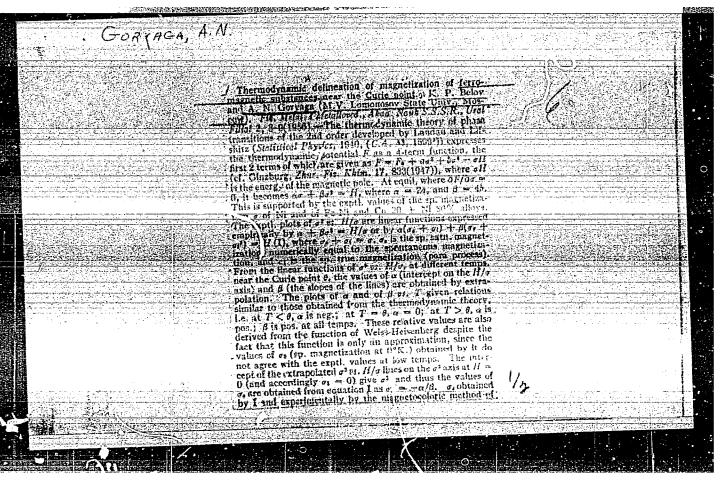
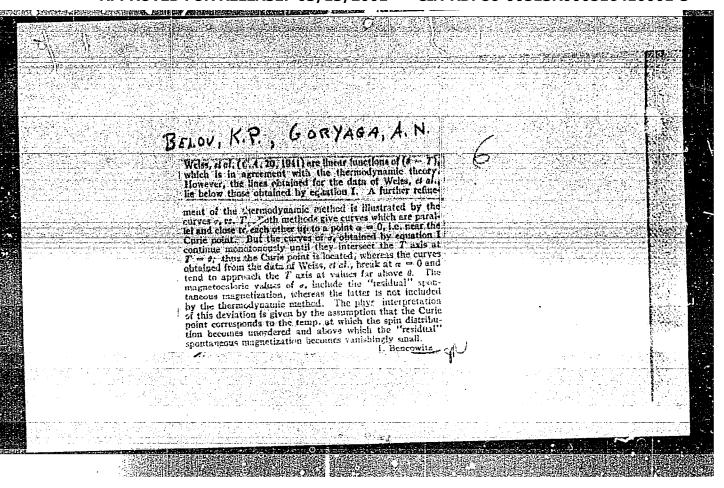


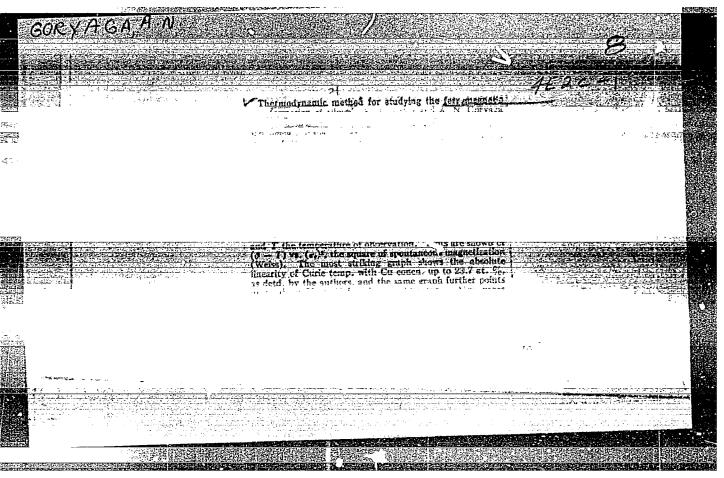
GORYAGA, A. N., BELOV, K. P., and PAYHES, Y. (Moscow)

SELECTED AND DESCRIPTION OF THE PROPERTY OF TH

"Thermodynamic Investigation of Ferromagnetics Substances in the Region of the Curie Temperature," paper presented at the International Conference on Physics of Magnetic Phenomena, Sverdlovsk, USSR, 23-31 May 1956.







GORYAGA, A.V

48-8-1/25

AUTHORS:

Belov, K.P., Goryaga, A.N.

TITLE:

Effects of Structural Properties of Ferromagnetica on the Temperature. Dependence of Spontaneous Magnetization (Vliyaniye strukturnykh osobennostey ferromagnetikov na temperaturnyy khod spontannoy namagnichennosti)

PERIODICAL:

Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol. 21, Nr 8, pp. 1038 - 1046 (USSR)

ABSTRACT:

It is maintained in this paper, that at present no systematic experimental data on the effects produced by structural properties on the temperature dependence of the spontaneous magnetization of alloys in the vicinity of the Curie-point are to be found in publications. This paper furnishes such data with respect to some nickel-alloys, which were obtained according to two methods. 1.) the method by Weiss and Forrer, which consists in the extrapolation of the curves H(T) = const of spontaneous magnetization for different intensities of magnetization to the value H = 0, and 2.) the method of thermodynamic coefficients, according to the thermodynamic equation = AG = H(G denoting the specific magnetization, and Endag thermodynamic coefficients.

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Effects of Structural Properties of Ferromagnetica on the Temperature Dependence of Spontaneous Magnetization

efficients.). Three examples of alloys are considered in the paper: Ni-Cu, Ni-Mn and Ni-Fe (invar alloy). In the first case (Ni-Cu) the author arrives at the conclusion, that the temperature dependence of spontaneous magnetization, as well as the thermodynamic coefficients &, & are very sensitive to variations of the concentration of the components in the vicinity of the Curie point. A quantitative comparison of the values of the coefficients of such alloys with a varying copper content is only possible after a prolonged annealing (50 hrs). A comparison of the coefficients (§) for nickel and nickel-copper alloys showed, that the value of § decreases with an increasing copper content in the alloy. According to the theory by Vonsovskiy and Vlasov in the case of Ni-Cu alloys the gradient of the straight line (\$\sigma_{\sigma} / \sigma_{\sigma} \) (T/O) decreases with the decrease of the exchange-interaction (s-d). In the second case of the Ni_Mn compound the author is lead to the conclusion, that the "tails" of the curves of spontaneous magnetization do not shrink during annealing, but grow in length. Ferromagnetic transformation is weakened here. Therefore a regular arrangement is difficult to obtain. In the third case of the Ni-Fe invar alloy magnetic ano-

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48-8-1/25

Effects of Structural Properties of Ferromagnetica on the Temperature Dependence of Spontaneous Magnetization

malies are mentioned. The temperature dependence of spontaneous magnetization near Curie point is here dependent on thermic history. Experiments have shown in this case that the ferromagnetic transformation of this alloy is extraordinarily weakened with respect to the temperature interval. As a possible source of this phenomenon it is considered, that the ferromagnetism in such alloys is caused by an unstable atomic interaction in the first sphere of coordination, as well as in the subsequent spheres, which gives rise to the weakening of the ferromagnetic transformation. There are 13 figures, 2 tables and 12 references, 8 of which are Slavic.

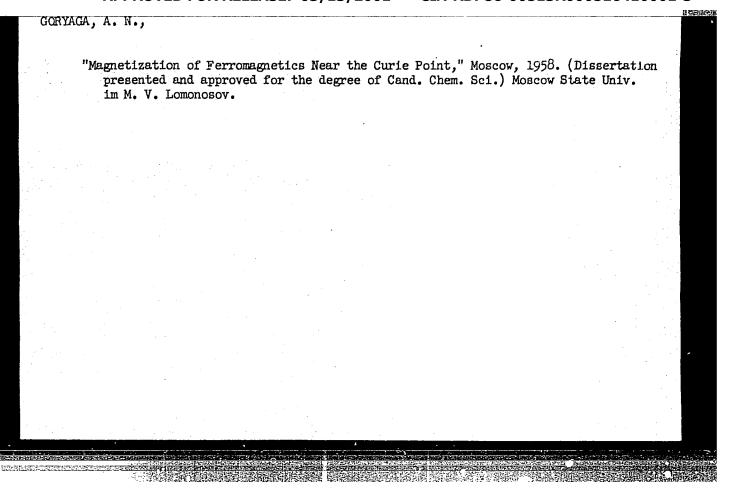
ASSOCIATION:

Dept. of Physics of the Moscow State University imeni M.V. Lomonosov (Fizicheskiy fakultet Moskovskogo gos. universiteta im. M.V. Lomonosova)

AVAILABLE:

Library of Congress

Card 3/3



24.7600 24.2130 24.3), 18 (6)

AUTHORS: Goryaga, A. N., Koroleva, L. I.

50V/55-59-3-13/32

TITLE:

The Electric and Galvanomagnetic Properties of Nickel - Zinc -

Ferrite N

PERIODICAL:

Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, Nr 3, pp 97 - 104 (USSR)

ABSTRACT:

It was the aim of the present paper to investigate the electric and galvanomagnetic properties of nickel-zinc ferrite, which, according to data published in recent literature, has the highest magnetic permeability and the highest dielectric constant. The ferrite sample of the composition 14.5% NiO, 36% ZnO, 49.5% Fe₂O₃ (in mol percents) was produced according to the usual ceramic process at the sintering temperature of 1320 (5 hours). The contacts were produced by burning-in a silver paste into the sample at 500°, as well as by dusting on to the cathode and by rubbing on of graphite. Burning-in of the silver paste does not essentially distort the results obtained by measuring the electric resistivity of the ferrite. The resistivity could immediately be determined on the cube-shaped sample. The

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The Electric and Galvanomagnetic Properties of Nickel - SOV/55-59-3-13/32 Zinc - Ferrite

electric resistivity of the ferrite depends essentially on the amperage of the current passing through the sample. The magnetization of the nickel-zinc ferrite was measured at various temperatures by the ponderomotoric method. The sample under investigation has a negative sign of the thermoelectromotive force, i.e. an n-type conductivity. The specific resistivity was investigated in the interval ranging from room temperature to 500°. The curve lgq = f(1/T) has four straight-lined regions and three breaks. The first break point corresponds to the Curie temperature of 80.50, which agrees with the experimental work by V. V. Komar and V. V. Klyushin (Ref 2). Next, the theoretical calculations by P. P. Irkhin and Ye. A. Turov (Ref 4) are mentioned. The result of the present paper corresponds to the quantum-mechanical theory of the last-named authors. The nature of the two other break points is, as yet, not clear. According to the results given, the electric resistivity of a nickel-zino ferrite probably has a more complicated character than the usual semiconductors. The transversal and the longitudinal galvanomagnetic effect have the same (negative) sign and also approximately the same values. Both at room temperature and at higher

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The Electric and Calvanomagnetic Properties of Nickel - SOV/55-59-3-13/32
Zinc - Ferrite

temperatures $\Delta \varrho/\varrho$ is caused nearly exclusively by the paraprocess (by true magnetization). For all field strengths, the galvanomagnetic effect has a highly blurred maximum in the temperature interval of from 60 to 65°. The result obtained by the present paper agrees with that obtained by K. P. Belov and Ye. V. Talalayeva (Ref 5) as concerning the temperature dependence of the galvanomagnetic effect in polycrystalline and monocrystalline samples of manganese ferrites. In the case of the ferrite under investigation (as well as in the case of ferromagnetic metals and alloys) the galvanomagnetic effect is a , linear function of magnetization: $-\Delta \varrho/\varrho = c(\sigma^2 - \sigma_S^2)$, where σ_S denotes spontaneous magnetization. Spontaneous magnetization decreases sharply with increasing temperature. In the case of the ferrite under investigation, the influence exerted by the inhomogeneous composition of the sample upon magnetic transformation is probably considerable. In metallic ferromagnetics and also in a ferrite in the immediate vicinity of the Curie point, the galvanomagnetic effect is proportional to H^2/\sim . The authors

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68045

The Electric and Galvanomagnetic Properties of Nickel - SOV/55-59-3-13/32

Zinc - Ferrite

thank Professor K. P. Belov for his useful advice. There are 8 figures and 7 references, 6 of which are Soviet.

ASSOCIATION: Kafedra obshchey fiziki dlya biologo-pochvennogo fakul'teta

(Chair of General Physics for the Biology and Soil Department)

SUBMITTED: January 21, 1959

Card 4/4

85703

S/056/60/038/006/046/049/xx B006/B070

24.7600 (1035,1043,1160) AUTHORS:

K. P., Goryaga, A. N., Lin' Chzhan-da

TITLE:

actrical and Galvanomagnetic Properties of Lithium Ferrite Chromita in the Vicinity of the Compensation Point

PERIODICAL:

Zhurnal eksperimental noy i teoreticheskoy fiziki, 1960,

Vol. 38, No. 6, pp. 1914 - 1915

Some ferrites showing a compensation point (θ_k) (in which the magnetic moments of the sub-lattices are in equilibrium) exhibit strongly anomalous temperature dependence of the spontaneous magnetization, and the magnetostrictive properties above and below $\boldsymbol{\theta}_k$ are largely different.

In gadolynium ferrite garnet, for example, they are determined below \mathfrak{O}_{k} essentially by the gadolynium sub-lattice, and above θ_k by the iron sublattice. Further studies of the role of sub-lattices in ferrimagnetism are communicated in this "Letter to the Editor". Electrical and galvanomagnetic effects in lithium ferrite chromite with a compensation point

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85703

Electrical and Galvanomagnetic Properties of Lithium Ferrite Chromite in the Vicinity of the Compensation Point

S/056/60/038/006/046/049/XX B006/B070

were measured. Fig.1 shows the temperature dependence of the longitudinal galvanomagnetic effect for different magnetic field strengths for Li₂0°2.5Fe₂0₃°2.5Cr₂0₃. The temperature dependence of the electrical resistance was measured for the same ferrite. Fig.2 shows logR=f(!/T) for d.c. (Curve 1) and a.c. (200 kc/sec, Curve 2). The temperature dependence of magnetization at H=2500e is also plotted. The behavior of the individual curves is discussed. The bend of the curves at θ_k is to be attributed, according to Ye. A. Turov and Yu. P. Irkhin, to the compensation of the volume fields of the magnetic sub-lattices at θ_k . There are 2 figures and 5 references: 2 Soviet, 2 French, and 1 Belgian.

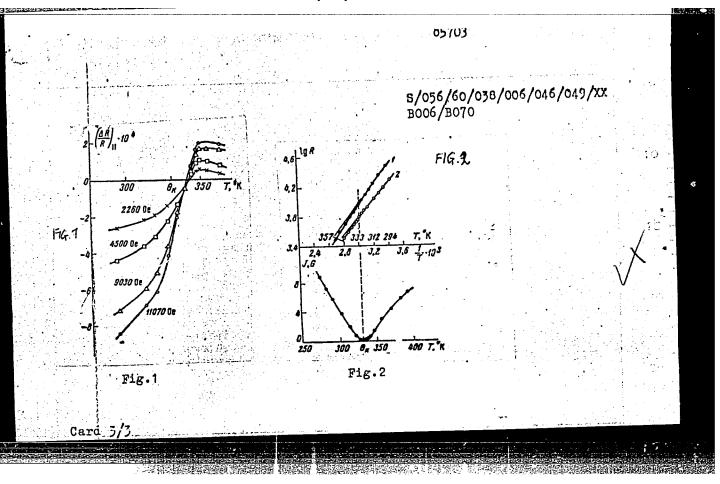
ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Mossow State University)

SUBMITTED:

March 29, 1960

Card 2/3

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S/126/61/012/003/019/021 E073/E335

AUTHORS: Goryaga, A.N., Levitin, R.Z. and Lin Chang-ta

TITLE: Anomaly of the Young modulus and internal friction in ferrites with a compensation point

PERIODICAL: Fizika metallov i metallovedeniye v. 12, no. 3, 1961, 458 - 460

TEXT: The authors studied the dependence of the Young modulus and of the internal friction of two ferrites of the following compositions: Li₂0·2·7Fe₂0₃ · 2·3Cr₂0₃ (with the compensation point $\Theta_k = 371.5$ °K) and Li₂0·2·5Fe₂0₃ · 2·5Cr₂0₃ ($\Theta_k = 326$ °K). The Yound modulus E and the internal friction Q^{-1} were measured by a method described by I.R. Zacharias (Ref. 9 - Phys. Rev., 1933, 44, 116), using a frequency of 150 kc/s. Fig. la show the temperature dependence of the Young modulus E, dyne/cm² x 10⁻¹¹ in the demagnetized state,

modulus E, dyne/cm x 10 in the demagnetized state, i.e. for H = 0 and at saturation, i.e. H = 2 690 Oe. It can be seen that, at the compensation point, the Young modulus Card $1/\frac{5}{3}$

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decreases and this phenomenon is particularly pronounced if an electric field (H = 2 690 0e) is applied. The maximum internal friction occurs at the same temperature but its magnitude is almost independent of the field (Fig. 15, shows the internal friction Q^{-1} versus temperature, oK). The temperature dependence of the ΔE effect in a saturation field of the same ferrite is shown in Fig. 2. This effect decreases at the compensation point, which is obviously associated with a reduction in the role of the processes of technical magnetization on approaching the compensation temperature. The fact that the ΔE effect differs from 0 at \mathfrak{Y}_k is attributed to the incomplete compensation of the spontaneous magnetization of the sub-lattices. Similar temperature dependences of E, Q-1 and of the ΔE effect were also obtained for the ferrite of the composition LiH20 2.5Fe20 2.5Cr20. The authors attribute the anomalies of the elastic properties to the fact that, at the compensation temperature, the ferrite Card 2/52

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Anomaly of the ...

becomes a compensated antiferromagnetic due to the magnetic moments of the sub-lattices being compensated. It is pointed out that at about 250 K a maximum of internal friction is observed which ceases on applying a field, indicating that this maximum is associated with domain phenomena. Measurement of the magnetization at various temperatures has shown that the maximum occurs in a range of the steepest decrease of spontaneous magnetization on approaching the ψ_{lc} point. Acknowledgments

are expressed to K.P. Belov for directing the work. There are 2 figures and 10 references: 5 3oviet-bloc and 5 non-Soviet-bloc. The four latest English-language references mentioned are: Ref. 1 - W. Gorter, Philips Res. Report, 1954, 9, 295; Ref. 6 - I.S. Van Wieringen - Phys. Rev., 1953, 90, 488; Ref. 7 - M.E. Fine - Phys. Rev., 1952, 87, 1143 and Ref. 8 - R. Street, B. Lewis - Phil. Mag., 1956, 1, 663.

ASSOCIATION:

Moskovskiy gosuniversitet im. M.V. Lomonosova (Moscow State University im. M.V. Lomonosov)

SUBMITTED: Card 3/5 March 13, 1961

22127

S/056/61/040/003/007/031 B102/B202

24.7900 (1149, 1158, 1160)

AUTHORS: Belov, K.P., Goryaga, A.N., Ling Chang-ta

TITLE: Galvanomagnetic properties of lithium ferrite chromite

PERIODICAL: Zhurnal eksperimental*noy i teoreticheskoy fiziki, v. 40, no. 3, 1961, 752 - 756

TEXT: The study of ferrites having a compensation point Θ_c (temperature at which the magnetic moments of the sublattices compensate each other) is of great importance to the theory of ferromagnetism. In a previous paper (ZhETF, 38, 1914, 1960), the authors already pointed out that Li $2^{\circ}2^{\circ}.5$ Fe $2^{\circ}2^{\circ}.5$ Cr $2^{\circ}3^{\circ}$ shows an extraordinary longitudinal galvanomagnetic effect (near Θ_c the sign of this effect changes from - to +). The authors describe the studies of the even galvanomagnetic effects (longitudinal and transverse) in ceramic Li $2^{\circ}2^{\circ}.7$ Fe $2^{\circ}2^{\circ}.3$ Cr $2^{\circ}3^{\circ}$ (A). (A) was first heated on air for 4 hours at 1000° C, subsequently it was sintered at 1200° C for three hours (on air), and then slowly cooled down. The gal-

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S/056/61/040/003/007/031 B102/B202

Galvanomagnetic properties of ...

vanomagnetic effect was measured in a solenoid (up to 2000 oe) and between the poles of an electromagnet (up to 12,000 ce); the effect $(r = \angle R/R)$ was determined by comparison with the standard resistors. Magnetization I was determined in a solenoid by a ballistic method. r and I were measured in the range of from room temperature to 300°C. The temperature was measured by means of a copper-constantan thermocouple which was connected to a highly resistive potentiometer of the type THIE-1 (PPTV-1). The results are graphically illustrated. Fig. 1 shows the galvanomagnetic effects r, and r, as well as I as temperature functions at H = 1550 oe and H = 1660 oe, respectively. The compensation point (incomplete compensation occurs) was at 98°C. Figs. 2 and 3 illustrate $r_{\parallel}(t)$ and $r_{\perp}(t)$ at high field strengths. The anomalies which become manifest in these curves can be explained by assuming that the sublattices of the ferrite concerned have "own" galvanomagnetic properties with different character. According to E.W. Gorter (Philips Res. Reports, 9, 295, 1954) (A) has two sublattices, the first one being formed mainly from Fe, Cr, and Li ions which occur in octahedral sites, the second one by Fe and Li ions in octahedral sites. Below 9 the octahedral

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sublattice is responsible of anomalies. The simple ferrite Li20.5Fe203 shows normal galvanomagnetic properties. A comparison of the effects r_{\parallel} and r_{\perp} showed the following: With $T \angle \theta_{c}$, $r_{\perp} \gg r_{\parallel}$, and both are negative. In the range $T > \theta_0$ $r_{||}$ becomes positive, the point $r_{||} = 0$ need not coincide with θ_c . In the range of the Curie point, the negative maximum of the galvanomagnetic paraprocess is somewhat greater for r_{\perp} . than for r_y . This is due to the fact that the difference between r_{\perp} and $r_{||}$ does not completely disappear at the Curie point. The experimental results prove that in (A) sublattices exist with different temperature dependence of spontaneous magnetisation. There are 5 figures and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION:

Moskovskiy gosudarstvennyy universitet

(Moscow State University)

SUBMITTED:

October 11, 1960

Card 3/6 3

28750

S/056/61/041/003/003/020 B125/B102

94, 2200 (1068, 1147, 1664)

AUTHORS:

Goryaga, A. N., Lin Chang-ta

TITLE:

Low-temperature magnetic anomalies in lithium chromite

ferrites

PERIODICAL:

Zhurnal eksperimental noy i teoreticheskoy fiziki, v. 41,

no. 3(9), 1961, 696 - 699

TEXT: The authors determined the temperature dependences of spontaneous magnetization, of the coercive force, of the magnetic susceptibility, and of the electric resistivity in lithium chromite ferrites possessing compensation points of the magnetic moments of the sublattices. The low-temperature anomalies, detected in these ferrites, confirm the supposition of K. P. Belov (ZhETF, $\underline{41}$, 3, 692). The measurements were made at $\underline{\mathsf{T}} \leftarrow \underline{\mathsf{Q}}_k$ with the following ceramically produced ferrites:

 $\text{Li}_2\text{O} \cdot 3\text{Fe}_2\text{O}_3 \cdot 2 \text{Cr}_2\text{O}_3 \ (\Theta_k = 523.5^{\circ}\text{K}), \ \text{Li}_2\text{O} \cdot 2.5\text{Fe}_2\text{O}_3 \cdot 2.5\text{Cr}_2\text{O}_3 \ (\Theta_k = 326^{\circ}\text{K}), \ \text{and} \ \text{Li}_2\text{O} \cdot 5\text{Fe}_2\text{O}_3 \ (\text{without a compensation point}). The magnetization 6, the}$

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Low-temperature magnetic...

magnetic susceptibility χ in a magnetic field of H = 10 cersteds and the coercive force H were measured in a solenoid by means of the ballistic method, whereas a Wheatstone bridge was used to measure the electric resistance. In ferrites, possessing a compensation point, the temperature dependence of the spontaneous magnetization 6 exhibits a clear break at liquid-nitrogen temperature. At the same temperature, the temperature dependences of $\mathbf{H}_{\mathbf{c}}$ and χ exhibit minima and maxima, respectively. Up to the temperature range of liquid nitrogen, the magnetization $\epsilon_{\rm c}$ of the first two ferrites mentioned above depends only slightly on temperature. However, it has a break when temperature rises further and decreases until the compensation temperature is reached. At this break, the susceptibility has a maximum and the coercive force a minimum. An increase in temperature after this minimum causes a sharp increase of the coercive force. The temperature dependences of any composition of the lithium chromite ferrites behave in an analogous way. If there is no compensation point, the curves $\mathcal{E}_s(T)$, $H_c(T)$ and $\chi(T)$ have no low-temperature anomalies. The following holds for lithium chromite Card 2/4

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Low-temperature magnetic...

ferrites possessing a compensation point θ_k : the log R = f(1/T) curve has a break at temperatures at which the temperature functions G, h, and have singularities. These anomalies as well as the anomaly of the temperature dependence of R is similar to the anomaly of ferromagnetics near the Curie point. The low-temperature anomalies in the temperature depender to of the magnetic and electric properties are due to a sharp change in the magnetic long-range order of the ferrites. According to K. P. Belov a change of this kind in ferrites, possessing compensation points, must occur in the sublattice with the "weak" exchange interaction. The "weak" sublattice of the lithium chromite ferrites is octahedral. The exchange interaction in the tetrahedral sublattice is stronger. The temperature dependence of the spontaneous magnetization of the sublattice with weak interaction may be blurred. The long-range magnetic order does not vanish completely from the weak sublattice, owing to the effect of the negative exchange interaction between the sublattices. The temperature dependences of the spontaneous magnetization of each sublattice and of the ferrite as a whole are schematically rendered in Fig. 5. The dashed curve $\mathcal{T}_{\mathbf{g}}(\mathbf{T})$ for the octahedral

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Low-temperature magnetic...

sublattice is blurred because of the effect of the antiferromagnetic interaction. Professor K. P. Belov is thanked for his advice. There are 5 figures and 3 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: April 6, 1961

Legend to Fig. 5: Θ_k - compensation point, Θ_H - temperature inducing a considerable change of the long-range magnetic order.

(1) Octahedral, (2) total, (3) tetrahedral.

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EWT(1)/EWT(m)/T/EWP(b)/EWA(d)/EWP'w)/EWP(t) Pad LIP(c) ACCESSION NO: APSO05285 8/0181/65/007/002/0474/0476 ATTUOP: Belov, K. P.; Coryaga, A. N.; Volkova, N. V. TITLE: Anomaly of electric resistivity in the region of the compensation temperature in the ferrite NiFe1.26 0.7404 SOURCE: Fizika tverdogo tela, v. 7, no. 2, 1955, 474-476 TOPIC TAGS: nickel ferrite, temperature dependence, electric resistivity, compensation temperature, activation energy, resistance anomaly ABSTRACT: Continuing an earlier study of the temperature dependence of the electric resistivity of certain ferrites (ZhETF v. 38, 1914, 1960) with the special aim of determining the nature of the anomalies in the region of the compensation coint, the authors made a thorough study of the electric resistivity (o) of the Sife ... , We willy, which has a lower resistivity and a lower activation enerthe proviously studied ferriter. The same a was prepared by a paper became Ann - 144 1 11997. The test results have shown that in the region of the temperature of com-Lard r

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	pensation of the magnetic moments of the sublattices (0) there is a complicated anomaly in the plot of lnp(0/T). The experimental results are in qualitative agreement with the theoretical deductions of Ye. A. Turov et al (Collection "Ferri- legged and BSSR, Minsk, 1960). The greater anomaly in the ferrite in- the present research, as compared with the previously investigated to the lower resistivity and to the strong increase in magnetics-	
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	ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscov State University) SUBMITTED: 23Jul64 ENCL: CO SUB CODE; EC. EM	2 3 3 1 2 1
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SOURCE CODE: UR/0056/66/051/006/1639/1642

AUTHOR: Belov, K. P.; Goryaga, A. N.; Shrinivasan, S.

ORG: Moscow State University (Moskovskiy gosudarstvennyy universitet)

TITLE: Behavior of the initial susceptibility of the paraprocess in ferromagnets and ferrimagnets near the Curie temperature

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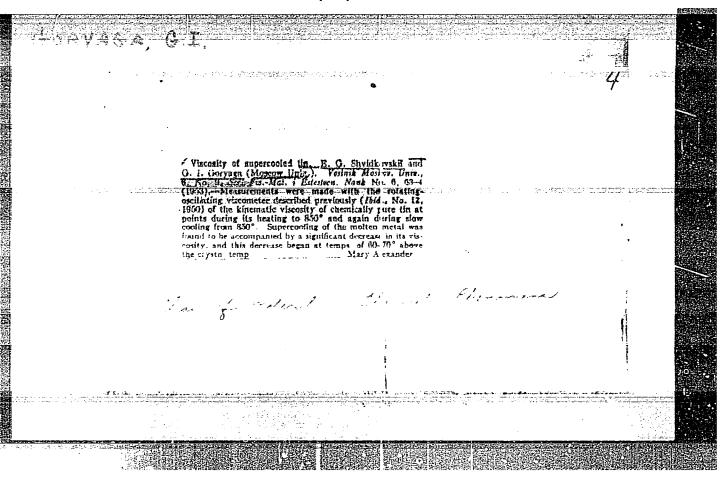
SOURCE: Zh eksper i teor fiz, v. 51, no. 6, 1966, 1639-1642

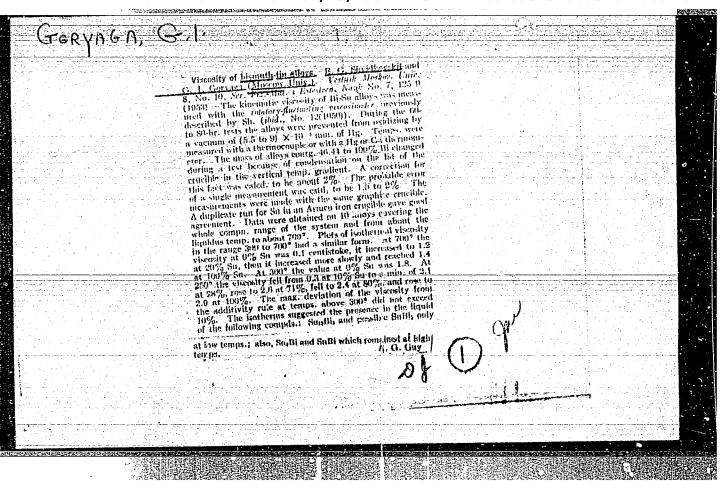
TOPIC TAGS: magnetic susceptibility, second order phase transition, ferrite, Curie point, thermodynamic calculation

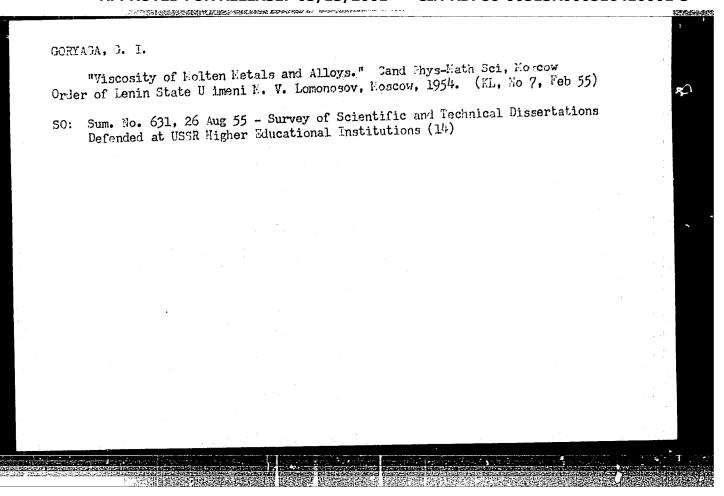
ABSTRACT: The purpose of the investigation was to check whether the temperature dependence of the initial susceptibility, as derived from the molecular-field and the thermodynamic theory of second-order phase transitions, holds true for the description of the magnetic susceptibility in ferrimagnets, especially ferrites, near their Curie point. To this end, the magnetic susceptibility of an invar alloy of composition 36 wt.% Ni and 64 wt.% Fe and in ferrites of the system Ni_{1-x}Zn_xFe₂O₄ (x = 0.0 - 0.75) was measured in the vicinity of the Curie temperature in both weak and strong fields. In addition, the sample was subjected to two different homogenizing heat treatments. The results obtained by the method of thermodynamic coefficients differ greatly from those determined in weak fields. Furthermore, the thermodynamic coefficient results did not depend on the heat treatment, whereas those determined in weak fields were strongly dependent on the heat treatment. This is taken as evidence that

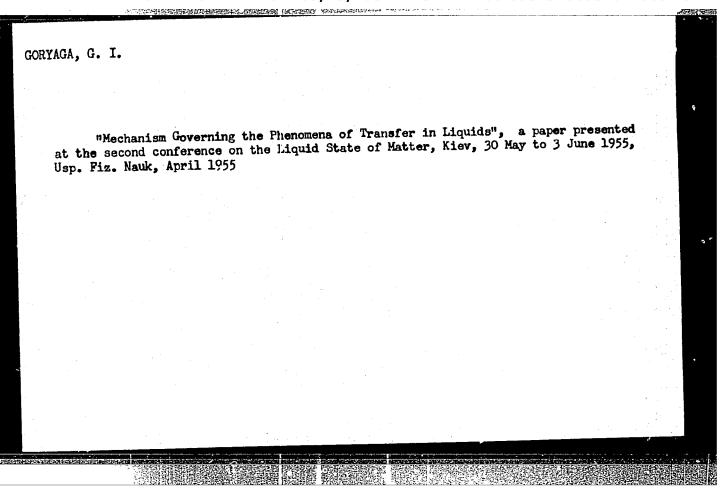
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		urie noint. 1	with v hazi	rves in weak fields near the Curie point. It is concluded that the theore rmula $X_0^{-1} = A(T - \theta)^{\gamma}$ can be used to describe the susceptibility for a numerrites near the Curie point, with γ having approximately the same value (1)								
1.37) as for ordinary ferromagnetis. The values of γ for ferrites and for the invaralloy are presented. Orig. art. has: 1 formula and 2 tables.												
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GORYAGA, G. 1.

SOV/124-58-4-4349

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 4, p 94 (USSR)

AUTHORS: Goryaga, G. I., Shvidkovskiy, Ye. G.

TITLE: Viscosity Hysteresis in Molten Metals (Gisterezis vyazkosti

rasplavlennykh metallov)

PERIODICAL: Vestn. Mosk. un-ta. Ser. matem., mekhan., astron., fiz.,

khimii, 1956, Nr 2, pp 71-76

ABSTRACT: An investigation of the viscosity of tin-bismuth alloy and

pure tin was performed with the aid of a rotation-type viscosimeter. It was found that the viscosity of molten metals containing insoluble admixtures exhibits hysteresis. Molten metals that have been purified of such admixtures by filtration in vacuum do not exhibit any viscosity hysteresis. The explanation of these phenomena is given as follows: The insoluble admixtures retard the process of re-coordination of the atoms (and, consequently, the change of viscosity) during which the atoms pass from the low-temperature packing to the high-

temperature packing.

1. Liquid metals--Viscosity 2. Hysteresis--Theory

Card 1/1 3. Liquid metals--Temperature factors

A. I. Golubev

"APPROVED FOR RELEASE: 03/13/2001 CIA

CIA-RDP86-00513R000516410001-3

GORYAGA, G.I.

USSR/Statistical Physics - Liquids

D-8

Abs Jour

: Referat Zhur - Fizika, No 5, 1957, 11518

Author

Goryaga, G.I., Shvidkovskiy, Ye.G.

Inst Title

: Influence of Insoluble Impurities on the Viscosity of

Molten Metals Upon Supercooling.

Orig Pub

: Vestn. Mosk. un-ta, 1956, No 6, 33-37

Abstract

The authors have previously observed (Referat Zhur Fizika, 1955, 8988), the "branching" of the curve for the temperature dependence of the viscosity of liquid tin, preceding the supercooling of the tin. This phenomenon was investigated in detail with tin and silicon. Particular attention was paid to the influence of the insoluble impurities contained in the specimens (oxides) and the removal upon purification on this effect. The results obtained permit the authors to suggest that even negligible impurities exert a delaying influence on the transformations of

Card 1/2

Moscow Unio, Chair Molecular Physics

USSR/Statistical Physics - Liquids

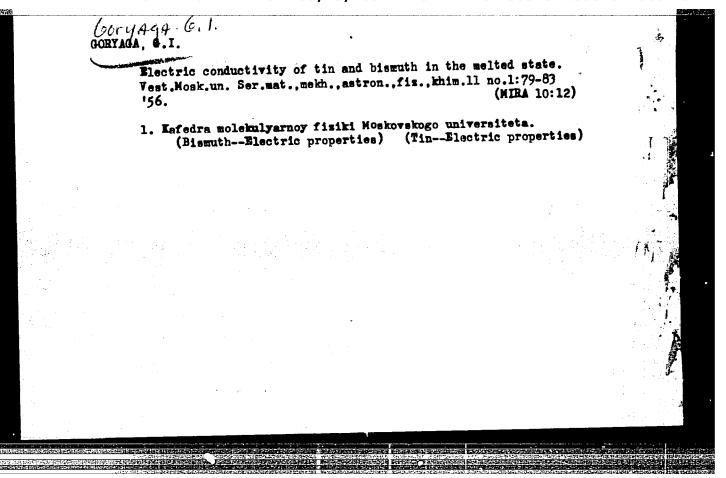
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Abs Jour

: Ref Zhur - Fizika, No 5, 1957, 11518

the structure, observed during temperature changes in pure liquids.

Card 2/2



GORYAGA, G.I.; RAKOVA, W.K.

Miffect of insoluble additions on the viscosity of bismuth-lead alloys. Vest. Mosk.un. Ser. mat., mekh., astron., fiz., khim.ll

no.1:85-88 '56. (MIRA 10:12)

1. Kafedra molekulyarnoy fiziki Moskovskogo universiteta.
(Viscosity) (Bismuth-lead alloys)

GORYAGA, G. I.

"Methods for the Measurement of Viscosity of Metals and the Influence of Impurities on the Viscosity of Metals."

Hydrodynamics of Molten Metals (Gidrodinamika rasplavlennykh metalov; trudy pervogo soveshchaniia po teorii liteinykh protsessov. Moskva, Izd-vo Akad. nauk SSSR, 1958, 257 pp.

(Proceedings of the First Conference on the Theory of Casting Processes)

Moscow State University imeni "M.V. Lomonosov"

AUTHORS: Goryaga, G.I., and Belozerova, E.P. SOV/55-58-1-17/33

TITLE: Electrical Conductivity of Liquid Gallium and Indium (Elektro-

provodnost' zhidkikh galliya i indiya)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya fiziko-matematicheskikh i

yestestvennykh nauk, 1958, Nr 1, pp 133-136 (USSR)

ABSTRACT: The authors state experimentally (relative error 1%):

1) In the interval 156-450° C the conductivity of 'ndium depends linearly on the temperature; here no structural changes take place; 2) the curve of conductivity of the liquid gallium is also a linear function of the temperature, but for 270-300° C it has a slight break; thence it is concluded that the micro structure

changes.

There are 2 figures, and 14 references, 12 of which are Soviet,

1 English, and 1 German.

ASSOCIATION: Kafedra molekulyarnoy fiziki (Chair of Molecular Physics)

SUBMITTED: March 27, 1957

Card 1/1

AUTHORS:

Rakova, N. K., Goryaga, G. I.,

sov/163-58-2-36/46

Belozerova, E. P.

TITLE:

Investigation of the Electric Conductivity of Some Metals in Solid and Liquid State (Issledovaniye elektroprovodnosti

nekotorykh metallov v tverdom i zhidkom sostoyanii)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958,

Nr 2, pp. 200 - 204 (USSR)

ABSTRACT:

An investigation of the electric conductivity in bismuth, lead, and tin in solid and liquid state was carried out. From the determinations of the electric conductivity of lead and bismuth in undercooled state may be seen that at the transition from the liquid to the undercooled state the temperature coefficient of the electric conductivity is not changed. The dependence of the electric conductivity of molten lead, tin, and bismuth on the temperature was investigated and graphically represented. The electric conductivity of bismuth and tin is linearly dependent on the temperature. The dependence between the electric properties of the alloys mentioned above and the change in structure of the metallic melt was investigated, too. In

Card 1/2

Investigation of the Electric Conductivity of Some Metals in Solid and Liquid State

SOV/163-58-2-36/46

molten bismuth and tin a considerable change in structure occurs within the temperature range from 500-540°C; this change causes the change of the temperature coefficient of the electric conductivity. The change of the electric conductivity of monocrystalline bismuth in dependence on the degree of everheating of the melt at temperatures by 40°C higher than the melting temperature was also investigated and graphically represented. There are 2 figures and 18 references. 14 of which are Soviet.

ASSOCIATION: MGU. fizicheskiy fakultet (Moscow State University, Department

of Physics)

SUBMITTED:

October 1, 1957

Card 2/2

CIA-RDP86-00513R000516410001-3" APPROVED FOR RELEASE: 03/13/2001

81533

SOV/137-59-5-11176

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 240 (USSR)

AUTHOR:

Goryaga, G.I.

TITLE:

Methods of Measuring Viscosity of Metals. The Effect of In-

coluble Impurities on the Viscosity of Metals

PFRICDICAL:

V sb.: Gidrodinamika rasplavl. metallov, Moscow, AS USSR, 1958,

pp 56 - 62

ABSTRACT:

The author studied various methods of measuring the viscosity of liquids: 1) discharge through a capillary; 2) the method of a rotating oylinder; 3) the method of a solid immersed in the liquid; 4) the method of torsional oscillations of a sphere containing the investigated liquid and 5) the method of torsional oscillations of a pail containing the investigated liquid. The author describes a viscosimeter designed by Shvidkovskiy: a pail placed in a furnace and filled with the investigated liquid is suspended on an elastic thread to the torsion mechanism and carries out free torsional oscillations. The viscosity of the under investigation liquid is determined from the legarithmic decrement

Card 1/2

81533

SOV/137-59-5-11176

Methods of Measuring Viscosity of Metals. The Effect of Insoluble Impurities on the Viscosity of Metals

of damping and the oscillation period. The method makes it possible to investigate liquids with ten-thousandfold variations of viscosity on one and the same device by a continuous process. Unlike the four aforementioned methods, the given method prevents that the development of surface oxide films influences the results of measurements. Investigation into the viscosity of volatile metals is also possible. These facts combined with the simplicity of the experiment under conditions of high temperature and high chemical activity of the molten metals promoted the widespread introduction of the method. The author cites results of investigations into the effect of insoluble impurities on the viscosity in molten Sn, Pb, Bi, Zn, Cd, Sb, and on alloys of the Bi - Sn and Bi - Pb system.

Z.F.

Card 2/2

sov/55-58-6-8/31

18(7) AUTHORS:

Goryaga, G. I., Nosyreva, I. A.

TITLE:

The Viscosity of Molten Zinc, Aluminum, Cadmium, and Antimony (Vyazkost' rasplavlennykh tsinka, alyuminiya, kadmiya i sur'my)

PERIODICAL:

Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 6, pp 59-64 (USSR)

ABSTRACT:

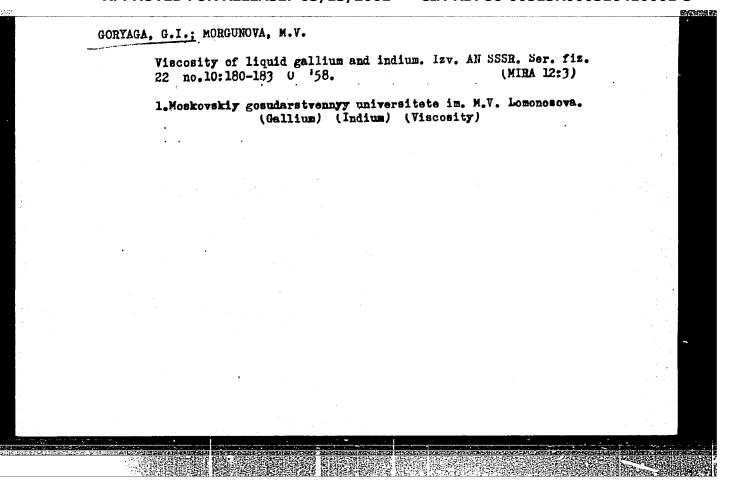
Measurements of the kinematic viscosity of the elements mentioned in the title were carried out by the method of torsional oscillations of a crucible filled with the liquid to be investigated. This method had been worked out by Ye. G. Shvidkovskiy (Ref 1). The device for the determination of Al viscosity is described by reference 1. For volatile metals the crucible was hermetically sealed. The device is exactly described, crucible and scheme are shown by figures 1 and 2. Published data concerning the viscosity of molten metals deviate from one another rather considerably which is said to be due to the use of samples of different degrees of purity. Therefore, the influence of undissolved impurities upon the viscosity of metals was investigated. The samples to be investigated were therefore produced in different ways

Card 1/3

SOV/55-58-6-8/31 The Viscosity of Molten Zinc, Aluminum, Cadmium, and Antimony

and with different degrees of purity. Investigations showed that with increasing impurity, viscosity increased considerably. The results obtained by investigations of the temperature dependence of viscosity are shown together with the data obtained by other authors (Refs 3, 4, 1) by figures 3 - 5. The impurities (oxides) converted the metals to another than the normal (heterogeneous)state. A similar cause was also assumed by Shvidkovskiy for the deviation between results (Ref 1). The formula developed by Shvidkovskiy for the determination of metal viscosity underlaboratory conditions (for pure metals) was simplified for industrial purposes, in which connection the considerable amount of impurities in industrial metals was taken into account. The authors thank Ye. G. Shvidkovskiy for advice and discussions. There are 5 figures and 10 references, 5 of which are Soviet.

ASSOCIATION: Kafedra molekulyarncy fiziki Card 2/3 (Chair for Molecular Physics)



GORYAGA, G.I.; KUZOVNIKOV, A.A.; RUBAN, A.A.; YARAMYSHEV, G.S.

Stabilization of a brush discharge. Vest. Mosk. un. Ser. 3:
 Fiz., astron. 20 no.6:80-82 N-D '65. (MIRA 19:1)

1. Kafedra molekulyarnoy fiziki i kafedra elektroniki Moskovskogo gosudarstvennogo universiteta. Submitted Feb. 3, 1965.

ACC NR. AP6033813

SOURCE CODE: UR/0188/66/000/004/0003/0008

AUTHOR: Goryaga, G. I.; Kokorev, A. I.; Persiantseva, N. M.

ORG: NILYAF

TITLE: Interaction between the luminescence front and the transverse magnetic field in an electrodynamic shock tube

SOURCE: Moscow. Universitet. Vestnik. Seriya III. Fizika, astronomiya, no. 4, 1966,

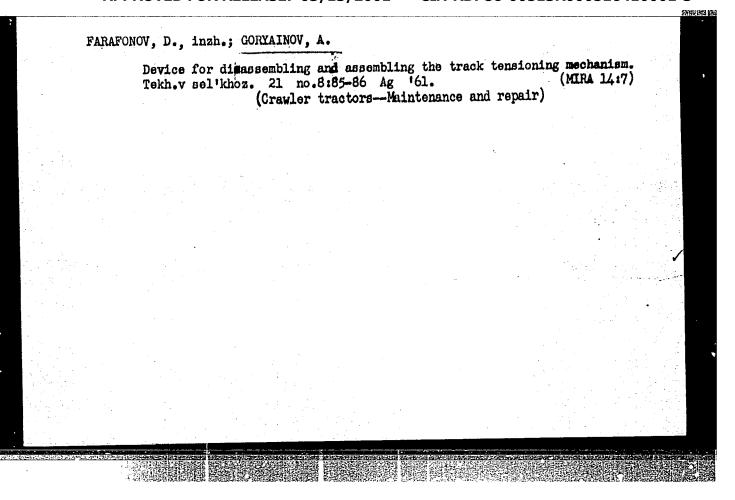
TOPIC TAGS: moving plasma, plasma acceleration, plasma shock wave, plasma wave reflection; plasma gun, magnetoactive plasma, plasma velocity, transverse magnetic field

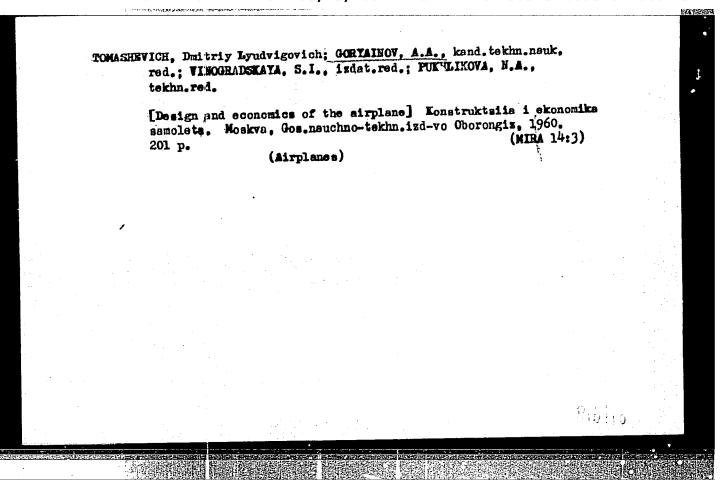
ABSTRACT: A coaxial plasma gun (coaxial length--100 mm, central electrode diameter-8 mm, inner diameter of external electrode--28 mm) and a rail injector (accelerating gap--18 mm) were used to produce a high-pressure chamber. A glass tube, approximately 45 cm long, with an inner diameter of 28 mm provided the low-pressure chamber. Experiments were performed at a residual gas pressure of $P = 8 \cdot 10^{-1} - 3 \cdot 10^{-2}$ mm Hg. The maximum discharge current, measured by a Rogovskiy loop and an OK-17 oscillograph was ~ 50 ka. The range of the magnetic field was 10^3 to $7 \cdot 10^3$ oersted. In a strong magnetic field ($H \ge 3000$ oersted) the propagation rate of the luminescence front decreases, and the luminescence intensity goes up. No stratification and reflection of the luminescence

UDC: 533.95.538.4

Card 1/2

C NR: AP603							
escence front from the magnetic wall (as reported in the past by a number of authors) as observed. It is assumed that in these experiments, the luminescence front is not dentical to the front of the shock wave but rather to the forward boundary of the moving plasma bunch. Energy equations of the moving plasma bunch were derived. Experients with the rail injector appeared to indicate that the intensive luminescence front							
n the shock t ischarge plas	ube does not comma. This assumpt : 2 formulas, 5	respond to she tion was veri	ock wave. Dut	to the cu	L. GH C _ COTT	1416 BOO	
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Card 2/2	**************************************						





SHAROV, S.I.; VEGMAN, Ye.F.; NORIK, N.P.; CORYAINOV, A.P.

Mineral formation pattern during the sintering of iron ores from the Kursk Magnetic Anomaly. Izv. vys. ucheb. zav.; chern. met. 7 no.11:24-28 *64. (MIRA 17:12)

1. Moskovskiy institut stali i splavov i Novo-Lipetskiy metallurgicheskiy zavod.

GORYPINOU, A.S.

USSR / Radiophysics

Ι

: Ref Zhur - Fizika, No 4, 1957, No 9973 Abs Jour

Author : Goryaincy, A.S.

Inst : Not given

Title : Diffraction of Electromagnetic Waves by an Infinite Cylin-

Orig Pub : Tr. 3-vo Bses. matem. s'yezda, T. 1, M. AN SSSR, 1956, 220-

Abstract : See Ref Zhur - Fizika, 1957, 7305

Card : 1/1

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000516410001-3"

GORYATNOV, A.S.

USSR / PHYSICS SUBJECT

CARD 1 / 2

PA - 1467

AUTHOR

PERIODICAL

TITLE

GORJAINOV, A.S.

The Diffraction of a Plane Electromagnetic Wave on a Conductive

Dokl. Akad. Nauk, 109, fasc. 3, 477-480 (1956)

Issued: 9 / 1956 reviewed: 11 / 1956

The present work investigates the diffraction (in a vacuum) of a plane electromagnetic wave in an infinitely long ideally conductive circular cylinder the radius of which is large compared with the wavelength. Cylinder coordinates (r,φ,z) are introduced and the z-axis is identical with the cylinder axis. In the case of direct incidence and E-polarization, if the wave is propagated along the positive x-direction with the amplitude 1, and if the vector of the electric field strength is vertical to the z-axis, the rigorous solution for the component j_z of the current density may be represented in form of an integral over . con-

tour C: $j_z = -(ic/2\pi^2 ka)$ ($e^{-i\pi \Upsilon/2}\cos \varphi/H_{\Upsilon}^{(1)}(ka) \sin \Upsilon\pi$) $dV(k=2\pi/\lambda - wave number,$ - HANKEL function). From this integral the solution j_z -(c/2 π)cos ϕ e ika cos ϕ is obtained by the method of the steady phase. Because of its derivation this solution, which is identical with the solution of geometric optics, is applicable only to that part of the illuminated domain in which the asymptotic representation by DEBYE is valid. The latter has the form: $-\cos \varphi \gg (ka)^{-1/3}$. Next, the

Dokl. Akad. Nauk, 109, fasc. 3, 477-480 (1956) CARD 2 / 2 PA - 1467 solution found for the domain of shade and penumbra is explicitly given. Also the component j found in the case of H-polarization (if the vector of magnetic field strength of the inciding wave is parallel to the z-axis and if the wave is propagated along the positive x-direction) is written down. The most important terms correspond to a current which is generated on the inciding wave immediately on the surface of the cylinder. The remaining terms decribe currents passing from the illuminated side through the shade boundary into the domain of shade. The solution given here goes over continuously into the solution of geometric optics at the shade boundary ($\varphi \sim +$). Now the diffracted field in the wave zone is determined for the point $(r, \gamma, 0)$ (where $0 \leqslant \phi \leqslant \pi$). The integrals occurring on this occasion are computed by an improved method of the steady phase. The solution obtained for E is explicitly given. The asymptotic expression for the z-component of the magnetic field strength of the diffracted field, which is found in a similar manner for H-polarization, is also given. The physical significations of the terms of various orders of the solutions for $\mathbf{E}_{\mathbf{Z}}$ and $\mathbf{H}_{\mathbf{Z}}$ are mentioned separately. The formulae derived for the domains of shade and penumbra are transformed also for the illuminated domain.

INSTITUTION:

"Electromagneti	c Wave Diffraction on an Infinite Cone."	
paper presented at t	he 4th All-Union Conf. on Acoustics, Mosc	ow, 26 May - # Jun 58.
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		1 1 1

AUTHOR: Goryainov. A.S. 109-3-5-3/17

TITIE:

Asymptotic Sol tion of the Problem of Diffraction of a Plane Electromagnetic Wave on a Conducting Cylinder (Asimptoticheskoye resheniye zadachi o difraktsii ploskoy elektromagnitnoy volny na provodyashchem tsilindre)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol III, Nr 5, pp 603 - 614 (USSR)

ABSTRACT: A cylindrical co-ordinate system $(r, \phi \text{ and } z)$ is chosen for the purpose of analysis. The axis z coincides with the axis of the cylinder and the co-ordinate ϕ is measured from the positive direction of the axis x , so that φ is contained between -T and +T (see Fig.1). If an E-polarised wave having a unit amplitude propagates along the positive direction of the axis x and the electric field vector has a single component along the z axis, the diffracted field is given by an exact expression, which is in the form of Eq.(1). The z-component of the current density is given by Eq.(2), where $\varepsilon_n = 2$ for $n = 1, 2, 3 \dots$; $\varepsilon_0 = 1$ and and J_n are Bessel functions. In the case of an H-polarised wave, the diffracted field is accurately expressed Cardl/3

12. 对自己的记者代码中,就由此,是为此的经验的特殊中的企业的的特别的。 Alternative and alterna

109-3-5-3/17

Asymptotic Solution of the Problem of Diffraction of a Plane Electromagnetic Wave on a Conducting Cylinder

 $M = \left(\frac{ka}{2}\right)^{1/3}$

and w₁(t) is the Airy function. The second current component is expressed by Eq.(16). The final expression for the z-current component is therefore in the form of Eq.(17). For the case of H-polarisation, the φ-component of the current can be expressed by Eq.(21), which is based on the Fok(Refs.3,4) asymptotic approximation. The diffracted field for the point r, φ, 0 for E-polarisation can be expressed by Eq.(23), where σ₁ and σ₂ are two integrals to be evaluated. It is Card2/3

Asymptotic Solution of the Problem of Diffraction of a Plane Electromagnetic Wave on a Conducting Cylinder

shown that the final expression for σ_1 , 2 is given by Eq.(25) where plus signs relate to σ_1 , while the minus signs correspond to σ_2 . The diffracted field for the H-polarisation can be expressed by Eq.(26), in which the integrals ϕ_1 and ϕ_2 are given by Eq.(27). The diffracted field can therefore be expressed by Eqs.(28), in which the functions $e(\phi, ka)$ and $h(\phi, ka)$ can be regarded as the complex directional patterns and are described by Eqs.(29). The functions f and f of Eqs.(29) are defined by Eqs.(30) and (31). The directional patterns can therefore be written as Eqs.(32). The above formulae were used to evaluate the directional functions for ka = 5 and 16 (see Figs. 6 and 7). It is found that the asymptotic formulae (see the dotted-line curves) are in good agreement with the rigorous formulae. The author thanks L.A. Vaynshteyn for directing this work.

SUBMITTEEN: November 20, 1056 5 Soviet references.

SUBMITTED: November 20, 1956

AVAILABLE: Library of Congress

1. Electromagnetic waves-Defraction-Theory

9.1912

21.429 5/109/61/006/001/006/023 E032/E114

AUTHOR :

Goryainov, A.S.

TITLE:

Diffraction of a plane electromagnetic wave

propagated along the axis of a cone PERIODICAL: Radiotekhnika i elektronika, Vol.6, No.1, 1961,

TEXT : In the diffraction of electromagnetic waves by a finite conical surface the diffraction field may be looked upon as consisting of two parts, the first being determined by the laws of physical optics and the second being due to additional currents near the edge and apex of the cone. The "physical optics field"

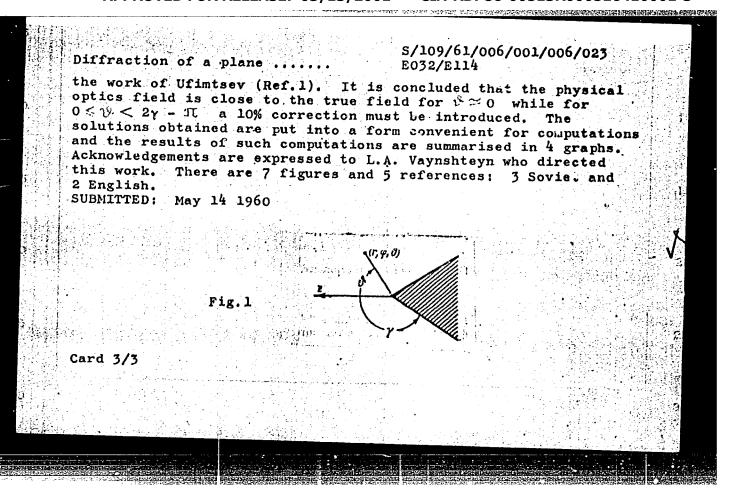
where H is the magnetic field vector of the incident wave, and n is the outward normal to the surface. Near the apex of the (1)cone the current given by Eq. (1) must be augmented by a further current which is associated with the rapid contraction of the

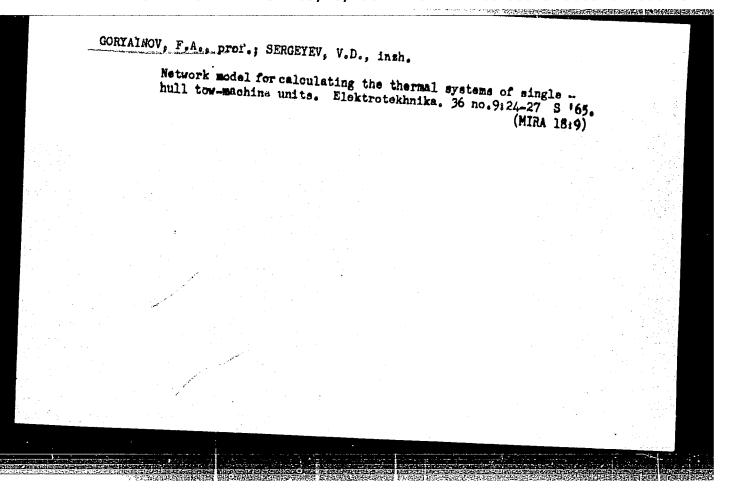
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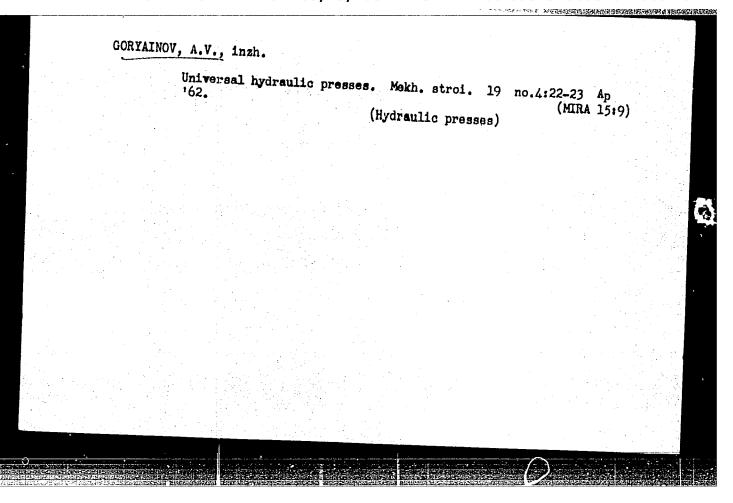
Diffraction of a plane electromagnetic wave propagated along the axis of a cone

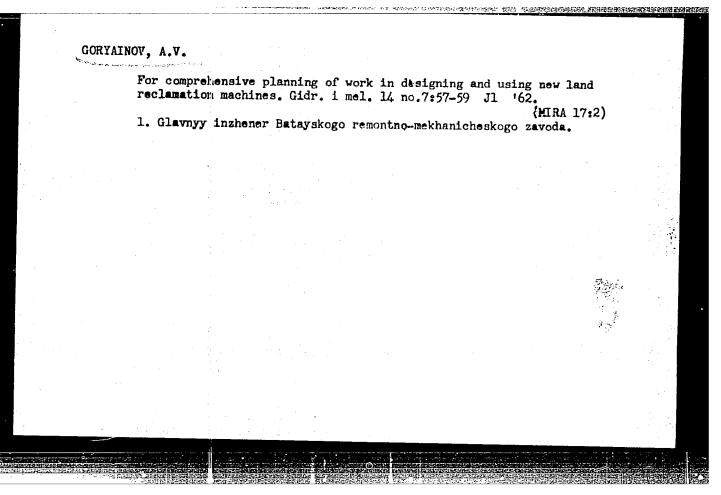
surface at the apex. This additional current is largely concentrated near the apex and hence the additional field is the same both for a finite and an infinite cone provided $\ell \sin \gamma \gg \lambda$ where ℓ is the length of a generator, λ is the wavelength and γ is indicated in Fig.1. In this case the additional field due to the apex may be determined as the difference between the field obtained from an exact solution for an infinite cone and the field obtained on the basis of physical optics laws. Since the additional current is highly localised in the sense described above, it follows that at large distances from the apex the additional field will take the form of a spherical wave. present author derives an exact solution for the diffraction of a plane electromagnetic wave by an infinite cone of the angle $2(T - \gamma) < T$ in the case where the wave is propagated along the axis of the cone, The paper is therefore largely concerned with the effect of the apex of the cone on the diffraction field. Generalisation to a finite cone can be carried out on the basis of Card 2/3

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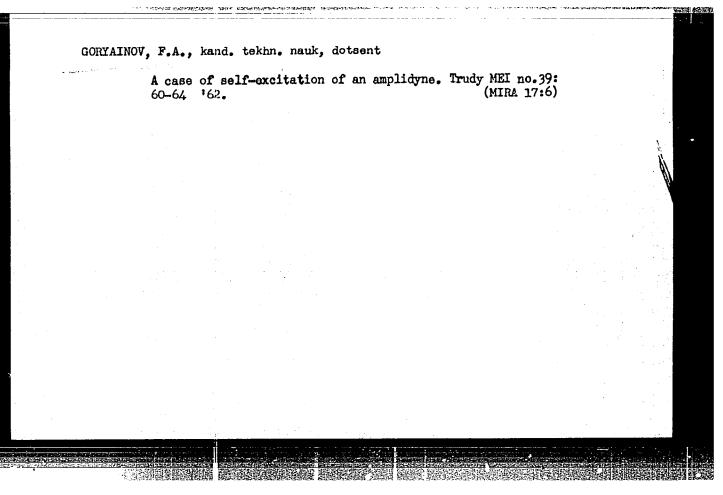


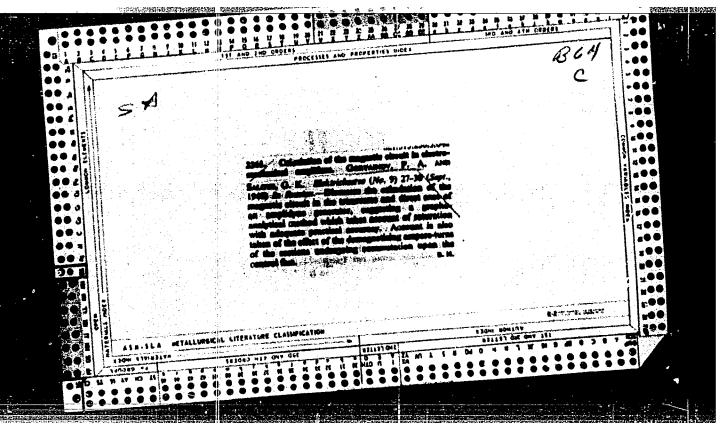


BORISOGLEBSKIY, B.N., kand. tekhn. nauk, red.; VINOGRADOV, Yu.M., kand. tekhn. nauk, red.; GALITSKIY, B.A., red.; GORYAINOVA, A.V., kand. tekhn. nauk, red.; ZHEREBTSOV, M.N., red.; KORETSKIY, I.M., red.; MAKAROVA, N.S., red.; MORDOVSKIY, S.I., kand. tekhn. nauk; SALAMATOV, I.I., doktor tekhn. nauk; SHVARTS, G.L., kand. tekhn. nauk, red.; YUKALOV, I.N., kand. tekhn. nauk, red.; YUSOVA, G.M., kand. tekhn. nauk, red.; VASIL'YEVA, G.N., red.

[Manufacture of filters in the U.S.S.R.; collection of reports at the united session of the scientific and technical councils of the All-Union Scientific Research Institute of Chemical Machinery, the Ukrainian Scientific Research Institute of Chemical Machinery and the technical council of the Ural Chemical Machinery Plant] Filtrostroenie v SSSR; sbornik dokladov na ob"edinennoi sessii nauchnotekhnicheskikh sovetov Niikhimmasha, Ukrniikhimmasha i tekhnicheskogo soveta zavoda "Uralkhimmasha" Moskva, Otdel nauchnotekhn. informatsii, 1963. 107 p. (MIRA 17:12)

1. Nauchno-issledovatel skiy institut khimicheskogo mashinostroyeniya (for Borisoglebskiy, Mordovskiy).





GORYAINOV, F. A., DOCEN'T

USSR/El ctricity Transformers Scientists

May 49

"Professor G. N. Petrov (Twenty Years of Scientific, Engineering and Pedagogic Activity)," Docent V. A. Golubzov, Dir MEI, Cand Tech Sci, Prof K. A. Krug, Corr Mem, Acad Sci USSR; Prof Yu. S. Chechet, Dr Tech Sci; Docent F. A. Goryainov, Cand Tech Sci, 1 p

"Elektrichestvo" No 5

Describes Petrov's early background and his accomplishments in design and construction of high-voltage transformers. Developed general theory of magnetic leakage of transformers. Developed general theory of magnetic leakage of transformers. Directed Transformer Lab of VEI / All-Union Elec Eng Inst ?/. Received Stalin Prize in 1948 for work in preventing breakdowns of transformers feeding high-power mercury rectifiers. Also received "Red Star" and other medals. Present Editor of "Elektrichestvo."

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"APPROVED FOR RELEASE: 03/13/2001

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GORYATHOV, F. A.

PA 52/49T2

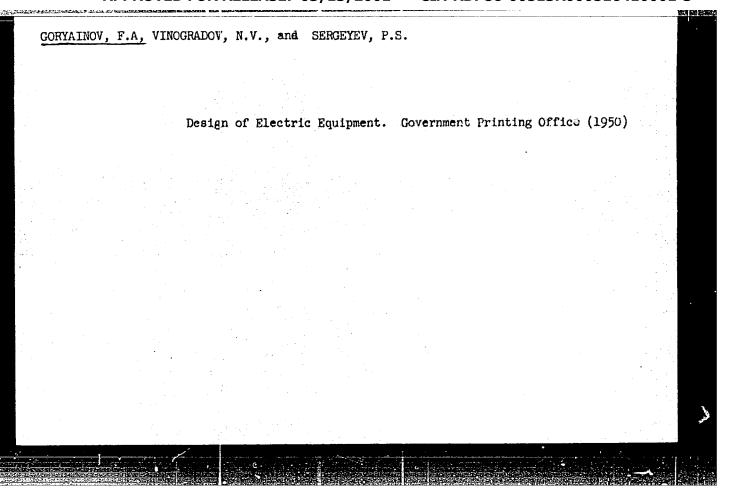
USSR/Academy of Sciences
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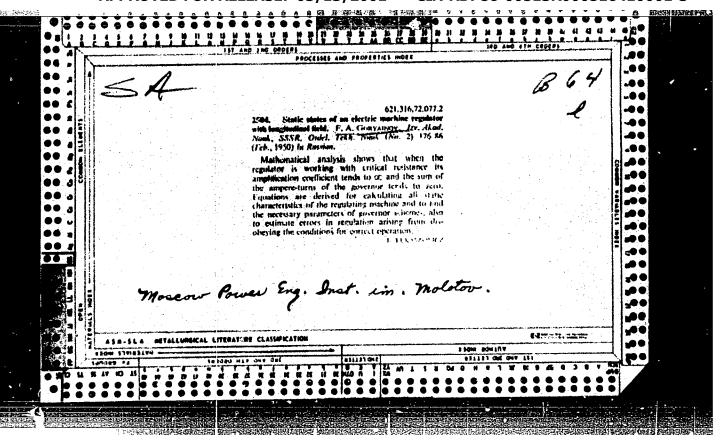
Jul 49

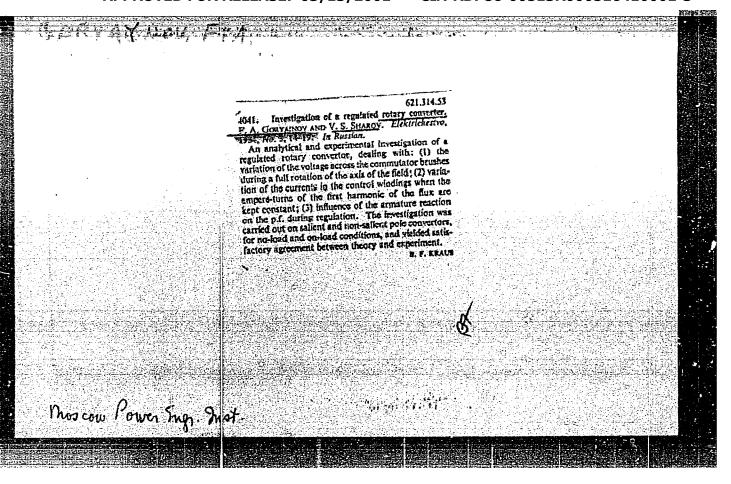
"Scientific Seminar of the Institue of Automatics and Telemechanics on Automatic Electric Drive," I. V. Utkin, 5 pp

"Iz Ak Nauk SSSR, Otdel Telh Nauk" No 7

At the seminar, attended by about 100 scientific and engineering-technical workers of Moscow, reports submitted included: V. S. Kulebakin's "Theory of the Impulse Method of Regulating Speed in Electric Motors," F. A. Goryafnov's "Operation of an Electrical (Rototrol) in Regulation Systems," and D. A. Popov's "Characteristics of Aircraft Electric Drive." Two sessions were devoted to the report, "Frequency Method of Analyzing the Quality of a Servoelectric Drive."







· Congalmon, F.A.

ANDREYEV, A.B.; ANTOHOV, A.I.; ARAPOV, P.P., BARMASH, A.I., BEDNYAKOVA, A.B.; BENIN, G.S.; BERESMEVICH, V.V.; HERNSHTKYN, S.A.; BITYUTSKOV, V.I.; BLYUMENBERG, V.V.; BONCH-BRUYEVICH, M.D.; BORMOTOV, A.D.; BULGAKOV, N.I.; VEKSLER, B.A.; GAVRILERKO, I.V.; GENDLER, Ye.S., [deceased]; GERLIVANOV, N.A., [deceased]; GIBSHMAN, Ye.Ye.; GOLDOVSKIY, Ye.M.; GORBUNOV, P.P.; GORYAINOV, F.A.; GRINBERG, B.G.; GRYUNER, V.S.; DANOVSKIY, N.F.; DZEVUL-SKIY, V.M., [deceased]; DRIMAYIO, P.G.; DYBETS, S.G.; D'YACHENKO, P.F.; DYURMBAUM, N.S., [deceased]; YEGORCHENKO, B.F. [deceased]; YEL'YASHKEVICH, S.A.; ZHEREBOV, L.P.; ZAVEL'SKIY, A.S.: ZAVEL'SKIY, F.S.; IVANOVSKIY, S.R.; ITKIN, I.M.; KAZHDAN, A.Ya.; KAZHINSKIY, B.B.; KAPLINSKIY, S.V.: KASATKIN, F.S.; KATSAUROV, I.N.; KITAYGORODSKIY, I.I.; KOLESNIKOV, I.F.; KOLOSOV, V.A.; KOMAROV, N.S.; KOTOV, B.I.; LINDE, V.V.; LEDEDRY, H.V.; LEVITSKIY, N.I.; LOKSHIN, Ya.Yu; LUTTSAU, V.K.; MANNERBERGER, A.A.; MIKHAYLOV, V.A.; MIKHAYLOV, N.M.; MURAV'YEV, I.M.; MYDEL MAN, G.E.; PAVLYSHKOV, L.S.; POLLYANOV, V.A.; POLYAKOV, Ye.S.; POPOV. V.V.; POPOV. N.I.; RAKHLIN, I.Ye., RZHEVSKIY, V.V.; ROZEMBERG, G.V.; ROZEMFRETER, B.A.; ROKOTYAN, Ye.S.; RUKAVISHNIKOV, V.I.; RUTOVSKIY, B.W. [deceased]; RYVKIN, P.M.; SMIRNOV, A.P.; STRPANOV, G.Yu, STEPANOV, Ku.A.; TARASOV, L.Ya.; TOKAREV, L.I.; USPASSKIY, P.P.; FEDOROV, A.V.; FERE, N.E.; FRENKEL!, N.Z.; KHEYFETS, S.Ya.; KHLOPIN. M.I.; KHODOT, V.V.; SHAMSHUR, V.I.; SHAPIRO, A.Ye.; SHATSOV, W.I.; SHISHKINA, N.M.; SHOR, E.R.; SHPICHENETSKIY, Ye.S.; SHPRINK, B.E.; SHTERLIEG, S.Z.; SHUTTY, L.R.; SHUKHGAL'TER, L. Ya.; ERVAYS. A.V.; (Continued on next card)

AMDREYSV. A.B. (continued) Card 2.

YAKOVLEY, A.V.; AMDREYEV, Ye.S., retsensent, redaktor; BERKEN-GMM,B.M., retsensent, redaktor; BERMAN, L.D., retsensent, redaktor; BOLTIMSKIY, V.N., retsensent, redaktor; BONCH-BRUYEVICH, V.L., retsensent, redaktor; VELLER, M.A., retsensent, redaktor; VINOGRADOV, A.V., retsensent, redaktor; GUDTSOV, N.T., retsensent, redaktor; DECTYAREV, I.L., retsensent, redsktor; DEM'YANYUK, F.S., retsensent; redaktor; DORDOSMYSLOV, I.N., retsenzent, redaktor; YELANCHIE, G.M. retsensent redaktor; ZNEWOCHKIN, D.N., retsenzent, redaktor: SHURAVCHEAGO, A. H., retwensent, redaktor; ZLODEYEV, G.A., retsensent, redaktor; KAPLUMOV, R.P., retsensent, redaktor; KUSAKOV, M.M., retsensent, redaktor; LEVINSON, L.Ye., [deceased] retsensent, redaktor; MALOV, N.M., retsensent, redaktor; MARKUS, V.A. retsensent, redaktor; METRLITSYN, I.I., retsonsent, redaktor; MIKHAYLOV, S.M., retsensent; redaktor; OLIVETSKIY, B.A., retsenzent, redaktor; PAVIOV, B.A., retsensent, redaktor; PANYUKOV, M.P., retsensent, redaktor; PLAKSIE, I.M. retsensent, reduktor; RAKOV, K.A. retsensent, redaktor; RZHAVINSKIY, V.V., retsensent, redaktor; RINBERG, A.M., retsensent; redaktor; MOGOVIN. N. Ye., retsensent, redaktor; MUDENKO, K.G., retsenzent, redaktor: hUTCVSKIY, B.M., [deceased] retsenzent, redaktor: MYZHOV, P.A., retsensent, redaktor: SANDOMIRSKIY, V.B., retsensent, redaktor; SKRAMTAYEV, B.G., retsensent, redaktor; SOKOV, V.S., retsensent, redaktor; SOKOLOV, N.S., retsensent, redaktor; SPIVAKOVSKIY, A.O., retsensent, redaktor; STRAMENTOV, A.Ye., retsensent, redaktor; STRELETSKIY, N.S., retsensent, redaktor; (Continued on next card)

ANDREYEV, A.V., (continued) Card 3.

TRET'YAKOV, A.P., retsenzent, redaktor; FAYERMAN, Ye.M., retsenzent, redaktor; KHACHATYROV, T.S., retsenzent, redaktor; CHERNOV, H.V., retsenzent, redaktor; SHERGIN, A.P., retsenzent, redaktor; SHESTO-PAL, V.M., retsenzent, redaktor; SHESHKO, Ye.F., retsenzent, redaktor; SHCHAPOV, M.M., retsenzent, redaktor; YAKOBSON, M.O., retsenzent, redaktor; STEPANOV, Yu.A., Professor, redaktor; DEM'YANYUK, F.S., professor, redaktor; ZNAMENSKIY, A.A., inzhener, redaktor; PLAKSIN, I.N., redaktor; RUTOVSKIY, B.N. [deceased] doktor khimicheskikh nauk, professor, redaktor; SHUKHGAL'TER, L. Ya, kandidat tekhnicheskikh nauk, dotsent; redaktor; BRESTINA, B.S., redaktor; ZNAMENSKIY, A.A., redaktor.

ANDREY W., A.V. (continued) Card 4.

[Concise polytechnical dictionary] Kratkii politekhnicheskii slovar'. Redaktsionary sovet; IU.A.Stepanov i dr. Moskva, Gos. izd-vo tektniko-teoret. lit-ry, 1955. ll36 p. (MLRA 8:12)

1. Chlen-korrespondent AN SSSR (for Plaksin)

(Technology--Dictionaries)

GIORYATHOU, T. H.

Subject

: USSR/Electricity

Card 1/2

Pub. 27 - 7/24

Authors

: Gorvainov, F. A., Kand. Tech. Sci., Dotsent, and B. F. Tokarev, Kand. Tech. Sci., Moscow

Title

: Influence of magnetic asymmetry upon the performance of

AID P - 4096

a three-step rotating regulator.

Periodical: Elektrichestvo, 11, 43-46, N 1955

Abstract

The authors investigate the influence of magnetic asymmetry on the basis of a magnetic equivalent circuit of the rotating regulator. They analyze two cases of asymmetry: the one occuring when under the like poles of the first and third steps and also of the second and third steps a larger air gap is placed than under the poles of opposite polarity; the second, when under the like poles of the first and third and also second and third steps a smaller air gap is placed than under the poles of opposite polarity. The authors conclude that

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Elektrichestvo, 11, 43-46, N 1955

Card 2/2 Pub. 27 - 7/24

> in the first case the magnetic asymmetry causes a sharp decline of the coefficient of amplification, and in the second is the cause of self-excitation of the rotating

regulator. Five drawings and diagrams.

Institution: Moscow Power Engineering Institute im. Molotov

Submitted : Fe 21, 1955

GORYAINOV,F.A., dotsent, kandidat tekhnicheskikh nauk; GUSEV,B.Ya.,
kandidat tekhnicheskikh nauk

Investigation of the two-stage longitudinal-field rotating amplifier. Trudy Mil no.15:55-66 '55. (MERA 8:11)

1. Kafedra elehtricheskikh nashin Moskovskogo ordena Lenina energeticheskogo instituta imeni V.M.Molotova

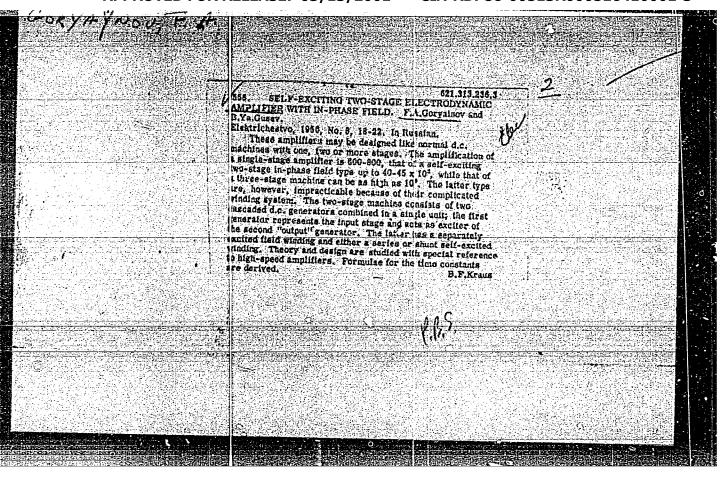
(Electric controllers)

VINOGRADOV, Mikolay Vladimirovich; GORYAINOV, Fador Aleksayavich; SERGEYEV,
Petr Sergeyevich; ABRAMOV, A.I., redaktor; FRIDEIM, L.M., tekhnicheskiy redaktor; MEDVERMOV, L.M., tekhnicheskiy redaktor

[Designing electric machinery] Proektirovanie elektricheskikh mashin.
Pod obshohei red. P.S.Sergeeva. Moskva, Gos. energ. izd-vo, 1956.
504 p.

(Blectric machinery)

(MIRA 10:1)



GORYAINOV, F.A. 112-3-5814 Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957; Nr 3, p. 109 (USSR) 'AUTHOR: Goryainov, F.A., Tishchenko, P.A. TITLE: The Problem of Fast Response of the Rotating Regulator (K voprosu o bystrodeystvii elektromashinnogo regulyatora) PERIODICAL: Tr. Mosk. energ. in-ta, 1956, Nr 16, pp. 128-133. Tast response of rotating regulators is judged by the control circuit time constant τ . If the possibility of variations in the time constant is disregarded, it is ABSTRACT: possible to establish ways in which the value of the time constant is influenced, by writing the expression for T in various forms: ΥσΦa. γσ where o dispersion coefficient of the poles; Φ_a = useful flux; γ = specific resistance of the control Card 1/3

112-3-5814

The Problem of Fast Response of the Rotating Regulator

winding conductors; $\alpha = ratio of the total voltage$ drop in the control circuit, including the voltage drop in the additional resistance, to the voltage drop in the control winding; J = current density in the control winding; l = average length of turn of the control winding; v_a speed of rotation of the regulator armature; A = armature linear load; Pa = capacity of the rotating regulator; 2 p = number of poles in the rotating regulator; E, fa = emf and speed of rotation of armature; Wa = number of series turns of armature winding. To make the time constant shorter, analysis indicates that it is necessary to include additional resistances in the control circuit, increase the current density in the control winding, which requires the use of heat-resistant insulation and improved ventilation, decrease the specific power of the regulator per pole, increase the number of commutator plates and series conductors in the armature winding branch, increase the speed of rotation and the frequency of polarity reversal of the armature, and increase the linear load to the extent permitted by reliable commutation. The magnetic circuit of

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112-3-5814

The Problem of Fast Response of the Rotating Regulator

the auxiliary commutation poles should be designed with an additional gap between each pole and yoke; the magnetic circuit should consist of sheet steel with a lower specific permeability, and the frame and bearing housings should be made of normagnetic materials in order to reduce leakage flux.

A.I.M.

ASSOCIATION:

Moscow Institute of Power Engineering (Mosk. energ.

in-t)

Card 3/3

112-3-5813

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957,

Nr 3, pp. 108-109 (USSR)

AUTHOR: Goryainov, F.A., and Tokarev, B.F.

GUKTATAGE JITT

TITLE: Transients in a Three-Stage Longitudinal-Field Dyra-

motor (Perekhodnyye protsessy v trekhstupenchatom EMU

prodol'nogo polya)

PERIODICAL: Tr. Mosk. energ. in-ta, 1956, Nr 16, pp. 134-144

ABSTRACT: A three-stage longitudinal-field self-excited dynamo-

electric amplifier is discussed; it possesses high power gain and rapid response. [Included in the abstract is a schematic diagram of the dynamo-electric amplifier, showing the first stage control winding (located on two opposite poles); the third stage control winding (located on all main poles); the self-excitation winding (located on all main poles; compensating winding (located on the same poles as the first stage control winding); and a winding for auxiliary commutating poles]. The dyna-

Card 1/4 motor has three stages of amplification and excitation.

112-3-5813

Transients in a Three-Stage Longitudinal-Field Dynamotor

If the magnetic circuit is not saturated, and if the armature reaction due to current I_{24} is fully compensated, the following system of linear differential equations may be written: First stage: $m_y U_y = (1 + pT_y)E_{132}$

Second stage: $m_2E_{13} = (1+pT_2)E_{241}$ Third stage: $m_3E_{24} =$

$$(1 + pT_{e_1}) (1 + pT_{e_2}) E_{yr}$$
, where $m_y = \frac{E_{13}}{U_y}$
 $m_2 = \frac{E_{24}}{B_{13}}$, $m_3 = \frac{E_3}{E_{24}}$ - voltage

gain of the corresponding stage; Ty, T, etc., are time constants computed by means of formulae provided in the text. A relationship between Uy (the input voltage) and E, (the output voltage) is obtained from the above system of equations:

 $mU_y = (1 + pT_y)(2 + pT_2)(1 + pT_{e_1})(1 + pT_{e_2}) E_{31}$

Card 2/4

Transients in a Three-Stage Longitudinal-Field Dynametor

where $m = m_y m_2 m_3$ is the overall voltage gain. In the event there are no auxiliary commutating poles in the dynamotor, the relationship between U_y and E_{5T} assumes the following form:

 $m U_y = (1 + pT_y)(1 + pT_2)(1 + pT_e) E_{3\pi}$

where $\frac{1}{\sqrt{5k-R_c}}$; $\frac{1}{$

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112-3-5813

Transients in a Three-Stage Longitudinal-Field Dynamotor

the smaller the power gain. The equivalent time constant can be decreased by decreasing the time constant of the circuit of brushes 2 and 4 and of the self-excitation winding. The time constant of the circuit of brushes 2 and 4 can be decreased by reducing the number of turns of the third stage control winding. 2. Insufficient compensation of the armature reaction to current I24 accelerates the transient to some extent, and overcompensation retards the transient. 3. The coincidence of the design and experimental curves is sufficiently close for application of the equations to the computation of transients in the three-stage dynamo-electric amplifier.

0.I.Z.

ASSOCIATION: Moscow Institute of Power Engineering (Mosk. energ. in-t)

Card 4/4

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Hr 1, p. 120 (USSR)

AUTHORS: Goryainov, F. A., Tokarev, B. F.

Design | of a Three-Stage Dynamoelectric Amplifier of the Longitudinal TITLE: Field (K raschetu trekhstupenchatogo elektromashinnogo usilitelya pro-

dol'nogo polya)

PERIODICAL: Tr. Mosk. energ. in-ta, 1956, Mr 16, pp. 145-148

ABSTRACT: Recommendations are given concerning the design of a 4-pole 3-stage amplidyne (EMU) of the longitudinal field, with self-excitation winding in the last stage. The calculation is done separately for every stage starting from the terminal (third), because of the unsaturated magnetic system. The selection of the main dimensions is made according to the formula of the machine constant. The values of Byare taken as 1.5 to 3 times, and those of AS as 1.1 to 1.2 times smaller than in normal machines. A percentage value of the relationship between the magnetizing force of the self-excitation and of the control winding of the third stage is given, and also between the output currents of the third,

second and first stages. The magnetizing forces of the control wind-Card 1/2 ings of the second and first stages are determined from the conditions

Design of a Three- Stage Dynamoelectric Amplifier of the Longitudinal Field (Cont.)

of generating the electromotive force which provides the required current in the controlling winding of the subsequent stage. In order to secure a highest commutation of all three armature currents, the auxiliary poles of the EMU are provided with four coils each. A connection diagram for these coils is provided and formulas for the selection of the number of their turns are given. The compensating winding for compensating the armature reaction of the third stage control current is placed on the same poles as the control finding of the first stage. The compensating winding has a number of turns per pole equal to M/16, where N is the number of active armature conductors. V. S.M.

Card 2/2

GORYAINOV, F.A., dotsent, kand.tekhn.nauk; TISHCHENKO, P.A., assistent

Dynamoelectric regulator "Magnicon". Izv. vys. uch.b. zav.;
elektromekh. no.1:79-85 '58. (MIRA 11:6)

1.Moskovskiy energeticheskiy institut.
(Voltage regulators)

AUTHORS: Goryainov, Fedor Alekseyevich, Candidate SOV/ 161-58-1-15/33 of Technical Sciences, Docent at the Chair of Electrical Machines at the Moscow Institute of Power Engineering, Kuznetsova, Larisa Ivanovna, Candidate of Technical Sciences, Assistant at the Chair of Electrical Machines at the All-Union Institute of Power Engineering On the Problem of the Compensated Electrodynamical Longitudinal-TITLE: Field Controller(K voprosu o kompensirovannom elektromashinnom regulyatore prodolinogo polya) Nauchnyye doklady vysshey shkoly, Elektromekhanika i avtomatika, PERIODICAL: 1958, Nr 1, pp. 122 - 130 (USSR) ABSTRACT: The particular features of the compensated electrodynamical longitudinal-field controllers used in automatic electric drives are exposed. They permit to increase the quality of existent electro dynamical longitudinal-field controllers. First a non-compensated longitudinal-field controller with a self-exciting parallel winding and with a control winding is investigated. If the mean-value i of the additional currents across the commutating segment is computed according to the

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mean value of the additional e=e - e_R in the commutating segment, which equals (e_k) e_R a positive current i_k is obtained with an accelerated communication $(e_k < e_R)$ and a negative

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positive current i, is ob-

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current i, with a retarded commutation $(e_k \leq e_R)$. e_k denotes the commutating EMF and e_R the reactive EMF. In the second chapter the degree of compensation of the armature reaction is investigated. The degree & of compensation of the transverse armature reaction in the zone of the main poles must be chosen equal to unity or somewhat larger. If the compensation is complete the field at load will be the same as at idling. In this case no local increase of induction and of the voltage between neighboring commutator segments occurs. Thus the danger of a flashing-over at the commutator is abolished. It is possible to increase the linear load of the armature, when a compensation is present. Thus the amplification coefficient of the controller can be increased. The third section deals with the amplification and the factor of merit. According to formulae (11) and (12) both factors will increase in a machine with a greater linear armature load and a higher speed. It will also increase when the air gap is smaller, the straying, the saturation of the machine and the induction in the air gap are higher. With a compensation winding the transverse armature

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 On the Problem of the Compensated Electrodynamical Longitudinal-Field Controller

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reaction can be completely compensated. Thus a saturation in the slot zone can be removed. In the forth chapter the time constant is investigated. Formula (13) for the time constant T (Ref 2) of the exciter winding is written down. Its analysis shows that the number of poles (2p) the maximum admissible armature speed (va) and the current density in the exciter winding must be increased in order to reduce the time constant. The frame of the machine is to be laminated in order to reduce the slowing-down effect of eddy currents upon the velocity of transient processes. In the fifth section the test runs are described. The model of a compensated electrodynamical controller was subjected to test runs at a static and at a transient mode of operation. The amplification factor and hence the factor of merit of the controller is considerably influenced by the degree of compensation of the transverse armature reaction and by the resistance of the self-exciter winding. The gradient of a current rise in the armature is greater almost by a factor of 5 than in a controller without a compensation winding. The compensated controller exhibits a sufficiently great high-speed

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On the Problem of the Compensated Electrodynamical Longitudinal-Field Controller

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action and a stable operation. Thus it needs no stabilizing devices. As compared to the longitudinal-field controller the compensated electrodynamical controller is simple and reliable. It can be recommended: 1) For electric drives in iron metallurgy and for electric drives of reversing milltrains. 2) Instead of a cascade connection of two cne-stage electrodynamical controllers. 3) As a control of the exciter winding of large synchronous machines. There are 3 figures, 3 tables, and 5 references, which are Soviet.

ASSOCIATION:

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SUBMITTED:

January 3, 1958

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