wavelengths because of lack of sensitivity. Attempts at making large parabolic reflectors suitable for use at short wavelengths have been frustrated by the following difficulty. (Large telescopes for centimetre waves are best built with reflectors. It is difficult to design for large areas when centimetre waves are to be used in, say, radio interferometers). The reflecting surface must not deviate from the correct shape by more than 0.1 λ. Thus the relative accuracy (ratio of permitted deviation to diameter) increases as the wavelength is reduced. No existing radio telescope has a relative accuracy better than 1 in 10^4, and there is no reason to expect any substantial improvement. Now the diameter should not greatly exceed 1000 λ; the directional pattern must show a divergence not substantially less than 3' (because the angle to half power is about λ/D radians). The resolving power can be increased only if some new principle is used to produce large reflectors of relative accuracy much better than 1 in 10^4. The present authors proposed one such principle in 1952, which principle has been utilised at the Main Astronomical Observatory. The reflector

SOV/120-59-2-5/50

A New Radio Telescope of High Resolving Power

is split up into many separate strips, each of which is set to produce the desired form of surface. The number of strips increases with the size of the reflector; the only increase in accuracy demanded falls on the mutual positioning of the strips and not on the form of each strip. The reflector strips can be adjusted by geodetic methods to a relative accuracy of about 1 in 10^6, i.e. to an accuracy much higher than that accessible with an integral reflector. The strips have to be set on the ground, and so the size can be increased greatly only in the horizontal direction. Hence the viewing angle will be narrow only in horizontal direction ('knife-edge pattern'). However, Bracewell (Ref 1) and Pariyskiy have shown that this type of pattern can usually be used to give the high resolution in both coordinates, if observations are made at different azimuths (direct and oblique to the direction of rise.) The curvature of the reflecting surface must vary with the azimuth and right elevation. This variation is possible with a given set of strips only if the strips are flat. The surface can be built up from separate flat strips in the

Card 4/11

following way. Consider a paraboloid of rotation whose focus lies fixed at a certain height above the ground. This paraboloid can be turned about the focus F to view different directions (Fig 1). The paraboloid meets the horizontal plane MN through the focus in an ellipse (Fig 2), whose equation is

$$\rho = P/(1 + \cos \alpha \cos \varphi) \qquad (1)$$

where ρ is the distance from the focus to a point on the ellipse, P is the parameter of the initial paraboloid, and α is the viewing angle (to the horizontal). (The eccentricity varies from 1 to 0, and ρ from P/2 to P, as α changes from 0 to 90°). If the strips are placed very close together along this ellipse, an incident plane wave will be transformed to a convergent cylindrical one, whose axis passes through the focus. The horizontal size ℓ of a strip must then be small and such that the path difference between the centre and edge of a strip is much less than the shortest wave-length (λ_{min}) to be received; the vertical length h must be large in order to minimize diffraction at the

SOV/120-59-2-5/50

A New Radio Telescope of High Resolving Power

longest wavelength (λ_{max}) to be received. Then all rays reflected from points in the plane MN will arrive in the same phase at the focus, and waves reflected in any other plane will arrive at a vertical line passing through the focus in that same phase. The surface thus transforms a plane wave into a cylindrical one that propagates horizontally and that converges to a vertical line passing through the focus. A second reflector (a parabolic cylinder) placed near the focus with its axis horizontal, and with its focus placed at the focus of the first reflector, will transform the cylindrical wave into a convergent spherical one. Thus the incident plane wave is focussed in two steps. The second reflector handles a convergent cylindrical wave near the focus, and so can be made with its horizontal dimensions very small compared to those of the first reflector. The vertical dimension of the antenna is chosen to give optimal reception; the best height varies a little with α on account of the change in the distance from focus to reflector. The best length is $h_0 = 0.8h$. The periodically varying path differences, and the slots

Card 6/11

between the strips, cause widely separated weak interference lobes (similar to the principal maxima produced by a diffraction grating with a periodically varying refractive index); these reduce the efficiency of the surface, but do not affect the shape of the main lobe. The strips are set to the appropriate configuration in turn by displacement horizontally and by rotation about vertical and horizontal axes. Motion along the radius R of a circle that passes through the centres of the strips (when the object is in the zenith) is sufficient for the horizontal setting. The relative radial displacement of a strip seen at an azimuth Ω from the centre of the circle (Fig 2) is:

$$\delta = \frac{\Delta R}{R} = \frac{\cos\Omega\,(\sin^2\alpha - q)}{1 - \cos^2\alpha\cos^2\Omega} + \frac{\sqrt{\cos^2\Omega(\sin^2\alpha - q)^2 + (2q - \sin^2\alpha)(1 - \cos^2\alpha\cos^2\Omega)}}{1 - \cos^2\alpha\cos^2\Omega} - 1 \qquad (2)$$

where $q = P/R$.

It is essential for design reasons to minimize the radial displacements required. This may be done by choosing for each Ω the value of P for which the mean line of the surface differs least from a circle of radius R. The inclination β of a strip seen at an angle φ from the focus is given by:

$$\sin \beta = \sin \alpha / \sqrt{2(1 + \cos \varphi \cos \alpha)} \qquad (3)$$

The strip has to be rotated about its vertical axis through an angle $\Omega - \psi$ where ψ is given by:

$$\mathrm{tg}\, \psi = (1 - \delta) \sin \Omega / \sqrt{q^2 - (1 + \delta)^2 \sin^2 \Omega \sin^2 \alpha} \qquad (4)$$

A complete circle of strips makes it possible to turn the telescope to any azimuth. Automatic devices could provide rapid setting of the strips and automatic following of a source. This principle was in part used in the large GAO telescope built in 1956 (Fig 3). This telescope has at present 90 strips, each with $\ell = 1.5$ m and $h = 3$ m, which lie on an arc of a circle with $R = 100$ m. Each strip has means for moving it radially by 30 cm, and for turning it about its horizontal and vertical axes (Fig 4). P.D. Kalachev designed the strip systems. The strips

SOV/120-59-2-5/50

A New Radio Telescope of High Resolving Power

are set manually from scales on the mechanisms, and from spirit levels. The zeros on the scales are checked (to correct for possible sinking in the foundations) by means of a system of fiduciary marks. V.D. Korotchenko and O.N. Shivris supervised the erection and adjustment. Two forms of antenna have been used, one as a segment of a paraboloid ('cheese'), and the other as a paraboloidal cylinder. The second of these (Fig 5) can be used over a range of centimetre and decimetre wavelengths. Each antenna is mounted on a rail system, and can be brought up to the focus. The antenna can be set at any height from 0 to 80°. The azimuth can be varied by ±40° from south (the number of strips is halved at the extreme positions). Tables for setting the strips have been drawn up on a computer. At 3 cm the widths to half power are 1.2', and 1° at small angles, and the coefficient of effective use for the reflector is about 30%. The angles were determined from the minimum widths of sun-spot records, and by a method developed by N.A. Yesepkina (Ref 2). The following new results emerged from examining the sun: a) the radio sources

Card 9/11

SOV/120-59-2-5/50

A New Radio Telescope of High Resolving Power

located on groups of sun-spots gave steady emissions during 2-3 rotations of the sun; b) the limiting sizes of these sources are about 1', the brightness temperatures are about 10^6 °K, and the heights are at 1.06 - 1.08 solar radii; the values are the same for 3 and 10 cm, Ref 3; c) powerful bursts occur at 3 cm; these are related to flashes in chromosphere, and have sizes of 1.5 to 2', temperatures of 10^8 °K or more, and heights of 1.1 solar radii (Ref 4). The radio telescope is fitted with sensitive receivers for wavelengths of 3.2 and 10 cm; discrete sources can be observed, as well as the sun. Observations on the Crab nebula at 3.2 cm gave results similar to those expected for this wavelength. G.P. Apushkinskiy, Yu.N. Pariyskiy and N.A. Bol'shakov designed the receivers; the first two studied the Crab nebula. A much larger telescope could be built on the same principle (the GAO one has an area of about 350 m^2). The lengths of the strips are limited by the permissible error at λ_{min}, whereas the horizontal dimension is limited by the maximum permissible focal distance at λ_{max}. The useful range of wavelengths is thus

Card 10/11

SOV/120-59-2-5/50

A New Radio Telescope of High Resolving Power

limited by the size of the largest areas that are available. Thus, if the relative accuracy is to be 1 in 10^4, with λ_{min} = 3 cm and λ_{max} = 1 m, the area can be raised to $(1 \div 2) \times 10^4$ m^2; with λ_{min} = 10 cm and λ_{max} = = 2 m the value becomes $(1 \div 2) \times 10^5$ m^2.

Card 11/11

(slightly abridged translation).
There are 5 figures and 4 references, of which 3 are Soviet and 1 English.

ASSOCIATION: Glavnaya astronomicheskaya observatoriya AN SSSR (Main Astronomical Observatory, Ac.Sc. USSR)

SUBMITTED: September 17, 1958

KHAYKIN, S.E.; KAYDANOVSKIY, N.L.; YESEPKINA, N.A.; SHIVRIS, O.N.

Large Pulkovo radio telescope. Izv.GAO 21 no.5:3-26 '59.
(MIRA 13:9)
(Pulkovo Observatory--Telescope, Radio)

PHASE I BOOK EXPLOITATION SOV/4313

Barabashov, N.P., V.A. Bronshten, M.S. Zel'tser, N.L. Kaydanovskiy, A.V. Markov, K.P. Stanyukovich, N.N. Sytinskaya, A.V. Khabakov, Sh.T. Khabibullin, V.V. Sharonov, and A.A. Yakovkin

Luna (The Moon) Moscow, Fizmatgiz, 1960. 384 p. 4,500 copies printed.

Ed.: (Title page): A.V. Markov, Doctor of Physics and Mathematics; Ed.: G.A. Manova; Tech. Ed.: N.Ya. Murashova.

PURPOSE: This book is intended for astronomers, astrophysicists, and other scientific and technical personnel interested in lunar research.

COVERAGE: The book, written by 11 Soviet authorities, summarizes and evaluates research done to date in selenology. The motion, rotation, and figure of the Moon, physical properties of the lunar surface, the question of the existence of lunar atmosphere, mapping of the Moon, radar investigations, and the effect of external cosmic forces on the Moon are discussed. An index of Russian and Latin designations of lunar features is included. The text is illustrated with 110 figures and 32 tables. There are 74 references: 34 Soviet, 32 English, 6 German, and 2 French.

~~Card 1/6~~

KAYDANOVSKIY, N. L.

Observation of Radar-Beaming on the Moon on the Wave - 2.3 CM with the aid of the Great Pulkovo Radio Telescope, et al.

report presented at the International Symposium on the moon, held at the Pulkovo Obs rvatory, Leningrad, USSR, 6-8 Dec 1960.

KAYDANOVSKIY, N. L. and IKHSANOVA, V. N. (USSR)

"Observations of the Moon with the Pulkovo radio telescope"

report presented at the Intl. Astronomical Union's Symposium on the Moon, Leningrad, 6 Dec 60.

21164
S/141/60/003/006/003/025
E133/E361

3,1710 (1041,1126,1127)
9,4230

AUTHORS: Khanberdiyev, A. and Kaydanovskiy, N.L.

TITLE: The Travelling-wave Tube as a Phase-modulator for Radio-interferometers

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol. 3, No. 6, pp. 943 - 948

TEXT: The tube is to be used in the centimetre or decimetre range. The phase change produced depends mainly on the electrode potentials and the focusing field, with a change of grid voltage producing the most effect. If the optimum voltage of the latter (U_o) is changed by 1%, the phase change is 40-55%. For changes in U_o (the synchronising voltage) $>$ 2%, the corresponding phase change does not increase linearly. To obtain 100% modulation, one can have a constant phase change of 90° together with a supplementary change of $\pm$ 90° between the two interferometer arms. A block diagram of the interferometer is given. Either one or two travelling-wave tubes can be used. The block diagram is given of an experimental

Card 1/4

set-up (phase-modulator) which was tested in the laboratory. The dependence of the low-frequency amplifier output of this phase-modulator on the modulating voltage is shown in Fig. 4. A travelling-wave tube can also be used as an amplitude-modulator in a single-antenna radio telescope but it is less effective in this case. Phase-modulation produces amplitude-modulation of the internal noise of the tube. In most tubes the minimum noise factor occurs slightly below the synchronising voltage. Fig. 6 shows the variation of amplification coefficient with grid voltage. This curve, and the corresponding one for the noise factor, are almost symmetrical about the synchronising voltage U_o. The dependence of amplitude-modulation on the frequency of the modulating voltage and its harmonics has been investigated experimentally. The following values were obtained for the power of the parasitic amplitude-modulation harmonics (in % of the total power): 2, 91, 0 and 7 for the fundamental wave, second, third and fourth harmonics, respectively. Thus, if a narrow-band filter

centred on the modulation frequency is used, only 2% of the modulation noise will be passed. This refers to the case where only one tube is used; if two tubes with modulation of opposite phases are employed, the parasitic effects can be lowered by an order of magnitude. The advantages of these tubes are: 1) when the tube is used as a low-frequency amplifier, there is no need for a special modulator; 2) the range of possible modulation frequencies is increased by many tens of megacycles. Acknowledgments are expressed to S.E. Khaykin for valuable advice and to A.A. Novysh for participation in the work. There are 7 figures, 1 table and 7 references: 1 Soviet and 6 non-Soviet.

ASSOCIATION: Glavnaya astronomicheskaya observatoriya AN SSSR (Main Astronomical Observatory of the AS USSR)

SUBMITTED: July 1, 1960

69895

S/109/60/005/04/008/028
E140/E435

9.1000

AUTHORS: Braude, B.V., Yesepkina, N.A., Kaydanovskiy, N.L. and Khaykin, S.E.

TITLE: The Effects of Random Errors on the Electrical Characteristics of Narrow-Beam Antennas with Variable-Profile Reflectors

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 4, pp 584-596 (USSR)

ABSTRACT: When a reflector antenna is constructed of individually adjustable plane elements the directional characteristics may be much better than those of a normal reflector antenna of rigid metal construction of equivalent aperture. The random and periodic errors of such construction are analysed. Certain of the conclusions of this analysis have been tested on the large radiotelescope of GAO AN SSSR (GAO Academy of Sciences USSR). While the 76 m paraboloid built in England permits work on a wavelength of 0.7 m (precision 10^{-3}), the radiotelescope of GAO has a precision of 4×10^{-5}, with invar-wire construction aligned by an ordinary theodolite. It is expected that this type of antenna on rocky ground

Card 1/2

69895

S/109/60/005/04/008/028
E140/E435

The Effects of Random Errors on the Electrical Characteristics of Narrow-Beam Antennas with Variable-Profile Reflectors

aligned by precision geodetic instruments will permit precisions of 10^{-5} to 10^{-6} and apertures of the order of 1 km. There are 8 figures and 5 references, 4 of which are Soviet and 1 French.

4

SUBMITTED: July 1, 1959

Card 2/2

87354

S/035/60/000/012/012/019
A001/A001

9.1910

Translation from: Referativnyy zhurnal, Astronomiya i Geodeziya, 1960, No. 12, p. 48, # 12267

AUTHORS: Khaykin, S. E., Kaydanovskiy, N. L., Yesepkina, N. A., Shivris, O. N.

TITLE: The Great Pulkovo Radiotelescope

PERIODICAL: Izv. Gl. astron. observ. v Pulkove, 1960, Vol. 21, No. 5, pp. 3-26 (English summary)

TEXT: The authors describe the principle, design and results of investigation of the new mirror radiotelescope for centimeter wavelengths. The radiotelescope has the large surface of the reflector and is characterized by the high resolving power. Some astronomical results obtained by means of this instrument are presented. The reflector of the radiotelescope consists of a number of flat reflecting elements which form a polyhedral surface touching the surface of an elliptic cone. The reflector transforms the plane incident wave into a cylindrical one with a vertical axis. The cylindrical wave is transformed into a spherical one by the second mirror, a parabolic cylinder. The high relative precision of

Card 1/2

87354

The Great Pulkovo Radiotelescope

S/035/60/000/012/012/019
A001/A001

the dismembered reflecting surface is achieved by the precise arrangement of its individual elements. The axis of the radiotelescope can be installed in any direction by displacements of reflecting elements and irradiator. Geometry of the reflecting surface, special features of the radiotelescope directivity diagram, and kinematics of mechanisms for the positioning of reflecting elements, are considered, and the measured characteristics of the radiotelescope are presented. There are 22 references.

From authors' summary

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

Card 2/2

37943

S/035/62/000/005/038/098
A055/A101

3.1720

AUTHORS: Molchanov, A. P., Kaydanovskiy, N. L., Peterova, N. G.

TITLE: Observations of local sources of solar radio emission with the aid of the great radio telescope of the GAO (Main Astronomical Observatory), on the 2.3-cm wavelength

PERIODICAL: Referativnyy zhurnal, Astronomiye i Geodeziya, no. 5, 1962, 42, abstract 5A327 ("Solnechnyye dannyye", 1961, no. 3, 68-69)

TEXT: The authors reproduce the preliminary results of the processing of 15 recordings of solar radio emission on the 2.3 cm wavelength, obtained with the aid of the great radio telescope of the Main Astronomical Observatory, the Academy of Sciences of the USSR (width of the main lobe of the diagram 1'8). The dimensions of the observed sources do not exceed the distance between the outer edges of the nuclei of the remotest spots in the corresponding group. The height of the sources over the photosphere was $(0.06 \pm 0.02)\ R_\odot$ for the source linked with the group no. 594, and did not exceed $0.07\ R_\odot$ for the groups nos. 596, 597. The flux of the radio emission from the sources did not vary considerably when the sources moved from the edge of the solar disk towards its center.

I. Gosachinskiy

[Abstracter's note: Complete translation]

Card 1/1

25942
S/141/61/004/001/002/022
E032/E314

3,1720 (1126, 1127, 1129, 1395)

AUTHORS: Kaydanovskiy, N.L. and Salomonovich, A.Ye.

TITLE: On the Determination of the Characteristics of the Lunar Surface Using Observations Obtained with High-resolution Radio Telescopes

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol. 4, No. 1, pp. 40 - 43

TEXT: According to the theory of thermal radio emission of the Moon, as developed by Troitskiy (Ref. 1), the brightness radio temperature of the Moon for a uniform spherical model is given by

$$T_e(\varphi, \psi, t) = T_{e_0} + \sum_{n=1}^{\infty} T_{e_{-n}} \cos(n\omega t - n\varphi - \xi_n), \qquad (1)$$

where

Card 1/9

$$T_{r_0} = (1 - R)\left[T_H + \frac{a_0}{2} D\eta(\psi)\right];$$

$$T_{r_{-n}} = (1 - R)\frac{a_n D\eta(\psi)}{\sqrt{1 + 2\delta_n \cos\alpha + 2\delta_n^2 \cos^2\alpha}}. \qquad (2)$$

In these expressions φ and ψ are the selenographic longitude and latitude, respectively, $R(\varphi, \psi)$ is the reflection coefficient, T_H is the night temperature of the surface, $D = T_\Pi - T_H$, where T_Π is the temperature of the surface at the point directly facing the Sun, $\eta(\psi)$ is the temperature distribution function for the Moon illuminated by the Sun, $a_n = \frac{1}{\pi}\int_{-\pi/2}^{+\pi/2} \eta(z)\cos(nz)dz$, ω is the angular frequency

of the Moon, $\zeta_n = \text{arc tg} \dfrac{\delta_n}{1 + \delta_n}$ is the phase shift of the n-th harmonic, $\delta_n = \beta_n/\varkappa$ is the ratio of the depth of penetration of an electromagnetic wave $1/\varkappa$ to the depth of penetration of the n-th harmonic of the temperature wave $1/\beta_n$, and α is the angle of incidence of a ray from within the lunar crust onto the surface. Since up to recently the radio emission of the Moon has been recorded with low-resolution radio telescopes, the quantity that was measured was not $T_e(\varphi, \psi, t)$ but, rather, a certain temperature representing the average over the lunar disc. The latter depends on the polar diagram of the radio telescope (Troitskiy - Ref. 1). In order to determine the physical characteristics of the lunar surface it is necessary to obtain T_H and T_Π from radiometric measurements.

Moreover, it is also necessary to assume some specific form for the functions R and η. The form of these functions was chosen as in Ref. 1, using optical data wherever possible. Since radio telescopes measure the projection of the distribution $T_e(\varphi, \psi, t)$ onto a plane, it is expedient to transform the selenographic coordinates φ, ψ to the rectangular coordinates x, y on this plane. These axes are respectively parallel to the Equator and the Central Meridian of the lunar disc. The relation between x, y and φ, ψ is given by the usual formulae

$$x = r \sin \varphi \cos \psi ; \quad y = r \sin \psi \tag{3}$$

where r is the radius of the Moon. For points on the Equator

$$x = r \sin \varphi, \quad y = 0 \tag{4}$$

while for points on the Central Meridian

$$x = 0, \quad y = r \sin \psi \qquad (5) .$$

To begin with, consider the constant component

$$T_{e,o}(x, y) = \left[1 - R(x, y)\right]\left[T_H + (a_o/2)D\eta(y)\right]$$

where

$$\tilde{\eta}(y) = \eta\left(\arcsin \frac{y}{r}\right) .$$

In the above plane, the radio isophotes $T_{e,o}$ = const. take the form of approximately oval curves with a common centre at the centre of the disc and the y-axis as the axis of symmetry. This follows from the assumption that the lunar surface is homogeneous. The variable component $T_{e\sim}$ is superimposed on the $T_{e,o}$ distribution and, in general,

distorts the symmetry of the isophotes, displacing the point with the maximum brightness towards the point immediately below the Sun, i.e. it displaces the "centre of gravity" of the emission. When the higher harmonics of $T_{e\sim}$ can be neglected, and when it can be assumed that $\cos\alpha \approx 1$, an approximate distribution of the radio isophotes of the constant component can be obtained directly, using the $T_e(x, y)$ distribution obtained with maximum displacements of the "centre of gravity" of the emission, i.e. for $\omega t - \xi = \Phi = \pi/2$ or $\Phi = 3\pi/2$. The isophotes of the constant components $T_{e,o}$ can in turn be used to obtain the curve $\tilde{\eta}(y)$ and then to compute the dielectric constant. As will be shown below, the observations must be carried out with the linearly polarised exciter of the radio telescope arranged at an angle of $\pm\pi/4$ to the lunar equator (the x-axis). The distribution along the Equator in the case of the constant component is then given by

$$T_e(x, 0, \Phi) = [1-R(x, 0)]\left\{T_n + \frac{a_0}{2}D + \frac{a_1 D}{\sqrt{1+2\delta_i+2\delta_i^2}}\left(\cos\Phi\sqrt{1-\frac{x^2}{r^2}}+\sin\Phi\frac{x}{r}\right)\right\}.$$

and hence when $\Phi = \pi/2$

$$\frac{T_e(x, 0, \pi/2) + T_e(-x, 0, \pi/2)}{2T_e(0, 0, \pi/2)} = \frac{1-R(x, 0)}{1-R(0, 0)} \qquad (6).$$

On the other hand, when $\Phi = \pi/2$, the distribution along the Meridian is

$$T_e(0, y, \pi/2) = T_{e,0}(0, y, \pi/2).$$

Moreover, in accordance with Eq. (1), the distribution of the constant component along the Central Meridian is given by

$$\frac{T_{e_0}(0, y, \pi/2)}{T_{e_0}(0, 0, \pi/2)} = \frac{|1 - R(0, y)|}{|1 - R(0, 0)|} \frac{|T_H + (a_0/2) D \tilde{\eta}(y)|}{|T_H + (a_0/2) D|}, \qquad (7)$$

Assuming that the emissive power as given by Eq. (6) is independent of local changes and that it is the same along Ox and Oy, it is possible to choose $\tilde{\eta}(y)$ (with T_H and D known from radiometric measurements) so that the righthand side of Eq. (7) should be equal, as near as possible, to the lefthand side which is obtained from measurements. Having determined the form of the function $\tilde{\eta}(y)$ and consequently knowing a_0, the value of $1 - R$ and of the dielectric constant $\eta(y)$ can be calculated from Eq. (2).

25942
S/141/61/004/001/002/022
E032/E314

On the Determination of ....

The measured amplitudes of the harmonics of the variable component of the brightness temperature can then be used to determine the depths of penetration of the electromagnetic and the n-th thermal waves and to calculate the effective electrical conductivity and the loss angle Δ .
There are 5 references: 4 Soviet and 1 non-Soviet.

ASSOCIATION: Fizicheskiy institut im. P.N. Lebedeva AN SSSR (Physics Institute im. P.N. Lebedev of the AS USSR)

SUBMITTED: September 3, 1960

Card 9/9

3,1710
3,2500 (1080)

30753
S/141/61/004/003/004/020
E133/E435

AUTHORS: Kaydanovskiy, N.L., Ikhsanova, V.N., Apushkinskiy, G.P., Shivris, O.N.

TITLE: Observations of lunar radio emission at a wavelength $\lambda = 2.3$ cm, using the large Pulkovo radiotelescope

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1961, Vol.4, No.3, pp.428-432

TEXT: It has been shown (Ref.1: V.S.Troitskiy, Astron.zh., 31, 511 (1954)) that measurements of the brightness temperature at the centre of the lunar disc permit an estimate to be made of the equivalent conductivity of the lunar surface material. Such measures, carried out over the course of a lunation, demand great stability of the instrument used. In order to minimize the stability requirements, the antenna temperature was determined indirectly by measuring the displacement (x) of the centre of gravity of the emitted lunar radiation from the geometrical centre of the Moon. Using this method, the amplification coefficient of the system only has to remain constant during the course of one observation. The use of the displacement x is discussed in the

Card 1/3

paper of N.L.Kaydanovskiy and his team (Ref.2: Izv. AN SSSR, M., 1956, p.347). The results there are inaccurate owing to the fact that the lower reflectivity of the Moon, towards the limb, was ignored. The antenna temperature is derived from the displacement in the way which has been described by Troitskiy (Ref.1). Only the first harmonic term is retained in the present paper. The variation of x with the amplitude of the variable component of the brightness temperature at the centre of the disc is thus obtained. The theory of Troitskiy assumes that the Moon's orbit lies in the ecliptic plane and that there is no libration. This approximation is applicable except near new, or full, moon. At these latter times, however, the displacement of the centre of gravity of the lunar radiation is small and, therefore, the deviations can also be ignored at these points. The authors discuss the use of an antenna with a low half-width in one coordinate and a considerably greater half width in the other coordinate (Fig.2). Such an antenna can be used so long as the pattern is elongated parallel to the plane of the Earth-Moon axes, so long as it is trailed in a direction perpendicular to this. Observations of the Moon were made in October-December 1959 at

30753
S/141/61/004/003/004/020
E133/E435

Observations of lunar radio ...

λ = 2.3 cm on the large Pulkovo telescope. The angular resolution of the antenna was 2' in one direction and 20' to 1° in the other. The observations were made with the Moon at upper culmination in order to fulfil the conditions mentioned in the previous paragraph. Fig.4 shows the variation of x with lunar phase. $x = 0'.17\ (\omega t - 35°)$, where t is counted from the new Moon. The accuracy of this expression is ± 30%. The amplitude of the variable component at the centre of the lunar disc is, hence, derived as 13.5 ± 4°K. Acknowledgments are expressed to S.E.Khaykin and A.A.Novysh. There are 4 figures and 4 Soviet-bloc references.

ASSOCIATION: Glavnaya astronomicheskaya observatoriya AN SSSR (Main Astronomical Observatory AS USSR)

SUBMITTED: October 7, 1960

Card 3/4

30426
S/109/61/006/012/001/020
D266/D305

9.1911 (1127)

AUTHORS: Yesepkina, N.A., Kaydanovskiy, N.L., Kuznetsov, B.G., Kuznetsova, G.V., and Khaykin, S.E.

TITLE: Investigating the radiation pattern of highly directive antennas whose reflecting surface is adjustable

PERIODICAL: Radiotekhnika i elektronika, v. 6, no. 12, 1961, 1947 - 1960

TEXT: The purpose of the paper is to derive mathematical expressions for the radiation pattern and for the effective area of a certain class of antennas. The antenna investigated consists of a large number of elements (rectangular metal plates of height h and width a) whose position and inclination are adjustable. The elements are in no mechanical contact with each other which facilitates greater accuracy of manufacturing. They can be adjusted in such a way that the main lobe of the vertical radiation pattern is in a specified direction (θ_o in Fig. 1). This condition is satisfied if the radius vector of the center of the elements is given by the follow-

Card 1/4

ing formula

$$\rho = \frac{p}{1 + \cos\theta_0 \cos\varphi} = \frac{R_0 - a_0 \cos\theta_0}{1 + \cos\theta_0 \cos\varphi} \qquad (1)$$

where p - constant, φ - angle between the radius vector and the x axis (see Fig. 1). If $0 < \theta_0 < \pi/2$ (1) represents an ellipse, for $\theta_0 = 0$ a parabola, and for $\theta_0 = \pi/2$ a circle. It follows from (1) that the distance between the primary source and the reflector depends also on θ_0. The inclination of the metal plates is determined by the angles β and χ (see Fig. 1) which are related to θ_0 and as follows

$$\sin\beta = \frac{\sin\theta_0}{\sqrt{2(1 + \cos\theta_0 \cos\varphi)}} \qquad (3)$$

and

$$\tan\chi = \frac{\sin\varphi}{\cos\theta_0 + \cos\varphi} \qquad (4)$$

in a plane perpendicular to the direction of the main lobe, the waves are in phase (this must be always the case because the antenna was designed according to this criterion) and the shape of the illuminated area in this plane is an incomplete ring. The distribution of the electric field (both polarizations are present) in the aperture is calculated by geometrical optics and the far field is obtained with the aid of wave optics. The arising integrals are integrated out leading to an infinite series of Bessel functions of the first kind. The radiation pattern is calculated for the reflector current as well. No analytical solutions are found in this case, but some numerical calculations indicate similar results to those obtained by the aperture method. Aperture efficiency is also determined and monotonically decreasing function of θ_0 is found. In conclusion the authors express their gratitude to V.B. Braude for his assistance. There are 15 figures and 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: S. Silver, Microwave Antenna Theory and Design, M.I.T. Rad. Lab. Series.

SUBMITTED: February 22, 1961

KAYDANOVSKIY, Naum L'vovich; KHAYKIN, S.E., prof., nauchnyy red.; VOROB'YEV, G.S., red.izd-va; GURDZHIYEVA, A.M., tekhn. red.

[Unseen universe; essays on the achievements of radio astronomy] Nevidimaia Vselennaia; ocherki dostizhenii radioastronomii. Leningrad, Ob-vo po rasprostraneniiu polit. i nauchn. znanii RSFSR, 1962. 62 p. (MIRA 15:12)

(Radio astronomy)

MIKHAYLOV, A.A., otv. red.; DADAYEV, A.N., red.; VASIL'YEVA, L.M., red.; KAYDANOVSKIY, N.L., red.; MARKOV, A.V., red.; POTTER, Kh.I., red.; SHCHEGOLEV, D.Ye., red.; SMIRNOVA, M.Ye., red. izd-va; KONDRAT'YEVA, M.N., tekhn. red.

[New developments in lunar studies] Novoe o Lune; doklady i soobshcheniia na.... Moskva, Izd-vo Akad. nauk SSSR, 1963. 426 p. (MIRA 16:5)

1. Mezhdunarodnyy simpozium po issledovaniyu luny, Pulkovo, 1960. 2. Glavnaya astronomicheskaya observatoriya Akademii nauk SSSR, Pulkovo (for Mikhaylov, Kaydanovskiy, Markov, Potter, Shchegolev). 3. Chlen-korrespondent Akademii nauk SSSR (for Mikhaylov). (Moon)

GOL'NEV, V.Ya.; KAYDANOVSKIY, N.L.; MALUMYAN, V.G.

Observations with the large radiotelescope of the Pulkov Observatory on 33 cm. wavelengths beyond the long-wave limit of its range. Izv. vys. ucheb. zav.; radiofiz. 5 no.4:805-807 '62. (MIRA 16:7)

1. Glavnaya astronomicheskaya observatoriya AN SSSR.
(Telescope, Radio) (Radio astronomy)

ZAKHARENKOV, V.F.; KAYDANOVSKIY, N.L.; PARIYSKIY, Yu.N.; PROZOROV, V.A.

Observations of discrete radio sources at 3.2 cm. wave length at Pulkovo. Astron.zhur. 40 no.2:216-222 Mr-Ap '63. (MIRA 16:3)

1. Glavnaya astronomicheskaya observatoriya AN SSSR.
(Radio astronomy)

L 4930-66 FBD/EWT(1) GS/GW/WS-2

ACC NR: AT5024311 SOURCE CODE: UR/0000/65/000/000/0129/0135

40
B+1

AUTHORS: Smirnova, N. A.; Kaydanovskiy, N. L.
55 55

ORG: All-Union Conference Dedicated to the Problem of Extraterrestrial Civilization (Vsesoyuznoye soveshchaniye, posvyashchennoye probleme vnezemnykh tsivilizatsiy); Main Astronomical Observatory, AN SSSR, Pulkovo (Glavnaya astronomicheskaya observatoriya, AN SSSR)
55

TITLE: The effect of conditions of radio wave scatter in the cosmic medium and in the earth's atmosphere on the apparent angular dimensions of the source

SOURCE: Vsesoyuznoye soveshchaniye, posvyashchennoye probleme vnezemnykh tsivilizatsiy. 1st, Byurakan, 1964. Vnezemnyye tsivilizatsii (Extraterrestrial civilizations); trudy soveshchaniya. Yerevan, Izd-vo AN ArmSSR, 1965, 129-135

TOPIC TAGS: astronometry, galactic radiation, radio astronomy, cosmic radio source
12, 55

ABSTRACT: The angular dimensions of a radio source in outer space are discussed as a criterion of the artificiality of the transmission source. An effort is made to develop the joint scattering effect of the cosmic medium and the earth's

Card 1/3 0901 1564

L 4930-66

ACC NR: AT5024311

atmosphere. The scattering effect upon a planar wave front entering the earth's atmosphere is pictorialized in Fig. 1.

Fig. 1. The distortion of a wave front passing through a nonuniform layer. 1- planar wave front; 2- layer of nonuniformity; 3- deformed wave front; 4- the surface of the earth

The equation

$$\overline{\varphi^2} = \frac{4\pi^2 Sr}{\lambda^2}\overline{\Delta n^2},$$

is used to model the mean square phase deviation from the undisturbed state. The equation is due to H. Chandrasekhar (Monthly Notices, 112, 475, 1952). Here, S is the ray path having a mean dimension r which is significantly larger than the

Card 2/3

L 4930-66
ACC NR: AT5024311

wavelength λ; $\overline{\Delta\eta^2}$ is the mean square value of the fluctuation of the refraction index and

$$\sqrt{\overline{\Delta n^2}} \ll 1.$$

Using data on the nonuniformity of the troposphere, ionosphere, interplanetary and interstellar media, and the metagalaxy, the authors solve and tabulate the phase deviation. It is noted that the most significant phase disturbance is due to the cosmic medium. The formula for evaluating a ray's mean square deviation from the undisturbed direction is given by

$$\overline{\sigma_l^2} = 4\pi^{3/2} \frac{S}{r} \overline{\Delta n^2}.$$

Additional discussion is devoted to analyzing frequency distortion. The authors cite the need for experimental data on the nonuniformity of the cosmic medium. The useful advice and comments of Yu. N. Pariyskiy are gratefully acknowledged. Orig. art. has: 2 equations, 2 tables, and 1 figure.

SUB CODE: AA/ SUBM DATE: 26May65/ ORIG REF: 008/ OTH REF: 004

Card 3/3

KAYDANOVSKIY, N.L.; SMIRNOVA, N.A.

Limitation of the resolving power of radio telescopes and radio interferometers due to the conditions of radio wave propagation in outer space and in the earth's atmosphere. Radiotekh. i elektron. 10 no.9:1574-1582 S '65. (MIRA 18:9)

L 41092-66 EWT(1)/T/EBD GW/WS-2/WR

ACC NR: AP6027233 SOURCE CODE: UR/0109/66/011/008/1405/1412

AUTHOR: Yesepkina, N. A.; Kaydanovskiy, N. L.; Korol'kov, D. V.; Kuznetsov, B. G.; Khaykin, S. E.

ORG: none

55
B

TITLE: Effects of atmosphere on characteristics of small radio telescopes

SOURCE: Radiotekhnika i elektronika, v. 11, no. 8, 1966, 1405-1412

TOPIC TAGS: radio telescope antenna, radar antenna, ATMOSPHERIC PROPERTY, RADIO WAVE ABSORPTION

ABSTRACT: A study is conducted of atmospheric effects on the performance of a high-resolution radio telescope antenna with a variable profile. Factors influencing the antenna dimensions, such as wavefront phase distortions, existence of a gradient of index of refraction, and radio wave absorption in the ground layer of the atmosphere are considered. It is noted that phase distortion can be minimized if the average radius of curvature of the reflector is much greater than the height of irregularities in the atmosphere. By assuming a 10^{-4} relative accuracy of the antenna reflecting surface and mean atmospheric conditions, antenna gain was calculated for various azimuth angles. Nearly optimal performance conditions were found for the vertical dimensions of a reflector equal to $0.5 \times 10^3\lambda$, and horizontal dimensions of an antenna chosen to make the attenuation equal to 30%. With such a choice of

UDC: [522.2:523.164]+621.371.24

Card 1/2

L 41092-66

ACC NR: AP6027233

dimensions, the effective area of the antenna is 2×10^5, 1.3×10^4, 0.9×10^3 m^2 for λ = 10, 3 and 1 cm, respectively. Orig. art. has: 6 figures and 2 formulas. [JV]

SUB CODE: 09, 17/ SUBM DATE: 12Apr65/ ORIG REF: 012/ OTH REF: 003/ ATD PRESS: 5057

Card 2/2 hs

ACC NR: AP6033253 SOURCE CODE: UR/0109/66/011/010/1741/1745

AUTHOR: Kaydanovskiy, N. L.

ORG: none

TITLE: Feasibility of superlong-base radio interferometers

SOURCE: Radiotekhnika i elektronika, v. 11, no. 10, 1966, 1741-1745

TOPIC TAGS: interferometer, radio astronomy

ABSTRACT: The possibility is examined of building a superlong-base interferometer by means of (a) highly-stable autonomous heterodyne oscillators situated on the antennas and serving to convert antenna signals into IF signals, or (b) a phase-lock AFC of local oscillators from a common oscillator located on a synchronous artificial Earth satellite; in this case, the phase fluctuation in the antennas due to propagation of master-oscillator wave through a heterogeneous

Card 1/2

ACC NR: AP6033253

medium will be small. The above systems would be particularly suitable in the centimeter and millimeter wave bands. In the "a"-method, the IF voltages can be transmitted by feeders or stored by antenna-mounted devices and later jointly processed. The required stability of heterodyne oscillators is figured out: base, 1000 km. The information storage and subsequent joint processing are feasible only if precision time synchronization (Moon or satellite relaying) is available. There is another possibility of canceling the effect of phase fluctuation due to random variation of interferometer arms, viz., the phase shift of the heterodyne wave (propagating from the midbase to the antenna mixer) can be compensated by an equal phase shift of the signal wave converted to IF. "The author wishes to thank S. E. Khaykin for discussing the manuscript." Orig. art. has: 16 formulas.

SUB CODE: 03, 09 SUBM DATE: 20Sep65 / ORIG REF: 001

Card 2/2

KAYDANOVSKIY, N. N.

"Prospects in the Investigation of Thermal Radiation From the Moon (based upon observations by Ye. K. Kokhan in the Abastumani Observatory)."

Report presented at the Plenary Meeting of the Committee of Planetary Physics, Council of Astronomers, Khar'kov, 20-22 May 1958.
(Vest. Ak Nauk SSSR, 1958, No. 8, p. 113-114)

KAYDANOVSKIY, P.A., zasluzhennyy vrach RSFSR

Systematization of case histories in city hospital archives.
Sov. zdrav. 16 no.2:60-62 F '57 (MLRA 10:4)

1. Iz 4-y Moskovskoy gorodskoy klinicheskoy bol'nitsy (glavnyy vrach-zasluzhennyy vrach RSFSR M.V. Ivanyukov)
(MEDICAL RECORDS
hosp., systematization)

KAYDANOVSKIY, P.A., zasluzhennyy vrach RSFSR (Moskva)

Work of the department of medical statistics in hospitals. Sov. zdrav. 19 no.10:74-80 '60. (MIRA 14:1)

1. Iz 4-y Moskovskoy gorodskoy klinicheskoy bol'nitsy (glavnyye vrachi - zasluzhennyy vrach RSFSR M.V.Ivanyukov, G.F.Papko).
(HOSPITALS—ADMINISTRATION) (MEDICAL STATISTICS)

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721220009-8"

ACCESSION NR: AP5021625

KAYDASH, A.N. (Kherson, ul. Ushakova, d.67)

Foreign body simulating a tumor of the bronchus. Klin.khir. no.11:84 N '62. (MIRA 16:2)

1. Khersonskiy oblastnoy onkologicheskiy dispanser.
(BRONCHI--FOREIGN BODIES)

KAYDASH, A.N.; YAKOVENKO, I.I.

Unusual method of removing foreign bodies from the esophagus. Zhur. ush. nos. i gorl. bol. 23 no.2:84 Mr-Ap'63.(MIRA 16:8)

1. Iz khirurgicheskogo otdeleniya (zav. - kand. med. nauk P.I. Yurzhenko) Khersonskoy oblastnoy bol'nitsy.
(ESOPHAGUS—FOREIGN BODIES)

KAYDASH, A.S., Cand Agr Sci -- (diss) "Methods of controling ~~[illegible]~~ Canada thistle [Cirsium arvense] and young weeds in the system of fundamental and pre-sowing tilling of soil for the cultivation of sunflowers in the Kuban'." Krasnodar, Sov Kuban', 1958. 16 pp (Min of Agr USSR. Kuban' Agr Inst). 120 copies. (KL, 34-58, 100)

KAYDASH, N.F.

USSR/Chemical Technology. Chemical Products and Their Application -- Treatment of natural gases and petroleum. Motor fuels. Lubricants, I-13

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5548

Author: Kaydash, N. F., Livshits, S. M.

Institution: None

Title: Investigation of Detonation Stability of Automobile Gasolines in the ZIS-120 Engine

Original Publication: Khimiya i tekhnol. topliva, 1956, No 4, 30-36

Abstract: Detonation characteristics of ZIS-120 engine were determined, while operating at full power, over the range from 1,000 to 3,000 RPM. The detonation stability of fuels was determined on the basis of maximum angle of ignition advance corresponding to the first occurrence of detonation. Decrease in power and efficiency of the engine was found to occur on operation with three grades of gasoline under study (octane ratings (OR) according to GOST 511-52: 55.1, 59.3 and 60.2),

Card 1/2

USSR/Chemical Technology. Chemical Products and Their Application -- Treatment of natural gases and petroleum. Motor fuels. Lubricants, I-13

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5548

Abstract: in comparison with the performance of the engine when standard A-66 gasoline was used. The nature of the thus secured curves of detonation stability according to the angle of ignition advance, is out of agreement with the OR values of the fuels as determined by the motor method of GOST 511-52. Gasolines with OR of 55.1 and 59.3 show a substantially better performance over the major range of operating conditions of the engine, than the gasoline having an OR of 60.2. Gasolines of OR 55.1 and 60.2 contained practically the same amounts of alkenes and alkanes.

Card 2/2

chloride [illegible]. It was established that [illegible]

effect of boron on heat resistance. After boronizing and aluminizing at temperatures greater than 1050C, borides $Al(AlB_2)$ were observed at the bottom of the

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721220009-8"

Card 2/3

NO SUBJ GOV: 004 OTHER: 002

mob

Card 3/3

AUTHOR: Zemskov, G. V.; Karpasn, A. G.

impregnation process proceeded at positive pressure

ture's reaction products. Active boron

impregnation temperature. The samples have a satisfactory surface

Card 1/1

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721220009-8"

ACCESSION NR: AP4020252 S/0129/64/000/003/0061/0063

AUTHORS: Zemskov, G. V.; Kaydash, N. G.; Praven'kaya, L. L.

TITLE: Boronizing of iron and steel in vacuum

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 3, 1964, 61-63

TOPIC TAGS: iron boronizing, steel boronizing, vacuum boronizing

ABSTRACT: This study is an analysis of vacuum boronizing of iron and steel. The boronizing was done in a TGB-1M vacuum furnace at a pressure of 3×10^{-3} mm Hg in a mixture of boron carbide and borax. Active boron which is formed in the reaction mixture at high temperatures diffuses into the metal. The boron contacts the article's surface primarily in a vaporized state. The boronizing of armco-iron and 45 steel in mixtures of varying composition was carried out at 900C for 4 hr. The greatest boride layer thickness is attained with a mixture containing 16—18% borax. The thickness of the boride layer depends upon duration and temperature of the saturation process

Card 1/2

ACCESSION NR: AP4020252

and carbon content in the steel. When the duration of the process is extended and temperature is increased, the thicknesses of the boride layer increase. The thicknesses decrease with an increase in the percentage content of carbon in the steel. The most dense boride layers are obtained at 900—1000C for 6—9 hr. Orig. Art. has: 2 figures and 1 table.

ASSOCIATION: Odesskiy politekhnicheskiy institut (Odessa Polytechnical Institute)

SUBMITTED: 00 ATD PRESS: 3046 ENCL: 00

SUB CODE: MM, GC NR REF SOV: 004 OTHER: 000

Card 2/2

ZEMSKOV, G.V.; KAYDASH, N.G.

Aluminum boride coatings on steel. Metalloved. i term. obr. met. 51-53 Ap '65. (MIRA 18:6)

1. Odesskiy politekhnicheskiy institut.

L 3436-66 EWT(m)/EWP(i)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) MJW/JD/GS

ACCESSION NR: AT5024872 UR/0000/65/000/000/0056/0064

AUTHOR: Zemskov, G. V.; Kaydash, N. G.

TITLE: Borocalorizing of iron and steel

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Diffuzionnyye pokrytiya na metallakh (Diffusion coatings on metals). Kiev, Naukova dumka, 1965, 56-64

TOPIC TAGS: metal coating, boron, aluminum, steel, boride, metal diffusion plating, compressive stress, tensile stress

ABSTRACT: Borocalorizing, or the combined boronizing and calorizing of iron and steel, eliminates the disadvantages inherent in either technique if applied alone: high brittleness and low high-temperature strength of the boronized case and low hardness and wear resistance of the alitized case. In view of the scarcity of the published data on borocalorizing and the great prospects of this combined technique, the authors investigated the effect of the composition of the saturation mixture, temperature, and duration of the process on the structure and thickness of the diffusion layer following joint and successive borocalorizing of commercial iron, steel 45 and steel U8A. Findings: on joint borocalorizing of iron and

Card 1/3

L 3436-66

ACCESSION NR: AT5024872

3

steel the structure of the diffusion layer depends on the composition of the saturation mixture: thus, if the proportion of ferroaluminum to boron carbide, borax, and ammonium chloride in the saturation mixture exceeds 15%, a solution of aluminum and boron forms in the iron, in addition to the borides. If the proportion of ferroaluminum exceeds 50 wt.%, the surface layers consist chiefly of solid solutions of Al and B in iron (outer zone) and an insignificant amount of borides bordering to the base metal (inner zone). The phase composition of the diffusion layer is determined by the diffusion rate of B and Al through iron; since this rate is higher for B, the growth of the diffusion layer commences with the formation of boride phases. When borocalorizing is performed at temperatures of below 900°C, only boride phases form in the diffusion layer, which is another proof of the higher rate of diffusion of B through iron as compared with the diffusion rate of Al. The investigation of residual stresses in the surface layer of borocalorized specimens is a good technique of verifying the variations in phase composition over the case depth. Thus, for steel 45 this investigation revealed that residual stresses change twice in polarity, becoming alternately compressive, tensile, and then again compressive over the case depth, owing to the attendant formation within the case layer of structures with specific volume

Card 2/3

L 3436-66

ACCESSION NR: AT5024872

differing from the specific volume of the metal saturated. Orig. art. has: 5 figures, 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NR REF SOV: 008 OTHER: 001

Card 3/3

L 14419-66 EWP(z)/EWT(m)/EWP(b)/EWA(d)/EWP(t) IJP(c) MJW/JD/JG

ACC NR: AP6002122 (N) SOURCE CODE: UR/0369/65/001/006/0712/0716

AUTHOR: Kaydash, N. G.; Pokhmurskiy, V. I.

ORG: Uman' Pedagogical Institute (Umanskiy pedagogicheskiy institut); Physico-mechanical Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskiy institut AN UkrSSR)

TITLE: Effect of boronizing on the fatigue strength and corrosion-fatigue strength of steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 6, 1965, 712-716

TOPIC TAGS: steel, fatigue strength, sodium chloride, corrosion protection, boride

ABSTRACT: Boronizing of 45 steel was carried out in a boron carbide-borax mixture containing 16% borax. X-ray analysis, etching in sodium picrate and microhariness measurements showed that the diffusion layers formed consist of FeB (outer layer) and Fe_2B (inner layer). Residual compressive stresses were found to arise in the surface layers of steel 45 as a result of the boronizing. The fatigue strength and corrosion-fatigue strength were studied on 20 steel boronized for 6 hr at 950C. Boronizing increased the fatigue strength in air by about 15%, and the corrosion-fatigue strength in a 3% NaCl solution by 35%. The increase is due to

Card 1/2

L 04781-67 EWP(e)/EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6023444 (N) SOURCE CODE: UR/0369/66/002/003/0295/0299

AUTHOR: Kaydash, N. G.; Nelyub, M. G.; Baranova, Z. I.; Pokhmurskiy, V. I. 51 B

ORG: Uman' Pedagogical Institute (Umanskiy pedagogicheskiy institut); Physico-Mechanical Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskiy institut AN UkrSSR)

TITLE: Effect of boronizing, borosiliconizing, calorizing and borocalorizing on the corrosion resistance of steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 3, 1966, 295-299

TOPIC TAGS: BORON, SILICON, photocolorimeter, metal coating, corrosion resistance, fatigue strength / / FEK-M photocolorimeter, steel 45, steel 20

ABSTRACT: The effect of each of these types of the surface impregnation of steel was investigated with respect to such properties of steel 45 as corrosion resistance, fatigue strength and corrosion-fatigue strength. Boronizing was accomplished in a mixture of boron carbide and borax and of crystalline silicon with ammonium chloride; calorizing, in a mixture of ferroaluminum and ammonium chloride; and boronizing-calorizing and calorizing-boronizing, in boronizing and calorizing mixtures (G. V. Zemskov, N. G. Kaydash, MiTOM,

Card 1/2

L 04781-67
ACC NR: AP6023444

1964, no. 3; 1965, no. 5). The steel specimens thus treated were tested for corrosion in freshly prepared 10% aqueous solutions of table salt, NaOH, HCl, H_2SO_4, HNO_3 and phosphoric acid, with subsequent analysis of the spent solutions for Fe and diffusing elements (B, Al, Si) and visual observation of corrosion damage to the specimens (cracks, pits and peeling of the diffusion layer from the base metal). Quantitative analysis was performed with the aid of a FEK-M photocolorimeter. Findings: diffusion boronizing, borosiliconizing, calorizing and borocalorizing all enhance the corrosion resistance of 45 steel in 10% aqueous solutions of the aforementioned aggressive media. In the NaCl solution the corrosion resistance of steel is best enhanced by calorizing, calorizing-boronizing and boronizing; in the NaOH solution, by calorizing, boronizing, borosiliconizing, and boronizing-calorizing; in the HCl solution, by borosiloconizing, boronizing, and calorizing-boronizing. Considering that many work parts perform under loads while being exposed to aggressive media, the effect of these types of surface treatment on the fatigue and corrosion-fatigue strength of steel 20 was also investigated and it was found that boronizing and borosiliconizing enhance the fatigue limit of the steel in corrosive media by as much as 35 and 80%, respectively. Boronized specimens display a higher corrosion resistance and lower corrosion-fatigue strength than borosiliconized specimens. This indicates that for diffusion coatings -- at least for those of the boride type -- there does not exist a correlation between the corrosion resistance of metals in nonstressed state and their corrosion-fatigue strength. Orig. art. has: 1 figure, 2 tables.

SUB CODE: 13, 11, 20/ SUBM DATE: 26Jan66/ ORIG REF: 009

Card 2/2

KAYDASH, N. M.

Dissertation: -- "On Satisfactory Conditions for the Convergence of the Fourier Series Almost Everywhere." Cand Phys-Math Sci, Moscow Oblast Pedagogical Inst, 28 Jun 54. (Vechernyaya Moskva, Moscow, 18 Jun 54)

SO: Sum 318, 23 Dec. 1954

KAYDASHOVA, L.I., yurist (Moskva)

Legal advice. Fel'd. i akush. 25 no.1:53-55 Ja '60. (MIRA 13:4)
(MEDICINE-- STUDY AND TEACHING)

KAYDASHOVA, L.I., yurist (Moskva)

Method of designating a pension for medical personnel for prolonged meritorious service. Fel'd. i akush. 25 no. 7:57-60 Je '60. (MIRA 13:8)

(MEDICAL PERSONNEL--PENSIONS)

T

COUNTRY : USSR
CATEGORY : Human and Animal Physiology, Metabolism

ABS. JOUR. : RZhBiol., No. 5 1959, No. 21775

AUTHOR : Grebennink, L.I.; Kaydin, D.A.; Bogomolova N.S.
INST. : --
TITLE : The Growth of Suckling Rats When the Mother is Given Phthivazid and Tubazid in the Diet both with and without Vitamin B_6.

ORIG. PUB. : Vopr. pitanya, 1958, 17, No. 4, 8--15

ABSTRACT : Lactating female rats recieved in their diets the antitubercular preparations phthivazid and tubazid (50 and 25 mg per animal per day respectively). The presence of these preparations in the diet of the mother did not reflect upon the development of the litter. The simultaneous addition of 150 micrograms of vitamin B_6 to the diet resulted in an increase in the weight of the young rats. The control rats, suckled by mothers receiving a diet devoid of vitamin B_6, developed poorly and succumbed between day 15 and

Card: 1/2

T-12

COUNTRY : USSR
CATEGORY :

ABS. JOUR. : RZhBiol., No. 5 1959, No. 21775

AUTHOR :
INST. :
TITLE :

ORIG. PUB. :

ABSTRACT : 20. The phthivazid and tubazid somewhat diminished the deleterious effect of a diet devoid of vitamin B_6.--A.A.Aleksandrova

1. Iz otdela khimioterapii (zav. - prof. G.N. Pershin) Vsesoyuznogo nauchno-issledovatel'skogo khimiko-farmatsevticheskogo instituta imeni S. Ordzhonikidze, Moskva.

Card: 2/2

GREBENNIK, L.I.; KAYDIN, D.A.; BOGOMOLOVA, N.S.

Secretion of isoniazid, phthivazide, and some other antitubercular drugs with milk. Farm. i toks. 22 no.4:362-364 Jl-Ag '59. (MIRA 13:1)

1. Otdel khimioterapii (zav. - prof. G.N. Pershin) Vsesoyuznogo nauchno-issledovatel'skogo khimiko-farmatsevticheskogo instituta imeni S. Ordzhonikidze.
(ANTITUBERCULAR DRUGS metab.)
(MILK)

KAYDIN, D.A.

Effect of epilin on the growth of young rats. Farm.i toks. 24 no.1:105-108 Ja-F '61. (MIRA 14:5)

1. Otdel khimioterapii (zav. - prof. G.N.Pershin) Vsesoyuznogo nauchno-issledovatel'skogo khimiko-farmatsevticheskogo instituta imeni S.Ordzhonikidze.
(FUNGICIDES) (HAIR, REMOVAL OF) (GROWTH)

1ST AND 2ND ORDER

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDER

KAYDINA, T. L.

C4

18

Oxides of N in accumulator acid. A. G. Amelin and T. L. Kaidina. *J. Chem. Ind.* (U. S. S. R.) 18, No. 18, 16-18(1941).—The solv. of NO in concd. H_2SO_4 is so low and the conditions of treatment in prepg. the acid are so unfavorable to its absorption that almost no NO or NO_2 enters the acid from this source. The impurities are usually present in the H_2O used for dilg. the acid, and should be removed before the diln. by passing a stream of SO_2 through the H_2O.

H. M. Leicester

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

MARGULOVA, T.Kh., doktor tekhn. nauk; STERMAN, L.S., doktor tekhn. nauk; KAYDUK, K., inzh.

Composite atomic electric power plants and indices of their thermal efficiency. Teploenergetika 11 no.6:7-10 Je '64. (MIRA 18:7)

1. Moskovskiy energeticheskiy institut.

KAYDUK, YU. M.

USSR/ Scientists - Mathematics

Card 1/1 Pub. 86 - 34/36

Authors : Kayduk, Yu. M.

Title : Mathematical genius - Lobachevskiy

Periodical : Priroda 44/6, 112 - 125, Jun 1955

Abstract : A review is presented of the book, "Lobachevskiy," a novel by Ivan Zabotin, published by the Tartar Book Publishing Office in Kazan, in 1954, and containing 540 pages. The book deals [illegible] life and work of the outstanding Russian mathematician [illegible] Nikolay Ivanovich Lobachevskiy. Peter Russian [illegible] ences (1855-1954).

Institution : .....

Submitted : .....

31183
S/076/61/035/012/002/008
B101/B138

5.3610

AUTHORS: Andreyev, K. K., and Kaydymov, B. I.

TITLE: Thermal decomposition of nitro esters. III. Thermal decomposition of pentaerythritol tetranitrate

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 12, 1961, 2676 - 2688

TEXT: The decomposition of pentaerythritol tetranitrate (PETN) was studied under various conditions, including the admixture of TNT using a glass Bourdon manometer. (K. K. Andreyev et al., Zh. fiz. khimii, 32, 1726, 1958) and moderate degrees of filling δ (ratio between volume of substance and volume of vessel). (1) Decomposition in the melt (145 - 171°C) is basically the same as with other nitroesters. The initial rate of decomposition of molten PETN is approximately 0.5 that of nitroglycerin, and 1.5 that of nitro-glycol. The following data were obtained: E = 39,000 cal/mole; decomposition rate constant (rate of gas formation) w at 160°C: $6.86 \cdot 10^{-5}$ sec^{-1}, factor in the Arrhenius equation: $10^{15.6}$. (2) With PETN in solution in TNT, two stages were observed: (a) initial stage with slowly, and (b) with rapidly, accelerating w, the latter due to

Card 1/[illegible] 7

31183
S/076/61/035/012/002/008
B101/B138

Thermal decomposition of nitro...

the hydrolytic effect of the H_2O formed and to the acid decomposition products. This mechanism was not affected by the TNT. TNT only accelerates the destruction of solid PETN if part of it has become liquid. (3) The temperature dependence of the decomposition of PETN is higher in the solid than in the molten state. The function log w = f(1/T) is no longer linear since partial liquefaction of PETN sets in. (4) The decomposition rate of PETN vapor is at first high, decreasing later. w largely depends on δ. Decomposition of PETN vapor occurs 6 - 8 times more rapidly than liquid. Filling the vessel with glass capillaries did not affect w. (5) The effect of H_2O on solid PETN at 120°C was the same as for the solution in TNT. O_2 does not affect the initial w but makes the first stage shorter. H_2O+O_2 had an additive accelerating effect on w. From these results it is concluded that: (A) the high stability of PETN is not due to its chemical structure but to its being in the solid state at ordinary temperatures; (B) for maximum stability, the solute impurities must be removed; (C) the kinetics of PETN decomposition are no different from other nitro esters. Maslov who conducted experiments with PETN together with K. K. Andreyev in 1939 - 1940 is mentioned. There are 12 figures,

Card 2/3

L 18175-63 EPR/EPF(c)/EWT(m)/BDS AFFTC/RPL Ps-4/Pr-4 RM/WW/JW/JWD/H

ACCESSION NR: AT3006082 S/2938/63/000/000/0241/0273

73

AUTHORS: Andreyev, K. K.; Kaydy*mov, B. I.

TITLE: Thermal decomposition of PETN

SOURCE: Teoriya vzry*vchaty*kh veshchestv, sbornik statey, 1963, 241-273

TOPIC TAGS: explosive, PETN, nitroglycerine, nitroglycol, TNT

ABSTRACT: The decomposition of PETN in fusions, in solutions, and in vapor and solid phases was analyzed by a manometric method. The decomposition rate is greater in the vapor phase and smaller in the solid phase. The fusion and the solution of PETN have equal decomposition rates and they occupy an intermediate position close to other nitroethers such as nitroglycerine and nitroglycol. Two macrodecomposition stages are observed in the liquid and solid phases: One with a slightly increasing rate which is not accelerated by the decomposition of gaseous products, and another with a rapid increase in rate as the result of hydrolytic action of the formed water and

Card 1/2

L 18175-63

ACCESSION NR: AT3006082

intensified by the decomposition of oxidized products. The decomposition rate of solid PETN also increases as the result of its partial lique-faction with the decomposition products. A comparatively high stability of PETN at ordinary temperatures is stipulated by the fact that it is in a solid aggregate state. TNT decreases decomposition rate of liquid PETN, and it can increase the decomposition of solid PETN by an amount equal to its conversion to the liquid state. Orig. art. has: 8 tables and 29 figures.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 14Jun63 ENCL: 00

SUB CODE: AR, CH NO REF SOV: 004 OTHER: 016

Card 2/2

KAYDZHELEV, Dimitr

Bibliography, Sofia, Vol 17, No 3, 1962

1. [illegible] (Prof) [illegible] Bibliography of Technical Work Carried Out in Bulgaria in the Field of Pharmaceutical Products and Medicinal Herbs for the Period, pp 1-4.

2. Ivanov [illegible] (Prof): Effect of Composition of Pharmaceuticals Plasma Substitutes, pp 5-8.

3. [illegible] (Prof) [illegible] of the Economy (Section 2-02 Part 2.) [illegible] pp 9-10.

4. [illegible] (Junior Scientific Associate, CHIISC) (Prof) [illegible] (Ed.) and [illegible] Chemical Pharmacology Laboratory, Pharmaceutical Research Institute, Council of Ministers, Sofia): Pharmacological Research Institute Service in Bulgaria, pp 11-14.

5. Ivanov [illegible]: Increase in Medication in our Pharmacy Tests, pp 15-18.

6. [illegible] Medical Institutes in Plovdiv and Their Role of Gastro-Intestinal Pathologies in Plovdiv, pp 19-22.

7. [illegible] (Senior Research Associate, CHIIPH) [illegible] of Municipal Pharmacy in the City of Plovdiv and Its Contribution to the Concentration Field Work in Plovdiv, p 23.

8. [illegible] Law Pharmacy Inspector in the City of Sofia, pp 24-26.

9. [illegible] (Senior Research Associate, CHIIPH) [illegible] Department of Medicinal Plants, Ministry of Agriculture, pp 27-33. Medicinal Herbs in Our Agricultural Economy, [illegible]

10. [illegible] (Ph.D., Head of Veterinary Public Health Inspection in Pleven) [illegible] in the Pharmacy in the Village, pp 34-36.

11. [illegible] (Director [illegible] Institute - Kolarov-grad): [illegible] Practice in Czechoslovakia, pp 37-40.

(continued)

KAYDZHIEV, D.

(13)

(104)

Zhivotnovodstvo, Sofia, Vol 15, No 3, 1952

1. N. YAKIMOV (Senior Minister -Zam-minister)(Ministry of Agriculture -Ministerstvo na zemedelieto): Highly Productive Meadows and Pastures Mean Improved Feed for Our Animals, pp 1-4.

2. Boris NEYKOV (Prof): Effect of Composition of Pasture on Constitution of Animals Feeding Thereon, pp 5-8.

3. Dimitr KAYDZHIEV: One of Our Reserves (Pasture from Park, Tr.) is Mobilized, pp 9-10.

4. Zhivko STRANDZHOV (Junior Scientific Associate, CNIISS -abbr. not identified-) and Dimitrina KANDZHEVA (Pasture Agronomist, District People's Council -Okrozhen narodeen sovet- in Pleven): Efficient Use of Natural Pastures, pp 11-14.

5. Boris PETROV: Increase in Motivation is our Primary Task, pp 15-19.

6. Krum GEROV and Petor [illegible]: Causes of Non-Infectious Gastro-Intestinal Disturbances in Pigs and Means of Preventing Their Occurrence, pp 20-24.

7. Dimitr DZHUMAKOV (Senior Research Associate, CNIIZh -abbr. not identified- City of Kostiborod): Effect of Feeds Varying in Vitamin A and Carotene Concentration on Milk, pp 25-26.

8. Lyubomir SAVOV: The Fishing Industry in the City of Smolyan, pp 27-29.

9. Vladimir POPOV (Senior Research Associate, CNIIZh Kostinbrod) and Venko VENKOV (Head, Department of Horse Economy, Ministry of Agriculture): Purebred Horses in Our Horse-Breeding Establishments, pp 30-33.

10. Dimitr ANGELOV (Dr, Head of Veterinary Health Inspection in Plovdiv): Implementing Hygiene in the Milking Farm in the Perushchina village, pp 34-35.

11. Cvyatko YAGNILEV (Director NIIZh -not ident.- Kolarovgrad): Swine Farming in Czechoslovakia, pp 37-42.

(continued)

1/2

KAYDZHIEV, D.

(14)

Sofia, Zhivotnovudstvo, Vol 16, No 2, February 1962 (42)

1. "Production Is Now Better and Cheaper," conversation with Ivan TONCHEV, Chief Zoologist at the cooperative farm in the village of Kozloduy (Vratsa okrug); pp 3-6.

2. "New Organization of Labor in Livestock Raising at the State Farm in Stara Zagora," Vulko KABAKOV and Blagovest SIVINOV; pp 7-11.

3. "The Advantages of Concentrated Feeds Are Obvious from the Very Beginning," Todor DIMITROV, Chief Zoologist at the cooperative farm in Dulovo; pp 12-13.

4. "Specialization and Concentration on Hog Raising in State Farms," Vasil Lazarov of the "G. Dimitrov" VSSI (Agricultural Statistical Institute); pp 14-20.

5. "Joint Fattening Farm of the Cooperative Farms in Sliven okrug," Borislav SAVOV; pp 21-24.

6. "The Possibilities for Producing More Lamb," Nedko KYDKOV of the State Livestock Breeding Improvement Inspectorate, Plovdiv; pp 25-29.

7. "Hay Flour--a Substitute for Concentrated Fodder," K. KOEV, Senior Zoologist, Okrug People's Council, Razgrad; pp 30-31.

8. "Potatoes--an Important Reserve for Strengthening the Fodder Base," Konstadin GANCHEV (zoologist with the Blagoevgrad Okrug Committee of the Bulgarian Communist Party) and Dimitur KAYDZHIEV; pp 32-34.

9. "The Time for Using Fodder Crops," Stefan DIMITROV, Junior Scientific Collaborator at the regional livestock scientific research institute in Stara Zagora; pp 35-40.

— 1/1 —

S/137/61/000/012/132/149
A006/A101

AUTHORS: Krupkovskiy, A., Kayekh, V.

TITLE: Investigating high-strength zinc alloys

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 12, 1961, 28, abstract 12I227 (V sb. "26-y Mezhdunarodn. kongress liteyshchikov, 1959", Moscow, Mashgiz, 1961, 141 - 160)

TEXT: The authors studied alloys of the Zn-Cu-Mn system whose mechanical properties are not below those of brass which is widely used in the industry. Optimum properties are offered by alloy Zn+19% Mn+15% Cu with σ_b 65 kg/mm^2, δ 9% and alloy Zn+24% Mn + 14% Cu with σ_b 57 kg/mm^2, δ 19%. Zn-Mn-Cu alloys are highly wear resistant, in particular under friction conditions without greasing, and their hardness is very high ($H_B > 60$). Their corrosion resistance is somewhat higher than of Zn alloys containing Al. The authors studied the effect of C, Si, Fe on the mechanical properties of alloys of the Zn-Cu-Mn system. C reduces sharply δ; therefore its content must be below 0.03%. The Si content must not exceed 0.5% so that the casting properties of the alloys be not impaired.

Card 1/2

S/137/61/000/012/132/149
A006/A101

Investigating high-strength zinc alloys

The casting properties of Zn-Cu-Mn alloys are similar to those of various types of brass; they are not prone to hot cracks and can therefore be pressure-cast into a chill mold.

N. Sladkova

[Abstracter's note: Complete translation]

Card 2/2

L 10517-63 EWT(1)/BDS--AFFTC/ASD--Pi-4

ACCESSION NR: AP3000816 S/0046/63/009/002/0162/0170

55

AUTHOR: Viktorov, I. A.; Grishchenko, Ye. K.; Kayekina, T. M. 56

TITLE: Investigation of ultrasonic surface wave propagation on a solid-liquid interface 21

SOURCE: Akusticheskiy zhurnal, v. 9, no. 2, 1963, 162-170

TOPIC TAGS: surface wave, Rayleigh wave, liquid-solid interface, phase-velocity measurement, damping factor, wave number, wave damping

ABSTRACT: Theoretical and experimental investigations have been conducted concerning the effect of a layer of liquid of finite or infinite thickness on the characteristics of an ultrasonic surface wave moving on the common boundary of a solid half-space and a liquid and turning into a Rayleigh wave when the density of the liquid approaches zero. Cases considered are 1) adjacent solid and liquid half-spaces and 2) a liquid layer of finite thickness bounded on one side by a vacuum and on the other by a solid half-space. The solid is assumed to be homogeneous, isotropic, and perfectly elastic, and the liquid to be ideal.

Card 1/32

L 10517-63

ACCESSION NR: AP3000816

Expressions previously derived from wave equations for determining, in both cases, displacements in the liquid and in the solid are given, as is an equation for determining phase velocity and wave number. The results obtained by solving these equations on the "Ural" electronic computer are plotted in diagrams, showing the dependence of the C/C_R ratio and of the damping factor of the surface wave on the ρ_{liq}/ρ_{sol} ratio for various Poisson ratios and wave numbers, where C is the phase velocity of the surface wave, C_R is the phase velocity of the Rayleigh wave, and ρ_{sol} and ρ_{liq} are the densities of the liquid and solid. The experimental investigation was carried out on a pulse device consisting of a signal generator modulated by a rectangular pulse and an amplifier and indicator. Steel and aluminum were used as solid media, and water and transformer oil as liquids. The phenomenon of transformation of a Rayleigh wave propagating in the solid into a surface wave at the instant of reaching the interface between solid and liquid is discussed, as are the associated energy losses, their amount, and nature. The theoretical and empirical data obtained are compared in a table showing discrepancies in phase velocities (about 15%) and in wave damping (about 10%). "In conclusion the authors express their thanks to L. S. Yanina for her carrying out of the basic measurements." Orig. art. has: 6 figures, 1 table, and 3 formulas.

Card 2/2 Acoustics Inst.

ACCESSION NR: AP4025728 S/0046/64/010/001/0030/0033

AUTHORS: Viktorov, I. A.; Kayekina, T. M.

TITLE: Scattering of ultrasonic Rayleigh waves in models of surface defects

SOURCE: Akusticheskiy zhurnal, v. 10, no. 1, 1964, 30-33

TOPIC TAGS: wave scattering, ultrasonic Rayleigh wave, surface defect, semi-spherical hollow, cylindrical cavity, wave propagation, wave damping

ABSTRACT: I. A. Viktorov (O vliyanii defektov poverkhnosti na rasprostraneniye releyevskikh voln. Sb. "Primeneniye ul'trazvukovy*kh kolebaniy dlya issledovaniya svoystv, kontrolya kachestva i obrabotki metallov i splalov", Kiyev, Izd-vo AN USSR, 1960, 54-61) described results of the experimental study of the effect of unit surface defects on reflection and passage of Rayleigh waves; he studied the following forms of surface defects: cracks and semi-cylindrical hollows cut on the surface along which the waves are propagated. The majority of strained surface defects (cracks, hollows, notches) can be reduced to these two models. The present authors describe an experimental study of scattering of ultrasonic Rayleigh waves for two other types of surface defects: semi-spherical hollows of various diameters and

Card 1/3

ACCESSION NR: AP4025728

cylindrical channels of various diameters and depths, drilled perpendicular to the surface along which the Rayleigh wave is propagated. By these models, which are a natural complement to the first two, one can represent surface defects of pit and vertical crack type, going down from the surface, and so forth. Together with models of surface-strain defects, these models characterize to some extent all forms of surface defects. Measurements were made under impulse conditions as described by Viktorov. The duration of an impulse was 10 microseconds, the charging frequency - 2.74 megacycles per second. Models of defects of various dimensions were used on well-worked surfaces of rectangular Dural sheets 450 x 300 x 7 mm. Radiation and a dose of Rayleigh waves were accomplished by the wedge method. A radiating wedge was placed at a distance of 225 mm from the model of the defect, and a beam of Rayleigh waves was sent in its direction. A receiving wedge was then placed at circumference points of radius 50 mm around the model. Each measurement of amplitude of the scattered wave was immediately referred to the corresponding measurement of amplitude of the incident wave at a point between the radiator and the model of the defect separated from the radiator along the axis by 103 mm and sideways from the axis by 25 mm. The oscillation amplitude of the surface at this point is uniquely related to the oscillation amplitude of the model directly. This relation was experimentally determined without a model by measuring the amplitude of

Card 2/3

ACCESSION NR: AP4025728

the incident wave in the assumed place of position of the model. The receiving wedge was in acoustical contact with the surface of the Dural sheet only in a circle of diameter 3 mm, which made it possible to measure the oscillation amplitude of the surface of the sheet in a small region (locally). Acoustical contact was made by a film of castor oil. For exclusion of the effect of changes of the acoustical contact on the results of the measurements, each pair of measurements (at points of the circumference and between the radiator and the model of the defect) was repeated 20 times with subsequent averaging. "In conclusion we express our gratitude to L. S. Grishchenko for doing the basic measurements." Orig. art. has: 3 figures and 2 formulas.

ASSOCIATION: Akusticheskiy institut AN SSSR, Moscow (Acoustical Institute, AN SSSR)

SUBMITTED: 04Jun63 DATE ACQ: 10Apr64 ENCL: 00

SUB CODE: AI, PH NO REF SOV: 004 OTHER: 000

Card 3/3

VIKTOROV, I.A.; ZUBOVA, O.M.; KAYEKINA, T.M.

Use of the "wedge" method in studying the generation of Lamb waves. Akust.zhur. 10 no.4:412-418 '64. (MIRA 18:2)

1. Akusticheskiy institut AN SSSR, Moskva.

KAYELA, I.

Pave the way for rapid steel smelting. Sov.profsoiuzy 5 no.1:12-15 Ja '57. (MLRA 10:2)

1. Stalevar 4-y martenovskoy pechi zavoda "Zaporozhstal'."
(Steel--Metallurgy)