For $y > 0$,

$$E_x = \frac{1}{ik_o} \frac{\partial H_z}{\partial y} = - \frac{\gamma_1}{ik_o} H_z \qquad (4)$$

Using the condition that E_x and H_z must be continuous across the boundary, one can find the characteristic equation for the phase velocity of the surface waves. It is shown that

$$\varepsilon_{\perp} \sqrt{u^2 - 1} + \sqrt{u^2 - \varepsilon_{\perp}} = \Gamma u \qquad (7)$$

where $u = h/k_o$ and is the ratio of the phase velocity in vacuum to the phase velocity in the medium. Four cases then arise:

1) $\varepsilon_{\perp} > 0$, $\Gamma > 0$, $\varepsilon_{\perp} > 1$. The condition for the propagation is then:

$$\varepsilon_{\perp} + 1 > \Gamma > [\varepsilon_{\perp} (\varepsilon_{\perp} - 1)]^{1/2} \qquad (10)$$

2) $\varepsilon_{\perp} > 0$ but < 1, $\Gamma > 0$. Here the condition for the propagation of the direct wave is:

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$$\varepsilon_{\perp} + 1 > \Gamma > (1 - \varepsilon_{\perp})^{1/2} \tag{11}$$

3) $\varepsilon_{\perp} < 0$ but $|\varepsilon_{\perp}| < 1$, $\Gamma > 0$. As before, only the direct wave is propagated here and the condition is:

$$(1 - \varepsilon_{\perp})^{1/2} > \Gamma > \varepsilon_{\perp} + 1 \tag{12}$$

4) $\varepsilon_{\perp} < 0$, $|\varepsilon_{\perp}| > 1$, $\Gamma > 0$. The condition for the propagation of a direct wave is:

$$(1 - \varepsilon_{\perp})^{1/2} > \Gamma \tag{13}$$

and the condition for the reverse wave is:

$$|\varepsilon_{\perp} + 1| > \Gamma \tag{14}$$

Thus, for sufficiently small Γ both waves can propagate but their phase velocities and the field distribution will be different. The second case considered is that where the boundary $y = 0$ separates two gyrotropic media (two plasma layers with different electron concentrations). Medium 1 is described by the tensor ε_{ik} and medium 2 by $\tilde{\varepsilon}_{ik}$. The equation corresponding to Eq.(7) now becomes:

$$\varepsilon_{\perp}\sqrt{u^2 - \tilde{\varepsilon}_{\perp}} + \tilde{\varepsilon}_{\perp}\sqrt{u^2 - \varepsilon_{\perp}} = u(\varepsilon_{\perp}\tilde{\Gamma} - \tilde{\varepsilon}_{\perp}\Gamma) \quad (15)$$

and the propagation conditions are as follows:

1) $\varepsilon_{\perp} > 0$, $\tilde{\varepsilon}_{\perp} > 0$;

$$[\varepsilon_{\perp}(\varepsilon_{\perp} - \tilde{\varepsilon}_{\perp})]^{1/2} < |\varepsilon_{\perp}\tilde{\Gamma} - \tilde{\varepsilon}_{\perp}\Gamma| < \varepsilon_{\perp} + \tilde{\varepsilon}_{\perp} \quad (17)$$

2) $\varepsilon_{\perp} > 0$, $\tilde{\varepsilon}_{\perp} < 0$, $\varepsilon_{\perp} + \tilde{\varepsilon}_{\perp} > 0$:

$$[\varepsilon_{\perp}(\varepsilon_{\perp} - \tilde{\varepsilon}_{\perp})]^{1/2} > |\varepsilon_{\perp}\tilde{\Gamma} - \tilde{\varepsilon}_{\perp}\Gamma| > \varepsilon_{\perp} + \tilde{\varepsilon}_{\perp} \quad (18)$$

3) $\varepsilon_{\perp} > 0$, $\tilde{\varepsilon}_{\perp} < 0$, $\varepsilon_{\perp} + \tilde{\varepsilon}_{\perp} < 0$, $\varepsilon_{\perp}\tilde{\Gamma} + \Gamma\tilde{\varepsilon}_{\perp} > 0$;

$$[|\varepsilon_{\perp}| \quad (\varepsilon_{\perp} - \tilde{\varepsilon}_{\perp})]^{1/2} > \varepsilon_{\perp}\tilde{\Gamma} - \tilde{\varepsilon}_{\perp}\Gamma, \quad \text{(direct wave)} \qquad (19)$$

and

$$|\varepsilon_{\perp} + \tilde{\varepsilon}_{\perp}| > \Gamma \quad \text{(reverse wave).} \qquad (20)$$

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4) $\varepsilon_{\perp} < 0$, $\tilde{\varepsilon}_{\perp} < 0$;

$$|\varepsilon_{\perp} + \tilde{\varepsilon}_{\perp}| < |\Gamma| \qquad (21)$$

where for $\Gamma > 0$ the reverse wave is propagated while for $\Gamma < 0$ the direct wave is propagated. The analysis can be extended to a set of parallel layers. Acknowledgments are expressed to Ya.L. Al'pert for discussing the results.
There are 4 figures and 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc, (including 1 Russian translation fron non-Soviet publication. The English language references read as follows:

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Surface waves on the boundary of ... S/570/60/000/017/008/012
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Ref.4: W. Pfister, J. Ulwick. J. Geophys. Res., v.63, N 2, 301, 1958.
Ref.5: J Jackson, J. Seddon. J. Geophys. Res., v.63, N 1, 197, 1958.

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Card 7/7

GinTsburG, M.A.

S/181/60/002/05/24/041
B020/B056

AUTHOR: Gintsburg, M. A.

TITLE: The Theory of Spin Waves

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 5, pp. 913 - 921

TEXT: The present paper was read at the Seminar of the Theoretical Department of FIAN on January 7, 1959. The basic relation in the theory of spin waves is, as known, the dispersion law - the dependence of the wavelength λ on frequency. Hitherto, the theory of spin waves had been based upon a dispersion law (Refs. 1-3) which is mathematically expressed by equation (1). On the basis of the statements made in the paper, the question arises as to the manner in which transition from spin waves to electromagnetic waves takes place, as to the nature of the waves in the transition zone, and as to the part played by absorption. This question is briefly dealt with by the present paper. In case A a loss-free ferromagnetic is studied. At θ = 0 the dispersion law (equation (2)) takes the form of (4). With an increase of frequency in (4), this equation continuously goes over into equation (1) (see Fig.1).

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The Theory of Spin Waves

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In Fig. 1 the solid curves represent the dispersion law (4) and the analogous relation for $\Theta = \pi/2$, whereas the broken curves illustrate the dispersion law (1). The next paragraph deals with the case of real ferromagnetics. Fig. 2 shows the curves $k_1(\omega)$ and $k_2(\omega)$ for both branches of equations (8) and (9) (solid curves), whereas the broken curves illustrate the dispersion law (1), where k_1 is the wave number, and the imaginary part k_2 is the damping coefficient (k in equation (9) is complex: $k = k_1 - ik_2$). A further paragraph deals with the dispersion law of spin waves for an arbitrary direction of their propagation. The position of the branches of the dispersion curves for this case is given in Fig. 3. There are 3 figures and 15 references: 3 Soviet, 2 German, and 10 British.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute for Terrestrial Magnetism, the Ionosphere, and the Propagation of Radio Waves of the AS USSR)

SUBMITTED: January 10, 1959

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S/141/60/003/006/006/025
E133/E361

9,9841 (also 1036, 1041, 1126)

AUTHOR: Gintsburg, M.A.

TITLE: On the Possibility of Exciting Radio Waves by Solar Corpuscular Streams

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 6, pp. 983 - 988

TEXT: A stream of particles moving in a plasma in the direction of an external magnetic field can radiate transverse electromagnetic waves. This can be applied to the case of ions and electrons from the Sun moving in the ionized atmosphere of the Earth. A Maxwellian velocity distribution is assumed in the stream (with a small correction due to the presence of a field). (All terms in the equations are used to a first-order approximation.) An expression is then derived for the effective electrical conductivity . The problem is restricted to trying to find a value for the wave number which will correspond to instability of the solar corpuscular stream in the Earth's exosphere - this being the condition for radio waves to be emitted. In practice this means that one looks

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for a value of ω and k for which the imaginary part of the equation:

$$\varepsilon = \varepsilon_{xx} \mp i\varepsilon_{xy} = 1 + \frac{i\sqrt{\pi}}{\omega_1^2 k} \sum_{l=1}^{4} \frac{\omega_{0,l}^2}{S_l} (\omega_1 - u_l k) \dot{W}(z_l), \qquad (1)$$

is negative. The extraordinary wave is considered first and it is shown that this condition is fulfilled if:

$$u_2 = v_\Phi (1 + \Omega_H/\omega) \qquad (5)$$

holds (where u_2 is the ion velocity,
v_Φ is the phase velocity of the waves, and
Ω_H is the Larmor frequency of the ions).
The extraordinary wave is excited by the ions and not by the

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electrons. Fig. 1 shows the dependence of v_{Φ} (Curve A) and u_2' (Curve B) on frequency. v_{Φ} has a maximum at $1/2 |\omega_H|$ (where ω_H is the Larmor frequency for the electrons). u_2 has a minimum value at $\omega \simeq 2.7 \Omega_H$, at which point it is equal to 2.6 $v_{\Gamma A}$ (where $v_{\Gamma A}$ is the phase velocity of hydromagnetic waves). Ion streams with velocities greater than $u_{2,min}$ therefore excite an extraordinary wave in the plasma. The electron stream excites waves of opposite polarization. The dispersion of these, however, is determined by the ions. In order to excite the waves it is necessary that the increment (the imaginary part of the angular frequency) due to the corpuscular stream should be greater than the decrement (that is, the damping due to collisions and cyclotron resonance absorption). The author next considers typical conditions in the Earth's exosphere, at a distance of 28 x 10^3 km from the centre of the Earth (Ref. 4). It is

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shown that the velocity of solar corpuscular streams is fast enough to excite waves. For a stream velocity of 8.5×10^8 cm sec^{-1}, three ranges of frequency are excited: $\sim$ 5 c.p.s., 850 c.p.s. and 7 600 c.p.s. The low-frequency range is probably connected with micro-pulsations of the Earth's magnetic field. Assuming an average stream velocity of 2×10^8 $cmsec^{-1}$, the requirements for instability are satisfied in the ionosphere (h $<$ 700 km) and in the outer radiation belt (h $\gtrsim 2.5 \times 10^4$ km). Observations of low-frequency radio waves from corpuscular streams by R. Gallet, R. Helliwell and G. Ellis (Refs. 6-8) agree well with the predictions of this paper. Eq. (5) also demonstrates the predicted correlation between the radio waves and magnetic activity. The author estimates the amplitude of the excited geomagnetic pulsations to be about 10 - 100 γ .

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On the Possibility of ....

There are 1 figure and 11 references: 5 Soviet and 6 non-Soviet.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Earth Magnetism, Ionosphere and Propagation of Radio Waves of the AS USSR)

SUBMITTED: February 1, 1960

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20433

S/109/60/005/012/031/035
E032/E514

24.2120 (1049,1482,1502,1532)

AUTHOR: Gintsburg, M.A.

TITLE: The Dielectric Constant Tensor for a Plasma and a Beam

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.12, pp.2060-2062

TEXT: Shafranov's formula (Refs.1 and 2) is used to calculate the components of the dielectric constant of a plasma-beam system under the following assumptions:

1) the plasma obeys the Maxwellian velocity distribution;
2) a charged particle beam (ions and electrons) is passing through the plasma. The beam is assumed to be infinite and the velocity distribution in it is also Maxwellian and given by

$$f_{o,n}(V) = C \exp\left\{- \frac{\left[(v_z - u)^2 + v_x^2 + v_y^2\right]}{s^2}\right\},$$

where u is the velocity of the beam and $s = \sqrt{2\varkappa T/m}$ is the thermal velocity of the ions (electrons) in the beam. The external magnetic field H_o is assumed to be uniform and such that

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$H_o \parallel Oz, u \parallel H_o$. The following notation is employed: $\omega_{H,\ell} = \frac{eH_o}{m_\ell c}$ is the Larmor frequency, ω_1 is the complex frequency of the wave ($\omega = \omega_1 + i\gamma$), N_ℓ is the concentration of particles of the ℓ-th type, T_ℓ is their kinetic temperature, u_ℓ is the velocity of the directed motion and k is the wave vector ($E,H \sim e^{i(\vec{k}\vec{r} - \omega t)}$, $\vec{k}\{k_x, 0, k_z\}$). The subscripts $\ell = 1$ and $\ell = 2$ refer to electrons and ions in the beam and the subscripts $\ell = 3$ and $\ell = 4$ refer to electrons and ions in the plasma. The plasma frequency is denoted by

$$\omega_{o,\ell} = \sqrt{\frac{4\pi e^2 N_\ell}{m_\ell}}, \quad \lambda = \frac{k_x s_\ell}{\omega_{H,\ell}},$$

and $W(z) = e^{-z^2}\left(1 + \frac{2i}{\sqrt{\pi}}\int_0^z e^{t^2}\,dt\right)$ is the probability integral.

The functions $F_n(\lambda)$, $\Phi_n(\lambda)$ and $\Psi_n(\lambda)$ are defined by Eq.(1) and

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using the expansion $e^{-i\alpha \sin\psi} = \sum_{n=-\infty}^{+\infty} J_n(\alpha) e^{-in\psi}$ in conjunction with Eq.(5) of Ref.2), the dielectric constant components are found to be given by

$$\varepsilon_{xx} = 1 + i\sqrt{\pi} \frac{\omega_0^2}{\omega^2} \frac{\omega - uk_z}{sk_z} \sum_n \frac{F_n(\lambda)}{\lambda^2} W(z_n) n^2, \quad (2)$$

$$\varepsilon_{xy} = -\varepsilon_{yx} = \sqrt{\pi} \frac{\omega_0^2}{\omega^2} \frac{\omega - uk_z}{sk_z} \sum \frac{\Phi_n(\lambda)}{\lambda} W(z_n) n, \quad (3)$$

$$\varepsilon_{xz} = \frac{\omega_0^2}{\omega^2} \frac{\omega}{sk_z} \sum \frac{n}{\lambda} F_n(\lambda) \left[1 + i\sqrt{\pi} \frac{\omega - uk_z}{\omega s k_z} (\omega - n\omega_H) W(z_n)\right], \quad (4)$$

$$\varepsilon_{yy} = 1 + i\sqrt{\pi} \frac{\omega_0^2}{\omega^2} \frac{\omega - uk_z}{sk_z} \sum \Psi_n(\lambda) W(z_n). \quad (5)$$

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$$\varepsilon_{xz} = i\frac{\omega_0^2}{\omega^2}\frac{\omega - uk_z}{sk_z}\sum\frac{n}{\lambda}F_n(\lambda)\left[1 + i\sqrt{\pi}\,\frac{\omega - n\omega_H}{sk_z}W(z_n)\right], \quad (6)$$

$$\varepsilon_{zy} = -\frac{\omega_0^2}{\omega^2}\frac{\omega - uk_z}{sk_z}\sum\Phi_n(\lambda)\left[1 + i\sqrt{\pi}\,\frac{\omega - n\omega_H}{sk_z}W(z_n)\right], \quad (7)$$

$$\varepsilon_{yz} = -i\frac{\omega_0^2}{\omega^2}\frac{\omega}{sk_z}\sum\Phi_n(\lambda)\left[1 + i\sqrt{\pi}\,\frac{\omega - uk_z}{\omega sk_z}(\omega - n\omega_H)W(z_n)\right], \quad (8)$$

$$\varepsilon_{zz} = 1 + \frac{\omega_0^2}{\omega^2}\frac{\omega}{sk_z}\sum F_n(\lambda)\left\{\frac{\omega - n\omega_H\left(\frac{\omega - uk_z}{\omega}\right)}{sk^2} + i\sqrt{\pi}\,\frac{(\omega - n\omega_H)^2}{(sk_z)^2}\frac{(\omega - uk_z)}{\omega}W(z_n)\right\}; \quad (9)$$

In these formulae the summation over n is carried out between $-\infty$ and $+\infty$ and the summation sign over ℓ is $\left(\sum_{\ell=1}^{\ell=4}\right)$

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omitted. These formulae hold for a plasma with any number of beams (all parallel to H_o) and can be used to solve various problems in radio engineering, including numerical calculations on plasma amplifiers, calculation of the absorption of waves in the plasma near the gyromagnetic resonance, calculation of the excitation of waves in the ionosphere by an ion jet and other problems in which the elementary theory is insufficient and the thermal motion of the plasma particles must be taken into account. When $T \to 0$, these formulae become identical with the formulae of the elementary theory (ε_{yz}, ε_{zy}, ε_{xz}, $\varepsilon_{zx} \to 0$, $\varepsilon_{yy} \to \varepsilon_{xx}$), while when $u \to 0$ the formulae become identical with those obtained by Stepanov and Sitenko (Ref.4). These are 4 Soviet references.

SUBMITTED: June 1, 1960

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87246
S/033/60/037/006/005/022
E032/E514

9.9845
3.1720 (1041, 1126, 1127)

AUTHOR: Gintsburg, M. A.

TITLE: Generation of Plasma Waves by Solar Corpuscular Streams

PERIODICAL: Astronomicheskiy zhurnal, 1960, Vol.37, No.6, pp.979-982

TEXT: It is shown that solar corpuscular streams should excite plasma waves in the exosphere and the Earth's ionosphere. A numerical solution is obtained for the dispersion equation for a solar corpuscular stream in the Earth's exosphere. It was shown in Refs. 2 and 3 that the kinetic equation describing a beam-plasma system can be written in the form:

$$\sum_{\ell=1}^{4} - \frac{1}{a_\ell^2 k^2}\left[1 + i\sqrt{\pi}\, z_\ell W(z_\ell)\right] = 1 \qquad (1)$$

where

$$z_\ell = x_\ell + iy_\ell = \frac{\omega + i\gamma - kU_\ell + i\nu_\ell}{kS_\ell}$$

and

$$W(Z) = e^{-Z^2}\left(1 + \frac{2i}{\sqrt{\pi}} \int_0^Z e^{t^2} dt\right)$$

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and the remaining symbols are as follows: N_ℓ - concentration of particles of the ℓ-th type, T_ℓ - their temperature, ε - their charge, S_ℓ - thermal velocity, U_ℓ - velocity of the directed motion, a_ℓ - Debye radius, ν_ℓ - effective number of collisions, k - wave number of excited plasma wave and $\ell = 1, 2, 3, 4$, where these numbers refer to the electrons and ions in the solar corpuscular stream and electrons and ions in the plasma through which the stream is passing, respectively. These equations are solved numerically for the following numerical parameters:

A: Solar corpuscular stream:

$T = 30000°K$, $U_2 = 10^8$ cm/sec, $N_2 = 10$ cm^{-3}, $U_1 = 0$.

B: Exosphere (h = 2000 km from the Earth's surface):

$T = 3000°K$, $N = 1000$ cm^{-3}.

The numerical results obtained as are follows:

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$(\omega/k)_1 = 0.9645 \cdot 10^8$ cm/sec; $(\omega/k)_2 = 0.9986 \cdot 10^8$ cm/sec;

$f_1 = 315$ kc/s; $f_2 = 110$ kc/s;

$\lambda_1 = 3$ m; $\lambda_2 = 9$ m (λ - wavelength).

Thus, the protons of the solar corpuscular stream can excite electron plasma waves in the exosphere, the frequency being close to the proper frequency for electrons in the plasma $f_o \sim 300$ kc/s. Measurement of the frequencies of these waves would provide information on the parameters and nature of corpuscular streams. Plasma waves will be propagated only at frequencies close to f_o. Since f_o is proportional to the concentration N and the latter increases towards the Earth's surface, it follows that plasma waves which originate at large altitudes cannot penetrate towards the Earth's surface. However, plasma waves (without a magnetic field) can become transformed into electromagnetic waves on scattering and can reach the Earth's surface in this form. It follows that, in addition to polar auroras and magnetic variations,

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solar corpuscular streams should produce radio noise in the frequency range 10^5 - 10^6 cps on the Earth's surface. Dowden (Ref.9) has reported radio noise of exospheric origin on 230 kc/s and the present author identifies this with the above waves. Owing to the screening effect of the ionosphere, this noise is best observed from a rocket or a satellite. Plasma waves can also be excited by beams under laboratory conditions. In recent years considerable effort has been devoted to possibilities of ion jet propulsion. The ion beams producedin these experiments may also generate plasma waves. A graphical method is described which can be used to estimate the stability of the ion beam under these conditions. Acknowledgments are made to N. N. Mayman for valuable advice. There are 2 figures and 9 references: 6 Soviet and 3 non-Soviet.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Akademii nauk SSSR (Institute of Terrestrial Magnetism, Ionosphere and the Propagation of Radio Waves, AS, USSR)

SUBMITTED: January 28, 1960

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30283

S/049/61/000/011/005/005
D239/D303

3.9110 (1482, 1121)

AUTHOR: Gintsburg, M.A.

TITLE: On a new mechanism for the excitation of micropulsations in the earth's magnetic field

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya geofizicheskaya, no. 11, 1961, 1979-1691

TEXT: The radiation from a single ion in the solar corpuscular stream (SCS) interacting with the earth's magnetic field is considered. Apart from radio frequencies, solutions are found for low-frequency mhd-waves in the range 0.1 to 0.001 c/s and it is suggested that these are components of the earth's short-period variation field. It is shown in the course of the theory that the ion must be travelling at super-critical speed (i.e. with a velocity greater than that of radiation in the plasma) in order to radiate in this mode. The cases are divided into two, according as u, the velocity of the ion, is greater or less than the velocity v_A of radiation in the plasma. For the subcritical case, the ex-

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pression for the Larmor frequency as received by an observer fixed w.r.t. the plasma, ω', is

$$\omega' = \frac{\Omega}{1 - \frac{u}{c} N \cos\theta} \qquad (1)$$

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where Ω is the Larmor frequency of the ion, N is the refractive index of the plasma and θ is the angle between u and the wave-vector. For the super-critical case the mechanism of radiation may be of either the cyclotron or Cherenkov type. For the cyclotron type the equation corresponding to (1) is

$$\omega' = \frac{\Omega}{\frac{u}{c} N \cdot \cos\theta - 1} \qquad (2)$$

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of the anomalous Doppler effect. For each case of interest now, the procedure is to write the expression for N and by some manipulation to obtain a relation between η and u/v_A where η is defined by ω/Ω, ω being the symbol for 2π times the frequency observed. In the simplest case where the ion is travelling down a line of force and considering the wave of magnetosonic type this relation is as follows:

$$\frac{u}{v_A} = \left(1 + \frac{1}{\eta}\right)\sqrt{(1 + \eta)\ (1 - \alpha\eta)} \qquad (5)$$

The equation which has three roots given approximately by $\eta_1 = v_A/u$, $\eta_2 = (u/v_A)^2$ and $\eta_3 = 1/\alpha - (u/v_A)^2$ where $\alpha = m/M = 1/1836$, is graphed for various cases. Inserting typical values the η_1 root corresponds to a frequency of 0.46 c/s. The cases where 0 is finite and of Cherenkov radiation are also treated in detail. The case of radiation from protons in the inner radiation belt requires the

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substitution for (2) of the relativistic Doppler equation

$$\omega = \frac{\Omega\sqrt{1 - \beta^2}}{\frac{u}{c} N \cos \Theta - 1} \qquad (14)$$

Alfven waves are now considered. The equation for η is

$$\eta = \frac{v_A}{c} Q \left[(2 + T/Mc^2)\ T/Mc^2\right]^{-1/2} \qquad (16)$$

where $Q = M_p/M_s$ = ratio of masses of plasma ions (O^+_{16}) to SCS ions (H^+) and T is the kinetic energy of the ion. Likely values of F are given in a table, e.g. for T = 750 MeV, $v_A = 2.10^7$ cm/sec and at h = 500 Km, F = 0.17 c/s. In a geophysical appendix the importance is

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discussed of the focussing effect of the field which brings the group-velocity vector closer to the field-line direction than the wave-vector. The attenuation and polarization of the low-frequency waves are also discussed. It is concluded that a single ion with subcritical velocity travelling along the field cannot radiate, (i.e. there is no incoherent radiation with $u < v_A$). Coherent radiation also disappears. However, the position is radically different for ions travelling with super-critical velocities, where both coherent and incoherent radiation at very low frequencies in an mhd-mode are possible for all directions of the ion relative to the field. There is a mathematical appendix. There are 1 figure, 1 table and 23 references: 15 Soviet-bloc and 8 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: M. Sugiura, Phys. Rev. Letters, 6, 255, 1961; R. Santirocco, Proc. IRE, 48, 1650, 1960; W. Murcray, J. Rope, Proc. IRE, 49, 811, 1961; J. Pope, W. Campbell, J. Geophys., 65, 1960.

ASSOCIATION: Akademiya nauk SSSR, Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln (Academy of

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On a new mechanism for ...

Sciences USSR, Institute of Terrestial Magnetism, Ionosphere and Wave Propagation)

SUBMITTED: August 29, 1960

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28755
S/056/61/041/003/008/020
B125/B102

24.2120 (1049, 1141, 1160)

AUTHOR: Gintsburg, M. A.

TITLE: Anomalous Doppler effect in plasma

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 3(9), 1961, 752-755

TEXT: This article deals with the excitation of electromagnetic waves in plasma by an ion beam, account being taken of the motion of ions in the plasma. An ion having the mass M_1 is assumed to move in a plasma along the external magnetic field H at a velocity u. Since it is assumed to rotate around the lines of force, it may also be considered an oscillator with the sequence of eigenfrequencies $\omega_s = s\Omega_1$ ($s = 1, 2, \ldots$). Ω_1 denotes the ionic Larmor frequency. If $\omega < \omega_H < \omega_0$ and $\Theta = 0$ (i.e., in the case of propagation along the field), the dimensionless frequency $\eta = \omega/\Omega$ is defined by the equation $u/v_A = (1 + Q/\eta)\sqrt{(1+\eta)(1-\alpha\eta)}$ (1), where m is the electron mass, M is the mass of the plasma ion, N is the ion

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concentration in the plasma, $v_A = \sqrt{4\pi NM}$ is the Alfvén velocity, and $\alpha = m/M$, $Q = M/M_1$. Eq. (1) has the approximate roots $\eta_1 = v_A/u$, $\eta_2 = (u/v_A)^2$, $\eta_3 = 1/\alpha - (u/v_A)^2$. A graphical analysis of (1) shows that: a) when $u > \frac{1}{2} v_A \sqrt{M/m}$, the ion excites the wave with the single frequency F_1; b) when $\frac{1}{2} v_A \sqrt{M/2} > u > 2.6\ v_A$, the ion excites waves in the three frequency ranges F_1, F_2, and F_3; c) when $u < 2.6\ v_A$, an ion moving faster than light excites a wave only in the range of gyromagnetic electron resonance $(\omega \sim \omega_H)$. For $\omega \sim \omega_H$ it is necessary to take also account of resonance absorption without collisions. A new effect results from (1), i.e., the ionic excitation of electromagnetic waves with a frequency smaller than the Larmor frequency of the ion. This is similar to the excitation of magnetohydrodynamic waves. The ion also excites electromagnetic plasma oscillations in the F_3 range. For waves propagating at an angle Θ relative to $\vec{H}$, the condition for excitation reads $\frac{u}{v_A} = (1 + \frac{Q}{\eta}) \frac{1}{n(\Theta,\eta)\cos\Theta} \frac{c}{v_A}$ (2). The dependence of the refractive index on Θ and η is, however, more complex.

28755
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B125/B102

Anomalous Doppler effect in plasma

There are three radiation cones corresponding to the three frequency ranges F_1, F_2, and F_3. For $Q = 0$, (2) is the condition for Cherenkov radiation. Low-frequency oscillations are also excited by relativistic particles, e.g., the relativistic protons of the internal radiation belt. A formula of V. D. Shafranov is mentioned. In the author's opinion, the short-time fluctuations of the geomagnetic field might be ascribed to the protons of solar corpuscular currents. The magnetohydrodynamic branch of radiation corresponds to oscillations with some tenth of cycles. According to V. Ya. Eydman (ZhETF, 36, 1335, 1959), the ion does not radiate along the field when $u < c/n$. The radiation of an infinite ion beam is discussed next. Assuming a displaced Maxwell distribution $f(v) = \text{const}\cdot\exp\left\{-S^{-2}\left[v_x^2 + v_y^2 + (v_z - u)^2\right]\right\}$ and for $\Theta = 0$ one obtains the following expression for the refractive index:

$$n^2 = 1 + \frac{i\sqrt{\pi}}{(\omega + i\gamma)^2 k}\sum_{l=1}^{4}\frac{\omega_{0l}^2}{S_l}(\omega + i\gamma - ku_l)\ W(p_l),$$

where k is the wave number, and γ is the increment. $S = (2\varkappa T)^{1/2}\ M^{-1/2}$ is the thermal velocity;

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S/056/61/041/003/008/020
B125/B102

Anomalous Doppler effect in plasma

$p_1 = \frac{\omega \mp \omega_{H,1} + i\gamma - ku_1}{kS_1}$ and $W(p) = e^{-p^2}\left(1 + \frac{2i}{\sqrt{\pi}}\int_0^p e^{t^2}dt\right)$. Summation is performed in (4) over the electrons and ions of the plasma. For a hot beam and a cold plasma, the increment is given by

$$\frac{\gamma}{\omega} = -\frac{\omega - ku}{kS}\frac{\omega_o^2}{\omega^2}\frac{1}{2\varepsilon_{plasma} + \omega\partial\varepsilon_{plasma}/\partial\omega} \quad (5).$$

This expression is valid for a low density and a moderate temperature of the beam. $\gamma > 0$ holds for an anomalous Doppler effect. The beam is unstable, and the wave amplitude increases. For a normal Doppler effect one has $\gamma < 0$, i.e., instead of the buildup of the oscillation there occurs an attenuation. The author thanks V. D. Shafranov and R. Z. Sagdeyev for discussions. There are 1 figure and 12 references: 8 Soviet and 4 non-Soviet. The three most recent references to English-language publications read as follows: J. Aaron, C. Gustavsson, A. Egeland. Nature, 185, 148, 1960; M. Sugiura. Phys. Rev. Lett., 255, 1961. W. Murcray, J. Pope. Phys. Rev. Lett., 4, 5, 1960

SUBMITTED: June 27, 1960

Card 4/4

42143

S/203/62/002/004/004/018
I046/I242

3.1720
3.24/30

AUTHOR: Gintsburg, M.A.

TITLE: Radioemission of solar corpuscular streams in the earth's atmosphere

PERIODICAL: Geomagnetizm i aeronomiya, v.2, no.4, 1962, 642-652

TEXT: Analysis of the radioemission of solar corpuscular streams in the 1 to 20 kilocycles range shows that at any given frequency the Čerenkov radiation is invariably accompanied by cyclotronic radiation and viceversa. The radiation-intensity formula derived in the isolated-ion approximation (which does not consider interaction with fields produced by the ion itself or by other ions) indicates that the Čerenkov radiation intensity tends to be equal to the radiation intensity of the first cyclotronic harmonic, and that the energy output is about the same for the first 10 to 20 harmonics. Contrary to Ondoh (Ref.5: J.Geomagn. and Geoelectric., 1961, 12, 77), the joint contribution of the cyclotronic harmonics is not less

Card 1/2

S/203/62/002/004/004/018
I046/I242

Radioemission of solar corpuscular...

than that of the Čerenkov radiation intensity. The radiation intensity of an isolated ion in atmospheric plasma ($W \approx 10^{-22}$ erg/sec) exceeds the radiation intensity of an ion in vacuum by a factor of about 10^{14}. Whereas the isolated-ion approximation does not differentiate between superlight and hyperlight motion in the corpuscular stream, the kinetic approximation used in the analysis of the wave amplification factor in plasma, L , shows that interactions between ions result in instabilities ($L > 0$) in the first case and damping ($L < 0$) in the second case. There is 1 figure.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere and Propagation of Radio Waves, AS USSR)

SUBMITTED: April 2, 1962

Card 2/2

44456
S/203/62/002/006/015/020
A160/A101

3.9110

AUTHOR: Gintsburg, M. A.

TITLE: Electromagnetic oscillations in the terrestrial region

PERIODICAL: Geomagnetizm i aeronomiya, v. 2, no, 6, 1962, 1142

TEXT: The author briefly deals with magnetic oscillations in the terrestrial region formed by the magnetic sphere of the Earth in the solar corpuscular beam and whose dimensions on the night side are greater than on the day side. In case the size of the region on the day side is determined by the condition

$$H^2_{day} = 8\pi Mu^2N,$$

where H_{day} is the magnetic field, M - the mass of the proton, u - the directed beam velocity, and N - its density, the length of the rear body on the night side is determined by two effects. The first effect, the pressure of the plasma p, yields the condition

$$H^2_{night} = 8\pi u^2_T MN,$$

Card 1/3

where u_T is the heat velocity of the beam ions. The second effect is as follows. The body, moving in the plasma, ejects in the latter a certain volume. The filling of the vacuum behind the body takes place at a speed corresponding to the heat velocity of the ions. Therefore, a vacuum region, a so-called rear cone, arises behind the body which moves at a speed that is higher than the heat velocity of the plasma ions. The radius r_o of the moving "body" is determined in the given case by the condition

$$H^2 (r_o) = 8\pi M u^2 N,$$

where $r_o \approx 8 \div 10$ of the terrestrial radii. Standing hydromagnetic waves in the terrestrial resonator have to have different periods on the day and night sides. Since the conductivity and the losses are greatest in the lower ionosphere, oscillations with a node may possibly occur on the surface of the Earth. The second node will by on the day or the night side of the terrestrial region. In the first case, the dimensions of the resonator are smaller than in the second case. Correspondingly, the period is also shorter. The first-type oscillations are so-called pc magnetic-field micropulsations, the second-type oscillations lead

S/203/62/002/006/015/020

Electromagnetic oscillations in the terrestrial region A160/A101

to pt micropulsations.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetizm, Ionosphere and Radiowave Propagation, AS USSR)

SUBMITTED: July 8, 1962

X

Card 3/3

GINTSBURG, M.A.

Addition to the brief report "Tensor of the electric permeability of plasma with a beam" published in "Radiotekhnika i Elektronika" no.12 1960. Radiotekh. i electron. 7 no.2:360 F '62. (MIRA 15:1)
(Plasma (Ionized gases)) (Electron beams)

S/203/63/003/002/020/027
D207/D307

AUTHOR: Gintsburg, M.A.

TITLE: Determination of all three components of the static magnetic field vector from its modulus

PERIODICAL: Geomagnetizm i aeronomiya, v. 3, no. 2, 1963, 374

TEXT: The modulus $|H|$ of the magnetic field vector $\vec{H}$ can be determined more accurately than the direction of H and there are more instruments with which the modulus can be measured. The author shows that the three components of H can be found from the spatial distribution of the modulus because it obeys the well-known eikonal equation

$$\left(\frac{\partial\varphi}{\partial x}\right)^2 + \left(\frac{\partial\varphi}{\partial y}\right)^2 + \left(\frac{\partial\varphi}{\partial z}\right)^2 = |H|^2 \quad (|H|^2 = f(x,y,z)), \quad (2)$$

for which there are known methods of solution. If the vector $\vec{H} = -\text{grad}\ \varphi$ is known at several points, all the three components of the vector can be determined at these points.

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Determination of all three ...

S/203/63/003/002/020/027
D207/D307

ASSOCIATION: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institut for Terrestrial Magnetism, Ionosphere and Radiowave Propagation, AS USSR)

SUBMITTED: August 25, 1962

Card 2/2

GINTSBURG, M.A.

Low-frequency waves in a multicomponent plasma. Geomag. i aer. 3 no.4 :757-761 Jl-Ag '63. (MIRA 16:11)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

ACCESSION NR: AP4001838 S/0203/63/003/006/1127/1128

AUTHOR: Gintsburg, M. A.

TITLE: Head shock wave in front of the earth and its influence on the radiation belts

SOURCE: Geomagnetizm i aeronomiya, v. 3, no. 6, 1963, 1127-1128

TOPIC TAGS: radiation belt, earth shock wave, Pioneer I, plasma wave, electron concentration, galactic radio emission, relativistic electron, Fermi mechanism, plasma wave generation, head shock wave, shock wave radiation belt interaction, astronomy, Van Allen radiation belt, galactic radio noise, extraterrestrial radio waves

ABSTRACT: In Part One the author tries to clarify a paradox on the magnetic field pulse obtained on the basis of data from Pioneer I by C. Sonett (J. Geophys. Res., 1963, 68, 1265). He shows that the pulse systems observed by Pioneer I and V at 12 to 24 earth radii are nothing more than collisionless head shock-wave fronts which are fixed relative to the earth but move relative to the solar corpuscular plasma flow with speeds u = 3 to 5 x 10^7 cm/sec. In Part Two the

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ACCESSION NR: AP4001838

author reviews the possibility of plasma wave generation in the shock wave that can accelerate electrons from a 30-kev energy to 3-Mev energy in 10^5 seconds at solar wind temperatures of 10^5K. Orig. art. has: 2 formulas.

ASSOCIATION: Institut zemnogo magnetizma, ionosfery* i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation, AN SSSR)

SUBMITTED: 25May63 DATE ACQ: 17Dec63 ENCL: 00

SUB CODE: AS NO REF SOV: 004 OTHER: 004

Card 2/2

GINTSBURG, M.A.

Structure of the equations of cosmic electrodynamics. Astron.zhur. 40 no.4:703-709 Jl-Ag '63. (MIRA 16:8)

1. Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.
(Magnetic fields (Cosmic physics)) (Differential equations)

PIKEL'NER, S.B.; GINTSBURG, M.A.

Mechanism of type-2 bursts of solar radio emission. Astron. zhur. 40 no.5:842-846 S-O '63. (MIRA 16:11)

1. Gosudarstvennyy astronomicheskiy institut im. P.K. Shternberga i Institut zemnogo magnetizma, ionosfery i radio AN SSSR.

L 58468-65 EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Po-4/Pe-5/Pq-4/Pae-2/
Peb/Pi-4 GW
ACCESSION NR: AT5011146 UR/3148/64/000/006/0005/0013

AUTHOR: Gintsburg, M. A.

TITLE: Emission of electromagnetic waves by solar corpuscular streams

SOURCE: AN SSSR. Mezhduvedomstvennyy geofizicheskiy komitet. 3 razdel programmy MGG: Geomagnetizm i zemnyye toki. Sbornik statey, no. 6, 1964. Geomagnitnyye issledovaniya, 5-13

TOPIC TAGS: solar corpuscular stream, proton, magnetic field, relativistic electron, Alfven wave, Doppler effect, magnetosonic wave, plasma, gyromagnetic frequency

ABSTRACT: Solar corpuscular streams consist of fast particles including fast protons captured by the magnetic field of the stream and probably also relativistic electrons. Moving in a magnetically active plasma, these particles radiate different kinds of waves. The emission of Alfven waves is analyzed by the Doppler effect equation which yields two solutions, one of the normal Doppler effect with a velocity less than the speed of light and the other of the anomalous Doppler effect with a velocity greater than the speed of light. The length of the wave period changes with the velocity of the corpuscular stream. This change is caused by the transfer of the electromagnetic field by the particles. Magnetosonic waves emitted

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L 58468-65
ACCESSION NR: AT5011146

propagate in the stream with low frequencies. In the stream plasma there are low-frequency waves which propagate across the magnetic field. Magnetosonic wave propagating in a quasi-longitudinal direction may have any frequency, but the wave propagating in a transverse direction may have only a limited frequency range. The transverse Doppler effect diminishes the frequency of fast relativistic particles. Slow particles with longutudinal velocity may emit hydromagnetic waves. Alfven and magnetosonic waves created in the plasma stream penetrate into the earth's atmosphere. The gyromagnetic frequency increases near the earth's surface. The effect of total inner reflection may take place near the earth's surface where the increase in density and the refraction index exists. Orig. art. has: 1 table, 1 figure, and 14 formulas. [EG]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: AA, EM

NO REF SOV: 005 OTHER: 005 ATD PRESS: 4012

Card 2/2

L 14479-65 FBD/EWT(1)/EWG(v)/FCC/EEC-4/EEC(t)/EWA(h) Pe-5/Pi-4/Po-4/Pq-4/Pae-2
Peb ASD(f)-2/AFWL/AEDC(a)/SSD/BSD/SSD(b)/AFETR/ASD(p)-3 GW/WS

ACCESSION NR: AP4026235 S/0293/64/002/001/0064/0070

AUTHOR: Gintsburg, M. A.

B

TITLE: Radio emission from shock waves on the earth and in the interplanetary gas

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 1, 1964, 64-70

TOPIC TAGS: radio emission, shock wave, bow shock wave, interplanetary gas, radiation belt, solar corpuscular stream

ABSTRACT: A new effect is reported — a radio emission in the range 10-30 kc — which originates from a bow shock wave near the earth and planets and from the turbulent trail of the earth in the interplanetary gas. This wave and the accompanying radio emission occur when a solar corpuscular stream engulfs the bodies of the solar system, both with and without magnetic fields. Fig. 1. of the Enclosure shows this phenomenon for the earth. The mechanism of the radio emission of the shock wave near the earth is described. Observation of the radio emission of the other planets and the moon at frequencies of 10-30 kc can be useful in separating the two types of radio emission. Radio emission from the turbulent trail should be observed when the dark side of a planet is turned toward the earth or during a new moon, and that from a bow shock wave

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L 14479-65
ACCESSION NR: AP4026235

when the illuminated surface of the planet is turned toward the earth or when the moon is full. At intermediate phases there will be a combination of the two types of emission. The problem of experimental detection of this emission is discussed. The investigation of such low-frequency radio emission of the planets is generally possible only from satellites and rockets at a distance of 10^5/km or more from the earth; another possible means would be observations made in the Arctic and Antarctic. Other effects caused by the shock wave are also discussed. Orig. art. has: 12 formulas, 1 figure, and 2 tables.

ASSOCIATION: none

SUBMITTED: 10Sep63 ENCL: 01

SUB CODE: AA, EC NO REF SOV: 012 OTHER: 006

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L 14479-65
ACCESSION NR: AP4026235

ENCLOSURE: 01

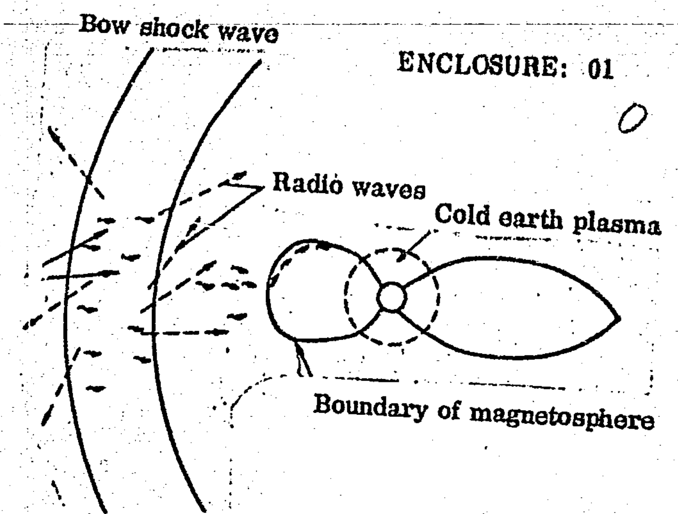

Fig. 1. Radio emission effect of the earth's corpuscular-stream bow-shock wave.

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S/0057/64/034/005/0818/0820

ACCESSION NR: AP4035689

AUTHOR: Vinnikova, T.L.; Gintsburg, M.A.

TITLE: Spectrum of the surface waves at the boundary between the vacuum and a magnetized plasma

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.5, 1964, 818-820

TOPIC TAGS: plasma, surface wave, plasma physics, plasma wave dispersion

ABSTRACT: The dispersion equation for surface waves at the plane boundary between the vacuum and a plasma in a uniform magnetic field parallel to the boundary was solved numerically for various values of the parameters, and some of the results are presented in graphical and tabular form. Only solutions for waves propagating transversely to the magnetic field are discussed. The dispersion equation was derived earlier (M.A.Gintsburg,Tr.Inst.zemnogo magnetizma, ionosfery* i rasprostraneniya voln AN SSSR,No.17,p.208,1960) and it is valid only for a sharp boundary, for which the electron Larmor radius is less than the penetration depth of the wave into the vacuum. The limiting frequencies for which this condition is satisfied are tabulated for several values of the thermal velocity and magnetic field. The phase velocity

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L 41839-65 EWT(d)/FSS-2/EWT(1)/EEC(k)-2/EPF(n)-2/EWG(v)/EWG(m)/FCC/EEC-4/EPA(w)-2/EEC(t)/EEC(c)-2/EWA(h) Pe-5/Pg-4/Pi-4/Pl-4/Pn-4/Po-4/Pq-4/Pt-7/Pz-6/Pab-10/Pac-4/Pae-2/Peb IJP(c) AT/AST/WW/RB/GW/WS-4

ACCESSION NR: AP5009655 UR/0293/65/003/002/0340/0342

AUTHOR: Gintsburg, M. A.

117

B

TITLE: Radiowave propagation in a moving cosmic plasma

21

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 2, 1965, 340-342

TOPIC TAGS: plasma, radiowave propagation, magnetic satellite sounding, shockwave theory, ionosphere electromagnetic property, refractive index, electric permeability

ABSTRACT: The author considers the fact that the cosmic plasma about the Earth is in a state of constant motion. Equations are derived for the calculation of the electrical permeability ε_{ik} and the index of refraction for moving plasma. The parameters involved are the constant velocity of particles of a given sort (electrons, ions), the component of their velocity caused by the variable field of the wave, the magnetic field of the wave, and the constant external magnetic field. In accordance with the expressions derived, the phase velocity and polarization of radio waves in such a plasma with current will differ from those in a plasma without current. The magnetic field in the region of 12 - 14 earth radii is considered in part on the basis of information derived from "Pioneer-1" and "Explorer-12" data. The author claims that electrons, accelerated in oblique pulses (and also

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L 41839-65

ACCESSION NR: AP5009655

in similar non-linear waves of more complex form) with energy levels up to the order of 1 kev, penetrate into the ionosphere. The mechanism of the aurora borealis is explained in this way. These electrons also function as the source of the nocturnal ionospheric ionization. Pulse velocity increases with amplitude, while pulse asymmetry is related to the dissipation and instability in the movement of electrons with respect to ions. The longitudinal oscillations which arise are transformed into transverse waves with a frequency of $\omega_{0,i} \approx$ 500-700 cycles. In the two halves of the isolated (single) pulse the electrons travel in opposite directions. Consequently, the plasma waves which they radiate also have different wave vectors and their non-linear interaction results in transverse radiowaves of doubled frequency. The author demonstrates that, because of the intensified process of second harmonic generation, this harmonic (30-40 cycles) must be a characteristic feature of the radio radiation of a leading shockwave. Orig. art. has: 12 formulae

ASSOCIATION: None

SUBMITTED: 27Apr64 ENCL: 00 SUB CODE: AA, EM

NO REF SOV: 005 OTHER: 001

Card 2/2

L 46921-66 EWT(1)/FCC GW

ACC NR: AR6015217 SOURCE CODE: UR/0269/65/000/012/0053/0054

AUTHOR: Gintsburg, M. A.

ORG: none

TITLE: Irradiation of electromagnetic waves by solar corpuscular streams

SOURCE: Ref. zh. Astronomiya, Abs. 12.51.414

REF SOURCE: Sb. Geomagnitn. issledovaniya. No. 6. M., Nauka, 1964, 5-13

TOPIC TAGS: sun, electromagnetic wave, corpuscular stream, solar particle, Doppler effect, Cerenkov effect, magnetoactive plasma, Alfven wave, proton, earth, relativistic electron, cyclotron radiation

ABSTRACT: On the basis of formulas for the Doppler effect and the Cerenkov effect, plasma frequencies are calculated at which the radiation of electromagnetic waves must be expected. These waves appear during the movement of high-velocity particles in magnetoactive plasma. Frequencies for the Alfven and magneto-acoustic waves, the Cerenkov radiation of the magnetoacoustic wave, and the slow extraordinary wave during the movement of fast protons are evaluated. The

Card 1/2 UDC: 523.75:523.165

ACC NR: AR6015217

cyclotronic radiation of Alfven and magnetoacoustic waves is examined for relativistic electrons. A diagram of frequency ranges of the types of radiation examined is presented in the original paper. Attention is called to the difference in radiation frequencies of corpuscular streams on the night side of the Earth and on its day side. The appendix includes a conclusion on the dependence of the wave frequency upon the direction of its radiation. The bibliography has 10 titles.

[GC]

SUB CODE: 03, 20/

Card 2/2 fv

L 10229-67 EWT(1)/FCC GW

ACC NR: AP7003081 SOURCE CODE: UR/0293/66/004/002/0296/0301

AUTHOR: Gintsburg, M. A.

ORG: none

TITLE: Interpretation of magnetic measurements in 'Pioner-1' and its geophysical corollaries

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 2, 1966, 296-301

TOPIC TAGS: shock wave, geophysics

ABSTRACT: A collisionless shock wave near the earth is possible because it is oblique. An oblique shock wave consists of oblique isolated impulses. The first part of this article gives an analysis of the properties of these impulses (amplitude, polarization) as a function of velocity and the angle θ. The second part develops the hypothesis that acceleration in the neighborhood of the earth for soft electrons ($E \sim 1$ keV, third outer belt of charged particles, auroral electrons, and electrons ionizing the nighttime ionosphere), and also electrons with energies $E \gtrsim 40$ keV (outer radiation belt), occurs in such oblique impulses. The author presents experimental confirmations of this hypothesis and various morphological corollaries. Orig. art. has: 1 figure and 5 formulas. [JPRS: 37,710]

SUB CODE: 08 / SUBM DATE: 05Jan65 / ORIG REF: 010 / OTH REF: 011

Card 1/1 UDC: 523.72

L 00907-67 EWT(1)/FCC IJP(c) AT/GW

ACC NR: AP6019669 SOURCE CODE: UR/0033/66/043/003/0550/0552

AUTHOR: Gintsburg, M. A.

ORG: Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation, Academy of Sciences SSSR (In-t zemnogo magnetizma ionosfery i rasprostraneniya radiovoln Akademii nauk SSSR)

TITLE: Acceleration of particles in cosmic plasma

SOURCE: Astronomicheskiy zhurnal, v. 43, no. 3, 1966, 550-552

TOPIC TAGS: cosmic plasma, particle acceleration, nonlinear plasma wave, solitary wave

ABSTRACT: The process of electron and ion acceleration by nonlinear waves in cosmic plasmas is analyzed. It is shown that electron and ion accelerations can be achieved through solitary wave pulses (solitons). In nonrelativistic solitons, the energy imparted to electrons and ions, respectively, is given by

$$\frac{\cos\theta}{\sqrt{2}}\sqrt{M/m} > \mathfrak{M} > \frac{\cos\theta}{2}\sqrt{M/m}; \quad H_f = H_0\mathfrak{M}\sqrt{2};$$

$$E_{f,e} = \frac{mv_{\perp}^2{}_f}{2} = \frac{1}{2}\frac{H_f^2}{8\pi n_0} = \frac{Mu_0^2}{2},$$

$$E_{f,i} = \frac{Mc^2}{2}\frac{R^2}{(R^2+1)^2}\cdot(1+2R^2)^2 \quad (R = v_A/c).$$

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UDC: 523.165

L 00907-

ACC NR: AP6019669

The nature of the solitons is discussed briefly. Their origin is attributed to strong, turbulent, nonuniform plasmas which are collisionless. Examples of such plasmas are those found in areas ahead of a planet colliding with supersonic streams of solar winds. When the amplitude of the soliton reaches 400 γ at $\theta = 0$, it can penetrate the magnetosphere of a planet (Earth or Jupiter) with the subsequent generation of radiation belts. Orig. art. has: 3 formulas.

SUB CODE: 03, 20, 04/ SUBM DATE: 11Sep65/ ORIG REF: 005/ OTH REF: 007

hs

Card 2/2

GINZBURG, M.

11g

PROCESSES AND PROPERTIES INDEX

Proteinases (cathepsin) in the tissues of the infantile organism with dysentery and toxic dyspepsia. B. Gol'dshtein and M. Ginzburg. *Ukrain. Biochem. Zhur.* 7, No. 3-4, 147-59(1935).—The cathepsin per g. of dry matter is less than normal in glycerol exts. of liver, kidney and spleen of children who have died of toxic dyspepsia. B. C. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Tissue proteases (cathepsin) in protein deficiency. Boris Gol'dshtein and M. Gintsburg. *Ukrain. Biokhem. Zhur.* 9, 341-6(in Russian 345-52; in German 353-4) (1936); cf. *C. A.* 30, 5843[9]; cf. *Ukrain. Biokhem. Zhur.* VII, No. 1 (1935); VIII, No. 3; VII, No. 3 (1934).—The concn. of cathepsin in rabbit liver and kidneys is higher than normal in protein deficiency. The difference between cathepsin unactivated and activated with H_2S also is much increased, especially in the liver. It is concluded that when protein synthesis predominates over hydrolysis, a considerable activating action of SH groups of the cathepsin takes place, and, that when hydrolysis predominates, there is a depressing action. Protein synthesis in rabbit liver is obviously increased on a deficient protein diet.

H. P. Stefanowsky

11e

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

GINZBURG, M.

PROCESSES AND PROPERTIES INDEX

The mechanism of antimalarial action of quinine. V. S. Galkin, M. Ginzburg, R. C. Averbukh and V. A. Kostanian. *Bull. biol. méd. expél. U. R. S. S.* 1, 441-2 (1936); *Ber. ges. Physiol. expll. Pharmakol.* 96, 632.—Quinine is only slightly toxic for plasmodia and concns. above 1:2500 in the blood are required to assist in the treatment of malaria. Quinine specifically changes the nervous system, after several large daily doses, rendering it refractory to the action of malaria. J. C. M.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

11F

PROCESSES AND PROPERTIES INDEX

Proteinases (cathepsin) in tissues of the hen embryo. B. Gol'dshtein and M. Ginzburg. *Ukrain. Biokhem. Zhur.* 9, 583 8 (in Russian 589 91, in German 592) (1936). —The catheptic action of glycerol exts. from embryonal membranes on gelatin becomes evident on the 9th day of incubation. Highest values of the proteolytic action are attained speedily and are maintained at about the same level until the last days of incubation. The difference of unactivated cathepsin and that activated by H_2S in the exts. investigated is great, especially in the first days of its appearance. The cathepsin values and the character of the activating action of H_2S are similar to those observed with placenta cathepsin. E. E. Stefanowsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

GINTSBURG, M.B.

Ca

11A

Cathepsin in the tissues of the embryo and mother. II. Boris Gol'dshtein and M. Gintsburg. *Biochem. J.* (Ukraine) **10**, 647-68 (in Russian 658-61; in English 661-2) (1937).—H_2S has no activating effect on freshly prepd. liver cathepsin exts. of normal and pregnant rabbits. After the exts. from a pregnant rabbit have been kept in a refrigerator for several days, a considerable activating effect of H_2S on the cathepsin is noted. In exts. of a normal animal this effect appears not at all or considerably later and to a smaller degree. Reduced glutathione disappears from the liver exts. of the pregnant animal more rapidly than from those of a normal female rabbit. However, the activating effect of H_2S on cathepsin appears later than the disappearance of the glutathione. Therefore it is assumed that this disappearance does not play the leading part in the activation of cathepsin in exts. The cathepsin concn. in the extracts is higher in the pregnant than in the normal animal. E. F. Stefanowsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GINSBURG, M. B.

Proteinase (cathepsin) in tissues of a chick embryo II. Boris Gol'dshtein and M. Gintsburg. *Biochem. J.* (Ukraine) 11, 65-70 (in Russian 70, in German 71) (1938); cf. *C. A.* 31, 3127[4], 3972[4]. During the development of the embryo cathepsin forms in the yolk sack; it is evidently absent from the yolk, the amniotic and the allantoic fluids. The cathepsin of the embryonic membrane of an egg has a great hydrolytic effect on the yolk and specificity toward albumin and globulin in the white of the egg, whereas, the cathepsin of the organs of mammals has no hydrolytic effect on these compds.

F. F. Stefanowsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

GINZBURG, M. N.

BC

a-4

Specificity of tissue proteinases (cathepsins). B. Goldstein, M. Ginzburg, and E. Milgram (Ukrain. Biochem. J., [illegible]).—[illegible] dog, rabbit, and [illegible] liver cathepsins do not hydrolyse ovalbumin, addition of which to the extracts [illegible] of the homologous tissue-proteins, [illegible] formation of stable ovalbumin-cathepsin complexes. [illegible] of production of NH_2-acids [illegible] liver extracts is unaffected by addition [illegible] that these cathepsins [illegible] substrate. The rate of [illegible] ovalbumin rises in the [illegible] < C. [illegible] < [illegible] < [illegible] < [illegible] yolk sac cathepsins. It is concluded that the higher is a given genus in the evolutionary scale, the greater is the specificity of its tissue proteinases. Physiological changes in the animal affect the specificity of cathepsins; thus liver cathepsin from pregnant rabbits hydrolyses ovalbumin. The same property is conferred on ordinary rabbit liver cathepsin by addition of heat-inactivated yolk sac cathepsin. R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Cathepsin and glutathione in the liver of normal rabbits and in hyperthyreosis. Boris Gol'dshtein, M. Ginzburg, and G. Sheves. *Biochem. J.* (Ukraine) 12, 385-401 (in Russian, 401-6; in English, 407-11)(1938).—The cathepsin activity of exts. of the liver of rabbits fed with thyroid gland is greater than in normal rabbits. H_2S lowers the activity of both exts., to a greater extent in the former than in the latter group. The activity of the exts. falls with time, and such exts. are then activated by H_2S, to a greater extent in thyroid-fed animals; this effect is not paralleled by disappearance of reduced glutathione from the exts. The presence of activators of cathepsin other than glutathione is postulated. B. C. P. A.

GINTSBURG, M.B.

Ca

11A

Regulation mechanism of the activation of tissue proteinases. II. Cathepsin, glutathione and ascorbic acid in the liver tissue of normal and hyperthyreosic rabbits. M. B. Gintsburg and S. A. Kacherova. *Biochem. J. (Ukraine)* 16, 667-79 (in Russian, 670-81; in English, 684) (1940); cf. *C. A.* 33, 8253[1].—In normal rabbit liver exts. the proteolytic activity (I) reduction is insignificant after several days; H_2S depression remains unchanged. In hyperthyreosis (II), the reduction is sharp and H_2S again reactivates I to a considerable extent; glutathione (III) is lost from the exts., exptl. and controls. Possibly, the cathepsin activity is regulated in normal rabbits simultaneously by the labile and stable (to oxidation) activators; after disappearance (oxidation) of III, I is supported by the stable activators. Hyperthyreosis, with the consequent intensification of the protein metabolism and oxidation processes, labilizes the stable activators; all the activators in the liver exts. are in a labile state and quickly disappear; the I drops sharply and H_2S restores it. By use of liver tissue in place of the exts., with no substrate, and, to eliminate the peptidase effect, hydrolyzing for 1 hr., when only the proteinase is active, the hydrolysis in II is greater, particularly in animals killed between January and July. Likewise, as with the exts., the addn. of H_2S to the controls reduces the hydrolysis, and this is intensified after 2-hr. aeration; in II, the gradual and strong depression caused by H_2S is reduced, and sometimes even reversed to activation after aeration. There is no difference with the III; 2-hr. aeration has no effect. There is less ascorbic acid (IV) in II; it is reduced, from 20 mg. % in December to 5 mg. % in February; season had no effect on the controls. There is an inverse relation between IV and III, increased IV corresponding to min. III; this may not be due to its disappearance from the tissues; the condition of hyperthyreosis stimulates the transformation of part of IV into a bound state, activating proteolysis. B. Gutoff

ASM-SLA METALLURGICAL LITERATURE

GINTSBURG, M. B.

Uk ...

Inst. Biochemistry, (-1944-).

Inst. Zoobiology, (-1944-).

"A Method for Obtaining of the Dry Dysenteric Bacteriophage,"

Zhur. Mikrobiol., Epidemiol., i Immunobiol., No. 10-11, 1944.

GINTSBURG, M.B.

11A

CA

Changes of sulfur-containing amino acids within the protein molecule, and the influence of thyroid hormone. M. B. Gintsburg, E. A. Kolli, E. Yu. B. I. Gol'dshtein, Mil'gram, and O. S. Sklovskaya (Inst. Exptl. Endocrinology, Moscow). *Biokhimiya* 11, 447-70(1946).—The changes in the SH groups and S-contg. amino acids in the muscle protein myosin were studied. During the prolonged extn. of myosin, some ATP always disappeared from the ext. The addn. of ATP lowered the SH content of myosin. It is postulated that during the enzymic hydrolysis of ATP there takes place a perpetual transfer (oscillation) of the S atom from one peptide chain to the other, thus producing the first phase of muscular contraction. The amt. of free SH groups in myosin and heptatosin increased during exptl. hyperthyroidism. This suggests that the thyroid hormone ruptures the thio ether linkages in proteins. The SH groups that are thereby formed are then oxidized. H. Priestley

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GINTSBURG, M.B.

USSR/Medicine - Biochemistry
Medicine - Cysteine

Sep/Oct 48

"Methods of Converting Methionine Into Cysteine," M. B. Gintsburg, Moscow, 10 pp

"Uspekh Soverm Biol" Vol XXVI, No 2 (5)

Conversion of methionine into cysteine proceeds in three stages: (1) demethylating methionine to homocysteine, (2) adding the homocysteine to serine and forming cystothionine thio ether, (3) breaking up the cystothionine with the aid of a ferment system including ATP into phosphohomoserin and cysteine. There is a possibility of forming

60/49T73

60/49T73

USSR/Medicine - Biochemistry (Contd) Sep/Oct 48

cysteine in the organism, i.e., from sulfur and sulfide by means of a desulfurase.

60/49T73

GINTSBURG, M. B.

Properties of the sulfhydryl groups of reconstituted myosin. M. B. Glatsburg (All-Union Inst. Exptl. Endocrinol., Moscow). *Ukrain. Biokhim. Zhur.* 23, 291-8(1951)(in Russian).—In myosin there was found a small percentage of S—S groups, which are easily broken up by H_2S, creating conditions favorable to the oxidation of the SH groups and their entering into the compn. of myosin. Atm. O does not oxidize these groups normally and only slightly after denaturation with urea. After myosin has been reconstituted with H_2S, atm. oxidation becomes enhanced. Destruction of the S—S union renders the denatured myosin insol. in KCl. With the removal of the urea the soly. of the modified myosin in KCl is reëstablished, despite the fact that urea alone does not render the denatured myosin insol. in KCl.

B. S. Levine

GINTSBURG, M.B.; PANDRE, Ye.M.; BINUS, N.M.

Role of sulfhydryl groups and peroxides in the biological action of ionizing radiations [with summary in English]. Biokhimiia 22 no.3: 467-475 My-Je '57. (MIRA 10:11)

1. Ukrainskiy nauchno-issledovatel'skiy sanitarno-khimicheskiy institut, Kiyev.

(ROENTGEN RAYS, effects,
lethal dose, on peroxides & sulfhydryl cpds. metab. (Rus))

(SULFHYDRYL COMPOUNDS, metabolism,
eff. of x-rays, lethal dose (Rus))

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00051672(

GINTSBURG, M.B.

Effect of ionizing radiations on some nonprotein thio compounds in the anima organism [with summary in English]. Biokhimiia 23 no.6:840-844 N-D '58 (MIRA 11:12)

1. Ukrainskiy nauchno-issledovatel'skiy sanitarno-khimicheskiy institut, Kiyev.
(X RAYS--PHYSIOLOGICAL EFFECT)
(MERCAPTO GROUP)

PAVLOV, S.M.; GINTSBURG, M.G.; KOVALENKO, V.I., inzh., retsenzent; TIKHONOV, A.Ya., tekhn. red.

[Operation and repair of motorcycles] Ekspluatatsiia i remont mototsiklov. Izd.2., perer. i dop. Moskva, Mashgiz, 1953. 395 p. (MIRA 16:7)
(Motorcycles--Maintenance and repair)

G.

AKIMOVA, N., GINTSBURG, M.

New method of heating the cold engine of a Moskvich automobile. Avt.transp.33 no.10:33 O '55. (MLRA 9:1)
(Automobiles--Engines)

GINTSBURG, Matvey Grigor'yevich; PAVLOV, Serafim Mikhaylovich; BAUMAN, I.M., inzhener, redaktor; MODEL', B.I., tekhnicheskiy redaktor

[Operation and repair of motorcycles] Ekspluatatsiia i remont mototsiklov. Izd. 3-e, perer. i dop. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 428 p. (MLRA 9:7)
(Motorcycles)

GINTSBURG, M.G.

IVANITSKIY, Svyatoslav Yur'yevich, inzh.; IGNATOV, Yuriy Vladimirovich, inzh.; KARMANOV, Boris Sergeyevich, inzh.; ROGOZHIN, Vsevolod Vyachislavovich, inzh.; BEKMAN, V.V., inzh., retsenzent; GINTSBURG, M.G., retsenzent; SMELYANSKIY, V.A., inzh., red.; UVAROVA, A.F., tekhn.red.

[Motorcycles; construction, theory, design] Mototsikl; konstruktsiia, teoriia, raschet. Moskva, Gos. nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1958. 503 p. (MIRA 11:4)
(Motorcycles)

GINTSBURG, Matvey Grigor'yevich; KOVALENKO, V.I., inzh., retsenzent; ABEZ'YANIN, D.N., retsenzent; TERENT'YEV, V.D., doktor tekhn. nauk, red.; NAKHIMSON, V.A., red.izd-va; TIKHANOV, A.Ya., tekhn. red.; UVAROVA, A.F., tekhn.red.

[Motorcycles; construction and servicing] Mototsikly; ustroistvo i obsluzhivanie. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1959. 286 p. (MIRA 12:4)
(Motorcycles)

AKIMOVA, N.I.; GINTSBURG, M.G.

Rally Moscow-Sevastopol-Moscow. Avtomobilist. no.47-49 '61. (MIRA 15:1)

(Automobile racing)

LOTOTSKIY, Aleksey Vladimirovich, inzh.; ZOBNIN, Vladimir Andreyevich, inzh.; KAMERILOV, Vladimir Konstantinovich, inzh.; SHMELEV, Oleg Filippovich, inzh.; GINTSBURG, M.G., red.; NAKHIMSON, V.A., red.izd-va; EL'KIND, V.D., tekhn.red.

[Freight motor scooters] Gruzovye motorollery. Moskva, Gos. nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1961. 163 p. (MIRA 14:4)
(Motor scooters)

POPOV, Yakov Savel'yevich. Prinimali uchastiye: GINTSBURG, M.G.; MOROZ, R.P.; SILKIN, A.N.; SEDOV, A.V., red.; MANINA, M.P., tekhn. red.

[Handbook for a motorcycle driver] Sputnik mototsiklista. Moskva, Fizkul'tura i sport, 1963. 319 p. (MIRA 17:2)

LEVINSON, Nikolay Grigor'yevich [deceased]; GEYDYSH, S.S., inzh., retsenzent; GINTSBURG, M.V., inzh., retsenzent; LUGOVOY, M.V., inzh., retsenzent; REZNIK, I.S., inzh., retsenzent; TROYANOVSKIY, V.V., inzh., retsenzent; TIMOFEYEVSKIY, T.P., inzh., red.; BARYKOVA, G.I., red.izd-va; MODEL', B.I., tekhn.red.

[Mechanization of management control (management technology)] Mekhanizatsiia upravlencheskogo truda (orgatekhnika). Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry. Vol.1. 1958. 386 p. (MIRA 12:2)

(Automatic control) (Industrial management)

L 34091-66 EWT(m)/EWP(j)/T WW/JW/JWD/RM

ACC NR: AP6012923 SOURCE CODE: UR/0020/66/167/005/1083/1086

AUTHOR: Ginsburg, V. A.; Medvedev, A. N.; Dubov, S. S.; Lebedeva, M. F.

ORG: none

63
B

TITLE: Electron transfer in reactions of nitroso compounds

SOURCE: AN SSSR. Doklady, v. 167, no. 5, 1966, 1083-1086

TOPIC TAGS: organic nitroso compound, free radical, EPR spectrum, electron donor

ABSTRACT: In a continuation of the study of electron transfer processes in donor-acceptor transformations of nitroso compounds, the following systems consisting of trifluoronitrosomethane and typical nucleophilic compounds were analyzed: (A) CF_3NO + amines ($(C_2H_5)_3N$; C_5H_5N; $C_6H_5NH_2$; $C_6H_5NHCH_3$; $C_6H_5N(CH_3)_2$); (B) $CF_3NO + C_6H_5SH$; (C) CF_3NO + $(iso\text{-}C_4H_9O)_3P$; (D) CF_3NO + RNNO; R = $((CH_3)_2$, $(C_2H_5)_2)$; (E) $CF_3NO + (CH_3)_2CClNO$, and also (F) $CF_3NO + C_2H_5ONO$; (G) CF_3NO + aldehydes (CH_3CHO, C_3H_7CHO, C_6H_5CHO). In these systems, in the temperature range from -160 to +20C, EPR spectra were obtained, indicating a radical nature of the transformations taking place. The signals are attributed to ion radicals of the type $CF_3\overset{\cdot}{N}(O)\text{-}\overset{+}{D}$ (where D is the donor molecule) and $CF_3N\dot{O}^-$, and also to products of secondary reactions. The formation of these ion radicals in systems A-F indicates that oxidation-reduction processes occur during the initial stages of the reaction between the nitroso compound and the nucleophilic molecule, the latter acting as the electron donor. The

Card 1/2 UDC: 543.878

L 34091-66

ACC NR: AP6012923

paper was presented by Academician Voyevodskiy, V.V., 26 Jul 65. Orig. art. has: 2 figures.

SUB CODE: 07 / SUBM DATE: 02Jun65 / ORIG REF: 007

Card 2/2 vmb

CHALIKOV, Anatoliy Viktorovich; VARSHAVSKIY, V.I., nauchn. red.; GINTSBURG, V.I., ved. red.

[Programming of design calculations] Programmirovanie proektnykh raschetov. Leningrad, Izd-vo "Nedra," 1964. 113 p. (MIRA 17:7)

GRACHEV, Rostislav Ivanovich; BROYTMAN, Roman Yakovlevich, VERESHCHAKO, Igor' Aleksandrovich; ROZENBERG, Nikolay Mikhaylovich; LEYBSON, M.G., nauchnyy red.; GINTSBURG, V.I., vedushchiy red.

[Determining the efficiency of geological prospecting; methodological instructions]. Opredelenie effektivnosti geologorazvedochnykh rabot; metodicheskie ukazaniia. Leningrad, Nedra, 1964. 84 p. (Leningrad. Vsesoiuznyi neftianoi nauchno-issledovatel'skii geologorazvedochnyi institut. Trudy, no. 229) (MIRA 17:6)

32-7-25/49

AUTHOR: Gintsburg, V. S.

TITLE: On the Third Period of the Creeping (of Metals and Alloys) and Relaxation of Stress. (O tret'yem periode polzuchesti i relaksatsii napryazheniy).

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 7, pp. 838-842 (USSR)

ABSTRACT: Relaxation stress can be determined in those cases of a state of stress which favor a decrease of the solid and an increase of the plastic deformation. The "creeping" of metals and alloys is investigated at conditions favoring unlimited deformation and may be observed with diminishing relaxation stress and with the constancy of general deformation. This fact makes it possible to apply the rules of creeping to the phenomenon of relaxation stress. The third period of creeping can be determined only at high temperatures (critical temperature). Investigations carried out at a temperature of 650° resulted in the following arrangement of diagram curves and gave the following results:

1) Diagram curves of tungsten- and niobium alloys, which show the greatest resistance against stigmatization, show a much slower development of the III.period of creeping.

2) Diagram curves of niobium alloys with an average degree of resistance against stigmatization show a more rapid development of the III.period.

3) Diagram curves of tungsten alloys with an inclination towards

Card 1/2

On the Third Period of the Creeping (of Metals and Alloys) and 32-7-25/49
Relaxation of Stress.

intense stigmatization showed the fastest development of the III. period. The phenomenon of the III.period of creeping and relaxation stress is a property of every substance that possesses the ability of viscous flow. There are 6 figures.

AVAILABLE Library of Congress.

Card 2/2

GAMBURG, P.Yu., red.; GINTSBURG, V.B., red.; VINOGRADOVA, G.M., red. izd-va; OSENKO, L.M., tekhn. red.

[Improving the design and planning of ventilation, heating and heat supply of industrial buildings] Uluchshenie proektirovaniia ventiliatsii, otopleniia i teplosnabzheniia promyshlennykh zdanii. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1960. 94 p. (MIRA 14:10)

1. Nauchno-tekhnicheskoye obshchestvo stroitel'noy industrii SSSR. (Industrial buildings--Heating and ventilation)

MIKHEYEV, Vikentiy Pavlovich; VENEDIKTOV, Aleksey Vladimirovich; GLOZSHTEYN, Ya.S., nauchn. red.; GINTSBURG, V.I., ved. red.

[Jet burners for natural gas with active air spray] Inzhektsionnye gorelki dlia prirodnogo gaza s aktivnoi vozdushnoi struei. Leningrad, Izd-vo "Nedra," 1964. 92 p. (MIRA 17:4)

ANIKIYEV, Kirill Aleksandrovich; GINTSBURG, V.I., vedushchiy red.; KRUGLIKOV, N.M., red.

[Unusually high reservoir pressures in oil and gas fields.] Anomal'no-vysokie plastovye davleniia v neftianykh i gazovykh mestorozhdeniiakh. Leningrad, Nedra, 1964. 166p. (Leningrad. Vsesoiuznyi neftianoi nauchno-issledovatel'skii geologorazvedochnyi institut. Trudy, no.233).

(MIRA 17:10)

GINTSBURG, V.S.

Enlarging brigades. Sudostroenie 23 no.9:57-58 S '57. (MIRA 10:12)
(Shipbuilding workers)

GINTSBURG, DECENT YA. A.

Feb 52

USSR/Engineering - Welding

"Weldability and Crack Formation Tendency During Welding," Docent Ya. A. Gintsburg, Cand Tech Sci

"Avtogen Delo" No 2, pp 28, 29

Briefly reviews attempts to establish clear concept of weldability." Concludes term is useless since it has no abs meaning, and meaning varies as welding technique advances. Study of tendency of steel to crack formation under definite conditions at given level of welding technique is

212T23

more important. States that there are no nonweldable metals or alloys, but certain processes of welding and heat treatment are as yet insufficiently developed to attain proper quality of welded joints and structures.

212T23

PROCESSES AND PROPERTIES INDEX

BC

B-I-6

Hot-working of chromium-manganese, chromium-manganese-nickel, and chromium-nickel stainless steels. J. S. Ginzburg, N. A. Aleksandrova, and L. S. Geldernan (Rep. Inst. Met., Leningrad, [illegible], No. 15, 56—60).—Pure austenite was found in a Cr-Mn steel with 2% Cu. The ferrite diminishes with increase of Mn and C. Ni has a greater effect than has Mn on increase of austenite. Cr–Ni steels with C 0·16—0·31, Si 0·38—0·77, Mn 0·40—0·88, Cr 17·91—19·60, and Ni 7·85—10·24% have a pure austenite structure. CH. ABS. (e)

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

BC

8-I-5

Production of magnetic chromium steel. J. S. Gurmung (Rep. Centr. Inst. Met., Leningrad, 1934, No. 16, 77—91).—Magnetic properties of the forged hot-rolled steel (C 0·07, Si 0·35, Mn 0·26, S 0·01, P 0·024, Cr 2·27, Ni 0·20%) were higher than after hot-rolling without forging. CH. ABS. (r)

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

High-speed tool steel for hack saws. Ya. S. Ginzburg, L. S. Gel'derman and A. N. Zhuronkin. *Repts. Central Inst. Metals* (Leningrad) No. 16, 134 40(in English 140)(1934).—An exptl. investigation of the problems of heat treatment, rolling and annealing of steel used in the manuf. of hack saws. S. I. Madorsky

ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION ca

9

The manufacture of stainless bimetal. Ya. S. Gintsburg, L. S. Gel'derman and A. D. Gol'dberg. *Repts. Central Inst. Metals* (Leningrad) No. 17, 158-64(in German 164)(1934).—A discussion is given of methods of making 2-layer metal plates, where one layer is resistant to corrosion. The problem has not yet been completely solved and that exptl. work should be carried out in making bimetal as well as trimetal plates.

S. L. Madorsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

BC

B-I-6

Production of nichrome wire. J. S. G[illegible] and A. D. G[illegible] (Rep. Inst. Met., Leningrad, 1936, No. 18, 70—78).—The alloy (Cr 16·67, Ni 59·17, Si 0·30, Mn 1·64, C 0·08, P 0·006, S 0·004%) should be produced in a crucible furnace rather than in an induction furnace, as in the latter the grain boundaries of the product are not free from slag and impurities. Before rolling into bars the ingots should be forged (1200—1220°). Grinding of the ingots before forging and of the bars before rolling is essential. Rolling to 45 × 45 mm. size should start at 1150°. Further reduction should be by cold-rolling.

Ch. Abs. (e)

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Investigation of spreading of alloy steels during rolling Cast alloys. Ya. S. Gintsburg and L. S. Gel'derman. *Rept. Central Inst. Metals Leningrad* No. 18, 52-67 (1936).—The pearlite steels tested are widely used in automobile, tractor and turbine work. In all cases, spreading increased with a drop in rolling temp. The differences in spreading between the various steels decrease as the temp. rises. The addn. of C, Ni and Cr-Ni to C, Ni and Cr-Ni steels, resp., causes an increase in spreading. Cr acts more effectively than Ni in spreading of Cr-Ni steels.

B. Z. Kamich

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

BC

B-1-4

Rolling [illegible] chromium-silicon steels of the [illegible] type. [illegible] The [illegible] properties of [illegible] steels [illegible] were studied in the wrought, tempered, and rolled condition. [illegible] Ch. Abs. (e)

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

The production of rustproof bimetal Ya. S. Gintsburg, M. B. Katsenelenbogen and A. S. Lur'e. *Kachestvennaya Stal* **1935**, No. 8, 27-31; *Chem. Zentr.* **1936**, I, 4350.—The production of rust-resistant bimetal by a method developed at the "Sickle and Hammer" foundry of Moscow is described. Two plates of rustproof steel, firmly pressed together and sepd. by an insulating material (MgO) and graphite, 10 kg., are recast surrounded by a soft metal (as Armco Fe or low C steel) in a chill mold. Half of the ingot so prepd. is then rolled to form a bimetal sheet.

M. G. Moore

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION