Possibility of semiconductor...

The authors mention Abrikosov who studied the superconductivity of metals with high electron gas density, and N. N. Bogolyubov et al. who made calculations for metals (Novyy metod v teorii sverkhprovodimosti, izd. AN SSSR, 1958). The authors first consider a model with isotropic effective mass. They derive an equation for calculating the energy gap

$$\Delta(\omega)=-\frac{ia}{\pi}\int\int\left(1-\frac{\varepsilon_\infty}{\varepsilon_0}\frac{\omega_l^2}{\omega_l^2-(\omega-\omega_1)^2}\right)\frac{\Delta(\omega_1)\,d\zeta_1 d(\hbar\omega_1)}{(\hbar\omega_1)^2-\zeta_1^2-\Delta^2-i\delta}. \qquad (12)$$

$$a=\frac{e^2}{4\pi\hbar v_F\varepsilon_\infty}\ln\frac{p_F^2}{\hbar^2\varkappa^2}; \qquad (13).$$

v_F = electron velocity at Fermi surface, ε_∞, ε_c = dielectric constants, $\zeta^2 = (p - p_F)^2 v_F^2$, ω_l = frequency of longitudinal optical phonons, ζ-Fermi energy. For other denotations c.f. G. M. Eliashberg, ZhETF, 38, 966, 1960. It can be seen that the maximum gap width corresponds to the minimum velocity at the Fermi surface, i. e., to the maximum effective mass.

Card 2/3

Possibility of semiconductor...

These formulas obtained for the model with isotropic effective mass also hold for the anisotropic case up to and including one numerical factor under the natural logarithm. In piezoelectric semiconductors the attractive force between the electrons contributes to the exchange of piezoacoustic phonons. Superconductivity can be the most favorably studied in those polar semiconductors in which the electrons in the conduction band are sufficiently concentrated and in which they are strongly coupled with the lattice vibrations. There are 1 figure and 4 references: 3 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: J. Bardeen, L. Cooper, J. Schrieffer. Phys. Rev., 108, 1175, 1957.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors AS USSR, Leningrad)

SUBMITTED: July 24, 1961

Card 3/3

ZHIRYAKOV, B.M.; LARKIN, A.I.

Imitator of the signals of nuclear magnetic resonance. Avtom. i telem.; sbor. st. no.2:95-99 '62. (MIRA 15:9)
(Nuclear magnetic resonance and relaxation)
(Oscillators, Electron-tube)
(Electronic measurements)

24.2140

S/056/62/042/005/028/050
B102/B104

AUTHORS: Vaks, V. G., Galitskiy, V. M., Larkin, A. I.

TITLE: Collective excitations of particles with non-zero angular momentum pairing

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 5, 1962, 1319-1325

TEXT: In this contribution to the theory of superconductivity, systems are examined in which the attraction in a state with $l_0 \neq 0$ is dominant, as in the case of He^3 where the attraction in the D state is dominant (L. P. Pitayevskiy, ZhETF, 37, 1794, 1959). As well as those from single particles, collective excitations in such systems are examined. The shape of the excitation spectrum is important for explaining of superfluidity properties as well as for stability investigations. The equation for the gap Δ in the energy spectrum admits of general solutions only in the case of zero angular momentum pairing (two solutions: $\Delta = 0$, and $\Delta \neq 0$). Where non-zero moments are paired, special solutions must be sought. Collective excitations are examined here by a relativity technique as

Card 1/5 .

Collective excitations of ...

developed in a preparatory work (Vaks et al. ZhETF, 41, 1655, 1961). The system, which is assumed to be composed of fermions, coexists with sonic excitation and other excitations causing no gap in the energy spectrum. The scope is restricted to a graph of the first order $\frown = \hat{\Sigma} = \Delta_1 + i\Delta_2\gamma_5$; ($\Delta_1 = \mathrm{Re}\,\Delta$, $\Delta_2 = \mathrm{Im}\,\Delta$). The fermion Green function $G(p) = 1/(i\hat{p} + \hat{\Sigma})$ becomes

$$G = \frac{1}{i\hat{p} + \Delta_1 + i\Delta_2\gamma_5} = \frac{-i\hat{p} + \Delta_1 - i\Delta_2\gamma_5}{p^2 + |\Delta|^2} \qquad (8).$$

for $\Delta_{1,2}$

$$\Delta_{1,2} = \rho \int D(nn') \frac{\Delta_{1,2}(n')}{p^2 + |\Delta(n')|^2} \frac{dn'}{4\pi} d^2p. \qquad (9)$$

is found and since $\Delta(p) = (\vec{n})$ is

$$\Delta(n) = \frac{1}{2}\rho \int D(nn') \ln \frac{\Lambda^2}{|\Delta(n')|^2} \Delta(n') \frac{dn'}{4\pi}, \qquad (10),$$

the energy width of the interaction range (10) can be inserted into a system of algebraic equations

Card 2/5

Collective excitations of ...

wherein $\Gamma_+ = \Gamma_1 + \Gamma_5$; $\Gamma_- = \Gamma_1 - \Gamma_5$; $\gamma_\pm = \gamma_1 \pm \gamma_5$; α and β stand for + or -. If energy and moment are zero ($\omega = k = 0$) the equation for the change of the self-energy part of $\hat{\Sigma}$ coincides with the solution above mentioned: $\Gamma_\pm = \frac{1}{4} \mathrm{Sp}\,(1 \pm \gamma_5)\hat{\Sigma}'(n)$. As an example the case of the scalar pairing is examined when $D(\vec{n}\,\vec{n}')$ is independent of angle. Δ is assumed to be real so that $\Sigma' = \Delta i\alpha\gamma_5$, ($\gamma_5 = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ and the given equation is valid when $\Gamma_+ = -\Gamma_-$. With gradient transformation $\hat{\Sigma} \rightarrow \hat{\Sigma} + i\alpha\gamma_5\hat{\Sigma}$ we have $\Gamma_+ = \Gamma^* = i\alpha\Delta$. The excitation spectrum with small k is obtained from the condition under which the following equation can be solved:

$$\sum_m \int dn \frac{\omega^2 - (v\vec{k}\vec{n})^2}{|\Delta|^2}\left(2\Gamma_+^{*n}\Gamma_+^m + 2\Gamma_+^n\Gamma_+^{*m} - \frac{\Delta^{**}}{|\Delta|^2}\Gamma_+^n\Gamma_+^m - \frac{\Delta^2}{|\Delta|^2}\Gamma_+^{*n}\Gamma_+^{*m}\right)c_m = 0 \qquad (29)$$

wherein ω is a linear function of k. A sonic branch always exists, the hydrodynamic velocity of the sound waves being $v/\sqrt{3}$. The velocity of other excitations depends on the direction of $\vec{k}$ and can be expressed in terms of Δ of the single particle excitation spectrum. As an example, the case examined by Anderson and Morel (Phys. Rev. 123, 1911, 1961) is

Card 4/5

S/056/62/043/001/025/056
B104/B102

AUTHORS: Baz', A. I., Vaks, V. G., Larkin, A. I.

TITLE: K-meson - hyperon resonances

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 166 - 174

TEXT: Experimental data on the cross sections of the reactions $\pi^- + p \longrightarrow \Sigma + K$ and $\pi^- + p \longrightarrow \Lambda + K$ near the $\Sigma + K$ threshold are phenomenologically analyzed. A level in the system $\Sigma + K$ with $T = 1/2$ with a binding energy of about 30 Mev is assumed to exist. In the cross section of the reaction $\pi + N \longrightarrow \Lambda + K$; this level leads to a resonance below the $\Sigma + K$ threshold. Possible levels in the systems $\Lambda + K$, $N + \varrho$, $N + \omega$, and $N + K^*$ are discussed. To clarify the interaction between Σ and K in states with $T = 1/2$, the cross sections of the reaction $\pi + N \longrightarrow \Lambda + K$ must be studied in the energy range $T_\pi = 810 - 900$ Mev, and of the reaction $\pi^- + p \longrightarrow \Sigma + K$, near the threshold. The analysis is conducted by methods of R. Dalitz and S. Tuan (Ann. Phys., 8, 100, 1959; 10, 307, 1960;

Card 1/2

S/056/62/043/001/025/056
B104/B102

K-meson - hyperon resonances

Phys. Rev. Lett., 2, 425, 1959; Rev. Mod. Phys., 33, 471, 1961; Talk at Aix-en-Provence Int. Conf., September, 1961, preprint); unitarity, time reversal, and analycity of the scattering matrix are used for analyzing the $\overline{K}N$ interaction at small energies. There are 3 figures.

SUBMITTED: January 24, 1962

Card 2/2

S/056/62/043/006/056/067
B102/B186

AUTHOR: Larkin, A. I.

TITLE: Solution of the Bethe-Salpeter equation for the Fermi-Yang model

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 6(12), 1962, 2302-2307

TEXT: Fermi and Yang (Phys. Rev. 79, 1739, 1949) were the first to develop a model in which a meson is considered a bound state of baryon and anti-baryon. This model is now modified. The nucleon-antinucleon bound states are considered for the case where the interaction can be described by a potential well, but instead of the Breit equation (solved by Fermi-Yang) the Bethe-Salpeter equation is solved. The difference is that here the Dirac vacuum is partly taken into account because, for the nucleon considered, a transition to a negative-energy state is forbidden. Interaction with the vacuum leading to NN-interaction and changes in the nucleon mass is neglected. Thus the interaction is described by

$$\bar{\psi}_1\gamma_\mu\psi_1 U(r_1 - r_2)\,\bar{\psi}_2\gamma_\mu\psi_2, \qquad (1)$$

Solution of the Bethe-Salpeter...

where the potential U depends only on the particle distance, and

$$K_{\alpha\beta}(p) = \left(\frac{1}{\hat{p}_1 - m}\gamma_r\right)_{\beta\mu}\left(\gamma_r\frac{1}{\hat{p}_2 - m}\right)_{\nu\alpha}\int U(p-p')\,K_{\nu\mu}(p')\,d^4p', \qquad (2)$$

is the Bethe-Salpeter equation for the particle-antiparticle bound state; K is the two-particle Green function, $p_{1,2} = p \pm q/2$, where p is the relative four-momentum, q the total four-momentum in the c.m.s., $q \equiv (\mu,0,0,0)$, μ - meson mass, U(p-p') - Fourier component of interaction potential. K is then given as the superposition of 16 linearly independent matrices, the function $\psi_n(p) = \int K_n(p)dp_o$ is introduced and for $J = \frac{2}{\pi i}\int \frac{dp_o}{p_1^2 p_2^2}$ the system

$$\begin{aligned} J^{-1}\psi^P &= 2(p^2+m^2)\int V\psi^P + \tfrac{1}{2}\mu m\int V\psi_0^A, \\ J^{-1}\psi_0^A &= -\mu m\int V\psi^P - m^2\int V\psi_0^A; \\ J^{-1}\psi^S &= 2p^2\int V\psi_S + mp_a\int V\psi_a^V, \end{aligned} \qquad (9)$$

Card 2/5

Solution of the Bethe-Salpeter...

$$J^{-1}\psi_\alpha^V = 2mp_\alpha \int V\psi_S + [(m^2 + p^2)\,\delta_{\alpha\beta} - p_\alpha p_\beta] \int V\psi_\beta^V + \varepsilon_{\alpha\beta\gamma} p_\gamma \frac{\mu}{2} \int V\psi_\beta^A, \quad (10)$$

$$J^{-1}\psi_\alpha^A = -\varepsilon_{\alpha\beta\gamma} p_\gamma \frac{\mu}{2} \int V\psi_\beta^V + (p^2\delta_{\alpha\beta} - p_\alpha p_\beta) \int V\psi_\beta^A.$$

$$\psi_i \equiv (\psi_0, \psi_\alpha), \quad \int V\psi \equiv \int V(p-p')\psi(p')\,d^3p'$$

is obtained for the singlet and triplet states, respectively. These equations can be treated only for special limiting cases. An estimate obtained by variational calculus yields

$$V \leqslant 32m/15\pi\,(1-5c^{-2}) \doteq 2 \text{ BeV} \quad (18)$$

for the depth of the potential well if $(\mu/2m)^2 \sim 1/200$. Fermi-Yang obtained $V \sim 25$ Bev and $V \to \infty$ if $\mu \to 0$. For a square well of radius $a \gg 1/m$ from Eq. (9)

$$\mu_n^2 = 4(m^2 - mV - 2V^2) + 4(\pi/a)^2(1 - 3V/2m + 2V^2/m^2) \approx$$
$$\approx 6m^2(1-2V/m) + 3(\pi/a)^2. \quad (19)$$

Card 3/5

Solution of the Bethe-Salpeter...

is obtained. Normalizing the potential with respect to the pion mass, one obtains for the masses of the other particles (two pseudovector μ_{1A}, μ_{2A}, a scalar μ_S and a vector particle μ_V):

$$\begin{aligned}
\mu_{1A}^2 &\equiv 6m^2(1-2V/m) + 3\,(4,5/a)^2 = \mu_\pi^2 + 30/a^2,\\
\mu_{2A} &= 4m^2(1-V/m) + 2\,(4,5/a)^2 = 2m^2 + 30/a^2,\\
\mu_S^2 &= 4m^2\,(1-V/m) + (4,5/a)^2 = 2m^2 + 10/a^2,\\
\mu_V^2 &= 4m^2\,(1-V/m) + (3,8/a)^2 = 2m^2 + 4,5/a^2.
\end{aligned} \qquad (20)$$

In the other case, for small a, in (9) (10) m and ω are negligible against p and in zeroth approximation the condition for the existence of a pseudoscalar meson will be $\varphi = \frac{2}{p}\int_0^\infty V_0(p,p')\varphi(p')dp'$. For its mass the inequality $\mu_\pi^2 + 4m^2 > \mu_s^2 > \mu_\pi^2 + 2m^2$ will be valid. The results show that due to the application of the Bethe-Salpeter equations the main qualitative predictions

Card 4/5

of Fermi-Yang, such as a larger well depth or large number of levels are no longer valid. From Eq. (19) it follows that at strong interactions the square of the pion mass becomes negative which indicates vacuum instability. This can be avoided if the change in nucleon mass (due to interaction) is taken into account.

ASSOCIATION: Moskovskiy fiziko-tekhnicheskiy institut (Moscow Physico-technical Institute)

SUBMITTED: July 28, 1962

VAKS, V.G.; GALITSKIY, V.M.; LARKIN, A.I.

Collective excitations in paring in the case of non-zero angular momentum. Zhur. eksp. i teor. fiz. 42 no.5:1319-1325 My '62. (MIRA 15:9)

1. Moskovskiy inzhenerno-fizicheskiy institut.
(Angular momentum (Nuclear physics)) (Superconductivity)

L 10193-63 EWT(1)/EDS--AFFTC/ASD--GG

ACCESSION NR: AP3000071 S/0056/63/044/005/1703/1718

52

AUTHOR: Larkin, A. I.; Migdal, A. B.

TITLE: Theory of a superfluid Fermi liquid. Application to the nucleus.

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1703-1718

TOPIC TAGS: Superfluid Fermi liquid, strong-interactions

ABSTRACT: A method is given for treating systems of strongly interacting particles, in which the observable quantities are expressed in terms of several constants that are introduced into the theory somewhat in the way that the masses and charges of particles are introduced in the theory of dispersion relations. The two-particle spectrum and the reaction of the system to an external field are determined by the two-particle Green's function, and it is shown that the finding of these quantities reduces to the solution of a simple equation analogous to the Schroedinger equation for two interacting particles in a potential well. The Landau theory of the Fermi liquid is extended to the case of superfluidity for systems of finite size. An equation is obtained which makes it possible to

Card 1/2

L 10193-63 0
ACCESSION NR: AP3000071

find the probabilities of electromagnetic transitions in nuclei. Orig. art. has: 63 formulas, of which 9 are in diagram form.

ASSOCIATION: none

SUBMITTED: 25Dec62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 007 OTHER: 000

bm/ CL
Card 2/2

VAKS, V.G.; LARKIN, A.I.

Regge poles in the nonrelativistic problem assuming nonlocal and singular interaction. Zhur. eksp. i teor. fiz. 45 no.3: 800-809 '63. (MIRA 16:10)

1. Institut atomnoy energii AN SSSR.
(Potential, Theory of)
(Particles (Nuclear physics))

MIGDAL, A.B.; LARKIN, A.I.

Phenomenological approach to the theory of the nucleus. Zhur. eksp. i teor. fiz. 45 no.4:1036-1050 O '63. (MIRA 16:11)

VAKS, V.G.; LARKIN, A.I.

Amplitude characteristics at $\ell = -1$ in the Bethe - Salpeter equations. Zhur. eksp. i teor. fiz. 45 no.4:1087-1101 O '63. (MIRA 16:11)

ACCESSION NR: AP4042584 S/0056/64/046/006/2188/2201

AUTHOR: Larkin, A. I.

TITLE: Effect of collective excitations on the electrodynamics of superconductors

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 6, 1964, 2188-2201

TOPIC TAGS: superconductivity, electrodynamics, surface layer, ir absorption, microwave spectroscopy, thin film

ABSTRACT: Unlike the earlier studies of the electrodynamics of superconductors, the author investigates the electromagnetic properties of superconductors without assuming that the interaction between the electrons is weak. It is shown the number of free electrons contained in the London constant depends on the residual interaction and on the form of the periodic potential, and coincides with the corresponding constant in the permittivity of metals in

Card 1/2

ACCESSION NR: AP4042584

the infrared region. The surface impedance is determined by taking collective excitations into account. The result obtained explains the two maxima observed in the frequency dependence of the difference between the absorption of mercury and lead in the normal and superconducting states at microwave frequencies, and other experiments on infrared absorption in these metals. The coefficient of reflection of collective oscillations from the surface is found and is used for the analysis of the electrodynamics of superconducting films of thickness larger than the penetration depth. "The author is grateful to V. M. Galitskiy for valuable advice." Orig. art. has: 84 formulas.

ASSOCIATION: None

SUBMITTED: 30Dec63/ ENCL: 00

SUB CODE: SS, EM NR REF SOV: 008 OTHER: 006

Card 2/2

L 6358-66

ACC NR: AP5026094 SOURCE CODE: UR/0386/65/002/005/0205/0209

AUTHOR: Larkin, A. I. 47 B

ORG: Moscow Physicotechnical Institute (Moskovskiy fiziko-tekhnicheskiy institut)

TITLE: Vector pairing in superconductors of small dimensions

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 5, 1965, 205-209

TOPIC TAGS: superconductivity, spin orbit coupling, free path, pair theory, critical point

ABSTRACT: The author proves that the Knight shift in some superconductors cannot be attributed to electron pairing in a state with unity orbital angular momentum, as was proposed recently by several authors (e.g., R. Balian and N. R. Werthamer, Phys. Rev. v. 131, 1553, 1963), because the theoretical analysis of the vector pairing was made for infinite space, whereas the experiments were performed on samples with dimensions much smaller than the depth of penetration of the magnetic field. By analyzing the influence of impurities on vector pairing, it is shown that vector pairing vanishes when the pair dimensions are larger than the sample dimensions or the electron mean free path, whereas in ordinary scalar pairing the transition temperature is independent of both the sample dimensions and the impurity concentration. The reason for this difference is that in vector pairing the wave function F of the pair depends on the direction of the relative momentum of the electrons forming the pair, and vanishes

Card 1/2

L 6358-66

ACC NR: AP5026094

when the momentum uncertainty becomes of the order of the pair dimensions. From the equation for the critical temperature it is then deduced that a small semiconductor behaves in the same manner as a contaminated superconductor in which the electron mean free path is of the order of the sample dimensions, the critical dimensions of the sample being of the order of the pair dimension. Although the article deals only with one form of a state with vector pairing, the equation derived for the critical temperature is valid also for other cases. When the normal state is checked for stability, the critical temperature determines the point at which the electron scattering amplitude has a pole at zero frequency. Further decrease of the temperature leads to the occurrence of growing excitations in the normal states. Consequently the experiments on the Knight shift (G. M. Androes and W. D. Knight, Phys. Rev. v. 121, 779, 1961) can not be attributed to the existence of vector pairing. So far, the only natural explanation for these experiments is spin-orbit interaction with the impurities. Author is grateful to I. A. Privorotskiy for valuable advice. Orig. art. has: 9 formulas.

SUB CODE: SS, NP/ SUBM DATE: 25Jun65/ ORIG REF: 006/ OTH REF: 004

Card 2/2 Rds

L 11013-65 EWT(l)/KEC(f)/KEC(b)-2 IJP(c)/AFWL/AS(mp)-2/SSD/ASD(a)-5/ESD(ge)/ESD(t) GG

ACCESSION NR: AP4046435 S/0056/64/047/003/1136/1146

AUTHORS: Larkin, A. I.; Ovchinnikov, Yu. N.

TITLE: Inhomogeneous state of superconductors (B)

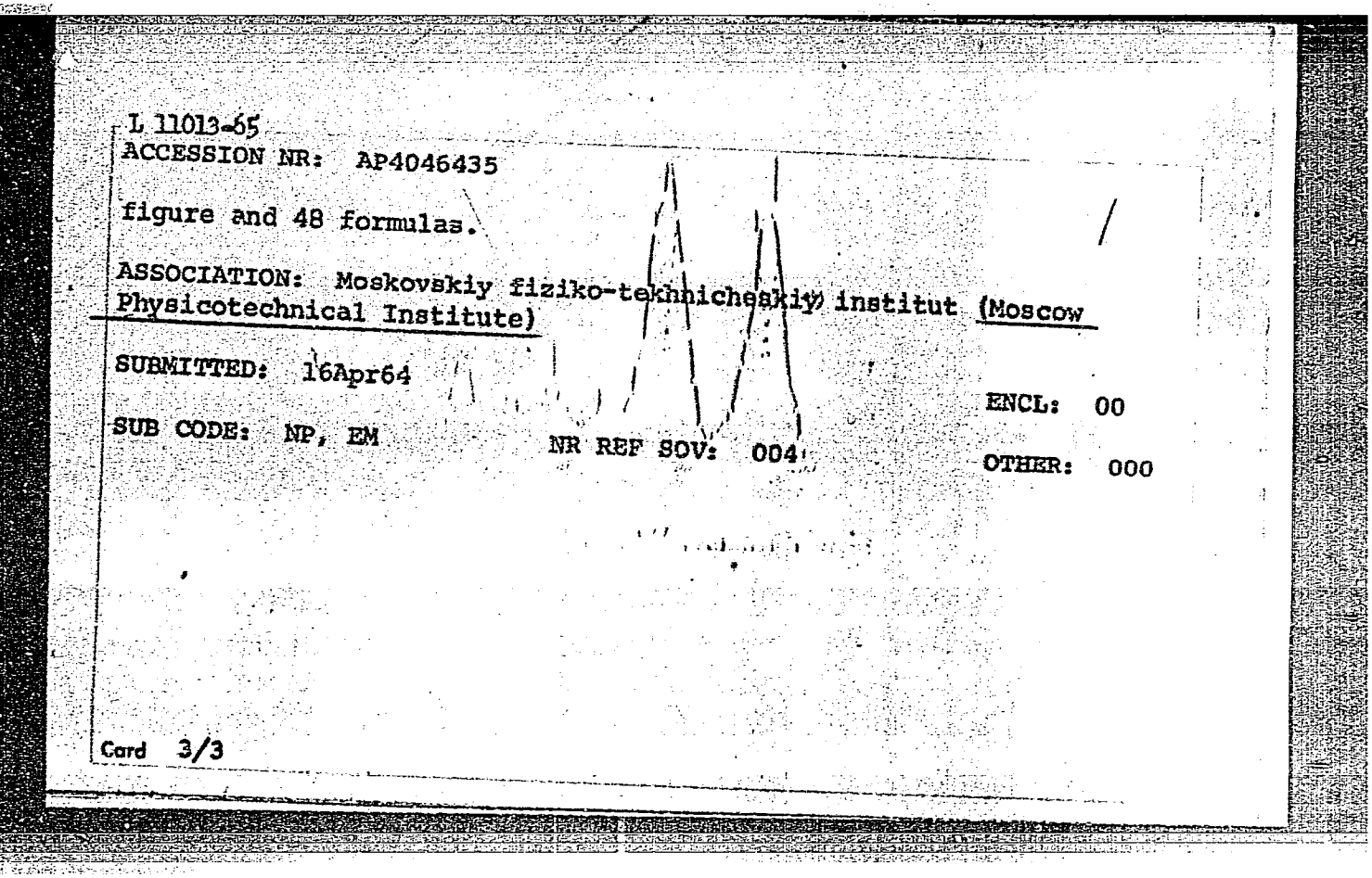
SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 3, 1964, 1136-1146

TOPIC TAGS: superconductivity, ferromagnet, Fermi surface, Green function, crystal structure, energy gap

ABSTRACT: The authors investigate the superconductivity of a weak ferromagnet with Fermi surfaces separated by a distance on the order of the energy gap in a non-ferromagnetic superconductor. The net momentum of the electron pairs in such a superconductor does not vanish, so that the quantity Δ, which enters into the equation for the Green's function and determines the spectrum of the single-particle excitations, is a periodic function of the coordinates. Such

Card 1/3

a system of electrons has a crystalline structure with a unit cell with dimensions on the order of the pair in the superconductor. The authors calculate the energies of different types of crystal lattices that are produced near the transition point. It is shown that in this case the magnetic field becomes forced out of the metal, and the depth of penetration depends on the direction of the magnetic field. The spectrum of the single-particle excitations does not have a gap, and the speed of the excitations depends on the direction and vanishes in some directions. This results in a slow decrease of the specific heat with temperature. The unit cell dimension is 10^{-4} cm. Several speculations are made concerning the type of transitions between the conducting and superconducting state and the possibility of experimentally observing these effects. "The questions connected with the instability of the ferromagnetic state were considered in 1958 together with V. M. Galitskiy, to whom the authors are grateful. The authors are grateful to L. P. Gor'kov and A. A. Abrikosov for useful discussions." Orig. art. has: 1



L 11013-65
ACCESSION NR: AP4046435

figure and 48 formulas.

ASSOCIATION: Moskovskiy fiziko-tekhnicheskiy institut (Moscow Physicotechnical Institute)

SUBMITTED: 16Apr64 ENCL: 00

SUB CODE: NP, EM NR REF SOV: 004 OTHER: 000

Card 3/3

L 1837-66 EWT(1)/T IJP(c) GG

ACCESSION NR: AT5022310 UR/3136/65/000/863/0001/0019

AUTHOR: Vaks, V.G.; Larkin, A.I.; Ovchinnikov, Yu. N.

TITLE: The Ising model in the interaction with other than the closest neighbors

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-863, 1965. Model' Izinga pri vzaimodeystvii s neblizhayshimi sosedyami, 1-19

TOPIC TAGS: ferroelectric crystal, second order phase transition, correlation function, free energy, spontaneous magnetization

ABSTRACT: The Ising model consists of a lattice of dipoles, each of which assumes only two positions and interacts only with its closest neighbors. It was of interest to determine the extent to which the results are sensitive to the form of the model, particularly whether the singularities in the macroscopic quantities and the form of the correlation function change when the interaction with neighbors other than the closest ones is taken into account. A two-dimensional Ising lattice is considered in which, in addition to the usual interactions, there is an interaction along the diagonals between lattice points with the same parity of rows and columns. The free energy and spontaneous magnetization were determined as functions of temperature. A form of the correlation function was obtained at large distances at the phase transition point and

Card 1/2

L 1837-66
ACCESSION NR: AT5022310

in its vicinity. It was found that the singularities in the macroscopic quantities at the transition point remain the same as in the Ising model. The only difference of the model studied from the Ising model is that for a certain ratio of the constants, three successive phase transitions exist in the system as the temperature changes. "The authors thank G.V. Ryazanov for communicating the results of his study (G.V. Ryazanov, ZhETF, 1965) of the asymptotic behavior of G(r), and N.V. Vdovichenko for drawing our attention to his paper (N.V. Vdovichenko, ZhETF 48, 526, 1965) prior to its publication." Orig. art. has: 2 figures and 43 formulas.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: SS

NO REF SOV: 006 OTHER: 008

Card 2/2

L 1929-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/JW/GG

ACCESSION NR: AT5022284 UR/3136/65/000/864/0001/0023

AUTHOR: Vaks, V. G.; Larkin, A. I.

TITLE: Second-order phase transitions

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-864, 1965. O fazovykh perekhodakh vtorogo roda, 1-23

TOPIC TAGS: second order phase transition, thermodynamic property, Bose Einstein statistics, quantum mechanics, alloy, heat capacity, ferroelectric crystal

ABSTRACT: Second-order phase transitions involving a change in crystal symmetry in binary alloys and in a Bose gas are treated statistically. With certain assumptions concerning the relationship between the interaction constants, it is shown that a specific part of the thermodynamic quantities has the same form as in the Ising model or in its complex variants. All these models can be studied with relative ease by means of computers. A series of results have already been obtained for the standard three-dimensional Ising lattice, and these results can be compared with the observed changes in macroscopic quantities near the transition. The phase transition in a Bose gas turns out to be equivalent to the transition in a lattice of flat dipoles. In conclusion, further computations which would be desirable for checking the suitability of the approximations

Card 1/2

L 1929-66

ACCESSION NR: AT5022284

12

employed and for comparison with experimental data are discussed. "The authors thank V. M. Galitskiy, who participated in the initial stage of this work, and L. P. Pitayevskiy, V. L. Pokrovskiy, and A. A. Vedenov for reviewing the results." Orig. art. has: 46 formulas.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: SS, GP

NO REF SOV: 007 OTHER: 009

Card 2/2

L 4375-66 EWT(m) DIAAP
ACCESSION NR: AP5020252 UR/0367/65/002/001/0040/0050

AUTHORS: Grin', Yu. T.; Larkin, A. I.

TITLE: Nuclear rotational spectra at high momenta

SOURCE: Yadernaya fizika, v. 2, no. 1, 1965, 40-50

TOPIC TAGS: nuclear spectroscopy, heavy nucleus, deformed nucleus

ABSTRACT: The authors calculate the dependence of the pair correlation on the angular momentum of the system, without assuming the latter to be small. It is shown that the pair correlation vanishes at angular momenta 20 -- 22 in the rare-earth region and 36 -- 40 in the heavy-element region. The dependence of the energy and of the moment of inertia on the angular momentum of the system is also calculated. It turns out that in the region of large angular momenta all the quantities depend little on the deformation of the nucleus, so that perturbation theory can be used. On the other hand, at small angular momenta, near the ground state, the deformation leads to a qualitative difference in the properties of the spherical and deformed

Card 1/2

L 4375-66
ACCESSION NR: AP5020252

nuclei. At small angular momenta the pair correlation causes the moment of inertia to decrease by a factor 2 -- 3 compared with the rigid-body value. With increasing angular momentum, the moment of inertia increases and reaches its rigid value at some critical angular momentum. This corresponds to a second-order phase transition in an infinite system. Above the critical angular momentum, the moment of inertia remains that of a rigid body and its dependence on the angular momentum is much weaker than below the critical momentum, being determined only by the stretching of the nucleus by the rotation. The theory developed is compared with experiment and a qualitative agreement is noted. 'The authors thank L. P. Gor'kov and A. B. Migdal for useful discussions.' Orig. art. has: 2 figures and 54 formulas.

ASSOCIATION: None

SUBMITTED: 19Feb65 ENCL: 00 SUB CODE: NP, OP

NR REF SOV: 006 OTHER: 006

Card 2/2

L 31830-65 EWT(1)/T/EWA(h) Pz-6/Peb IJP(c) AT

ACCESSION NR: AP5004397 S/0056/65/048/001/0232/0241

AUTHOR: Larkin, A. I.

30
28
B

TITLE: Small size superconductors in a strong magnetic field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 1, 1965, 232-241

TOPIC TAGS: superconductivity, Knight shift, diamagnetic susceptibility, spectrum gap, excitation spectrum, Cooper pair

ABSTRACT: Spherical and cylindrical superconductors are considered whose dimensions are small compared with the size of a Cooper pair and with the magnetic-field penetration depth, and whose shape has a symmetry axis directed along the field (small sphere or cylinder). It is shown analytically that application of the magnetic field makes the energy gap dependent on the dimensions of the system, on the form of the boundary conditions at the surface, and on the impurity concentration. The gap decreases with increasing field and vanishes at a critical field, which is evaluated. Some properties of a superconducting state without a gap in its spectrum, which is of some interest in principle, are discussed. The field

Card 1/2

L 31830-65

ACCESSION NR: AP5004397

at which pairing vanishes is determined, and the dependence of the magnetic moment on the field strength is calculated. The presence of impurities is accounted for by averaging the initial equations with respect to the positions of the impurities. In this case the gap vanishes at a field strength lower than critical. The dependence of the Knight shift on the size of the particles and on the field strength is obtained for the case when the field is not small compared with the critical field. It is deduced that the magnitude of the Knight shift must depend on the size of the samples, and that for a large degree of dispersion of the particles the nuclear magnetic resonance line must be broad. "The author thanks A. A. Abrikosov for a helpful discussion of the results obtained." Ori . art. has: 1 figure and 49 formulas. [02]

ASSOCIATION: Moskovskiy fiziko-tekhnicheskiy institut (Moscow Physicotechnical Institute)

SUBMITTED: 29Jun64 ENCL: 00 SUB CODE: GP

NO REF SOV: 006 OTHER: 002 ATD PRESS: 3199

Card 2/2

VAKS, V.G.; LARKIN, A.I.

Phase transitions of the second kind. Zhur. eksp. i teor. fiz. 49 no.3:975-989 S '65. (MIRA 18:10)

ZHIRYAKOV, B.M.; LARKIN, A.I.; PROTASOV, Ye.A.

Study on permanent magnets. Zav. lab. 31 no.8:1022-1023 '65.
(MIRA 18:9)

1. Moskovskiy inzhenerno-fizicheskiy institut.

IARKIN, A.I.

Vector pairing in small-size superconductors. Pis'. v red. Zhur. eksper. i teoret. fiz. 2 no.5:205-209 S '65.

(MIRA 18:12)

1. Moskovskiy fiziko-tekhnicheskiy institut. Submitted June 25, 1965.

L 12178-66 EWT(m)/T/EWP(t)/EWA(c)/EWP(b) JD/JW

ACC NR: AP5024720 SOURCE CODE: UR/0056/65/049/003/0975/0989

AUTHORS: Vaks, V. G.; Larkin, A. I.

ORG: None

TITLE: Phase transitions of second order

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 975-989

TOPIC TAGS: second order phase transition, binary alloy, crystal symmetry

ABSTRACT: The article is devoted to a statistical study of second-order phase transitions in binary alloys with changes of crystal symmetry and in a Bose gas. Under certain assumption concerning the interaction constants and for certain relations between the parameters, it is shown that the singular parts of the thermodynamic quantities are of the same form as in the Ising model or its generalizations, for which a number of results are known from computer calculations. In particular, the results known for the three-dimensional Ising lattice are compared with the behavior of the observed macroscopic quantities near the transition point. The accuracy of the calculations and the desirability of further computer

Card 1/2

L 12178-66

ACC NR: AP5024720

calculations for the purpose of checking the approximation made and for comparison with experiments are discussed. Arguments are presented to show that subsequent terms do not alter the already obtained results. A phase transition in a Bose gas is found to be equivalent to a transition in a lattice of plane dipoles. Authors are grateful to V. M. Galitskiy for participating in the initial stages of the work, and to L. P. Pitayevskiy, V. L. Pokrovskiy, and A. A. Vedenov for discussions.

SUB CODE: 20/ SUBM DATE: 21Apr65/ NR REF SOV: 007/ OTH REF: 009

Card 2/2

L 12783-66 EWT(1)

ACC NR: AP5026611 SOURCE CODE: UR/0056/65/049/004/1180/1189

AUTHORS: Vaks, V. G.; Larkin, A. I.; Ovchinnikov, Yu. N.

ORG: None

TITLE: Ising model with interaction between nonnearest neighbors

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 4, 1965, 1180-1189

TOPIC TAGS: correlation function, free energy, spontaneous magnetization

ABSTRACT: To check on the sensitivity of the results of the standard Ising model to the actual form of the model, especially with respect to the nature of singularities of the different macroscopic quantities and the form of the correlation function, the authors consider a modification of the Ising model in the form of a two-dimensional lattice in which, besides the usual interaction, there is an interaction between certain non-nearest neighbors, along diagonals between nodes with equal row-plus-column parities. The free energy and the spontaneous magnetization are determined as functions of the temperature. The form of the correlation function at large distances is derived at and close to the

Card 1/2

L 12783-66

ACC NR: AP5026611

phase-transition point. The singularities in the macroscopic quantities are found to be the same as in the Ising model, nor is there any change in the behavior of the correlation function near the transition point. The only difference between the authors' model and the Ising lattice is that for a certain ratio of the system constants there are three successive phase transitions as the temperature is varied. Authors thank G. V. Ryazanov and N. V. Vdovichenko for preliminary information about their current work. Orig. art. has: 2 figures and 44 formulas.

SUB CODE: 20/ SUBM DATE: 21Apr65/ NR REF SOV: 006/ OTH REF: 008

Card 2/2

L 05786-67 EWT(1)

ACC NR: AP6031455 SOURCE CODE: UR/0056/66/051/002/0683/0687

AUTHOR: Larkin, A. I.; Ovchinnikov, Yu. N.; Fedorov, M. A. 28 B

ORG: Moscow Physicotechnical Institute (Moskovskiy fiziko-tekhnicheskiy institut)

TITLE: Boundary condition of the Josephson effect

SOURCE: Zh eksper i teor fiz, v. 51, no. 2, 1966, 683-687

TOPIC TAGS: approximation method, functional equation, tunnel effect, Hamiltonian, Josephson effect

ABSTRACT: A boundary condition is obtained for the Josephson effect in the quasi-classical approximation from the Gor'kov equations. The results of the investigation are in agreement with those in earlier studies in which the effect was analyzed by means of the tunneling Hamiltonian. The authors thank L. P. Gor'kov for his valuable advice. Orig. art. has: 20 formulas. [Based on authors' abstract]

SUB CODE: 20/ SUBM DATE: 31Mar66/ ORIG REF: 002/ OTH REF: 005/

Card 1/1

ACC NR: AP6024896 SOURCE CODE: UR/0056/66/050/006/1961/1972

AUTHOR: Vaks, V. G.; Larkin, A. I.; Pikin, S. A. 57 56

ORG: none

TITLE: On the self-consistent field method in the description of phase transitions

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 1, 1966, 361-375

TOPIC TAGS: phase transition, correlation function, thermodynamic function, crystal symmetry, ferroelectric material, dipole interaction, superconductivity

ABSTRACT: The purpose of the investigation was to determine the region of applicability of the Landau phenomenological theory for phase transitions, inasmuch as this theory disagrees with experiment in the direct vicinity of the phase transition point. Since the phenomenological theory is equivalent to the zeroth approximation of the self consistent field method from the microscopic point of view, the authors consider the phase transitions in an Ising model and in crystals for a large interaction radius r_0. Then the method of constructing the successive approximations is illustrated with the Ising model as an example. The first two terms of the expansion in terms of the parameter r_0^{-3} are obtained in the correlation function and in the thermodynamic quantities. The methods developed for the Ising model are then applied to the more complicated case of phase transitions accompanied by a change in crystal symmetry. The influence of the electric dipole-dipole interaction in ferroelectrics is analyzed and

Card 1/2

L 08179-67

ACC NR: AP6024896

it is shown that the results of the phenomenological theory are valid in a wide range of temperatures. The question of the phase transitions in one-dimensional systems is considered. It is shown that as the temperature approaches the transition temperature, the parameter r_0^{-3} increases like $r_0^{-3}|T - T_c|^{-1/2}$ for forces of finite radius and like $r_0^{-3}\ln|T - T_c|$ for dipole-dipole interaction in uniaxial ferroelectrics. The results show that when the interaction radius is large, $r_0 \gg 1$, the self-consistent approximation describes the phase transitions in crystals and in the Ising model correctly everywhere except a narrow region near the transition point. The phenomenological theory is best applicable to superconductors, where the role of the interaction radius is played by the pair dimension. The authors thank A. P. Levanyuk for a useful discussion. Orig. art. has: 51 formulas.

SUB CODE: 20/ SUBM DATE: 25Feb66/ ORIG REF: 015/ OTH REF: 005

Card 2/2 nst

ACC NR: AP6037083 SOURCE CODE: UR/0056/66/051/005/1535/1543

AUTHOR: Larkin, A. I.; Ovchinnikov, Yu. N.

ORG: Moscow Physicotechnical Institute (Moskovskiy fiziko-tekhnicheskiy institut)

TITLE: Tunnel effect between superconductors in an alternating field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 5, 1966, 1535-1543

TOPIC TAGS: tunnel effect, superconductivity, tunnel diode, volt ampere characteristic, magnetic impurity, paramagnetic impurity, superconductor

ABSTRACT: The authors derive a general expression for the Josephson tunnel current between two superconductors separated by a dielectric barrier for an arbitrary voltage applied to the barrier and for all temperatures. The limiting cases of slow and fast time variations of the voltage are considered, and also the case of small voltages with arbitrary time dependence. The expression for the current is reduced in all these cases to four single integrals, for which the limiting values are obtained. These limiting cases are superconductors without magnetic impurities and superconductors with paramagnetic impurities. The authors thank I. O. Kulik, A. V. Svidzinskiy, and V. A. Slyusarev for preprints of their papers. Orig. art. has: 30 formulas.

SUB CODE: 20/ SUBM DATE: 03Jun66/ ORIG REF: 007/ OTH REF: 004

Card 1/1

ACC NR: AP6037090 SOURCE CODE: UR/0056/66/051/005/1592/1608

AUTHOR: Vaks, V. G.; Galitskiy, V. M.; Larkin, A. I.

ORG: none

TITLE: Collective excitations near second order phase transition points

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 5, 1966, 1592-1608

TOPIC TAGS: second order phase transition, crystal lattice vibration, permitivity, excitation spectrum, ferroelectricity

ABSTRACT: The authors present a microscopic treatment of critical excitations in solids with temperature-dependent frequency, which tends to zero on approaching the transition point. The theory developed makes it possible to explain the region of existence of the critical vibrations and the physical meaning of the phenomenological parameters employed. Simple models, which are not related to any specific substance but which include all the essential properties of the real crystals, are considered. The interaction radius is assumed to be large enough to permit the use of the self-consistent field method. This method is then used to determine the spectrum of these excitations and the dispersion of the dielectric permitivity in ferroelectric transitions. A diagram technique, which makes it possible to calculate further approxima-

Card 1/2

ACC NR: AP6037090

tions of the self consistent field method, is developed. The damping of the excitations is determined with the aid of this method. It is found that very close to the critical frequency the damping is comparable to the frequency, so that the concept of vibrations loses its meaning. The critical vibrations are thus described in the entire region of their existence in the self-consistent field approximation. The applicability of the results to real systems is discussed, and an extension to first-order transitions is considered. Orig. art. has: 3 figures and 55 formulas.

SUB CODE: 20/ SUBM DATE: 22Jun66/ ORIG REF: 019/ OTH REF: 004

Card 2/2

VESHENEVSKIY, S.N.; SOLODUKHO, Ya.Yu.; TSALLAGOV, A.P.; ZAMARAYEV, B.S.; VOLKOV, A.F. (Moskva); NIKULIN, G.F.; LARKIN, A.P.

Exciter for electrical machines using thyristors. Elektrichestvo no.2:74-77 F '64. (MIRA 17:3)

1. Gosudarstvennyy institut po proyektirovaniyu elektrooborudovaniya dlya tyazheloy promyshlennosti (for Veshenevskiy, Solodukho, TSallagov, Zamarayev). 2. Metallurgicheskiy zavod "Serp i molot" (for Nikulin, Larkin).

RYABOV, S.A.; LARKIN, D.P.

Devices for checking the precision of the guides of beds and carriages. Mashinostroitel' no.3:11-12 Mr '65.
(MIRA 18:4)

KARPOVA, Kh.N.; KON'KOVA, Ye.A.; LARKIN, E.D.; SAVEL'YEV, V.F.

Avicennite - a new thallium mineral. Dokl. AN Uz. SSR no.2:23-25 '58. (MIRA 11:5)

1.Institut geologii AN UzSSR, Krasnokholmskaya ekspeditsiya. Predstavleno akad. AN UzSSR A.S Uklonskim.
(Thallium ores)

AUTHOR: Larkin, F.R. SOV-113-58-9-7/19

TITLE: Tests of the Semiaxes of the ZIL-150 and ZIL-151 Axle Shafts (Ispytaniya poluosey avtomobiley ZIL-150 i ZIL-151)

PERIODICAL: Avtomobil'naya promyshlennost', 1958, Nr 9, pp 16-19 (USSR)

ABSTRACT: As early as 1947, Ye.A. Chudakov, and in 1950 and 1953 V.A. Dobrovol'skiy and N.S. Acherkan pointed out that splined shafts should be calculated by the inner diameter of the grooves. The stability of such a shaft then equals that of an even shaft the diameter of which is somewhat less than the inner diameter of its splined end. But automobile designers have not yet heeded this suggestion. The present calculation method of axle shafts of ZIL-150 (Photo 1), the 3-axle ZIL-151 and the ZIL-585 dump truck is described and test results are considered. The axle shafts of ZIL-150 had fatigue defects after 2,000 to 85,000 km. Standard axle shafts of ZIL-151 could not be used after runs of up to 75,000 km. These standard shafts are made of 45 Kh, 40KhGR, 40KhGT, 35KhGS and 40KhNMA steels. Axle shafts that were reinforced by shot-peening did not show any fatigue in cross-country test runs after 96,000 km. They also endured cycles of up to 1,200,000 to 1,500,000, while the standard axles of 5 steel brands could stand only 223,000 to 256,000

Card 1/2

Tests of the Semiaxes of the ZIL-150 and ZIL-151 Axle Shafts

cycles and experimental axle shafts of 38 mm diameter (inner diameter of the grooves equalling 37.5 mm), 430,000 cycles. Axle shafts of ZIL-585 were tested on first-class roads, dirt roads and in cross-country rides. They succumbed to fatigue after 82,000 to 101,000 km, but in one instance this was already found after a run of only 34,500 km. The author concludes that new calculation methods and additional reinforcement will increase the life and fatigue resistance of these axle shafts.
There are 4 photos, 2 diagrams, and 3 Soviet references.

ASSOCIATION: Moskovskiy avtozavod imeni Likhacheva (The Moscow Automobile Plant imeni Likhachev).

1. Automobiles--Design 2. Shafts--Applications 3. Shafts--Test methods

LARKIN, I. N.

PHASE I BOOK EXPLOITATION SOV/5291

Soveshchaniye po kompleksnoy mekhanizatsii i avtomatizatsii tekhnologicheskikh protsessov v mashinostroyenii. 2d, Moscow, 1956

Avtomatizatsiya mashinostroitel'nykh protsessov. t. III: Obrabotka rezaniyem i obshchiye voprosy avtomatizatsii (Automation of Machine-Building Processes. v. 3: Metal Cutting and General Automation Problems) Moscow, Izd-vo AN SSSR, 1960. 296 p. (Series: Its: Trudy, t. 3) 2,700 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya. Komissiya po tekhnologii mashinostroyeniya.

Resp. Ed.: V. I. Dikushin, Academician; Ed. of Publishing House: V. A. Kotov; Tech. Ed.: I. F. Kuz'min.

PURPOSE: This collection of articles is intended for technical personnel concerned with the automation of the machine industry.

COVERAGE: This is Volume III of the transactions of the Second Conference on the Full Mechanization and Automation of Manufacturing Processes in the Machine Industry, held September 25-29, 1956. The transactions have been published in three volumes. Volume I deals with the hot pressworking of metals, and volume II, with the actuation and control of machines. The present volume deals with the automation of metal machining and workhardening, and with general problems encountered in automation. The transactions on the automation of metal-machining processes were published under the supervision of F. S. Demyanok and A. M. Karatygin, and those on the automation of work hardening processes, under the supervision of E. A. Satel' and M. O. Yakobson. No personalities are mentioned. There are no references.

Card 4/7

LARKIN, F.R.

Tests of splined parts of motor vehicles under operating conditions and means for increasing the endurance of these parts. Sbor.trud.Inst.mash.i avtom.AN BSSR no.2:46-64 '61. (MIRA 15:3)

(Motor vehicles—Transmission devices—Testing)

KARASEV, N.A.; BOGOSLOVSKIY, I.D.; KOSTOGONOV, V.G.; LARKIN, F.R.; MOROZOV, V.I.; SERGIYEVSKIY, A.Ya.

Effect of shot peening on the properties of a nitrogen case-hardened layer. Metalloved. i term.obr.met. no.10:12-16 O '65. (MIRA 18:11)

1. Moskovskiy institut radioelektroniki.

MAKAROV, A.F.; OBOROTOV, I.Ye.; KALYADIN, I.I.; FELENKO, L.I.; PEREPELITSA, V.R.; NECHAYEV, B.N.; DAVYDOV, A.M.; IVANOV, N.G.; CHUVAKOV, P.F.; FIL'KOV, P.V.; LAR'KIN, G.D.; SVYATKIN, V.V.; SHARIFULLIN, M.

Railroad workers address metallurgists. Put' i put.khoz. 4 no.8:14 Ag '60. (MIRA 13:8)

1. Kovylkinskaya distantsiya puti i putevaya mashinnava stantsiya No.66, stantsiya Kovylkino, Kuybyshevskoy dorogi. 2. Nachal'nik Kovylkinskoy distantsii puti (for Makarov). 3. Sekretari partbyuro, stantsiya Kovylkino, Kuybyshevskoy dorogi (for Oborotov, Nechayev). 4. Predsedatel' mestkoma, stantsiya Kovylkino, Kuybyshevskoy dorogi (for Kalyadin). 5. Sekretari Vsesoyuznogo Leninskogo kommunisticheskogo soyuza molodezhi, stantsiya Kovylkino, Kuybyshevskoy dorogi (for Felenko, Ivanov). 6. Nachal'nik putevoy mashinnoy stantsii No.66, stantsiya Kovylkino, kuybyshevskoy dorogi (for Perepelitsa). 7. Chlen mestkoma, stantsiya Kovylkino, Kuybyshevskoy dorogy (for Davydov). 8. Rukovoditeli brigad i udarniki kommunisticheskogo truda distantsii i putevoy mashinnoy stantsii No.66, stantsiy Kovylkino, Kuybyshevskoy dorogi (for Chuvakov, Fil'kov, Lar'kin, Svyatkin, Sharifullin).
(Railroads--Rails)

1. LARKIN, I.

2. SSSR (600)

4. Metalwork

7. Metal economy in hot and cold stamping.
Za ekon. mat. No. 4, 1952

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

LAR'KIN, M.

Designs of radio amateurs shown of the Exhibition of Achievements of the National Economy. Radio no.2:10 F '61. (MIRA 14:9)

1. Zamestitel' predsedatelya komiteta Dobrovol'nogo obshchestva sodeystviya armii, aviatsii i flotu na Vystavke dostizheniy narodnogo khozyaystva SSSR.
(Radio clubs) (Radio operators)

LARKIN, M.

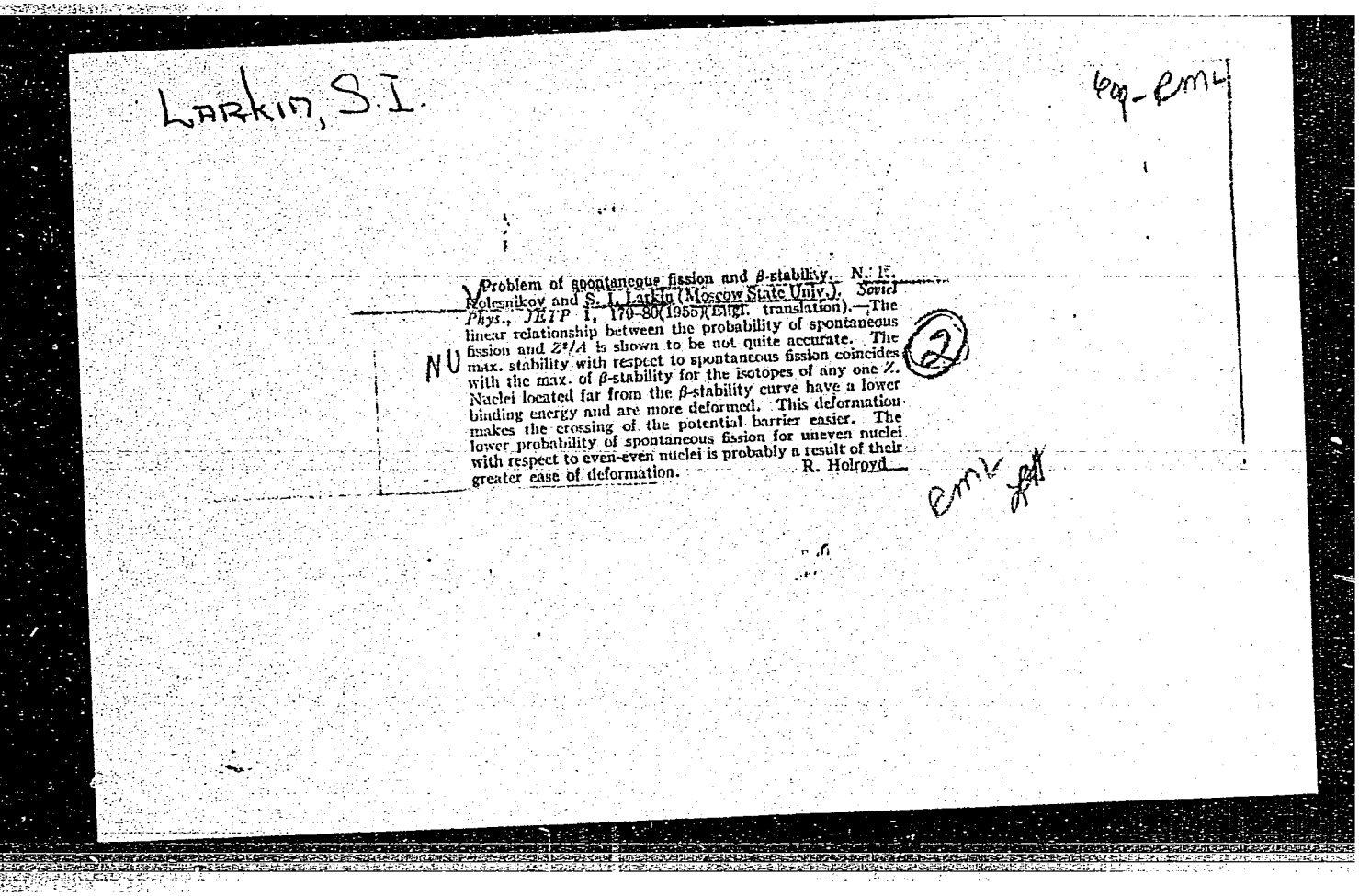
"IUnyi Sibiriak-62" automobile. IUn.tekh. 7 no.3:37-38 Mr '63.
(MIRA 16:3)

1. Rukovoditel' avtokonstruktorskoy laboratorii Novosibirskoy oblastnoy stantsii yunykh tekhnikov.
(Motor vehicles--Design and construction)

BYKHOVSKIY, Izrail' Adol'fovich; YEFREMOV, K.P., kand. tekhn. nauk, retsenzent; LARKIN, N.N., kand. tekhn. nauk, retsenzent; YEGOROV, S.A., nauchn. red.; MISHKEVICH, G.I., red.; SHISHKOVA, L.M., tekhn. red.

[Atomic submarines] Atomnye podvodnye lodki. Izd.2., perer. i dop. Leningrad, Sudpromgiz, 1963. 230 p. (MIRA 17:1)

(Atomic submarines)



Larkin, S.I.

609-BML

Problem of spontaneous fission and β-stability. N. F. Nolesnikov and S. I. Larkin (Moscow State Univ.). *Soviet Phys., JETP* 1, 170–80(1955)(Engl. translation).—The linear relationship between the probability of spontaneous fission and Z^2/A is shown to be not quite accurate. The max. stability with respect to spontaneous fission coincides with the max. of β-stability for the isotopes of any one Z. Nuclei located far from the β-stability curve have a lower binding energy and are more deformed. This deformation makes the crossing of the potential barrier easier. The lower probability of spontaneous fission for uneven nuclei with respect to even-even nuclei is probably a result of their greater ease of deformation.
R. Holroyd

NU

(2)

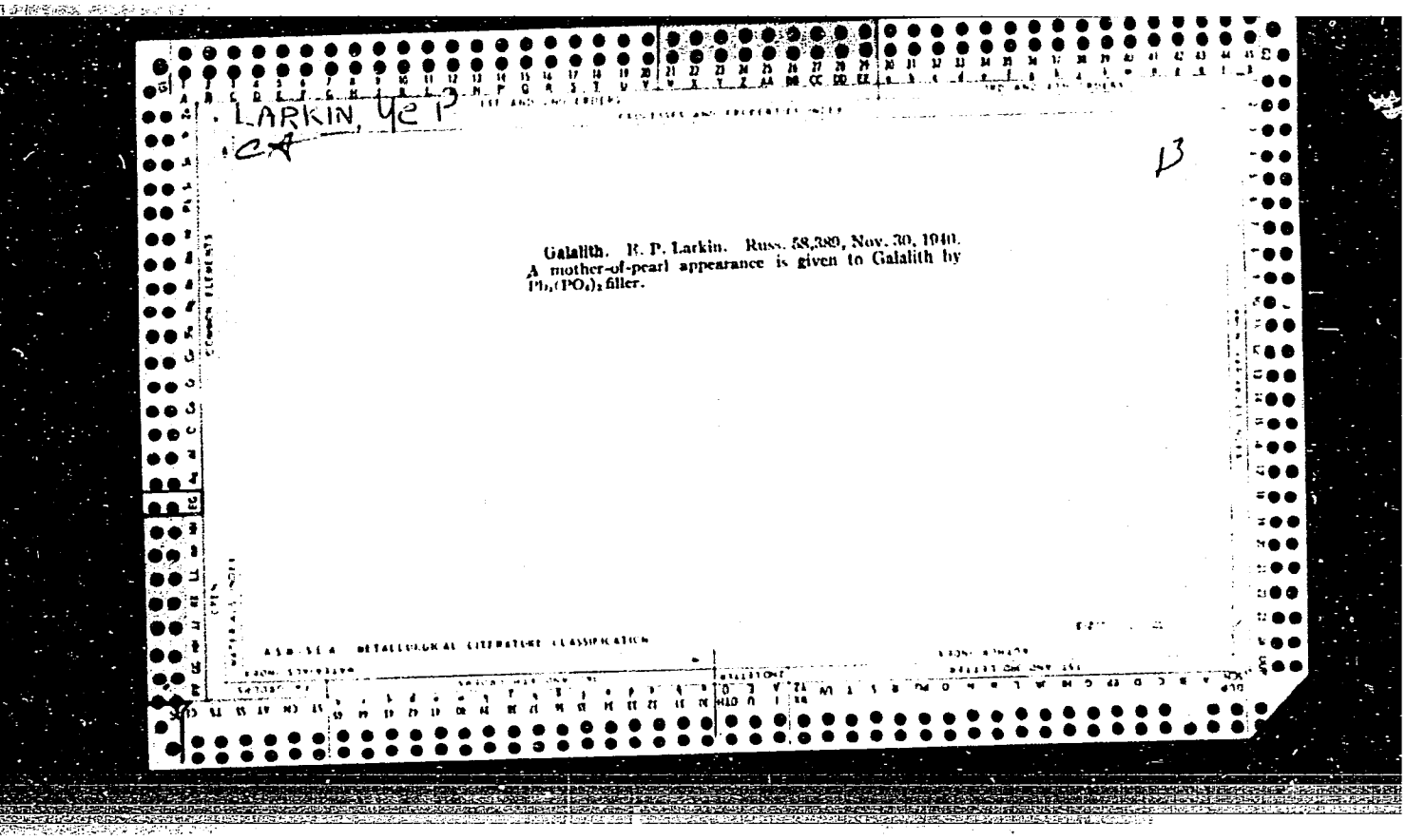
BML

LAR'KIN, YA. I.

Dredging

Advanced method of dredging. Rech.transp. 12 no. 1, 1952.

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


LARKIN, Ye P

13

Galalith. E. P. Larkin. Russ. 58,389, Nov. 30, 1940. A mother-of-pearl appearance is given to Galalith by $Pb_3(PO_4)_2$ filler.

LARKIN, Ye.P.

AUTHORS: Andrianov, K.A. (Corresponding Member of the Acad. of Sci. of the USSR), Novikov, N.G. (Engineer), and Larkin, Ye.P. (Engineer). 110-7-11/30

TITLE: Heat resisting electrically insulating cylinders and tubes for dry transformers. (Teplostoykiye elektroizolyatsionnye tsilindrye i trubki dlya sukhikh transformatorov).

PERIODICAL: "Vestnik Elektropromyshlennosti" (Journal of the Electrical Industry), Vol.28, No.7,1957, pp.38-42 (USSR).

ABSTRACT: It is important to produce heat resisting explosion proof dry transformers for the coal industry because they can be installed much nearer the coal face than can flame-proof oil-filled transformers. For the manufacture of such transformers it is important to have insulating cylinders and tubes capable of operating at high temperatures and voltages. This article describes briefly experimental data on the production and study of heat-stable glass-fabric cylinders and tubes based on silicone resins. Polyphenyl-methyl-siloxane resin of high thermal and water resistance and satisfactory binding properties for glass cloth was mamufactured on a semi-industrial scale. This resin was introduced into production at the Kuskovsk Chemical works under the brand Varnish K-41, which was later

Card 1/3

modified by poly-ether Г-4 and used for the impregnation of glass-cloth used in the manufacture of wound glass-cloth products. The technology of production of cylinders and tubes from this material is then described briefly.

Figs.1, 2 and 3 show the changes in the dielectric properties of these cylinders as a function of the time of wetting, and Fig.4 the change in capacitance of the cylinder with the time of wetting. The cylinder with a wall thickness of 5 mm was placed in water and kept there for 41 hours (after it had been first exposed to a humid atmosphere). Its loss angle did not change. It withstood a voltage of 30 kV for 5 minutes. It was then heated for two hours at 200 C and was tested at 30 kV for five minutes at this temperature. Further increase in the voltage to 47 kV caused breakdown.

Glass-cloth cylinders were tested both in the initial condition and after ageing at temperatures up to 220 C. The results of the tests are given in Tables 1, 2 and 3.

Card 2/3

Samples 1 and 2 withstood a test voltage of 20 and 40 kV after ageing for 2000 hours in the dry condition and after

Heat resisting electrically insulating cylinders and tubes for dry transformers. (Cont.) 110-7-11/30

wetting for three days. Table 2 gives the results of tests on cylinders after maintaining for a long time at a temperature of 200 C with periodic wetting. Table 3 gives results of tests on glass cloth cylinders after periodic heating to a temperature of 220 C and exposure to a medium of relative humidity of 98%. All the cylinders withstood the test voltages of 20 and 40 KV before and after wetting and after ageing for times up to 500 hours. Table 4 gives the results of tests on the dielectric properties of glass-cloth cylinders used as the main insulators in a dry type mining transformer. A dry type transformer, TCMB-180/6, of 180 kVA, 6000 V ± 5% was made. During the process of testing, this transformer was often overloaded two or three-fold in respect of current and to double output. In these difficult conditions the transformer continued in experimental service. This transformer should, therefore, be very valuable and reliable under the difficult conditions encountered in mines. There are 4 figures, 4 tables, 5 foreign references.

Card 3/3

ASSOCIATION: All-Union Electrotechnical Institute. (VEI).
AVAILABLE:

GRANKIN, I.M.; LARKIN, Yu.F.

Characteristics of some ferrite microwave phase shifters. Izv. vys. ucheb. zav.; radiotekh. 7 no.2:186-190 Mr-Ap '64. (MIRA 17:8)

L 14027-66 EEC(k)-2/EWA(h)/EWT(1)

ACC NR: AP6001940 SOURCE CODE: UR/0142/65/008/006/0715/0718

AUTHOR: Larkin, Yu. F.

ORG: none

TITLE: Double serrodyning in shf impedance meters and characterographs

SOURCE: IVUZ. Radiotekhnika, v. 8, no. 6, 1965, 715-718

TOPIC TAGS: impedance meter, characterograph, serrodyne

ABSTRACT: The factors restricting the use of serrodynes in impedance meters and characterographs are: spurious AM, relative-phase-shift character dispersion, and nonlinearity of these characteristics. These factors are responsible for a side "mirror" frequency which affects the accuracy of measurement. The accuracy can be greatly improved by modulating the phase of one of the signals according to a more-complicated-than-serrodyne law. Two modulator and one-modulator cases are considered. It is found that: (1) The double phase modulation essentially reduces the error (due to incomplete suppression of the side "mirror" frequency) in impedance meters and characterographs; (2) The best accuracy can be expected when two modulators are used; (3) If one modulator is used, only the units generating the control and synchronizing signals become slightly complicated. Orig. art. has: 3 figures and 18 formulas.

SUB CODE: 09 / SUBM DATE: 16Oct64 / ORIG REF: 002 / OTH REF: 003

Card 1/1

ZAYKOV, M.A.; TSELUYKOV, V.S.; KAMINSKIY, D.M.; DADOCHKIN, N.V.; LAR'KINA, E.G.; MESHCHERYAKOV, P.A.; Prinimali uchastiye: PERMYAKOV, V.M.; MERKUTOV, V.N.; PROKOP'YEV, KAFTNAOV, M.P.; MARAMYGIN, G.F.; ZHURAVLEV, M.A.; MARININ, P.G.; NASIBUDIN, A.S.; MANCHEVSKIY, I.V.; FELYAVSKIY, M.A.; SERGEYEV, V.V.; CHVANOV, L.K.; KOBYLEV, V.K.; KUCHKO, I.I.; MIRENSKIY, M.L.

Pressure of the metal on rolls in rolling carbon and alloyed steels on a three-high billet mill. Izv. vys. ucheb. zav.; chern. met. 4 no.8:78-83 '61. (MIRA 14:9)

1. Sibirskiy metallurgicheskiy institut.
(Rolling mills)

ZAYKOV, M.A.; TSELUYKOV, V.S.; KAMINSKIY, D.M.; DADOCHKIN, N.V.; MESHCHERYAKOV, P.A.; MARININ, P.G.; MIRENSKIY, M.L.; PROKOP'YEV, A.V.; OVCHINNIKOVA, R.F.; Prinimali uchastiye; BELYAVSKIY, M.A.; KAFTANOV, M.P.; KUCHKO, I.I.; LAR'KINA, E.Ye.; MANCHEVSKIY, I.V.; MARAMYGIN, G.F.; MERKUTOV, V.N.; NASIBULIN, A.S.; NEFEDOV, M.K.; PERMYAKOV, V.M.; CHELYSHEV, N.A.; CHVANOV, L.K.

Investigating conditions of rolling on three-high billet mills. Izvy vys. ucheb. zav.; chern. met. 6 no.10:74-83 '63. (MIRA 16:12)

1. Sibirskiy metallurgicheskiy institut i Kuznetskiy metallurgicheskiy kombinat.

GUZENKO, T.G. [Huzenko, T.H.], kand. arkhitektury; LARKINA, O.M., arkh.; RODICHKIN, O.M.[Rodychkin, O.M.], kand. arkh.; SALATICH, A.K.[Salatych, A.K.], kand. arkh.; SVIDERSKIY, V.M.[Sviders'kyi, V.M.], kand. arkh.; SEVERIN, S.I., arkh.; RUBTSOV, L.I., doktor biol. nauk, prof.; PLOTNIKOVA, T.V., kand. biol. nauk; KATONINA, Ye.I., doktor arkh., prof., red.; ZASLAVSKAYA, T.M.[Zaslavs'ka, T.M.], red.; KIYANICHENKO, N.S. [Kyianychenko, N.S.], red.; USHCHENKO, N.S., red.; ZELENKOVA, Ye.Yu., tekhn. red.; BABIL'CHANOVA, G.O.[Babil'chanova, H.O.], tekhn. red.

[Flowers in city landscaping] Kvitkove oformlennia mist'; al'bom. Kyiv, Derzhbudvydav URSR, 1962. 158 p. (MIRA 17:1)

1. Akademiya budivnytstva i arkhitektury URSR. Instytut misto-budivnytstva. 2. Sotrudnik sadovo-parkovogo khozyaystva No.3 goroda Kiyeva (for Plotnikova), 3. Zaveduyushchiy dendrologichnym otdelom TSentral'nogo respublikanskogo botanicheskogo sada AN Ukr.SSR (for Rubtsov).

CHERKINSKIY, Yu.S.; LARKINA, V.I.; OSIPOV, G.L.

Making various kinds of floors. Inform.biul.VDNKH no.3:18-20 Mr '64. (MIRA 17:3)

1. Sotrudnik laboratorii polimernykh rastvorov i betonov Vsesoyuznogo nauchno-issledovatel'skogo instituta novykh stroitel'nykh materialov (for Cherkinskiy). 2. Sotrudnik laboratorii polimernykh materialov Vsesoyuznogo nauchno-issledovatel'skogo instituta novykh stroitel'nykh materialov (for Larkina). 3. Rukovoditel' laboratorii stroitel'noy akustiki Nauchno-issledovatel'skogo instituta stroitel'noy fiziki Akademii stroitel'stva i arkhitektury SSSR (for Osipov).

KOSHKIN, V.G., kand. tekhn. nauk; LARKINA, V.I., inzh.

Coverings on the basis of epoxy resins for floors of industrial buildings. Stroi. mat. no.11:31 N '65. (MIRA 18:12)

KOSHKIN, V.G.; CHERKINSKIY, Yu.S.; LARKINA, V.I.; SHCHAVELEVA, N.A.; SLIPCHENKO, G.F.

Seamless mastic and polymer-cement floors. Prom. stroi. 43 no.11:17-20 '65. (MIRA 18:12)

LARKINA, T. A.

Patent leather. T. A. Larkina, V. I. Eliseeva, and A. A. Blagonravova. U.S.S.R. 106,130, July 25, 1957. Leather is coated with polyurethan-type resin obtained by interaction of compds. (I) contg. OH groups with di- and polyisocyanates. The reaction is carried out in a solvent inert to the isocyanates. Castor oil is used as I. In a preferred method, 100 parts castor oil is dissolved in 50–100 parts cyclohexanol or turpentine, 38 parts of toluene diisocyanate is added, and the mixt. is brought to the desired consistency at 60°.

M. Hosch

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YELISEYEVA, V.I.; LARKINA, T.A.

Oil varnishes for leather. Kozh.-obuv.prom. no.7:24-27 Jl '59. (MIRA 12:11)
(Varnish and varnishing)
(Leather industry--Equipment and supplies)

YELISEYEVA, V.I., doktor tekhn.nauk; KUZ'MINA, Ye.V., inzh.; LARKINA, T.A., inzh.

Dyeing and finishing of leather. Nauch.-issl. trudy TSNIKP no. 30:91-100 '59. (MIRA 14:5)

(Dyes and dyeing--Leather) (Leather)

KOSHKIN, V.G., kand. tekhn. nauk; GALAKTIONOV, A.A., kand. arkh.; LARKINA, V.I., inzh.; YANTIKOVA, M.P., inzh.; KAZAKOVA, G.N., tekhn.; GUZMAN, M.A., red. izd-va; SHERTNEVA, N.V., tekhn. red.

[Synthetic floor coverings] Sinteticheskie materialy dlia pokrytiia polov. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1961. 155 p. (MIRA 15:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh stroitel'nykh materialov. 2. Laboratoriya otdelochnykh plastmass Vsesoyuznogo nauchno-issledovatel'skogo instituta novykh stroitel'nykh materialov Akademii stroitel'stva i arkhitektury SSSR (for Koshkin, Galaktionov, Larkina, Yantikova, Kazakova).
(Floor coverings)

KOSHKIN, V.G., kand.tekhn.nauk; LARKINA, V.I., inzh.

Polyvinyl acetate mastic compounds of increased quality for laying seamless floor coverings. Stroi. mat. 9 no.2:17-18 F '63. (MIRA 16:2)

(Mastics) (Floor coverings)

KOSHKIN, Viktor Gavrilovich; CHERKINSKIY, Yuliy Samuilovich; LARKINA, Vera Ivanovna; ISAKOVICH, Grigoriy Aleksandrovich; SLIPCHENKO, Galina Fedorovna; BELOVA, Aleksandra Panteleymonovna; GURVICH, E.A., red.izd-va; SHERSTNEVA, N.V., tekhn. red.

[Synthetic materials for floor coverings in industrial buildings] Sinteticheskie materialy dlia pokrytii polov promyshlennykh zdanii. [By] V.G.Koshkin i dr. Moskva, Gosstroiizdat, 1963. 128 p. (MIRA 17:2)

LAR'KINA, Yekaterina Ivanovna; PETROV, L., red.; TOLOKNOVA, M., mladshiy red.; ULANOVA, L., tekhn.red.

[Training of collective-farm personnel during the period of mass collectivization] Podgotovka kolkhoznykh kadrov v period massovoi kollektivizatsii. Moskva, Izd-vo sots.-ekon.lit-ry, 1960. 165 p. (MIRA 13:5)

(Collective farms)

LAR'KOV, A.; PLYUSHCHEVA, A.; CHIRKOV, D., khudozhnik (poselok Mstera); BESHENTSEVA, I., khudozhnik (poselok Mstera); RABOTNOVA, I., kand.iskusstvovedeniya (g. Ivanovo)

Toward survey exhibitions. Prom.koop. 13 no.3:28-29 Mr '59.
(MIRA 12:4)

1. Predsedatel' pravleniya Ural'skoy kamnereznoy arteli, Ordinskiy rayon, Permskoy oblasti (for Lar'kov). 2. Starshiy inzhener-tekhnolog Nauchno-issledovatel'skogo instituta khudozhestvennoy promyshlennosti Rospromsoveta, g. Yeletsk, Lipetskoy oblasti (for Plyushcheva). 3. Zamestitel' predsedatelya pravleniya arteli "Pobeda," g. Kirov (for Krupinin).

(Art industries--Exhibitions)

LAR'KOV, A., polkovnik, kand.istoricheskikh nauk

Let's strictly maintain Soviet military discipline. Komm.Vooruzh. Sil 1 no.3:71-76 N '60. (MIRA 14:8)
(Military discipline)

LAR'KOV, A., kand.istoricheskikh nauk

International duty of the peoples of socialist countries. Komm. Vooruzh.Sil 2 no.11:16-24 Je '62. (MIRA 15:5)
(Communist countries--Internationalism) (Warsaw Pact, 1955)

LAR'KOV, A.M., inzh.; DRONDIN, Ye.F., inzh.

Automatic control of pumps for water-lowering wells. Izv.vys. ucheb.zav.; energ. 2 no.11:47-51 N '59. (MIRA 13:4)

1. Kuybyshevskiy inzhenerno-stroitel'nyy institut imeni A.I. Mikoyana. Predstavlena kafedroy fiziki i elektrotekhniki.
(Automatic control) (Pumping machinery)

DRONDIN, Ye.F., inzh.; LAR'KOV, A.M., inzh.

Performance of filters in draining foundation holes of the Stalingrad Hydroelectric Power Station. Gidr.stroi. 30 no.2: 19-20 F '60. (MIRA 13:5)
(Stalingrad Hydroelectric Power Station)
(Filters and filteration)

LAR'KOV, A.M., inzh.; YEMBAYEV, M.F., inzh.

Interlocking safeguards of machines and mechanisms. Bezop.truda v prom. 5 no.9:16-17 S '61. (MIRA 14:10)
(Machinery--Safety measures)

LAR'KOV, A.M., inzh.

All-purpose guard system for woodworking machinery. Der. prom. 10 no. 4:18-19 Ap '61. (MIRA 14:4)
(Woodworking machinery—Safety appliances)

LAR'KOV, A.M., inzh.

Automatic discharge control of pump units for lowering the water level. Gidr. stroi. 32 no.10:47-48 O '61. (MIRA 14:10)
(Water, Underground) (Automatic control) (Pumping machinery)

LARKOV, P.

Help the stonecutting trade. Prom. koop. no.5:22 My '58.(MIRA 11:4)

1. Predsedatel' pravleniya Ural'skoy kamnereznoy artely, Permskaya oblast'.

(Stonecutting)

1. LAR'KOV, S. P.

2. USSR (600)

4. Arboriculture

7. Example worthy of imitation, Les i step', 14, No. 11, 1952.

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

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S/109/62/007/011/002/012
D295/D308

6,9200

AUTHORS: Tikhonov, V.I. and Lar'kov, V.A.

TITLE: Experimental investigation of frequency blips

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 11, 1962, 1901 - 1909

TEXT: The following parameters are defined for the time derivative (frequency) of the random phase of the sum of a sinusoidal oscillation and quasi-sinusoidal gaussian noise, considered over a finite interval of time T: the number of times that the frequency crosses an assigned level, C, with a positive derivative (the number of positive blips, n) the time interval between a positive crossing and the next negative crossing (the blip duration, τ), the highest frequency value attained (the highest blip, H_m), and the frequency difference between a frequency maximum and the preceding frequency minimum (the blip height, h). Statistics of these parameters are important for assessing the region of applicability of optimum-reception methods and for optimum

Card 1/2

Experimental investigation ...

relay-type regulation systems. The mean values, standard deviations and distributions of n, τ, H_m and h were investigated for a given T ($T = 10 / 1.5 \times 10^{-3}$ sec.) and various C by using an experimental set-up that comprised a sound-frequency source, a noise source ($f = 50$ kc/s, $\Delta f = 5.5$ kc/s), a mixer, an IF amplifier ($f = 140$ kc/s, $\Delta f = 1.5$ kc/s), a bilateral limiter and a frequency detector, the input being either noise alone or noise plus signal of various S/N ratios. The result of statistical processing of 500 frequency oscillograms are shown in the form of tables and curves and agree well with theoretical results where available (for n and τ). Thus the τ distribution tends to an exponential distribution as C increases. There are 2 tables and 9 figures.

SUBMITTED: December 29, 1961

Card 2/2

ACCESSION NR: AP4042503 S/0106/64/000/007/0033/0039

AUTHOR: Lar'kov, V. A.

TITLE: Transients in a noisy AFC system

SOURCE: Elektrosvyaz', no. 7, 1964, 33-39

TOPIC TAGS: AFC, AFC transients, noisy AFC transients

ABSTRACT: The results of an experimental study conducted on a hookup described by V. A. Lar'kov, et al., earlier (Elektrosvyaz', 1963, no. 11) are reported. It is found that, under no-modulation conditions, the time of the transient process in a heterodyne oscillator increases when a noise is present; even with a low noise level, but with a high initial detuning Δf, the transient time exceeds that of the no-noise case by 2—2.5 times. Also, the noise narrows the lock-in and holding bands of the AFC system. Two measures to offset the effects of noise are recommended: (1) To utilize only a small part of the lock-in band

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ACCESSION NR: AP4042503

and (2) To select the frequency-detector characteristic as flat as possible within the low-level characteristic of an IF amplifier. The above findings also hold true in the case of a modulated carrier. Orig. art. has: 8 figures and 7 formulas.

ASSOCIATION: none

SUBMITTED: 28Jan64 ENCL: 00

SUB CODE: EC NO REF SOV: 008 OTHER: 000

Card 2/2

LARKOWA, Helena, mgr

Evaluation of working capacity of disabled persons and occupational advising assistance in the United States and Canada. Praca zabezp spol 6 no.12:21-25 D '64.

LARMER, J.

Refractometric determination of glycerol. J. Larmer (Krajská kontrolní lab. Mediky, Ostrava). *Farmacia* 25, 151–4(1958).—The method for detn. of glycerol in the presence of low concn. of boric acid has been worked out. The sum of glycerol and boric acid is detd. by n (I) or by immersion refraction (II). H_3BO_3 is detd. by the titration with 0.1*N* NaOH. Glycerol is calcd. from the value I or II after subtracting the amt. of boric acid (found by titration, but calcd. in units of I or II). K. Macek

LARMER, K.

Standardization of agricultural machinery. p. 11.

VYNALEZY A NORMALISACE, OCHRANNE ZNAMKY, CHANENE VZORY. (Urad pro vynalezy a normalisaci)
Praha, Czechoslovakia
Vol. 3, no. 3, Mar. 1959.

Monthly list of East European Acessions (EEAI), LC, Vol. 8, no. 7
July 1959
Uncl.

TIKHONOV, V.I.; LAR'KOV, V.A.

Experimental study of frequency overshoots. Radiotekh. i elektron. 7 no.11:1901-1909 N '62. (MIRA 15:11)
(Radio measurements) (Frequency measurements)

LARKOWA, Helena, mgr

Occupational consulting in the United States and Canada. Praca zabezp spol 6 no.10:27-29 O '64.