELOUSOV, S.P.; YAMPOL'SKIY, V.G., otv. red.; VORONOVA, A.I., red.; MARKOCH, K.G., tekhn. red.

[Directional antennas for radio reception in the range from 200 - 2000 meters] Napravlennye antenny dlia professional'nogo priema radioveshchaniia v diapazone 200 - 2000 m. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio, 1961. 71 p. (MIRA 14:9)

(Radio—Antennas)

31209

S/108/61/016/012/003/009
D201/D302

9,1100

AUTHORS: Ayzenberg, G.Z., Belousov, S.P., Lindeberg, A.Kh., and Yampol'skiy, V.G., Members of the Society, (See Association)

TITLE: An anti-fading broadcast antenna

PERIODICAL: Radiotekhnika, v. 16, no. 12, 1961, 21-30

TEXT: In the present article, the authors describe an antenna designed so as to have anti-fading properties within a wide frequency band. The antenna is based on the wide-band anti-fading antenna with controlled current distribution as suggested by G.Z. Ayzenberg in 1939 (Ref. 1: Elektrosvyaz', no. 9, 1940) (Ref. 3: Author's certificate No. 71603 of December 12, 1948). Controlled current antennae, described recently in foreign literature are designed around the Ayzenberg principle, but are not designed for wide band operation. The antenny described is based on the extended band width 200-2000 m. range antenna as shown on Fig. 2. It consists of the mast 1 insulated from earth. The screening of the

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An anti-fading ...

feeder 2 is extended up to height H_1 around the antenna mast. The current in the antenna is controlled by means of a variable impedance in the form of a s.c. stub, connected between the earth and the lower end of the screening. The s.c. stub is actually the outer sheath 3 of the feeder. By changing the length of the s.c. line from 0 to $\lambda/2$, the input resistance varies from [illegible] to [illegible]. The reactance is controlled by moving the s.c. stub to earth 4. To decrease surface losses - a thick wire mesh is placed under the stub 3. Matching is either by a distributed or a lumped constant transmission line. The main dimensions have been chosen for the antenna to have anti-fading properties in the 200-550 m. band. The height of the antenna should not exceed 220-230 m, although to increase the band width it has actually been increased to 257 m, the height of screening H_1 corresponding then to 0.33 H. Increasing H_1 to 0.5 H increases the operating range down to 140 m with better anti-fading properties at 200-230 m. The characteristic impedance of the antenna depends on the transmitter power. The characteristic stub impedance W_s

An anti-fading ...

may be taken as 60 ± 120 ohms, with the maximum stub length 160-200 m. Because the antenna is fed not at its base, but at a height 0.3 ± 0.5 H, its radiation pattern depends little on its characteristic impedance. The following statements are made in conclusion: 1) The designed antenna has good anti-fading properties. An antenna 257 m high has good directional properties in the 230-250 m range. 2) When tuned to maximum gain, the gain is substantially increased in comparison to that of anti-fading tuning. 3) The experiments, carried out with a scaled down model of antenna, confirmed the results of theoretical calculations. 4) The controlled-current antennae should find application in new broadcasting centers in the modification of existing antennae systems. There are 10 figures, and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: H. Brueckmann. Electronics, v. 23, no. 5, 1950; H. Page and G.D. Monteant, PIEE, part 3, v. 102, no. 3, 1955.

4

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A.S. Popova (Scientific and Technical

31209

S/108/61/016/012/003/009
D201/D302

An anti-fading ...

Society of Radio Engineering and Electrical Communications im. A.S. Popov) [Abstracter's note: Name of Association taken from first page of journal]

SUBMITTED: May 30, 1961

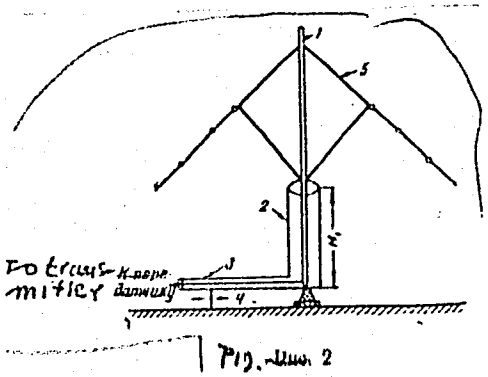

Fig. 2

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9,1700

AUTHORS: Belousov, S.P.; Yampol'skiy, V.G.

TITLE: Two-wire traveling wave antenna

PERIODICAL: Elektrosvyaz', no. 5, 1962, 24 - 30

TEXT: In this article are examined the parameters of a short wave two-wire traveling wave antenna installed over a damp ground. The parameters of the medium wave and long wave antennas were discussed by the authors in an earlier work ["Dvukhprovodnaya antenna begushchey volny" ("Two-wire traveling wave antenna"), Sbornik NII Ministerstva svyazi, 1960, no. 2, (16)]. In the first part of the present article, the authors reproduce a formula giving the efficiency coefficient m as the ratio of the gain of a two-wire antenna to the gain of a single-wire antenna of the same length. They also reproduce a formula giving the radiation pattern of the two-wire antenna. In the second part of the article, they deal with the propagation constants of the current along the single-wire antenna ($\gamma_1 = d_1 - i\beta_1$) and the two-wire antenna ($\gamma_2 = d_2 - i\beta_2$). These constants are determined by the following expressions:

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Two-wire traveling wave antenna

$$\frac{\gamma_1}{\alpha} = 1 - \frac{R_1}{\ln \frac{2h}{\rho}} \quad (6), \quad \text{and} \quad \frac{\gamma_2}{\alpha} = 1 - \frac{R_2}{\ln \frac{2h}{\rho}}, \quad (7)$$

where h is the suspension height, ρ is the radius of the wire, and

$$R_1 = \frac{s^2}{\varepsilon'} \int_0^\infty w \frac{\sqrt{w^2 + p^2} - w}{w + \frac{1}{\varepsilon'}\sqrt{w^2 + p^2}} e^{-bw} dw, \quad (8)$$

$$R_2 = \frac{s^2}{\varepsilon'} \int_0^\infty w \frac{\sqrt{w^2 + p^2} - w}{w + \frac{1}{\varepsilon'}\sqrt{w^2 + p^2}} e^{-bw} \cos awdw, \quad (9)$$

where ε' is the complex permittivity of the ground, and $s = |\sqrt{1 - \varepsilon'}|$, (10)

$b = 2\alpha hs$ (11), $a = \alpha ds$ (12), $p = \frac{\sqrt{1 - \varepsilon'}}{s}$ ($|p| = 1$) (13).

The authors describe a new method for computing the integrals in (8) and (9). These integrals, as computed by this method, give a more accurate formula for

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Two-wire traveling wave antenna

the calculation of the current propagation constant (in the short wave range) than the asymptotic formula deduced by Wise ("Propagation of high-frequency currents in ground return circuits", Proc. IRE, 1934, April). In the third part of the article, the authors present three graphs showing the dependence of the current attenuation constant upon the distance between the two wires for three different wavelengths. They also give graphs showing the phase velocity of the current. The analysis of the thus obtained data leads the authors to the conclusion that the efficiency coefficient m, characterizing the gain ensured by the use of a two-wire antenna, possesses the following properties:

$$\lim_{\lambda \to 0} m \to \frac{W_1}{W_2} \approx 2 \qquad (25), \qquad \lim_{\lambda \to \omega} m \to \frac{W_1}{W_2} \approx 2 \qquad (26)$$

W_1 and W_2 being, respectively, the wave impedances of a single-wire and a two-wire antenna. The efficiency of the two-wire antenna was also determined experimentally; the experimental results are in good agreement with the calculated ones. The Soviet personalities mentioned in the article are: G.Z. Ayzenberg, G.A. Grinberg and B.E. Bonshtedt. There are 9 figures and 8 references: 5 Soviet-bloc and 3 non-Soviet-bloc.

SUBMITTED: December 20, 1961

Card 3/3

YAMPOLSKIY, V. G.

PHASE I BOOK EXPLOITATION SOV/6112

Ayzenberg, Grigoriy Zakharovich

Korotkovolnovyye antenny (Short-Wave Antennas). Moscow, Svyaz'izdat, 1962. 814 p. Errata slip inserted. 10,000 copies printed.

Resp. Ed.: G. N. Kocherzhevskiy; Tech. Ed.: G. I. Shefer.

PURPOSE: This monograph is intended for scientists and radio engineers concerned with the theory and design of short-wave transmitting and receiving antennas. It may also be useful as a textbook for students in advanced radio engineering courses in schools of higher education.

COVERAGE: The present work is a revised edition of a book by the same author, entitled "Antennas for Main Short-Wave Radio Communications," published in 1948. In the new book considerable progress in the field of short-wave antennas is taken into consideration, and the latest developments in antenna technique,

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such as cophasal band antenna arrays with parasitic reflectors, traveling wave antennas with pure coupling resistance, logarithmic antennas, and band shunt-fed vibrators, are described. The chapter on rhombic antennas is substantially expanded. A new chapter (XVI) dealing with single-wire traveling wave antennas is introduced. The fundamental problem of the interference immunity of various receiving antennas is discussed in an added chapter (XVII). Ch. XIII was written by S. P. Belousov; Chs. XIV and XV, by Belousov and V. G. Yampol'skiy; Ch. XVIII, by L. K. Olifin; and Sec. 4 of Ch. XIX, by M. A. Shkud. The graphs for calculating mutual impedance in balanced vibrators of arbitrary dimensions were compiled under the supervision of Belousov. The author thanks the coauthors and L. S. Tartakovskiy, Ye. G. Pol'skaya, V. G. Ezrin, I. T. Govorkov, and G. N. Kocherzhevskiy. There are no references.

TABLE OF CONTENTS:

Card [redacted] 5/5

Card [illegible] 5/5

S/108/62/017/011/003/007
D413/D308

9.1700

AUTHOR: Lokshin, V.L. and Yampol'skiy, V.G.

TITLE: An approximation technique for calculating mutual impedances of ~~vibrators~~ dipoles

PERIODICAL: Radiotekhnika, v. 17, no. 11, 1962, 23-29

TEXT: The precise formulas for the mutual impedance are too complex for use in design calculations on multi-element arrays, while the published curves only cover a few of the cases needed in practice. The authors present a new approximation to the general formula, and compare the results from it with accurate calculations for various cases. The new formula appears to give good agreement for the resistive component of mutual impedance provided the ~~vibra~~-dipoles tors are not much longer than full-wave and whatever the distance between them: the reactive component is not accurately given when the separation is less than $\lambda/2$, since the basis of the approximation breaks down, but a correction can be developed to take account of this. There are 11 figures.

SUBMITTED: January 3, 1962

Card 1/1

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Pl-4/Pm-4/Pn-4 WR S/109/63/008/004/004/030

78

AUTHOR: Yampol'skiy, V. G.

TITLE: Diffraction of a flat electromagnetic wave in a system of metal strips

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 4, 1963, 564-576

24

TEXT: The author examines the diffraction of a flat electromagnetic wave in a normal fall upon a periodic grid consisting of parallel metal strips. The results of computations for a number of individual cases, are given. He reports that a comparison of experimental results indicates that, in cases where grid density θ is low, the degree of diffraction in a periodic grid consisting of flat metal strips is identical to the diffraction that would be obtained with a grid consisting of round-section wires with a density of $\theta/2$. The obvious conclusion is that grids made of round wires reflect electromagnetic waves much more intensively than do systems of flat metal strips. This characteristic, is retained with $\theta < 0.3$ and $2a/\lambda < 0.4$.

SUBMITTED: March 15, 1962.

Card 1/1

S/108/63/018/002/002/010
D413/D308

AUTHOR: Yampol'skiy, V. G., Member of the Society (see Association)

TITLE: The effect of phase distortion on the efficiency of an aperiodic antenna

PERIODICAL: Radiotekhnika, v. 18, no. 2, 1963, 10-14

TEXT: The author uses the methods developed in his earlier paper (Radiotekhnika, v. 10, no. 5, 1955) to analyze the direction of maximum radiation and the gain of an aperiodic antenna for the general case of any distribution of field amplitude and phase over the aperture. He gives design formulas and shows that they are sufficiently accurate under certain phase conditions which are readily satisfied with non-uniform illumination. He takes as a particular case a symmetrically illuminated aperture with phase distribution approximated by a third-order polynomial and two alternative polynomial amplitude distributions, derives the expressions for gain and direction of maximum and plots some of the calcula-

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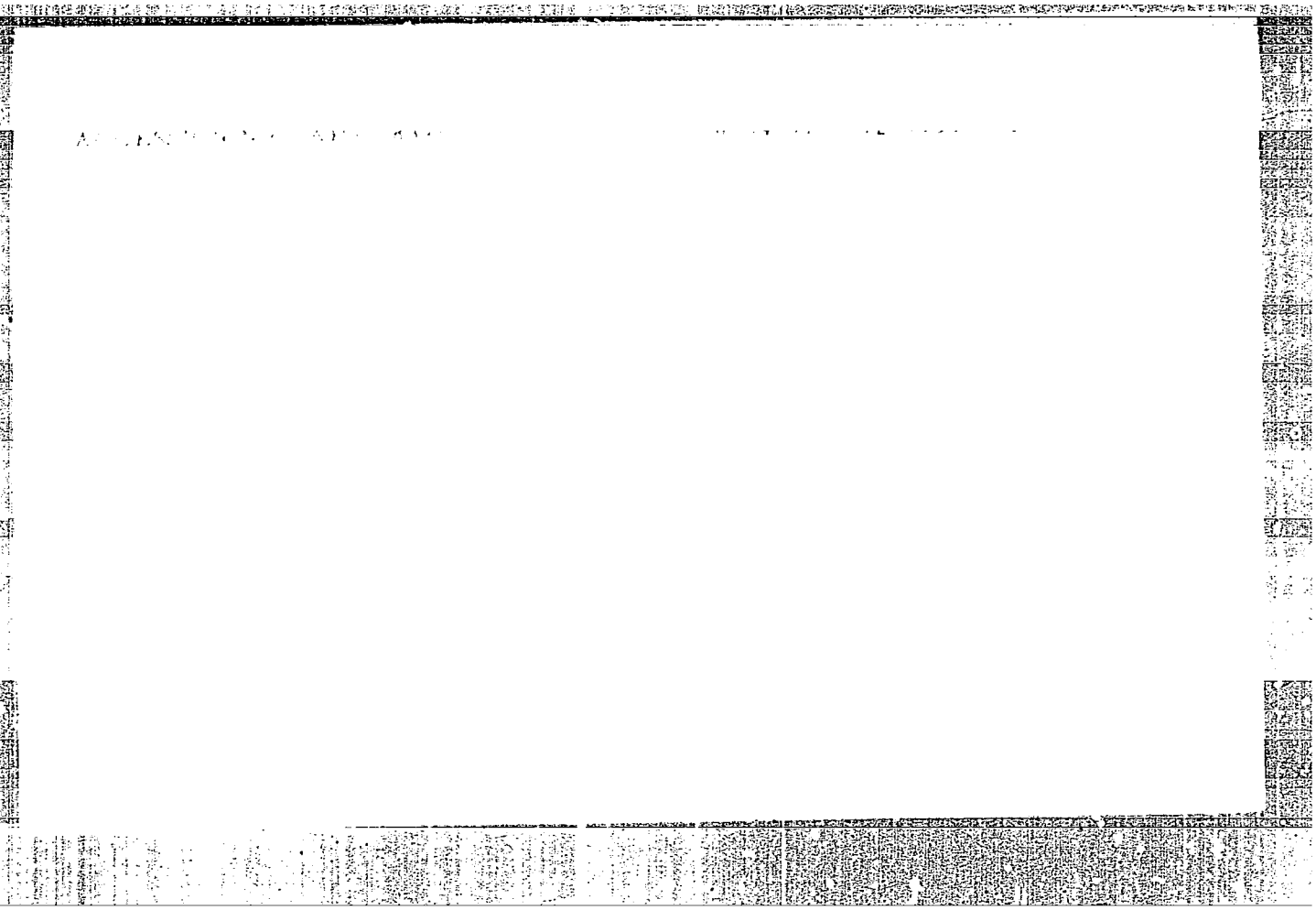
The effect of phase ...

ted values, a few of which have been compared with accurate values obtained from Fresnel integrals and have shown satisfactory agreement. There are 4 figures.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A. S. Popova (Scientific and Technical Society of Radio Engineering and Electrical Communications imeni A. S. Popov) [Abstracter's note: Name of Association taken from first page of journal]

SUBMITTED: April 26, 1961

Card 2/2



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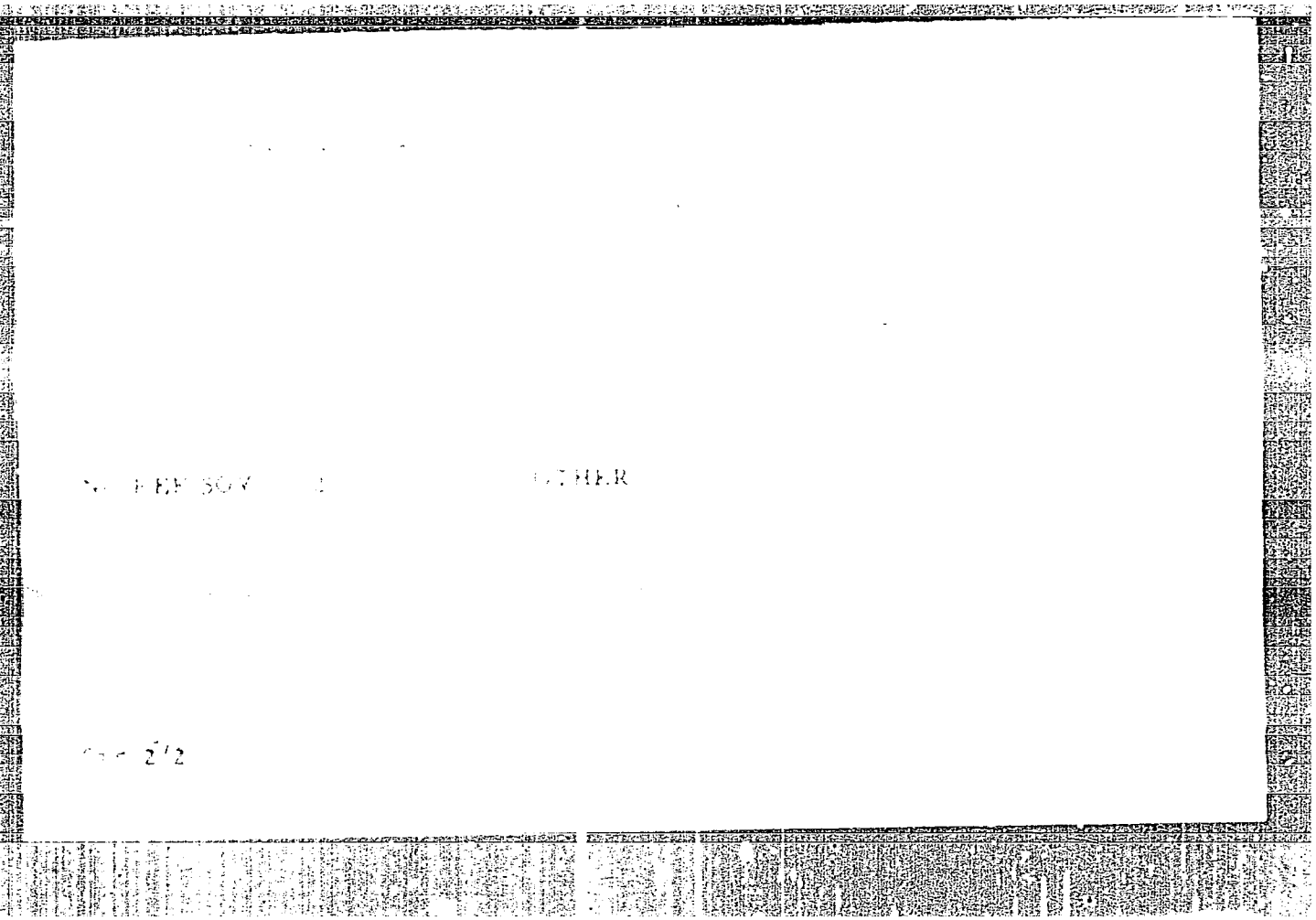

UR/0106/65/000/004/0015/0022

AUTHOR: Vanpol'skiy, V. G.

TITLE: Linear antennas [illegible]

SOURCE: [illegible]

TOPIC TAGS: antenna pattern, antenna noise reduction, [illegible] array design, array synthesis, antenna temperature

[illegible] problem of noise shielding for a linear dipole antenna array is [illegible] directional patterns of linear antennas with [illegible]

Card 1/1

Card 2/6

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