$$\frac{1}{\sqrt{2\pi}}\sum_{\gamma=1}^{4}\frac{\omega_{0\gamma}^2}{\omega v_{T\gamma}^3}\int\frac{u(u-v_\gamma)\exp\left[-\frac{1}{2}\left(\frac{u-v_{0\gamma}}{v_{T\gamma}}\right)^2\right]}{\omega-ku+iv_\gamma}du-1=0, \quad (1.1) \qquad (1.1)$$

$$\frac{1}{\sqrt{2\pi}}\sum_{\gamma=1}^{4}\frac{\omega_{0\gamma}^2(\omega-kv_{0\gamma})}{v_{T\gamma}}\int\frac{\exp\left[-\frac{1}{2}\left(\frac{u-v_{0\gamma}}{v_{T\gamma}}\right)^2\right]}{\omega-ku\pm\omega_{H\gamma}+iv_\gamma}du=c^2k^2-\omega^2. \quad (1.2)$$

one obtains, with $\omega_{0\gamma}^2 = 4\pi N_\gamma e^2/m_\gamma$; $v_{T\gamma}^2 = T_\gamma/M_\gamma$ (1.2)

$$1+\sum_{\gamma=1}^{4}\frac{\omega_{0\gamma}^3}{k^2v_{T\gamma}^2}\left[1-\frac{\omega-kv_{0\gamma}}{kv_{T\gamma}}B(\beta_\gamma)\right]=0, \quad (1.3)$$

for longitudinal waves, and (1.3)

$$1+\sum_{\gamma=1}^{4}\frac{\omega_{0\gamma}^2(\omega-kv_{0\gamma})}{(c^2k^2-\omega^2)kv_{T\gamma}}B(\beta_\gamma)=0, \quad (1.4)$$

Card 3/12 (1.4), where

$$B(\beta_\gamma) = e^{-\beta_\gamma^2/2} \int_{i\infty}^{\beta_\gamma} e^{x^2/2}\, dx, \qquad \beta_\gamma = \frac{\omega - k v_{0\gamma} \mp \omega_{H\gamma}}{k v_{T\gamma}}. \tag{1.5}$$

for transverse waves. In limit cases (1.5)

$$B(\beta_\gamma) \approx -i\sqrt{\pi/2}\, e^{-\beta_\gamma^2/2} + \beta_\gamma - \frac{1}{3}\beta_\gamma^3 + \ldots \quad (|\beta_\gamma| \ll 1),$$

$$B(\beta_\gamma) \approx -i\sqrt{\pi/2}\, e^{-\beta_\gamma^2/2} + \beta_\gamma^{-1} + \beta_\gamma^{-3} + \ldots \quad (|\beta_\gamma| \gg 1). \tag{1.6}$$

holds. Here, e is the electron (or ion) charge, m and M are the masses, (1.6)
v_0 is the mean velocity of particles of a given kind in the laboratory system, N_γ, ν_γ, T_γ are the concentration, collision number, and temperature of the kind of particle, ω the frequency, k the wave number; γ = 1,2,3,4 refers to electrons and ions of the plasma and of the particle beam, respectively. $\omega_{H1} = \omega_{H3} \equiv -\Omega_H = -eH_0/mc$ and

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$\omega_{H2} = \omega_{H4} = \omega_H = eH_0/mc$. Section 2 offers a consideration of the instability with respect to transverse disturbances for the case of the effect of the thermal motion of the beam particles and of the plasma being negligible ($|\beta_y| \gg 1$). The dispersion equation

$$\frac{\omega_{01}^2\omega}{\omega \pm \Omega_H} + \frac{\omega_{02}^2(\omega - kv_{02})}{\omega \mp \omega_H - kv_{02}} + \frac{\omega_{03}^2(\omega - kv_{03})}{\omega \pm \Omega_H - kv_{03}} + \frac{\omega_{04}^2(\omega - kv_{04})}{\omega \mp \omega_H - kv_{04}} = \omega^2 - c^2k^2. \quad (2.2)$$

is first transformed into

$$(\omega + \Omega_{II} - kv_{03})\left[\frac{\omega_{01}^2\omega}{\omega + \Omega_{II}} + \frac{\omega_{03}^2(\omega - kv_{03})}{\omega - \omega_{II} - kv_{03}} + c^2k^2 - \omega^2\right] = -\omega_{03}^2(\omega - kv_{03}). \quad (2.5),$$

which holds for a quasineutral system ($N_2 = N_1 + N_3$), if $N_3 \ll N_2$. (2.5) is satisfied at $\omega^{(0)} + \Omega_H - kv_{03} = 0$, or

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$$\frac{\omega_{01}^2\omega^{(0)}}{\omega^{(0)}+\Omega_H}+\frac{\omega_{02}^2(\omega^{(0)}-kv_{03})}{\omega^{(0)}-\omega_H-kv_{03}}+c^2k^2-\omega^{(0)2}=0 \qquad (2.7)$$

If $\omega - kv_{03} \ll \Omega_H$, $\omega \ll \Omega_H$, $\omega_{01}^2/\Omega_H^2 \gg 1$, the dispersion equation (2.7) will read

$$\omega_{01}^2\omega^2/\Omega_H^2+\omega_{03}^2(\omega-kv_{03})^2/\Omega^2{}_H-c^2k^2=0, \qquad (2.12)$$

and an instability will appear if (2.12),

$$v_{03} > H_0/\sqrt{4\pi MN_{эфф}}, \quad N_{эфф}=\sqrt{N_1N_3/(N_1+N_3)}. \qquad (2.13)$$

If the particle flux is small, and if $N_1 = N_2 + N_4$, $N_2 \gg N_4$, $N_3 = 0$, (2.13) and $\omega \ll \omega_H$, relation .

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$$\frac{\omega_{01}^2\,\omega}{\omega \pm \Omega_H} + \frac{\omega_{02}^2\,(\omega + kv_{02})}{\omega \mp \omega_H - kv_{02}} + \frac{\omega_{04}^2\,(\omega - kv_{04})}{\omega \mp \omega_H - kv_{04}} = \omega^2 - c^2k^2. \qquad (2.16)$$

will hold. Section 3 of the paper deals with the effect of a thermal motion. The plasma is assumed to be again quasineutral, and the distribution functions to be isotropic.

$$-\frac{\omega_{02}^2\,\omega^2}{\omega_H(\omega + \Omega_H)} + \omega_{03}^2(\omega - kv_0)\left[\frac{\omega - kv_0 + \Omega_H}{(kv_{T3})^2} - \frac{1}{\Omega_H}\right] + c^2k^2 - \omega^2 =$$

$$= i\sqrt{\frac{\pi}{2}}\left\{\frac{\omega_{01}^2\,\omega}{kv_{T1}}\left[\exp\left\{-\frac{1}{2}\left(\frac{\omega + \Omega_H}{kv_{T1}}\right)^2\right\} + \sqrt{\frac{T_1M}{T_2m}}\exp\left\{-\frac{1}{2}\left(\frac{\omega - \omega_H}{kv_{T2}}\right)^2\right\}\right] + \right.$$

$$\left. + \frac{\omega_{03}^2\,(\omega - kv_0)}{kv_{T3}}\left[1 + \sqrt{\frac{T_3M}{T_4m}}\exp\left\{-\frac{1}{2}\left(\frac{\omega - \omega_H - kv_0}{kv_{T4}}\right)^2\right\}\right]\right\}; \qquad (3.5)$$

is obtained, which, by way of (3.5)

$$\sqrt{\frac{T_3M}{T_4m}}\left|\exp\left\{-\frac{1}{2}\left(\frac{\omega-\omega_H-kv_0}{kv_{T_4}}\right)^2\right\}\right|\leqslant 1,$$

$$\frac{\omega_{03}^2|\omega-kv_0|}{v_{T_3}}\geqslant\frac{\omega_{01}^2}{v_{T_1}}\left|\omega\left\{\exp\left[-\frac{1}{2}\left(\frac{\omega+\Omega_H}{kv_{T_1}}\right)^2\right]+\right.\right.$$

$$\left.\left.+\sqrt{\frac{T_1M}{T_2m}}\exp\left[-\frac{1}{2}\left(\frac{\omega-\omega_H}{kv_{T_2}}\right)^2\right]\right\}\right|. \qquad (3.6)$$

can be simplified to (3.6),

$$\frac{\mu}{\omega_1}\left\{\frac{\omega_{02}^2}{\omega_H}\frac{\omega_1^2+\mu^2+2\omega_1\Omega_H}{\mu^2+(\omega_1+\Omega_H)^2}+\omega_{03}^2\left[\frac{1}{\Omega_H}-\frac{2\omega_1-2kv_0+\Omega_H}{(kv_{T_3})^2}\right]\right\}=$$

$$=-\sqrt{\frac{\pi}{2}}\frac{\omega_{03}^2(\omega_1-kv_0)}{\omega_1kv_{T_3}}, \qquad (3.7)$$

$\mu = \mathrm{Im}\,\omega$, $\omega_1 = \mathrm{Re}\,\omega$

Card 8/12 (3.7).

Here again, special cases are discussed. Thus, e.g., if $|\omega - \Omega_H| \ll kv_{T_1}$ and

$$|\omega + \omega_H| \gg kv_{T_2}, \quad |\omega - kv_0 - \Omega_H| \gg kv_{T_3}, \quad |\omega + \omega_H - kv_0| \ll kv_{T_4}. \tag{3.16}$$

hold,

$$\frac{\omega_{01}^2\,\omega}{kv_{T_1}}\left\{-i\sqrt{\frac{\pi}{2}}+\frac{\omega-\Omega_H}{kv_{T_1}}\right\}+\frac{\omega_{02}^2\,\omega}{kv_{T_2}}\left\{-i\sqrt{\frac{\pi}{2}}\,e^{-\beta_2^2/2}+\frac{kv_{T_2}}{\omega+\omega_H}\right\}+$$
$$+\frac{\omega_{03}^2\,(\omega-kv_0)}{kv_{T_3}}\left\{-i\sqrt{\frac{\pi}{2}}\,e^{-\beta_3^2/2}+\frac{kv_{T_3}}{\omega-\Omega_H-kv_0}\right\}+$$
$$+\frac{\omega_{04}^2\,(\omega-kv_0)}{kv_{T_4}}\left\{-i\sqrt{\frac{\pi}{2}}+\frac{\omega+\omega_H-kv_0}{kv_{T_4}}\right\}+c^2k^2-\omega^2=0. \tag{3.17}$$

will be obtained from

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$$\frac{\omega}{k}\left[\frac{\omega_{01}^2}{v_{T_1}}B(\beta_1)+\frac{\omega_{02}^2}{v_{T_2}}B(\beta_2)\right]+\frac{(\omega-kv_0)}{k}\left[\frac{\omega_{03}^2}{v_{T_3}}B(\beta_3)+\frac{\omega_{04}^2}{v_{T_4}}B(\beta_4)\right]+$$
$$+c^2k^2-\omega^2=0. \qquad (3.2)$$

by using (1.6). Finally, section 4 of the paper deals with the propagation of longitudinal waves, and some formulas are given. In lieu of (1.3) one obtains

$$k^2+\sum_{\gamma=1}^{4}\frac{\omega_{0\gamma}^2}{v_{T_\gamma}^2}-\frac{\omega}{k}\sum_{\gamma=1}^{2}\frac{\omega_{0\gamma}^2}{v_{T_\gamma}^3}B(\beta_\gamma)-\frac{\omega-kv_0}{k}\sum_{\gamma=3}^{4}\frac{\omega_{0\gamma}^2}{v_{T_\gamma}^3}B(\beta_\gamma)=0. \qquad (4.1)$$

and if $|(\omega-kv_0)/kv_{T3}| \ll 1$, $|(\omega-kv_0)/kv_{T4}| \ll 1$ one obtains

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$$1-\frac{\omega_{01}^2}{k^2v_{T_1}^2}\left(\frac{k^2v_{T_1}^2}{\omega^2}+3\frac{k^4v_{T_1}^4}{\omega^4}\right)+\sum_{\gamma=2}^{4}\frac{\omega_{0\gamma}^2}{k^2v_{T_\gamma}^2}+$$

$$+i\sqrt{\frac{\pi}{2}}\left\{\frac{\omega}{k^3}\left[\frac{\omega_{01}^2}{v_{T_1}^3}\exp\left\langle-\frac{1}{2}\left(\frac{\omega}{kv_{T_1}}\right)^2\right\rangle+\frac{\omega_{02}^2}{v_{T_2}^3}\right]+\frac{\omega-kv_0}{k^3}\left(\frac{\omega_{03}^2}{v_{T_3}^3}+\frac{\omega_{04}^2}{v_{T_4}^3}\right)\right\}=0. \quad (4.8)$$

The condition for the appearance of instability reads (4.8).

$$N_s>N\left(\frac{T_2}{T_1}\right)^{1/2}\frac{\omega}{kv_0-\omega}\left(1+\sqrt{\frac{mT_2^3}{MT_1^3}}\right)^{-1}\left[e^{-\omega^2/2k^2v_{T_1}^2}+\left(\frac{mT_1^3}{MT_2^3}\right)^{1/2}\right]. \quad (4.9)$$

For the growth (damping) factor one obtains the simple relation
$|\mu/\omega| \ll 1$ and

$$\frac{\mu}{\omega}=-\sqrt{\frac{\pi}{8}}\frac{\omega^2}{\omega_{01}^2}\left\{\frac{\omega_1}{k^3}\left[\frac{\omega_{01}^2}{v_{T_1}^3}e^{-\omega^2/2k^2v_{T_1}^2}+\frac{\omega_{02}^2}{v_{T_2}^3}\right]+\frac{\omega-kv_0}{k^3}\left[\frac{\omega_{03}^2}{v_{T_3}^3}+\frac{\omega_{04}^2}{v_{T_4}^3}\right]\right\}.$$

Instability of low-frequency ... S/056/61/040/002/024/047
B102/B201

B. N. Gershman and V. V. Zheleznyakov are thanked for having revised the manuscript and for discussions. There are 22 references: 19 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet (Gor'kiy State University)

SUBMITTED: July 5, 1960

Card 12/12

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S/057/62/032/002/003/022
B104/B102

24.6714

AUTHOR: Kovner, M. S.

TITLE: Excitation of waves in an unbounded non-equilibrium plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 2, 1962, 145-155

TEXT: An unbounded and homogeneous charged-particle current penetrates into a resting plasma. The velocity of the particle current which is directed along a constant external magnetic field $\vec{H}_0$ ($\vec{v}_0 \ll c$) is $\vec{v}_0$. After extensive calculation the dispersion equation

$$\begin{aligned}\mathrm{Det}\,\varepsilon_{ik} &+ (\varepsilon'_{11}+\varepsilon^s_{11})(\varepsilon_{22}\varepsilon_{33}+\varepsilon^2_{23}) + (\varepsilon'_{22}+\varepsilon^s_{22})(\varepsilon_{11}\varepsilon_{33}-\varepsilon^2_{13}) + \\ &+ (\varepsilon'_{33}+\varepsilon^s_{33})(\varepsilon_{11}\varepsilon_{22}+\varepsilon^2_{12}) + 2(\varepsilon'_{12}+\varepsilon^s_{12})(\varepsilon_{12}\varepsilon_{33}+\varepsilon_{23}\varepsilon_{13}) + \\ &+ 2(\varepsilon'_{13}+\varepsilon^s_{13})(\varepsilon_{12}\varepsilon_{23}-\varepsilon_{22}\varepsilon_{13}) + 2(\varepsilon'_{23}+\varepsilon^s_{23})(\varepsilon_{11}\varepsilon_{23}+\varepsilon_{13}\varepsilon_{12}) = 0. \qquad (2.1)\end{aligned}$$

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of the plasma is brought to the form

$$\frac{a_1}{(c^2k^2)^m}\prod_{j=1}^{p}(c^2k^2-n_j^2\omega^2)+\Delta'=iF(\delta_\gamma), \tag{2.9}$$

where

$$\mathrm{Det}\,\varepsilon_{ik}=a_1(c^2k^2)^{r-m}+a_2(c^2k^2)^{r-m-1}+\ldots+a_p(c^2k^2)^{-m}=$$
$$=\frac{a_1}{(c^2k^2)^m}\prod_{j=1}^{p}(c^2k^2-n_j^2\omega^2), \tag{2.10}$$

and $n_j^2\omega^2 = c^2k_j^2$ are the roots of the equation $(c^2k^2)^m \mathrm{Det}_{ik} = 0$.

$$F(\delta)=\sum_{\gamma=1}^{2}\left\{\delta_\gamma^+\left[b_\gamma\left\langle A_1+A_2+B+\mathcal{E}\left(\frac{\omega+\omega_{H\gamma}}{\omega_{H\gamma}}\right)^2\mathrm{tg}^2\alpha\right\rangle-b_\gamma^+(C-D)\right]+\right. \tag{2.12}$$
$$+\delta_\gamma^-\left[b_\gamma\left\langle A_1+A_2-B+\mathcal{E}\left(\frac{\omega-\omega_{H\gamma}}{\omega_{H\gamma}}\right)^2\mathrm{tg}^2\alpha\right\rangle+b_\gamma^-(C+D)\right]+$$
$$\left.+\delta_\gamma^0\left[\mathcal{E}b_{1\gamma}-2Db_\gamma^0+4A_2b_\gamma\frac{k^2v_{T\gamma}^2}{\omega_{H\gamma}^2}\sin^2\alpha\right]\right\}$$

Excitation of waves in an unbounded ...

$$\left.\begin{aligned} A_1 &= \varepsilon_{22}\varepsilon_{33} + \varepsilon_{23}^2;\quad A_2 = \varepsilon_{11}\varepsilon_{33} - \varepsilon_{13}^2, \\ B &= 2i(\varepsilon_{12}\varepsilon_{33} + \varepsilon_{23}\varepsilon_{13});\quad C = 2(\varepsilon_{12}\varepsilon_{23} - \varepsilon_{22}\varepsilon_{13}) \\ D &= 2i(\varepsilon_{11}\varepsilon_{23} + \varepsilon_{13}\varepsilon_{12});\quad \mathcal{E} = \varepsilon_{12}\varepsilon_{22} + \varepsilon_{12}^2. \end{aligned}\right\} \qquad (2.13)$$

hold for the left-hand side of (2.9). A study of the instability which is related to the Cherenkov radiation shows that those waves the propagation of which is not forbidden, increase in amplitude. If the thermal motion in the flux determines the stability of the system then the necessary condition for the increase of the wave amplitudes is

$$\omega_1 - \mathbf{k}\mathbf{v}_0 < 0. \qquad (3.13);$$

the sufficient condition is

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X

Excitation of waves in an unbounded ...

$$(\mathbf{kv}_0-\omega_1)\left|\sum_{\gamma=3}^{4}\frac{\omega_{0\gamma}^2}{kv_{T\gamma}\cos\alpha}\left[\mathcal{E}\frac{\omega_1^2}{k^2v_{T\gamma}^2\cos^2\alpha}-D\frac{\omega_1}{\omega_{H\gamma}}\operatorname{tg}\alpha-2A_2\frac{k^2v_{T\gamma}^2}{\omega_{H\gamma}^2}\sin^2\alpha\right]\right|> \\ >\sqrt{\frac{2}{\pi}}|F(\delta)|. \qquad (3.14).$$

Furthermore, the instability is studied which is related to the coherent magnetic bremsstrahlung of the particles in the region of the anomalous Doppler effect. Assuming that the inequality

$$|\omega-\mathbf{kv}_0+p|\omega_{H\gamma}||\gg kv_{T\gamma}\cos\alpha,\ p=0,\ \pm1, \qquad (4.1)$$

holds,

$$\mu a_1\Phi-i\mu(c^2k^2)^m F(\delta_\gamma)-\frac{\omega_{0\gamma}^2(c^2k^2)^m}{2|\omega_{H\gamma}|}Q=0. \qquad (4.3)$$

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Excitation of waves in an unbounded ...

$$\frac{(kv_0-\omega)\,\omega_{0\gamma}^2}{kv_{T\gamma}\cos\alpha}\left|A_1+A_2\mp B+(D\pm C)\frac{\omega+|\omega_{H\gamma}|}{\omega_{H\gamma}}\operatorname{tg}\alpha+\right.$$

$$\left.+E\left(\frac{\omega+|\omega_{H\gamma}|}{\omega_{H\gamma}}\right)^2\operatorname{tg}^2\alpha\right|>\sqrt{\frac{8}{\pi}}\left|F(\delta_\gamma)\right|. \qquad (4.15).$$

The author thanks B. N. Gershman and V. V. Zheleznyakov for help and discussion. There are 20 references: 18 Soviet and 2 non-Soviet. The reference to the English-language publication reads as follows: R. Q. Twiss. Phys. Rev., 84, 448, 1951.

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet im. N. I. Lobachevskogo (Gor'kiy State University imeni N. I. Lobachevskiy)

SUBMITTED: April 17, 1961

Card 6/6

KOVNER, M.S.; TRAKHTENGERTS, V.Yu.

Interaction of weak corpuscular streams in the upper atmosphere. Geomag.i aer. 2 no.6:1053-1060 N-D '62. (MIRA 16:1)

1. Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete.

(Atmosphere, Upper)

KOVNER, M.S.; CHERTOK, I.M.

Coherent Cherenkov and magnetodeceleration instabilities of solar corpuscular streams. Geomag. i aer. 3 no.6:1014-1020 N-D '63. (MIRA 16:12)

1. Radiofizicheskiy institut pri Gor'kovskom gosudarstvennom universitete.

Card 2/3

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ACCESSION NR: AP4048253

SUBMITTED: 06Nov63 ENCL: 00

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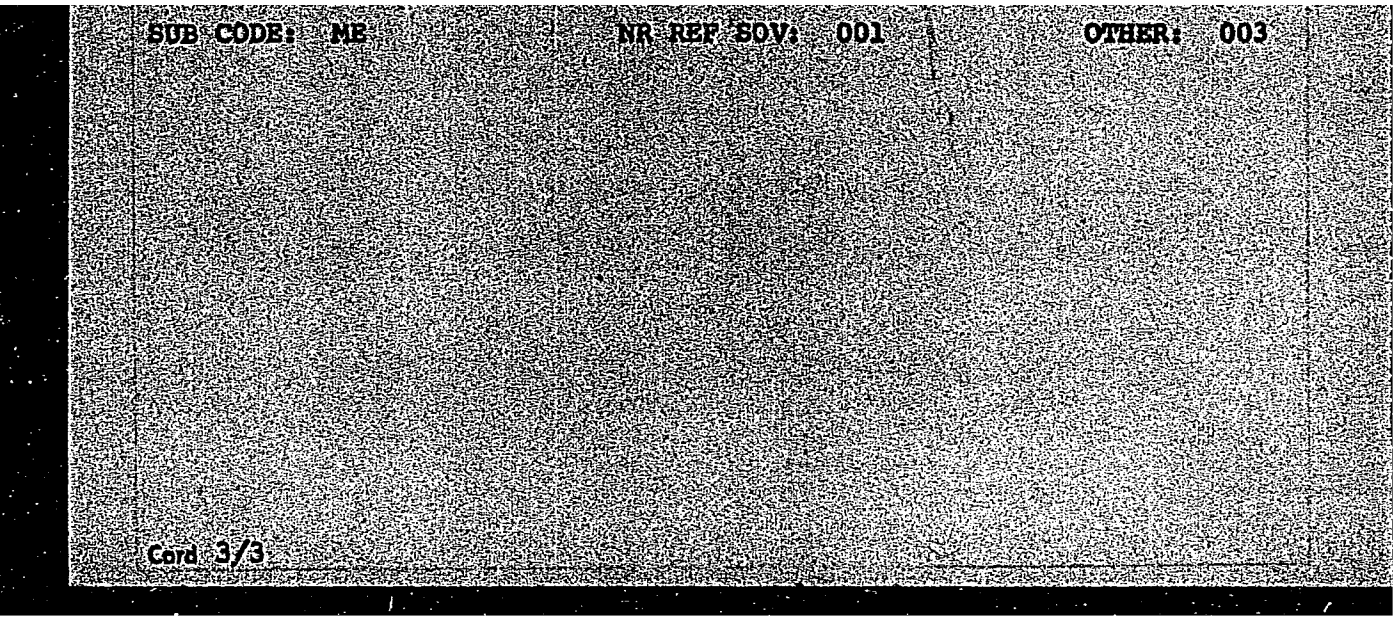

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L 5268-66 FBD/EWT(1)/FCS(k) GW/WS-2/WR

ACCESSION NR: AP5022800

UR/0141/65/008/004/0768/0770
621.396.677.497:523.164

AUTHOR: Grigor'yev, G. I.; Kovner, M. S.; Nikiforova, O. G.; Obolenskiy, L. M.; Samsomov, A. V.; Trakhtengerts, V. Yu.

TITLE: Logarithmic-periodic helical exciter for a paraboloid with 1:7 frequency coverage

SOURCE: IVUZ. Radiofizika, v. 8, no. 4, 1965, 768-770

TOPIC TAGS: antenna directivity, conic antenna, antenna polarization, radio telescope antenna

ABSTRACT: The authors present the results of tests on a model of a broadband exciter for the 15-meter paraboloid of the Zimenki radio telescope. The model scale was 1:10. The reflector used was a parabolic cylinder with focal distance 0.525 m, height 1 m, and aperture D = 1.5 m. The exciter was a conical bifilar-wound cable helix with vertex angle 90° and pitch angle 7°. The vertex of the cone was at the focus of the paraboloid. The directional pattern and the standing wave ratio of the system were measured in the range $1.5 \leq D/\lambda \leq 10$, where λ is the working wavelength. The results are shown in Fig. 1 of the Enclosure. The fact that a directivity angle of 10° can be obtained with D/λ close to 2 is taken as an indi-

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cation that such a system can ensure high directivity with small antenna dimensions. It is emphasized, however, that no final conclusions can be drawn until phase-distribution measurements are made. The results for horizontally polarized radiation differ little from those for vertical polarization, except that side lobes appear at some frequencies. "The authors thank Yu. M. Zhidko for a discussion of the results." Orig. art.has: 2 figures. [02]

ASSOCIATION: Gor'kovskiy gosudarstvennyy universitet (Gor'kiy State University)

SUBMITTED: 08Jul64 ENCL: 01 SUB CODE: AA, EC

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L 5268-66

ACCESSION NR: AP5022800

ENCLOSURE: 01

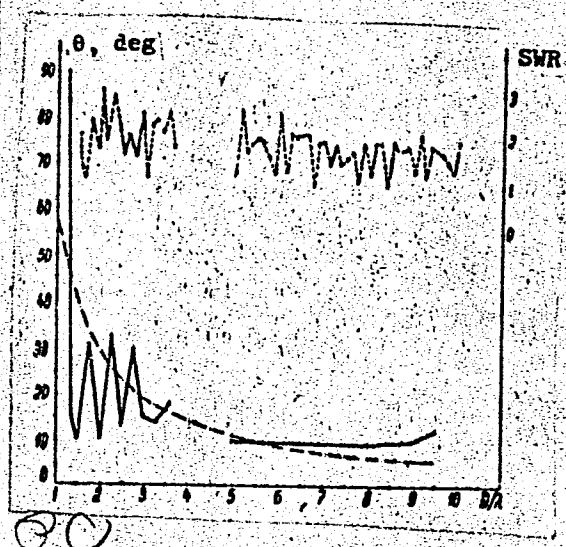

Fig. 1. Width of directivity pattern (θ, degrees) and standing wave ratio plotted against the aperture-to-wavelength ratio D/λ

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L 16161-66 FSS-2/EWT(1)/FS(v)-3/FCC TT/GW

ACC NR: AP5025478 SOURCE CODE: UR/0203/65/005/005/0831/0834

AUTHOR: Kovner, M. S.; Obolenskiy, L. M.

ORG: Gorki State University (Gor'kovskiy gosudarstvennyy universitet)

TITLE: Possibility of determining the electronic concentration and the magnetic field in the plasma via the measurements of drift wave frequencies

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 5, 1965, 831-834

TOPIC TAGS: earth magnetic field, ionosphere, artificial satellite, drift mobility, electromagnetic wave frequency, plasma magnetic field, plasma concentration

ABSTRACT: Recently, a number of experiments were conducted concerning the various frequency radiations as well as the direct computation of the parameters of the ionosphere. These experiments were performed by the on-board laboratories of the artificial satellites. The author investigated the possibility of determining the corpuscular flux velocity, the magnetic field intensity and the concentration of the charged particles in the interplanetary environment and in the upper ionosphere

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ACC NR: AP5025478

by measuring the slow drift-wave frequencies. The investigation was premised on the assumption that these waves were generated by a flux of solar origin. The authors thank B. N. Gershman for assistance. Orig. art. has: 19 formulas.

SUB CODE: 04,20/SUBM DATE: 14Dec64/ ORIG REF: 007/ OTH REF: 002

Card 1/2

L 33281-66 EWP(m)/EWT(1) GW/WW

ACC NR: AP6011694 SOURCE CODE: UR/0203/66/006/002/0241/0245

AUTHOR: Koyner, M. S. 81 80 B

ORG: Radio-Physics Institute, Gor'kiy State University (Radiofizicheskii institut pri Gor'kovsom gosudarstvennom universitete)

TITLE: Radiation excited at the boundary of the magnetosphere by a shock wave 12

SOURCE: Geomagnetizm i aeronomiya, v.6, no. 2, 1966, 241-245

TOPIC TAGS: external magnetic field, shock wave interaction, plasma wave, electromagnetic radiation

ABSTRACT: In this article the author examines the problem of the radiation of radiowaves from the region of a shock wave at the boundary of the magnetosphere. The author assumes that the external magnetic field is directed at an arbitrary angle to the wave front, since this apparently corresponds more to reality. The electric field strength of the plasma waves is estimated and is shown to be about 25 mV/n. The author dwells on certain results of the theory of shock wave generation of plasma waves and their subsequent transformation, direct generation of extraordinary waves by drifting electrons, and scattering of shock waves on density fluctuations. The author points out that some difficulty arises

UDC 523.038

Card 2/2

YEREMENKO, V.V.; KOVNER, N.N.; MATYUSHKIN, E.V.

Effect of uniaxial compression on the electroconductivity and photoconductivity of cadmium sulfide single crystals. Fiz. tver. tela 6 no.10:3190-3192 O '64. (MIRA 17:12)

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KOVNER, S. S. DECEASED 1963/3

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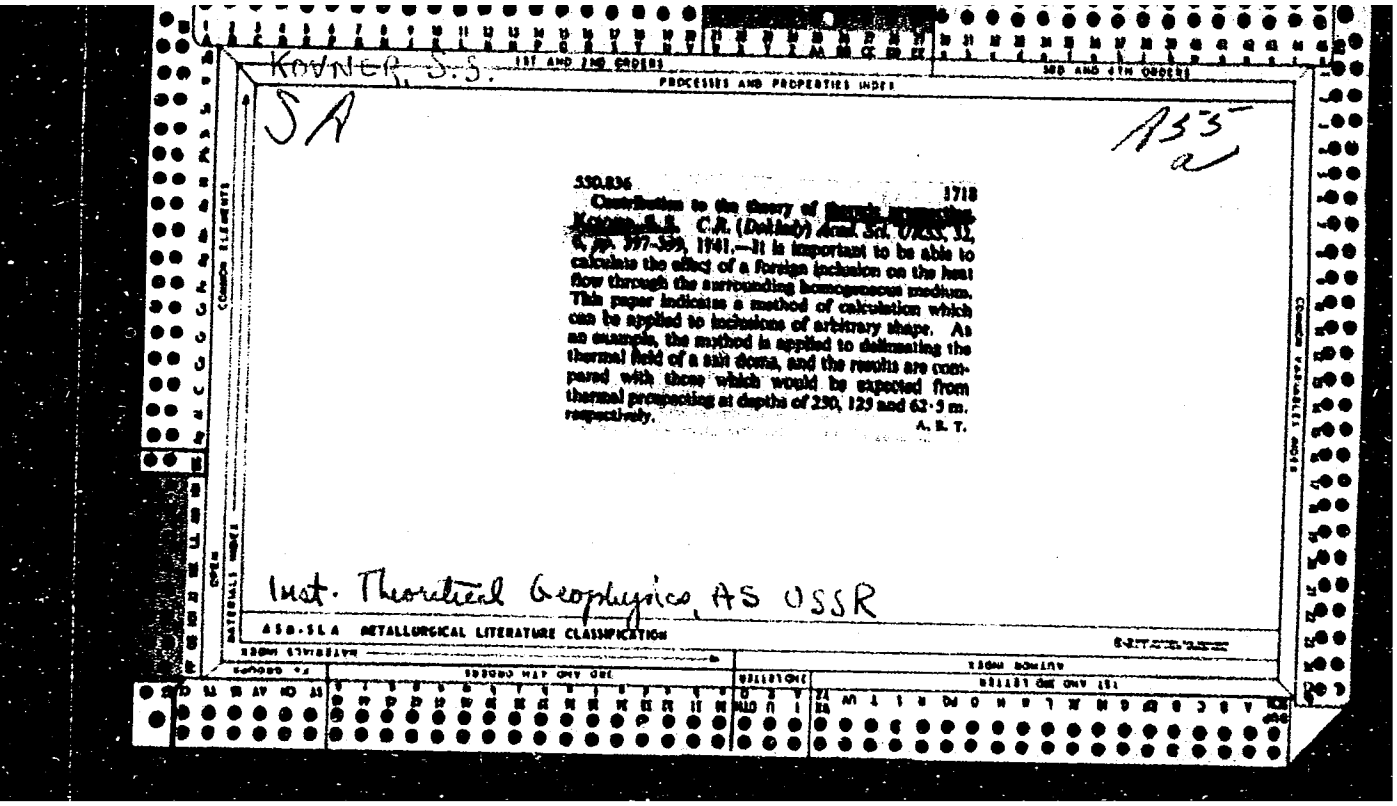
TEXTILES -
spinning, machinery

see ILC



KOANER, S.S.

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Contribution to the theory of [illegible]. Kaner, S.S. C.R. (Doklady) Acad. Sci. URSS, 32, 6, pp. 397-399, 1941.—It is important to be able to calculate the effect of a foreign inclusion on the heat flow through the surrounding homogeneous medium. This paper indicates a method of calculation which can be applied to inclusions of arbitrary shape. As an example, the method is applied to delineating the thermal field of a salt dome, and the results are compared with those which would be expected from thermal prospecting at depths of 250, 125 and 62·5 m. respectively. A. B. T.

Inst. Theoretical Geophysics, AS USSR

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

KOVNER, S. S.

"On the Technique of Numerical Integration of Differential Equations with Partial Derivatives," Dokl. AN SSSR, 37, No.1, 1942

Inst. Theoretical Geophysics, AS USSR

KOVNER, S. S.

"Contribution to the Foundation of Thermal Method in Prospecting," Dokl. AN SSSR, 37, No.3, 1942

KOVNER, S. S.

"On the Theory of Thermal Proppecting: Artinskian Massif as Revealed on the Slope of Gravitation Maximum," Dokl. AN SSSR, 42, No.6, 1943

Inst. Theoretical Geophysics, AS USSR

KOVNER, S. S. AND SHNEYERSON, B. L.

Mbr., Institute Theoretical Geophysics, Acad. Sci., 1944.

"Thermal Method of Prospecting vs. Gravitational and Electric Methods."
Dok. AN. 47, No. 1. 1945.

KOVNER, S. S. PA 8T51

USSR/Geology Mar 1947
Geophysical prospecting

"Qualitative Analysis of the Thermal Anomaly of Anticline," S. S. Kovner, 4 pp

"CR Acad Sci" Vol LV, No 7

Thermal reconnaissance of anticlinal structures to distinguish by measurements the thermal field of a given geological profile from that of a profile similar in all respects, but with one or more of its strata uplifted to form an anticline.

8T51

PA 52T44

KOVNER, S. S.

USSR/Mathematics - Equations, Integral Oct 1947
Mathematics - Operational Theory

"Calculation of the Operator Stages of Liebmann and Gershgorin and Their Application to the Mechanical Integration of Equations," S. S. Kovner, D. K. Zhak, 4 pp

"Dok Akad Nauk SSSR" Vol LVIII, No 1

Describes method of approximate integration with aid of operator stages, which is claimed to create new basis for practical solution of series of basic problems of mathematical physics. Submitted by Academician A. N. Kolmogorov, 4 Apr 1947.

52T44

KOVNER, S. S. PA 27/49T61

USSR/Geology Jan 49
Stratification
Heat - Conductivity

"Thermal Anomalies of the Ishimbay Deposits,"
S. S. Kovner, 4 pp

"Dok Ak Nauk SSSR" Vol LXIV, No 3

Difference in temperature over the top and over the bottom of solid, buried mass constitutes local thermal anomaly. States that precise mathematical calculation of the form of the buried masses and the difference in the coefficients of heat conductivity of the rocks which surround them permits pre-evaluation of local thermal anomalies. Submitted 29 Nov 48.

27/49T61

ДОКЛАДЫ

LAZAREV, P.P., akademik; VAVILOV, S.I. [deceased], akademik, red.; ORBELI, L.A., akademik, red.; SHULEYKIN, V.V., akademik, red.; DERYAGIN, B.V., red.; KRAVKOV, S.V. [deceased], red.; VOLAROVICH, M.P., doktor fiz.-matem.nauk, red.; KOVNER, S.S., prof., red.; FRANK, G.M., d-r biolog.nauk, red.; YEFIMOV, V.V., d-r biologich. nauk, red.; MASLOV, N.M., nauchnyy sotrudnik, red.; GESSEN, L.V., red.izd-va; ZELENKOVA, Ye.V., tekhn.red.

[Works] Sochineniia. Moskva, Izd-vo Akad.nauk SSSR. Vol.1. 1957. 895 p. (MIRA 11:1)

1. Chlen-korrespondent AN SSSR (for Deryagin, Kravkov). (Physics)

KOVNER, Veniamin Naumovich; GONCHAROV, Anatoliy Filippovich; TOVSTOLUZHSKIY, N.I., red.; SARMATSKAYA, G.I., red.izd-va; BRATISHKO, L.V., tekhn.red.

[Building roads of wooden beams for transporting lumber] Stroitel'stvo lesovoznykh avtomobil'nykh dorog s dereviannym pokrytiem. Moskva, Goslesbumizdat, 1957. 77 p. (MIRA 11:5)
(Forest construction)

SOV-116-58-7-6/20

AUTHORS: Kovner, V.N. and Lebedev, N.I., Engineers

TITLE: Frameless Diesel Hammer of the Type DB-45 (Beskoprovyy dizel'-molot DB-45)

PERIODICAL: Mekhanizatsiya trudoyëmkikh i tyazhëlykh rabot, 1958, Nr 7, p 18, (USSR)

ABSTRACT: The diesel hammer DB-45 is used to ram the pilings of wooden bridges to be built on timber transportation roads. The weight is only 260 kg; the main parts are the diesel hammer, the bridge-type telpher crane and the holding device. The diesel hammer DB-45 is of simple design and is easy to operate. It may be recommended for wide application in the lumber industry. There is one technical drawing.

1. Pile drivers--Development

Card 1/1

FILIPPOV, Georgiy Afanas'yevich; KOVNER, V.N.; SHAKHOVA, L.I., red.izd-va; PARAKHINA, N.L., tekhn.red.

[Switches for narrow-gauge railroads] Uzkokoleinye strelochnye perevody. Moskva, Goslesbumizdat, 1959. 131 p. (MIRA 13:2)
(Railroads--Switches)

KOVNEREV, I.P.

Methods of improving the qualities of Romanov sheep. Kozh.-obuv. prom. no.6:31-33 Je '59. (MIRA 12:9)
(Sheep) (Leather)

VOROB'YEV, P.A.; SHTYKOVA, Ye.I.; KOVNEREV, I.P.; VASIL'YEV, N.A., retsenzent; ZAVARSKIY, A.I., red.

[Breeding Romanov sheep] Razvedenie romanovskikh ovets. Moskva, Kolos, 1965. 191 p. (MIRA 18:12)

1. Glavnoye upravleniye zhivotnovodstva Ministerstva sel'skogo khozyaystva SSSR (for Vasil'yev).

KOVNEREV, I. P., kand. sel'skokhozyaystvennykh nauk

Quality of the pelts of young Romanov breed sheep. Kozh. obuv. prom. 4 no.10:8-10 O '62. (MIRA 15:10)

(Sheep breeds) (Hides and skins—Testing)

KOVNERISTA, A.S. [Kovnerysta, A.S.]

Electric conductivity of nonaqueous solutions of lithium chloride.
Nauk povid. KDU no.1:50-51 '56. (MIRA 11:4)
(Lithium chloride--Electric properties)

KOTORLENKO, L.A.; GOLIK, A.Z.; KOVNERISTAYA, A.S.

Viscosity and electric conductivity of lithium chloride solutions in alcohols. Ukr.khim.zhur. 24 no.5:618-625 '58. (MIRA 12:1)

1. Kiyevskiy gosudarstvennyy universitet imeni T.G. Shevchenko.
(Lithium chloride) (Solution (Chemistry))

S/124/63/000/003/026/065
D234/D308

AUTHOR: Kovneristov, G. P.

TITLE: Plane contact problem of the theory of elasticity for concave dies

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 3, 1963, 8, abstract 3Y41 (Izv. vyssh. uchebn. zavedeniy. Str-vo i arkhitektura, 1962, no. 3, 3-12)

TEXT: A rigid concave die is in contact with an elastic half-plane. The latter is extended symmetrically to make an entire plane, and the mixed problem for a half-plane is replaced by that for a plane with rigid insertion, which is easier to solve in practice. After making a cut there remain stresses at the boundary which, according to the conditions of the mixed problem, is free from stresses. Compensating stresses are applied, which results in a new mixed problem, to which again symmetrization is applied. Displacements appear at the die edge, which had not been present previously. They are compensated again, and the process is repeated until the

Card 1/2

KOVNERISTYY, K.S

KOVNERISTYY, K.S., inzh.

Mechanization of various operations in the rolling industry.
Mekh.trud.rab.11 no.9:14-19 S '57. (MIRA 10:11)
(Rolling (Metalwork))

KOVNERISTYY, K.S.; NOVAKOV, V.A.

Oil spraying machine. Biul.tekh.-ekon.inform. no.12:12-13 '59. (MIRA 13:4)

(Spraying and dusting)

30(11)

AUTHOR: Kovneristyy, Yu., Student of the 5th Course at the Mechanical-Technological Dept. MVTU (Moscow Polytechnic College)

SOV/29-59-2-36/41

TITLE: Each of Us Will Come to Communism With Big Baggage Full of Knowledge and Experience (Kazhdyy iz nas pridet k kommunizmu s bol'shim bagazhom znaniy i opyta)

PERIODICAL: Tekhnika molodezhi, 1959, Nr 2, p 38 (USSR)

ABSTRACT: To the question raised by the editors of the periodical "Tekhnika - molodezhi" how he imagined future to be Yu. Kovneristyy answered:" Numerous popular tales tell of such things that now have come true in our country. This was only possible because the people have mastered science and engineering. Now, after the reorganization of schools, the youth will understand theory still better and will master practice. Each of us will come to Communism with a much bigger stock of knowledge and experience. Bold scientific theories being developed now in laboratories will have to be introduced in the production. The metals and alloys used now have faults in crystal lattices and therefore are not very durable. It lies ahead of us to obtain such metals and alloys that will be

Card 1/2

KOVNERISTYY, Yu.K.; BANNYKH, O.A.; ZUDIN, I.F.; PROKOSHKIN, D.A.

Effect of aluminum and carbon on the properties of steel with 10 % Cr and 13 % Mn at high temperatures. Issl. po zharopr. splav. 7:319-328 '61. (MIRA 14:11)
(Steel alloys--Metallurgy) (Metals at high temperatures)

ACCESSION NR: AT4013939 S/2659/63/010/000/0138/0143

AUTHOR: Prokoshkin, D. A.; Banny*kh, O. A.; Kovneristy*y, Yu. K.; Zudin, I. F.

TITLE: Investigation of the phase composition of chromium-manganese-aluminum steel

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya po zharoprochny*m splavam, v. 10, 1963, 138-143

TOPIC TAGS: steel phase composition, steel, chromium alloy, manganese alloy, aluminum alloy, steel property carbon dependence

ABSTRACT: Chromium-nickel austenite steels are being replaced by chromium-manganese steels, both in the SSSR and in other countries. The influence of carbon (0.1-0.8%) and aluminum (3-7.5%) on the position of the α, ($\alpha+\gamma$) and γ phases for steel with 10% Cr and 14% Mn was investigated at 800, 950, 1100 and 1250C. It was shown that the content of the ferro-magnetic phase in the steel increases in direct proportion to the aluminum concentration (for constant carbon content) and decreases as the carbon content increases (for a constant aluminum content). The top concentration of aluminum in the austenite rises together with an increase of carbon in the steel. The carbon concentration required for complete change of the α-crystalline lattice into γ

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ACCESSION NR: AT4013939

remains practically the same when the aluminum content in the steel changes. The effectiveness of aluminum for α-formation is lowered and that of carbon for α-formation increases as the temperature rises. Using metallographic analysis, it can be shown that the diffusion temperature of carbides rises with an increase in the aluminum and carbon content. Orig. art. has: 5 figures and 2 tables.

ASSOCIATION: Institut metallurgii AN SSSR (Metallurigical Institute AN SSSR)

SUBMITTED: 00	DATE ACQ: 27Feb64	ENCL: 00
SUB CODE: ML	NO REF SOV: 004	OTHER: 001

2/2

Card

ACCESSION NR: AT4013940 S/2659/63/010/000/0144/0148

AUTHOR: Prokoshkin, D. A.; Banny*kh, O. A.; Kovneristy*y, Yu. K.; Zudin, I. F.

TITLE: Chromium-manganese-aluminum austenite steel

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya po zharoprochny*m splavam, v. 10, 1963, 144-148

TOPIC TAGS: steel, austenite steel, chromium-manganese-aluminum steel, austenite steel magnetic property, steel strength carbon content dependence

ABSTRACT: Austenitic steels with an Fe-Cr-Mn base are finding an ever-widening range of industrial application. The authors point out that the alloying of chromium-manganese steel with carbon and aluminum yields a satisfactory complex of strength properties at both normal and high temperatures. This paper gives the results of a study of the mechanical properties, as well as certain other properties, of chromium-manganese-aluminum steel. The study was based on an alloy of 9-10% Cr and 13-15% Mn, with a varying content of aluminum and carbon. Strength tests were made on IM-4P machines (tensile strength tests) and IP-5 machines (tests for creep and fatigue strength). The data obtained on short-term mechanical properties indicate that carbon definitely strengthens chromium-manganese-aluminum steel. An increase in plasticity results from increasing the amount of the plas-

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ACCESSION NR: AT4013940

tic structural component (austenite) in the steel. The maximum is attained with a carbon concentration which provides for a 100% austenitic condition. An increase in the carbon content from 0.5 to 0.9% has no effect on the notch toughness of the steel, after annealing at temperatures of 1050-1150C. At temperatures of 700-750C, steel containing approximately 3% Al has reduced creep resistance when the carbon content is increased over the amount necessary for the creation of a stable austenitic structure. In the initial condition (after annealing), all the steels were non-magnetic. The long-term effect of temperature and stress led to the formation of up to 34-36% ferromagnetic phase in steel with 10% Cr, 14% Mn, and 0.1%C. When the aluminum concentration was increased from 3 to 6%, the authors noted a considerable rise in the ultimate strength value. This rise results from a certain strengthening of the austenite and from a considerable reduction of the grain that occurs with the appearance of small quantities of ferrite phase. In the fatigue-strength test, failure time was shortened drastically as the aluminum concentration was increased. A sample of austenitic steel with 3% Al did not fracture after 6000 hours of testing, and the total deformation was less than 1.1%. In the case of steel with 4.5% Al, the austenite partially decays under the influence of high temperature deformation. Although this steel was non-magnetic prior to the test, it was found to be about 35% magnetic after a failure time of 134 hours. The authors conclude that it is possible to obtain a metal with satisfactory heat resistance by the aluminum-alloying of Fe-Cr-Mn-C austenitic steel. However, the aluminum con-

Card 2/3

ACCESSION NR: AT4013940

tent must not exceed that which causes the appearance in the structure of a ferrite component, either in the initial (tempered) state, or after an extended exposure to high temperatures and stress. It was also noted that an addition of 6-8% aluminum reduces the density of Cr-Mn steel by about 10-12%. Orig. art. has: 5 figures and 4 tables.

ASSOCIATION: INSTITUT METALLURGII AN SSSR (Institute of Metallurgy, AN SSSR)

SUBMITTED: 00 DATE ACQ: 27Feb64 ENCL: 00

SUB CODE: ML NO REF SOV: 004 OTHER: 001

Card 3/3

PROKOSHKIN, D.A.; MOLDAVSKIY, O.D.; BANNYKH, O.A.; KOVNERISTYY, Yu.K.

Effect of phosphorus and aluminum on the mechanical properties of austenitic chromium-manganese steel. Izv. vys. ucheb. zav.; chern. met. 6 no.12:147-151 '63.
(MIRA 17:1)

KOVNEROV, I. P.: Cand Master Agric Sci (diss) -- "Increasing the viability and productivity of sheep of the Romanov breed by using various methods of feeding and breeding". Leningrad-Pushkin, 1958. 31 pp (Min Agric USSR, Leningrad Agric Inst), 130 copies (KL, No 5, 1959, 153)

KOVNIR, V.

Transistor radio with low gain. Radio no.6:32-34 Je '65.
(MIRA 18:10)

ACC NR: AT6[illegible](1) SOURCE CODE: UR/0413/66/000/015/0094/0094

AUTHOR: [illegible], B. Ye.; Semennikov, V. S.; Ayzman, Yu. A.; Sokolinskiy, Ye. A.; [illegible]; [illegible], A. I.; Fedorov, V. N.; Ivanov, A. M.; Malinskiy, S. A.; [illegible]; Nalik, V. Kh.; Vysotskiy, Yu. A.; Zamskiy, V. M.; Bystrov, V. V.; Korobov, V. T.; Glebovskiy, I. V.; Yevzerov, D. A.; Germanov, Yu. G.; Maksimov, K. P.; [illegible]; Shchekalin, V. V.

ORG: none

TITLE: Seismic station. Class 42, No. 184466 [announced by "Neftepribor" Factory of the Instrument Manufacture Administration of Mosgorsovnarkhoz (Zavod "Neftepribor" Upravleniya priborostroyeniya Mosgorsovnarkhoza)]

SOURCE: Izobret prom obraz tov zn, no. 15, 1966, 94

TOPIC TAGS: seismologic station, seismologic instrument

ABSTRACT: This Author Certificate presents a seismic station containing a seismic signal detector, a recording amplifier unit, an oscillograph, a magnetic drum recorder, a channel reproduction unit, a control unit, a reproduction amplifier, a multichannel borehole probe, a drum with photographic paper, a retransmitting unit, and a power supply. To increase the reliability when transferring from operation with the method of reflected waves to the method of refracted waves, a filter unit is connected between the first and second stages of the recording amplifier unit. A

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modulator-demodulator unit and a reel type magnetic recorder are connected in series to the output of the recording amplifier unit. For operation with the method of refracted waves, the filter unit has frequency cutoffs of 7--30 hz, and for operation at sea--frequency cutoffs of 20--50 hz. To increase the reliability of the recorded data with operation by the method of regulated directional reception, a switching unit for the channels to be summed, a static correction unit, and a summing unit are connected in series between the magnetic drum recorder and the reproduction amplifier. To increase the reliability when transferring from operation with the method of reflected waves to seismic logging, a frequency selection unit is connected between the multichannel borehole probe and the magnetic drum recorder. To improve the quality of the recorded material, an electron beam unit for introducing static and dynamic corrections is connected between the reproduction amplifier and the drum with photographic paper.

SUB CODE: 08/ SUBM DATE: 05May65

Card 2/2

LUTSEVICH, P.A.; MONGALEV, G.F.; MIKHALEVICH, N.G.; ZINOVICH, K.F.; SAFRONENKO, A.P.; KLIMENKOV, P.A.; GAYDUKEVICH, N.M.; SILIN, M.S.; BRAZOVSKIY, P.V.; KOVPAK, M.D.; MELESHKEVICH, O.A.; KAMENTSEVA, V.N.; KULIKOVSKIY, A.V.; TARAYKOVICH, P.I.; ALEYNIKOV, G.A.; SHMULEVICH, Sh.S.; GRACHEVA, K.I.; NIKOLAYEVA, Yu.N.; VOLOKHOV, M.A.; DOMASHEVICH, O., red.; KARKLINA, E., red.; ZUYKOVA, V., tekhn. red.

[Manual for livestock raisers] Spravochnik zhivotnovoda. 2., dop. i perer. izd. Minsk, Gos.izd-vo sel'khoz.lit-ry BSSR, 1963. 462 p. (MIRA 16:8)

1. Glavnyy zootekhnik Upravleniya nauki Ministerstva sel'skogo khozyaystva Belorusskoy SSR (for Safronenko).
(Stock and stockbreeding)

KOVORKIAN, Agop, prof.

Scientific Technological Conference on Textiles in Bucharest.
Tekstilna prom 13 no.5:46-47 '64.

MAMOLAT, A.S.; DVOYRIN, M.S.; ZAMDBORG, L.Ya.; KOVOROTNAYA, N.F.; EYDEL'MAN, R.I.

Results of the administration of double BCG doses in newborn infants; preliminary communication. Probl.tub. 39 no.3:16-22 '61. (MIRA 14:5)

1. Iz orgmetotdela (zav. - prof. S.G. Kagan) Ukrainskogo nauchno-issledovatel'skogo instituta tuberkuleza (dir. - dotsent A.S. Mamolat) i Chernigovskogo oblastnogo protivotuberkuleznogo dispansera (glavnyy vrach L.Ya. Zamdborg).
(BCG VACCINATION) (INFANTS (NEWBORN))

KSHANOVSKIY, S. A.; DVOYRIN, M. S.; SHAPOVAL, N. M.; CHAPLYGINA (Kiyev); ZAMDBORG, L. Ya.; KOVOROTNAYA, N. F.; SOKOLOVA, L. N. (Chernigovskaya oblast')

Frequency and significance of tuberculin reactions with an infiltrate of less than 5 mm. Probl. tub. 40 no.4:24-29 '62. (MIRA 15:6)

1. Iz Ukrainskogo nauchno-issledovatel'skogo instituta tuberkuleza i grudnoy khirurgii imeni akad. F. G. Yanovskogo (dir. - dotsent A. S. Mamolat)

(TUBERCULIN—TESTING)

KOVPAK, N.YE.

S/058/60/000/006/004/040
A005/A001

26.2312

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 6, p. 30, # 13142

AUTHORS: Sinel'nikov, K.K., Zeydlits, P.M., Nekrashevich, A.M., [illegible] I.I., Shutskever, Ya.S., Akshanov, B.S., Kovpak, N.Ye., Leonidovich, K.A., Akhiyezer, A.I., Lifshits, I.M., Faynberg, Ya.B., Rozentsveyg, L.N., Lyubarskiy, G.Ya., Kaganov, M.I., Fargamanis, [illegible]

TITLE: A 20.5-Mev Linear Proton Accelerator

PERIODICAL: Tr. Sessii AN UkrSSR, po mirn. ispol'zovaniyu atomn. energii. Kiyev, AN UkrSSR, 1958, pp. 5-15

TEXT: The physical substantiation of the parameter choice is presented and the design of a linear proton accelerator with a drift tube at 20.5 Mev energy is described; the accelerator was constructed in the Fiziko-tekhnicheskiy institut AN UkrSSR (Institute of Physical Engineering of the AS UkrSSR). The main computational data of the accelerator are the following: the operational wave length is $\lambda = 215$ cm; the injection energy is 1.7 Mev; the length of the accelerator is 1,446.8 cm; the synchronous phase is 20°; the length of the first half-tube is 4.875 cm; that of the last one is 16.725 cm; the length of the first gap is

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3.360 cm; that of the last one is 11.150 cm; the length of the first drift tube is 0.145 cm; that of the last one is 32.955 cm. Altogether, the number of drift tubes is 50, that of the half tubes is 2; the acceleration system begins and ends with the latter. At the entrance of every drift tube, focusing grids are fixed consisting of parallel tungsten wires of 0.07 mm thickness; their total geometric transmittance amounts to 30%. The drift tubes are installed within the resonator by means of a suspension system; the resonator is made as a 1,446.8-cm long regular 16-face prism. The resonator is fed from 20 h.f. generators. The Q-factor of the resonator in the loaded state is equal to $6.5 \cdot 10^4$ in consequence of which the h.f. power needed for accelerating particles to the rated energy amounts to 1.2 Mw. An electrostatic generator operating by pulses with the pulse duration of 500 μ sec at about 1 ma current intensity and 1.7 mv voltage serves as proton injector. The principal circuit and the design of the individual accelerator units are presented.

ASSOCIATION: Fiz.-tekhn. in-t AN UkrSSR (Physico-Engineering Institute of the Ukrainian Academy of Sciences)

A.P. Fateyev

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

KOVPAK, Sidor Artemovich.

N/5
217.4
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Geroicheskiye Dela Osoaviakhimovtsev (Heroic Acts of Members of the Osoavikhim (Society for the Defense of the Soviet Union and for the Development of Aviation and Chemical Industries) by Sidor Artem'yevich Kovpak. Moskva, DOSAAF, 1956.

85 p. illus., ports.

KOVPAK, V.I.

Machine for programming tests for long-period strength.
Zav.lab. 26 no.7:867-869 '60. (MIRA 13:7)
(Testing machines) (Strength of materials)

KOVPAK, V. I.

Cand Tech Sci - (diss) "Study of the protracted strength in programmed change of load and temperature." Kiev, 1961. 9 pp; with diagrams; (Ministry of Higher and Secondary Specialist Education Ukrainian SSR, Kiev Order of Lenin Polytechnic Inst); 200 copies; price not given; (KL, 7-61 sup, 238)

4132
S/032/61/027/005/008/017
B130/B220

IK 89,1 0 obs 2807

AUTHOR: Kovpak, V. I.

TITLE: Methods of electric heating of specimens, used in program tests on fatigue strength

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 5, 1961, 585 - 589

TEXT: It is shown in the paper, that electric heating of specimens may be used in program tests on fatigue strength under steady or varying working conditions. This method has, however, its short comings, e. g. it is difficult to achieve a uniform temperature over the entire length of the specimen. The temperature distribution has a parabolic character. The temperature decreases clearly with increasing distance from the center. Furthermore, it is difficult to measure the temperature with one thermocouple. Therefore, several thermocouples (at least 4) were used, which were melted or tied to the specimen. In the latter case, thermocouples of low inertia (diameter: 0.2 - 0.3 mm) were chosen. It is necessary to establish the temperature distribution over the length of each type of specimen tested and to introduce a correction factor. The test results obtained on heating steel specimens of the types ЭИ437 (EI437), ЭИ415
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Methods of electric heating...

(EI415), ЭИ612 (EI612) indicated that the temperature distribution over the length may be expressed by a parabola $T_x = T_{max} \cdot (1-0.565\gamma^2)$. Here, T_{max} is the maximum temperature of the specimen; T_x = the temperature in the point corresponding to the coordinate, $\gamma = \frac{x}{l}$, l = length of the specimen. If the irregularity ΔT^0 along the test length is known, the length of the specimen can be determined. This calculation results, however, in large lengths (230 mm for a diameter of 6 - 8 mm) involving technical difficulties. It is possible to achieve a uniform temperature distribution over a distance of 50 mm by reducing the heat elimination and by insolating the ends of the specimen with asbestos cords. The steady working process was obtained by an autotransformer РНО-1 (RNO-2) which was connected to the primary winding of a power transformer of 5-kw capacity. The temperature of the specimen was controlled by a potentiometer ЭПА-12 (EPA-12). In the varying working process, the feed to the power transformer was interrupted by means of an electronic millivoltmeter МРЩПр-54 (MRShchPr-54), as soon as the specimen had reached a certain temperature. Specimen 1 was connected with the terminals by thread and lock-nut in order to achieve a safe electric contact. The minimum temperature of the test space of oven

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Methods of electric heating...

2 was maintained by the electronic potentiometer 3 EPD-12. Chromel-alumel thermocouples were melted or fixed to the specimen in certain distances from the center of the length. One was attached in the center and the other two at the ends of the test length of the specimen. A movable thermocouple was introduced into the central bore of the specimen in order to record the measuring errors of the thermocouples arranged at the surface. Thermocouple T_m served to transmit the signal for the disconnection of the power transformer 4. The current of the power transformer was controlled by the autotransformer. The disconnection was effected by starter 6, after interruption of the chain by the control millivoltmeter. The cold soldered joints of the thermocouples were connected to the measuring instruments 8 and the transfer potentiometer 9 which were connected alternatively by switches 10 and 11. When the specimens were heated for a short time to a temperature surpassing the minimum temperature (100 - 150°C) a satisfactory distribution of the temperature could be obtained over the entire length (100 mm) of a specimen having a diameter of 6 mm. There are 1 figure, 1 table, and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR (Institute of Powder Metallurgy and Special Alloys, Academy of Sciences Ukr SSR)

Methods of electric heating...

Figure. Scheme of heating and temperature recording during heating of a specimen by current

Legend: a) Grid.

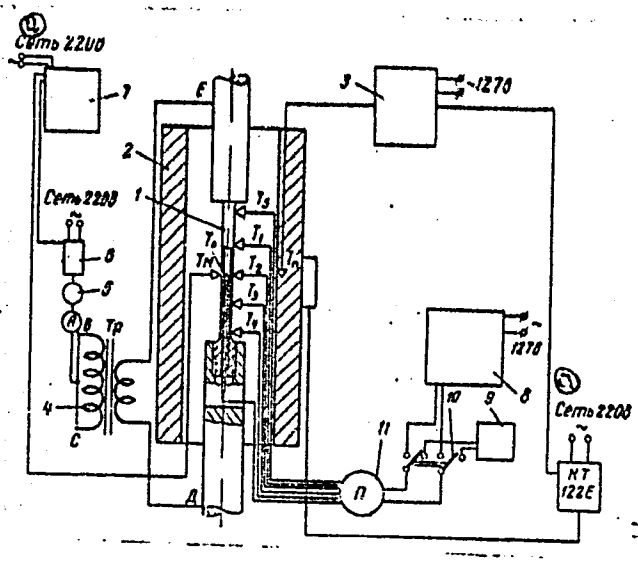

Fig.

Card 4/4

30014,3
S/032/61/027/011/01[illegible]/016
B104/B138

18.8200

AUTHOR: Kovpak, V. I.

TITLE: Influence of variable test conditions on the long-time strength characteristics of steel

PERIODICAL: Zavodskaya laboratoriya, v. 27, no. 11, 1961, 1390 - 1392

TEXT: The material for the specimens (15-mm thick rods) was quenched from 1150°C in water, aged for 10 hours at 800°C and then cooled in the furnace. The experiments were made on 1X18H9T (1Kh18N9T) steel using two programmes. The variation of temperature with time is shown in Fig. 1. The dimensions of the specimens are given in Fig. 2. To improve heat insulation a hole 5 mm in diam. was drilled through each end, leaving the test length solid. Silicon-base wire was wound round these ends, and a split sleeve was placed over the test length to improve heat transfer. By these means a uniform temperature field was achieved (±2°C). Temperature was measured at three points by means of thermocouples. The results of the two test programmes are plotted against one another. In both cases of variable condition testing evaluation of the suitability of a material from upper temperature

Card 1/[illegible] 2

S/114/62/000/003/005/005
E193/E383

18.1151
26.V1V0

AUTHORS: Pisarenko, G.S., Corresponding Member of the AS UkrSSR and Kovpak, V.I., Candidate of Technical Sciences

TITLE: Some results of a study of creep-resistance of steel 1Kh18N9T (1Kh18N9T) under unsteady conditions

PERIODICAL: Energomashinostroyeniye, no. 3, 1962, 38 - 40

TEXT: Laboratory creep tests are usually carried out at a constant temperature and under a constant load or stress. In contrast, certain parts of turbines, turbine rotor components in particular, operate under unsteady conditions, i.e. under conditions of varying stress and temperature. To assess the creep properties of metals operating under such conditions, many workers use the method of integrating relative time-to-rupture values:

$$\sum_{i=1}^{n} \frac{t_i}{\tau_i} = 1 \qquad (1)$$

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Some results of ....

where t_i is the total holding time at a given i-th stress and temperature level under unsteady conditions, τ_i denoting time-to-rupture determined for the same stress and temperature level but under a steady mode of operation.

This method is based on the assumption that time-to-rupture is independent of the number of cycles and that no irreversible structural changes take place at various temperature levels. It has been shown (Ref. 1: Rozanov, M.P. and Rusanova, Ye.I. and Taubina, M.G. - Teploenergetika, no. 9, 1960; Ref. 2 - Getsov, L.B. Energomashinostroyeniye, no. 11, 1960; Ref. 3: I.A. Oding and V.V. Burdukskiy - (Issledovaniye po zharoprochnym splavam' Research for Heat-resistant Alloys, v.6, AN SSSR, 1960 that this method gives reliable results only when each temperature or stress cycle lasts not less than 4 hours. When the cycles become shorter, the results of tests may be affected by the rate of heating from one temperature level to another and in these cases, the effect of this factor should be determined

Card 2/8

Some results of ....

experimentally. This was the object of the present investigation, carried out on steel 1Kh18N9T specimens, heat-treated by water-quenching from 1 150 °C, followed by 10 hours tempering at 800 °C. Experiments were carried out in specially designed apparatus, described in Ref. 4 - V.I. Kovpak - Zavodskaya laboratoriya, 1960, v.26, no. 7). An electric resistance furnace, maintained at the lower limit of the temperature cycle (600 °C) could be lifted clear of the test piece to enable it to be cooled in air to the lower temperature. Provision was made to pass electric current through the test piece to raise its temperature to the upper limit of the temperature cycle, the rate of heating attained being 2 °C/sec. In the first series of experiments, the following three types of temperature cycle were used:
1) heating the test piece (by passing the electric current) to 700 °C and cooling it to 600 °C, this stage lasting 6 min; holding the test piece at 600 °C for 120 min and cooling it to 250 °C; heating it to 700 °C, and so on. The load was taken off the test piece at the end of each cycle;
2) 2 hours at 600 °C, followed by rapid heating to 700 °C and cooling to 600 °C, this stage lasting 6 min; in this case, the

Some results of ....

load was not taken off the test piece;
3) rapid heating and cooling between 600 and 700 °C, each cycle lasting 2.5 min.
The results of these tests in the form of time-to-rupture curves (stress σ in kg/mm^2, time in hours or number of cycles - Fig. 3B) are reproduced in Fig. 3, diagrams a, σ and B relating to temperature cycles 1, 2, 3, respectively, each cycle being illustrated graphically in the righthand top corner of the appropriate diagram. Regarding diagram a, zone 5 (hached) represents the experimental results for unsteady conditions (cycle no. 1); curves 1, 2 and 3 represent results obtained in steady conditions at 600, 650 and 700 °C, respectively; curve 4 has been constructed analytically with the aid of the Robinson-Miller formula (Ref. 5 - Symposium ASTM Techn. Publ., 1954, no. 165):

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Crosses in Fig. 3c represent results obtained for cycle no. 2. Zone 3 (plotted for comparison) denotes results obtained for cycle no. 1; curve 1 represents results for steady conditions at 650 °C (equivalent to curve 2 in Fig. 3a); curve 3 is the theoretical curve constructed with the aid of the Robinson-Miller formula. Comparison of the experimental and theoretical data reproduced in Figs. 3a and b indicates that the above formula cannot be used even for approximate assessment of creep-resistance of metals operating under cyclic temperature variation. Regarding diagram 3b curve 1 relates to experimental results for cycle no. 3, curve 2 being constructed analytically. The last series of tests was conducted according to the following schedule: the test piece was held for 60 min at 600 °C under a stress σ and then for 60 min at 700 °C under a stress σ_2; the heating and cooling time was disregarded and the test piece was continuously under load; σ_1 and σ_2 were selected in such a way that if applied under steady conditions at the corresponding temperatures, they would give the same time-to-

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KOLPAK, V.I.

(12)

S/198/62/008/005/008/009
D234/D308

AUTHOR: Botte, O. V.

TITLE: Dissertations defended in 1961 at the Institutes of the Division of Technical Sciences, AS UkrSSR, in the field of mechanics

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Instytut mekhaniky. Prikladna mekhanika, v..8, no. 5, 1962, 571-575

TEXT: The following dissertations were presented by the collaborators of the above section and approved: For the degree of Candidate of Technical Sciences: Instytut mekhaniky (Institute of Mechanics): Vasyl' Mykolayovych Buyvol, Aspirant: 'Plane problems of the theory of elasticity for multiply-connected regions with cyclic symmetry', on March 16, 1961, at Dnipropetrovsk Universty. Yaroslav Mykhaylovich Hryhorenko, Junior Scientific Collaborator: 'Stressed state of round plates and conical shells of linearly varying thickness under asymmetric loads', on April 6, at Dnipropetrovsk University. Igor Tymofiyovych Selezov, Aspirant, 'Investigation of the propa-

Card 1/3

Dissertations defended in ...

gation of elastic waves in plates and shells', on June 19, at Kyyivs'kyy politekhnichnyy instytut (Kiev Politechnic Institute), Andriy Feofanovych Ulitko, Aspirant, 'Solution of 3-dimensional problems of the theory of elasticity by the method of vector eigenfunctions', on September 26, at Kiev University. Mikhaylo Petrovych Petrenko, Junior Scientific Collaborator, 'Transverse and longitudinal vibrations in short rods of constant and variable thickness, due to impacts', on October 24, at Kiev University. Mariya Dmytrivna Synyavs'ka, Junior Scientific Collaborator, 'Increase of wear resistance of piston rings of integral combustion engines with the aid of galvanic coating', on October 24, at Kyyivs'kyy avtomobil'no dorozhnyy instytut (Kiev Institute of Automobiles and Highways). Heorkiy Ivanovych Dybenko, Engineer, 'Change of strength and deformability of ДСП (DSP) plastics in time at increased temperatures', on November 28, at Kiev Institute of Automobiles and Highways. For the degree of Doctor of Technical Sciences: Instytut elektrozvaryuvannya im. Ye. O. Patona (Institute of Electric Welding imeni Ye. O. Paton): Borys Oleksiyovych Movchan, Senior Scientific Collaborator, Candidate of Technical Sciences, 'Microscopic

Card 2/3

Dissertations defended in ...

inhomogeneities in cast alloys', on May 16, at the Siberian sections of AS USSR. For the degree of Candidate of Technical Sciences: Instytut mashynoznavstva ta avtomatyky (Institute of Machine Science and Automation): Hryhoriy Semenovych Kit, Junior Scientific Collaborator, 'Approximate solution of the problem of free torsion', on March 16, at Dnipropetrovsk University. Hryhoriy Vasyl'ovych Plyatsko, Junior Scientific Collaborator, 'Nonstationary problems of heat conduction and thermoelasticity', on April 20, at the Institute of Mechanics of AS UkrSSR. Mykola Yuriyovych Shvayko, Aspirant, 'Some problems of elastoplastic torsion of prismatic rods', on December 25, at L'viv University. Instytut metalokeramiky i spetsial'nykh splaviv (Institute of Metal Ceramics and Special Alloys): Volodymyr Ivanovych Kovpak, Aspirant: 'Investigation of durable strength during programmed change of load and temperature', on October 23, at Kiev Polytechnic Institute.

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L 11406-63 BDS S/032/63/029/005/019/022

46

AUTHOR: Kovpak, V. I.

TITLE: Device for automatic recording of deformation during prolonged tests of heat-resistance

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 5, 1963, 617-618

TEXT: The device consists of units for continuous measurement and recording of deformation during prolonged tests. Deformation is measured by a spring arrangement and recorded with a stylus on tape. There is one figure.

ASSOCIATION: Institut metallokeramiki i spetssplavov Akademii nauk UkrSSR (Institute of Metal Ceramics and Special Alloys of the Academy of Sciences Ukrainian SSR)

lm/ja
Card 1/1

KOVPAK, V.I.; KUZEMA, Yu.A.

Apparatus for cyclic tensile testing. Zav. lab. 30 no.5:611-612 '64. (MIRA 17:5)

1. Institut metallokeramiki i spetsial'nykh splavov AN UkrSSR.

AUTHORS: Yefremova, G. D., Kovpakova R. P. SOV/76-32-6-7/46

TITLE: Phase Equilibria in Systems Containing Ethylene and Tetrachloroalkanes (Fazovyye ravnovesiya v sistemakh, soderzhashchikh etilen i tetrachloralkany)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 6, pp. 1237-1240 (USSR)

ABSTRACT: The above mentioned systems can be used as a means to study the dependence of the shifting of the phase equilibrium on the length of the carbon chain of tetrachloroalkanes. The systems ethylene-tetrachloropropane, ethylene-tetrachloropentane, ethylene-tetrachlorcheptane and ethylene-tetrachlorononane were investigated at temperatures of from 0,2 to 100°. The results are given graphically. It may be seen that the solubility of ethylene in tetrachloropropane increases sharply with the pressure. Critical phenomena must exist even at 100° and at a pressure of from 150-160 atmospheres excess pressure. A three-phase equilibrium was found in the pressure range of from 41 to 45 atmospheres excess pressure, because the ethylene contained 2,5 % of admixtures. At higher pressure

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critical phenomena were observed between two liquid phases. Critical phenomena between the liquid and the gaseous phase were found in the system ethylene-tetrachloroheptane at a pressure of 116 atmospheres excess pressure. The diagrams of the phase equilibria of the systems ethylene-tetrachloroheptane and ethylene-tetrachlorononane have the same character as that of ethylene-tetrachloropentane. A triple point, liquid--liquid-gas, was found to exist at 0,2°C. In the system with tetrachloroheptane the transition from the triple point to a two-phase system at a temperature rise was investigated. It was observed that a triple point also exists at temperatures above the critical temperature of ethylene (9,9°C). The diagrams pertinent to the various investigations are given. Finally, the authors thank Professor I. R. Krichevskiy for his advice. There are 15 figures; 4 tables, and 10 references, 5 of which are Soviet.

SUBMITTED: February 3, 1957

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SOV/ 76-32-6-7/46

Phase Equilibria in Systems Containing Ethylene and Tetrachloroalkanes

1. Ethylenes--Phase studies 2. Ethylenes--Solubility 3. Carbon tetrachloride --Phase studies 4. Chemical equilibrium

Card 3/3

KOVPAKOVA, R. F.: Master Chem Sci (diss) -- "Phase equilibria in ethylene-tetrachloroalkane systems". Khar'kov, 1959. 14 pp (Min Higher Educ Ukr SSR, Khar'kov Polytech Inst im V. I. Lenin), 110 copies (KL, No 11, 1959, 115)

OVCHARENKO, B.G.; KOVPAKOVA, R.F.

Nitrogen oxides in fuel gases and their determination. Koks. i khim. no. 3:21-26 '61. (MIRA 14:4)

1. Gosudarstvennyy komitet Soveta ministrov SSSR po khimii (for Ovcharenko). 2. Dneprodzerzhinskiy filial Gosudarstvennogo instituta azotnoy promyshlennosti (for Kovpakova).
(Coke--Oven gas) (Nitrogen oxide)

KOVPAKOVA, R.F., kand. khim.nauk; PAVLYUCHENKO, L.A.

Time factor in the process of NO removal from coke-oven gas.
Khim. prom.[Ukr.] no.1:25-27 Ja-Mr '65. (MIRA 18:4)

KOVPANENKO, T. M.

7991. KOVPANENKO, T. M. Uchebno issle dovatel'skaya rabota uchenikov po bor'be s vreditelyami sel'skokhozyaystvennykh kul'tur. kiyev, "rad shkola", 1954.44s 20 sm. (m-vo prosveshcheniya USSR. Resp. Stanisiya yunykh naturalistov. V pomoshch'yunym naturalistam-michu-rinisam). 10.000 EKZ. Bespl.--NA ukr. yaz.--(55-3028)

371.8: 632

SO: Knizhuaya Letopis', Vol. 7, 1955

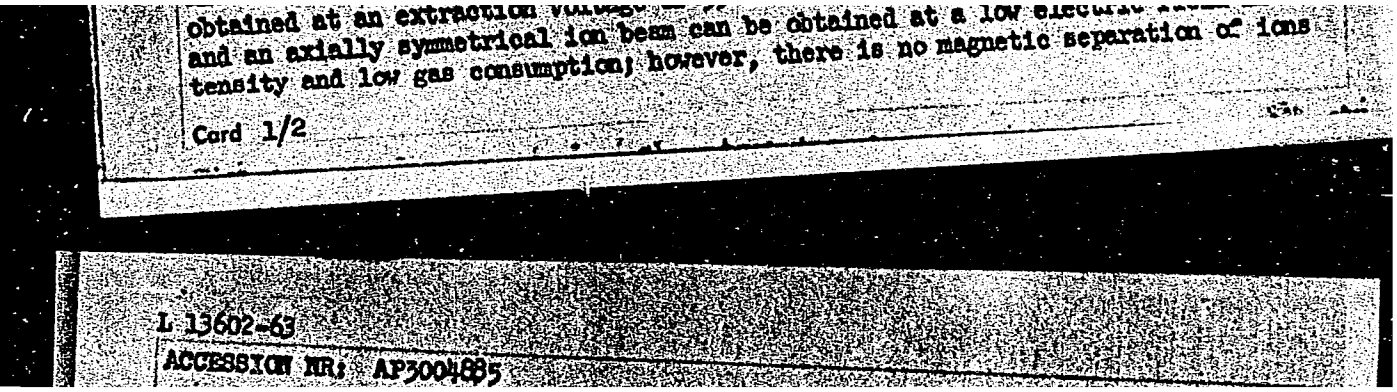
KOVPANENKO, T. M.

VOLODARS'KA, D.M.; GOROKHOVS'KYY, M.E.; KONDRAT'YEV, S.F.; PRAKHOV, M.M.; KOVPANENKO, T.M.; SUKHENKO, Ye.K.; LYASHEVS'KA, V.F.; ZHEL'NIO, T.M.; KHIVRICH, G.K.; GEORGIYEVSKYY, M.I.; NAYVEL'T, E.M.; DENISENKO, L., veduchiy redaktor; PATSALYUK, P., tekhnichniy redaktor

[Hints for everyday living] Pobutovi porady; Vyd. 3-ie, vypr. i dop. Kyiv, Derzh. vyd-vo tekhn.lit-ry URSR, 1957. 184 p.
(Home economics) (MIRA 10:8)

TOPIC TAGS: pulsed ion source, accelerator ion [illegible] source, plasma source

ABSTRACT: An economical heavy-current pulse source of multiply charged ions with a cold cathode and oscillating electrons in a magnetic field has been developed for a linear accelerator of heavy ions. The source consists of an electromagnet, a discharge chamber (anode), two cathodes and two insulators. The maximum induction supplied by the electromagnet was 7 kgauss in a gap of 7 cm between the source and the extraction electrode. The length of the discharge chamber was 64 mm. Experiments showed that with the application of axial ion extraction and effective plasma focusing at the source, a total ion current of 300 ma may be obtained at an extraction voltage of 35 kv and a gap of 1 cm. A heavy ion current [illegible] axially symmetrical ion beam can be obtained at a low electric field in- [illegible] there is no magnetic separation of ions



obtained at an extraction [illegible] can be obtained at a low electric [illegible] and an axially symmetrical ion beam can be obtained at a low electric [illegible] tensity and low gas consumption; however, there is no magnetic separation of ions

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L 13602-63

ACCESSION NR: AP3004885

ACCESSION NR: AP3004885

2

according to e/m, i.e., when the ions are extracted in direction perpendicular to the discharge axis. The source can be used effectively in a linear heavy-ion accelerator as a source of multiply charged ions with the ratio (e/m) ~ 0.1 to 0.15. "The authors thank A. K. Val'ter for his interest in the work and discussion of the results." Orig. art. has: 7 figures and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR (Physicotechnical Institute, AN USSR)

SUBMITTED: 12Sep63 DATE ACQ: 28Aug63 ENCL: 00

SUB CODE: NS NO REF SOV: 013 OTHER: 009

Card 2/2

L 24119-66 EWT(1)
ACC NR: AP6014609 SOURCE CODE: UR/0386/66/003/009/0354/0357

AUTHOR: Kornilov, Ye. A.; Faynberg, Ya. B.; Bolotin, L. I.; Kovpik, O. F. 72 B

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Suppression of low-frequency oscillations in two-stream instability by prior modulation of the electron beam

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 9, 1966, 354-357

TOPIC TAGS: plasma instability, plasma oscillation, plasma beam interaction, electron beam, beam modulation

ABSTRACT: This is a continuation of earlier work (coll. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy [Interaction of Charged Particle Beams with a Plasma], p. 18, Kiev, 1965), where it was shown that development of a two-stream instability is accompanied, besides high-frequency oscillations (1000--6000 Mcs), also by low-frequency oscillations (10 kcs--30 Mcs) and by intense ion currents. To check on the cause of these low-frequency oscillations and to find methods of suppressing these oscillations, the authors experimented with an electron beam (up

2/

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ACC NR: AP6014609

to 100 ma) of 2--5 kev particles injected into an interaction chamber situated in a longitudinal magnetic field of intensity up to 2000 oe. The experimental setup was similar to that described earlier. The results show that the low-frequency oscillations are caused by the high-frequency ones and can be suppressed by modulating the beam at a modulating frequency equal to twice the electron gyro frequency. The prior modulation of the beam suppresses also the high-frequency oscillations. The suppression efficacy increases with increasing depth of modulation. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 28Feb66/ ORIG REF: 005

Card 2/2 Bw

MINEYEV, F.I.; KOVPIK, O.F.

Selection and primary focusing of ions in a source of multiply charged ions. Zhur. tekh. fiz. 33 no.12:1444-1448 D '63. (MIRA 16:12)

L 44714-66 EWT(1) IJP(c) AT

ACC NR: AP6031588 SOURCE CODE: UR/0386/66/004/004/0147/0152

AUTHOR: Kornilov, Ye. A.; Faynberg, Ya. B.; Kovpik, O. F.

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Spatial and temporal correlations of electric fields in a weakly turbulent plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 4, 1966, 147-152

TOPIC TAGS: turbulent plasma, plasma diagnostics, electric field, autocorrelation function, spectral energy distribution, plasma beam interaction, plasma instability

ABSTRACT: The purpose of the present work was to determine the spectral energy density E_R^2 of the electric field during the transition of a plasma into a turbulent state, using as an example the simplest and most prevalent two-stream instability. This was done by measuring the spatial autocorreleation functions of the electric fields of high-frequency oscillations excited in a plasma-beam discharge. The experiment was carried out with an electron beam with energy up to 5 kev and current 20-100 ma, in a magnetic field up to 2000 G and at 10^{-4} mm Hg pressure (Fig. 1). Under these conditions, a plasma was produced with density up to 6×10^{11} el/cm^2. With the aid of a cylindrical cavity placed ahead of the interaction chamber, the beam could be modulated at a frequency of 3,000 MHz. The spatial autocorrelation function R(l) was

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ACC NR: AP6031588

determined by summing oscillations (600-6000 MHz) received at different points of the discharge in a quadratic detector, with subsequent time averaging. From the form of the autocorrelation function it was possible to estimate the correlation length and the spectral energy density of the electric field. Plots are presented of the spatial autocorrelation functions of the oscillations and spectral energy density of the electric field and of the temporal autocorrelation functions of the oscillations. It is deduced from an analysis of the results that the oscillations of a plasma-beam discharge have an irregular stochastic character, with the correlation length and the correlation time depending essentially on the oscillation amplitude. A decrease in the oscillation amplitude, as well as external modulation, leads to an increase in the length and time of the correlation and to a transition from irregular to regular oscillations. The authors thank V. D. Shapiro and V. I, Kurilko for a discussion of the results, A. G. Shevlyakov for help with the measurements, and L. I. Bolotin for interest and help with the work. Orig. art. has: 3 figures and 3 formulas.

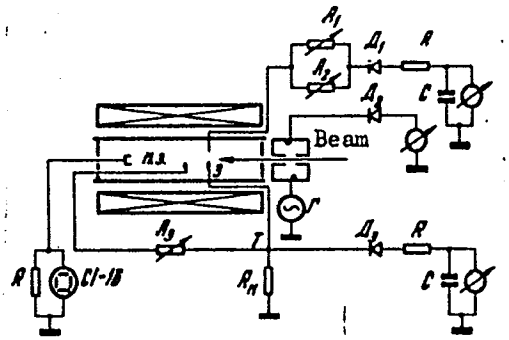

Fig. 1. Measurement scheme

SUB CODE: 20/ SUBM DATE: 11Jun66/ ORIG REF: 008/ OTH REF: 001

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L 00312-01 EWA(1) IJP(c) AT/GD

ACC NR: AT6020432 SOURCE CODE: UR/0000/65/000/000/0024/0035

AUTHOR: Kornilov, Ye. A.; Kovpik, O. F.; Faynberg, Ya. B.; Khrachenko, I. F.

72
B+1

ORG: none

TITLE: Investigation of particle energy and conditions of excitation of low frequency oscillations in a plasma formed by the growth of instabilities in a beam-plasma system

SOURCE: AN UkrSSR. Vzaimodeystviye puchkov zaryazhennykh chastits s plazmoy (Interaction of charged particle beams with plasma). Kiev, Naukova dumka, 1965, 24-35

TOPIC TAGS: ion current, ion density, plasma interaction, plasma beam interaction, acoustic frequency

ABSTRACT: The conditions necessary for the excitation of ion currents in experiments where electron beams traverse the plasma are reported. The experiment is described and a diagram of it is given. An electron beam of 2-5 kev electrons (10-80 mA) is incident on the plasma in the magnetic field (0-2 kg) parallel to the beam. Movable analyzers were used thus permitting the interaction length of beam and plasma to be changed. Analysis of the discharge showed that ion current density across the magnetic field lines is smaller than that along the field lines. These currents could be generated only when the ambient pressure was between $4 \cdot 10^{-4}$ and 10^{-2} mm Hg. The current maximum also appears at a pressure corresponding to maximum plasma oscillations. It is also shown

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