BAKUSHINSKAYA, O.A.; BELOVA, L.D.

Increasing the yeast yield from raw materials by means of growth
promoting substances prepared from natural products. Trudy TSNIIKHP
no.10.151-158 '62.   (MIRA 18:2)

L 19429-63   EWT(1)/BDS/FCC(w)   AFFTC/ASD/IJP(C) S/0044/63/000/006/V008/V009
ACCESSION NR: AR3005386

SOURCE: RZh. Matematika, Abs. 6V23

AUTHOR: Bakushinskiy, A. B.; Vlasov, V. K.

TITLE: Computation of exciton energy levels with the aid of a continual integral

CITED SOURCE: Sb. rabot Vychisl. tsentra Mosk. un-ta, v. 1, 1962, 103-119

TOPIC TAGS: Monte Carlo method, exciton, continual integral, eigenvalue, eigen-function, Laplace operator, Hamiltonian operator, Schroedinger equation, Green function, Cauchy problem

TRANSLATION: The authors consider the equation

$$\frac{\partial \psi}{\partial t} = -H\left(x, \frac{\partial}{\partial x}\right)\psi. \qquad (1)$$

having the same energy spectrum (eigenvalues of the Hamiltonian operator H) as the Schroedinger equation of quantum mechanics

$$i\frac{\partial \psi}{\partial t} = H\left(x, \frac{\partial}{\partial x}\right)\psi.$$

Card 1/3

L 19429-63

ACCESSION NR: AR3005386

The Green function of the Cauchy problem for equation (1) has the form

$$G(x, x_0, T) = \sum_{n=0}^{\infty} \varphi_n(x_0)\, \varphi_n(x)\, e^{-E_n T},$$

where $\quad E_n (E_0 < E_1 < \ldots < E_n < \ldots)$

and $\varphi_n(x)$ are the eigenvalues and eigenfunctions of the operator H, respectively.

The authors employ the integral with respect to Wiener's measure, and to compute the "lower energy level" (E_0) of the exciton study the asymptotics of the continual integral

$$E_0 = -\lim_{T \to \infty} \frac{1}{T} \ln \int_C \exp\left\{ \int_0^T H[\dot{x}, \tau]\, d\tau \right\} d_W x(\tau). \quad (2)$$

where C is the space of function $x(\mathcal{T})$; $x(0) = 0$,

$$d_W x(\tau) = \exp\left\{ -\frac{1}{2} \int_0^T |\dot{x}(\tau)|^2\, d\tau \right\} \prod_0^T dx(\tau).$$

In the case considered by the authors the Hamiltonian has the form:

$$H = -\frac{\hbar^2}{2m_1} \Delta_{r_1} - \frac{\hbar^2}{2m_2} \Delta_{r_2} - \frac{e}{\hbar^2 r_{12}} - \sum_k \left\{ \frac{1}{2\hbar} \dot{q}_k^2 - \right.$$

$$\left. -\frac{\omega^2}{2\hbar} q_k^2 - \frac{1}{\hbar} P_k(\sin k r_1 + \sin k r_2)\, q_k \right\}.$$

2/3

Card 2/3

L 19429-63

ACCESSION NR: AR3005386

where $\hbar$ is Planck's constant, m_1 is the electron mass, Δ is the Laplace operator

$$p_k = -2\pi i \sqrt{\frac{2\pi e}{v}} \cdot \frac{1}{|k|} .$$

ω is the frequency of lattice oscillation, v is the volume of the crystal, r_1 is the vector describing the electron position, r_2 is the vector describing the position of the "hole", q_k, $\dot{q}_k$ are the generalized coordinates and velocities of the lattice molecules. The integral with respect to Wiener's measure appearing in the right-hand side of (2) is computed approximately by the Monte Carlo method. The computation technique is described. A brief description of the program is given. The computations were carried out on a "Strela-4" computer. D. Topolyanskiy

DATE ACQ: 24Jul63   SUB CODE: MA, PH   ENCL: 00

Card 3/3

BAKUSHINSKIY, A.B.; VLASOV, V.K.

A method for the numerical solution of Dirichlet's problem for
the Laplace equation. Vych. met. i prog. 1:141-151 '62.
(MIRA 15:8)
(Differential equations—Numerical solutions)

S/181/62/004/012/027/052
B125/B102

AUTHORS: Lyubimov, V. N., Venevtsev, Yu. N., Solov'yev, S. P.,
Zhdanov, G. S., and Bakushinskiy, A. B.

TITLE: The dipole structure and the internal electric fields in
PbZrO$_3$

PERIODICAL: Fizika tverdogo tela, v. 4, no. 12, 1962, 3543-3550

TEXT: The most probable values of the internal electric fields and field-
induced electron dipoles are calculated for a PbZrO$_3$ crystal on the basis
of the model of point dipole structure. Using the method developed by
S. P. Solov'yev, Yu. N. Venevtsev, G. S. Zhdanov (Kristallografiya 3, 473,
1958), the determination of the 28 different projections of the electron
dipole moments was reduced to the solution of a system of 28 linear
algebraic equations for 28 unknowns. The structural sums which are
necessary for the set-up of these equations describe the fields of the
infinite sublattices of the unit charges and unit dipoles, the number of
which exceeds by far 1000. Both the structural sums and the system of

Card 1/3

The dipole structure and the ...

S/181/62/004/012/027/052
B125/B102

equations itself were calculated in various modifications using the electronic computer "Strela". The effect of all structure sublattices on each of the 40 atoms incorporated in the elementary cell was taken into account. The variant P_S was determined by extrapolation for the parameters $e_{Pb} = 1.27$, $e_{Zr} = 1.73$, $e_O = -1$, $\alpha_{Pb} = 4.32 \cdot 10^{-24}$ cm^3,

$\alpha_{Zr} = 0.80 \cdot 10^{-24}$ cm^3, $\alpha_O = 2.26 \cdot 10^{-24}$ cm^3. e_i denotes the effective charges and α_i denotes the electron polarizabilities of the ions. The small value of P_S within a certain temperature interval makes it possible to establish a correlation between the data obtained from structure and those from dielectric studies. At room temperature, the ion polarization for the above-mentioned values of the parameters is compensated by electron polarization. Hence, the PbZrO$_3$ crystal is antipolarized and very similar to an anti-electret. Results, similar in principle, are obtained for any of the ten crystallographic polar classes of pyroelectrics (electrets). It is assumed that at least the direction of most of the projections of the electron dipole moments and of the internal fields corresponds to the

Card 2/3

The dipole structure and the ...

S/181/62/004/012/027/052
B125/B102

real structures of $PbZrO_3$ at room temperature. The displacement of the atoms may be attributed to nonelectrostatic forces. The highest field strength acts on the Zr ion. In general the internal field strength increases with decreasing ion polarizability. The rules found for $PbZrO_3$ resemble those governing the ferroelectric crystals $BaTiO_3$ and $PbTiO_3$. It would be useful to investigate $PbZrO_3$ under pressure. There are 7 tables.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva
(Physicochemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: July 9, 1962

Card 3/3

L 11077-63   EWT.d)/FCC(w)/BDS   AFFTC   (r,c)

ACCESSION NR: AP3001110   S/0208/63/003/003/0574/0580

53
52

AUTHOR: Vlasov, V. K.; Bakushchinskiy, A. B.

TITLE: The method of potentials and numerical solution of the Dirichlet problem
for the Laplace equations ||

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 3, no. 3,
1963, 574-580

TOPIC TAGS: numerical solution method, Dirichlet problem, Laplace equation

ABSTRACT: The approximate method developed by N. N. Bogolyubov and N. M. Krylov
for the numerical solution of integral equations of the theory of potentials is
applied to the numerical solution of the exterior Dirichlet problem for the Laplace
equations. The approximate value of the harmonic function and the estimate of the
approximation error are derived for the cases when the boundary of the domain is
a smooth curve and when it is a convex curve with some rectilinear portions. It
is noted that the method presented can be easily realized on an electronic computer
and makes possible much faster calculation of the values of harmonic functions at
discrete points than other numerical methods. Numerical results of two examples
of solving the Dirichlet problem for the Laplace equation by the method described

Card 1/2

L 11077-63
ACCESSION NR: AP3001110

are presented. The program was written for the "Strela" computer and realized
for any number of partitions of the boundary curve and for any arbitrary domain.
"In conclusion the authors acknowledge their deep gratitude to A. N. Tikhonov for
his valuable counsel in discussing the present work." Orig. art. has: 25 equations
and 3 tables.

ASSOCIATION: none

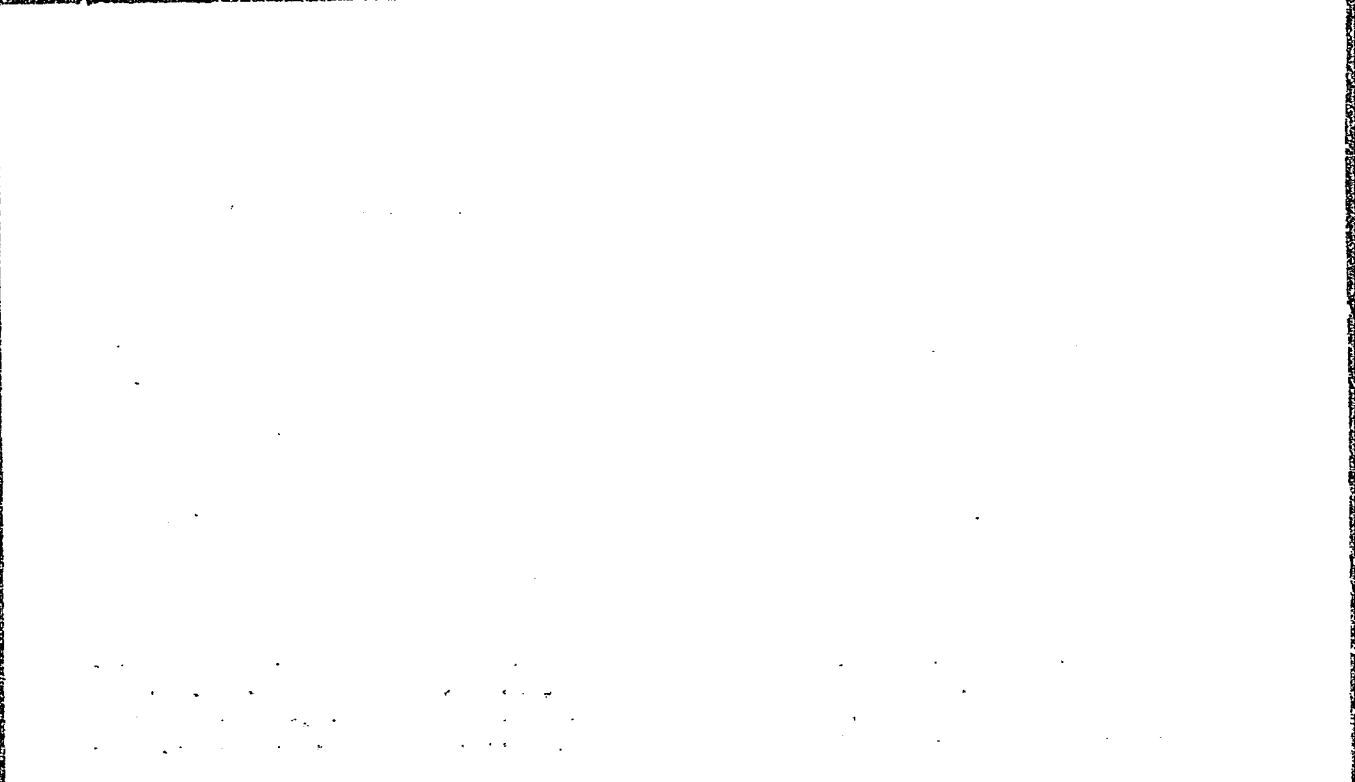SUBMITTED: 13Apr62   DATE ACQ: 10Jun63   ENCL: 00

SUB CODE: MM   NO REF SOV: 007   OTHER: 002

Card 2/2

BAKUSHINSKIY, A.B. (Moskva)

Method for solving "degenerate" and "almost degenerate" linear al-
gebraic equations. Zhur. vych. mat i mat fiz. 3 no.6:1113-1114 N-
D '63.   (MIRA 17:1)

are known, and $q(z)$ is the unknown function. In one-dimensional problems where
unity, the integration of this equation calls for the solution of a system of line-

BAKUSHINSKIY, A.B. (Moskva)

Numerical method for solving Fredholm integral equations of
the first order. Zhur. vych. mat. i mat. fiz. 5 no.4:744-749
Jl-Ag '65.   (MIRA 18:8)

BAKUSHINSKIY, V.N.

[Organization of laboratory work in physics in the secondary school]
Organizatsiia laboratornykh rabot po fizike v srednei shkole. Part.2,
Moskva, Gos. uch. red. izd-vo Narkoprosa RSFSR, 1946. 123 p.(MLRA 7:4)
      (Physics--Laboratory manuals)
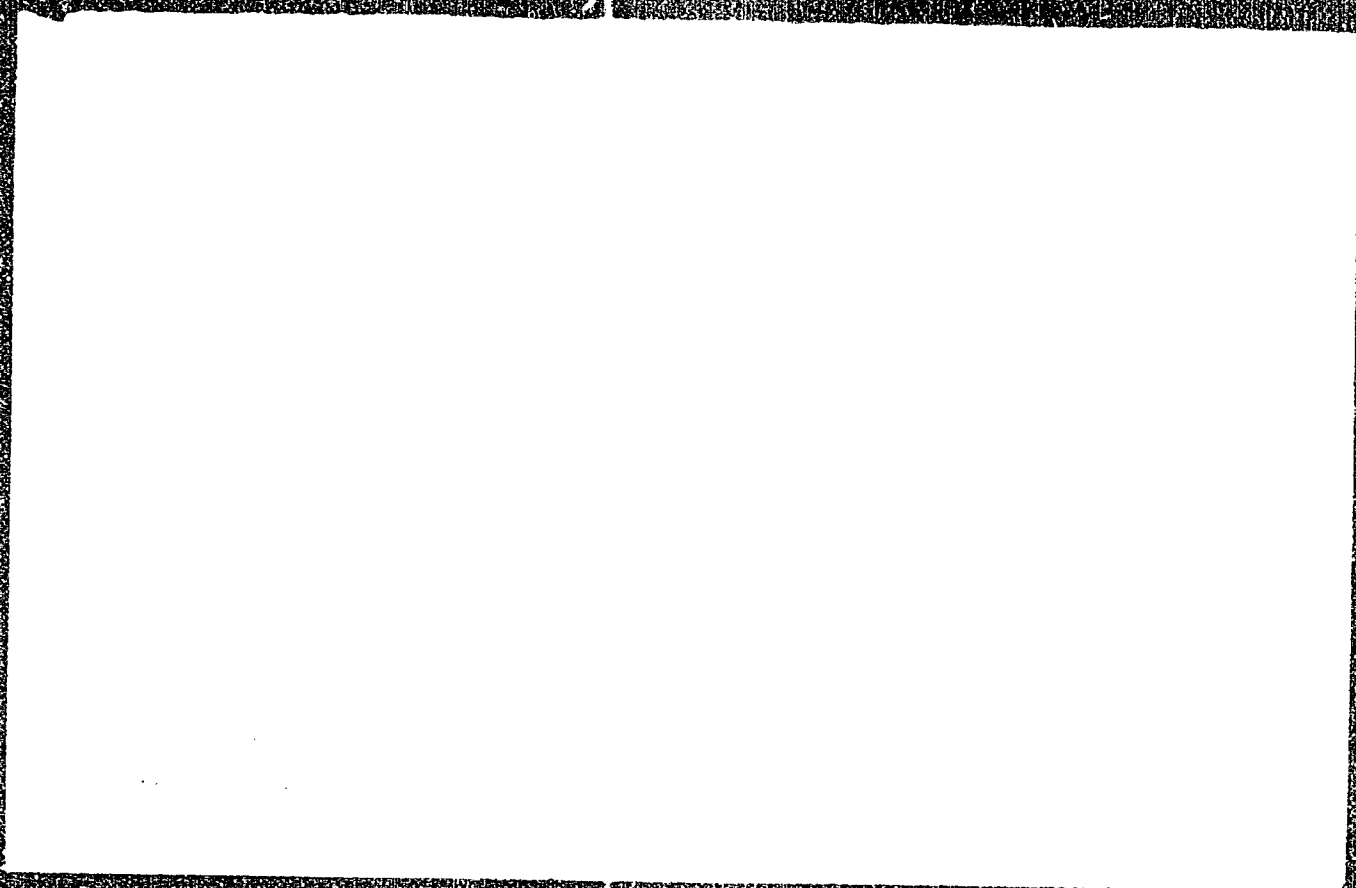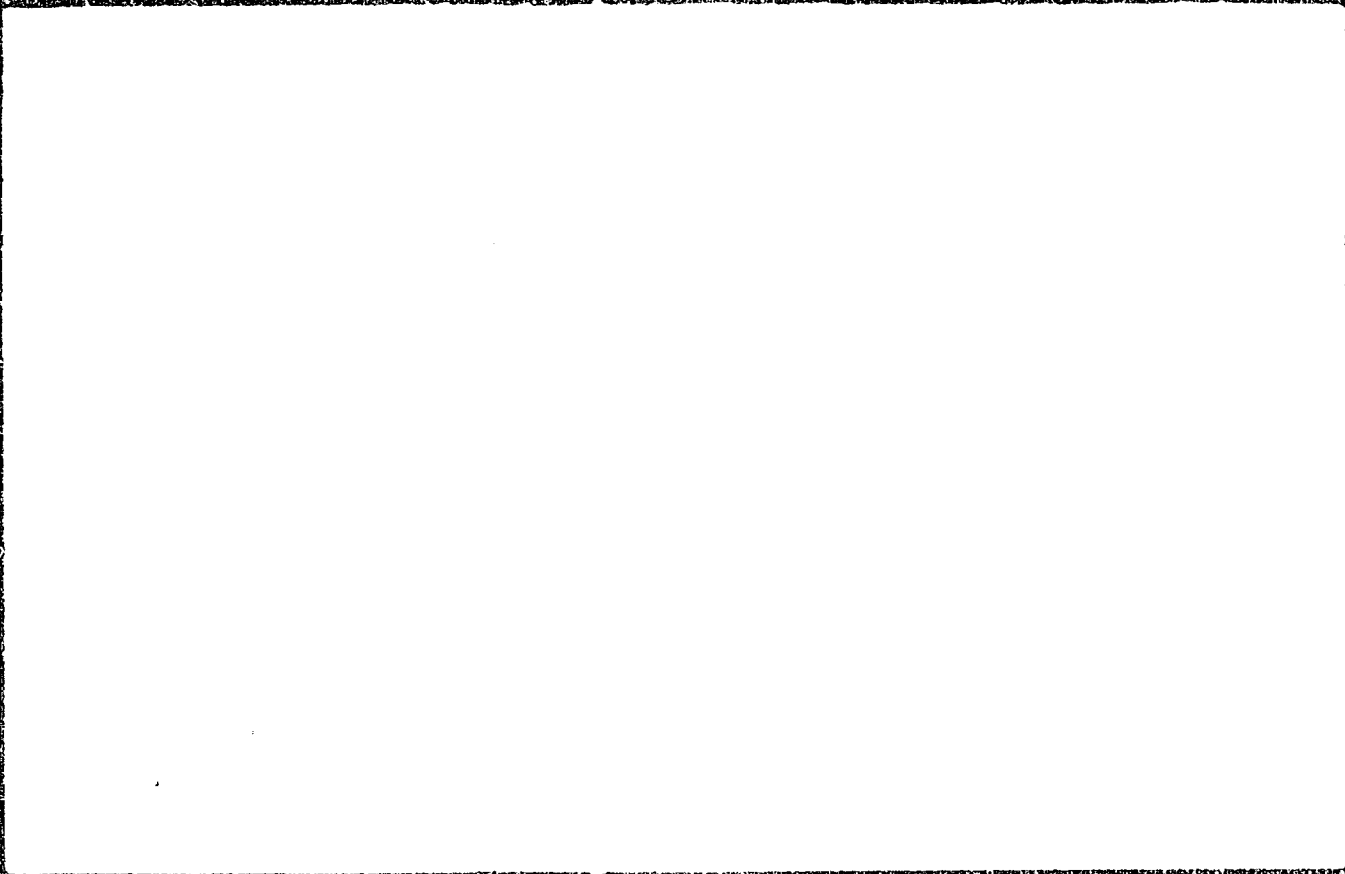
RAKUI, P. A.,

"Determining the Upper Limits of the Degree of Stability in Single-loop
Systems with Derivative Action," Research in Physics and Radio Engineer-
ing, Moscow, Oborongiz, 1958. p. 123.

The book is a collection of 13 articles written by instructors and graduate
and undergraduate students of the Moscow Inst. of Physics and Technology.
The articles discuss problems in radio physics, optics and physics.

BAKUT, P.A.

Upper values of stability degree of single-circuit systems involving
disturbances of derivatives. Trudy MFTI no.2:123-133 ' 58.
(MIRA 11:12)

(Automatic control)

9 (2, 3)

66311
SOV/162-59-1-4/27

AUTHOR: Bakut, P.A.

TITLE: The Theory of Correcting Codes With an Arbitrary Basis

ABSTRACT: The author discusses the problem of finding the maximum possible number d, for which there is an n-place code with the basis a, containing N signals, when the shortest distance between the signals is a. A method of constructing such codes is found, if

$$n = \frac{N!1}{M!^{a-L}(M+1)!^{L}(a-L)!L!}$$ where M and L are

the quotient and the rest from the division of N by a, while 1 is any full number. It was found that these codes have the highest d/n ratio. An estimation of the above and the asymptotic formula (for large n) are given, for d in the general case. The author discusses

Card 1/3   a coding system in which the signals are sequences,

66311
SOV/162-59-1-4/27

The Theory of Correcting Codes With an Arbitrary Basis

consisting of n elementary pulse trains of a types.
Such signals are designated by the sequence
$$y = (x_1, x_2, \ldots, x_n) \qquad (1)$$
where each symbol x_1 has one of a values: l_1, l_2, ...
l_a. A set of sequences of the aforementioned type are
designated by D, which contains a^n different sequen-
ces. The errors arising during signal transmission may
be detected and corrected, if not the entire signal
set of (1) is used, but some subset D_1 instead, consi-
sting of N signals. When constructing correcting codes,
it is necessary to find the maximum possible number d,
at which the subset D_1 may be selected from N signals
of the signal set D; the smallest distance between
these signals is equal to d. The code formed in this
case by the signals D_1 enables to detect and to correct
the maximum number of errors with given N and n. This
problem has been investigated in a number of papers,
Card 2/3   for example by R.W. Hamming [Ref 1], V.I. Siforov [Ref

66311
SOV/162-59-1-4/27

The Theory of Correcting Codes With an Arbitrary Basis

    2/ and R.R. Varshamov /Ref 3/. However, a full solu-
    tion of this problem has not been found as yet. The
    author's paper is a new approach to this problem and
    produced some new results. The author introduces the
    so-called t-functions. A more detailed study of t-
    function sets will possible lead further to a solution
    of the problem discussed in this paper. There are 3
    references, 2 of which are Soviet and 1 American.

SUBMITTED: July 2, 1958

Card 3/3

6.9200

S/142/62/005/003/002/009
E140/E435

AUTHOR: Bakut, P.A.

TITLE: Estimate of maximum likelihood of normal signal
            parameters

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Radiotekhnika,·
            v.5, no.3, 1962, 326-330

TEXT: The purpose of the article is to estimate the maximum
likelihood of the parameters of normal random signals, e.g.
radiolocation return pulses.   The normal random signal is
defined on an interval of time $(0, T)$ by its mathematical
expectation $\mu(t, \Theta)$ and correlation function $\lambda(t, s, \Theta)$,
where Θ is an unknown parameter.   All statistical parameters
of the normal signal are thus defined.   The problem posed by ·the
author is reduced to the solution of a certain integral equation.
An important practical case is that where the time of
observation is great with respect to the correlation time, with
stationary signal.   A simple solution can be found for this
case.   An example is given of the measurement of the frequency
of a fluctuating signal with superimposed white noise.   There
Card 1/2

V_B

Estimate of maximum likelihood ...

S/142/62/005/003/002/009
E140/E435

are 2 figures.

ASSOCIATION: Kafedra,Moskovskiy fiziko-tekhnicheskiy institut
(Department of Moscow Physicotechnical Institute)

SUBMITTED: August 3, 1959 (to the Editorial Office of NDVSh)
February 4, 1960 (to Izv.VUZ Radiotekhnika)

Card 2/2

BAKUT, P.A.; BOL'SHAKOV, I.A.; GERASIMOV, B.M.; KURIKSHA, A.A.;
REPIN, V.G.; TARTAKOVSKIY, G.P., prof.; SHIROKOV, V.V.;
ALEKSANDROVA, A.A., red.; BELYAYEVA, V.V., tekhn. red.

[Problems of the statistical theory of radar] Voprosy sta-
tisticheskoi teorii radiolokatsii. [By] P.A.Bakut i dr.
Pod obshchei red. G.P.Tartakovskogo. Moskva, Sovetskoe
radio. Vol.1. 1963. 423 p.   (MIRA 16:5)
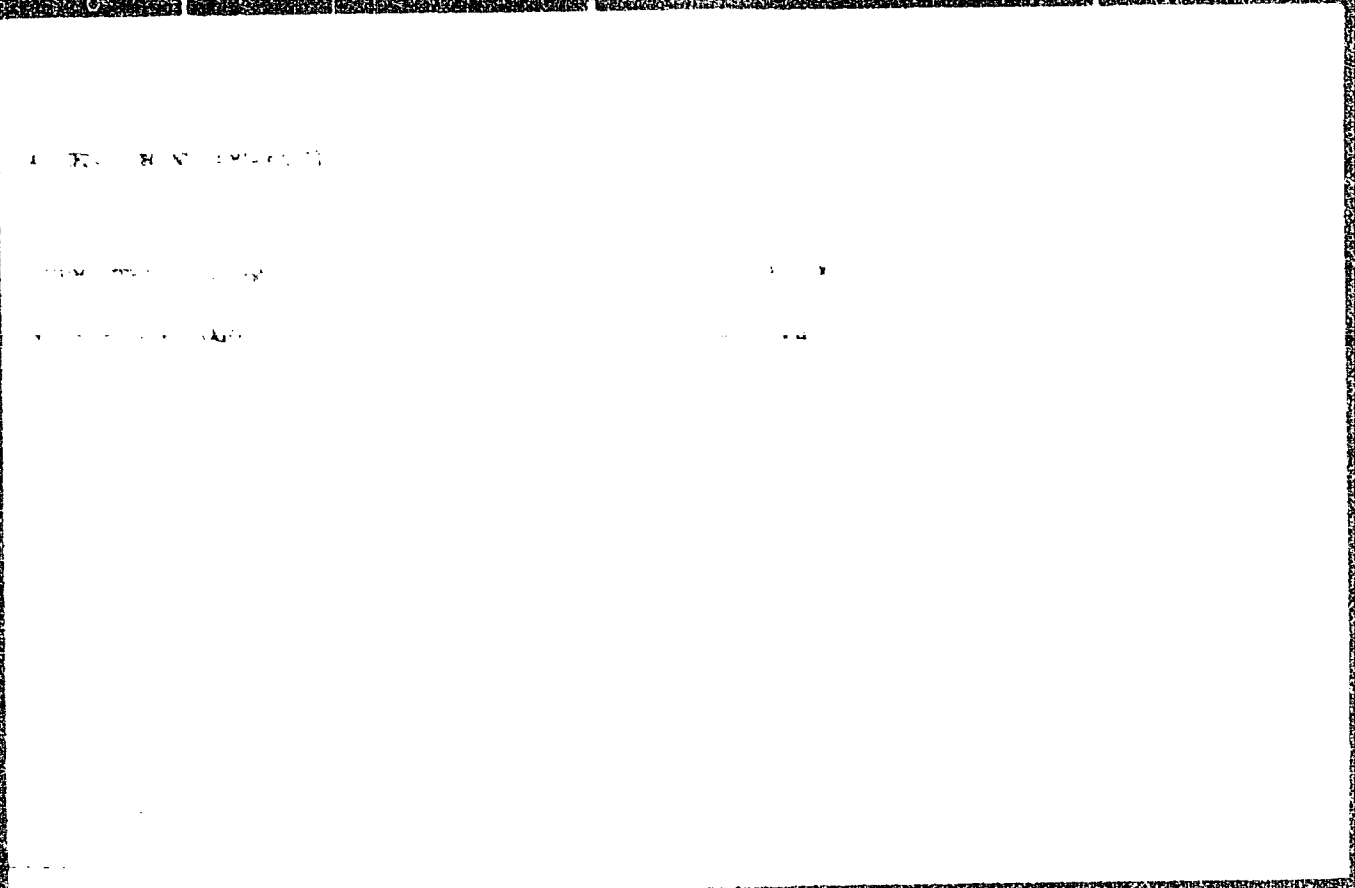   (Radar)
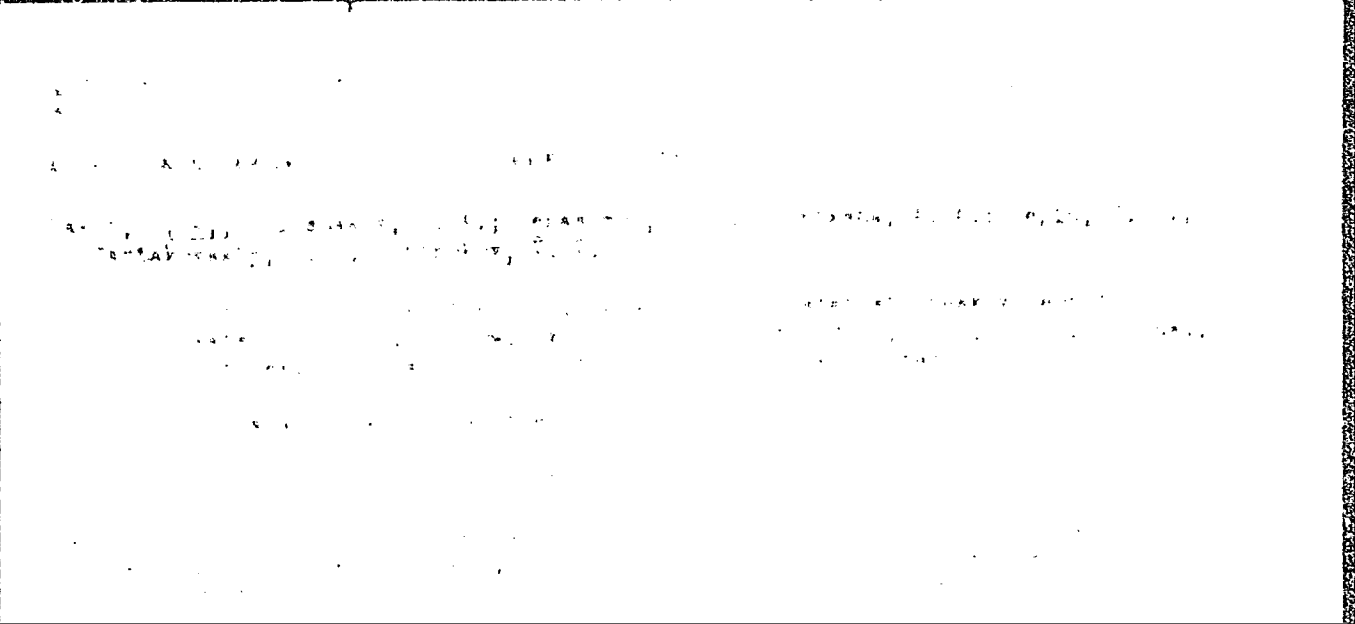
nontracking measurement systems, linear and nonlinear, and the synthesis of

students. Many problems of the general theory are also of interest to those
mathematical problems in all fields based on the theory of

L 36190-66   FBD/FSS-2/EWT(l)/EEC(k)-2/T/EWP(k)   IJP(c) WR/WG
ACC NR: AP6011445   SOURCE CODE: UR/0109/66/011/004/0643/0652

AUTHOR: Bakut, P. A.

ORG: none

TITLE: Potentialities of location by signals having quantum structure

SOURCE: Radiotekhnika i elektronika, v. 11, no. 4, 1966, 643-652

TOPIC TAGS: optic radar, radar engineering

ABSTRACT: A method of radar reception is considered in which field amplitudes
are recorded; this method preserves the information associated with the coherence
of received (laser) signals (cf. J. P. Gordon, Proc. IRE, 1962, 50, 9, 1929). Only
the potentialities of such a method are considered. A quantum field is generated
by several sources, e.g., by targets that disperse probing signals. The
parameters or even the existence of some sources is assumed to be unknown. The

Card 1/2   UDC: 621.378.9:621.396.9

L 36190–66
ACC NR: AP6011445 O

possibility of observation of field amplitudes in a restricted region is assumed.
Using a simple scalar field as an example, the possibility of detecting the sources
and the finding of limitations imposed by the field quantum nature are explored. It
is found that the quantum structure of the signal is responsible for certain statis-
tical errors in signal detection and its parameter evaluation. Error formulas are
similar to those in the classical coherent-signal white-noise problems. The
signal-to-noise ratio is represented by $E_v / \hbar \omega_e$ which means the average number
of photons in the observed space. Orig. art. has: 58 formulas.

SUB CODE: 17 / SUBM DATE: 16Jan65 / ORIG REF: 005 / OTH REF: 003

Card 2/2

BAKUTA, O.M.

The "Zavety Lenina" Collective Farm struggles for large crops. Zemledelie 25 no.11:28-30 N '63.   (MIRA 17:2)

1. Starshiy agronom kolkhoza "Zavety Lenina" Ust'-Labinskogo proizvodstvennogo upravleniya, Krasnodarskogo kraya.

SOV/112-57-5-10487

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 5, p 136 (USSR)

AUTHOR: Nekrashevich, I. G., Bakuta, I. A.

TITLE: On the Problem of the Mechanism of Electric Erosion of Metals
(K voprosu o mekhanizme elektricheskoy erozii metallov)

PERIODICAL: Sb. nauch. tr. fiz.-tekhn. in-ta AS BelSSR, 1955, Nr 2, pp 167-176

ABSTRACT: The authors present a discharge mechanism that attempts to explain
erosion caused by impulse low-voltage discharge. According to the theory set
forth in the article, after the formation of a channel, its current density
changes only slightly during the greater part of the discharge period. The
erosion is considered to be a result of multiple explosions due to shifting of the
channel within the discharge area and due to overheating of the metal by high-
density currents. Investigations of the sweeps of discharge spectrum have
disclosed the existence of nonperiodical pulsations of spectral-line brightness
and have corroborated, according to the authors, the veracity of the mechanism
suggested by them.

A.I.K.

Card 1/1

NEKRASHEVICH, I.G.; BAKUTO, I.A.

Dependence of the efficiency of an electric erosion unit on
the frequency of successive discharge pulses and on the average
current intensity. Dokl. AN BSSR 6 no.5:308-310 My '62. (MIRA 15:6)

1. Fiziko-tekhnicheskiy institut AN BSSR. Predstavleno
akademikom AN BSSR V.P. Severdenko.
                    (Electric discharges)
   (Electrodes)

NEKRASHEVICH, I.O.; BAKUTO, I.A.

Problem of the dependence of the electroerosion on the length
of the discharge interval in apparatus with RC circuits. Zhur.-
tekh.fiz. 32 no.5:641-643 My '62.   (MIRA 15:7)

1. Fiziko-tekhnicheskiy institut AN BSSR i, kafedra eksperimental'noy
fiziki Belorusskogo gosudarstvennogo universiteta imeni V.I.Lenina,
Minsk.
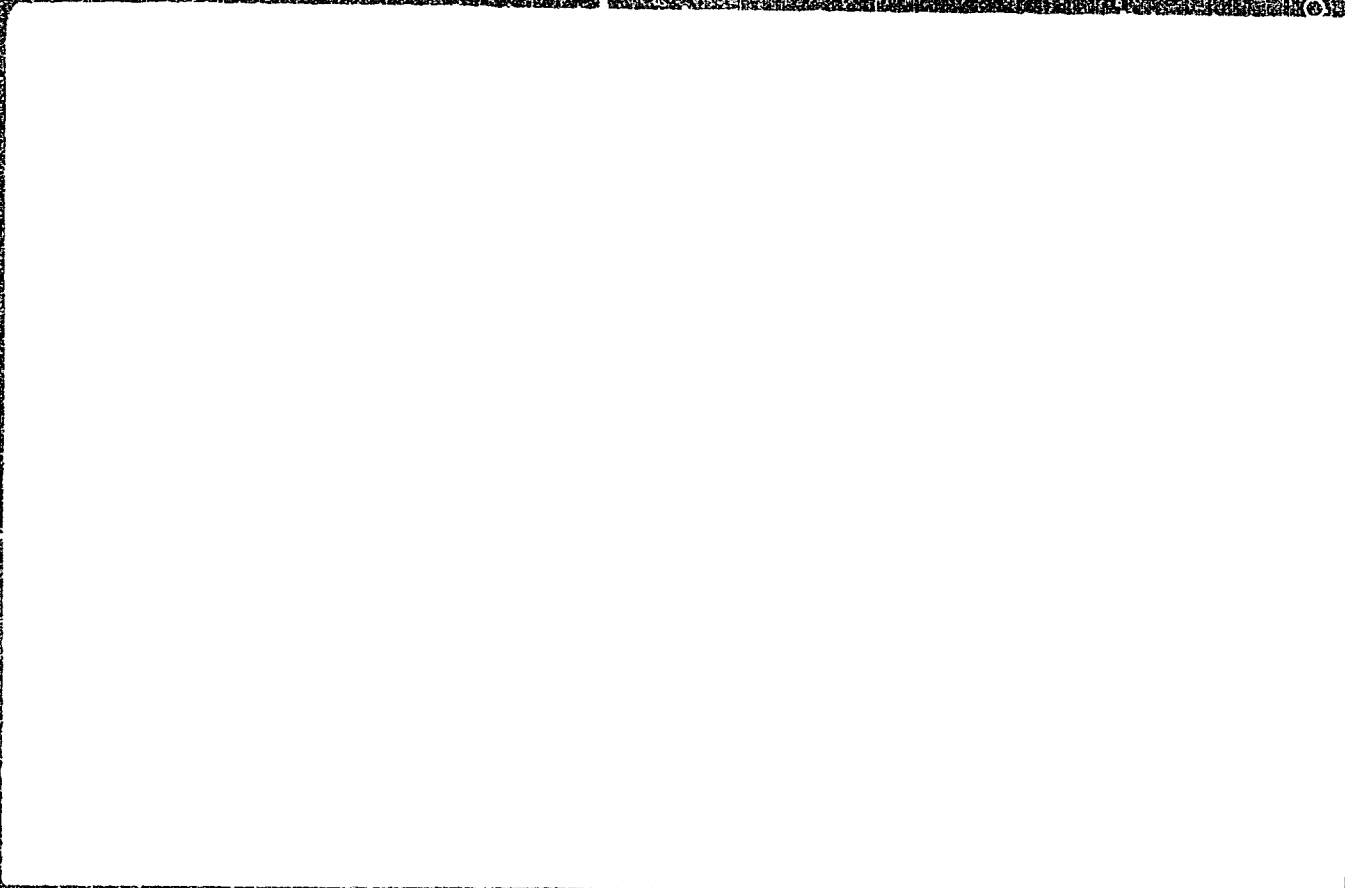   (Electric metal cutting)
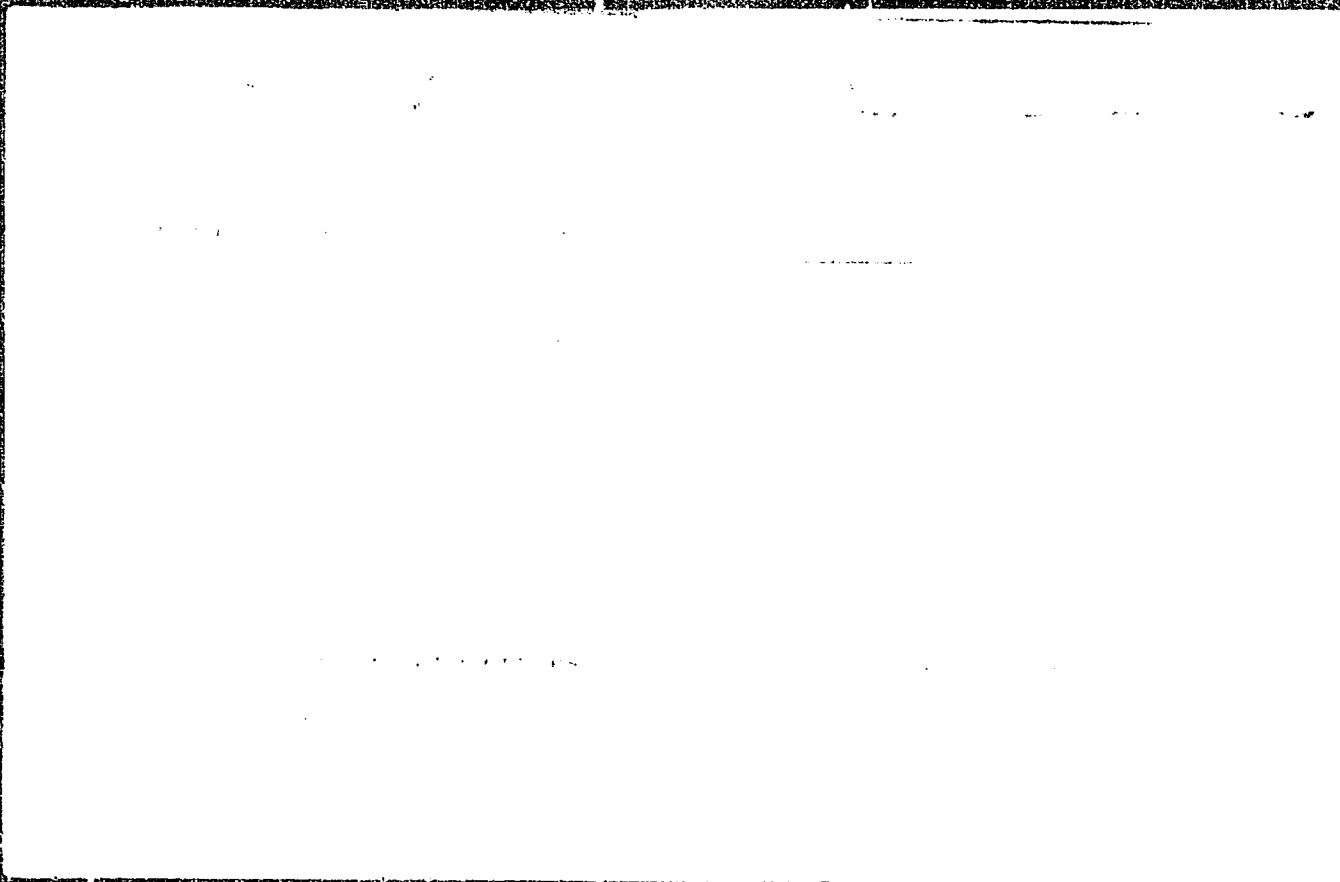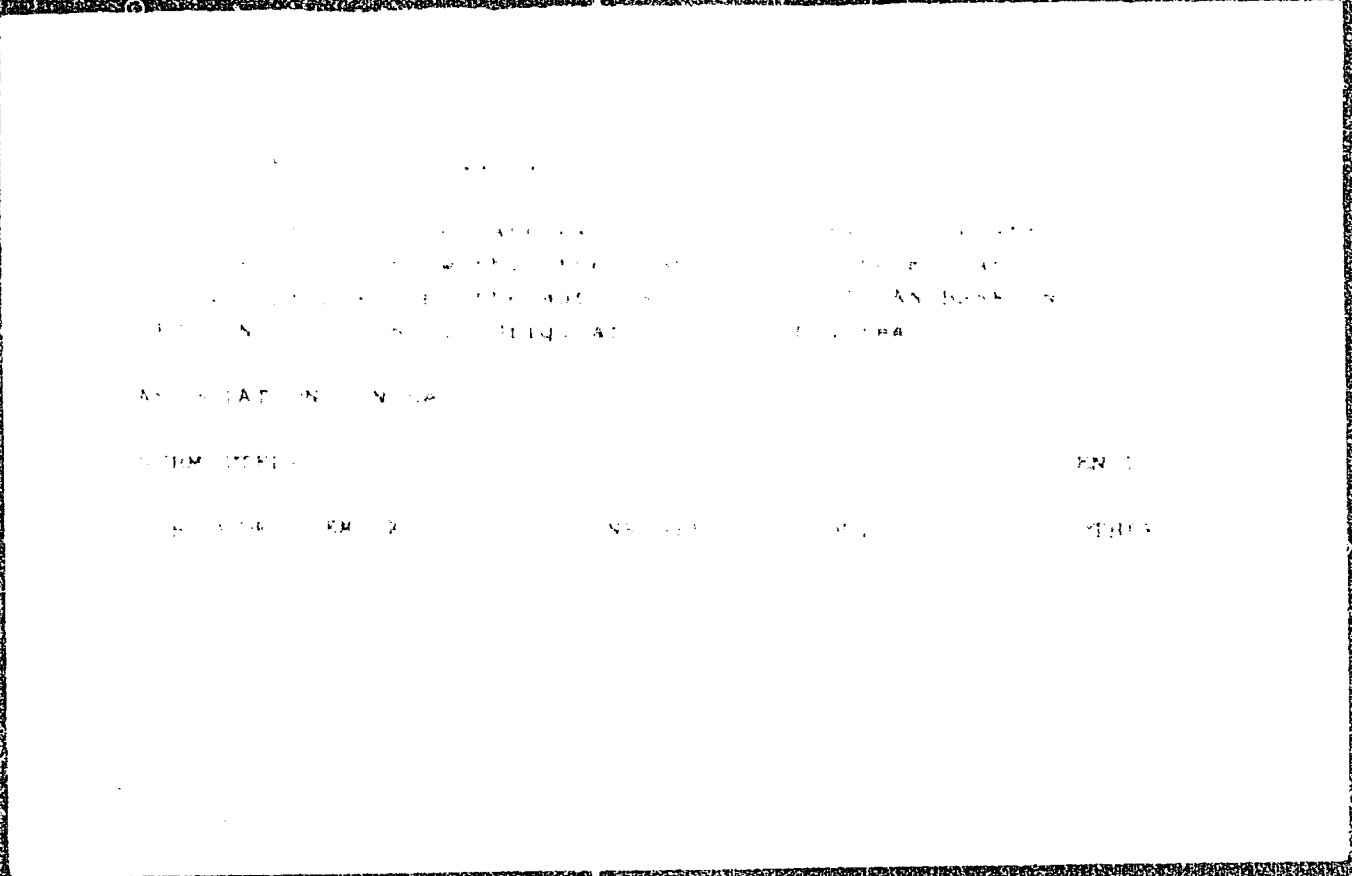
L 2714-66   EWT(1)/EPA(s)-2   IJP(c)   GG

ACCESSION NR: AP5017177   UR/0139/65/000/003/0053/0055

AUTHOR: Nekrashevich, I. G.; Bakuto, I. A.

TITLE: Concerning electronic breakdown of dielectrics in the presence of a source of nonelectric energy

SOURCE: IVUZ. Fizika, no. 3, 1965, 53-55

TOPIC TAGS: dielectric breakdown, heat balance, ion bombardment

ABSTRACT: An analysis of the energy balance equation in general form is used by the authors to calculate the conditions under which breakdown by electrons takes place in a dielectric which receives energy not only from the electric field but also from another source, such as a source of ionizing radiation. The heat re-leased in the dielectric is assumed to be an additive quantity, and the heat pro-duced by the ions is neglected. The breakdown condition is defined as the flow of infinite current. An analysis of the heat-balance equations and its modifications shows that different variants of breakdown criteria can be obtained, depending on the relations between the parameters of the equations. This is a reflection of the experimentally observed variety in the type of electric breakdown occurring in die-lectrics, so that any conclusion concerning the applicability of the theoretical

Card 1/2

L 2714-66

ACCESSION NR: AP5017177

3

results will depend on an analysis of the actual experimental data.   Orig. art.
has: 8 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institute AN BSSR (Physicotechnical Institute,
AN BSSR)

SUBMITTED: 02Dec63	ENCL: 00	SUB CODE: EM, NP
NR REF SOV: 003	OTHER: 000	

Card 2/2

L 2006-66   EWT(d)/EWT(m)/EWP(w)/EWP(k)/EWP(t)/EWP(b)/EWA(c)   EM/JD/HW

ACCESSION NR: AP5017696

UR/0250/65/009/006/0376/0378

AUTHOR: Nekrashevich, I. G.; Bakuto, I. A.

TITLE: On the influence of supplementary energy on the plastic flow of solids

SOURCE: AN BSSR. Doklady, v. 9, no. 6, 1965, 376-378

TOPIC TAGS: plastic flow, plastic deformation, deformation rate

ABSTRACT: The additional energy in question is introduced in the form of ultra-sound, shock waves, or heating with electric current connected with partial displacement of matter, and by other means. Analysis of the heat balance equation yields an expression for the stress component due to the supplementary energy, and yields a differential equation for the mass flow. The solution of the latter goes over into the standard Prandtl formula in the absence of supplementary energy. The presence of supplementary energy increases the rate of plastic deformation in proportion to the added energy. This report was presented by V. P. Severdenko. Orig. art. has: 10 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR (Physicotechnical Institute, AN BSSR); Belorusskiy gosudarstvenny universitet im. V. I. Lenina (Belorussian State University)

Card 1/2

L 2006-66
ACCESSION NR: AP5017696

SUBMITTED: 05Jun64   ENCL: 00   SUB CODE: ME

NR REF SOV: 001   OTHER: 001

Card 2/2

BAKUTA, N.K., inzh.

Improvement of a scraper conveyor. Stroi.mat. 9 no.12:20 D
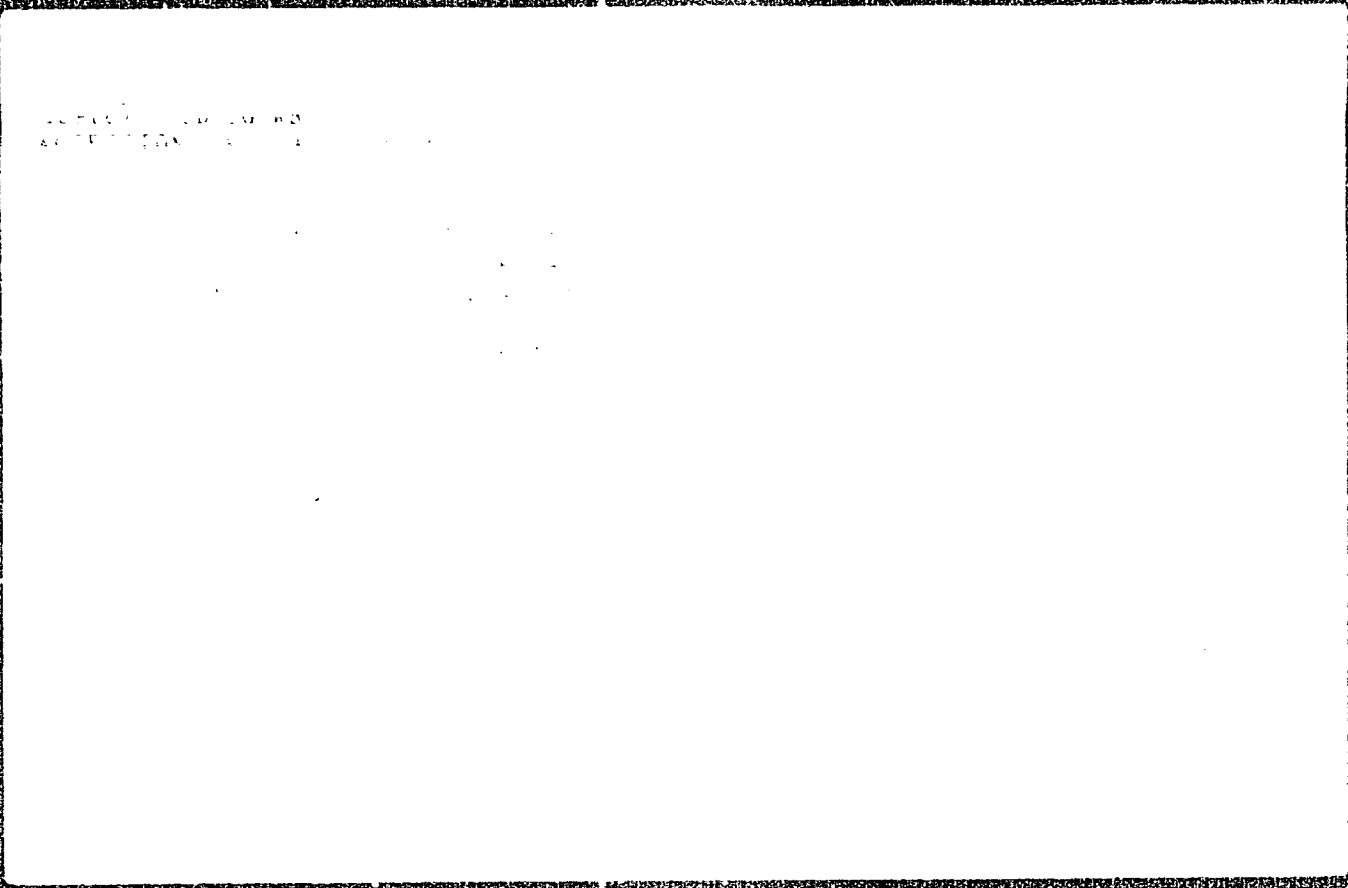'63.   (MIRA 17:3)
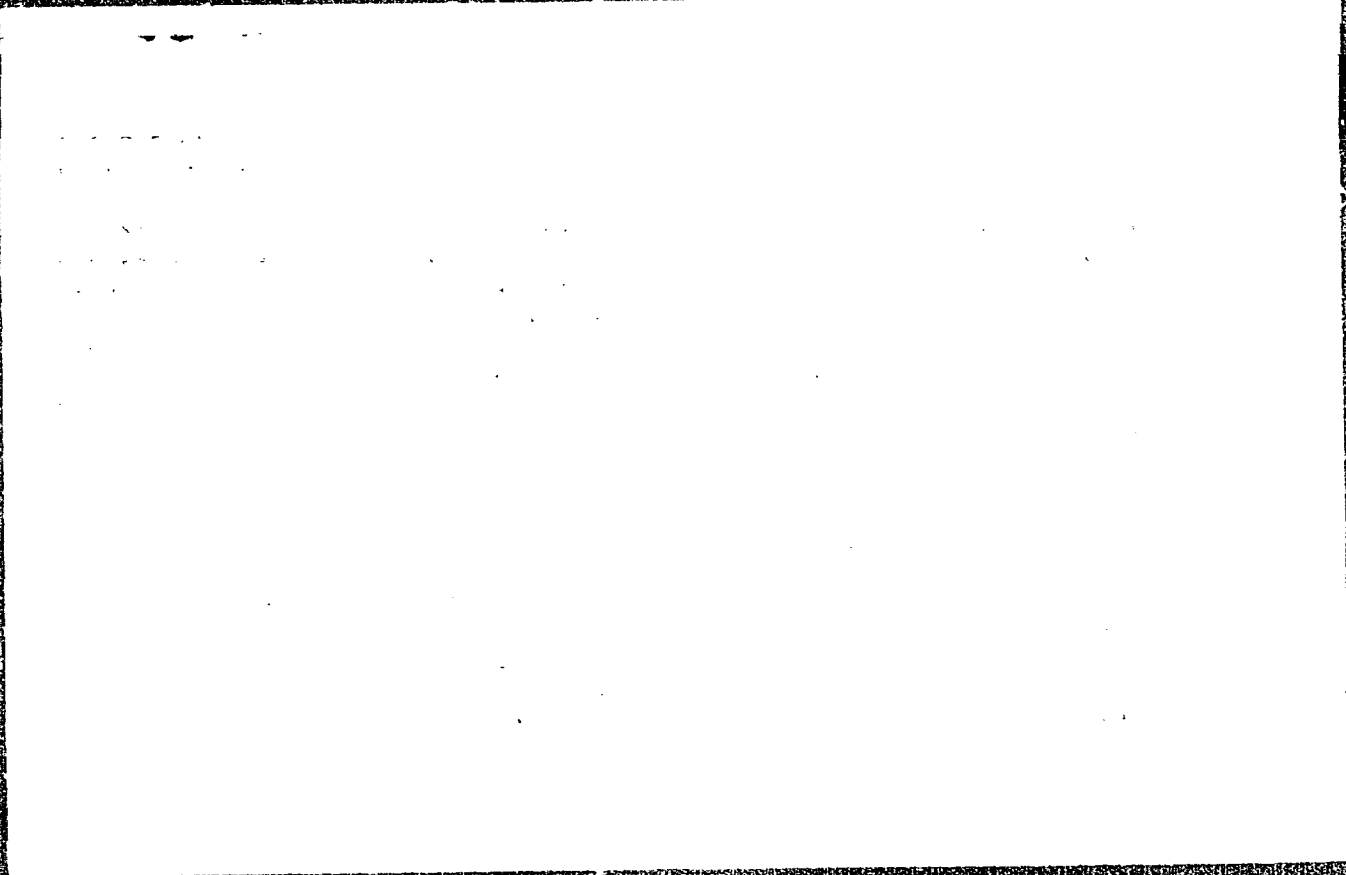
BAKUTA, N.K.

Mechanizing the gathering of shavings in a pipe factory. Strol.mat.
10 no.4:36 Ap '64.   (MIRA 17:5)

BAKUTA, N.K.

Casting asbestos-cement pipes in a closed cycle of industrial
water. Stroi. mat. 10 no.6:8-9 Je '64.

(MIRA 17:10)

SUBMITTED: 16Sep64   ENCL: 00   SUB CODE: MM
                                                              4012
NO ASF SOV: 007   OTHER: 012   ATD PRESS:

BAKUTIS, V. E.

   "Investigation of Problems in the Distribution of Underground Sanitary
Engineering Lines Under Streets and Squares in USSR Cities," Thesis for
degree of Cand. Tech. Sci. Sub. 8 Feb 49, Academy of Communal Economy im.
K. D. Pamfilov.

Sum. 82, 18 Dec 52

BAKUTIS, V. E.

Gorodskie podzemnye seti. Dopushcheno y kachestve ucheb. Posobilia dlia spetsial nosti "Avtomagistrali i gorodskie dorogi". /City underground network. Hand book for "Automobile highways and city roads" _/. Moskva, Izd-vo Ministerstva kommunal' nogo khoziaistva RSFSR, 1950, 163 0 p.   DLC: Slavic unclass

SO: Soviet Transportation and Communication. A Bibliography, Library of Congress, Reference Department, Washington, 1952, Unclassified.

STRAMENTOV, Andrey Yevger\yevich, doktor tekhnicheskikh nauk, professor;
    BAKUTIS, V.E., kandidat tekhnicheskikh nauk, dotsent, redaktor;
    KOZNETSOV, A.I., arkhitektor, redaktor; FRIDBERG, G.V., inzhener,
    redaktor; USTRUGOVA, N.L., arkhitektor, redaktor; PERSON, M.N.,
    tekhnicheskiy redaktor

    [Engineering problems in city planning] Inzhenernye voprosy plani-
    rovki gordov. Moskva, Gos. izd-vo lit-ry po stroit. i arkhit.,
    1955. 361 p.   (MIRA 8:6)
        (Municipal engineering) (City planning)

BAKUTIS, Vladimir Eduardovich, dotsent, kandidat tekhnicheskikh nauk;
POPKOVICH, O.S., redaktor; SOKOL'SKIY, I.F., redaktor izdatel'stva;
KONYASHINA, A.D., tekhnicheskiy redaktor

[Sanitary services in cities] Sanitarnoe blagoustroistvo gorodov.
Moskva, Izd-vo Ministerstva kommunal'nogo khoziaistva RSFSR, 1956.
310 p.   (MIRA 10:2)
        (Municipal engineering)

STRAMENTOV, Andrey Yevgen'yevich, prof., doktor tekhn.nauk; POLYAKOV,
    N.Kh., prof., retsenzent; BAKUTIS, V.E., kand.tekhn.nauk,
    nauchnyy red.; FRIDBERG, G.V., inzh., red.izd-va; STEPANOVA,
    I.S., tekhn.red.

[Engineering problems in city planning] Inzhenernye voprosy
planirovki gorodov. Izd.2, perer. i dop. Moskva, Gos.izd-vo
lit-ry po stroit., arkhit. i stroit.materialam, 1959. 423 p.
                                                (MIRA 13:3)
1. Chleny-korrespondenty Akademii stroitel'stva i arkhitektury
SSSR (for Stramentov, Polyakov).
        (City planning)   (Civil engineering)

BAKUTIS, Vladimir Eduardovich, dots., kand. tekhn. nauk; YERESNOV,
N.I., red.

[Urban sanitation services] Sanitarnoe blagoustroistvo go-
rodov. Moskva, Stroiizdat, 1964. 277 p.   (MIRA 17:12)

BAKUTKIN, A.B.; SEMENOV, B.S.; PANTAYEV, N.F., inzhener, retsenzent;
BOLDIN, O.M., inzhener, retsenzent.

[Operation and maintenance of measuring apparatus and automatic
regulators in petroleum refineries] Ekspluatatsiia i remont izmeritel'-
nykh priborov i avtomaticheskikh reguliatorov na neftezavodakh.
Moskva, Gos. nauchno-tekhn. izd-vo neftianoi i gorno-toplivnoi lit-ry,
1953. 264 p.   (MLRA 7:7)
    (Measuring instruments--Maintenance and repair) (Petroleum--
    Refining) (Automatic control)

MAKSYUTA, V I.

X(1)   PHASE I BOOK EXPLOITATION   SOV/1580

USSR. Gosudarstvennyy nauchno-tekhnicheskiy komitet

Avtomatizatsiya khimicheskikh i koksokhimicheskogo proizvodstv; sbornik statey
(Automation of the Chemical and By-product Coking, Industries) Moscow,
Metallurgizdat, 1958, 377 p. 4,000 copies printed.

Additional Sponsoring Agency: Akademiya nauk SSSR. Institut nauchnoy i tekhni-
cheskoy informatsii.

Eds.:G.Ya.Past, S.E. Telshin, and Yu.N. Goralyuytis; Ed. of Publishing
House: N.R. Lmovskaya; Tech. Ed.: N.P. Urvitsev.

PURPOSE: This book is intended for industrial engineers and technologists interes-
ted in the state of industrial automation and may be especially useful to organ-
izations concerned with the multifarious automation problems of the chemical in-
dustry.

COVERAGE: This collection was compiled to fulfill to some degree the need for a
readily accessible information source on the latest developments in the automa-
tion of industrial processes, both foreign and domestic, and to give supplementary
information on the automation state of several chemical, metallurgical, petroleum
Card 1/4   and textile-silkiness production processes.

Demelev, S.V., A.A. Babushkin, and A.A. Popov. Automation of the
Petroleum Refining and Petroleum-Chemical Industries   394

AVAILABLE: Library of Congress

                                        TM/cmp
                                        3-21-59

8(0), 11(4)

SOV/112-59-4-7662

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 4, p 174 (USSR)

AUTHOR: Nesmelov, S. V., Bakutkin, A. B., and Popov, A. A.

TITLE: Automating Oil-Refinery and Petro Chemical Industries

PERIODICAL: V sb.: Avtomatiz. khim. i koksokhim. proiz-v. M., Metallurgizdat, 1958, pp 354-378

ABSTRACT: A classification of degrees of automation applicable to the oil-refinery industry is presented; it is illustrated by examples. The expected effectiveness of automation at the Ryazan' and Moscow oil refineries is reported. The requirements of the processes scheduled for automation and the requirements of the apparatus are listed. Principal trends in automating oil-refinery and oil-chemical industries and the means of automation are considered. Atmosphere installations for refining the raw oil and the installations of 2-furnace thermal cracking which use a pneumatic monitoring and an automatic system are described. Expenses for automation at such installations amount to about 5%

Card 1/2

SOV/112-59-4-7662

Automating Oil-Refinery and Petro Chemical Industries

of their cost. A scheme of an installation for polymerization of propane-propylene fraction for producing polypropylenes is described. Principal automation-and-monitoring means that are needed for raising the degree of automation at the existing oil refineries and for realizing a complex process automation at new plants are listed. A brief characterization of the state of automation of foreign oil refineries is given.

A.A.S.

Card 2/2

AUTHORS: Gun, R. B. and Bakutkin, A. B.   SOV/65-58-5-11/14

TITLE: Indicating the Level in Oxidation Stills of a Bitumen
             Plant with the Aid of Radioactive Isotopes
             (Signalizatsiya urovnya v kubakh-okislitelyakh bitumnoy
             ustanovki pri pomoshchi radioaktivnykh izotopov)

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr.5.
             pp. 60 - 63. (USSR).

ABSTRACT: The change- over from the manual method of measuring
             the level in oxidation stills to an automatic distanc-
             ing indicator was investigated. Two methods were in-
             vestigated on the oxidation still CKB-AHI.: (1) with the aid
             of the radioactive isotope Co^{60} (with the new contact-
             less method), (2) with the aid of a thermocouple and a
             potentiometer to register the temperatures. A modified
             method using one radiation source, two measuring devices,
             and one thermocouple is discussed. It was found necessary
             to define the zones of sensitivity with a gamma relay
             when working with the radioactive isotope Co^{60}. Details
             are given of the fixing of the gamma relay on one of
             the oxidation stills of the bitumen plant of the Moscow
             NPZ. When the radioactive isotope Co^{60} was used it was
Card 1/3   found that the zone of sensitivy varied between 35 - 300cm.

SOV/65-58-5-11/14

Indicating the Level in Oxidation Stills of a Bitumen Plant with the
Aid of Radioactive Isotopes.

From Table 1 it can be seen that an increase in the
difference of the signals between the source and the
measuring device increases the error in defining the
level. During experiments with a thermocouple, the latter
was used for measuring the temperature of the product
during the oxidation of goudron; results of two ex-
periments are given in Fig.2. The advantages of the second
method lies in the fact that the temperature is registered
continuously, and by calculating the time elapsed after
stabilisation of the temperature it is possible to de-
fine the actual level of the product in the still; this
is not possible when using the first method. Three
modifications of the first method are compared. In the
first modification, the gamma rela is divided into two
blocks (Fig.3); in the second, the measuring device is
mounted together with the relay (Fig.4), and in the
third, the measuring device STS is assembled in a small
box, and fixed on the still. The cost of both methods
is calculated. The gamma relay PR-500, RK-50 and the
thermocouples TKhA and EPP-09 were u s e d during the
investigations. Both methods satisfied industrial

Card 2/3

SOV/65-58-5-11/14

Indicating the Level in Oxidation Stills of a Bitumen Plant with the Aid of Radioactive Isotopes.

requirements, and are of practically equal importance. There are 5 Figures, 1 Table, 1 Soviet reference.

ASSOCIATION: SKB ANN

Card 3/3

BAKUTKIN, N.I., inzh.; KRYSENKO, A.A., inzh.

Universal beds used for section assembly and welding. Sudostroenie
24 no.11:58-60 N '58.   (MIRA 12:1)
        (Sipbuilding--Equipment and supplies)

NEKRASHEVICH, I.G.; BAKUTO, I.A.; MITSKEVICH, M.K.

Effect of suspended   metal   particles   on the   spark-over   of
liquid dielectrics at low voltages. Sbor.nauch.trud.Fiz.-tekh.inst.
AN BSSR no.1:119-130 '54.   (MIRA 10:1)
              (Dielectrics) (Electric spark)

BAKUTO, I.A.

Calculating the extent of electro-erosion in metals. Sbor.nauch.
trud.Fiz.-tekh.inst.AN BSSR no.1:150-161 '54.   (MIRA 10:1)
(Electric spark)

NEKRASHEVICH, I.G.; BAKUTO, I.A.

Mechanism of electric erosion of metals. Sbor.nauch.trud. Fiz.-
tekh.inst. AN BSSR no.2:167-176 '55.   (MIRA 10:1)
                (Electric spark) (Metals)

123-1-781

Translation from: Referativnyy Zhurnal, Mashinostroyeniye, 1957,
                   Nr 1, p. 118 (USSR)

AUTHORS: Nekrashevich, I. G., Mitskevich, M. K., Bakuto, I. A.

TITLE: Character of Regularity in Phenomena of Electric Erosion
              (O kharaktere zakonomernosti v yavlenii elektricheskoy
              erozii)

PERIODICAL: Sbornik nauch.tr. Fiz.-tekhn. in-ta AN BSSR, 1955,
              Nr 2, pp. 177-189

ABSTRACT: Bibliographic entry.

Card 1/1

MITSKEVICH, M.K.; BAKUTO, I.A.

Effect of discharge circuit parameters on the magniture of mechanical
impulses imparted on electrodes at the discharge. Sbor.nauch.trud.
Fiz.-tekh.inst. AN BSSR no.2:199-208 '55.   (MIRA 10:1)
                    (Electric spark) (Electrodes)

SOV/137-57-10-20152

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 10, p 247 (USSR)

AUTHORS: Nekrashevich, I.G., Bakuto, I.A., Mitskevich, M.Ye.

TITLE: Aspects of Electrical Erosion of Porous Electrodes (Ob osobennost-
yakh elektricheskoy erozii poristykh elektrodov)

ABSTRACT: An investigation is made of electrical erosion (EE) of porous elec-
trodes (E) used   as tools in electric-spark machining. The porous
E are made by extrusion of Cu-Pb and Cu-Fe chip mixtures. The
particles are not classified by size, and various mixtures are used.
To obtain E of approximately identical porosity, equal initial volumes
of chip are taken, and they are reduced to identical volume by the
press. Before testing, the extruded E are held for several hours in
kerosene,   which is used as the working medium. Investigation of
the behavior of the E on the spark discharge is performed on a bal-
listic range. Measurement is made not only of the mechanical im-
pulse communicated to the E upon a single discharge, but of the mag-
nitude of the anode and cathode EE of extruded E and of the opposing

Card 1/2

SOV/137-57-10-20152

Aspects of Electrical Erosion of Porous Electrodes

steel E. The measurements are made for direct and reversed polarity with fluctuating and aperiodic types of discharge, the contour parameters being chosen so that the amplitude values of the currents in oscillating and aperiodic discharge remain identical. It is found that the magnitude of EE of a steel E working in conjunction with a porous one is virtually independent of the composition of the porous E. However, the magnitude of the EE of the porous E declines as the Cu contents of the E rises and becomes negative, meaning that the weight of the E increases. Study under the binocular microscope of E surfaces subjected to EE shows the pores of the E to become filled with fused metal both from the opposing E and from the porous E itself. As this occurs, irregularities are smoothed over somewhat, and a crust consisting of a mixture of materials from both E is formed. It is shown that a rise in the number of discharges results in further change in the E surface consisting in a reduction in pore size and formation of a protective layer which is spongy in structure, comprising a mixture of materials from both E. The mechanical impulse transmitted to the porous E is greater than that of the solid. The difference in the results for oscillating and aperiodic discharges is only quantitative. It is noted that as the porosity of E declines, their EE tends to approximate the EE of solid E.

L.G.

Card 2/2

NEKRASHEVICH, I.G.; BAKUTO, I.A.

A method of accurate weighing. Sbor. nauch. trud. Fiz.-tekh. inst.
AN BSSR no.3:234-237 '56.   (MIRA 10:6)
                            (Weighing machines)

MAKAREVICH, M. A.; NEKRASHEVICH, I. G.,

"The Electro-erosion Effect on Electrodes of Various Shape"
"On the Electro-erosion Series of B.R. and N.I. Lazarenko From the Point of
View of the Lents-Joule Effect"

Sbornik nauchnykh trudov, vyp. IV, Minsk, Izd-vo An BSSR, 1956, 261p.

NEKRASHEVICH, I.G.; BAKUTO, I.A.

Mechanism of a low-voltage condensed discharge. Fiz.sbor.
no.4:158-160 '58.
(MIRA 12:5)

1. Fiziko-tekhnicheskiy institut AN BSSR.
(Electric discharges)

YAKUTO, I.A.; MITSKEVICH, M.K.; NEKRASHEVICH, I.G.

Spark erosion effect on electrodes of various shapes. Sbor.nauch.
trud.Fiz.-tekh.inst. AN BSSR no.4:196-212 '58.   (MIRA 11:11)
(Electrodes)   (Electric metal cutting)

BAKUTO, I.A.

B.R. and N.I. Lazarenko spark erosion series considered from the point of view of Lenz-Joule effect. Sbor.nauch.trud. Fiz.-tekh. inst. AN BSSR no.4:220-224   '58.   (MIRA 11:11)
                          (Electrodes)

BAKUTO, I.A. [Bakuta, I.A.]

Electric erosion effect on bimetallic electrodes. Vesti
AN BSSR.Ser.fiz.-tekh.nav. no.4:55-61 '59.
                                        (MIRA 13:4)

    (Electrodes) (Laminated metal)

28(5)

05296
SOV/170-59-8-7/18

AUTHORS: Nekrashevich, I.G., Bakuto, I.A.

TITLE: On the Mechanism of Emission of Substance From Electrodes During Electric Pulse Discharges

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 8, pp 59 - 65 (USSR)

ABSTRACT: Phenomena of emission of substance from electrodes during electric pulse discharges are considered on the basis of the notion of spontaneously shifting current conducting channel with current density of at least 10^7 a/cm^2. A limiting case is considered when the rate of heat conductivity is sufficiently slow and consequently does not affect phenomena arising due to high values of specific power; therefore it is neglected. The mechanism of emission of substance from electrodes is considered as a process consisting of a number of consecutive "micro-explosions" of small volumes of metal in the surface layer of the electrode. Formula 4 is derived which expresses the dependence of the full amount of substance removed from the electrode during one discharge on the energy parameter of discharge and physical constants of the electrode material. The theoretical values obtained are compared with experimental data taken from Reference 12, and it is concluded that there is a qualitative agreement between the trends of

Card 1/2

05296
SOV/170-59-8-7/18

On the Mechanism of Emission of Substance From Electrodes During Electric Pulse Dis-
charges

two columns of Table 1 (with exception of ferromagnetic metals and carbon).
The analysis of Formula 4 shows that the magnitude of electric erosion can
be different for cathode and anode, and also for different media. Some
other regularities observed in the erosion of electrodes are also explained.
There are: 1 graph, 1 table and 13 references, 7 of which are Soviet, 2
English and 4 German.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR (Physico-Engineering Institute of the
AS Belorussian SSR), Minsk.

Card 2/2

NEKRASHEVICH, I.G. [Nekrashevich, I.H.]; BAKUTO, I.A. [Bakuta, I.A.]

Electric erosion of bimetallic electrodes. Vestsi AN BSSR. Ser.fiz.
-tekh.nav. no.3:69-75 '60.   (MIRA 13:9)
                           (Electrodes)

9.3260

AUTHORS: Nekrashevich, I. G., Bakuto, I. A., Mitskevich, M. K.

TITLE: The Dependence of Some Erosion Characteristics of an Electric
            Pulse Discharge on Its Duration

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 1, pp. 62 - 67

TEXT: Already previously (Ref. 1) it had been presumed that in an electric
pulse discharge spontaneous shifts of the current-conducting channel and its
contact with the metal surface occurs within a region filled by the discharge
cloud. Thus, equation (3) was derived, which indicates the mass of the molten
metal which is partly or completely removed from the electrode surfaces, and
also the total number of microexplosions in the course of the discharge (by
means of equation (4)) was determined. The correctness of these relations was
experimentally checked. Rectangular current pulses and a long line were used
for the purpose of obtaining discharge pulses with a duration of 45, 80, 120,
200, and 240 μsec. The discharge voltage, which was kept on a constant level,
was 200 v. In the case of a shunt within the discharge circuit the amperage
of the discharge current was 900 a. A typical oscillogram of the current pulse

Card 1/2

69968

The Dependence of Some Erosion Characteristics of an   S/170/60/003/01/10/023
Electric Pulse Discharge on Its Duration   B022/B007

is given in Fig. 1. The dependence of the erosion (Fig. 2), the surface of the
erosion track (Fig. 3), and of the magnitude of the ballistic amplitude of the
torsion pendulum on the time of the current pulse (Fig. 4) are given. The num-
ber of possible microexplosions during a discharge (Table 1) and the surfaces
of the erosion tracks (Table 2) are given. The possible causes of the decrease
in average pressure with prolongation of the time of the discharge is pointed
out. There are 4 figures, 2 tables, and 4 references, 3 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR, g.Minsk (Institute of
               Physics and Technology of the AS BSSR, City of Minsk)

Card 2/2

24.2100

AUTHORS: Nekrashevich, I. G., Bakuto, I. A.

TITLE: Determination of Mean Pressures in the Zone of Electric
                Pulse Discharge

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 7,
                pp. 60 - 66

TEXT: First the authors point out that the pressure measurements in
the discharge zone in the papers (Refs. 1,2) were carried out by methods
with considerable shortcomings. Here, they describe their method of the
ballistic torsion pendulum for determining the mean pressures in the
zone of a single pulse discharge. The method is based on measuring the
mechanical pulse (received by the electrode during a discharge) by mea-
suring the pendulum swing. The pendulum is a metallic crosspiece floating
in mercury and suspended from a thin steel thread. One electrode is
fastened to one arm of the crosspiece. The second electrode is slowly
approached to the former until the discharge begins. In the discharge,
the pendulum receives a pulse and then turns by a certain angle. This

Card 1/3

Determination of Mean Pressures in the Zone of   S/170/60/003/07/05/011
Electric Pulse Discharge   B012/B054   82231

angle characterizes the pulse intensity. The rotation is read off by
the deviation of the light beam reflected by the mirror on the upper
part of the crosspiece. Such a pendulum permits measurements at dis-
charges in any liquid and gaseous dielectric medium, and in the vacuum.
In order that this method should not only show the presence of pres-
sures but also determine their order of magnitude, the causes of the
mechanical pulse must be studied. For this purpose, it is necessary to
determine - at least approximately - the intensity of the pulse of the
expanding gas bubble in the time until leaving the electrode area. This
problem was set up and solved. Formula (13) is derived. It expresses
the dependence of the mechanical pulse on the radius and the grinding
angle of the conical electrode. If the radius R_0 is assumed as the
radius of the final erosion trace on the electrode, one obtains the de-
pendence of the mechanical pulse on all those variables on which the
extension of the erosion trace depends, i.e. the charging energy, the
pulse duration, as well as the physical properties of the electrode
material and the dielectric medium, etc. Figs. 2 and 3 compare the
curves calculated from this formula (13) with the curves measured in
the experiment. They show that formula (13) reproduces with sufficient

Card 2/3

Determination of Mean Pressures in the Zone of   S/170/60/003/07/05/011
Electric Pulse Discharge   B012/B054   82231

correctness the principal relation between the physical quantities
characteristic of the phenomenon under review; therefore, it may be
used for evaluating the mean pressures in the discharge zone. There
are 3 figures and 3 references: 1 Soviet, 1 British, and 1 Japanese.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR, g. Minsk
              (Institute of Physics and Technology of the AS BSSR,
              Minsk)

Card 3/3

NEKRASHEVICH, I.G.; BAKUTO, I.A.

Mechanism of the formation of erosion tracks on electrodes
in pulse discharges. Dokl.AN BSSR 4 no.1:7-10 Ja '60.
(MIRA 13:6)

1. Predstavleno akademikom AN BSSR B.I. Stepanovym.
(Electrodes)

NEKRASHEVICH, I.G. [Nekrashevich, I.H.]; BAKUTO, I.A. [Bakuta, I.A.]

Dependence of the erosion effect on the duration of the pulse discharge. Vestsi AN BSSR. Ser. Fiz.-tekh. nav. no. 4:107-112 '60.   (MIRA 14:1)

(Electric discharges)

1. 1110

26. 2311

30945
S/571/60/000/006/010/011
E073/E535

AUTHORS.   Nekrashevich I.G. and Bakuto, I.A.

TITLE.   Mechanism of erosion of metals during electric
impulse discharges

PERIODICAL: Akademiya navuk Jelaruskay SSR. Fiziko-tekhnicheskiy
institut. Sbornik nauchnykh trudov, no.6 Minsk, 1960.
193-215

TEXT   There are two main hypotheses explaining the phenomena
leading to electrical erosion. E. M. Williams (Ref 1: El Eng. 71.
257, 1952) holds the view that numerous successions of processes
of disintegration of the electrode material occur during a single
discharge This is also the view held by the authors of this
paper Other authors base their explanation of the hypothesis
of emission of material from the electrodes simultaneously
throughout the entire surface of the electrode on which a dis-
charge occurs.   Thereby, it is usually assumed that the discharge
current flows each time through a single channel, which widens
during the process of the discharge, and the finite boundaries of
this channel at the surface of the electrode are assumed as
coinciding with the boundaries of the erosion trace The largest

Card 1/8

Mechanism of erosion of metals   30945
                                        S/571/60/000/006/010/011
                                        E073/E535

number of published papers on the subject deal with the thermal
theory of electric erosion, which is based on the theory of
thermal conductivity. Many of the results obtained by means of
this theory are not in agreement with experiment   The authors of
this paper express different views, which take into consideration
experimental data on the kinetics of the processes that   occur in
the gap and on the electrodes during pulse discharges   further
development of this hypothesis enabled elucidating most of the
observed phenomena of electric erosion from a single point of view.
The quantitative relations obtained on the basis of this new
hypothesis are in good agreement with experimental results.   In
this paper the basic concepts of this hypothesis are described and
the relations between various quantities characterizing the
investigated phenomena of destruction of the electrodes during
discharges are calculated and the results are compared with
experimental data.   To explain all the experimentally observed
features of erosion during the discharge it is necessary to start
off from the experimental fact that the metal is removed from the
surface of the electrode in small portions   the sum of which

Card 2/8

Mechanism of erosion of metals ...   30945
S/571/60/000/006/010/011
E073/E535

corresponds to the full erosion effect of the single electric
discharge.   Such a mechanism is only possible if the discharge
current does not flow simultaneously throughout the entire surface
of contact of the electrode and the inter-electrode medium which
participates in the discharge but only through individual small
sections of the surface.   There are two possibilities: either the
contact surface of the current conducting discharge channel and
the electrodes consist of a number of individual simultaneously
acting areas or the contact surface consists of a single small
area, the position of which on the electrode surface changes at a
great speed during the discharge.   The first variant is based on
the c o n c e p t of a spatially discrete discharge channel on the
electrode surface, the second on a discharge channel which is
discrete with time.   The latter is the most likely.   The size of
the contact area in this case may depend on the physical
properties of the electrode materials and the dielectric medium
and also on the electrical conditions pertaining during the
discharge.   If both electrodes are of the same material, the
following variants are possible: the contact area of the plasma

Card 3/8

30945

Mechanism of erosion of metals ...   S/571/60/000/006/010/011
E073/E535

with the electrodes is larger on the cathode than on the anode;
it is larger on the anode than on the cathode; they are equal.
These differences in the area of the current conducting contact may
be due to physical phenomena (electrodynamic forces, diffusion of
charge carriers, electron optical effect etc.).   In the case that
the electrodes are made of different materials, it is necessary to
take into consideration the influence of the physical properties of
the material on the magnitude of the contact area.   The displace-
ment of the contact area may be due to non-steady state movements
in the form of shock-waves inside the discharge cloud and also
processes of explosive transformation of the material of the
electrodes into the vapour state, as a result of which the material
becomes non-conducting.   The size of the contact area determines
the density of the electric current on the electrodes.   The current
density will determine the energy release and, on the other hand,
the size of the contact area will be determined to some extent by
the heat exchange between the channel and the electrode material.
Thus, the released energy will be determined by both effects. Even
extreme cases are possible when the energy release is governed

Card 4/8

Mechanism of erosion of metals   S/571/60/000/006/010/011
E073/E535

30945

only by the Lentz-Joule effect or only by the effect of thermal
conductivity   Depending on the density and quantity of energy
released in the contact of the metal with the plasma, the
following effects are possible fusion of a certain volume of the
electrode material and also fusion accompanied by evaporation.
The dielectric medium in the discharge zone will be in the gaseous
state at high temperature and pressure, regardless of its state
at the beginning of the discharge. During the explosive
expansion of the metal vapours and the dielectric, the molten
metal will be squeezed out and an erosion cavity will be formed
The contact area which moves around during the discharge will
ensure the appearance of a series of such cavities, which
together form the full erosion trace on the surface of the
electrode Again three cases are possible: the erosion is equal
on the anode and the cathode, the erosion on the cathode is less
than the erosion on the anode and the erosion on the anode is
less than the erosion on the cathode If the electrodes are of
different materials or if they differ in shape, the mechanism of
the erosion process can be described in the same way but

Card 5/8

Mechanism of erosion of metals...   S/571/60/000/006/010/011
                                      E073/E535

30945

additional factors have to be taken into consideration. The
mechanical effect of the streams of metallic vapours ejected from
the electrodes may also have a certain but no too great effect.
The widening of the current conducting channel is due to new
sections of the volume of the medium being entrained into the
process of ionization and at the same time electrodynamic
compression forces act on the medium The resistance of the
discharge zone also decreases as a result of an increase in the
conductivity of the plasma with increasing ionization   In
numerous cases the discharge channel can be considered as being
almost invariable but performing displacements inside the
discharge zone, However, the process of displacement of the
current conducting contact area along the surface of the electrode
will have no influence on the current intensity in the external
circuit and, therefore, the above-mentioned phenomena may not be
detected on the oscillograms of the current and voltage and they
have to be detected from the optical effects   The phenomena in
spark discharge erosion are very similar to those observed in an
arc with a mercury electrode,   I G Kesayev (Ref 21 DAN SSSR,
113, No 1, 1957) has shown that the cathode spot in a mercury arc
Card 6/8

Mechanism of erosion of metals ...   S/571/60/000/006/010/011
30945
E073/E535

discharge only indicates the area in which a much smaller current
conducting spot moves about at a very fast rate (about 10^5 times
per second). There is only one spot at any given time. It is on
the basis of this concept that the theory of the electric
erosion of metals is evolved and the mass of eroded metal is
calculated. The calculations show that, depending on the
physical constants of the electrode materials, the quantity of
evaporated metal amounts to 20-40% of the total quantity of the
metal subjected to the erosive effect of the discharge. The
effect of the polarity of the discharge and the problems of the
evacuation of metal from the surface of the electrode are briefly
discussed. Metal that has been heated to the fusion temperature
can either be retained on its solid base by the surface tension
forces or it may be removed if these forces are overcome. The
explosive nature of the emission of materia' that has been heated
sufficiently to become vaporised produces large pressures which
are capable of squeezing out and scattering the molten metal.
These concepts seem to be supported by the experimental results
obtained in measuring the mechanical impulse transmitted to the

Card 7/8

Mechanism of erosion of metals ...   30945
S/571/60/000/006/010/011
E073/E535

electrodes during the discharge. The main role in evacuating the
molten metal is played by the vapours of the same metal. The
mechanism of squeezing out consists in explosive adiabatic
expansion of the evaporated portions of the metal during
"elementary" erosion. Following that, the vapours of the metal
and of the dielectric become mixed and a resulting medium
pressure is produced which removes the residues of the molten metal
and flattens out the mounds produced by the individual "elementary"
pittings.   There are 7 figures, 1 tables and 27 references:
21 Soviet and 6 non-Soviet.   The English-language references
read as follows: Ref.1 (quoted in text); Ref.16: Germer, L.H.,
Boyle, W.S. J.Appl.Phys., 27, No.1, 32-39, 1956: Ref.18
Sommerville, J.M., Grainger, C.T. Brit.J.Appl.Phys., 7,400, 1956;
Ref.19: Boyle, W.S. J.Appl.Phys., v.26, No.5, 584-586, 1955.

Card 8/8

NEKRASHEVICH, I.G.; BAKUTO, I.A.

Polar effect of the erosion of metals during an impulsive dis-
charge. Dokl.AN BSSR 4 no.6:241-243 Je '60.   (MIRA 13:7)

1. Predstavleno akad. AN BSSR B.I. Stepanovym.
           (Electrodes)

NEKRASHEVICH, I.G.; BAKUTO, I.A.

Multiplicity of channels in a single electric discharge. Dokl.AN
BSS' 4 no.8:328-331 Ag '60.   (MIRA 13:8)
1. Fiziko-tekhnicheskiy institut AN BSSR. Predstavleno
akademikom AN BSSR A.N.Sevchenko.
            (Electric discharges)

NEKRASHEVICH, I.G.; BAKUTO, I.A.

Ratio between the diameter and depth of an erosion crater formed in
a pulse discharge. Dokl.AN BSSR 4 no.10:413-416 '60.   (MIRA 13:9)

1. Fiziko-tekhnicheskiy institut AN BSSR. Predstavleno akademkom
AN BSSR V.P.Severdenko.
                              (Electrodes)

S/196/61/000/011/036/042
E194/E155

AUTHORS: Nekrashevich, I.G., and Bakuto, I.A.

TITLE: An oscillographic study of current distribution
            during electrical discharge on a composite electrode

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika,
            no.11, 1961, 29-30, abstract 11K 189. (Dokl. AN BSSR,
            v.4, no.12, 1960, 501-504)

TEXT: The article considers the distribution current within
the volume of an electrode directly adjacent to the place of
contact of the channel of an impulse discharge. The investigations
were made on equipment consisting of a composite electrode (two
plates separated by a thin layer of mica) and a conical electrode.
A long artificial line is used to form a square wave-shape current
with amplitude of 900 A and duration of 240 m.sec. Both halves of
the composite electrode were connected to the line through
identical resistances. The recording instrument was an oscillo-
graph type ИО-4 (IO-4): The deflecting plates of this cathode-
ray oscillograph were connected to the screening wire in each half
of the composite electrode. Transfer of the discharge channel
Card 1/ 2