FAL KOVICH, S. YE.

109-5-10/22

AUTHOR: FAL'KOVICH, S.Ye.

TITLE: On the Precision in the Recording of a Range Coordinate in Radiolocation Systems in the Case of Incoherent Integrations. (O tochnosti otscheta koordinaty dal'nosti v radiolokatsionnykh sistemakh pri nekogerentnom nakoplenii, Russian)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol 2, Nr 5, pp 601 - 608 (U.S.S.R.)

ABSTRACT: The author's work is based on the criteria of precision and the general formulae for the signal and the disturbances at the output of a radio reception plant. They were described in the author's paper Radiotekhnika i Elektronika, 1957, Vol 2, Nr 4, pp 450 - 460. Calculation formulae are derived here for average error squares in the measurement of ranges, and optimum parameters of the radio reception devices in the case of incoherent integration are determined from the point of view of precision. It is shown that the following is necessary for the conservation of a theoretical limiting accuracy: 1) The characteristic of the radio amplifier has to be brought into line with the form of the signal impulses. 2) The impulse characteristic of the video line has to have the character of a derivation of the delta function. 3) Recording must take place at the moment of the passage of the out-

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On the Precision in the Recording of a Range Coordinate in Radioelectric Systems in the Case of Incoherent Integrations.

put voltage through zero. It is shown that, in contrast to the linear detection of strong signals, the modification of the optimum form of the characteristic of the radio amplifier in the detecting of weak signals cannot be compensated by the corresponding of the characteristic of the video amplifier and that it leads to an increase in the dispersion of errors.
(2 Slavic references)

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED: 29.9.1956,
AVAILABLE: Library of Congress

Card 2/2

FAL'KOVICH, S.Ye.

Precision in reckoning the distance coordinates in radiolocation systems based on incoherent signal storage. Radiotekh. elektron. 2 no.5:601-608 My '57. (MLRA 10:9)

(Radar)

AUTHOR: Fal'kovich, S.Ye. SOV/109-4-1-25/30

TITLE: Potential Accuracy of the Determining of the Angular Co-ordinates in Radar Systems (Potentsial'naya tochnost' otscheta uglovykh koordinat v radiolokatsionnykh sistemakh)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 1, pp 142 - 144 (USSR)

ABSTRACT: In the analysis it is assumed that the received signal is reliably detected from the background noise. The problem consists of evaluating the limiting accuracy in determining the angular co-ordinate θ when the single-pulse method is employed (Ref 4). The mean square deviation:

$$(\theta_0^* - \theta_0)^{2*}$$

of the reading θ_0^* with respect to the true value of the co-ordinate θ_0 can be regarded as a measure of the accuracy. It is shown that the accuracy can be expressed by Eq (3) where $P_x(\theta)$ is the "a posteriori" distribution of the probabilities of the presence of a target at all the angular co-ordinates within a region θ_1 to θ_2. If

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the antenna system consists of two reflectors containing the radiating dipoles in their foci, and if these are separated at distances D from each other, the maximum accuracy is expressed by:

$$\overline{(\theta_0^* - \theta_0)^2} = \frac{\sigma^2}{4Q^2\left(\frac{\pi D}{\lambda}\right)^2} \quad (10)$$

where Q^2 is the total energy of the signal and σ^2 is the spectral intensity of the noise. Similarly, on the basis of Eq (3), it is shown that if the antenna system consists of one reflector and two radiating dipoles, the maximum accuracy is expressed by:

$$\overline{(\theta_0^* - \theta_0)^2} = \frac{\sigma^2\Delta^2}{4Q^2(2\ \ln 2)^2} \quad (17)$$

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Potential Accuracy of the Determining of the Angular Co-ordinates in Radar Systems

where Δ is the width of the directional pattern of the antenna.
There are 4 Soviet references.

SUBMITTED: June 12, 1957

Card 3/3

AUTHOR: Fal'kovich, S.Ye. SOV/109-4-4-8/24

TITLE: Some Results of Applying the "A Posteriori" Probability Method to the Problems of Radar System Design (Nekotoryye rezul'taty primeneniya metoda aposteriornoy veroyatnosti k zadacham proyektirovaniya radiolokatsionnykh sistem)

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 4, pp 618 - 628 (USSR)

ABSTRACT: For the purpose of analysis it is assumed that the radiated signal is expressed by Eq (3), the perturbing noise is given by Eq (4), while the received signal is represented by Eq (5); the black-face letters in these equations represent the complex slowly changing amplitudes, while f_o is the carrier frequency of the signal. The reflected signal is denoted by A_T. The signal reflected from a moving target has a continuously changing delay time, τ_t, and can be represented by:

$$A_T(t - \tau_t; \varphi) = \mathrm{Re}\left\{ \mathbf{A}_T(t - \tau_t) e^{j2\pi f_o (t-\tau_t)} e^{j\varphi} \right\} \quad (6)$$

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Some Results of Applying of the "A Posteriori" Probability Method to The Problems of Radar System Design

where the amplitude A_T has a certain finite value during the period T and is zero outside this interval. The phase φ in the received signal is a random quantity having a uniform distribution as represented by Eq (8). The energy of the reflected signal Q^2 is constant and is given by Eq (9). It is further assumed that the delay time τ_t varies at a constant rate and is expressed by Eq (10). The reflected signal can therefore be written in the form of Eq (12) where Φ is defined by Eq (11). The "a posteriori" distribution for the whole set of the received signals is given by Eq (13). The probability can also be expressed by Eq (15) or approximately by Eq (16); here q^2 denotes the signal-to-noise ratio and is defined by Eq (14). On the basis of the above equations it is shown that an ideal radio receiver can be composed of the following elements: 1) N linear channels; 2) N detectors (terminating each channel), and 3) a device which

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Some Results of Applying the "A Posteriori" Probability Method to the Problems of Radar System Design

adds the outputs of all the detectors and performs the weighting operation. Further analysis of the problem shows that the optimum processing of radar signals includes the process of coherent storage. The difficulties encountered in employing the storage technique are due to the movement of the target and to the resulting frequency shift in the reflected signal. When the signal duration is T , it is recommended that the coherent storage should be done within an interval of T/n where n is a digit not greater than 10. The coherent storage can be done in three ways: 1) selection of the signals which do not require the elimination of the parasitic random parameter, that is, the signals not requiring the velocity averaging; 2) application of multi-channel systems which permit the velocity averaging; 3) application of two-channel systems which introduce a velocity correction. The signals which permit the coherent storage without the velocity averaging are of two types: very short signals whose duration does not exceed 0.1 of the period of the maximum Doppler

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Some Results of Applying the "A Posteriori" Probability Method to the Problems of Radar System Design

frequency possess this property. Also, the signals which have a saw-tooth frequency modulation whose period is equal to the storage time interval do not require the velocity averaging. In general, the optimum processing of the signals reflected from a moving target can be done in a device consisting of N channels; a velocity correction $k\Delta\Phi$ is introduced in each channel; k denotes the number of a channel and $\Delta\Phi$ represents the frequency shift between the channels. There are 5 references, 1 of which is English and 4 Soviet; 1 of the Soviet references is translated from English.

SUBMITTED: February 20, 1957

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S/142/60/000/003/015/017
E192/E482

AUTHOR: Fal'kovich, S.Ye.

TITLE: The Threshold Ratios for a Frequency-Diversity Radar System

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1960, No.3, pp.404-407

TEXT: The fluctuation of the signal strength at radar receivers can be reduced by employing frequency diversity systems (Ref.2) which operate simultaneously at several frequencies. In such a system the received signal $s(t)$ is in the form of a sum of independently fluctuating elementary signals $s_1(t)$, $s_2(t)$,... $s_n(t)$ and can be represented in the form

Eq. (1)

$$S(t) = \sum_{i=1}^{n} s_i(t) = \sum_{i=1}^{n} s_i \operatorname{Re}\left\{ S_i(t) e^{j(2\pi f_0 t + \varphi_i)} \right\}. \qquad (1)$$

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The Threshold Ratios for a Frequency-Diversity Radar

The initial phases φ_i and the amplitude parameters ε_i for the various elementary signals $s_i(t)$ are statistically independent random quantities; φ_i has a uniform distribution $p(\varphi_i)$, while ε_i has a Rayleigh distribution $p(\varepsilon_i)$. It is assumed that the signal $x(t)$ appearing at the input of the receiving device contains a Gaussian noise of spectral density N_0 and sometimes the useful signal (defined by Eq.(1)). It is shown that the probability Λ for a radar system with the signal represented by Eq.(1) is given by (Ref.3)

Eq. (2)

$$\Lambda = \left(\frac{1}{1+q_1^2}\right)^n \exp\left(\frac{q_1^2}{1+q_1^2}\sum_{i=1}^{n} z_i\right). \quad (2)$$

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The Threshold Ratios for a Frequency-Diversity Radar

where q_i^2 is the mathematical expectation of the ratio of the energy of an elementary signal to the spectrum density of the noise and z_i is a random quantity which is a function of N_O, $x(t)$ and $S_i(t)$. Eq.(2) determines a system for optimal processing of the received signal $x(t)$ in a frequency-diversity equipment. Such a system consists of n channels and a device adding the outputs of the channels. Each of the n channels comprises an optimal linear filter and a square detector. If the received signal contains no useful signal, the distribution functions for z_i is

$$p_N(z_i) = \exp(-z_i) \quad (3)$$

If the received signal contains a useful signal, the distribution of z_i is given by

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Eq. (4)

$$p_{SN}(z_i) = l_i p_N(z_i) = \frac{1}{1+} \exp\left(-\frac{z_i}{1+q_i^2}\right). \qquad (4)$$

The random quantities z_i are statistically independent. Now, the threshold value of the signal/noise ratio can be determined by a simultaneous solution of

Eq. (6) and (7)

$$F = F(z_0;\ n) = \int_{z_0}^{\infty} p_N(z;\ n)\,dz; \qquad (6)$$

$$D = D(z_0;\ n) = \int_{z_0}^{\infty} p_{SN}(z;\ n)\,dz, \qquad (7)$$

where F and D represent the probability of a false alarm and

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The Threshold Ratios for a Frequency-Diversity Radar

the probability of detection respectively, p_N is the distribution function for n statistically independent random quantities for the case represented by Eq.(3) and p_{SN} is the distribution function for the case represented by Eq.(4). The final expressions for F and D are

Eq. (A)

$$F = \varphi_n(z_0);$$
$$D = \varphi_n\left(\frac{z_0}{1+q_1^2}\right),$$

where φ_n is defined by

Eq. (B)

$$\varphi_n(x) = 1 - \frac{\Gamma(n; x)}{\Gamma(n)}$$

By solving these equations it is found that the threshold value of

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the signal-to-noise ratio is given by

Eq. (C)

$$q^2_{1\,пор} = \frac{\text{arc}\,\varphi_n(F)}{\text{arc}\,\varphi_n(D)} - 1,$$

where arc φ_n defines a function which is inverse to φ_n, that is if $x = \text{arc}\,\varphi_n(y)$ then $y = \varphi_n(x)$. The values of the threshold signal/noise ratio as a function of n for various F and D are plotted in two figures. It is found that if the probability of detection is increased, the threshold signal/noise ratio is rapidly increased. By employing a frequency-diversity system, the effect of the signal strength fluctuation can considerably be reduced and so the energy necessary for detecting a signal with a given degree of reliability is reduced. There are 1 figure and 4 references: 2 Soviet and 2 non-Soviet.

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The Threshold Ratios for a Frequency-Diversity Radar

ASSOCIATION: Kafedra radioustroystv Ukrainskogo zaochnogo politekhnicheskogo instituta (Department of Radio Equipment of the Ukrainian Correspondence Technical Institute)

SUBMITTED: October 2, 1959

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APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000412410017-1"

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E032/E514

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AUTHOR: Fal'kovich, S. Ye.

TITLE: Optimum Detection of Signals on a Background of Noise of Unknown Intensity

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.9, pp.1539-1541

TEXT: The problem is formulated as follows. Suppose one is concerned with the reception of signals $s(t;\alpha)$ consisting of a given function of time t and a set of random parameters α on a noise background $n(t)$, which can be approximated by gaussian white noise. The spectral intensity of the noise N_o is unknown. This intensity is assumed to be random but constant in each interval of observation (O;T). Using the measured oscillation $x(t)$ $(0<t<T)$ and the Neyman-Pearson criterion, it is required to choose between the following two competing hypotheses $N - x(t) = n(t)$ and $SN - x(t) = n(t) + s(t;\alpha)$. It is well known that the optimum choice depends on a comparison of the probability coefficient Λ with the threshold number Λ_o, which in the present case is given by

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Optimum Detection of Signals on a Background of Noise of Unknown Intensity

$$\Lambda = \frac{\int\limits_V p_2(\alpha)d\alpha \int\limits_0^\infty p_1(N_o)\exp\left[-\frac{Q^2(\alpha)-2x_1(\alpha)}{N_o}\right]\left[\frac{1}{N_o}\exp\left(-\frac{Z^2}{N_o}\right)\right]^m dN_o}{\int\limits_0^\infty p_1(N_o)\left[\frac{1}{N_o}\exp\left(-\frac{Z^2}{N_o}\right)\right]^m dN_o} \gtrless \Lambda_o \qquad (4)$$

where $p_1(N_o)$ and $p_2(\alpha)$ are the distribution functions for the intensities of the noise and the random parameters of the signal, V is an ensemble of all the possible values of the vector random quantity α, $m = \Delta fT$ and Δf is the band width of the noise (on the above approximation m can be assumed to be very large) and the remaining quantities are defined by

$$x_1(\alpha) = \int\limits_0^T x(t)s(t;\alpha)dt; \quad Q^2(\alpha) = \int\limits_0^T s^2(t;\alpha)dt; \qquad (2)$$

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Optimum Detection of Signals on a Background of Noise of Unknown Intensity

$$Z^2 = \frac{1}{m} \int_0^T x^2(t)dt. \qquad (3)$$

The number Z^2 remains finite as $m \to \infty$. Asymptotic estimates of the integrals in Eq.(4) for large values of m can be obtained by the interval method (Ref.3). This method is based on the fact that the function

$$f(N_o) = \frac{1}{N_o} \exp\left(-\frac{Z^2}{N_o}\right)$$

which enters into Eq.(4) has a sharply defined maximum at the point $N_o = Z^2$. The larger the value of m, the better defined the maximum of the function $[f(N_o)]^m$. It follows that for large m the principal contribution to the above integrals is due to the region in the neighbourhood of the maximum ($Z^2 - h$; $Z^2 - h$). Using the above method, Eq.(5) can be re-written in the following form:

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Optimum Detection of Signals on a Background of Noise of Unknown Intensity

$$\Lambda \sim \int p_2(\alpha) \exp\left[-\frac{Q^2(\alpha) - 2x_1(\alpha)}{Z^2}\right] d\alpha \geqslant \Lambda \qquad (6)$$

When $m \to \infty$ the asymptotic sign $\sim$ can be replaced by the equality sign. A consideration of Eq.(6) leads to the following conclusions. In order to determine the optimum system, the knowledge of the a priori distribution law $p_1(N_o)$ is unnecessary. The analytical expression for the probability coefficient Λ for a system with an unknown noise intensity is identical with the analytical expression for this coefficient for systems with fixed noise intensity, provided N_o is replaced by Z^2 in the latter case. Accordingly, on carrying out this replacement, all the results of the theory of detection of signals on a background of white noise with fixed intensity can be applied to the above case. Thus, for example, if a specific system of random parameters α and the distribution function $p_2(\alpha)$ are given, Eq.(4) becomes

$$Y \geqslant Y_o(N_o) \qquad (7)$$

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Optimum Detection of Signals on a Background of Noise of Unknown Intensity

for a fixed intensity N_o, where Y is a monotonically increasing function of Λ which depends on the input data x(t), and $Y_o(N_o)$ is the threshold value. In accordance with the above conclusion, the result applying to the case investigated in the present paper reads

$$Y \geqslant Y_o(z^2) \qquad (8)$$

The function Y_o is the same both in Eqs.(7) and (8). The difference is that in the latter equation both Y and Y_o are functions not only of the a priori but also of the input data x(t). For this reason the optimum system should consist of two channels, namely, a Y shaping channel and a Y_o shaping channel. The paper is concluded with the application of the above theory to a number of special cases. There are 3 Soviet references.

SUBMITTED: December 16, 1959

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B010/B059

6.4320

AUTHOR: Fal'kovich, S. Ye., Member of the Society

TITLE: Correlation Functions and Spectra of Frequency-modulated Radiolocation Signals

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 12, pp. 13 - 18

TEXT: The author demonstrates the approximative calculation of correlation function and energy spectrum from a given frequency-modulated radiolocation signal. The reverse problem, i.e., calculation of the frequency-modulated signal from the given correlation function, is solved too. The results may be generalized to signals of small amplitude-modulated bandwidth and also to periodic signals. For a frequency-modulated signal of the shape $A(t) = A_o \cos\{2\pi[f_o t+\theta(t)]+\varphi\}$ (A_o - amplitude of the signal; f_o - carrier frequency; φ - initial phase angle; $\theta(t)$ - frequency swing), the correlation function (5) $\psi(\tau) = \frac{A_o^2}{2}\int_{-\frac{T}{2}+\tau}^{T/2} \cos\{2\pi[f_o\tau+\theta(t)-\theta(t-\tau)]\}\,dt$ is

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obtained if equal signal and modulation periods T are assumed. $\psi(\tau)$ is different from zero for very small τ-values only; thus, $\theta(t)-\theta(t-\tau)\approx F(t)\tau$ holds approximately, where $F(t) = \frac{d}{dt}\theta(t)$; then, (7)
$\psi(\tau)\approx\frac{A_o^2}{2}\cdot\int_{-T/2}^{T/2}\cos\left\{2\pi\left[f_o\tau + \bar{F}(t)\tau\right]\right\}dt$ is obtained in the place of (5). The energy spectrum $\Omega(f)$ is given as $\Omega(f) = \int_{-\infty}^{\infty}\psi(\tau)\exp(-i2\pi f\tau)\,d\tau$. An example with linear frequency swing function $F(t) = 2F_m t/T$, $|t|\leqslant T/2$ (T - period of modulation) is computed. If F(t) varies monotonically from one extremum (F_m) to the other ($-F_m$), then the frequency-modulated signal can be calculated from the given correlation function. Since t is a unique function of F: $t = \varphi(F)$, one can substitute $f = f_o + F(t)$ for t in (7) and, thus, $\psi(\tau) = \frac{A_o^2}{2}\int_{f_o-F_m}^{f_o+F_m}\left|\frac{d}{df}\varphi(f-f_o)\right|\cos(2\pi f\tau)df$ and $\Omega(t)= \frac{A_o^2}{2}\left|\frac{d}{df}\varphi(f-f_o)\right|$

(11). If, for instance, $\psi(\tau) = \frac{A_o^2 T}{2\sqrt{2\pi}F\tau_u} \exp(-\pi\tau^2/\tau_u^2) \cos 2\pi f_o\tau$ is given, then $t = \varphi(F) = \frac{2}{A_o^2}\int_{-\infty}^{F}\Omega(x)dx = \frac{T}{\sqrt{2\pi}}\int_{-\infty}^{u}\exp(-y^2/2)dy$ is obtained from (11). The notations are: $x = t/T$ and $y = (f - f_o)/F_m$; so, $F(t) = \frac{1}{\sqrt{2\pi}\tau_u}\Phi^{-1}(t/T)$, where $\Phi^{-1}(x)$ is the function inverse to $\Phi(x) = \frac{1}{\sqrt{2\pi}}\int_{-\infty}^{x}\exp(-y^2/2)dy$. The approximation $A_o(t)A_o(t - \tau)\approx A_o^2(t)$ is allowable if the signal has an additional amplitude modulation, provided the amplitude-modulated bandwidth is considerably smaller than the frequency swing. Thus,

$\psi(\tau) = \frac{1}{2}\int_{-T/2}^{T/2} A_o^2(t)\cos\left\{2\pi\left[f_o t + F(t)\tau\right]\right\}dt$ and

$\Omega(f) = \frac{1}{2}A_o^2\left[\varphi(f-f_o)\right]\cdot\left|\frac{d}{df}\varphi(f-f_o)\right|$ for $|f-f_o|\leq F_m$. Finally, the case where

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Correlation Functions and Spectra of Frequency-modulated Radiolocation Signals

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the signal consists of M repeating periods is briefly discussed: $A_{\Sigma}(t) = \sum_{k=0}^{M-1} A(t - kT)$. In this case, the energy spectrum $\Omega_{\Sigma}(f) = M^2 \sum_{n=-\infty}^{\infty} \Omega(n/T) \left| \sin \pi MT(f-n/T)/\pi MT(f-n/T) \right|^2$ is obtained. There are 2 Soviet references.

SUBMITTED: April 4, 1958

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PHASE I BOOK EXPLOITATION SOV/5513

Fal'kovich, S.Ye.

Priyem radiolokatsionnykh signalov na fone flyuktuatsionnykh pomekh (Reception of Radar Signals Against a Background of Fluctuation Noises) Moscow, Izd-vo "Sovetskoye radio", 1961. 310 p. 10,000 copies printed.

Ed.: N.D.Ivanushko; Tech. Ed.: A.A.Sveshnikov.

PURPOSE: This book is intended for radio engineers and technicians, and for students taking advanced courses in radio engineering divisions of schools of higher education.

COVERAGE: The book deals with the statistical determination of the limit (potential) capabilities of radar systems with various types of signals, and with theoretical problems related to the designing of radar receivers. Basic factors determining threshold signal

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Reception of Radar (Cont.)

energy and the maximum accuracy of target coordinate readings in reception against a background of stationary Gaussian noises are studied. Emphasis is laid on the formulation and methods of solving radar problems rather than on questions of the practical realization of the results of theoretical studies. The author thanks V.I. Tikhonov, A.Ye. Basharinov, and L.S. Gutkin who reviewed the book. There are 74 references: 53 Soviet (including 10 translations), 20 English, and 1 German.

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VILENSKIY, Khatskel' Moiseyevich [Vilens'kyi, Kh.M.], kand. tekhn. nauk; FAL'KOVICH, Saveliy Yeremeyevich [Fal'kovych, S.IA.], doktor tekhn. nauk; KOVAL'CHUK, O.V., inzh., red.izd-va; VOLKOV, V.M., kand. tekhn. nauk, retsenzent

[Reception of centimeter waves] Pryimannia santymetrovykh khvyl'. Kyiv, Tekhnika, 1964. 291 p. (MIRA 17:11)

L 38161-65 EEO-2/EWT(d)/FSS-2/EEC-4/EEC(t)/EED-2 Pn-4/Pp-4/Pac-4/Pj-4
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Vilenskiy, Khatskel' Moiseyevich (Candidate of Technical Sciences); Fal'kovich, Saveliy YEremeyevich (Doctor of Technical Sciences)

Reception of centimeter waves (Pryymannya santymetrovykh khvyl') Kiev, Vyd-vo "Tekhnika", 1964. 0292 p. illus., biblio. 700 copies printed.

TOPIC TAGS: centimeter wave receiver, travelling wave tube, SHF amplifier, negative feedback, tunnel diode amplifier, parametric amplifier, maser, klystron, backward wave tube, receiver noise reduction

PURPOSE AND COVERAGE: This book is intended for engineers, scientific workers, and students in advanced radio engineering courses in schools of higher education. The book deals with the theory, computation, and design of receiving equipment for centimeter radio waves. Methods of obtaining high sensitivity by reducing random noise in the equipment and the design and construction of vhf receivers are emphasized. Chapters I, III, and IV, with the exception of section 21, were written by S. Ya. Fal'kovich;

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Chapters II, V, VI, VII, and section 21 of Chapter IV were written by Kh. M. Vilens'kiy.

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SUB CODE: EC SUBMITTED: 08Jul64 NR REF SOV: 042

OTHER: 014

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ACCESSION NR: AP4024734 S/0109/64/009/003/0539/0545

AUTHOR: Fal'kovich, S. Ye.

TITLE: Noise-current correlation in tunnel-diode mixers

SOURCE: Radiotekhnika i elektronika, v. 9, no. 3, 1964, 539-545

TOPIC TAGS: mixer, frequency mixer, diode, tunnel diode, tunnel diode mixer, frequency converter

ABSTRACT: Hitherto, noise-current components in a tunnel diode have been assumed to be either statistically independent or entirely correlated. The present article tries to theoretically determine the real correlation that exists between various frequency components of the noise current in mixer diodes. Formulas are developed for the intensity and correlation of noise currents in an equivalent circuit of a diode mixer. The application of general formulas is illustrated by a microwave-mixer equivalent circuit having a finite admittance for the receiving,

ACCESSION NR: AP4024734

mirror, and intermediate frequencies; formulas for noise-factor calculation are developed. Orig. art. has: 1 figure and 30 formulas.

ASSOCIATION: none

SUBMITTED: 30Jan63 DATE ACQ: 10Apr64 ENCL: 00

SUB CODE: EC NO REF SOV: 002 OTHER: 003

GASUMYAN, Yu.; FAL'KOVICH, V.

Pneumatic and hydraulic step-by-step proportioner. Trakt. i sel'khozmash. no.12:40-41 D '61. (MIRA 15:2)

1. Nauchno-issledovatel'skiy institut tekhnologii traktornogo i sel'skokhozyaystvennogo mashinostroyeniya.

SUDOPLATOV, A.; FAL'KOVICH, Ya.; BURMAKIN, A.

More attention to the freezing of fruits and berries. Khol. tekh. 35 no.6:62-63 N-D '58. (MIRA 12:1)
(Kiev--Fruit, Frozen)

FAL'KOVICH, Ya.

Manufacturing natural sirups from frozen fruits and berries. Khol.tekh. 35 no.6:63 N-D '58. (MIRA 12:1)
(Kiev--Fruit juices, Frozen)

KIREYEV, P.M.; LIFSHITS, G.I.; DIK, M.G.; BATRAKOV, V.I.; SLAVUTSKIY, N.I., inzh.; FRID, M.Ya.; SUDOPLATOV, G.A.; FAL'KOVICH, Ya.D., starshiy tekhnolog

Worthy welcome to the 22d Congress of the CPSU. Khol. tekh. 38 no.4:5-13 Jl-Ag '61. (MIRA 15:1)

1. Direktor Moskovskogo khladokombinata No.3 (for Kireyev). 2. Glavnyy inzh. Moskovskogo khladokombinata No.3 (for Lifshits). 3. Glavnyy inzh. Moskovskogo kholodil'nika No.9 (for Dik). 4. Glavnyy inzh. Moskovskogo kholodil'nika No.10 (for Batrakov). 5. Glavnyy inzh. Moskovskogo kholodil'nika No.12 (for Frid). 6. Direktor Kiyevskogo kholodil'nika No.1 (for Sudoplatov).

(Refrigeration and refrigerating machinery)

KAL'KOVICH, YU. Ye.

21840 KAL'KOVICH, YU. Ye. K teoreticheskomu obosnovaniyu protsessa peregonki v kon'yachnom proizvodstve. Trudy Krasnodarsk. in-ta pishch. prom-sti, vyp. 6, 1949, s. 67-111. - Bibliogr: 29 nazv.

SO: Letopis' Zhurnal'nykh Statey, No. 29, Moskva, 1949

FAL'KOVICH Yu. Ye.

21841 FAL'KOVICH, Yu. Ye. i DEGTYAREVA, A. F.

Ochistka etilovogo spirta-rektifikata ot primesey.
Trudy Krasnodarsk. in - ta pishch. prom-sti, Vyp. 6, 1949, s. 189-91.

SO: Letopis' Zhurnal'nykh Statey, No. 29, Moskva, 1949

FAL'KOVICH, Yu. Ye. and MNDZHOYAN, Ye. L.

"Factors in the Redistillation of Imourities in Ethyl Alcohol," Vin. SSSR, 12, No.2, 1952

FAL'KOVICH, Yu.Ye.

Determining copper in wines and cognacs with the help of ion-exchange resins. Izv. vys. ucheb. zav.; pishch. tekh. no.3:144-147 '60. (MIRA 14:8)

1. Krasnodarskiy institut promyshlennosti, Kafedra tekhnologii vinodeliya.
(Ion exchage resins) (Wine and wine making—Analysis)

FAL'KOVICH, Yu.Ye.

Determination of tartaric acid in wine and wort by means of ion exchange resins. Izv.vys.ucheb.zav.;pishch.tekh. no.4:158-160 '60. (MIRA 13:11)

1. Krasnodarskiy institut pishchevoy promyshlennosti. Kafedra tekhnologii vinodeliya.
(Tartaric acid) (Wine and wine making--Analysis)

FAL'KOVICH, Yu.Ye.

Determining cations in pentose hydrolyzates by means of ion exchange resins. Izv.vys.ucheb.zav.; pishch.tekh. no.3:33-36 '62. (MIRA 15:7)

1. Krasnodarskiy institut pishchevoy promyshlennosti, kafedra organicheskoy khimii.
(Ion exchange resins) (Pentoses--Analysis)

FAL'KOVICH, Yu.Ye.

Using ion exchange resins in the anlysis of pentose hydrolysates. Gidroliz.i lesokhim.prom. 15 no.8:18-20 '62. (MIRA 15:12)

1. Krasnodarskiy institut pishchevoy promyshlennosti.
(Ion exchange resins) (Pentoses) (Hydrolysis)

FAL'KOVICH, Yu.Ye.; Prinimali uchastiye: STANCHU, I., student; SHCHERBINA, G., studentka

Determining copper content of wine and brandy by means of ion exchange resins. Trudy KIPP no.22:375-378 '61. (MIRA 16:4)
(Wine and winemaking--Analysis)
(Ion exchange resins)

FAL'KOVICH, Yu.Ye.

Determining tartaric acid in wine and must by means of ion exchange resins. Trudy KIPP no.22:379-382 '61. (MIRA 16:4)
(Wine and winemaking—Analysis)
(Tartaric acid) (Ion exchange resins)

KUL'NEVICH, V.G.; FAL'KOVICH, Yu.Ye.; PARFENT'YEVA, T.L.

Selective determining of xylite and xylose content in their mixture. Izv.vys.ucheb.zav.; pishch.tekh. no.1:153-157 '63. (MIRA 16:3)

1. Krasnodarskiy institut pishchevoy promyshlennosti, kafedra organicheskoy khimii.

(Hydrogenation) (Xylose)

KUL'NEVICH, V.G.; FAL'KOVICH, Yu.Ye.; PARFENT'YEVA, T.L.

Separate determining of sugars and polyatomic alcohols in multicomponent systems. Izv. vys. ucheb. zav.; pishch. tekh. no.6:147-149 '63. (MIRA 17:3)

1. Krasnodarskiy politekhnicheskiy institut, kafedra organicheskoy khimii.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Bitumens and humic acids present in coals. G. L. Stadnikov and A. A. Fal'kovskaya. *Khim. Tverdogo Topliva* 5, 668-9(1934); cf. *C. A.* 29, 3030[4]. — The bitumen and humic acid contents of various Russian coals are tabulated. A. A. Boehtlingk

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

BC

B-I-2

[illegible]

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

Weathering of sapropelite. A. A. [illegible]. *Khim. Tverdogo Topliva* **8**, 210-21([illegible]). Pure sapropelite was prepd. by treating [illegible] and Khakhari boghead with 2% alkali under press. The treatment completely removed all humic admixts. leaving a residue of purely sapropelic character. The residue was subjected to long heating (in glass) in a stream of air. The temp. was raised very slowly to prevent autoxidation. The content of alk.-sol. and the mass was stirred daily. The products gradually increased with the oxidation process, reaching after 5-6 months of treatment at [illegible]. The product of various degrees of oxidation and their alk. extracts, checked by increased soly. in alkali, ultimate analyses, and methylation ability, a gradual approximation of the humic substances. However, the products differ from natural humic substances by higher COOH group content, lower phenolic —OH group, and by the presence of an unknown active group, which reacted with $Ba(OH)_2$, but was not methylated with diazomethane. Data are tabulated. Twenty references. A. A. [illegible]

CHEMICAL ELEMENTS

MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

21

CA

Brown and hard coals. A. A. Fal'kovskaya.—*Khim. Tverdogo Topliva* 8, 472-84(1937).—Chem. analyses are given of several samples of coal from different deposits. Twenty references. A. A. Podgorny

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000412410017-1"

Fal'kovskaya, A.A.

Synthesis of hydrocarbons over iron catalysts. A. A. Fal'kovskaya and I. B. Rapoport. *Trudy Vsesoyuz. Nauch.-Issledovatel. Inst. Iskusstven. Zhidkogo Topliva i Gaza* 1954, No. 6, 60-84.—The fluidized catalyst is effective in removing the heat of reaction and permitting the use of highly dispersed, highly reactive catalysts, but requires higher mech. strength; it results in higher CH_4 formation and a $CO:H_2$ ratio of 1:2 because of the high decompn. rate. Liquid-phase CO hydrogenation is highly selective (low CH_4 formation), proceeds with low catalyst superheating, and can be used with any Fe catalyst, but its output is relatively low. Fixed bed high-activity Fe catalysts can give complete conversion of the synthesis gas in a single stage at 30-atm. pressure and 200°, at space velocities of 2000 vols./vol.catalyst/hr., without C deposition. However, cooling of the catalyst is difficult and the temp. must be controlled closely to avoid C deposition. 25 references.

W. M. Sternberg

S/081/62/000/005/086/112
B162/B101

11.9700

AUTHORS: Fal'kovskaya, A. A., Vavul, A. Ya., Kheyfets, Ye. M., Rapoport, I. B., Listov, V. A., Petyakina, Ye. I.

TITLE: Efficiency of some molybdenum and organosulfur compounds as antiwear additives to lubricating materials

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 530, abstract 5M224 (Sb. "Prisadki k maslam i toplivam". M., Gostoptekhizdat, 1961, 71-79)

TEXT: It is shown that the additive B-15/30 (V-15/30), containing a complex compound of Mo, greatly improves the antiwear properties of mineral and synthetic lubricating materials; its action is particularly effective when used jointly with organic compounds containing S, Cl, and other elements. A disadvantage of the additive is its unsatisfactory thermal stability in certain high-temperature lubricating materials. The Mo-organic additive B-15/1 (B-15/1) can be used for preliminary application of antifriction noncorroding films on friction surfaces; in this case,

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S/081/62/000/005/086/112
B162/B101

Efficiency of some molybdenum ...

the efficiency of high-temperature lubrication using various lubricating materials is greatly improved. The S-organic additive B-15/2A (V-15/2A) is extremely effective as an antiseizing medium for high-temperature lubricating materials. 1.5 - 3% of it added to lubricating materials, including those prepared on a base of Si-organic liquids, greatly improves their lubricating capacity under conditions of high-temperature friction of heavily loaded parts. [Abstracter's note: Complete translation.]

B

Card 2/2

ACC NR: AP7002569 (A,N) SOURCE CODE: UR/0413/66/000/023/0061/0062

INVENTOR: Fal'kovskaya, A. A.; Oberfel'd, M. Sh.; Kheyfets, Ya. M.; Rapoport, I. B.; Puchkov, N. G.; Borovaya, M. S.; Reznikov, V. D.

ORG: none

TITLE: Improving the antiseizure and anticorrosion properties and thermal oxidative stability of lubricants. Class 23, No. 189109 [announced by All-Union Scientific Research Institute for Petroleum Refining (Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 23, 1966, 61-62

TOPIC TAGS: lubricant, EP property, anticorrosion additive, thermal oxidative stability, xanthate additive, lubricant additive

ABSTRACT:

An Author Certificate has been issued for a method for improving the antiseizure (EP) and anticorrosive properties, and thermal oxidative stability of lubricants. The method provides for the addition to the lubricants of xanthates of the formula ROCSSR', where R and R' are higher and branched alkyl radicals.

SUB CODE: 11/ SUBM DATE: 02Jul65/ ATD PRESS: 5112

Card 1/1 UDC: 621.892.84

NAPORKO, A.G., kand.ekonom.nauk; BELEN'KIY, M.N., kand.ekonom.nauk; CHERNOV, P.N., dotsent; BEL'KOV, S.P., kand.ekonom.nauk; KOMISSAROVA, N.N., prepodavatel'; FAL'KOVSKAYA, D.L., starshiy inzh.-ekonomist

Necessary textbook on transportation economics ("Economics of railroad transportation" by I.V. Belov; N.E. Borovoi; N.G. Vinnichenko; G.S. Raikher; E.D. Khanukov; and N.F. Khokhlov. Reviewed by A.G. Naporko and others). Zhel.dor.transp. 43 no.8: 95-96 Ag '61. (MIRA 14:8)

1. Zaveduyushchiy kafedroy "Ekonomika transporta" Tashkentskogo instituta inzhenervo zheleznodorozhnogo transporta (for Belen'kiy).
2. Kafedra "Ekonomika transporta" Tashkentskogo instituta inzhenerov zheleznodorozhnogo transporta (for Chernov).

(Railroads) (Belov, I.V.) (Borovoi, N.E.)
(Vinnichenko, N.G.) (Raikher, G.S.)
(Khanukov, E.D.) (Khokhlov, N.F.)

FAL'KOVSKAYA, E. M.

24471 FAL'KOVSKAYA, E. M. Primoneniye aminostimulina v lechenii gipotrofii u detey rannego vozrasta. Vrachob. Delo, 1949, No. 8, STB. 711-12.

SO: Letopis, No. 32, 1949.

FAL'KOVSKAYA, Kh.

Ca

PROCESSES AND PROPERTIES INDEX

2

Effect of temperature on rate of electroösmosis. B. O. Zaprometov and Kh. Fal'kovskaya. *Colloid J.* (U. S. S. R.) 3, 481-90 (1937).—An investigation of the effect of temp. on the rate of electroösmosis of H_2O-glycerol solns. of KCl in contact with a silica gel membrane, showed a max. rate at 30-40°. The elec. cond. and viscosity of these solns. at various temps. and various concns. of the components, was studied. Fourteen references.

S. L. Madorsky

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

ANDROSOV, V.V.; FAL'KOVSKAYA, K.V.

Improved method of fastening ties with screws. Put' i put.khoz. 5 no.4:12-13 Ap '61. (MIRA 14:7)

1. Zamestitel' nachal'nika Kishinevskoy distantsii puti Moldavskoy dorogi (for Androsov). 2. Starshiy inzhener stantsii Kishinev, Moldavskoy dorogi (for Fal'kovskaya).

(Railroads--Ties)

GODES, I.; SOKOLOV, V.; FAL'KOVSKAYA, L.

Liquidate water losses in domestic water pipe systems. Zhil.-kom. khoz. 4 no.2:16-17 '54. (MLRA 7:5)
(Water pipes)

FAL'KOVSKAYA, L. A.

Fal'kovskaya, L. A. - "The electrochemical protection of iron in water of various compositions in the presence of inhibitors," (Authors: Rosenberg, M. A., Fal'-kovskaya, L. A., Pogorel'skiy, Ye. I. and Yurkovskaya, F. B.) Nauch. zapiski (Dnepropetr. gos. un-t), Vol XXXIII, 1948, p. 19-31, - Bibliog: 15 items

SO: U-5240, 17, Dec. 53, (Letopis 'Zhurnal 'nykh Statey, No. 25, 1949).

FAL KOVSKAYA, L.M.

~~Fal'Kovskaya, L. M.~~

Coagulation of natural waters. II. M. A. Rozenberg, L. M. Fal'kovskaya, and F. B. Yurkovskaya. *Nauch. Zapiski Dnepropetrov. Univ.* 43, 17-21(1953); *Referat. Zhur. Khim.* 1954, No. 20030; cf. *Sbornik Rabot Khim. Fakul'teta Dnepropetrovsk. Univ.* 37, 9(1951).—The purpose of this investigation was to find the proper amt. of various coagulants for the removal of suspended matter from some natural waters. The effectiveness of coagulants was judged from their clearing effect and the ability of the water to form scale. Coupled with preliminary soda-lime softening of the water the optimal concn. of $FeSO_4.7H_2O$ for water from the river Samara contg. approx. 600 mg./l. suspended matter was 75 mg./l. and of $Al_2(SO_4)_3.18H_2O$ for water from the river Volch'ya contg. about 450 mg./l. suspended matter was 50 mg./l. $NaAlO_2$ acted simultaneously as a softener and a coagulant. Its optimal concn. for Dnepropetrovsk city water contg. 200 mg./l. purposely added kaolin was 100-150 mg./l.

M. H.

FAL'KOVSKAYA, L. N.

USSR/Microbiology - Sanitary Microbiology. F-3

Abs Jour : Ref Zhur - Biologiya, No 7, 1957, 26322

Author : Fal'kovskaya, L.N.

Inst : ---

Title : Decontamination of Drinking Water by Ultrasonic Vibrations.

Orig Pub : Gigiena i sanitariya, 1956, No 1, 11-14

Abst : A study was made of the bactericidal effect of ultrasonic vibrations, produced by a magnetostriction generator at a frequency of 46 thousand vibrations per second. Tests were conducted with stream water, artificially polluted with Bacterium coli, Bact. aerogenes and spores of Bacillus subtilis. The bactericidal effect was increased sharply when intensity of exposure to sound was increased from 0.7 to 1.2 and, particularly, to /1.8 cm^2, and attains 99 - 99.8% for Bact. coli and B. subtilis. Most of the bacteria perish within 2 to 5 seconds of exposure

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USSR/Microbiology - Sanitary Microbiology. F-3

Abs Jour : Ref Zhur - Biologiya, No 7, 1957, 26322

to sound of a layer of water up to 10 cm deep, and turbidity up to 50 mg/liter dies not affect the operation. The relation between bactericidal effect and intensity of exposure to sound may be expressed for intensities within the 0.3 - 1.2 watts/cm^2 range by means of the formula $\frac{N}{N_o} = e^{-1.4x}$, where N is the number of bacteria after exposure, N_o is the number prior to exposure, x is ultrasonic intensity in watts/cm^2, and e is the basis of natural logarithms, equal to 2.71. At an intensity above 1.2 watts/cm^2, bacteria perish at a more rapid rate, which may be derived from the relation

$\frac{N}{N_o} = 0.6 - 0.33x$. At a rate of flow of the water from

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USSR/Microbiology - Sanitary MIcrobiology. F-3

Abs Jour : Ref Zhur - Biologiya, No 7, 1957, 26322

1 to 10 cm per second, a similar effect is obtained from exposure to sound. The author believes that the effectiveness of exposure to ultrasonic vibrations of an intensity of 2 watts/cm^2 at a frequency of 46 thousand oscillations per second is higher than that of chlorine in decontamination.

Card 3/3

Fal'kovskaya, L.N.

SHUBERT, S.A.; PERLINA, A.M.; KULZHINSKIY, V.I.; SIDENKO, T.K.; ALEKSANDROV, D.N.; SOKOLOV, V.F.; FAL'KOVSKAYA, L.N.; BRUK-LEVINSON, T.L.; BELYAKOVA, A.N.; KOZHEVNIKOVA, Ye.K.; AVRUSHCHENKO, R.A., red. izd-va; VOLKOV, S.V., tekhn.red.

[Water purification for water supply to machine-tractor stations and state farms] Ochistka vody dlia vodosnabzheniia poselkov MTS i sovkhozov. Moskva, Izd-vo M-va kommun.khoz. RSFSR, 1957. 69 p. (MIRA 11:6)

1. Akademiya kommunal'nogo khozyaystva, Moscow.
(Water--Purification) (Water supply, Rural)

FAL'KOVSKAYA, L.N.

GORIN, G.S.; FAL'KOVSKAYA, L.N.

The water supply of Berlin. Vod.i san.tekh. no.9:33-36 S '57. (MIRA 10:11)

(Berlin--Water supply)

FAL'KOVSKAYA, L., kand. tekhn. nauk.

Water supply in cities of the German Democratic Republic. Zhil.-kom. khoz. 8 no.11:29-30 '58. (MIRA 11:12)
(Germany, East--Water-supply engineering)

FAL'KOVSKAYA, L.N.

Ultrasonic disinfection of water. Vod. i san. tekh. no.12:8-10 D '58. (MIRA 11:12)
(Ultrasonic waves--Physiological effect) (Water--Disinfection)

GODES, I.G., kand. tekhn. nauk; FAL'KOVSKAYA, L.N., kand. tekhn. nauk; BOLOTINA, A.V., red. izd-va; KHENOKH, E.M., tekhn. red.

[Using equipment developed by other branches of the national economy for temporary water supply] Ispol'zovanie tekhniki narodnogo khoziaistva dlia vremennogo vodosnabzheniia. Moskva, Izd-vo M-va kommun. khoz. RSFSR. 1961. 46 p. (MIRA 15:7)

1. Akademiya kommunal'nogo khozyaystva.
(Water-supply engineering)

FAL'KOVSKAYA, L.N.

Water supply in the U.S.A. Nauch. trudy AKKH no.22:158-165 '63.
(MIRA 18:5)

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Fal'kovskaya, Lyudmila Nikolayevna

Organizing water supply for inhabited localities which have suffered from mass destruction weapons (Organizatsiya vodosnabzheniya naselennykh punktov, postradavshikh ot oruzhiya massovogo porazheniya) Moscow, Stroyizdat, 1964. 55 p. illus., biblio. 10,000 copies printed.

TOPIC TAGS: nuclear weapon, BW agent, CW agent, water supply system, water pollution, water purification, water sanitation

PURPOSE AND COVERAGE: Problems of the effect of mass destruction weapons on water supply systems of pupulated areas are elucidated in this brochure. The nature of the disruption of this system is brought out and recommendations are given for the organization of water supply in stricken cities. The brochure is intended for engineers and workers in the water supply field and also for a wide circle of DOSAAF active members.

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SUB CODE: GO, CB SUBMITTED: 24Sep64

NO REF SOV: 010 OTHER: 000

Card 2/2

FAL'KOVSKIY, B.I.

CA

PROCESSES AND PROPERTIES INDEX

19

Increasing the hardness of finished abrasive articles. B. I. Fal'kovskii and M. F. Khmov. Russ. 52,452, Jan. 31, 1938. Addn. to Russ. 44,451. In increasing the hardness of the tool by impregnating with silicate or Bakelite, the impregnating reagent is coagulated in the pores by immersion in solns. of salts of bi- and trivalent metals or acids for silicates, and in a mixt. of Bakelite with a solvent (alc., acetone) dild. with neutral solvents (water or aq. solns. of salts), for Bakelite.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

FAL'KOVSKIY, B.I.

CA

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PROCESSES AND PROPERTIES INDEX

Abrasives. B. I. Fal'kovskii. U.S.S.R. 66,195, Aug. 31, 1946. Abrasive particles for which alkyd resins are to be used as binders are wetted with a liquid causing the resins to swell but not to dissolve, e.g. H_2O, aq. solns. of salts, acids, alkalies, or water-sol. polyhydric alcs. The product is then finished as usual. M. Hosch

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 489-I

Book

Authors: LYUBOMUDROV, V. N., VASIL'YEV, N. N., FAL'KOVSKIY, B. I.

Full Title: ABRASIVE TOOLS AND THEIR MANUFACTURE

Transliterated Title: Abrazivnyye instrumenty i ikh izgotovleniye

PUBLISHING DATA

Originating Agency: None

Publishing House: State Scientific and Technical Publishing House of Machine-Building and Shipbuilding Literature (Mashgiz). Leningrad Branch

Date: 1953 No. pp.: 376 No. of copies: 5,000

Editorial Staff

Editor: Chistyakov, A. P., Engineer

Appraiser: Avgustinik, A. I., Prof., Dr. of Tech. Sci.

PURPOSE: Approved by the School Administration of the Ministry of Machine Building as a textbook for technical schools of machine-tool construction and machine building. This work can be also used as a reference book by engineers, technicians and foremen specializing in the production of abrasives.

TEXT DATA

COVERAGE: PART I (by N. N. Vasil'yev) describes grinding and polishing processes, the characteristics and basic properties of natural and

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artificial abrasive materials, as well as abrasive tools, pastes, emery cloths, sandpapers, etc., with their nomenclature. Part II (by V. N. Lyubomudrov and B. I. Fal'kovskiy) discusses the technology of the manufacture of abrasive tools with the use of ceramic, magnesia, silicate, vulcanite and bakelite bonds. Special attention is given to ceramic bonding materials because they are widely used and their processing, particularly their heat treatment, is more complicated. The book is provided with illustrations, tables and diagrams.

No. of References: 49 (1931-1952)
Facilities: Not given

DASHEVSKIY, Il'ya Isaakovich; ZASLAVSKIY, Simon Shlemovich; FAL'KOVSKIY, B.L., inzh., retsenzent; PILIPENKO, Yu.P., inzh., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn. red.

[Mechanization of the manufacture of metalworking and forging dies] Mekhanizatsiia izgotovleniia shtampov i press-form. Moskva, Mashgiz, 1962. 172 p. (MIRA 15:8)
(Dies (Metalworking))

FAL'KOVSKIY, G., inzh.

Centralized transportation of ammonia water. Avt. transp. 43
no.12:13-14 D '65. (MIRA 18:12)

1. Ministerstvo avtotransporta i shosseynykh dorog Litovskoy SSR.

KOVANOV, V.V.; PAVLENKO, S.M.: MEDELYANOVSKIY, A.N.; BOGDANOVA, Ye.V.; KISELEV, O.I.; KHIL'KIN, A.M.; FAL'KOVSKIY, G.A.

Method of phasic control of the blood circulation. Trudy po nov. app. i metod.no.1:86-92 '63 (MIRA 16:12)

FAL'KOVSKIY, G.E.; KRASNOVA, A.Ye.

Comparative evaluation of vairous methods of placing a circular vascular suture. Eksper.khir. 4 no.5:12-16 S-O '59. (MIRA 13:1)

1. Iz kafedry topograficheskoy anatomii i operativnoy khirurgii (zav. - prof. V.V. Kovanov) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M. Sechenova.
(BLOOD VESSELS, surg.)

FAL'KOVSKIY, G.E.

Changes in hemodynamics following the exclusion of various quantities of pulmonary tissue. Biul. eksp. biol. i med. 59 no.4:19-22 Ap '65. (MIRA 18:5)

1. Kafedra operativnoy khirurgii i topograficheskoy anatomii (zav. - deystvetel'nyy chlen AMN SSSR prof. V.V. Kovanov) I Moskovskogo ordena Lenina meditsinskogo instituta imeni Sechenova.

r...........I, ...

The placing, organization and control of the [illegible]rying process [illegible]n [illegible]lax mills of standard construction Moskva Gizlegprom, 1940. 50 p.
(Bibliotechka tekstil'shchika) (54-22219)

1. FAL'KOVSKIY, I. M.

2. USSR (600)

4. Peat

7. Effect of air parameters on the drying process of peat. Torf. prom., 29 no. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000412410017-1"

FAL'KOVSKIY, Isaak Moiseyevich; LYKOV, A.V., laureat Stalinskoy premii, doktor tekhnicheskikh nauk, retsenzent; KHOMUTSKIY, N.D., kandidat tekhnicheskikh nauk, dotsent; SOKOLOVA, V.Ye., redaktor; EL'KINA, E.M., tekhnicheskiy redaktor.

[Drying and wetting bast fiber materials] Sushka i uvlazhnenie lubovoloknistykh materialov. Izd. 2-e, perer. i dop. Moskva, Gos. nauchno-tekhn. izd-vo Ministerstva promyshl. tovarov shirokogo potrebleniia SSSR, 1954. 410 p. [Microfilm] (MIRA 8:2)
(Bast) (Drying apparatus)

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AUTHORS: Abrikosov, A. A., Fal'kovskiy, L. A.

TITLE: Raman scattering of light in superconductors

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 1, 1961, 262-270

TEXT: A study of the behavior of a superconductor allows many conclusions as to its energy spectrum. The existence of a gap Δ in the energy spectrum brings about an effect that at T=0 a radiation with a frequency smaller than the threshold frequency 2Δ is not absorbed. Besides such experiments with varied frequencies, M. S. Khaykin and V. P. Bykov have carried out other experiments in order to determine the electron spectrum with the help of Raman scattering of light in superconductors. At a sufficiently high intensity, it should be possible to measure the distribution of satellite frequencies spectroscopically. The main problem of such experiments is that scattering is extremely small in connection with the fact that due to the skin effect the light will only penetrate about 10^{-5} cm into a body. No satellite lines have been observed by Khaykin and Bykov; now the ques-

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tion comes up, how much the sensitivity has to be increased in order to perform such an experiment successfully and how would such an effect look like. To find out this was the aim of the present work. The authors tried to determine the frequency and angular distribution of a plane surface of a superconductor, filling a semispace $z>0$ at $T=0$. For simplicity the incident and reflected waves were assumed to form only small angles with the surface normal ($\sin^2\theta$, $\sin^2\theta' \ll |\varepsilon|$; ε denotes the complex dielectric constant). For most metals $|\varepsilon|\sim 10$. Furthermore, the radiation frequency was assumed to fall in the optical region. Since the absorption probability of a quantum is $B^{-}(\omega'\Omega') = \sum_j |S_{j0}|^2$, it is possible to concentrate the problem to determining the elements S_{j0} of the scattering matrix, which describe the transition from the ground state to the j-th state for electrons of the outer field A_2+A_2'. (The incident wave produces a field in the metal which is characterized by the vector potential A_2). The elements of the S-matrix are determined by a method using quantum field theory, as outlined by L. P. Gor'kov (also A. A. Abrikosov and Gor'kov, Ref. 4). Several eligible graphs are examined, and it is found that only graphs of the type  are of interest. This expression is found for

the corresponding matrix element:
$S_{j0} = -i\int\langle j|(e^2/m)(\vec{A}_2(x)\vec{A}_2'(x))\Psi^+_\alpha(x)\Psi_\alpha(x)|0\rangle d^4x$, and the total probability for all possible processes is given by

$$\sum_j |S_{j0}|^2 = \frac{e^4}{m^2}\int (\mathbf{A}_2^+(x')\,\mathbf{A}_2'(x'))\,(\mathbf{A}_2(x)\,\mathbf{A}_2'(x)) \times \times \langle\psi_\alpha^+(x')\,\psi_\alpha(x')\,\psi_\beta^+(x)\,\psi_\beta(x)\rangle\, d^4x\, d^4x'. \quad (2)$$

For an infinite superconductor relation

$$\langle\psi_\alpha^+(x')\,\psi_\beta(x)\rangle = \delta_{\alpha\beta}\int v_p^2\,\delta(\varepsilon+\varepsilon_p)\,e^{ip(x-x')}\frac{d^4p}{(2\pi)^3},$$
$$\langle\psi_\alpha(x')\,\psi_\beta^+(x)\rangle = \delta_{\alpha\beta}\int u_p^2\,\delta(\varepsilon-\varepsilon_p)\,e^{ip(x'-x)}\frac{d^4p}{(2\pi)^3}, \quad (3)$$
$$\langle\psi_\alpha(x')\,\psi_\beta(x)\rangle = -I_{\alpha\beta}\int u_p v_p\,\delta(\varepsilon-\varepsilon_p)\,e^{ip(x'-x)}\frac{d^4p}{(2\pi)^3},$$
$$\langle\psi_\alpha^+(x')\,\psi_\beta^+(x)\rangle = I_{\alpha\beta}\int u_p v_p\,\delta(\varepsilon+\varepsilon_p)\,e^{ip(x-x')}\frac{d^4p}{(2\pi)^3}.$$

$$p = (\varepsilon, \mathbf{p}), \qquad \varepsilon_p = \sqrt{\xi_p^2+\Delta^2}, \qquad \xi_p = v(|\mathbf{p}|-p_0),$$
$$u_p^2 = \tfrac{1}{2}(1+\xi_p/\varepsilon_p), \quad v_p^2 = \tfrac{1}{2}(1-\xi_p/\varepsilon_p);$$

holds; $I_{\alpha\beta}$ is an antisymmetric two-row unit matrix. The following expression is then obtained: $\sum_j |S_{j0}|^2 = \frac{e^4}{2m^2} t \sigma \int R(q_z) f(\vec{q}) dq_z$ (σ - surface area);

and after some intermediate calculations one finds:

$$f(\vec{q}) = \frac{p_0^2}{\pi^2 v^2 |\vec{q}|} \left[\left(\frac{q_0}{2} + \Delta \right) E\left(\frac{q_0 - 2\Delta}{q_0 + 2\Delta} \right) - \frac{q_0 \Delta}{q_0/2 + \Delta} K\left(\frac{q_0 - 2\Delta}{q_0 + 2\Delta} \right) \right],$$

where E and K are the complete elliptic integrals, and

$$R(q_z) = 8|A_0|^2 |A_0'|^2 \cos^2\theta \cos^2\theta' \left\{ \frac{\cos^2\varphi}{[(n+\cos\theta)^2 + \varkappa^2][(n+\cos\theta')^2 + \varkappa^2]} + \frac{\sin^2\varphi}{[(n\cos\theta+1)^2 + \varkappa^2\cos^2\theta][(n+\cos\theta')^2 + \varkappa^2]} + \frac{\sin^2\varphi}{[(n+\cos\theta)^2 + \varkappa^2][(n\cos\theta'+1)^2 + \varkappa^2\cos^2\theta']} + \frac{\cos^2\varphi}{[(n\cos\theta+1)^2 + \varkappa^2\cos^2\theta][(n\cos\theta'+1)^2 + \varkappa^2\cos^2\theta']} \right\} \frac{16\varkappa^2\omega^2}{(q_z^2 + 4\varkappa^2\omega^2)^2}. \quad (10)$$

The reflection coefficient $d\sigma$, which is defined as the fraction of energy hitting the superconductor surface that is reflected in the angular interval $d\Omega'$ and in the frequency interval $d\omega'$ is obtained as

$$d\sigma = \frac{2e^4}{\pi^3}\frac{\cos\theta\cos^2\theta'}{\varkappa^2\omega^2}\{[(1+\cos^2\theta)(n^2+\varkappa^2+1)+4n\cos\theta]\times$$
$$\times[(1+\cos^2\theta')(n^2+\varkappa^2+1)+4n\cos\theta']+\sin^2\theta\sin^2\theta'\cos 2\varphi\,(n^2+\varkappa^2-1)^2\}\times$$
$$\times\{[(n\cos\theta+1)^2+\varkappa^2\cos^2\theta][(n\cos\theta'+1)^2+\varkappa^2\cos^2\theta'][(n+\cos\theta)^2+\varkappa^2]\times$$
$$\times[(n+\cos\theta')^2+\varkappa^2]\}^{-1}\left[\left(\frac{\omega-\omega'}{2}+\Delta\right)E\left(\frac{\omega-\omega'-2\Delta}{\omega-\omega'+2\Delta}\right)-\right.$$
$$\left.-\frac{2(\omega-\omega')\Delta}{\omega-\omega'+2\Delta}K\left(\frac{\omega-\omega'-2\Delta}{\omega-\omega'+2\Delta}\right)\right]\ln\frac{2\varkappa\omega v}{\omega-\omega'}\,d\omega'd\Omega. \qquad (11)$$

The numerical value for Nb is at $\lambda\sim 5800$ A ($\omega = 3.2\cdot 10^{15}\,\mathrm{sec}^{-1}$), $\theta=\theta'=0$,: $d\sigma = 0.6\cdot 10^{-12}\beta\, d\Omega d\omega'/2\Delta$; $\beta\sim 1$. It was thus found that in order to be able to observe such an effect, the sensitivity has to be at least 10^5 times higher than in experiments of Khaykin and Bykov. Finally, the authors thank Academician L. D. Landau and M. S. Khaykin for discussions. There are 6 figures and 5 references: 4 Soviet-bloc.

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AUTHORS: Abrikosov, A. A., Fal'kovskiy, L. A.

TITLE: Theory of electron energy spectrum for metals of the bismuth type

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 3(9), 1962, 1089-1101

TEXT: Arsenic, antimony and bismuth have rhombohedral lattices formed when two face-centered sublattices of a cubic lattice are mutually displaced along the diagonal of the cube. First, the electron energy spectrum is calculated for a lattice differing infinitesimally from cubic. Then this lattice is deformed so as to cause mutual displacement of the two sublattices. The displacement results in the metal undergoing a phase transition of the second kind whereby the lattice constant is doubled. The number of carriers diminishes. The effect of such a deformation on the electron energy spectrum is investigated, leading to the formula

$$E_0 \sim L^2 \left\{ \int\limits_{\max(f,\gamma)}^{-\mu(0)} d|\Omega| \sqrt{\Omega^2 - \gamma^2} + 3 \int\limits_{\max\left(\frac{f}{3},\frac{\gamma}{3}\right)}^{-\mu(0)} d|\Omega| \right| \sqrt{\Omega^2 - \frac{\gamma^2}{9}} -$$

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$$-4\int_{0}^{-\mu(0)}\Omega d\Omega\approx-\frac{2}{3}L^{2}\gamma^{3}\ln\frac{|\mu(0)|}{\max([illegible])}\Big\}. \qquad (22),$$

where $\Omega = f - \omega$ are the eigenvalues of the matrix

$$D_{ss'}=$$

$$=\left\|\begin{matrix}
f+a\kappa_z+\Delta & 0 & \frac{b\kappa_++\beta_+}{\sqrt{2}} & -\frac{b\kappa_++\beta_+}{\sqrt{2}} & \gamma & 0 & \frac{\delta_-}{\sqrt{2}} & -\frac{\delta_+}{\sqrt{2}}\\
0 & f+a\kappa_z+\Delta & \frac{b\kappa_-+\beta_-}{\sqrt{2}} & \frac{b\kappa_-+\beta_-}{\sqrt{2}} & 0 & \gamma & \frac{\delta_-}{\sqrt{2}} & \frac{\delta_-}{\sqrt{2}}\\
\frac{b\kappa_-+\beta_-}{\sqrt{2}} & \frac{b\kappa_++\beta_+}{\sqrt{2}} & f+a\kappa_z-\Delta & 0 & \frac{\delta_-}{\sqrt{2}} & \frac{\delta_+}{\sqrt{2}} & \gamma & 0\\
-\frac{b\kappa_-+\beta_-}{\sqrt{2}} & \frac{b\kappa_++\beta_+}{\sqrt{2}} & 0 & f+a\kappa_z-\Delta & -\frac{\delta_-}{\sqrt{2}} & \frac{\delta_-}{\sqrt{2}} & 0 & \gamma\\
\gamma & 0 & \frac{\delta_+}{\sqrt{2}} & -\frac{\delta_+}{\sqrt{2}} & f-a\kappa_z+\Delta & 0 & \frac{-b\kappa_++\beta_+}{\sqrt{2}} & \frac{b\kappa_+-\beta_-}{\sqrt{2}}\\
0 & \gamma & \frac{\delta_-}{\sqrt{2}} & \frac{\delta_-}{\sqrt{2}} & 0 & f-a\kappa_z+\Delta & \frac{-b\kappa_-+\beta_-}{\sqrt{2}} & \frac{-b\kappa_-+\beta_-}{\sqrt{2}}\\
\frac{\delta_-}{\sqrt{2}} & \frac{\delta_+}{\sqrt{2}} & \gamma & 0 & \frac{-b\kappa_-+\beta_-}{\sqrt{2}} & \frac{-b\kappa_++\beta_+}{\sqrt{2}} & f-a\kappa_z-\Delta & 0\\
-\frac{\delta_-}{\sqrt{2}} & \frac{\delta_+}{\sqrt{2}} & 0 & \gamma & \frac{b\kappa_--\beta_-}{\sqrt{2}} & \frac{-b\kappa_++\beta_+}{\sqrt{2}} & 0 & f-a\kappa_z-\Delta
\end{matrix}\right\|$$

$$f = vu_z + \zeta w, \quad \gamma = cu_z, \quad \beta_\pm = eu_\pm = e(u_y \pm iu_x), \quad \delta_\pm = du_\pm. \quad (7),$$

$L \sim bK$. K is a quantity of the order of the inverse lattice parameter, $\vec{u}$ is the deformation vector, u_{ik} is the deformation tensor. There are 5 figures and 1 table.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems of the Academy of Sciences USSR)

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ANDREYEV, A.F.; FAL'KOVSKIY, L.A.

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AUTHOR: Fal'kovskiy, L. A.

TITLE: Theory of electron spectra of bismuth-type metals in a magnetic field

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 1935-1940

TOPIC TAGS: electron spectrum, bismuth-type metal, g-factor, spin-orbit coupling, diamagnetic level

ABSTRACT: The energy spectrum of holes and electrons of bismuth-type metals in a magnetic field is considered by starting with results previously obtained by the author and A. A. Abrikosov (ZhETF, v. 43, 1089 and 1083, 1962) in the absence of a magnetic field. The analysis is devoted essentially to the determination of the g-factor. The paramagnetic addition to the energy is calculated in the quasi-classical approximation, and is characterized by a g-factor that depends on the quasi-momentum. It is shown that this dependence is brought about by the noticeable spin-orbit coupling. The symmetry of the g-factor is determined by the symmetry of the Fermi surface. The calculation of the diamagnetic levels is carried through to conclusion only for holes and for the case when the magnetic field is parallel to the trigonal axis of the crystal. Comparison with experiment is limited by the experimental accuracy. "In conclusion, I want to express my