General theory of the...

$$\mathfrak{D}_{\alpha\beta}(r_1, r_2; \xi_n) = \mathfrak{D}^0_{\alpha\beta}(r_1, r_2; \xi_n) + \int dr_3\, dr_4\, \mathfrak{D}^0_{\alpha\gamma}(r_1, r_3; \xi_n)\, \Pi_{\gamma\delta}(r_3, r_4; \xi_n) \times$$
$$\times \left\{ \mathfrak{D}^0_{\delta\beta}(r_4, r_2; \xi_n) + \int dr_5\, dr_6\, \mathfrak{D}^0_{\delta\mu}(r_4, r_5; \xi_n)\, \Pi_{\mu\nu}(r_5, r_6; \xi_n)\, \mathfrak{D}_{\nu\beta}(r_6, r_2; \xi_n) + \right.$$
$$+ \int dr_5\, dr_6\, dr_7\, dr_8\, \mathfrak{D}^0_{\delta\mu}(r_4, r_5; \xi_n)\, \Pi_{\mu\nu}(r_5, r_6; \xi_n)\, \mathfrak{D}'_{\nu\lambda}(r_6, r_7; \xi_n) \times$$
$$\left. \times \Pi_{\lambda\varrho}(r_7, r_8; \xi_n)\, \mathfrak{D}^0_{\varrho\beta}(r_8, r_2; \xi_n) + \ldots \right\},$$

is an integral equation with respect to ν having the form

$$\mathfrak{D}_{\alpha\beta}(r_1, r_2; \xi_m) = \mathfrak{D}^0_{\alpha\beta}(r_1, r_2; \xi_m) +$$
$$+ \int \mathfrak{D}^0_{\alpha\gamma}(r_1, r_3; \xi_n)\, \Pi_{\gamma\delta}(r_3, r_4; \xi_n)\, \mathfrak{D}^0_{\delta\beta}(r_4, r_2; \xi_n)\, dr_3\, dr_4. \quad (2,9)$$

In the general case there is no expression in a closed form for the polarization operator. In the present case of longwave photons, the

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General theory of the...

polarization operator can be expressed by the dielectric constant of the body. To calculate the additional term to the energy of a condensed body, due to the longwave fluctuations of the electromagnetic field, a part describing the energy of interaction of the particle with the electromagnetic field:

$$H = H_0 + H_{int} = H_0 - A_\mu(\vec{r})\vec{j}_\mu(r)d^3\vec{r},$$

is separated from the total Hamiltonian of the system. The series of the perturbation theory is represented by diagrams of the type of Fig. 7 or Fig. 8 for the free energy or the Green function of the longwave photons, respectively. In the $k_0 a \ll 1$ approximation, only diagrams of the form of Fig. 7a offer a correction to the free energy. The corresponding expression for the free energy reads Eq. (3.1)

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$$F = F_0 - \frac{1}{2} T \sum_{n=-\infty}^{\infty} \left\{ \int \Pi_{\alpha\beta}(r_1, r_2; \xi_n) \mathfrak{D}^0_{\beta\alpha}(r_2, r_1; \xi_n) dr_1 dr_2 + \right.$$

$$+ \frac{1}{2} \int \Pi_{\alpha\beta}(r_1, r_2; \xi_n) \mathfrak{D}^0_{\beta\gamma}(r_2, r_3; \xi_n) \Pi_{\gamma\delta}(r_3, r_4; \xi_n) \times$$

$$\times \mathfrak{D}^0_{\delta\alpha}(r_4, r_1; \xi_n) dr_1 dr_2 dr_3 dr_4 + \ldots + \frac{1}{m} \int \Pi_{\alpha\beta}(r_1, r_2; \xi_n) \mathfrak{D}^0_{\beta\gamma}(r_2, r_3; \xi_n) \ldots$$

$$\left. \ldots \Pi_{\mu\nu}(r_{2m-1}, r_{2m}; \xi_n) \mathfrak{D}^0_{\nu\alpha}(r_{2m}, r_1; \xi_n) dr_1 \ldots dr_{2m} + \ldots \right\}, \quad (3.1)$$

If the polarization operator $\Pi_{ik}(r_1, r_2; \xi_n) = \Pi_{ki}(r_2, r_1; \xi_n)$ can be expressed by the dielectric constant of the body, it will be then possible in principle to express the corresponding correction to the free energy by formula (3.1).

General theory of the...

$$\mathbf{f} = -\operatorname{grad} p_0 - \frac{T}{4\pi}\sum_{n=0}^{\infty}{}' \xi_n^2 \mathfrak{D}_{11}(\mathbf{r}, \mathbf{r}; \xi_n)\operatorname{grad} \varepsilon - \\ + \frac{T}{4\pi}\sum_{n=0}^{\infty}{}' \xi_n^2 \operatorname{grad}\left\{\mathfrak{D}_1(\mathbf{r}, \mathbf{r}, \xi_n)\varrho\frac{\partial \varepsilon}{\partial \varrho}\right\}. \quad (3,17)$$

permits the realy calculation of the correction to the chemical potential of the body. The pressure is calculated next. The force can be represented by $f_i = -\partial\sigma_{ik}/\partial x_k$ with the potential tensor

$$\sigma_{ik} = -p_0\delta_{ik} - \frac{T}{2\pi}\sum_{n=0}^{\infty}{}' \left\{-\frac{1}{2}\delta_{ik}\left[\varepsilon(\mathbf{r}, i\xi_n) - \varrho\frac{\partial\varepsilon(\mathbf{r}, i\xi_n)}{\partial\varrho}\right]\mathfrak{D}_{ll}^{E}(\mathbf{r}, \mathbf{r}; \xi_n) + \right. \\ \left. + \varepsilon(\mathbf{r}, i\xi_n)\mathfrak{D}_{ik}^{E}(\mathbf{r}, \mathbf{r}; \xi_n) - \frac{1}{2}\delta_{ik}\mathfrak{D}_{ll}^{H}(\mathbf{r}, \mathbf{r}; \xi_n) + \mathfrak{D}_{ik}^{H}(\mathbf{r}, \mathbf{r}; \xi_n)\right\}. \quad (3,24)$$

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The equations (3.24) and

$$\zeta(\varrho,T)=\zeta_0(\varrho,T)+\frac{T}{4\pi}\sum_{n=0}^{\infty}{}'\frac{\partial\varepsilon(\mathbf{r},i\xi_n)}{\partial\varrho}D_{ll}^{E}(\mathbf{r},\mathbf{r};\xi_n). \qquad (3,25)$$

(found by I. Ye. Dzyaloshinskiy and L. I. Pitayevskiy, ZhETF 36, 1797 (1959)) solve in principle the problem of calculating the Van der Waals part of the thermodynamic quantities of a body. The fourth part of the present paper deals with the molecular forces of interaction between solid bodies. In this connection, the general theory developed above is applied to the calculation of the Van der Waals forces between closely approached bodies. The force between the unit area of the two bodies (media 1 and 2) which are separated by a gap of width l filled with medium 3, is described by Eq. (4.13).

General theory of the...

$$F(l) = \frac{kT}{\pi c^3} \sum_{n=0}^{\infty}{}' \varepsilon_3^{3/2} \xi_{3n}^3 \int_1^{\infty} p^2 \left\{ \left[\frac{(s_1+p)(s_3+p)}{(s_1-p)(s_3-p)} \exp\left(\frac{2p\xi_n}{c} l\sqrt{\varepsilon_3}\right) - 1 \right]^{-1} + \right.$$

$$\left. + \left[\frac{(s_1+p\varepsilon_1/\varepsilon_3)(s_3+p\varepsilon_3/\varepsilon_3)}{(s_1-p\varepsilon_1/\varepsilon_3)(s_3-p\varepsilon_3/\varepsilon_3)} \exp\left(\frac{2p\xi_n}{c} l\sqrt{\varepsilon_3}\right) - 1 \right]^{-1} \right\} dp, \quad (4,13)$$

где where

$$s_1 = \sqrt{(\varepsilon_1/\varepsilon_3) - 1 + p^2}, \quad s_3 = \sqrt{(\varepsilon_3/\varepsilon_3) - 1 + p^2}, \quad \xi_n = 2\pi nkT/\hbar;$$

Here ε_1, ε_2, ε_3 denote functions of the imaginary frequency $\omega = i\xi$ ($\varepsilon = \varepsilon(i\xi_n)$), k being the Boltzmann constant. Summation is done over the integers n, and the term with n = 0 is to be taken with half the weight. The general formula and limit cases are then discussed. Eq. (4.13) can be simplified because the effect of temperature upon the interaction force between the bodies is generally quite negligible. The thus resulting formula (4.14)

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General theory of the...

$$F = \frac{\hbar}{2\pi^2 c^3}\int_0^\infty\int_1^\infty p^3\xi^3\varepsilon_3'^{/3}\left\{\left[\frac{(s_1+p)(s_3+p)}{(s_1-p)(s_3-p)}\exp\left(\frac{2p\xi}{c}l\sqrt{\varepsilon_3}\right)-1\right]^{-1}+\right.$$
$$\left.+\left[\frac{(s_1+p\,\varepsilon_1/\varepsilon_3)(s_2+p\,\varepsilon_2/\varepsilon_3)}{(s_1-p\,\varepsilon_1/\varepsilon_3)(s_2-p\,\varepsilon_2/\varepsilon_3)}\exp\left(\frac{2p\xi}{c}l\sqrt{\varepsilon_3}\right)-1\right]^{-1}\right\}dp\,d\xi. \qquad (4,14)$$

is suited for distances $l \ll c\hbar/kT$. Also (4.14), however, can be appreciably simplified in two important limit cases:

$$F = \frac{\hbar}{16\pi^2 l^3}\int_0^\infty\int_0^\infty x^3\left[\frac{(\varepsilon_1+\varepsilon_3)(\varepsilon_2+\varepsilon_3)}{(\varepsilon_1-\varepsilon_3)(\varepsilon_2-\varepsilon_3)}e^x-1\right]^{-1}dx\,d\xi \qquad (4,15)$$

or

$$F = \frac{l\bar{\omega}}{8\pi^2 l^3}\,,\quad \bar{\omega} = \int_0^\infty \frac{|\varepsilon_1(i\xi)-\varepsilon_3(i\xi)|\,|\varepsilon_2(i\xi)-\varepsilon_3(i\xi)|}{|\varepsilon_1(i\xi)+\varepsilon_3(i\xi)|\,|\varepsilon_2(i\xi)+\varepsilon_3(i\xi)|}\,d\xi. \qquad (4,18)$$

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General theory of the...

respectively, holds for "small" distances (i.e., small with respect to the lengths λ_0 of the waves that are typical of the absorption spectra of the given bodies). $|\omega|$ is a frequency that is typical of the absorption spectra of all three media. For "large" distances $l \gg \lambda_0$,

$$F = \frac{\hbar c}{32\pi^2 l^4 \sqrt{\varepsilon_{30}}} \int_0^\infty \int_1^\infty \frac{x^3}{p^2} \left\{ \left[\frac{(s_{10}+p)(s_{30}+p)}{(s_{10}-p)(s_{30}-p)} e^x - 1 \right]^{-1} + \right.$$
$$\left. + \left[\frac{(s_{10}+p\,\varepsilon_{10}/\varepsilon_{30})(s_{30}+p\,\varepsilon_{20}/\varepsilon_{30})}{(s_{10}-p\,\varepsilon_{10}/\varepsilon_{30})(s_{30}-p\,\varepsilon_{20}/\varepsilon_{30})} e^x - 1 \right]^{-1} \right\} dp\,dx, \qquad (4,19)$$
$$s_{10} = \sqrt{(\varepsilon_{10}/\varepsilon_{30}) - 1 + p^2}, \quad s_{20} = \sqrt{(\varepsilon_{20}/\varepsilon_{30}) - 1 + p^2},$$

holds after the substitution $x = 2pl\zeta/c$, where ζ_{10}, ζ_{20}, ζ_{30} denote the electrostatic values of the dielectric constant. From (4.19),

$$F = \frac{\hbar c}{16\pi^2 l^4 \sqrt{\varepsilon_{30}}} \int_0^\infty \int_1^\infty \frac{x^3\,dp\,dx}{p^2(e^x-1)} = \frac{\pi^2}{240} \frac{\hbar c}{\sqrt{\varepsilon_{30}}\, l^4}. \qquad (4,21)$$

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follows for metals, and

$$F = \frac{\pi^2}{240}\frac{\hbar c}{l^4}\frac{1}{\sqrt{\varepsilon_{20}}}\left(\frac{\varepsilon_{10}-\varepsilon_{20}}{\varepsilon_{10}+\varepsilon_{20}}\right)^2 \Phi_{дл}\left(\frac{\varepsilon_{10}}{\varepsilon_{20}}\right). \qquad (4,22)$$

for equal bodies. If the gap between the two bodies is filled with a liquid metal, the interaction force decreases as l^{-3} at "small" distances, and as l^{-5} at "large" distances. B. V. Deryagin, I. I. Abrikosova made the first reliable measurements of molecular attractive forces between solid bodies. For two metals separated by a vacuum

$$F = \frac{kT}{8\pi l^3}\left[1 + 2\left(\frac{4\pi kTl}{\hbar c}\right)^2 \exp\left(-\frac{4\pi kTl}{\hbar c}\right)\right] \qquad (4.30)$$

At "large" distances

$$F = \frac{\hbar c}{l^4}\frac{23}{640\pi^2}(\varepsilon_{10}-1)(\varepsilon_{20}-1) \qquad (4.35)$$

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General theory of the...

holds for the attractive force between two split up bodies. This corresponds to the interaction of two atoms with the energy

$$U = -\frac{23\hbar\alpha}{4\pi R^7}\alpha_1\alpha_2 \quad (4.36)$$

The interaction energy between two atoms in a liquid is

$$U(R) = -\frac{3\hbar}{16\pi^3 R^6}\int_0^\infty \left(\frac{\partial\varepsilon_1(i\xi)}{\partial N_1}\right)_{N_1=0}\left(\frac{\partial\varepsilon_2(i\xi)}{\partial N_2}\right)_{N_2=0}\frac{d\xi}{\varepsilon^2(i\xi)}. \quad (4,40)$$

at "small" distances and

$$U(R) = -\frac{23\hbar c}{64\pi^3\varepsilon_0^{3/2}R^7}\left(\frac{\partial\varepsilon_{10}}{\partial N_1}\right)_{N_1=0}\left(\frac{\partial\varepsilon_{20}}{\partial N_2}\right)_{N_2=0}. \quad (4,41)$$

at "large" distances.

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$$U(R) = -\frac{27\hbar V^2}{16\pi^3 R^6}\int_0^\infty \left[\frac{\varepsilon'(i\xi)-\varepsilon(i\xi)}{\varepsilon'(i\xi)+2\varepsilon(i\xi)}\right]^2 d\xi, \quad R \ll \lambda_0, \tag{4,42}$$

and

$$U(R) = -\frac{207V^2}{64\pi^3 R^7}\frac{\hbar c}{\sqrt{\varepsilon(0)}}\left[\frac{\varepsilon_0'-\varepsilon_0}{\varepsilon_0'+2\varepsilon_0}\right]^2, \quad R \gg \lambda_0, \tag{4,43}$$

hold for the interaction force of emulsion particles at "small" and "large" distances, respectively. The theory described in the present paper is also suited for calculating the thermodynamic quantities of a thin liquid film on the surface of a solid. Simply, $\varepsilon_2 = 1$ is to be put in the earlier found formulas (e.g., general formula (4.13)) for determining μ. The function $\chi(T,l)$ determines all thermodynamic quantities of the film. A report is finally given of the negligibly small contribution of forces of non-electromagnetic origin (V. L. Ginzburg is mentioned), and liquid helium films are discussed. $\mu \sim l^{-3}$ is to be

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B125/B201

General theory of the...

expected for the actual thicknesses of the helium film, and $1 - z^{-1/3}$ for the film profile. There are 13 figures and 30 references: 15 Soviet-bloc and 15 non-Soviet-bloc. The two most recent references to English-language publications read as follows: L. G. Grimes, L. G. Jackson, Philos. Mag. 4, 1346 (1959). I. A. Kitchener, A. P. Prosser, Proc. Roy. Soc. A 242, 403 (1959).

Card 14/16

PITAYEVSKY, L. P., ALPERT, Ya. L., GUREVICH, A. V.

"On Effects Produced by a Body Moving Fast in Plasma"

Soviet Papers Presented at Plenary Meetings of Committee on Space Research (COSPAR) and Third International Space Science Symposium, Washington, D. C., 23 Apr - 9 May 62.

3455
S/056/62/042/002/043/055
B108/B138

11312C

AUTHORS: Gor'kov, L. P., Pitayevskiy, L. P.

TITLE: Transition of liquid He^3 into the superfluid state

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 600-605

TEXT: The Cooper effect in He^3, i.e. transition of He^3 to the superfluid state, is investigated. Theoretically, this effect is due to pairing of excitations which attract each other when they are in a state with a sufficiently large orbital angular momentum ($l \gg 1$). The transition temperature is found as

$$T_c' = (2/\pi)\gamma\omega e^{-1/\varkappa} = (p_0^2/m^*\pi l)\, e^{1/\varkappa} e^{-1/\varkappa}, \quad (14)$$

$$\varkappa = \frac{3m^* p_0^4 (2l+1) A\Phi}{8\pi}\left[\frac{2l+1}{(l+1/2)(l^2-1/4)(l^2-9/4)}\right] \approx 0{,}99\,\frac{(l+1/2)^2}{(l+1/2)(l^2-1/4)(l^2-9/4)}$$

$\Phi = \left\{\left[(2\pi)^2/3\, mm^* c^2\right](3N/8\pi)^{2/3}\right\}^2 = (mo_0^2/m^* c^2)^2$. N - number of atoms per unit volume, m - mass of He^3 atom, m^* - effective mass of excitation,

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c^{-2} - compressibility of liquid He^3, c_o^{-2} - compressibility of ideal Fermi gas with mass m and density N. In fact, pairing of the excitations takes place at not too great l (probably at l ~ 2), i.e., at temperatures much higher than calculated from the asymptotic formula (14). However, an estimation with the aid of formula (14) (which is applicable only for large values of l), using l ~ 2, yields $T_c \sim 2 \cdot 10^{-4}$ °K. On the basis of other estimations it is concluded that T_c probably lies between $8 \cdot 10^{-3}$ and 10^{-2} °K. E. E. Shnol' and N. D. Vvedenska, collaborators of the Matematicheskiy institut (Institute of Mathematics), are thanked for calculations, S. P. Kapitsa and Academician L. D. Landau for discussions and remarks. Mention is made of N. N. Bogolyubov et al. (Novyy metod v teorii sverkhprovodimosti (A new method in the theory of superconductivity, Izd. AN SSSR, 1958). There are 2 figures and 7 references: 4 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: V. I. Emery, A. M. Sessler. Phys. Rev., 119, 43, 1960; K. A. Bruecner, I. L. Cammel. Phys. Rev., 109, 1040, 1958; A. C. Anderson et al. Phys. Rev. Lett., 6, 331, 1961.

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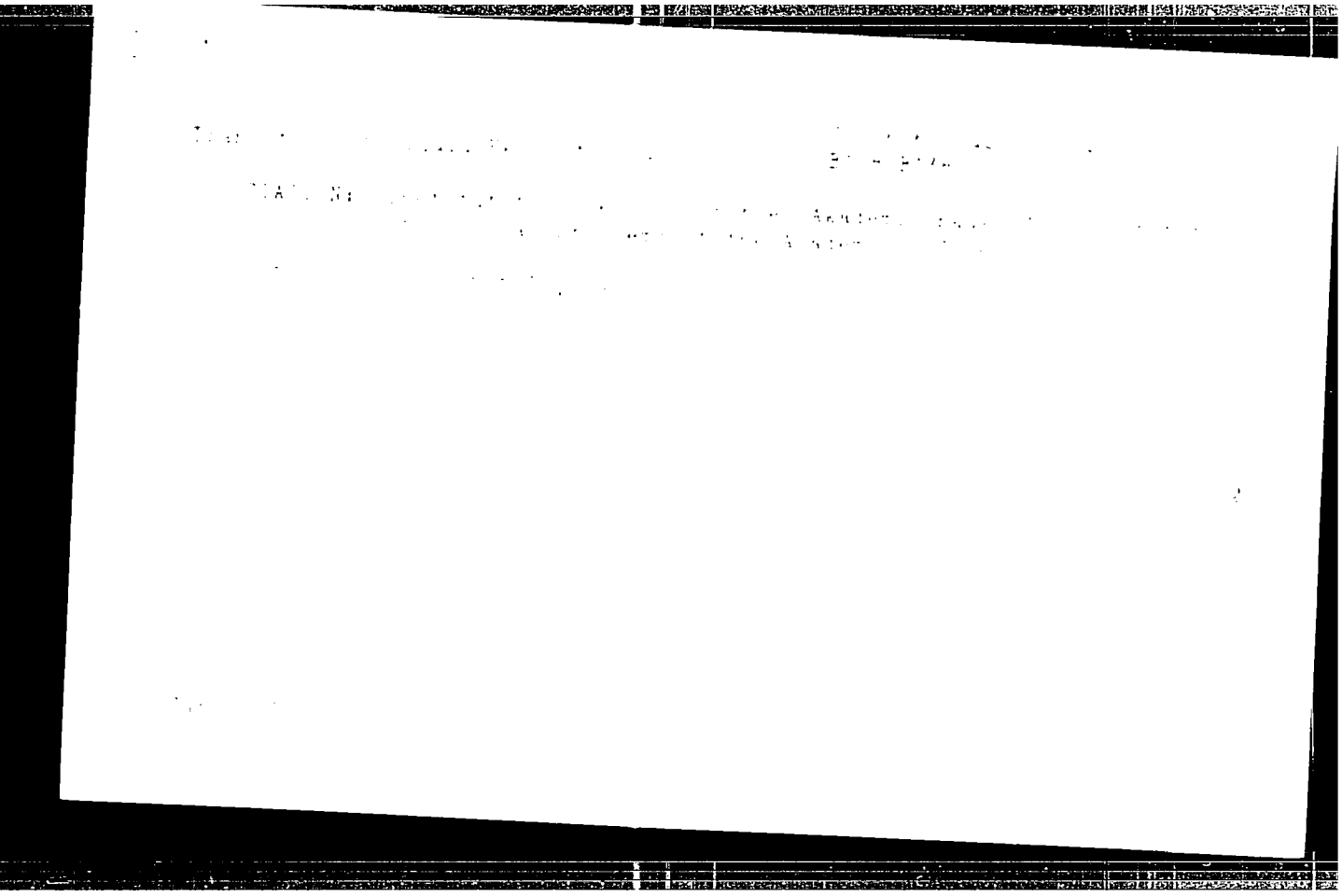

S/056/62/042/005/029/050
B102/B104

AUTHOR: [illegible]itayevskiy, L. P.

TITLE: Electron recombination in a monatomic gas

PERIODICAL: Zhurnal [illegible] i teoreticheskoy fiziki, v. 42, no. [illegible], [illegible]

TEXT: The electron-ion recombination coefficient is calculated by the [illegible] equation for triple collisions between electron, ion and gas atoms. The gas is assumed to be weakly ionized at high pressure but not at too high a temperature. The electron distribution function f(E) in the phase space has the form of a diffusion equation $\partial f/\partial t = -A(E)\,\partial/\partial E\, j(E)$ and the particle flux j(E) will vanish for a Boltzmann distribution: $j(E) = -B(E)(\partial f/\partial E + f/kT)$; Also $A = [illegible]\, E^{5/2}/2\pi^3 e^6 m^{3/2}$ for $E < 0$. The recombination coefficient is determined from a steady-state solution of (1) when $B(E)(\partial f/\partial E + f/kT) = -j = \mathrm{const}$.

$$\alpha = [illegible]\,(2\pi mkT)^{[illegible]} \left[\int_{\infty} e^{E/kT} \frac{dE}{B(E)} \right]^{-1}. \qquad (10)$$

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For B the expression is:

$$B = \frac{1}{2A}\frac{d\langle(\Delta E)^2\rangle}{dt} = \frac{\pi^3 \sqrt{2}}{2}\frac{e^6 m^{3/2}}{E^{5/2}}\frac{d\langle(\Delta E)^2\rangle}{dt}. \qquad (12)$$

The quantity $\langle(\Delta E)^2\rangle/dt$ has to be calculated for a definite case. For fast collisions when the electrons can be considered as free and $kT \ll \sqrt{m/M}\, e^2/a$ (where a = radius and M = mass of the atom):

$$B(E) = \frac{128\pi^3 e^6 m^2 a^2 kT n}{3 M E^{[illegible]}} \qquad (18)$$

and finally:

$$\alpha = \frac{32\sqrt{2\pi}}{3}\frac{m^{1/2} e^{[illegible]} a^2 n}{(kT)^{5/2} M}. \qquad (19)$$

are obtained. For e.g. helium this formula can be applied up to [illegible]°K. Academician P. L. Kapitsa is thanked for having proposed the theme and Academician L. D. Landau for help and discussions.

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

SUBMITTED: December 19, 1961

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December 6, 1961

GUREVICH, A.V.; PITAYEVSKIY, L.P.

Diffusion approximation of disturbances around a body moving in a plasma. Geomag. i aer. 3 no.5:823-829 S-O '63. (MIRA 16:11)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR i Institut fizicheskikh problem AN SSSR.

AL'PERT, Yakov L'vovich; GUREVICH, Aleksandr Viktorovich; PITAYEVSKIY, Lev Petrovich; SIDI, V.I., retirement; VLASKO, I.G., red.

[Artificial satellites in rarefied plasma] Iskusstvennye sputniki v razrezhennoi plazme. Moskva, Izd-vo "Nauka," 19[illegible]. 184 p. (MIRA 17:6)

L 24499-65 EEC-4/EEC(b)-2/EWP(m)/EWG(v)/EPA(w)-2/EWA(h)/EWG(k)/EWT(l)/EEC(t)/FS(v)-3/EPA(cp)-2/FCC/T/EWA(m)-2/EEC(a)/EEC(j)/EEC(r)/EWA(d) Pe-5/Pg-4/Pi-4/Po-4/Pq-4/Pt-10/Pz-6/Pab-10/Pae-2/Peb IJP(c)/AFMDC/AFWL/AEDC(b)/SSD/SSD(b)/AEDC(a)/ASD(a)-5/AFTC(a)/AFETR/ESD(si)/ESD(gs)/ESD(t) AT/GW/WS

ACCESSION NR AM4040599 BOOK EXPLOITATION S/ B+1

Al'pert, YAkov L'vovich; Gurevich, Aleksandr Viktorovich; Pitayevskiy, Lev Petrovich

Artificial satellites in rarefied plasma (Iskusstvenny*ye sputniki v razrezhennoy plazme), Moscow, Izd-vo "Nauka", 1964, 382 p. illus., biblio. 3,000 copies printed.

TOPIC TAGS: aerospace, artificial satellite, rarefied plasma

PURPOSE AND COVERAGE: The monograph considers various phenomena that appear in the motion of artificial Earth satellites in the ionosphere and interplanetary space. The instance of a rapidly moving body whose speed is considerably greater than the speed of particles in a plasma is studied at greatest length. There is a detailed examination of the problem of diffusion of electromagnetic waves in the "wake" that a satellite forms; a strict theory of sounding is given. The book is intended for researchers, students, and graduate students in radio physics and geophysics.

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SUB CODE: SV, ME SUBMITTED: 30Jan64 NR REF SOV: 047
OTHER: 022

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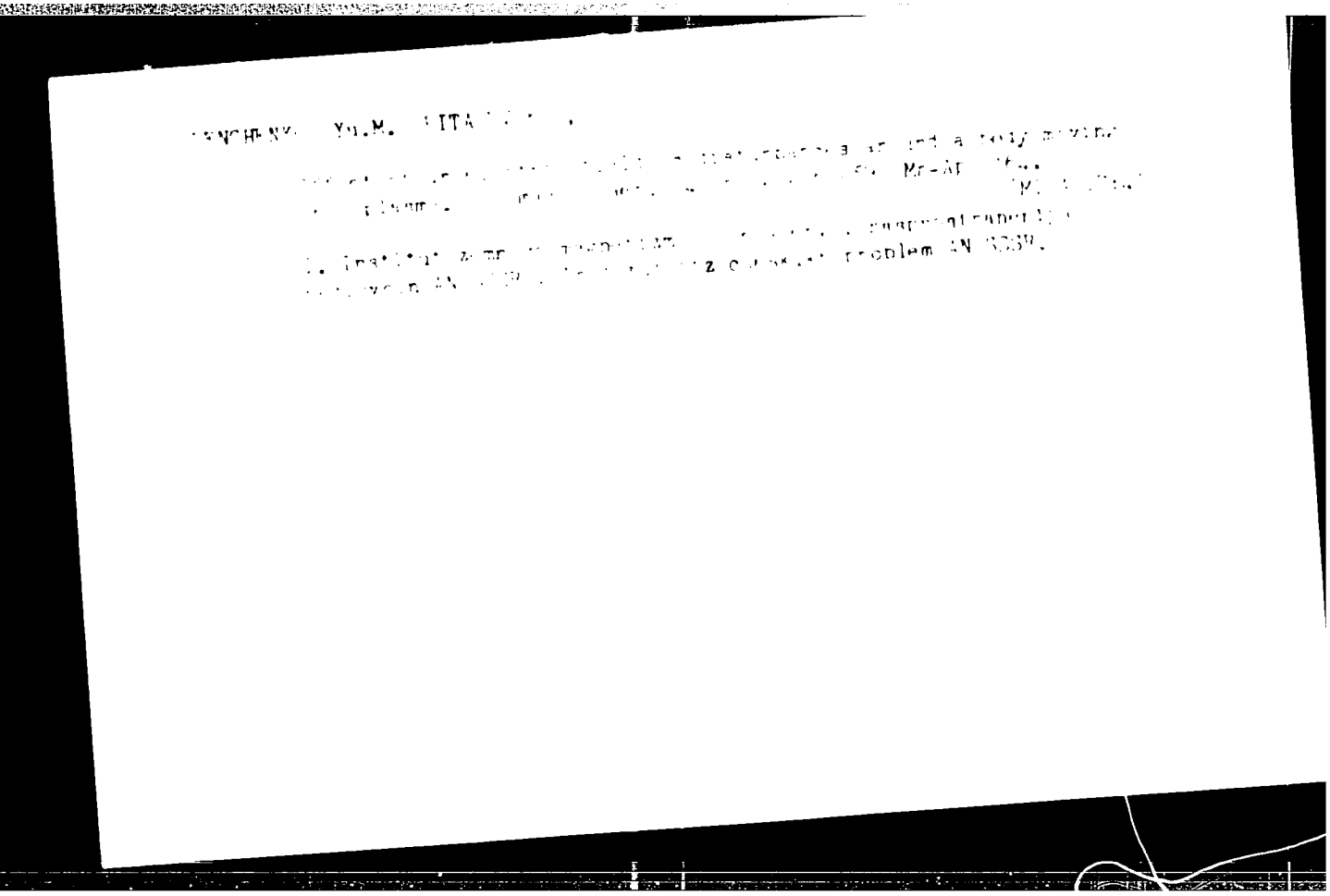
PITAYEVSKIY, L.P.

Magnetic field disturbances around a body moving in a plasma.
Geomag. i aer. 3 no.6:1036-1047 N-D '63. (MIRA 16:12)

1. Institut fizicheskikh problem AN SSSR.



S/0203/64/004/002/0256/0259

ACCESSION NR: AP4031629

AUTHORS: Panchenko, Yu. M.; Pitayevskiy, L. P.

TITLE: Effect of an electrical field on perturbations about a body moving in a plasma

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 2, 1964, 256-259

TOPIC TAGS: electric field, electron concentration, ion concentration, rarefied plasma, ion velocity, thermal velocity, Debye radius, plasma

ABSTRACT: The authors study a metallic sphere of radius R_0 moving rapidly in a plasma which is assumed to be so rarefied that the length of the free run of ions l_i is much larger than the characteristic dimensions of the body R_0, which in turn is much larger than the Debye radius D. They obtain the dependence of the perturbed ion and electron concentrations N(r) at large distances from this body. The velocity of the sphere V_0 is assumed small with respect to the mean thermal velocity of motion of electrons and much larger than the mean thermal velocity of ions

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ACCESSION NR: AP4031629

$$\sqrt{\frac{T}{M}} < v_0 < \sqrt{\frac{T}{m}}. \qquad (1)$$

where M and m are the mass of ions and electrons respectively, T is the plasma temperature in energy units. The surface of the body is also assumed to neutralize completely all ions hitting it. Other authors, in studying this problem, have not considered the effect of the electric field on the motion of the ions. Between them, with motion of the body, the plasma in its neighborhood is polarized and its quasi-neutrality is violated, as a result of which there arises an electrical field which can essentially change the magnitude of perturbed concentration. Two regions around the body, near and far, must be distinguished. The authors treat only the simpler "far" case. The maximal value of perturbation is attained not on the axis, but on a cone with angle of opening $2\alpha \approx 18^{\circ}$. "The authors express their gratitude to Ya. L. Al'pert, A. V. Gurevich and A. M. Moskalenko for their valuable discussions." Orig. art. has: 2 figures and 14 formulas.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery* i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere, and Propagation of Radio Waves, AN SSSR) Institut fizicheskikh problem AN SSSR (Institute of Physical Problems, AN SSSR)

Cord 2/3

ACCESSION NR: AP4031629

SUBMITTED: 24Oct63 DATE ACQ: 30Apr64

SUB CODE: ME NO REF SOV: 004 ENCL: 00

OTHER: 000

Card 3/3

ACCESSION NR: AP4031149 S/0056/64/046/004/1281/1284

AUTHORS: Gurevich, A. V.; Pitayevskiy, L. P.

TITLE: Recombination coefficient in a dense low temperature plasma

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1281-1284

TOPIC TAGS: low temperature plasma, recombination coefficient, ionized gas, ionized plasma, energy distribution, momentum distribution, particle collision

ABSTRACT: The electron recombination coefficient is calculated in a multiply charged partially ionized gas for the case when the energy is transferred by electron-electron collisions, and collision with the neutral atoms causes the momentum-direction equilibrium distribution to be established more rapidly than the energy distribution. The recombination coefficient due to triple collisions in the low-temperature plasma ($kT \ll E_i$) is calculated when the recombination

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can be regarded as diffusion by the electron, which executes a finite motion in the ion field, towards negative energies. In such cases the behavior of the captured electrons can be described by a classical transport equation, so that the calculation becomes much simpler. The formula derived for the recombination coefficient is valid for an arbitrary ion charge, particularly for singly-charged ions, and for arbitrary degree ionization of the plasma. The only limitation is that the plasma temperature be low. Comparison with the radiative recombination coefficient and with the recombination coefficient in a weakly ionized plasma shows that even at very low degrees of plasma ionization the recombination due to triple collisions is essentially caused by interaction between electrons and not by the collisions between the electron and the neutral atoms. Orig. art. has: 8 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR); Institut fizicheskikh problem AN SSSR

ACCESSION NR: AP4031149

(Institute of Physics Problems AN SSSR)

SUBMITTED: 25Jul63 DATE ACQ: 07May64 ENCL: 00

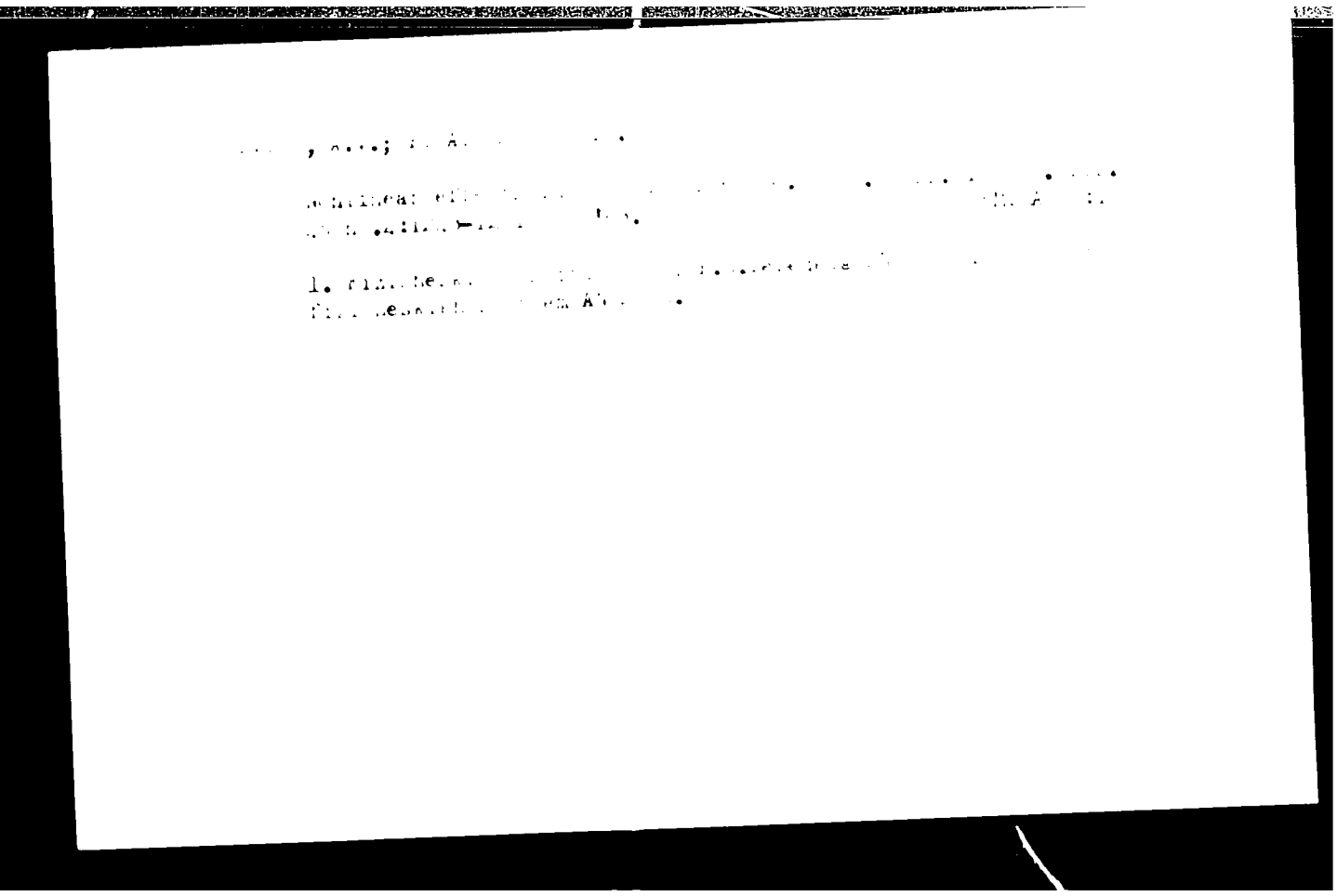
SUB CODE: NP NR REF SOV: 004 OTHER: 002

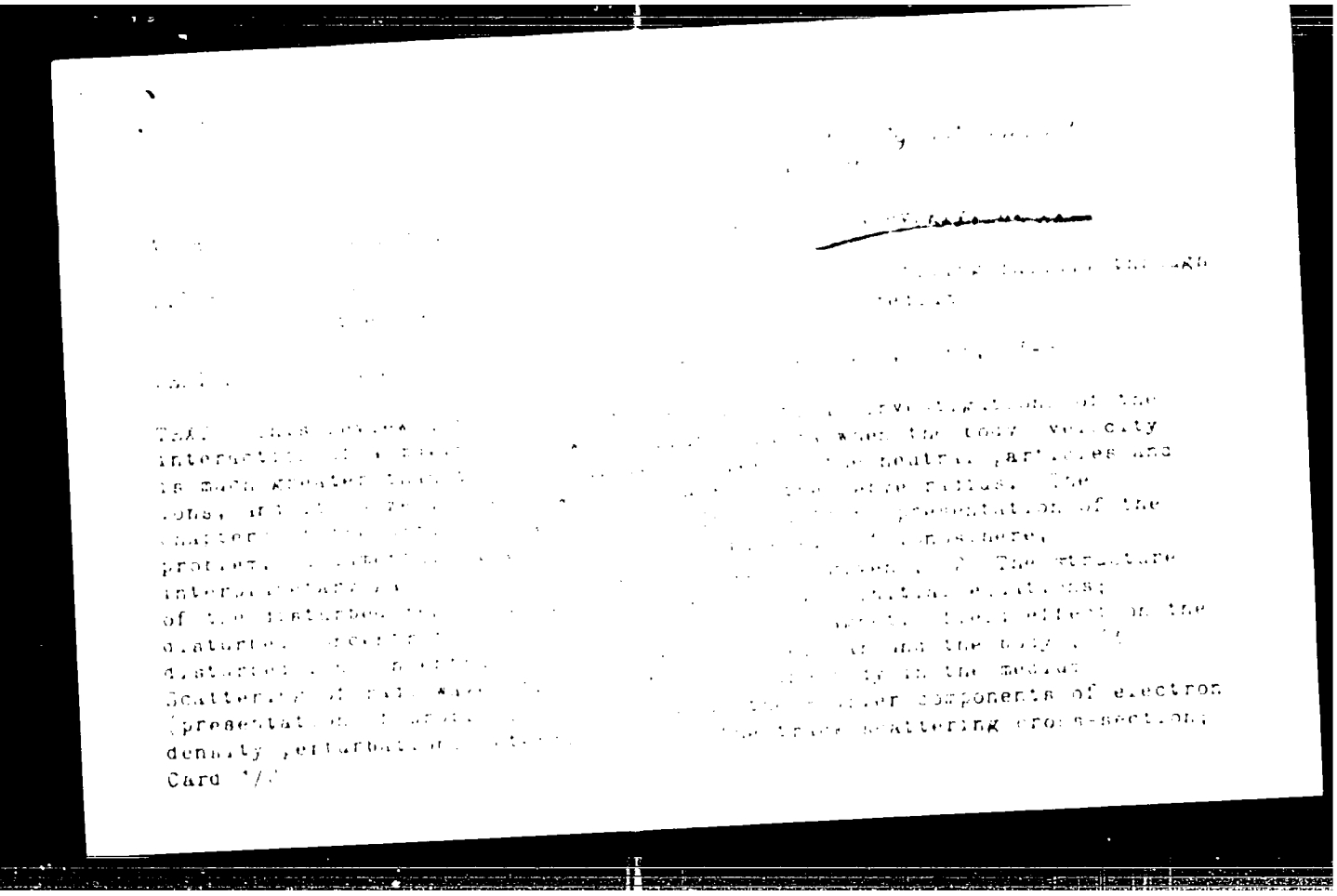
Card 3/3

PITAYEVSKIY, L...

Effect of collisions on the disturbances around a body moving in a plasma. Zhur. eksp. i teor. fiz. 44 no.3:969-979 Mr '63. (MIRA 16:3)

1. Institut fizicheskikh problem AN SSSR.
(Collisions (Nuclear physics)) (Plasma (Ionized gases))





Card 1/

[illegible] other experimental data [illegible] references.

Card [illegible]

L 17539-63 EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD/IJP(C) JD

ACCESSION NR: AP3004419 S/0020/63/151/004/0822/0825

AUTHORS: Gor'kov, L. P.; Pitayevskiy, L. P.

58
57

TITLE: Term splitting energy in a hydrogen molecule.

SOURCE: AN SSSR. Doklady*, v. 151, no. 4, 1963, 822-825

TOPIC TAGS: H sub 2 term splitting energy, Heitler-London theory, Schroedinger equation, perturbation theory.

ABSTRACT: The energy of the electron terms of a hydrogen molecule are generally computed by the Heitler-London approach in which the initial wave functions are taken as the symmetric and anti-symmetric combinations of wave functions in neutral atoms. Authors attempt to show in this work that this approximation is not valid even for large interatomic distances. Instead, the Schroedinger equation must be solved anew, and the wave functions of electrons within the range of the potential barrier must also be found. Author did this in present study. Results show that the van-der-Waals forces predominate for large interatomic distances, while the exchange forces predominate at small distances. Both forces are of the same order of magnitude at intermediate distances. Orig. art. has: 1 figure and 9 equations.

ASSN: Institute for Physics Problems, Academy of Sciences, SSSR.

Card 1/2

GUREVICH, A. V.; PITAYEVSKIY, L. P.

"Resonant Ionospheric Disturbances near the Surface of Satellite Antennas"

report submitted for 14th Int. Astronautical Cong, Warsaw, 1-7 Sep 63.

GUREVICH, A.V.; PITAYEV[illegible]KIY, [illegible].P.

Supersonic [illegible] of a body in a plasma. Geomag. i aer. [illegible] no.[illegible] 817-824 [illegible] '[illegible]. [illegible] (MIRA [illegible])

1. Fizicheskiy [illegible] imeni Lebedeva AN SSSR i Institut fiz[illegible] problem AN SSSR.

L 22131-66 EWT(1)/EWP(m)/EPF(n)-2/ETC(m)-6/EWA(1) WW/GG

ACC NR: AP6004942 SOURCE CODE: UR/0056/66/050/001/0243/0250

66
63
13

AUTHOR: Kemoklidze, M. P.; Pitayevskiy, L. P.

ORG: Institute of Physics, Academy of Sciences, Georgian SSR (Insititut fiziki Akademii nauk Gruzinskoy SSR); Institute of Physics Problems, Academy of Sciences, SSSR (Institut fizicheskikh problem Akademii nauk SSSR)

TITLE: Concerning the dynamics of a superfluid Fermi gas

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 1, 1966, 243-250

TOPIC TAGS: superfluidity, Fermi gas, forbidden band, nonlinear differential equation, crystal lattice, correlation statistics

ABSTRACT: The authors derive nonlinear differential equations for the energy gap in a superfluid Fermi gas. Earlier descriptions of the gap were in terms of complicated systems of equations which were not amenable to a general solution. The equation is derived at absolute zero, and even in this case the problem for a real superconductor is complicated by the presence of the crystal lattice in the magnetic field. Consequently, the derivation is confined to an uncharged superfluid Fermi gas. A study of this model makes it possible to resolve certain fundamental

2

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questions that apply also to the general case. The solution consists essentially of obtaining a linear differential equation for a certain component of the gap, from which it becomes possible then to reconstitute the nonlinear equation for the entire gap. The equation is valid under the condition that the change of gap within a distance of the order of the correlation length is small in time intervals of the order of the reciprocal of the gap. It is shown that the hydrodynamic equations of an ideal liquid can be derived from the equation. The extension of the results to nonzero temperature is planned for the future. The authors thank A. A. Abrikosov, A. F. Andreyev, and L. P. Gor'kov for discussions of the questions considered in this paper. Orig. art. has: 27 formulas.

SUB CODE: 20/ SUBM DATE: 03Aug65/ ORIG REF: 005/ OTH REF: 004

ACC NR: AR6020058 SOURCE CODE: UR/0313/66/000/002/0041/0042

AUTHOR: Gurevich, A. V., Pitayevskiy, L. P.

ORG: none

TITLE: The resonance disturbance of the ionosphere at the surface of the antenna situated on an artificial earth satellite

SOURCE: Ref. zh. Issl kosm prostr, Abs. 2.62.309

REF SOURCE: 15 Internats. kongress po astronavtike, Varshaya, sent., 1964

TOPIC TAGS: ionosphere, artificial satellite, antenna, electric current, Langmuir frequency, electron, plasma, hysteresis, electrode, current resonance

ABSTRACT: The author describes a method to study the ionosphere by measuring the constant component of the electric current flowing from the ionospheric plasma to an electrode to which a high-frequency electric potential has been applied. Such an electrode may be, for instance, an antenna placed on an artificial satellite.

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ACC NR: AR6020058

The author analyzes the problem of the resonance current increment, when the field frequency ω approaches the Langmuir frequency of the plasma resonance ω_p. This makes it possible to measure ω_p and other parameters of the ionosphere. The problem is solved for the case when the field amplitude changes little over the distance which the electron traverses during the oscillation period. The mean disturbance of electron concentration in time in the environs of the antenna and the size of the field in plasma have been found. It is shown that at certain values of dielectric permeability, three values of the field inside the plasma correspond to each value of the field outside the plasma, e.g. a hysteresis takes place. Corrections related to nonlinearity, dissipation of energy, and space dispersion have been examined. The bibliography has nine titles. O. Givishvili. [GC]

SUB CODE: 04, 09, 22/ SUBM DATE: none/

Card 2/2

EWT(1), FCC GW

ACC NR: AR6017542 SOURCE CODE: UR/0169/66/000/001/A010/A010

AUTHOR: Gurevich, A. V.; Pitayevskiy, L. P.

TITLE: On resonance perturbation of the ionosphere at the surface of an antenna placed on ISZ

SOURCE: Ref. zh. Geofizika, Abs. 1A49

REF SOURCE: (15 Internats. kongress po astronavtik Varshava, sent., 1964. - Has not been published

TOPIC TAGS: ionosphere, ionospheric disturbance, ionospheric resonance, plasma physics

ABSTRACT: A method of ionospheric study is described using measurement of the constant component of current from the ionospheric plasma to an electrode with an HF electric potential. Such an electrode can be an antenna placed on ISZ. Resonance increase of the current, when field frequency ω is close to the Langmuir frequency of plasma resonance ω_0, is discussed. The problem is solved for field amplitudes changing little over the electron traverse distance of one oscillation period. The time average of the perturbation of the electron concentration at the antenna and the plasma field are found. It is shown that for some values of $\mathcal{E}$, to each magnitude of field outside the plasma correspond three magnitudes of the field inside the plasma, i.e., hysterisis takes place. Corrections due to non-linearity, energy dissipation and space dispersion are discussed. Translation of abstract.

SUB CODE: 04

UDC: 550.388.2

ACC NR: A.7006017 SOURCE CODE: UR/0203/66/006/005/0842/0851

[illegible]: [illegible], A. V.; Pitayevskiy, L. P.

[illegible] Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR); Institute of Physical Problems, AN SSSR (Institut fizicheskikh problem AN SSSR)

[illegible]: [illegible] wave scattering [illegible] of a body moving in plasma

[illegible], [illegible] 5, 1966, 842-851

[illegible]: [illegible] wave scattering, [illegible]

[illegible] computations of the scattering of radio wa[illegible] behind a body moving in the lower [illegible] are generalized for the case when the body passes [illegible]. There also is a discussion of resonance scattering on the trail of a body moving along the magnetic field. The authors thank Ya. L. Al'pert for [illegible] of the results of the work. Orig. art. has: 2 figures, 32 formulas and 1 table. [JPRS: 3[illegible]]

SUB CODE: 17 / SUBM DATE: 14Jun65 / ORIG REF: 012 / OTH REF: 002

Card 1/1

UDC: 550.37

0927 0799

APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R0013411

L 30089-66 EWT([illegible] ETI IJP(c) RM/WW/JW/JD
ACC NR: AR6 [illegible] SOURCE CODE: UR/0053/66/088/003/0409/0418

AUTHOR: Pitayev [illegible], L. P.

ORG: Institute of Physics Problems, AN SSSR (Institut fizicheskikh problem AN SSSR)

TITLE: New research on the properties of liquid helium

SOURCE: Uspekhi fizicheskikh nauk, v. 88, no. 3, 1966, 409-418

TOPIC TAGS: liquid helium, quantum liquid, superfluidity, low temperature research

ABSTRACT: This is a review paper dealing with the theoretical and experimental research carried out on liquid helium and superfluidity and reported by various workers in 1[illegible]. The review does not claim to be exhaustive, and is limited to the papers which in the author's opinion are of greatest interest. The topics discussed are the energy spectrum of superfluid helium and its effect on superfluidity, vortex filaments and rings in liquid He^4, the interaction between the vortices in the [illegible] with ions, capture of ions by straight line vortex filaments, centripetal compression effects in liquid helium, density measurements, the question of [illegible]fluidity of He^3 at low temperatures, and the properties of liquid He^3 at temperatures that lie definitely outside the superfluidity range. Orig. art. has: 4 figures and 7 formulas.

SUB CODE: 20/ SUBM DATE: 00/ ORIG REF: 015/ OTH REF: 018

UDC: 546.291 + 542.79

Card 1/1

L 15889-66 EWT(1)/EWT(m)/T/EWP(t) IJP(c) JD

ACC NR: AT6002491 SOURCE CODE: UR/0000/65/000/000/0001/0009

AUTHOR: Ginzburg, V. L.; Motulevich, G. P.; Pitayevskiy, L. P.

ORG: Physics Institute im. P. N. Lebedev (Fizicheskiy institut)

TITLE: Optical properties of polyvalent metals and interelectronic interaction

SOURCE: AN SSSR. Fizicheskiy institut. Doklady, 1965. Opticheskiye svoystva polivalentnykh metallov i mezhduelektronnoye vzaimodeystviye, 1-9

TOPIC TAGS: electron, gold, aluminum, tin, lead, electron interaction, metal crystal, permittivity, absorption band

ABSTRACT: In polyvalent metals (Al, Sn, Pb), on the one hand, the approximation of weakly bound electrons is adequate, but on the other hand, the concentration of optical electrons N_{opt} is much lower than that of valence electrons N_{val} (by definition, N_{opt} figures in the expression for the permittivity $\epsilon \simeq 4 \frac{e^2 N_{opt}}{m\omega^2}$ for optical frequencies ω lying outside the absorption band). This difference can be explained by the influence of interelectronic interaction, since in the theory of the Fermi liquid for crystalline metals $N_{opt} \neq N_{val}$. At the same time, for liquid metals, the equality $N_{opt} \simeq N_{val}$ should take place, and this is indeed observed in practice. Authors are grateful to M. Ya. Azbel' and D. Pays for

Card 1/2

L 15889-66

ACC NR: AT6002491

a discussion of the problems touched upon in the present note. Orig art. has: 2 tables and 5 formulas.

SUB CODE: 07, 20 SUBM DATE: none / ORIG REF: 013 / OTH REF: 004

Card 2/2

L 5339-66 EWT(l)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACCESSION NR: AP5021130 UR/0056/65/049/002/0647/0654

AUTHORS: Gurevich, A. V.; Pariyskaya, L. V.; Pitayevskiy, L. P.

TITLE: Self-similar motion of charged plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 647-654

TOPIC TAGS: plasma flow, plasma charged particle, plasma acceleration, plasma temperature

ABSTRACT: A nonlinear kinetic equation is obtained for the description of the self-similar motion of an electron-ion plasma in the absence of collisions. The results are used to determine the expansion of the plasma that occupies a half space and begins to expand into a vacuum at the initial instant of time. The density and the velocity distributions of the ions are obtained. It is shown that during the course of filling the rarefied half space, some of the ions are accelerated by the resulting electric field to velocities of

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L 5339-66

ACCESSION NR: AP5021130 2/

the order of the thermal velocity of the electrons. At the same time, the effective temperature of the ions drops sharply and turns out to be many times smaller than the electron temperature (in the case of identical temperatures in the initial plasma). The results of a numerical calculation are presented. 'The authors are grateful to A. A. Vedenov, V. L. Ginzburg, L. A. Rudakov, A. A. Rukhadze, and V. P. Silin for discussion.' Orig. art. has: 2 figures and 20 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR); Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physics Problems Academy of Sciences, SSSR)

SUBMITTED: 10Mar65 ENCL: 00 SUB CODE: ME

NR REF SOV: 008 OTHER: 001

Card 2/2

BOROVIK-ROMANOV, A.S. (Moskva); PITAYEVSKIY, L.P. (Moskva)

Soviet physi[illegible] awarded the Niels Bohr Gold Medal. Priroda 54
no.7:113-[illegible] (MIRA 18:10)

L 3676-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(b) JD

ACCESSION NR: AP5021885 UR/0020/65/163/006/1352/1355

AUTHORS: Ginsburg, V. L. (Corresponding member AN SSSR); Motulevich, G. P.; Pitayevskiy, L. P.

TITLE: Optical properties of polyvalent metals and interelectronic interaction

SOURCE: AN SSSR. Doklady, v. 163, no. 6, 1965, 1352-1355

TOPIC TAGS: Fermi surface, optical electron, valence electron, polyvalent metal, polyvalent metal electron

ABSTRACT: A critical examination of literature data pertaining to the ratio of optical electrons to valence electrons for Au, Ag, Al, Sn, and Pb is presented. The data are examined in terms of the Fermi surface integral

$$\oint v\,dS \simeq \frac{4\pi p_F^2}{m} \simeq \frac{3(2\pi\hbar)^3}{2m} N_{val},$$

where m and p_F are the mass and momentum on the Fermi surface of the free electron and N_{val} the number of valence electrons per cm^3. It is concluded that the observed decrease of N optical from N valence in Al, Sn, and Pb is most probably due to interelectronic interactions. However, two difficulties regarding the

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L 3676-66

ACCESSION NR: AP5021885

6

above explanation are noted. For all polyvalent metals, the number of optical electrons per atom n opt $\simeq$ 1, a fact the authors are unable to explain. The assumption that interelectron interaction exerts a strong influence on the ratio n_{opt}/n_{val} is not supported by any existing theoretical model. The authors thank M. Ya. Azbel' and D. Payns for their helpful criticism. Orig. art. has: 2 tables and 7 equations.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva, Akademii nauk SSSR (Physical Institute, Academy of Sciences, SSSR); Institut fizicheskikh problem, Akademii nauk SSSR (Institute for Physical Problems, Academy of Sciences, SSSR)

SUBMITTED: 04Jun65 ENCL: 00 SUB CODE: MM, OP

NO REF SOV: 013 OTHER: 004

Card 2/2

Pitayevskiy, L.P.

56-3-14/59

AUTHORS: Gor'kov, L.P., Pitayevskiy, L.P.

TITLE: The Scattering of Light in He^3 - He^4 Mixtures. (O rasseyanii sveta v smesyakh He^3 i He^4)

PERIODICAL. Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol.33, Nr 3, pp. 634-636 (USSR)

ABSTRACT. The scattering of light in He^3 - He^4 mixtures below the λ-point is theoretically treated. It is shown that the spectral decomposition of the scattered light contains 5 lines. For these lines formulae for the calculation of their intensity are given. The width of the lines can be estimated and for γ/c^2 near the critical point $\sim 10^{-9}$ is obtained, which is less than the distance between the lines of the inside doublet. There are 2 Slavic references

ASSOCIATION: Institute for Physical Problems AN USSR (Institut fizicheskikh problem Akademii nauk SSSR)

SUBMITTED. March 25, 1957

AVAILABLE. Library of Congress

Card 1/1

L 9983-65 EWT(l)/EWG(k)/EPA(sp)-2/EWG(v)/FCC/EEC-4/EPA(w)-2/EEC(t)/T/
EEC(b)-2/EWA(m)-2/EWA(h) Po-4/Pe-5/Pq-4/Pae-2/Peb/Pi-4/Pz-6/Pab-24 IJP(c)/SSD/
RAE(a)/ASD(d)/AFETR/ASD(f)-2/ESD(c)/AEDC(b)/AFWL/ESD(gs)/ESD(t)/ASD(a)-5 AT/GM/
ACCESSION NR: AP4046279 WS S/0203/64/004/005/0817/0824

AUTHOR: Gurevich, A. V.; Pitayevskiy, L. P.

TITLE: The supersonic motion of a body in plasma

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 5, 1964, 817-824

TOPIC TAGS: plasma, ionosphere, ionospheric charged particle, quasi-neutral plasma, plasma ion concentration

ABSTRACT: As a result of the disturbances in the density of electrons and ions caused by a body moving in plasma, there is a disruption of the quasi-neutral state of the plasma. As a result, an electric field arises which itself influences the distribution of charged particles. Therefore, a rigorous computation of the electron and ion distribution and the distribution of the electric field in the neighborhood of a moving body requires the joint solution of field equations and kinematic equations for the functions of particle distribution. This problem is difficult, but is simplified greatly by taking into account a number of specific circumstances which are usually associated with the motion of bodies (rockets, satellites) in the ionosphere. These circumstances are discussed in detail, with references to the most important papers which have been written on

Card 1/2

L 9983-65

ACCESSION NR: AP4046279

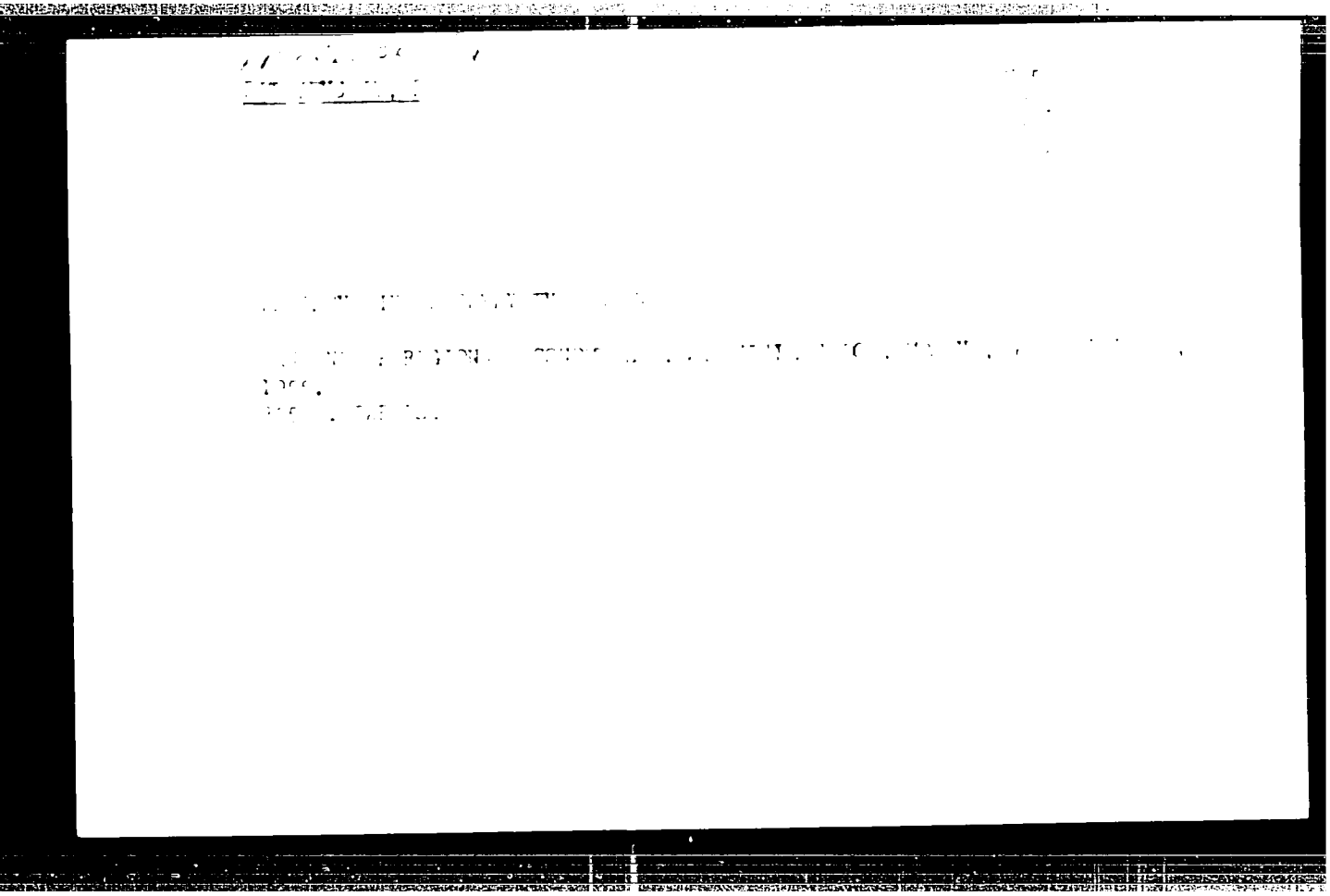
this subject (in particular, A. V. Gurevich, Iskusstvennyye sputniki Zemli, No. 7, Izd-vo AN SSSR, 1961, 101; L. P. Pitayevskiy and V. Z. Kresin, Zh. eksperim. i teor. fiziki, 1961, 40, 271; L. P. Pitayevskiy, Geomagn. i aeronomiya, 1961, 1, No. 1, 194). A simple expression is obtained for the electric field potential. Although in the first approximation the influence of the electric field on the motion of ions can be neglected, it is shown that, strictly speaking, this is true only in the region of concentration in front of the body. A dimensionless equation is derived describing the disturbance of the plasma behind the body. A similarity law is formulated for such motions. The article concludes with a discussion of the problem of electrons and ions which experience finite motion near the body, that is, particles trapped by the electric field in the neighborhood of the body. Orig. art. has: 39 formulas and 1 figure.

ASSOCIATION: Fizicheskiy Institut imeni Lebedeva AN SSSR (Lebedev Physics Institute, AN SSSR); Institut fizicheskikh problem AN SSSR (Institute of Physical Problems, AN SSSR)

SUBMITTED: 03May64 ENCL: 00 SUB CODE: ES

NO REF SOV: 013 OTHER: 001

Card 2/2



AVERKIYEV, A.S., red.; AGEYEV, Ye.P., dots., otv. red.; AREF'YEV, V.A., dots., kand. ekon. nauk, red.; DEMIDOV, S.F., akademik, red.; KARSHIN, V.Ye., dots., red.; KOGAN, A.Ya., starshiy prepodav., red.; MAKHALOV, V.I., starshiy prepodavatel', red.; PITAYEVSKIY, P.I., prof., red.; SLOBODIN, V.M., prof., red.; SHOLOKHOV, Ye.I., red.

[Problems in the new system of agricultural planning] Voprosy novogo poriadka planirovaniia sel'skogo khoziaistva; trudy. Kuibyshev, Kuibyshevskii planovoi in-t, 1961. 419 p. (MIRA 15:12)

1. Mezhvuzovskaya nauchnaya konferentsiya, Kuibyshev, 1960. 2. Zamestitel' predsedatelya Kuybyshevskoy oblastnoy komissii (for Averkiyev). 3. Kuybyshevskiy planovyy institut (for Ageyev, Makhalov, Karshin). 4. Deystvitel'nyy chlen Vsesoyuznoy akademii sel'skokhozyaystvennykh nauk imeni V.I.Lenina i Moskovskaya ordena Lenina sel'skokhozyaystvennaya akademiya imeni K.A.Timiryazev (for Demidov). 5. Ural'skiy filial Akademii nauk SSSR (for Slobodin). 6. Zamestitel' nachal'nika otdela sel'skogo khozyaystva i zagotovok Gosudarstvennogo planovogo komiteta Soveta Ministrov RSFSR (for Sholokhov).

(Agricultural policy)

AUTHORS: Lobachev, S.A., and [illegible]

TITLE: On Industrial Practice [illegible] Istvennoy Praktike

PERIODICAL: Vestnik Vysshey Shkoly [illegible], No. 1, page 4. USSR

ABSTRACT: The authors suggest that in the evening courses of industrial faculties, a practical training course be introduced: one of 2 weeks to familiarize the students with economic planning at the workshops, and one of a month to show them the enterprise's planning organization. The curricula of the evening courses and faculties of tuition by correspondence do not provide for any practical training as it is expected that the students acquire sufficient practical knowledge during their work. This is not applicable to some vuzes though, in particular, the economic ones with a yearly increasing number of correspondence students [illegible] enrolled in 19[illegible] for the evening courses of the [illegible] faculty of the Saratov Economic Institute, 40 were qualified workmen, 10 checkers, timekeepers, etc. with [illegible] economic experience. There were only a few bookkeepers, [illegible] and statisticians.

Card 1/2

On Industrial Practice

ASSOCIATION: Saratovskiy ekonomicheskiy institut Saratov Economic Institute

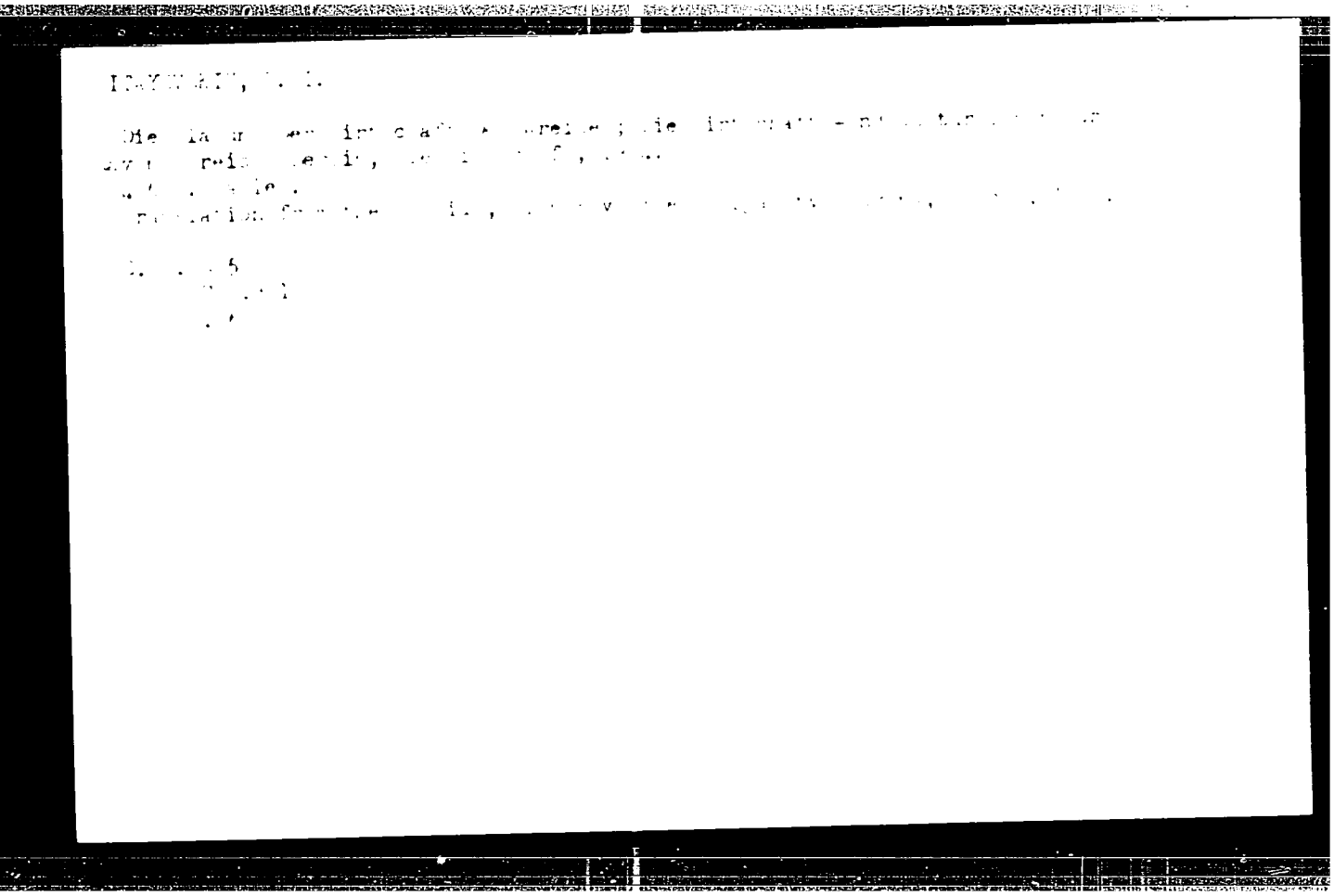
AVAILABLE: Library of Congress

Card 2/2

PITAVSKIY, P. I.

Planning the economy of a district, planning thelocal economy and the cultural construction for an administratice district; textbook(Kaluga) Gos. izd-vo Polit. lit-ry, 1952. 342 p. (52-17612)

HC335. P53



REISICH, A.; PITE, K.

Lethal poisoning by a choline preparation. Cas. lek. cesk. [illegible]
no.29-30:927-93[illegible] 17 July 59

1. Ustav pro soudni lekarstvi KU se sidlem v Plzni, prednosta doc.
dr. Jar. Jerie.
(CHOLINE, related cpds.)
(METHIONINE, related cpds.)

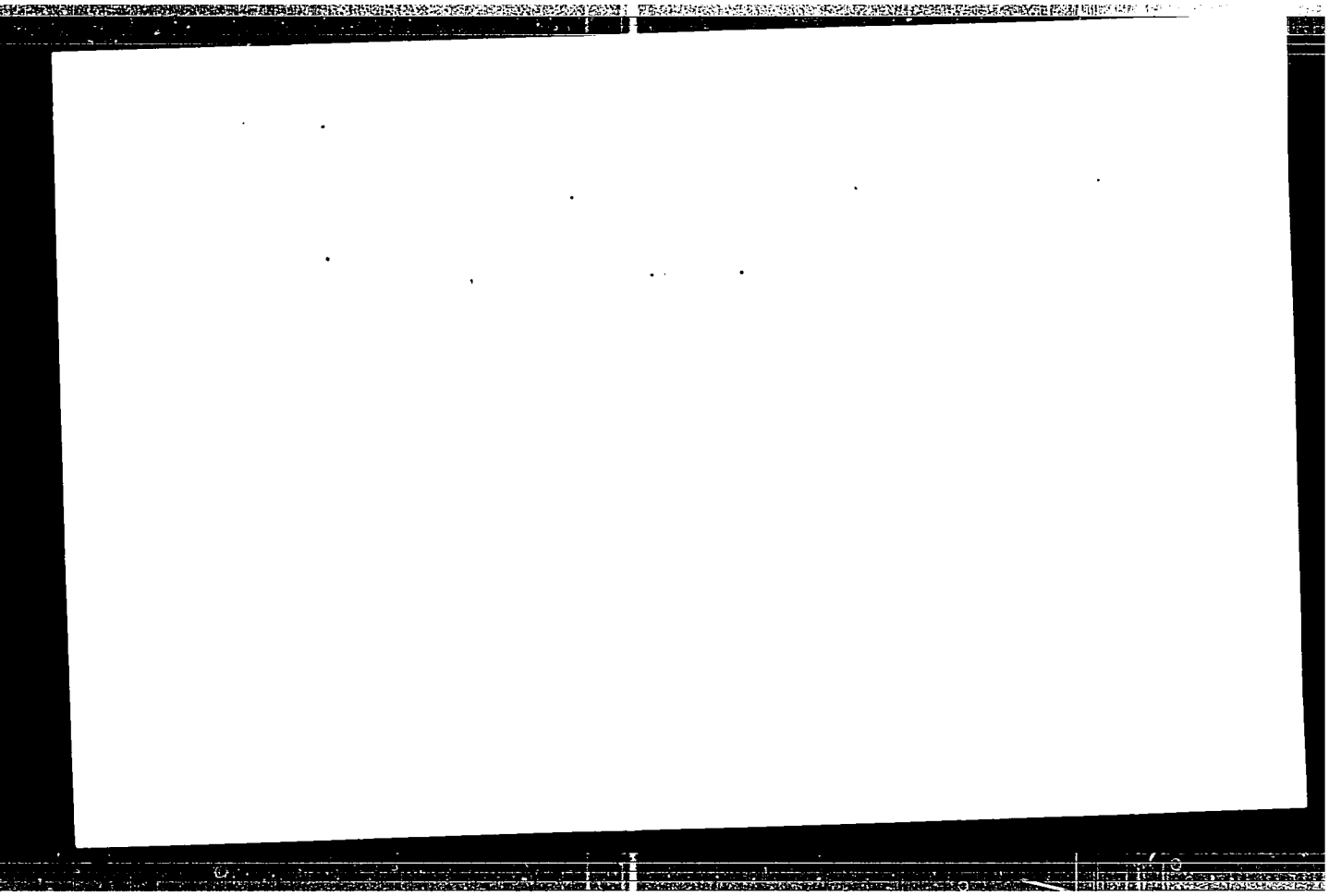
GAL.A, V.; COMES, V.; PITEA, I.

Investigations on vitamin A requirements during muscular exertion.
Rumanian M Rev. no.1:156-159 Ja-Mr '61.
(EXERTION physiology) (VITAMIN A metabolism)

POPPER, Ervin; GRECU, Ion; PITEA, Iulia; CHIOREAN, Lucia; GOCAN, Ileana

Contributions to the photometric determination of osmium.
Studii cerc chim 12 no.5:387-391 '64

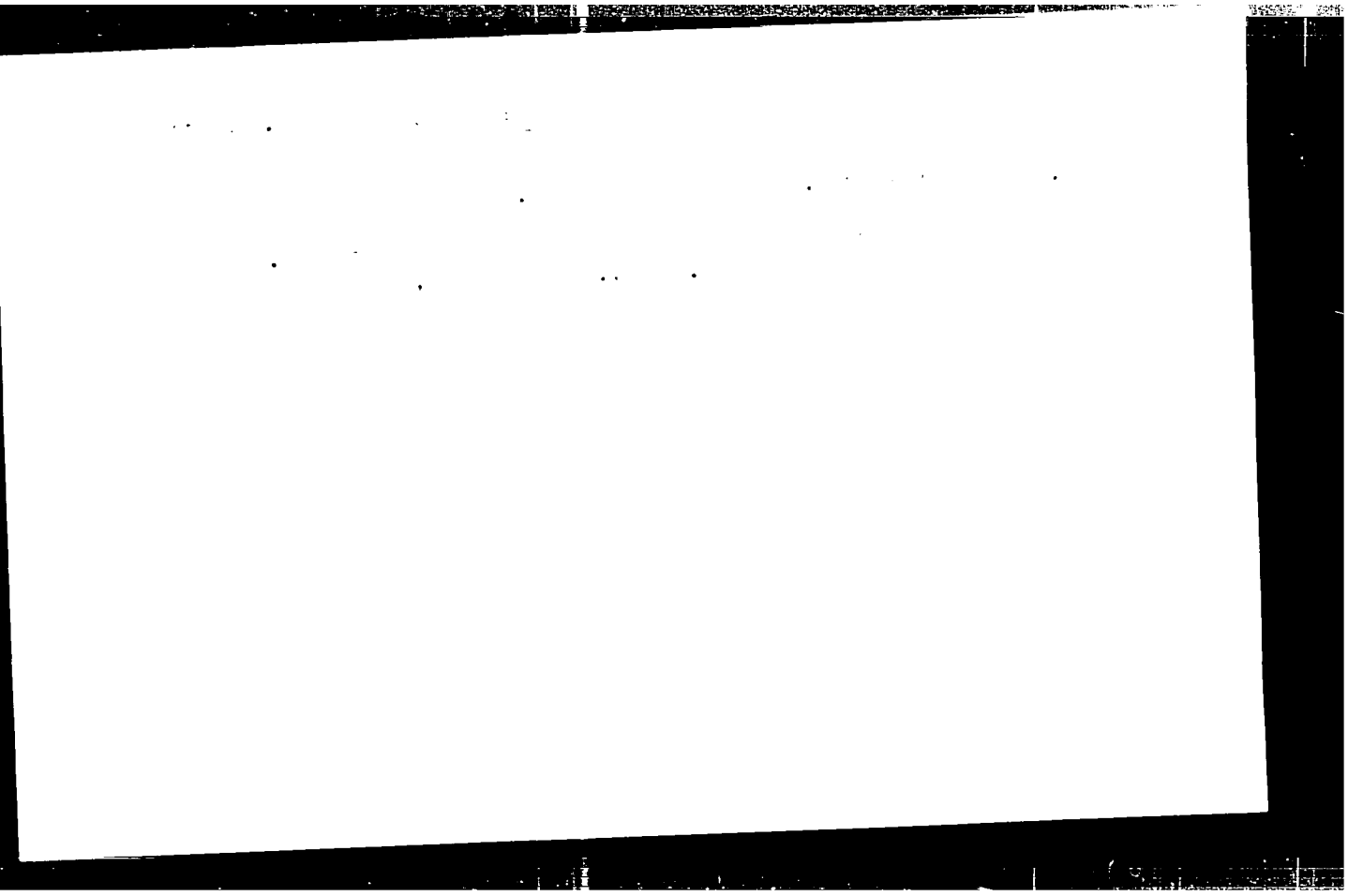
1. Chair of Analytical, Faculty of Pharmacy, Medico-pharmaceutical Institute, Republicii St., no.12, Cluj.



POPPE, E.; GEORGEAN, Lucia, LUTA, Iulia

Photocolorimetric dosing method of microquantities of trivalent gold with p-dimethylaminobenzylidenerhodanine. Studii cerc chim 13 no.1:93-96 C '64.

1. Laboratory of Analytic Chemistry, Institute of Medicine and Pharmacy, [illegible] Street.



POPPEP, F.; CHIORLAN, Lucia, PITTA, Iulia

Photocolorimetric dosing method of microquantities of trivalent gold with p-aminohippuric acid. Studii cerc chim 13 no.10:693-696 0 '64.

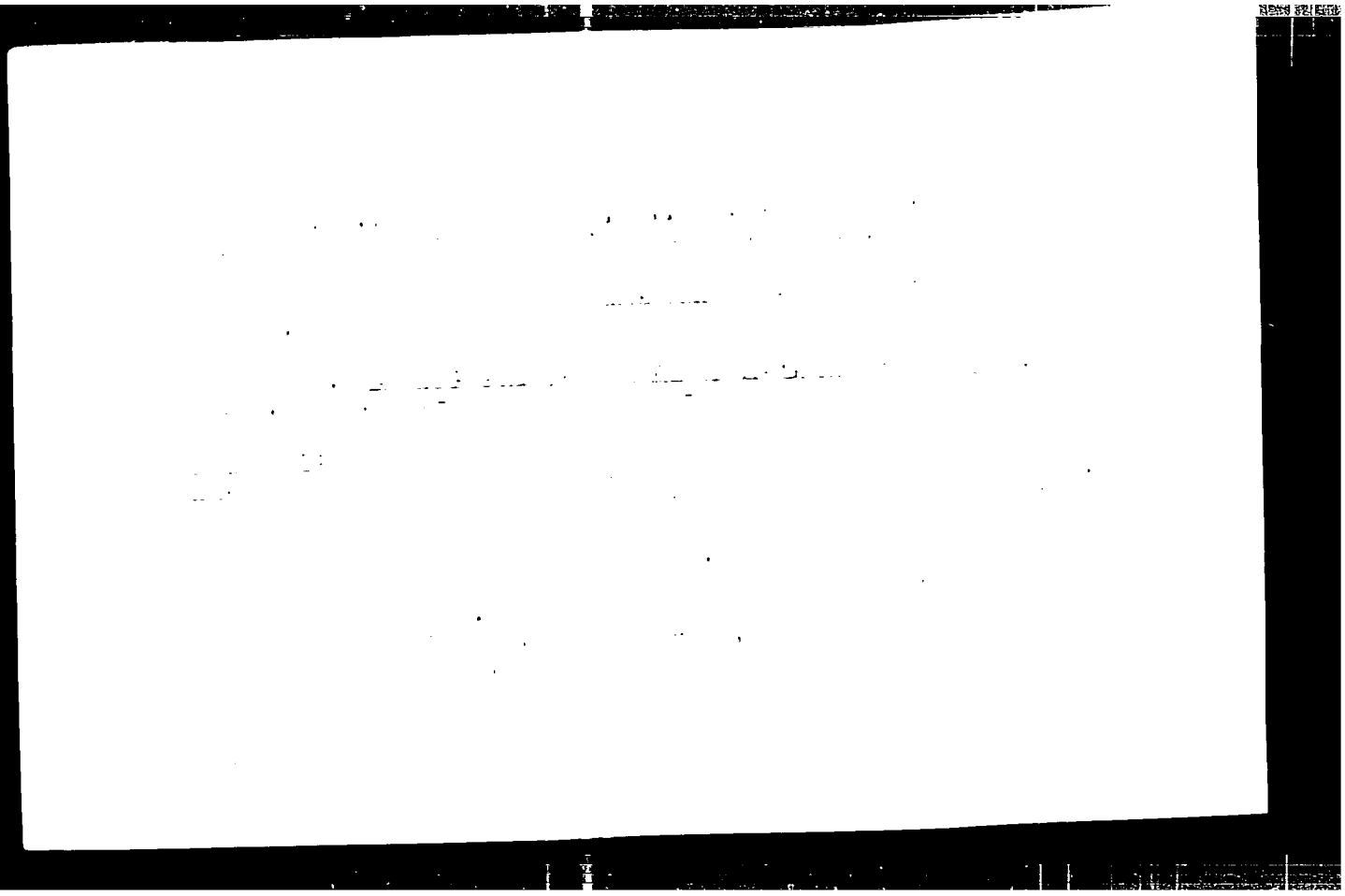
1. Laboratory of Analytic Chemistry, Institute of Medicine and Pharmacy, Cluj, 6 Pasteur Street.

MOGA, A. P.TKA, P.; MISSITS, P.; UZA, Gh.; ZAHAN, M.; CUCUIANU, M.

The influence of salt-free diet and diuretic therapy on serum lipids in arteriosclerosis. Stud. cercet. med. intern. 6 no.3: 269-277 '65.

MOGA, A., acad.; PITEA, [illegible]

Obesity and chronic degenerative diseases. [illegible] cercet. endocr. 16 no.3:[illegible]3[illegible]-24. [illegible].



MOGA, A., acad.; PITEA, P., dr.; COFARU, D. dr.

Concerning clinical and etiopathogenetic correlations in hypertensive disease. Med inter 15 no. 5:573-579 My '63.
(HYPERTENSION) (OBESITY) (DIABETES MELLITUS)
(ARTERIOSCLEROSIS)(PEPTIC ULCER)
(LIPID METABOLISM DISORDERS)
(CARBOHYDRATE METABOLISM DISORDERS) (STRESS)

PITEA, P., dr.; [illegible], M., dr.; MOGA, A., acad.; MISSITS, P., dr.

On the significance of the serum glycoprotein changes in vascular diseases. Med. intern. 15 no.6:729-737 Je '63.

1. Lucrare din Clinica I medicala, I.M.F., Cluj (director: acad. A. Moga).
(ARTERIOSCLEROSIS) (BLOOD PROTEINS)
(GLYCOPROTEINS) (MUCOPROTEINS)

BACIU, I.; NEUMANN, E.; DOROFTEIU, M.; PITEA, P.

On the stimulation of erythropoiesis through hypoxia. Rumanian M. Rev. 2 no.1:14-15 Jan-Mar 58.

(ERYTHROCYTES
erythropoiesis stimulation by anoxia in rats)

(ANOXIA, experimental
stimulation of erythropoiesis in rats)

RUMANIA / General Problems of Pathology. Allergy. U

Abs Jour: Ref Zhur-Biol., No 11, 1958, 51523.

Author : Moga, A., Pitea, P.
Inst : Rumanian Academy.
Title : Vasometer Investigations in the Therapy of Bronchial Asthma.

Orig Pub: Studii si cercetari med. Acad. RPR Fil. Chy, 1956, 7, No 1-4, 139-149.

Abstract: No abstract.

Card 1/1

PAUR, A., conf.; PITEA, P., dr.

Investigations in lambliasis. Med. intern., Bucur 13 no.1:65-70 Ja '61.

1. Lucrare efectuata in Clinica I medicala I.M.F., Cluj, director: acad. A. Moga.

(GIARDIASIS physiology) (ADRENAL CORTEX physiology)
(ELECTROLYTES blood) (NERVOUS SYSTEM physiology)
(QUINACRINE pharmacology)

PITEA, P. , dir.; CAPUSAN, I., conf.

Peripheral circulatory changes in scleroderma. Med. intern. (Bucur.) 16 no.5:575-580 My '64

1. Lucrare efectuata in Clinica I medicala, Cluj (director: acad. A. Moga) si Clinica de dermatologie (prof. P.Tirlea)

RUMANIA / Human and Animal Physiology. Blood Circu- T
lation.. The Vessels.

Abs Jour: Ref Zhur-Biol., No 2., 1958, 101883.

Author : Baciu, L.; Pitea, P.; Baciu, Tr.
Inst : Rumanian AS, Cluj Affiliate.
Title : An Adrenalin Test for Investigation of Vasomotor Centers.

Orig Pub: Studii si cercetari stiint. Acad. RPR Fil. Cluj, 1955, Ser. 2, 6, No 1-2, 123-132.

Abstract: A small dose of adrenalin (12.5 gamma/kg), introduced subcutaneously, induces only small peripheral changes noted objectively and subjectively. In 11 test subjects, unconditioned and conditioned vascular reflexes to heat and cold stimuli were registered with the aid of a digital plethysmograph.

Card 1/2

35

R[illegible]. General Problems of Path[illegible]y - Allergy. U

Abs. Jour : Ref Z[illegible] Bi[illegible] N[illegible], 1959, [illegible]

Author : F[illegible], Piten, P., O[illegible], I., [illegible]ciu, I.

Inst : -

Title : Pat[illegible]physiological and Therapeutic Studies of Allergic Injuries of the Ski[illegible]

Orig Pub : Med. [illegible]tern. 19[illegible] [illegible], [illegible] 2[illegible] [illegible]-267

Abstract : A [illegible] of activity of the vessels was established with the aid of plethysmography in patients with allergic in- juries of the skin. N[illegible]alizati[illegible] of the vas[illegible] reac- ti[illegible] coincided with clinical improvement following a course of therapy with [illegible]promazine.

Card 1/1

MOGA, A.; PRODAN, L.; PITEA, P.

Role of environmental factors in etiology and pathogenesis of rheumatism; rheumatism in the leather-goods and shoe industry. Probl. reumat., Bucur. 3:81-93 1955.

(OCCUPATIONAL DISEASES
rheum. in leather-goods & shoes indust. workers, etiol.)
(RHEUMATISM
in workers of leather-goods & shoe indust., etiol.)

NANA, A.; MINCIOIU, C.; [illegible], E.; POP[illegible] D.; PI[illegible], I.; ZAG[illegible], I.

Adaptation of the heart in shock. (Role of cardiac innervation in maintenance of hemodynamic equilibrium). Rev. sci. med. 6 no.3/4: 169-172 '61.

(SHOCK physiology) (HEART physiology)
(BLOOD CIRCULATION) (NERVOUS SYSTEM physiology)

PITEA, P., dr.; CUCUIANU, M., dr.; BELASCU, M., extern

Considerations on an unusual case of dermatomyositis. Med. intern. 13 no.12:1703-1706 D '61.

1. Lucrare efectuata in Clinica I medicala, Cluj, director acad. A. Moga.

(DERMATOMYOSITIS case reports)

PITEKOWNA, Irena

KURYLO-BOROWSKA, Zofia; PITEKOWNA, Irena

Effect of various conditions of drying on vitality of certain strains of bacteria. Bull. State Inst. Marine Trop. M. Gdansk Vol.5:101-109 1953.

1. Z Panstwowego Instytutu Medycyny Morskiej i Tropikalnej w Gdansku.

(BACTERIA,
*freeze-drying, eff. on vitality)

SKVORTSOV, Boris Sergeyevich; ITEL', E.S., inzh., otv. red.; ABRAMOV, V.I., red. izd-va; MINSKER, L.I., tekhn. red.

[Reading electric schematics of mine electric installations] Chtenie elektricheskikh skhem shakhtnykh elektroustanovok. Moskva, Gosgortekhizdat, 1962. 210 p. (MIRA 15:10)
(Electricity in mining)

PITKL', N. Ya.

Effect of iodine treatment on lipoid, protein and lipoprotein blood fractions and basal metabolism in atherosclerosis. Terap. arkh. 34 no.4:53-57 '62. (MIRA 15:6)

1. Iz fakul'tetskoy terapevticheskoy kliniki (zav. - prof. A. A. Kedrov) Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta.

(ARTERIOSCLEROSIS) (IODINE—THERAPEUTIC USE)
(BLOOD PROTEINS) (BASAL METABOLISM)

L 36466-66 EWT(1) JM/GD

ACC NR: AT6022254 SOURCE CODE: UR/0000/66/000/000/0028/0033

AUTHOR: Petrov, D. M.; Pitelin, A. P.

44
13+1

ORG: none

TITLE: Mutual synchronization of reflex klystrons with strong coupling between the resonators

SOURCE: Vsesoyuznaya nauchnaya sessiya, posvyashchennaya Dnyu radio. 22d, 1966. Sektsiya elektroniki. Doklady. Moscow, 1966, 28-33

TOPIC TAGS: klystron, reflex klystron, ELECTRONIC CIRCUIT

ABSTRACT: An analysis was made of the conditions of mutual synchronization of several reflex klystrons by considering a system of n coupled resonators with n klystrons as a system of n coupled circuits with lumped parameters L, C, R. Several expressions are presented describing, under certain conditions, both the existence and the form of the oscillations and the law governing their onset in a system with n degrees of freedom. Equations were derived for determining the natural frequency of the system, and the voltage amplitude in the klystron gaps. These expressions were then used to study the problem of mutual synchronization, taking as an example a system of two klystrons coupled through an intermediate resonator. The results indicate that the steady-state operating conditions of a system of several klystrons with strong coupling

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L 36466-66
ACC NR: AT6022254

between resonators can be considered to be the same as those of a single klystron with several electron fluxes. A decrease in the output power caused by the failure of one or more klystrons is, under certain conditions, equal to a decrease in the total current represented by the sum of the currents in the klystrons out of service. If the fluctuations in the power sources are not correlated, then the frequency instability is n_k times (n_k - number of klystrons) below the instability of a single klystron under the same steady-state operating conditions as in the case of mutual synchronization. Orig. art. has: 1 figure and 9 formulas. [JR]

SUB CODE: 09/ SUBM DATE: 09Apr66/ ORIG REF: 002/ ATD PRESS: 5040

Card 2/2

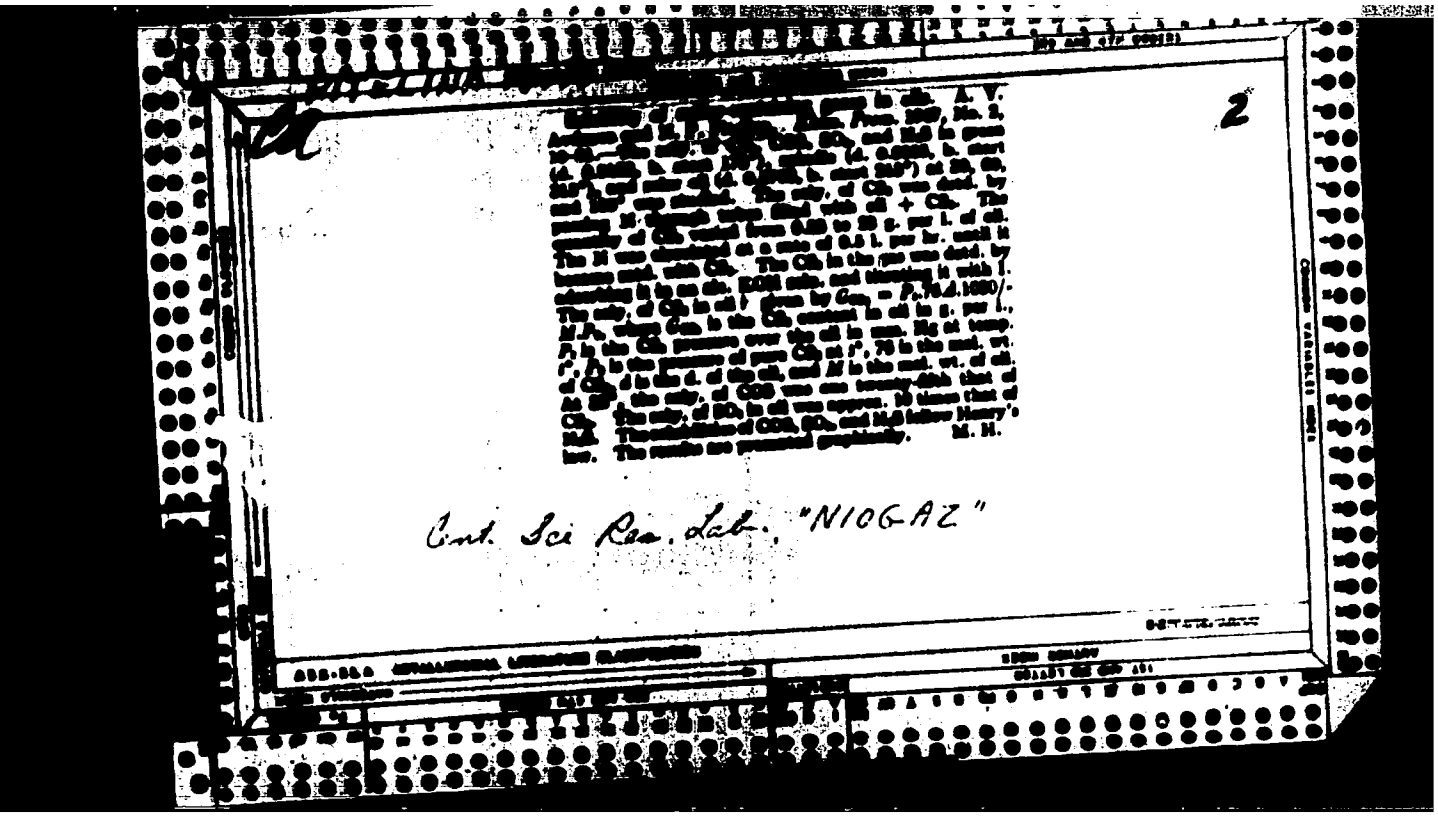
PITELIN, V.P., inzh.

Meeting on the exchange of work experience. Elek.sta. 31 no.4:94-95 Ap '60. (MIRA 13:7)
(Electric power production)

PITELINA, N.P.; KRASOVITSKIY, Yu.V.

Mechanism of action of a layered granular filter. Inzh.-fiz.zhur. 5 no.4:54-57 Ap '62. (MIRA 15:4)

1. Institut po promyshlennoy i sanitarnoy ochistke gazov, Moskva.
(Filters and filtration)



PITELINA, N. I. N. P.

"Sol[illegible] [illegible] in M[illegible]." T[illegible] [illegible]
[illegible] Fe[illegible], [illegible] Fertilizers and Insect[illegible] (Head [illegible]
Sa[illegible]v, Ministry [illegible] (USSR)

Summary [illegible], Dissertation presented [illegible] in [illegible]
in [illegible] in [illegible]. From [illegible]

APPROVED FOR RELEASE: Tuesday, August 01, 2000 CIA-RDP86-00513R0013411

AID P -

Subject : USSR/Medicine

Card 1/1 Pub. 37

Author : Pitelina, N. P., Kand. Tech. Sci.

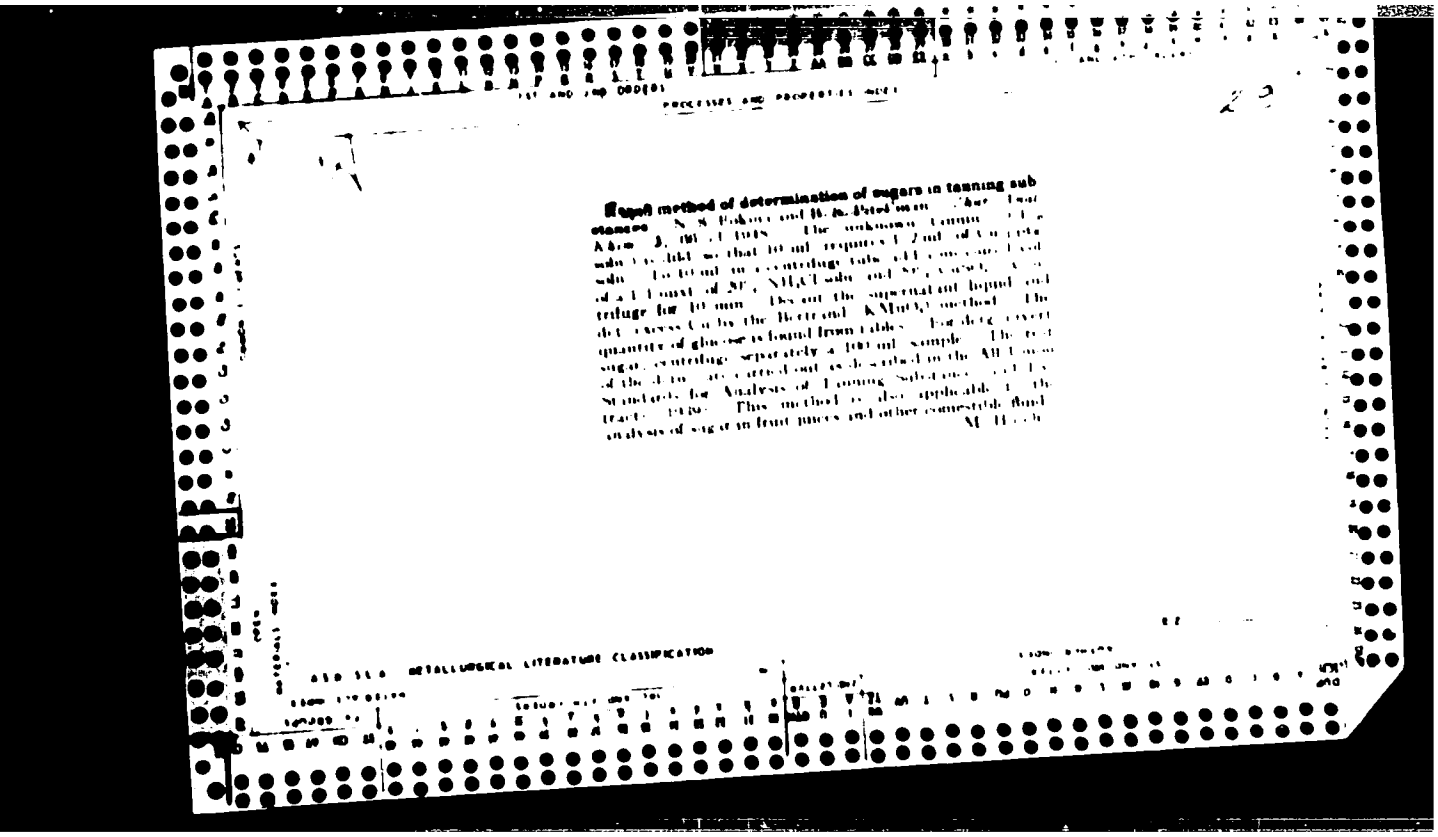
Title : Conference on Problems of Dust-Catching

Periodical : Gig. i san., 12, 47-48, D 1955

Abstract : Describes the work of the Conference in Moscow, March 22-24, 1955, in which 74 organizations from Moscow, Leningrad, Kiev, and other Soviet cities participated.

Institution : None

Submitted : No date



YUGOSLAVIA

PITELJ, Anton; RJABINSKIJ, Vladimir and RODOMAN, Vladimir; Urology Clinic of the Second Moscow Medical Institute "Nikolaj I. Pirogov" [original affiliation not shown], Director Prof Anton PITELJ, Moscow, U.S.S.R.

"The Use of Triphenyltetrazoliumchloride Test in the Determination of Bacteriuria."

Belgrade, Srpski Arkhiv za Tselokupno Lekarstvo, Vol 93, No 4, Apr 1965; pp 345-351.

Abstract [English summary modified]: Use of the triphenyltetrazolium-chloride test for the detection of urinary tract infection in 407 tests on 197 patients, compared with urine culture results revealed that 9 hours' incubation prior to read-out then another supplemental read-out 6 hours later is more valid if the threshold of urinary tract infection is considered to be 100,000 microbes per ml. Data also on use of the test in 149 obstetric and gynecologic, and 89 strictly gynecologic patients. Chemical structure of reagent, 7 Soviet and 19 Western references; manuscript received 6 May 65 [Sic].

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L 3624-66 EWT(1)/FS(v)-3 DD

ACCESSION NR: AP5023674 UR/0219/65/060/009/0055/0059
616.33-002.44-02 : 617.551 -001.22]-092.9

AUTHOR: Pitenin, I. V.; Subbota, A. G. 42 41 8

TITLE: The formation of ulcers in rabbits exposed to UHF irradiation of the epigastral region

SOURCE: Byulleten' eksperimental'noy biologii i meditsiny, v. 60, no. 9, 1965, 55-59

TOPIC TAGS: animal physiology, microwave, UHF, biological effect, gastric ulcer, histology, rabbit

ABSTRACT: The purpose of this study was to establish whether microwaves (UHF) of nonthermal intensity can produce pathological changes in the GI tract. Rabbits weighing 1.8—2.5 kg were fixed stomach-up on a stand at a distance of 10 cm from the cylindrical irradiator of a Luch-58 generator. The duration of exposure was 10 min, wavelength — 12.6 cm, and field flux density — 70, 110, and 160 mw/cm^2. The absence of a thermal effect was established by introducing a pouch filled with 20 ml of water with a temperature of 35C in the stomach of unfed rabbits and measuring the temperature after 20 min of irradiation. It was found that 40.5C was the maximum heat produced by microwaves. Rectal and epigastral (3—4 mm

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ACCESSION NR: AP5023674

deep) temperatures were also taken before and after irradiation. All irradiated rabbits were killed after 2, 10, 20, and 24 days for pathoanatomical examination. In all, 91 rabbits were studied. Anatomical investigations revealed ulcers in the mucosal membrane of the stomach. The muscular, serous layers, and abdominal wall through which microwaves passed were frequently undamaged. The ulcers were located in the irradiated portion of the stomach and were round or oval (0.3—3 cm), with dark red edges. Microscopic investigations revealed limited necrosis of the mucosa and mild leukocytic reactions. The vasculature of the stomach was distended and filled with blood. In general, the histological structures of microwave-induced ulcers were similar to chronic human ulcers. A table of the dependence of the incidence of ulcers on generator power and other conditions shows that at a generator power of 60 w, ulcers developed in unfed rabbits and those repeatedly irradiated once per day. At 80 w, injury to mucosa occurred more frequently and did not depend upon feeding conditions. A power of 100 w was critical, and some animals died. The fact that ulcers did not develop consistently was attributed to a total screening effect by the liver in some animals. It was concluded that the mechanism of microwave injury to stomach mucosa was unclear. The following hypotheses were offered: first, injuries may have taken place due to the highly convoluted configuration of the mucosa and the presence of gastric juices. Secondly, the mucosa histologically differs from serous and muscular layers, and

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L 3624-66

ACCESSION NR: AP5023674

it is known that young cells, which are more numerous in this layer than in the others, are more sensitive to UHF than mature cells. Thus, the mechanism of UHF induction of ulcers might be the physiological inhibition of normal regenerative processes in the mucosa. Finally, it is possible that the resistance of the stomach to self-digestion is directly or indirectly disrupted by UHF due to more intensive heating. Orig. art. has: 1 table and 3 figures.

[CD]

ASSOCIATION: Voyenno-meditsinskaya ordena Lenina akademiya im. S. M. Kirova, Leningrad (Military Medical Academy)

SUBMITTED: 12Mar64 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 001 ATD PRESS: 4114

Card 3/3

PITENIN, I.V.; SUBBOTA, A.G.

Formation of gastric ulcer in rabbits under the effect of superhigh frequency irradiation of the epigastric region of the abdomen. Biul. eksp. biol. i med. 60 no.9:55-59 S '65.
(MIRA 18:10)

1. Voyenno-meditsinskaya ordena Lenina akademiya imeni Kirova; nauchnyy rukovoditel' laboratorii - deystvitel'nyy chlen AMN SSSR prof. I.R. Petrov, Leningrad.

PITENKO, N.P., dotsent.

Odontogenic suppurative mediastinitis. Stomatologiia no.2:47 Mr-Ap '5-.
(MLRA 7:4)

1. Iz kafedry bolezney ukha, gorla i nosa Severo-Osetinskogo meditsinskogo instituta. (Mediastinum--Diseases)

PITENKO, N.F., dotsent

Congenital abnormality of the esophagus. Vest.oto-rin. 17 no.2:79-80 Mr-Ap '55. (MLRA 8:7)

1. Iz kliniki bolezney ukha, gorla i nosa Severo-Osetinskogo meditsinskogo instituta (Dzvaudzhikau).

(ESOPHAGUS, fistula,
tracheo-esophageal, congen. in adult)
(TRACHEA, fistula,
tracheo-esophageal, congen. in adult)
(FISTULA,
tracheo-esophageal, congen. in adult)

PITENKO, N. F., and SHUTOV, A. I., ZAGALOVA, P.I., and IONESUAN, A. S.

"Condition of the Upper Respiratory Tract in Workers of the Electrolytic Shop of 'Elektrotsink' Plant," by Docent N. F Pitenko and Clinical Physicians A. I. Shutov, I. I. Zagalova, and A. S. Ionesuan, Ear, Throat, and Nose Clinic, Severo Otinskiy Medical Institute, Gigiyena i Sanitariya, Moscow, Vol 21, No 12, Dec 56, pp 43-47

The authors report the results of medical examinations of a number of workers employed at the electrolytic shop of "Elektrotsink" plant who complained of diseases of the upper respiratory passages. The examinations revealed serious affections of the passages nosebleeds, ulcerations of the mucous membrane, perforations of the nasal diaphragm, and others, all undoubtedly caused by pungent substances which contaminated the atmosphere in the shop. The shop, it was found, had a large number of electrolytic baths filled with a neutral solution of neutral zinc sulfate. In the course of the electrolytic process, gas bubbles containing toxic substances are formed and evaporate forming a pungent fog which contaminates the atmosphere in the shop. In addition, it is thought that fluorite compounds which are present in the electrolytes in some quantities play their part in causing the affections.

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