BULGAKOV, Aleksey Alekseyevich; ANDREYCHIKOV, B.I., red.; VORONIN, K.P., tekhn. red.

[Electronic equipment for automatic control] Elektronnye ustroistva avtomaticheskogo upravleniia. Izd.2., perer. Moskva, Gos. energ. izd-vo, 1958. 256 p. (MIRA 11:9)
(Electronic apparatus and appliances) (Automatic control)

Bulgakov, A.A.

8(2); 28(1) PHASE I BOOK EXPLOITATION SOV/1433

Soveshchaniye po avtomatizirovannomu elektroprivodu peremennogo toka, Moscow, 1955

Trudy... (Transactions of the Conference on Automated A-C Electric Drives) Moscow, Izd-vo AN SSSR, 1958. 398 p. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.

Resp. Eds: V.S. Kulebakin, Academician, and M.G. Chilikin, Doctor of Technical Sciences, Professor; Ed. of Publishing House: D.M. Ioffe; Tech. Ed.: I.F. Kuz'min.

COVERAGE: The conference was organized on the initiative of the Institute of Automation and Telemechanics of the Academy of Sciences, USSR, and the Moscow Power Engineering Institute and had as its aim the planning of the most progressive ways of developing automatic control of electric drives. The first conference on the subject of automated electric drive took place more than ten years before the present one and was concerned with d-c electric drives. The results of this conference were found to be most valuable in the task of rebuilding postwar Soviet industry and in furthering industrial development. Present technical development of Soviet industry demands high speeds, simplicity of construction, reliability of operation, and economy. The squirrel-cage induction motor with frequency control appears to be the most promising type of controlled a-c drive. For wide application of this drive in the Soviet economy there is a need of developing new types of frequency converters. Some interesting studies were made in this connection at the Institute of Automation and Telemechanics of the USSR Academy of Sciences and its Leningrad branch, at the Moscow Power Engineering Institute, the Central Design Bureau of the "Elektroprivod Plant, the State Design Institute of the Ministry of Construction of the RSFSR, and in other design organizations. These studies were discussed at the present conference. The transactions contain material concerning the theory and design of reactor, pulse, and frequency methods of controlling a-c electric drives. Candidate of Technical Sciences I.V. Utkin and Engineer V.A. Kokoreva participated in the preparation of this collection of papers. The volume was reviewed by Professor Ya. V. Nitusov, Doctor of Technical Sciences. Some of the papers include a bibliography.

TABLE OF CONTENTS:

The paper discusses the problem of obtaining efficient relationships between voltage and frequency in the process of speed regulation of an induction motor by simultaneous changes in these quantities. The author investigates several practicable methods of obtaining such relationships in systems of automatic regulation. A specific relationship between voltage and frequency and also other variable parameters represents the principle of voltage regulation. Principles of regulation are efficient only when optimum mechanical characteristics, economy of operation, and optimal dimensions of the drive are ensured. Academician M.P. Kostenko established in 1925 that voltage must be regulated in direct proportion to the product of frequency and square root of the load moment. The author first investigates the performance of the motor according to Kostenko's formula. He then finds conditions which make it possible to avoid regulating the field of the machine as a function of load and to obtain for all the frequency range the same characteristics as those obtained with the rated frequency. There are 6 Soviet references.

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PHASE I BOOK EXPLOITATION SOV/4802

Bulgakov, Aleksey Alekseyevich, Mikhail Mikhaylovich Sokolov, and Aleksandr Viktorovich Shinyanskiy

Avtomatizirovannyy elektroprivod (Automated Electric Drive) Moscow, 1959. 69 p. (Series: Moskovskiy dom nauchno-tekhnicheskoy propagandy. Peredovoy opyt proizvodstva. Seriya: Elektroenergetika, vyp. 3) 5,000 copies printed.

Sponsoring Agencies: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR; Moskovskiy dom nauchno-tekhnicheskoy propagandy imeni F.E. Dzerzhinskogo.

Ed.: A.A. Tayts; Resp. Ed. for this book: G.G. Yatsenko; Tech. Ed.: R.A. Sukhareva.

PURPOSE: This booklet is intended for technical personnel concerned with the automation of electric drives.

COVERAGE: The article by A.A. Bulgakov entitled "Electronically Controlled Adjustable D-C and A-C Electric Drive" presents a detailed description of the various devices used in the automation of electric drives. The article by

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M.M. Sokolov and A.V. Shinyanskiy entitled "Adjustable Induction Electric Drive With Saturable Reactors in the Stator Circuit" contains a detailed description of this type of automated drive. The authors conclude that the latter drive has certain definite advantages in a number of low-power production processes, as it assures the adjustment of rotation speed within given limits during steady operation in the whole range. No personalities are mentioned. References accompany both articles.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

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JP/rm/mas
2-15-61

28(1) PHASE I BOOK EXPLOITATION SOV/3230

Bulgakov, Aleksey Alekseyevich

Programmnoye upravleniye metallorezhushchimi stankami (Program Control of Metal-cutting Machine Tools) Moscow, Gosenergoizdat, 1959. 125 p. (Series: Biblioteka po avtomatike, vyp. 5) 15,000 copies printed.

Ed.: B. I. Andreychikov; Tech. Ed.: N. I. Borunov; Editorial Board of the series: I. V. Antik, S. N. Veshenevskiy, V. S. Kulebakin, A. D. Smirnov, B. S. Sotskov, Ye. P. Stefani, and N. N. Shumilovskiy.

PURPOSE: The book is intended for engineers and technicians working in the field of automation of production processes but who have no special training in this field.

COVERAGE: The author outlines the fundamental problems in the automation of metal-cutting machine tools and the principles of programmed control of machine tools. He describes positioning

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servosystems equipped with selsyns, inductosyns and devices with a helical differential transformer and with an induction linear transmitter. He also describes contour control systems with multitrack programming, frequency separation of channels and helical magnetic heads. No personalities are mentioned. There are 23 references: 19 Soviet and 4 English.

TABLE OF CONTENTS:

PHASE I BOOK EXPLOITATION SOV/4954

Bulgakov, Aleksey Alekseyevich

Energeticheskiye protsessy sledyashchego elektroprivoda v garmonicheskom rezhime (Power Processes in Electric Servodrives Under Harmonic Operating Conditions) Moscow, Izd-vo AN SSSR, 1960. 121 p. Errata slip inserted. 7,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.

Resp. Ed.: Ya.Z. Tsypkin, Doctor of Technical Sciences, Professor; Ed. of Publishing House: B.I. Andreychikov; Tech. Ed.: L.A. Lebedeva.

PURPOSE: This book is intended for personnel engaged in the design, operation, and maintenance of servomechanisms.

COVERAGE: The author discusses basic problems of servodrive theory in the case of operation under harmonic conditions, when the command signal varies according to the sinusoidal law. An effort is made to explain systematically the basic energy problems connected with these conditions. The author emphasizes the effect of the load on the dynamic characteristics of servodrives

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and on the selection of efficient structural parameters. A considerable part of the material in the book is said to be published for the first time. No personalities are mentioned. There are 9 references: 7 Soviet, 1 French, and 1 Polish.

TABLE OF CONTENTS:

21433
S/109/61/006/001/011/023
E140/E163

9,2590 (incl. 2105)

AUTHORS: Shestopalov, V.P., and Bulgakov, A.A.

TITLE: Coaxial delay line consisting of two opposed helices filled with magneto-dielectric medium

PERIODICAL: Radiotekhnika i elektronika, Vol.6, No.1, 1961, pp. 92-100

TEXT: The article considers a double helix in the presence of a magneto-dielectric medium placed in a metal waveguide. Appropriate values of μ and ε of the magneto-dielectric medium permit the most favourable dispersion characteristic of the system with high impedance at the fundamental field component and reduced value of the impedance to the -1 field harmonic. The presence of the metal envelope also permits consideration of fast waves propagating in the system. The work neglects the change in surface currents at the intersections of the helices. For thin tapes this approximation is valid. Some experimental results are given at wavelengths between 15 and 8.6 cm. Acknowledgements are expressed to S.V. Troitskiy for his assistance.

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21433
S/109/61/006/001/011/023
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Coaxial delay line consisting of two opposed helices filled with magneto-dielectric medium

There are 8 figures, 1 table and 5 references: 2 Soviet and 3 English.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo
(Khar'kov State University imeni A.M. Gor'kiy)

SUBMITTED: April 2, 1960

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21872 S/109/61/006/007/012/020
D262/D306

9.1925

AUTHORS: Shestopalov, V.P., Bulgakov, A.A., and Bulgakov, B.M.

TITLE: Theoretical and experimental analysis of helical-dielectric antennae

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 7, 1961, 1136 - 1145.

TEXT: Dielectric and helical antennae are widely used in SHF range as the antennae for travelling waves. They consist of sections of a dielectric or helical waveguides, along which the electromagnetic wave can be propagated with a phase velocity v_f less than the velocity of light c in the free space. In a helical dielectric antennae there should be properties common both to the helical and to the dielectric antenna. In particular, its geometrical dimensions, for given angle of the helix ψ and for given dielectric constant ε, should be smaller. In the present article the theoretical and experimental study of mal antennae is presented. The theoretical analysis is

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Theoretical and experimental ...

carried out considering an infinite helical - dielectric waveguide made of a ribbon helix of radius a, width of the ribbon δ, angle of the helix ψ and pitch p. The helix is filled with dielectric having the dielectric constant ε_1 and magnetic permeability μ_1; outside the helix there is a medium with ε_2 and μ_2. The analysis shows that 1) The dielectric within the waveguide slows down considerably the phase velocity of the electromagnetic waves and increases the delay. This has been shown by solving the dispersion equation of the system with the boundary conditions as given in (1)

$$E_z^{(1)}|_{r=a} = E_z^{(2)}|_{r=a}, \quad E_\varphi^{(1)}|_{r=a} = E_\varphi^{(2)}|_{r=a},$$
$$(H_z^{(2)} - H_z^{(1)})|_{r=a} = j_\varphi, \quad (H_\varphi^{(1)} - H_\varphi^{(2)})|_{r=a} = j_z,$$

where indices 1, 2 refer to the space inside and outside the helix; j_φ, j_z - the surface components of current at the helix. From the obtained dispersion equations the current distribution is given by

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$$I_{sn} = \frac{\sin\frac{\Delta n}{2}}{\frac{\Delta n}{2}}, \quad \Delta = \frac{2p}{\pi\delta}. \qquad (9)$$

the non-resonant term of which is

$$S = 2\left[\left(\frac{\gamma_0 a}{k_2 a}\right)^2 \operatorname{tg}^2\psi \frac{1}{\varepsilon_1+\varepsilon_2} - \frac{1}{\frac{1}{\mu_1}+\frac{1}{\mu_2}}\right]\sin\psi \ln\frac{2}{\Delta}. \qquad (10)$$

2) The increase in time delay in the helix dielectric waveguide results in a greater directivity of radiating into the free space energy. This is established by applying Kirchhoff's integral method to the electric field $\vec{E}_m$

$$\vec{E}_M = \frac{ie^{-ik_0R}}{k_0R}\int_0^l e^{2\pi iz\left(\frac{\cos\Theta}{\lambda_0}-\frac{1}{\lambda_g}\right)}dz\int_0^{2\pi}\vec{V}(\varphi,\Theta,\Phi)\,d\Phi, \qquad (13)$$

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Theoretical and experimental ...

where λ_g - the wavelength of delayed wave; R - distance to the observation point; θ, φ - spherical coordinate system angles; Φ - azimuth angle along the cylinderical antenna surface; l - length of the antenna; V is independent of z. 3) The introduction of dielectric shifts the directivity pattern with respect to the antenna axis. This has been confirmed experimentally, although not quantitatively. It is thought that this effect is due to assymetrical, with respect to the helix azimuth, waves. 4) The dielectric filling the helix antenna permits the decrease of the antenna dimensions $\sqrt{3}$ times approximately but then the bandwidth of the antenna decreases. 5) To increase the bandwidth a stratified dielectric or a magneto dielectric medium should be used, the experimental part, consisting of measuring directivity patterns and current distribution along the antenna for helices with ψ = 4.13; 5.16; 8.42 and ε = 1; 4.5; 20; 81. In all cases the helix dimensions were kept constant: l = 14 cm; 2a = 4.6 cm, the wavelength being changed. The energy was supplied by a generator type ГС/12 (GS/12). For matching the central conductor was fixed on to organic glass terminals,

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24872 S-109-61 006 007 012/013
Theoretical and experimental ... D-62, D-06

[redacted]

[redacted]

[redacted]

[redacted]

BULGAKOV, A.A.; TSYPKIN, Ya.Z., doktor tekhn. nauk, prof., otv. red.; GRIGOR'YEV, Ye.N., red.izd-va; POLYAKOVA, T.V., tekhn. red.

[Principles of the dynamics of regulated rectifier systems] Osnovy dinamiki upravliaemykh ventil'nykh sistem. Moskva, Izd-vo Akad. nauk SSSR, 1963. 219 p. (MIRA 16:7)
(Electric current rectifiers)
(Electric current converters)

BALAKLITSKIY, I.M.; BULGAKOV, A.A.

Two methods for microwave power stabilization. Radiotekhnika 18 no.10:63-66 O '63. (MIRA 16:12)

AVEN, O.A.; DVORETSKIY, V.M.; DOMANITSKIY, S.M.; ZALMANZON, L.A.; KRASSOV, I.M.; KRUG, Ye.K.; TAL', A.A.; KHOKHLOV, V.A.; BULGAKOV, A.A.; DEMIDENKO, Ye.D.; BERNSHTEYN, S.I.; YEMEL'YANOV, S.V.; LERNER, A.Ya.; MEYEROV, M.V.; PEREL'MAN, I.I., FITSNER, L.N.; CHELYUSTKIN, A.B.; ZHOZHIKASHVILI, V.A.; IL'IN, V.A.; AGEYKIN, D.I.; GUSHCHIN, Yu.V.; KATYS, G.P.; MEL'TTSER, L.V.; PARKHOMENKO, P.P.; MIKHAYLOV, N.N.; FITSNER, L.N.; PARKHOMENKO, P.P.; ROZENBLAT, M.A.; SOTSKOV, B.S.; VASIL'YEVA, N.P.; PRANGISHVILI, I.V.; POLONNIKOV, D.Ye.; VOROB'YEVA, T.M.; DEKABRUN, I.Ye.

Work on the development of systems and principles of automatic control at the Institute of Automatic and Remote Control during 1939-1964. Avtom. i telem. 25 no. 6:807-851 Je '64.
(MIRA 17:7)

BULGAKOV, A.A.

"Twenty-fifth anniversary of the state system of vocational and technical education. Prof.-tekh. obr. 22 no.9:2-5 S '65. (MIRA 18:9)

1. Predsedatel' Gosudarstvennogo komiteta po professional'no-tekhnicheskomu obrazovaniyu pri Gosplane SSSR.

BULGAKOV, A.A. (Novosibirsk)

Portable universal level. Geog. v shkole 25 no.5:66-68 S-O '62.
(Level (Tool)) (MIRA 15:9)

ZEL'TSER, G.Ya.; VOLOBOYEV, I.N.; KOSTIN, A.P.; BULGAKOV, A.A.; VOZNYUK, V.S.; KALMYKOV, A.M.; STUDENTSOV, S.A.; BERSHIDSKIY, P.I.; MOISEYEV, G.A., inzh., retsenzent; SOBAKIN, V.V., inzh., red.; VOROTNIKOVA, L.F., tekhn. red.

[The TG102 diesel locomotive]Teplovoz TG102. Moskva, Transzheldorizdat, 1962. 150 p. (MIRA 16:1)
(Diesel locomotives--Hydraulic drive)

BULGAKOV. A. F.

USSR/Medicine - Darmin and Anabasis Jul/Aug 48
Medicine - Plants

"The Preparation of Darmin and Anabasis,"
A. F. Bulgakov, 3 pp

"Med Prom SSSR" No 4

Details characteristics and value of darmin, a perennial bush growing in Southern Kazakhstan steppes, as a medicinal plant, and anabasis, a bush which grows wild in Kazakh SSR, containing the alkaloid anabasine. Darmin contains ether oil, used in Soviet medicine for rheumatic and skin diseases, and as a substitute for imported medical preparations. Anabasis produces anabasin-sulfate, a very effective remedy in the fight against agricultural pests. Preparation of Darmin and anabasis can be expedited by processing these plants while they are green since they contain twice as much active ingredient.

[redacted] 62/49T70

BULGAKOV, A.G.

New high-pressure pump. Ugol' Ukr. 3 no.9:36 S '59.
(MIRA 13:2)
(Mine pumps)

S/754/62/000/001/005/006

AUTHOR: Bulgakov A. K., Rysakov V. M.

TITLE: Experimental investigation of transients in radiowave propagation

PERIODICAL: Leningrad. Universitet. Problemy difraktsii i rasprostraneniya voln. no. 1. 1962. Rasprostraneniye radiovoln. 151-155.

TEXT: The investigation was aimed at ascertaining experimentally the effect of various paths on the waveform of a radio-frequency pulse of the medium length band. The hitherto published theoretical computations used an excessive idealization of the field source. A short vertical antenna was used to transmit cosinusoidal step functions with 550 kc/sec carrier. The transmitting antenna was at a hight of 18 m, a 0.5 m antenna was used for reception, the signal being amplified and fed to an oscilloscope. The waveforms obtained in propagation over different paths were measured. When the paths had high conductivity (mud) the pulse waveform remained constant up to distances of 2 km. At low ground conductivity a noticeable decrease in the amplitude of the high-frequency oscillations was observed even after less than one km. At larger distances the high-

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frequency components attenuate almost completely, owing to preferred propagation of the low-frequency components. Interesting results were obtained in the case of propagation over two-layer grounds, and it is shown that some data can be obtained in this manner concerning the relative thicknesses and conductivityes of the layers. There are six figures and five references, two to work by Wait (Can. J. Phys.) and three to work by Johler.

S/754/62/000/001/004/006

AUTHOR: Bulgakov A. K., Rysakov V. M.

TITLE: Possibility of using high frequency electromagnetic oscillations in geophysical prospecting

PERIODICAL: Leningrad. Universitet. Problemy difraktsii i rasprostraneniya voln. no. 1. 1962. Rasprostraneniye radiovoln. 143-150

TEXT: The possibility of employing high-frequency waves in geophysical prospecting is investigated using calculations made with an electronic computer, with special emphasis on the intepretation of experimental data obtained in measurements of the surface impedance of geological structures (or of quantities related with the impedance. The earth is regarded as a double-layer plane-parallel structure with an upper layer of thickness ℓ and a lower layer extending to infinity. Approximate formulas are derived for the dielectric constant (ε_2), the thickness (ℓ), and the resistivity (ρ) of the upper layer in terms of the average surface impedance (δ_{av}, the experimentally measured quantity) and the reflection coefficient R, which can be regarded as equal to unity in most cases when the two layers differ appreciably in their electric properties:

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Possibility of using high frequency ... S/754/62/000/001/004/006

$$\varepsilon_2 = \delta_{av}^{-2}, \quad \ell = \frac{\delta_{av}}{2\Delta f}, \quad \rho_2 = \frac{5.7 \cdot 10^{10}\, \delta_{av}^2}{\Delta f \cdot \ln \frac{\Delta\delta}{\delta_{av} R_1}} \qquad (1)$$

The accuracy of the above approximate formula was checked against exact calculations with an electronic computer and found to be within 10% in most cases, but the value of deviated under some circumstances from the true value by a factor 2 -- 3. It is shown that an appreciable amount of information concerning the properties of the upper layer can be obtained only if the resistivity of the upper layer exceeds 1000 ohm-meters, when the radio-frequency range from 1 to 10 Mc/sec is most suitable. Direct measurement of surface impedance entails certain practical difficulties, but it is pointed out that satisfactory results are obtained by measuring quantities associated with the surface impedance, namely the coefficient of reflection from the earth's surface for a normally incident wave or the height amplification, the latter by a procedure described by J. R. Wait (ref. 3, Geofisica pura e appl. vol.28, 47, 1954). There are four figures and three references, the first two in Russian. V. V. Novikov, an assistant in the Radiophysics faculty of the Leningrad State University, is credited with the calculations.

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41155
S/169/62/000/009/046/120
D228/D307

AUTHORS: Bulgakov, A. K. and Rysakov, V. M.

TITLE: Experimental investigation of transients during the propagation of radio waves

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 9, 1962, 38, abstract 9A255 (In. collection: Probl. difraktsii i rasprostr. voln, 1, L., Leningr. un-t, 1962, 151-155)

TEXT: The results of experimentally investigating the influence of different routes on the form of the medium-wave band's radio-frequency pulse are described. The transmitter's antenna (a vertical pin, 18 m in height) was fed by current of the type $i = 1(t)\cos\omega_o t$ with a frequency charge of 550 kc/s (1(t) is the unit switching-on function). At the observation point the signal studied was received on a vertical 0.5-m high antenna, amplified by a wide-band amplifier, and put into a two-beam slave-sweep oscillograph, from whose screen photographs were taken. Time marks were fed to the oscillograph's second beam. The authors quote examples of oscillograms,

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Experimental investigation of ...

obtained in the propagation of pulses over routes of high (a bog) and low ($\sigma \approx 3 \times 10^{-3}$ ohm$\cdot$m^{-1}) conductance and over a two-layer structure. In the latter case the upper layer was of about 10-20 m and had a low conductance $\simeq 3 \times 10^{-4} - 1.5 \times 10^{-5}$ ohm$^{-1}\cdot$m^{-1}, but the lower layer was a good conductor. It is noted that on the propagation of a pulse over a well conducting medium its form hardly changes with distance, right up to the limiting distances (3 km) which were studied. The decrease in the amplitude of the high-frequency oscillations at a distance of only 1 km is distinctly noticeable in the second case, and these fade practically completely when the distance is further increased. When studying the propagation of pulses over a two-layer structure, considerable distortions were observed; these can be explained by the superimposition of the signal, reflected from the top surface of the lower well-conducting layer. It is pointed out that the upper layer's thickness can be readily ascertained on the oscillograms from the lag of the reflected pulse. It is mentioned that the depths, computed from these data (on the assumption that ε in the top layer equals 10 - 20),

Experimental investigation of ...

were found to be extremely close to values obtained by the method of d.c. vertical electric sounding. It is indicated that more detailed analysis of the distortions in the pulse's form will evidently allow not just the bottom layer's depth to be ascertained, but also the structure's electric parameters. [Abstracter's note: Complete translation.]

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3.252

S/141/62/005/002/014/025
E192/E382

9.1914

AUTHORS: Bulgakov, A.K., Rysakov, V.M.

TITLE: Experimental investigation of the transient radiation of a vertical antenna

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v. 5, no. 2, 1962, 328 - 332

TEXT: The transients radiated by a vertical antenna supplied with the current of the type:

$$I = 1(t) \cos (\omega_o t),$$

where $1(t)$ is the unit step function, were investigated experimentally. Both the dependence of the transient response on the distance from the antenna (the height being fixed) and the height of the antenna (the distance of the observation point from the antenna being fixed) were investigated. The transmitted frequency was f_o = 550 kc/s and the transmitted signal was received by a short vertical antenna (= 0.5 m) whose transients could be neglected. The signal so received was amplified in a

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wide-band amplifier and applied to an oscilloscope where the transients could be photographed. The experiments indicated the presence of the HF oscillatory transients which were due to the multiple reflections of the applied pulse from both ends of the antenna. The duration of the transient which is defined as the time necessary for the reduction of the amplitude of the HF oscillations by e times was about 10 τ , where $\tau = 2\ell/c$. The period of the HF oscillations T was approximately equal to the transit time of the wave to the top of the antenna and back. In general, the duration of the transients increases with distance from the antenna and its height. There are 7 figures.

SUBMITTED: July 28, 1961

Card 2/2

KOZINA, O.G.; YANEVICH, Yu.M.; FILIPPOV, K.F.; BULGAKOV, A.K.; MAKAROV, G.I., otv. red.; LALAYANTS, E.A., red.; ZHUKOVA, Ye.G., tekhn. red.

[Laboratory work on linear systems] Laboratornye raboty po lineinym sistemam. Leningrad, 1963. 168 p. (MIRA 16:9)

1. Leningrad. Universitet. Fizicheskiy fakul'tet.
(Electric engineering--Laboratory manuals)
(Electronic circuits)

L 11114-66 EWT(1)/T/FCS(k) WR

ACC NR: AP6002303 SOURCE CODE: UR/0141/65/008/006/1187/1195

AUTHOR: Bulgakov, A. K.; Busev, N. I.; Rysakov, V. M.

ORG: Leningrad State University (Leningradskiy gosudarstvennyy universitet)

TITLE: Transient processes in linear antennas

SOURCE: IVUZ. Radiofizika, v. 8, no. 6, 1965, 1187-1195

TOPIC TAGS: antenna, microwave antenna, transient electromagnetic field

ABSTRACT: Transient phenomena which occur during either stationary or nonstationary radiation from a linear antenna are investigated. For the traveling wave case, it is shown that radiation impedance is independent of the excitation waveform and the antenna length, and has a value of 83 ohm. In the general case of reflections from an antenna termination, it is shown that most of the attenuation occurs in the reflected rather than the incident portions of the applied wave. For step-function or similar sharply-rising driving voltages, it thus becomes necessary to take these reflections into account; whereas for sufficiently slowly rising voltages, they may be safely ignored. The analysis was extended to a study of transient effects in the near-field antenna region. Experimental results are given for both near- and far-field response to step-function excitation of load matched antennas. The authors conclude that in traveling wave antennas, transient effects must be considered in the near-field region, and for this reason it is not correct to equate antenna action to that of an equivalent point source dipole. Orig. art. has: 4 figures. [SH]

UDC: 621.396.671

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L 11114-66

ACC NR: AP6002303

SUB CODE: 09 SUBM DATE: 08Apr64/ ORIG REF: 005/ ATD PRESS: 4176

Card 2/2

BARDYSHEV, I.I.; CHERCHES, Kh.A.; AKINCHITS, Ye.A.; BULGAKOV, A.N.

Quantitative composition of the tar acids of pine and fir oleoresin. Gidroliz. i lesokhim. 18 no.2:10-11 '65.

(MIRA 18:5)

1. Institut fiziko-organicheskoy khimii AN BSSR.

CHERCHES, Kh.A.; BARDYSHEV, I.I.; BULGAKOV, A.N.; AKINCHITS, Ye.A.

Composition of resin oils of oleoresin from Aleppo and Crimean pines and their hydrides. Zhur.prikl.khim. 38 no.11:2624-2627 N '65.

(MIRA 18:12)

1. Submitted October 16, 1963.

SOV/130-58-12-15/21

AUTHORS: Ilyukovich, B.M., and Bulgakov, A.S.

TITLE: Reducing Roll Consumption (Umen'sheniye raskhoda prokatnykh valkov)

PERIODICAL: Metallurg, 1958, Nr 12, pp 34 - 35 (USSR)

ABSTRACT: The authors describe the use on a three-stand mill at the Chusovskiy metallurgical works of worn rolls which had previously been scrapped. They show the finishing passes for rolling Nr 10 channel (Fig 1) and state that when the rolls become unserviceable (not through breakage) only the top roll is scrapped and the bottom roll is made into the top roll; comparing (Table) new and re-used roll life for rolls of unknown composition, the authors state that when rolls of low-alloy, magnesium inoculated cast iron are used in this way roll life remains unchanged. Fig 2 shows the finishing-stand passes for rolling 90 x 60 x 6-8-10 and 80 x 55 x 6-8-10 mm angles where the top roll is also twice-used. Fig 3 shows the rough-stand (three-high) passes for rolling Nr 10 H-beam where for re-use the top and bottom rolls change places and a new middle roll is inserted. The re-using of rolls is most

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advantageous with long barrel lengths and at least five or six passes. The method has wide applicability but each case should be decided on its merits; it leads to a great saving in roll consumption with constant pass durability.

There are 3 figures and 1 table.

ASSOCIATIONS: Chusovskiy and Saldinskiy metallurgical works

SOV/137-57-10-19181

Translation from. Referativnyy zhurnal, Metallurgiya, 1957, Nr 10, p 106 (USSR)

AUTHOR: Bulgakov, A. V.

TITLE: Delivery Thin-walled Pipe of Maximum Length With Insulation Applied at the Plant (O postavke tonkostennykh trub maksimal'noy dliny s gotovoy zavodskoy izolyatsiyey)

PERIODICAL: V sb.: Ratsionalizatsiya profiley prokata. Moscow, Profizdat, 1956, pp 261-262

ABSTRACT: The increased transportation of petroleum and gas in the next five years will require ferrous metallurgy to supply a large quantity of thin-walled pipe (P). Each unnecessary mm of wall thickness in a 500-mm P will result in the consumption of 400,000 t of steel in the laying of the planned pipelines, and this comes to 0.5 billion rubles, not counting transportation and other costs. Therefore, planning of the production of P at the plant should be in m and not in t. At the same time, it is necessary to provide that P be insulated at the plant, and this too will yield a major economy.

V.O.

Card 1/1

BULGAKOV, A.V.

Boldly improve pipeline laying techniques. Stroi.pred.neft. prom. 1 no.10:16-21 D '56. (MLRA 10:2)

(Petroleum--Pipelines)

BULGAKOV, Anton Viktorovich; KAMERSHTEYN, A.G., kand.tekhn.nauk, red.; BESKDINA, O.S., red.; OLERSKIY, Ye.Ye., tekhn.red.

[Overhead gas pipelines with self-compensating thermal stresses; construction and maintenance] Nadzemnye gazoprovody s samokompensatsiei temperaturnykh napriazhenii; opyt stroitel'stva i ekspluatatsii. Moskva, Otdel nauchno-tekhn.informatsii, 1959. 71 p. (MIRA 13:9)

(Gas, Natural--Pipelines)

BULGAKOV, A. V. Cand Med Sci -- (diss) "On the Pathological Anatomy and Pathogenesis of ~~the~~ Changes in Lungs During Dysentery in young Children, ~~of Early Age.~~" Kursk, 1957. 15 pp 18 cm. (Voronezh State Medical Inst), 100 copies (KL, 26-57, 112)

BULGAKOV, A.V., assistent

Morphological changes in the lungs following aspiration of a vomited mass. Sbor. trud. Kursk. gos. med. inst. no.13:322-325 '58.
(MIRA 14:3)

1. Iz kafedry sudebnoy meditsiny (zav. - prof. K.I.Khizhnyakova) Kurskogo gosudarstvennogo meditsinskogo instituta.
(LUNGS--FOREIGN BODIES)

BULGAKOV, A.V., assistent

Case of pheochromocytoma. Sbor. trud. Kursk. gos. med. inst. no.13: 436-438 '58. (MIRA 14:3)

1. Iz kafedry sudebnoy meditsiny (zav. - prof. K.I.Khizhnyakova) Kurskogo gosudarstvennogo meditsinskogo instituta.
(ADRENAL GLANDS--TUMORS)

BULGAKOV, A. V.

Morphometric calculations on the Ural-2 Electronic Digital Computer. Transp. stroi. 13 no.4:58-59 Ap '63. (MIRA 16:4)

(Geomorphology) (Ural computer)

BULGAKOV, A.V., assistent

Morphology of the cardiovascular system in sudden "cardiac" death. Sbor. trud. Kursk. gos. med. inst. no.16:252-255 '62. (MIRA 17:9)

1. Iz kafedry sudebnoy meditsiny (zav. - prof. K.I. Khizhnyakova) Kurskogo meditsinskogo instituta.

BULGAKOV, B.A.

BULGAKOV, B.A., inzhener; SLAVNOV, Ye.V., inzhener.

Precast reinforced concrete framework for a tall building in Riga. Stroi.prom.32 no.11:6-8 N '54. (MLRA 7:11)

1. Respublikanskiy proyektnyy institut Latv.SSR.
(Riga--Reinforced concrete construction) (Precast concrete construction)

BULGAKOV, B.A.; NIKOLAYEV, V.V.; SOKOLOV, D.A.; GOLOVIN, G., red.; PETERSON, A., tekhn. red.

[Repair and reconstruction of quays in the city of Riga] Vosstanovlenie i rekonstruktsiia rizhskikh gorodskikh naberezhnykh. Riga, Izd-vo AN Latv.SSR, 1952. 109 p. (MIRA 16:6)

(Riga--Wharves)

BULGAKOV, B.I.

From practices of the transfer of sugar factory boiler rooms to mazut firing. Sakh.prom. 36 no.5:47-50 My '62. (MIRA 15:5)

1. Kiyevenergonaladka.
(Boilers--Firing) (Sugar industry--Equipment and supplies)

BULGAKOV, B.I.

Improving the burning of mazut in boiler rooms. Sakh. prom. 37 no.3:28-32 Mr '63. (MIRA 16:4)

1. Kiyevenergonaladka.

(Boilers—Firing)

BULGAKOV, B.I., inzh. (Kiyev)

Short-flame nozzleless burning of mazut in heating boilers. Vod. i san. tekh. no.9:29-30 S '64. (MIRA 17:11)

BULGAKOV, B.I.; PERERVA, I.A.

Boiler room with cyclone combustion of mazut by the vortex method. Ferm.i spirt.prom. 31 no.1:41-43 '65.

(MIRA 18:5)

1. UkrNIIGiproneft' (for Bulgakov). 2. Andrushevskiy spirtozavod (for Pererva).

BULGAKOV, B.L.

We must re-examine individual methods of calculating costs of shoes. Kozh.-obuv. prom. no.3:37 Mr '59. (MIRA 12:6)
(Shoe industry--Costs)

BUDGARUV, B.M.

"Periodic Phenomena During the Electrodeposition of Cadmium in the Presence of Alcohols. I. N. Frumkin, I. S. Shein, and B. M. Bulgakov. Zhur. Fiz. Khim., 1952, 26, [illegible]. [illegible]. Russian. [illegible]

GRITSAN, D.N.; SHUN, D.S.; BULGAKOV, B.N.; BULGAKOVA, ...

Oscillographic investigation of cathodic polarization in connection with electrodeposition of metals at high current densities. Uch.zap. KHGU 71:69-75 '56. (MLRA 10:8)
(Electroplating) (Polarization (Electricity))

BULGAKOV, B.M.

AUTHORS: Bulgakov, B. M., Shestopalov, V. P., 57-1-26/ 30

TITLE: Propagation of Electro-Magnetic Waves in Retarding Systems, Using a Spiral and a Dielectric (Rasprostraneniye elektromagnitnykh voln v zamedlyayushchikh sistemakh, ispol'zuyushchikh spiral' i dielektrik)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 1, pp. 188-201 (USSR)

ABSTRACT: The propagation of electromagnetic waves is investigated in a spiral located in a dielectric medium at the presence of an electron bundle. The properties of retarding systems in which construction changes in the spiral as well as in the dielectric are possible, are investigated. It is demonstrated: 1) The amplification of the system at constant wave length decreases somewhat with the increase of the dielectricity constant of the medium in which the spiral is located, i.e. in the case of a certain increase of the velocity interval of the electron bundle for which an amplification is still possible. The efficiency of the system changes unimportantly. 2) The amplification coefficient of the system electron bundle -spiral-dielectric - can be higher than the amplification coefficient of electron bundle - spiral if the wave length of the intensified oscillations is specially chosen i.e.

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Propagation of Electron-Magnetic Waves in Retarding Systems, Using a Spiral and a Dielectric. 57-1-26/30

$\frac{c}{v_{phase}} \frac{2\pi}{\lambda_o} r_1$ = const. r_1 - radius of the spiral, v_{phase} - phase velocity, λ_o - wave length, c - light velocity.
3) The introduction of additional elements into the retarding systems (axial metal bar, exterior metal housing, etc.) makes possible change dispersion dependence of the system. 4) The use of magnetic-cans (magnetik) in retarding systems along with dielectrics leads to an important new distribution of the electromagnetic energy flow propagating in the system.

ASSOCIATION: Khar'kov State University imeni A... Gor'kiy (Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo)

SUBMITTED: November 2o, 1956

AVAILABLE: Library of Congress

Card 2/2

67477

9.9000 SOV/24-59-4-21/33

AUTHORS: Bulgakov, B.M. and Shestopalov, V.P. (Khar'kov)

TITLE: Influence of the Magneto-dielectric Medium on the Propagation of Electromagnetic Waves in a Helical Waveguide Situated in a Magneto-dielectric

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1959, Nr 4, pp 166-176 (USSR)

ABSTRACT: It has been shown in the works of Shestopalov, Olvin et al (Refs 6-9) that the use of a dielectric or a magneto-dielectric in a travelling-wave tube can lead to the improvement of some of the characteristic parameters of the tube, in particular, the increase in gain and the reduction in its geometrical dimensions. A helical waveguide situated inside an isotropic axially-symmetrical magneto-dielectric cylinder is analysed in this article. For the purpose of analysis, it is assumed that the helix can be replaced by a helically-conducting cylinder. Only the axially-symmetrical waves are taken into account. The dependence of the field on time t and

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the longitudinal coordinate z is in the form of $\exp[i(\omega t - \beta z)]$, where ω is the angular frequency and β is the longitudinal propagation constant. The expressions for the normalised field components are:

$$e_r = \frac{E_r}{E_z} = \beta r \xi_1(x) \frac{1 - \delta\sigma_1(x)}{1 - \delta\sigma_0(x)}, \quad e_\varphi = \frac{E_\varphi}{H_z} = -\omega\mu r \xi_1(x) \frac{1 - \theta\sigma_1(x)}{1 + \theta\sigma_0(x)}$$

$$h_r = \frac{H_r}{H_z} = \beta r \xi_1(x) \frac{1 - \theta\sigma_1(x)}{1 + \theta\sigma_0(x)}, \quad h_\varphi = \frac{H_\varphi}{E_z} \omega\varepsilon r \xi_1(x) \frac{1 - \delta\sigma_1(x)}{1 + \delta\sigma_0(x)} \qquad (1.1)$$

where δ and θ are unknown integration constants which can be defined from the boundary conditions. Other parameters of Eqs (1.1) are defined by Eqs (1.2), where

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Influence of the Magneto-dielectric Medium on the Propagation of Electromagnetic Waves in a Helical Waveguide Situated in a Magneto-dielectric

I_n and K_n are modified Bessel functions of the first and second kind, γ is the transverse propagation constant which is related to β by Eqs (1.3), where β_{cp} is the propagation constant in a medium having a permittivity ε and a permeability μ. For a system consisting of a cylindrical helix situated inside a magneto-dielectric tube (Figure 1), the dispersion equation is:

$$\frac{x_{01}^2}{\beta_0^2 r_1^2} \operatorname{tg}^2\psi = \frac{1-A}{1-B}\rho_{101}\tau_{101}\frac{\left[1-(\sigma_{102}/\sigma_{101})\right]-B\left[1+(\sigma_{002}/\sigma_{101})\right]}{\left[1+(\sigma_{102}/\sigma_{001})\right]-A\left[1-(\sigma_{002}/\sigma_{001})\right]} \quad (1.4)$$

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$$x_{01} = \gamma_0 r_1, \quad x_{11} = \gamma_1 \gamma_1$$

Influence of the Magneto-dielectric Medium on the Propagation of Electromagnetic Waves in a Helical Waveguide Situated in a Magneto-dielectric

where A and B are defined by Eqs (1.5). The symbol Ψ in the above equations denotes the winding angle of the helix. In the symbols σ_{nml} and ξ_{nml}, the first subcript denotes the order of the functions in Eqs (1.2), the second subscript refers to the medium, while the third subscript denotes the radius of the helix or the radius of the magneto-dielectric. The constants δ_1 and θ_1, which define the relative field components in the space between the helix and the magneto-dielectric, and δ_2 and θ_2, which refer to the inside of the magneto-dielectric tube, are expressed by Eqs (1.6). Eq (1.4) determines the relationship between the transverse propagation constants for vacuum γ_o and for magneto-dielectric γ_1; These quantities are related by Eqs (1.7).

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Influence of the Magneto-dielectric Medium on the Propagation of Electromagnetic Waves in a Helical Waveguide Situated in a Magneto-dielectric

By adopting the notation $\gamma_0 r_1 = x_{01}$ and $\delta_1 r_1 = x_{11}$, the dispersion equation takes the form of Eq (1.9), where $y = x_{11}/x_{01}$, $\varepsilon = \varepsilon_1/\varepsilon_0$, $\mu = \mu_1/\mu_0$ and $F(x_{01}, y, \varepsilon, \mu)$ is a transcendental function which, for fixed values of ε and μ depends only on x_{01} and y. Eq (1.9) can be solved by grapho-analytical methods (Refs 13-15). This type of solution is illustrated in Figure 2. Eq (1.9) can be used to evaluate the delay of the system. This is defined by:

$$m = \frac{c}{v_\varphi} = \left(\frac{\varepsilon\mu - 1}{1 - y^2} - 1 \right)^{1/2} \qquad (1.10)$$

where c is the velocity of light in vacuum and v_φ is the phase velocity of a wave in the system. The calculated

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results obtained on the basis of Eq (1.9) are shown in Figures 3-7. Figure 3 illustrates the dependence of $(c/v_\Phi)tg\Psi$ on the ratio of the radius of the magneto-dielectric to the radius of the helix. The values of c/v_Φ as a function of βr_1 are plotted in Figures 4 and 5 for various values of ε and μ. Similar curves are shown in Figure 6. Figure 7 illustrates the solution of Eq (1.9) for special cases. Further calculated results are given in Figure 8, which shows the ratio of the power propagating inside the helix to the power outside it as a function βr_1. When the helix is closely adjacent to the magneto-dielectric, the boundary conditions of the system can be expressed by Eqs (3.1) (Refs 16, 17). The notation adopted in these equations is defined by Eq (3.2), where l is the width of the tape of the helix and d is its spacing. For this system, the dispersion

Influence of the Magneto-dielectric Medium on the Propagation of Electromagnetic Waves in a Helical Waveguide Situated in a Magneto-dielectric

equation is in the form of Eq (3.3). This is used to plot the graphs of Figure 10, which show that the delay of the system is strongly dependent on the values of ε. The losses due to the magneto-dielectric in the system can be evaluated by considering the dispersion equation for $r_1 = r_2$ and $r_3 = \infty$. The resulting expression at high frequencies is in the form of Eq (4.1). If the quantities β, ε and μ in Eq (1.4) are complex (as defined by Eqs 4.2) and if the conditions of Eqs (4.3) are fulfilled, the relationship between the real and the imaginary components of β are expressed by Eq (4.4). In this, the ratio $\varepsilon''/\varepsilon'$ characterises the dielectric losses, while μ''/μ' represents the magnetic losses. The possible applications of the above type of waveguide (helix in a magneto-dielectric tube) are discussed. It is shown that the waveguides can be used in travelling-wave tubes (as

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Influence of the Magneto-dielectric Medium on the Propagation of Electromagnetic Waves in a Helical Waveguide Situated in a Magneto-dielectric SOV 24-59-4-21/33

delay systems or matching sections), antennae, measurement of permittivity and permeability of various materials and long-distance transmission waveguides.
There are 10 figures and 22 references, of which 5 are English, 17 Soviet; 1 of the Soviet references is translated from English.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet (Khar'kov State University)

SUBMITTED: April 9, 1959

Card 8/8

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A001/A001

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 10, p. 321, # 27490

AUTHORS: Bulgakov, B.M., Shestopalov, V.P.

TITLE: Propagation of Electromagnetic Waves in Decelerating Systems Which Contain a Spiral and a Dielectric

PERIODICAL: Tr. Konferentsii po elektronike SVCh, 1957, Moscow-Leningrad, Gosenergoizdat, 1959, pp. 150 - 170

TEXT: The authors investigate theoretically propagation of electromagnetic waves in a spiral waveguide placed into a dielectric medium, when a monoenergetic electron beam is moving along the system axis. The problem was solved by the method of linking the fields at the interface of the beam and the spiral cyclindrical surface, which conducts anisotropically, in the approximation of the weak signal theory. It was established that with the increasing dielectric constant of the medium, into which the spiral is placed, the amplification of the system, at a constant wavelength, decreases somewhat with a certain increase in the velocity range of the electron beam, for which amplification is still possible. It is also

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shown that the amplification factor of such a system can be larger than the amplification factor of the spiral - electron beam system, if the wavelength of amplified oscillations is chosen in a special way and satisfies the following relation:

$$\frac{c}{v_{ph}} \cdot \frac{2\pi}{\lambda_o} a = \text{const},$$

where c and λ_o are light velocity and wavelength in free space, v_{ph} is the phase velocity of the decelerated wave, and a is spiral radius. Possible changes in the design of the spiral - dielectric system are considered. It was established that the introduction of additional elements into the decelerating system (axial metal rod, external metal casing, etc) permits changes in the nature of dispersion characteristics of the system. The authors performed also an analysis of the system consisting of a spiral and a magneto-dielectric. The use in decelerating systems of magnetics, side-by-side with dielectrics, leads to a considerable re-distribution of the flux of electromagnetic energy which propagates in the system. There are 9 references.

V.P. Shestopalov

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

BULGAKOV, B. M., Cand Phys-Math Sci -- (diss) "Propagation of electromagnetic waves in spiral waveguides set in laminated magnetodielectric and gyrotropic media." Khar'kov, 1960. 9 pp; (Ministry of Higher and Secondary Specialist Education Ukrainian SSR, Khar'kov Order of Labor Red Banner State Univ im A. M. Gor'kiy); 150 copies; free; bibliography at end of text (14 entries); (KL, 25-60, 125)

88159

S/109/60/005/011/008/014
E140/E485

9/1300

AUTHORS: Bulgakov, B.M., Shestopalov, V.P., Shishkin, L.A. and Yakimenko, I.P.

TITLE: Symmetrical Surface Waves in a Helical Waveguide Immersed in a Ferrite Medium

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.11, pp.1818-1827

TEXT: Suhl and Walker (Ref.3) have considered the dispersion properties of a helical waveguide with external ferrite medium in the presence of a constant transverse magnetic bias. The dispersion equations of such a system contain modified Bessel functions as well as Laguerre or Whittaker functions which complicates the analysis of the characteristic equations. If the magnetic bias field is parallel to the axis of the system, the longitudinal field components in the ferrite and free space are expressed by the modified Bessel functions. The dispersion equation can be analysed more fully therefore than in the case of transverse bias. The article derives the dispersion equation of a helical waveguide placed in a cylindrical cavity in an infinite ferrite medium. In cylindrical coordinates, the waveguide passes

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Symmetrical Surface Waves in a Helical Waveguide Immersed in a Ferrite Medium

in a radial direction. It is assumed that slow axially-symmetrical waves propagate in the system. The following special cases are considered: small gyrotropicity, large magnetic bias field, the system close to resonance and low magnetic permeability. The dispersion equations here derived are solved by a method of successive approximations. The dispersion curves for various values of the system parameters are given. The article concludes with the calculation of the power flux distribution in the system. There are 6 figures and 12 references: 9 Soviet (one of which is a translation from English) and 3 non-Soviet.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet
im. A.M.Gor'kogo
(Khar'kov State University imeni A.M.Gor'kiy)

SUBMITTED: December 10, 1959

Card 2/2

BULGAKOV, B.M., SHESTOPALOV, V.P., SHISHKIN, L.A., YAKIMENKO, I.P.

Slow waves in a spiral wave guide with plasma. Zhur. tekh. fiz. 30 no.7:840-850 Jl '60. (MIRA 13:8)

1. Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo.
(Wave guides) (Plasma (Ionized gases))

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S/109/61/006/001/010/023
E140/E163

AUTHORS: Bulgakov, B.M., Shestopalov, V.P., Shishkin, L.A., and Yakimenko, I.P.

TITLE: Unilateral wave propagation in helical waveguide immersed in ferrite medium

PERIODICAL: Radiotekhnika i elektronika, Vol.6, No.1, 1961, pp. 81-91

TEXT: The authors consider the previously observed but not satisfactorily explained phenomenon of directive propagation in a system consisting of a helix surrounded by a ferrite medium with an applied constant axial magnetic field. The actual directivity observed of 6:1 (Ref.2: J.A. Rich, S.E. Weber, Proc. I.R.E., 1955, 43, 1, 100) is higher than that predicted by elementary theory, which determines the degree of directivity from the eccentricity of the magnetic field vector ellipse in the plane perpendicular to the constant magnetic field. Rich and Weber (Ref.2) proposed that the divergence between the experimental results and the predictions of the elementary theory are caused by the influence of the ferrite permeability on the magnetic

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307430005-9"

Unilateral wave propagation in ...

vector ellipse eccentricity. The present authors have previously (Ref.3) published an electrodynamic solution of the problem for lossless systems. The present note solves the same problem for systems with dielectric and magnetic losses having a ferro-resonant character. The analysis predicts directivities of up to 8:1, a result useful for the design of ferrite attenuators for TWT-amplifiers. On the basis of the formulae obtained curves have been calculated which permit the following conclusions. (1) The directivity has a maximum in the neighbourhood of a resonant frequency, of the order of 8:1. (2) The dependence of attenuation of magnetization for a given magnetic field is weak. (3) At frequencies equidistant from resonance the attenuation increases as the magnetic field decreases. (4) In the presence of high dielectric losses frequency bands are possible in which the backward attenuation is lower than the forward attenuation. Thus the dependence of attenuation ratio and of absolute attenuation on the dielectric loss have the same character. It is necessary to take ferrites with the lowest possible dielectric loss.

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Unilateral wave propagation in ...

There are 5 figures and 5 references: 3 Soviet and 2 English.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A.M. Gor'kogo
(Khar'kov State University imeni A.M. Gor'kiy)

SUBMITTED: February 15, 1960

Card 3/3

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D262/D306

9.1925

AUTHORS: Shestopalov, V.P., Bulgakov, A.A., and Bulgakov, B.M.

TITLE: Theoretical and experimental analysis of helical-dielectric antennae

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 7, 1961, 1136 - 1145.

TEXT: Dielectric and helical antennae are widely used in SHF range as the antennae for travelling waves. They consist of sections of a dielectric or helical waveguides, along which the electromagnetic wave can be propagated with a phase velocity v_f less than the velocity of light e in the free space. In a helical dielectric antennae there should be properties common both to the helical and to the dielectric antenna. In particular, its geometrical dimensions, for given angle of the helix ψ and for given dielectric constant ε, should be smaller. In the present article the theoretical and experimental study of mal antennae is presented. The theoretical analysis is

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carried out considering an infinite helical - dielectric waveguide made of a ribbon helix of radius a, width of the ribbon δ, angle of the helix ψ and pitch p. The helix is filled with dielectric having the dielectric constant ε_1 and magnetic permeability μ_1; outside the helix there is a medium with ε_2 and μ_2. The analysis shows that 1) The dielectric within the waveguide slows down considerably the phase velocity of the electromagnetic waves and increases the delay. This has been shown by solving the dispersion equation of the system with the boundary conditions as given in

$$E_z^{(1)}|_{r=a} = E_z^{(2)}|_{r=a}, \quad E_\varphi^{(1)}|_{r=a} = E_\varphi^{(2)}|_{r=a}, \qquad (1)$$
$$(H_z^{(2)} - H_z^{(1)})|_{r=a} = j_\varphi, \quad (H_\varphi^{(1)} - H_\varphi^{(2)})|_{r=a} = j_z,$$

where indices 1, 2 refer to the space inside and outside the helix; j_φ, j_z - the surface components of current at the helix. From the obtained dispersion equations the current distribution is given by

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$$j_{sn} = \frac{\sin\frac{\Delta n}{2}}{\frac{\Delta n}{2}}, \quad \Delta = \frac{2p}{\pi\delta}. \qquad (9)$$

the non-resonant term of which is

$$S = 2\left[\left(\frac{\gamma_{0a}}{k_{2a}}\right)^2 \operatorname{tg}^2\psi \frac{1}{\varepsilon_1+\varepsilon_2} - \frac{1}{\frac{1}{\mu_1}+\frac{1}{\mu_2}}\right]\sin\psi \ln\frac{2}{\Delta}. \qquad (10)$$

2) The increase in time delay in the helix dielectric waveguide results in a greater directivity of radiating into the free space energy. This is established by applying Kirchhoff's integral method to the electric field $\vec{E}_m$

$$\vec{E}_M = \frac{ie^{-ik_0R}}{k_0R}\int_0^l e^{2\pi iz\left(\frac{\cos\Theta}{\lambda_0}-\frac{1}{\lambda_g}\right)}dz \int_0^{2\pi}\vec{V}(\varphi, \Theta, \Phi)\,d\Phi, \qquad (13)$$

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where λ_g - the wavelength of delayed wave; R - distance to the observation point; θ, φ - spherical coordinate system angles; Φ - azimuth angle along the cylinderical antenna surface; l - length of the antenna; V is independent of z. 3) The introduction of dielectric shifts the directivity pattern with respect to the antenna axis. This has been confirmed experimentally, although not quantitatively. It is thought that this effect is due to assymetrical, with respect to the helix azimuth, waves. 4) The dielectric filling the helix antenna permits the decrease of the antenna dimensions $\sqrt{3}$ times approximately but then the bandwidth of the antenna decreases. 5) To increase the bandwidth a stratified dielectric or a magneto dielectric medium should be used, the experimental part, consisting of measuring directivity patterns and current distribution along the antenna for helices with ψ = 4.13; 5.16; 8.42 and ε = 1; 4.5; 20; 81. In all cases the helix dimensions were kept constant: l = 14 cm; 2a = 4.6 cm, the wavelength being changed. The energy was supplied by a generator type ГС/12 (GS/12). For matching the central conductor was fixed on to organic glass terminals,

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Theoretical and experimental ...

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D062/D306

ABSTRACT: [illegible]

ASSOCIATION: [illegible]

SUBMITTED: [illegible]

Card 2/5

OBOLDUYEV, G.T.; PETROV, L.N.; SUKHANOV, G.I.; KAMNEV, P.V., kand. tekhn. nauk, red.; BULGAKOV, B.S., inzh., retsenzent

[Hammering and press forging] Kovka pod molotami i pressami. Moskva, Mashinostroenie, 1964. 206 p. (Bibliotechka kuznetsa-novatora, no.4) (MIRA 17:12)

BULGAKOV, Boris Sergeyevich; GATOV, B.I., red.; FREGER, D.P., red. izd-va; BELOGUROVA, I.A., tekhn. red.

[Adopting the group method of press forging die blocks] Osvoenie gruppovoi tekhnologii kovki shtampovykh kubikov pod pressami. Leningrad, 1962. 21 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia; Goriachaia i kholodnaia obrabotka metallov davleniem, no.7)
(MIRA 16:3)

(Forging)

S/182/62/000/007/003/007
D040/D113

AUTHOR: Bulgakov, B.S.

TITLE: Group method of forging die blocks

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 7, 1962, 14-18

TEXT: The Leningradskiy Zavod "Bol'shevik" (Leningrad "Bol'shevik" Plant) uses a "group-forging" method by which several die blocks are forged in flat dies from one steel ingot without preliminary billeting; only one reheat, instead of three reheats formerly used, is required. The new technique results in 15% less metal waste in cropping and 15% higher forging productivity. Detailed engineering data is given on the process, which was developed initially for forging 3 die blocks from one 5.5 ton ingot, and is now used with ingots weighing up to 8-9 t. Die blocks are produced as per ГОСТ 7831-55 (GOST 7831-55) using 4 different process programs depending on the weight of the ingots, the number of die blocks to be produced from one ingot, and the type and capacity of the press. The 4 processes are illustrated by a chart with sketch drawings. A drawing shows the tooling used at the "Bol'shevik"

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Group method of forging die blocks

Plant. Critical remarks are made in connection with a die block forging description given by N.V. Volynkin ("Kuznechno-shtampovochnoye proizvodstvo", no. 11, 1961). It is mentioned that the billeting operation was eliminated when forging any ingots (except for steel with specific physical properties), including billets used for die blocks. The author points out that forging with swaging of separate billets must only be employed in exclusive cases, mainly in drop forging when swaging of the entire billet is impossible. There are 2 figures and 1 chart.

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BULGAKOV, Boris Sergeyevich; KAMNEV, P.V., red.; FREGER, D.P., red.izd-va; BELOGUROVA, I.A., tekhn. red.

[Making large titanium alloy forgings] Kovka krupnykh pokovok iz titanovogo splava; stenogramma lektsii ob opyte zavodov, prochitannoi v LDNTP na zaniatii seminara po kovke i goriachei shtampovke. Leningrad, 1963. 35 p. (MIRA 17:1)
(Titanium alloys) (Forcing)

L 25680-65 EWT(d)/EWP(v)/EWA(d)/EWP(c)/T/EWP(h)/EWP(k)/EWP(l) Pf-4

ACCESSION NR: AP4047608 S/0193/64/000/010/0040/0042

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22
B

AUTHOR: Bulgakov, B. S.

TITLE: Automation of hydraulic forging presses 14

SOURCE: Byulleten' tekhniko-ekonomicheskoy informatsii, no. 10, 1964, 40-42

TOPIC TAGS: hydraulic forging press, automation

ABSTRACT: The Nevsk Machine Works (Nevskiy mashinostroitel'ny*y zavod im. V. I. Lenina Leningradskogo sovnarkhoza) in collaboration with the Moscow Machine Instrument Institute (Moskovskiy stankoinstrumental'nyy institut) in 1962-63 completely automated the 2000T and 3000T hydraulic forging presses with a radioactive measuring-controlling device. The Kirovsk Works (Kirovskiy zavod) similarly automated their 2000T press, the Izhorsk Works (Izhorskiy zavod), their 1250T press, and the Bolshevik Works (Zavod "Bol'shevik") their 1000T press. Automation of the Nevsk 2000T press can effect up to 40,000 rubles annual savings. The forgings produced by hydraulic and steam-hydraulic presses

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with the automated controls have a clean smooth surface, more accurate than previously produced. The output was increased by 20%, the time required for forge preparation and the metal consumption were reduced, and the available operating time of the presses was increased. Orig. art. has: 1 figure

ASSOCIATION: None

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

NR REF SOV: 000 OTHER: 000

Card 2/2

BULGAKOV, E.B.; GROMAN, M.B.

Standardization of corrected gear wheels. Standartizatsiia 26 7:7-10 Jl '62. (MIRA 15:7)
(Gearing--Standards)

STEPANOV, Vsevolod Georgiyevich, kand. tekhn. nauk; BULGAKOV, B.S., red.

[Equipment for the explosive forming of parts by means of the electrohydraulic effect; verbatim report of a lecture] Osnastka dlia gidrovzryvnoi shtampovki krupnogabaritnykh detalei; stenogramma lektsii. Leningrad, 1964. 33 p. (MIRA 17:7)

BULGAKOV, E. Kh., inzh.

"Some special feature of building in the Far North" by B. I. Berezovskii. Reviewed by E. Kh. Bulgakov. Prom. stroi. 39 no.4:62-63 '61. (MIRA 14:6)
(Russia, Northern—Construction industry)
(Berezovskii, B. I.)

MIRONOV, S.A.; BULGAKOV, E.Kh.

Concreting foundations in permafrost. Osn., fund. i mekh. grun. 4 no.3:8-10 '62. (MIRA 15:7)
(Frozen ground) (Foundations)
(Concrete construction)

BULGAKOV, E.Kh., inzh.

Characteristics of concrete work during the laying of foundations on permafrost soils. Izv.ASiA 4 no.1:98-106 '62. (MIRA 15:11)
(Foundations) (Frozen ground)
(Russia, Northern--Concrete construction--Cold weather conditions)

BULGAKOV, E.Kh., inzh.

Monolithic concrete pipes manufactured at the building site. Bet. i zhel.-bet. 8 no.3:136-137 Mr '62. (MIRA 15:3)
(Pipe, Concrete)

BULGAKOV, E.Kh., inzh.

Designing the concentration of chloride solutions in winter concreting. Bet. i zhel.-bet. 8 no.12:560-563 D '62. (MIRA 16:2)

(Concrete construction--Cold weather conditions)
(Chlorides)

BULGAKOV, E.Kh., inzh.

Dependence of the strength of concrete on water losses during thawing and subsequent hardening. Trudy NIIZHB no.32: 116-122 '63. (MIRA 17:1)

Bulgakov, F.N.

BULGAKOV, F. N.

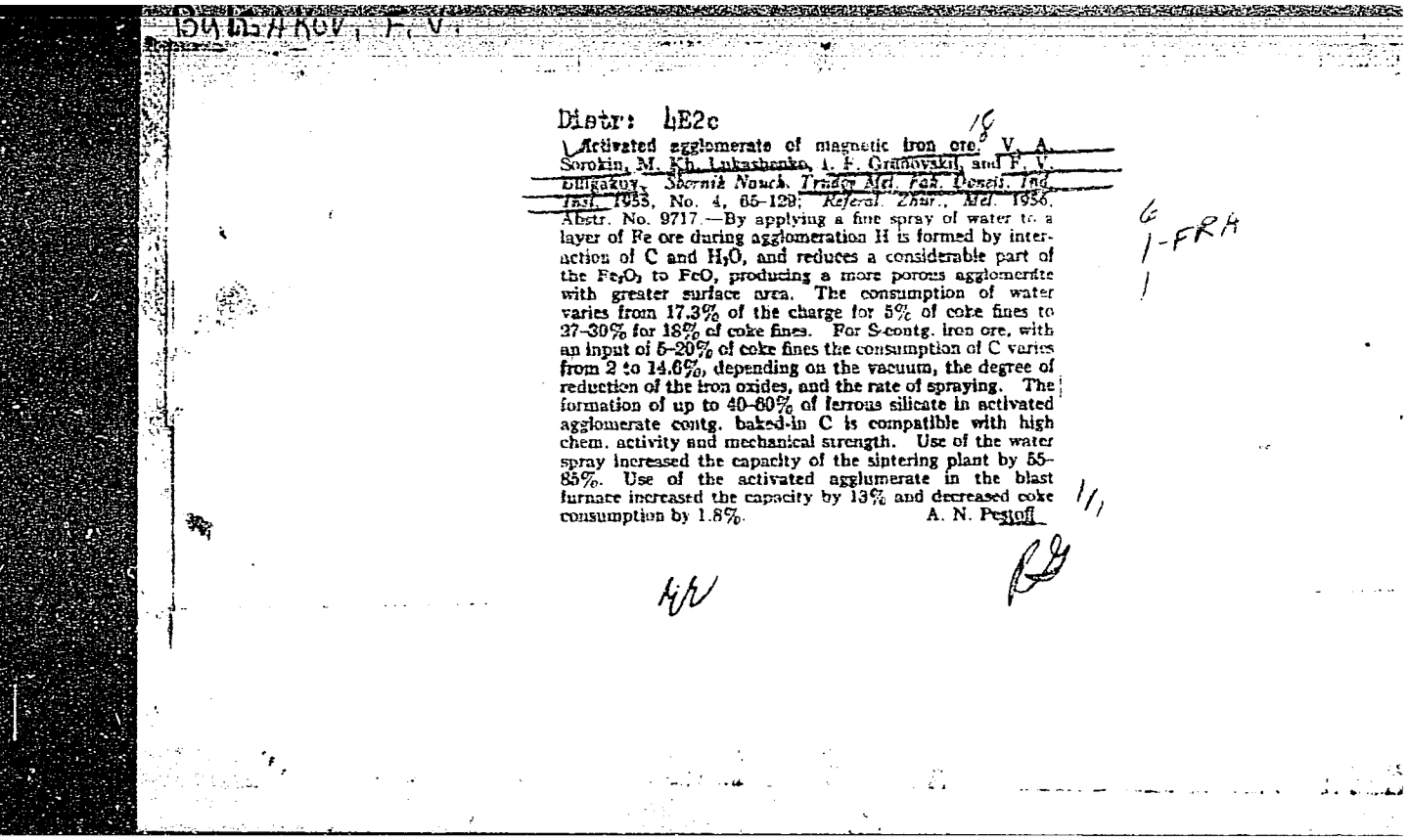
Droblenie i grokhochenie uglei [Crushing and screening coal]. Moskva, Ugletekhizdat, 1953. 160 p.

SO: Monthly List of Russian Accessions, Vol. 7, No. 3, June 1954.

BULGAKOV, Fedor Nikitovich; GUSAKOVA, Mariya Afrikanovna; STOROZHENKO, Aleksandr Panteleyevich; MARGOLIN, V.A., otvetstvennyy redaktor; GARBER, T.N., redaktor izdatel'stva; ANDREYEV, G.G., tekhnicheskiy redaktor

[Work practices of the Kalmius central coal preparation plant] Opyt raboty Kal'miusskoi tsentral'noi ugleobogatitel'noi fabriki. Moskva, Ugletekhizdat, 1956. 28 p. (MLRA 9:12)
(Donets Basin--Coal preparation)

BULGAKOV, F. N. Cand Teoh Sci -- (diss) "Study of ~~the~~ a centrifugal screen for ~~the~~ separation of the moist coal charges of chemical coke plants." Stalino, 1959. 17 pp with charts (Min of Higher and Secondary Specialized Education UkSSR. Donets Order of Labor Red Banner Industial Inst), 150 copies (KL, 52-59, 120)



Distr: 4E2c

Activated agglomerate of magnetic iron ore. V. A. Sorokin, M. Kh. Lukashenko, I. F. Gritsovskii, and F. V. Dilligakov. *Sbornik Nauch. Trudov Mol. Fak. Donsk. Ind. Inst.* 1955, No. 4, 65–129; *Referat. Zhur., Met.* 1956, Abstr. No. 9717.—By applying a fine spray of water to a layer of Fe ore during agglomeration H is formed by interaction of C and H_2O, and reduces a considerable part of the Fe_2O_3 to FeO, producing a more porous agglomerate with greater surface area. The consumption of water varies from 17.3% of the charge for 5% of coke fines to 27–30% for 18% of coke fines. For S-contg. iron ore, with an input of 5–20% of coke fines the consumption of C varies from 2 to 14.6%, depending on the vacuum, the degree of reduction of the iron oxides, and the rate of spraying. The formation of up to 40–60% of ferrous silicate in activated agglomerate contg. baked-in C is compatible with high chem. activity and mechanical strength. Use of the water spray increased the capacity of the sintering plant by 55–85%. Use of the activated agglomerate in the blast furnace increased the capacity by 13% and decreased coke consumption by 1.8%. A. N. Pestoff