BREKHOV, A.M.

Solution of navigation problems in the establishment and search of self-contained stations with the use of electronic computers. Trudy AANII 254:163-179 '63.

(MIRA 17:11)

S/137/62/000/001/146/237
A006/A101

AUTHORS: Severdenko, V.P., Brekhov, K.V.

TITLE: Mechanical properties of 9 ХС (9KhS) steel at high temperatures

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 1, 1962, 39, abstract 1I265 ("Dokl. AN BSSR", 1961, v. 5, no. 8, 339 - 340)

TEXT: An investigation was made of 9KhS steel containing in %: C 0.86; Cr 1.2; Si 1.3; Mn 0.42; Ni 0.15; S 0.023; P 0.039. The steel possesses a sufficient ductility reserve at 950 - 1,100°C. 9KhS steel should not be pressure-worked at 950°C, since a drop of ductility was observed at these temperatures. Considering the high Si content, causing intensified-scale formation, the steel should be preheated in deoxidizing atmosphere prior to being worked.

T. Rumyantseva

[Abstracter's note: Complete translation]

Phys-Tech Inst A.S. BSSR

Card 1/1

YERSHOV, V.N., kand.tekhn.nauk; STEPANOV, Yu.V., kand.tekhn.nauk; PAVLENKO, G.V., inzh.; BREKHOV, A.E., inzh.

Expanding the field of stable performance of the axial compressor stage. Teploenergetika 9 no.2:41-44 F '62. (MIRA 15:2)

1. Khar'kovskiy aviatsionnyy institut.
(Compressors)

34657

S/096/62/000/002/001/008
E194/E435

26.2120

AUTHORS: Yershov, V.N., Candidate of Technical Sciences, Stepanov, Yu.V., Candidate of Technical Sciences, Pavlenko, G.V., Engineer, Brekhov, A.F., Engineer

TITLE: Extending the region of stable operation of an axial compressor stage

PERIODICAL: Teploenergetika, no.2, 1962, 41-44

TEXT: A typical form of instability in axial compressors operating at low speeds is the formation of rotating zones of breakaway of fluid from the blades. These zones of breakaway usually begin only at the blade roots or tips but increase as the amount of throttling is increased and, at very low rates of flow, may cover the entire blade length. In multi-stage axial compressors running below the rated speed, critical angles of incidence occur mainly on the first stages or on stages immediately beyond air bleeding points. Total breakaway may occur on a few stages but may sometimes occur on all with great loss of efficiency. The trouble can be overcome by increasing the flow through the early stages but this is wasteful. Attention to blade design cannot

Card 1/3

give much improvement. Theoretical investigations of the stability of an axially symmetrical flow indicate that when stability is lost, flow may take one of two forms: with the formation of rotating zones of breakaway; or with an axially symmetrical annular zone of breakaway, or annular swirl, associated with the occurrence of a counter flow. The relative stabilities of these two kinds of flow vary according to circumstances but, by promoting annular swirl, it is in principle possible to prevent completely the formation of rotating zones of breakaway. Tests were made with compressor stages in which various measures had been taken to promote annular swirl, namely: cutting annular slots in the casing just ahead of and just beyond the tips of the blades; installing an annular step or ridge in the casing just in front of the ring of blades; also, blowing air into an annular slot located just ahead of the blades. All of these measures were found to extend the zone of stable operation; however, the most convenient and structurally simple is that of blowing air through an annular slot. With this stage, tested when air was blown in at a head two or three times greater than that of the stage, the boundary of stable

operation was displaced by 25 to 30% in the direction of lower outputs and the maximum energy of pulsation in the zone of breakaway was reduced by 40%. The amount of air blown in was about 2.5% of the minimum flow necessary to ensure stable operation. Additional tests have shown that the effect of blowing in air in this way differs for the different stages. There are 6 figures and 3 Soviet-bloc references.

ASSOCIATION: Khar'kovskiy aviatsionnyy institut
(Khar'kov Aviation Instituto)

4

BREKHOV, A.M.

Approximation of the vector current field. Trudy AANII 264: 67-70 '63. (MIRA 17:6)

BREKHOV, A.M., kand.

Mathematical model of astronomic methods to determine a satellite position. Sudovozhdenie no.3:20-28 '63.

SAZONOV, Anatoliy Yefimovich, doktor tekhn. nauk; FILIPPOV, Yuriy Markovich, kand. tekhn. nauk. Prinimali uchastiye: BREKHOV, A.M., inzh.; ANTONOV, Yu.G., kand. tekhn. nauk; DENISOV, K.N., kand. tekhn. nauk; MESHKOV, O.I., red.

[Mathematical principles of the automation of ship navigation] Matematicheskie osnovy avtomatizatsii sudovozhdeniia. Moskva, Izd-vo "Transport," 1964. 175 p. (MIRA 17:5)

BREKHOV, A.M., inzh.

Analyzing the errors of calculated celestial body altitudes with the use of electronic computers. Sudovozhdenie no.4: 50-57 '64. (MIRA 18:3)

Pq-4/Pg-4/Pae-2/Pk-4 IJP(c) BB/GG/GW

ACCESSION NR: AT5005824 S/3116/64/271/000/0122/0134

AUTHOR: Brekhov, A. M.

TITLE: Mathematical processing of observational material using electronic digital computers

SOURCE: Leningrad. Arkticheskiy i Antarkticheskiy nauchno-issledovatel'skiy institut. Trudy, v. 271, 1964. Chislennyye metody issledovaniya gidrometeorologicheskikh usloviy v Arktike s ispol'zovaniyem elektronnykh tsifrovykh vychislitel'nykh mashin; sbornik statey (Numerical methods of investigating hydrometeorological conditions in the Arctic using electronic digital computers; collection of articles), no. 1, 122-134

TOPIC TAGS: electronic digital computer, numerical forecasting, Arctic meteorology, computer programming, probabilistic analysis, actinometry, confidence limit, statistics

ABSTRACT: The paper deals with the principles common to the processing of all types of observational data, as carried out at the computer center of the Arkticheskiy i Antarkticheskiy Institut (Arctic and Antarctic Institute) with the aid of the Ural-2 computer. The examples presented here relate to actinometric and astronomical observations. A probabilistic analysis must include

Card 1/2

L 37710-65
ACCESSION NR: AT5005824

filtration of gross errors and slips made in taking observations, should analyze systematic shifts in errors of observation and should evaluate the measured quantity using confidence intervals. Algorithms for filtering out slips in observations are based on the Student and Gauss distributions and the principle that errors of low probability are impossible (deviations from the mean of probability of 0.003, or for Student type probability of 0.05 as compared with Grubb's tables, stored in the machine). An algorithm is also presented for filtering out slips, using the general dispersion, and one for analyzing systematic error shifts using Markov's criterion, and with 0.05 as the probability for rejection, as well as an algorithm for calculating confidence intervals using Fisher's method. Examples are given in each case. The program for probabilistic analysis of observational data is then given in operational form. Orig. art. has: 32 formulas.

ASSOCIATION: Arkticheskiy i Antarkticheskiy nauchno-issledovatel'skiy institut, Leningrad (Arctic and Antarctic Scientific Research Institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: DP, ES

NO REF SOV: 008 OTHER: 001

Card 1/2

LIVSHITS, S.Ye.; BREKHOV, A.M.; SMIRNOVA, T.I.

Problems of coding initial information in network planning and administration. Trudy LIEI no.55:89-95 '65.
(MIRA 18:11)

BREKHOV, I., delegat XIII s"yezda professional'nykh soyuzov

Plant committee, family and school. Sov. profsoiuzy 19 no.19: 20-21 O '63. (MIRA 16:11)

1. Predsedatel' Kalininskogo oblastnogo soveta professional'nykh soyuzov.

ACC NR: AR6027515 SOURCE CODE: UR/0137/66/000/004/I083/I083

AUTHOR: Severdenko, V. P.; Brekhov, K. B.

TITLE: Redistribution of carbides in high speed steel as a result of hot extrusion

SOURCE: Ref. zh. Metallurgiya, Abs. 4I559

REF SOURCE: Sb. Metallovedeniye i term. obrabotka met. Minsk, Nauka i tekhnika, 1965, 89-92

TOPIC TAGS: high speed steel, tool steel, metal extrusion / R18 steel

TRANSLATION: The dependence between the amount of deformation during hot extrusion and the change in the degree of carbide inhomogeneity in R18 steel was established. Hot extrusion was done at 1150°C with the use of a graphite-oil lubricant. During hot extrusion of R18 steel, the greatest decrease in the number was found in the center of the stock while the lowest was in the surface layers. The carbide number of a processed part could be regulated by the degree of deformation. V. Olenicheva.

SUB CODE: 11,13

UDC: 669.15.018.252.3

Card 1/1

SEVERDENKO, V.P.; BREKHOV, K.V.

Extrusion of high-speed steel. Dokl. AN BSSR 7 no.10:681-683 O '63. (MIRA 16:11)

1. Fiziko-tekhnicheskiy institut AN BSSR.

ACC NR: AP6032511 SOURCE CODE: UR/0413/66/000/017/0083/0083

INVENTOR: Brekhov, R. S.

ORG: none

TITLE: String-type instrument for voltage measurements. Class 42, No. 185532 [announced by the Moscow Aviation Institute imeni Sergo Ordzhonikidze (Moskovskiy aviatzionnyy institut im. Sergo Ordzhonikidze)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 17, 1966, 83

TOPIC TAGS: alternating voltage, voltmeter, electrode, frequency meter, voltage measurement

ABSTRACT: The proposed string-type instrument for voltage measurements contains a string which is fixed on the part to be investigated, a device for exciting string oscillations and a measuring instrument with a frequency meter. To simplify the design and broaden the range of effective temperature, the device for exciting string oscillations is designed in the form of a flat electrode placed parallel to the string. The electrode is connected to the alternating voltage generator and the constant

Card 1/2 UDC: 531.782:539.3

ACC NR: AP6032511

voltage source so as to produce electrostatic forces between the electrode and the string. The measuring instrument is designed in the form of a second flat electrode plased in parallel to the string and forming with it a capacitance connected to the vibrometer. The latter converts capacitance oscillations corresponding to the natural frequency of string oscillations and, consequently, to the voltage of the part to be measured, into an alternating voltage which is measured by the frequency meter. Orig. art. has: 1 figure. [Translation]

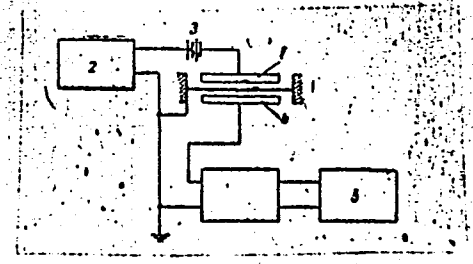


Fig. 1. String-type voltmeter. 1—Flat electrode; 2—alternating voltage generator; 3—constant voltage source; 4—second flat electrode; 5--frequency meter

SUB CODE: 09/ SUBM DATE: 02Sep65/

Card 2/2

BREKHOV, T.M.

Drug sickness caused by the use of PAS. Sov.med. 23 no.10:126-127 O '59. (MIRA 13:2)
(SALICYLIC ACID toxicology)

BREKHOV, T. M. (Major of the Medical Service)

"Diseases of the Stomach in Connection with a Hernia at the Linea Alba"

Voyenno-Meditsinskiy Zhurnal, No. 10, October 1961

BREKHOV, T.M., mayor med.sluzhby

Diseases of the stomach in connection with hernias of the white line of the abdomen. Voen.-med.zhur. no.10:88 O '61. (MIRA 15:5)

(STOMACH—DISEASES) (HERNIA)

BREKHOV, V.

Machine for flame cleaning of hot metal. NTO 3 no.4:62 Ap '61.
(MIRA 14:3)

1. Vedushchiy inzh.otdela glavnogo konstruktora Novo-Kramatorskogo mashinostroitel'nogo zavoda.
(Rolling (Metalwork))

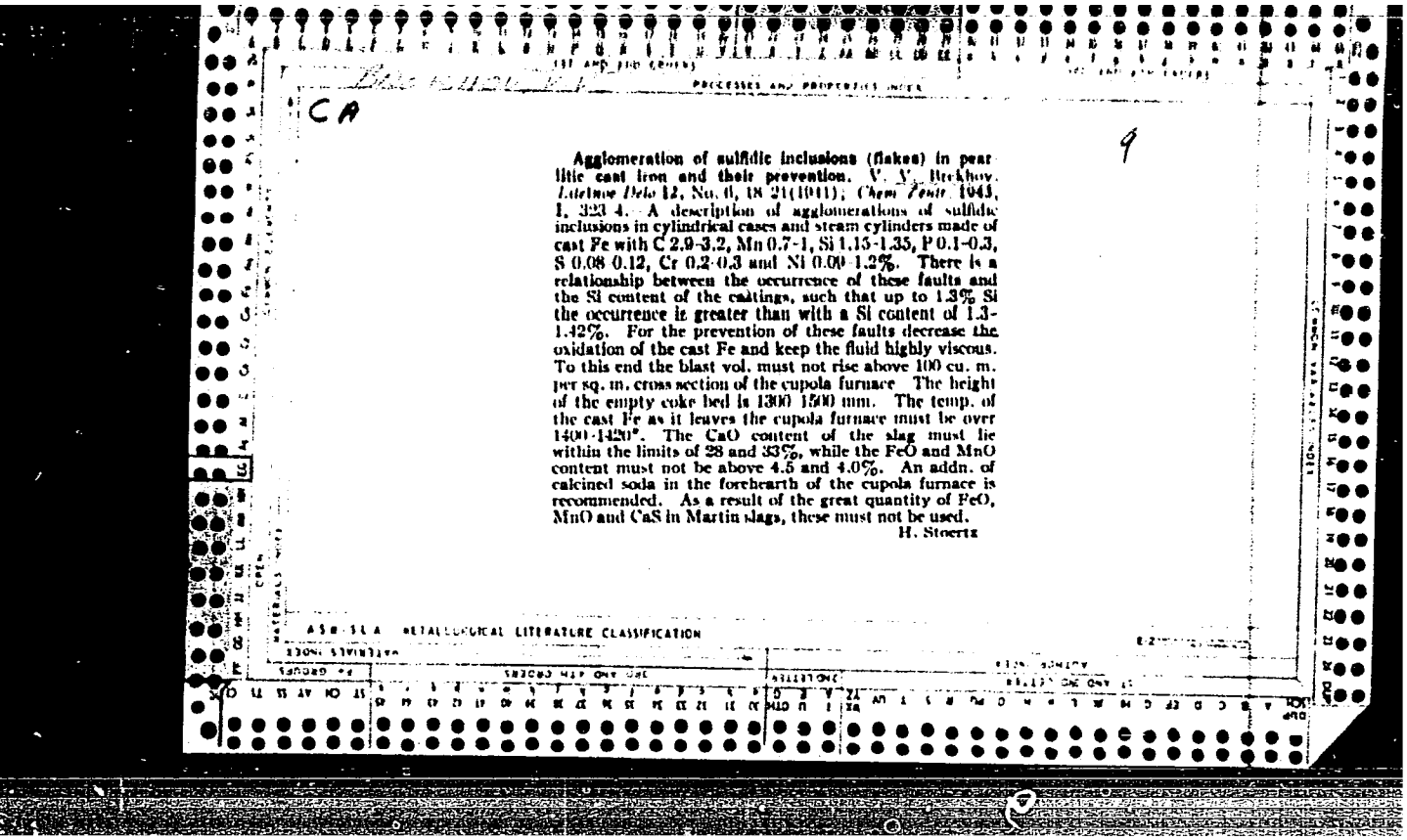
CHUBINIDZE, B.N., inzh.; BREKHOV, V.I., inzh.

Purification of hydrogen from sulfur compounds. Masl.-zhir. prom. 28 no.12:24-26 D '62. (MIRA 16:1)

1. Saratovskiy zhirovoy kombinat.
(Gases--Purification) (Hydrogenation)

BREKHOV, V.M., inzh.; SERGEYEV, Yu.G., inzh.

Magnetic registers using ferromagnetic tape. Elek. sta. 36 no.11: 86-87 N '65. (MIRA 18:10)



CA

9

Agglomeration of sulfidic inclusions (flakes) in pearlitic cast iron and their prevention. V. V. Brekhov. *Liteinoe Delo* 12, No. 6, 18-21(1941); *Chem. Zentr.* 1943, I, 323-4. A description of agglomerations of sulfidic inclusions in cylindrical cases and steam cylinders made of cast Fe with C 2.9-3.2, Mn 0.7-1, Si 1.15-1.35, P 0.1-0.3, S 0.08-0.12, Cr 0.2-0.3 and Ni 0.00-1.2%. There is a relationship between the occurrence of these faults and the Si content of the castings, such that up to 1.3% Si the occurrence is greater than with a Si content of 1.3-1.42%. For the prevention of these faults decrease the oxidation of the cast Fe and keep the fluid highly viscous. To this end the blast vol. must not rise above 100 cu. m. per sq. m. cross section of the cupola furnace. The height of the empty coke bed is 1300-1500 mm. The temp. of the cast Fe as it leaves the cupola furnace must be over 1400-1420°. The CaO content of the slag must lie within the limits of 28 and 33%, while the FeO and MnO content must not be above 4.5 and 4.0%. An addn. of calcined soda in the forehearth of the cupola furnace is recommended. As a result of the great quantity of FeO, MnO and CaS in Martin slags, these must not be used.

H. Stoertz

BREKHOV,V.V.

Raising medium and large molding machine efficiency. Lit.proizv. no.9:12-13 S'55. (MIRA 8:12)

(Molding machines)

BREKHOV, V.V.; LEVCHENKO, P.K.

Founding large iron castings in molds using ~~fast-drying~~ sand mixtures and liquid glass. Lit.proizv.no.2:supplement:44-46 '56. (Iron founding) (MLRA 9:7)

BREKHOV, V.V.; NAZARENKO, V.R.; KUTASOV, R.F.

Molding the nave of a gear wheel according to a segmental pattern. Lit. proizv. no. 5:43-44 My '61. (MIRA 14:5)
(Molding (Founding))

BREKHOV, V.V.; NAZARENKO, V.R.

Casting diaphragms with hollow vanes. Lit.proizv. no.11:7-9 N '61. (MIRA 14:10)
(Iron founding) (Steam turbines)

BREKHOV, V.V., inzh.; NAZARENKO, V.R., inzh.; KUTASOV, R.F., inzh.

Casting blanks for the manufacture of radial-axial hydraulic turbine rotor blades without allowance for machining. Lit. proizv. no.12:39-40 D '65. (MIRA 18:12)

L 17078-66 EWA(m)/EWP(j)/T/EXC(m)-6 WW/RM

ACC NR: AP6003950 SOURCE CODE: UR/0374/65/000/005/0142/0144

AUTHOR: Brekhova, V. D. (Leningrad)

ORG: none

TITLE: Determination of temperature dependence of the initial and delayed deformation in certain crystalline polymers under compression

SOURCE: Mekhanika polimerov, no. 5, 1965, 142-144

TOPIC TAGS: polymer, crystalline polymer, polyethylene, polytetrafluoroethylene, deformation rate, temperature dependence, compressive strength, material deformation

ABSTRACT: Deformation properties of the following two crystalline polymers: a low density polyethylene and polytetrafluoroethylene were investigated under static compression conditions at different temperatures. Total compression deformation was considered to exist as the result of initial and delayed deformation. It was also found that the rate of the increased delayed deformation was highest in the region of β transition. Orig. art. has: 5 figures. [Based on author's abstract]

SUB CODE: 11/ SUBM DATE: 22Apr65/ ORIG REF: 006/ OTH REF: 008/

Card 1/1 UDC: 678:541.6.678.5

L 24005-66 -EWT(m)/EWP(j)/T/ETC(m)-6 IJP(c) WW/RM

ACC NR: AP5014951 SOURCE CODE: UR/0374/65/000/004/0043/0046

AUTHOR: Brekhova, V. D. (Leningrad)

39
B

ORG: none

TITLE: Study of the Poisson ratio during the compression of some crystalline polymers under constant loading

SOURCE: Mekhanika polimerov, no. 4, 1965, 43-46

TOPIC TAGS: crystalline polymer, polytetrafluoroethylene, polyethylene plastic, hardness

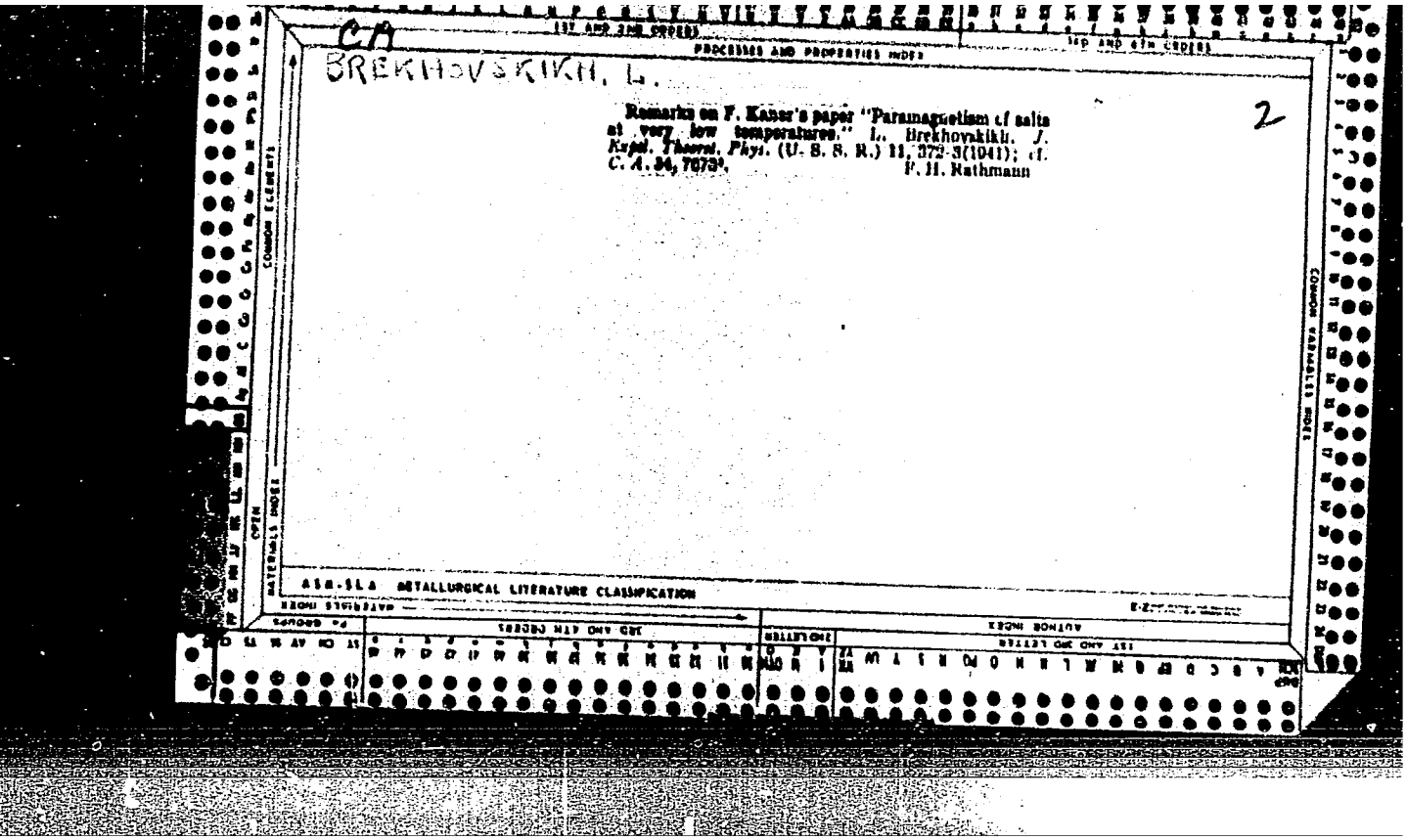
ABSTRACT: Using the hardness-gauge and electric-contact-tensiometer system of P. V. Melent'yev (Leningradskaya Promyshlennost', 1961, 11) as a testing apparatus, the author investigated the Poisson ratio of two crystalline polymers, low density polyethylene and polytetrafluoroethylene, during compression under contant loading. It was found that the compression time and temperature increase exert an effect on the magnitude of the Poisson ratio (with the exception of the transition region around 19 degrees for polytetrafluoroethylene). Orig. art. has: 4 figures. [JPRS]

SUB CODE: 11, 20 / SUBM DATE: 05Mar65 / ORIG REF: 002 / OTH REF: 003

Card 1/1 da

UDC: 678:539.376+539.377

2



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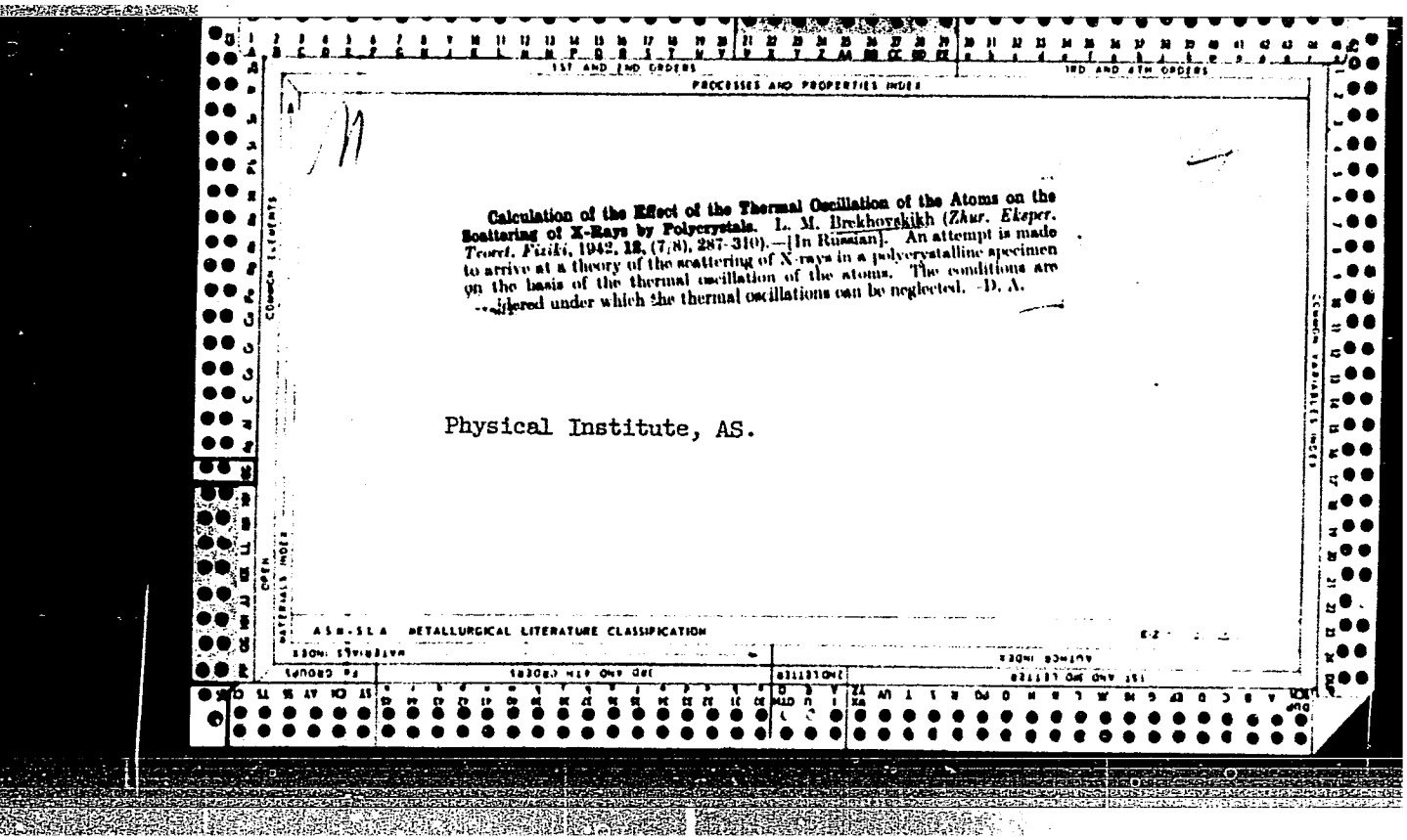
MA

On Diffuse Scattering of X-Rays. L. M. Brekhovskikh (*Comptes Rendus (Doklady) Acad. Sci. U.R.S.S.*, 1941, [N.S.] 32, (7), 478–480).—In English, it is pointed out that although the theories of diffuse X-ray scattering advanced by Zachariasen and by Preston both accurately predict the location of diffuse maxima even for complex crystals, they are not equivalent when the widths of the maxima are considered. Examination of the theories shows that the Preston theory gives incorrect values for the widths of maxima, and the theory of Zachariasen is preferred.—G. V. R.

P. N. Lebedev Physical Inst., AS Moscow.

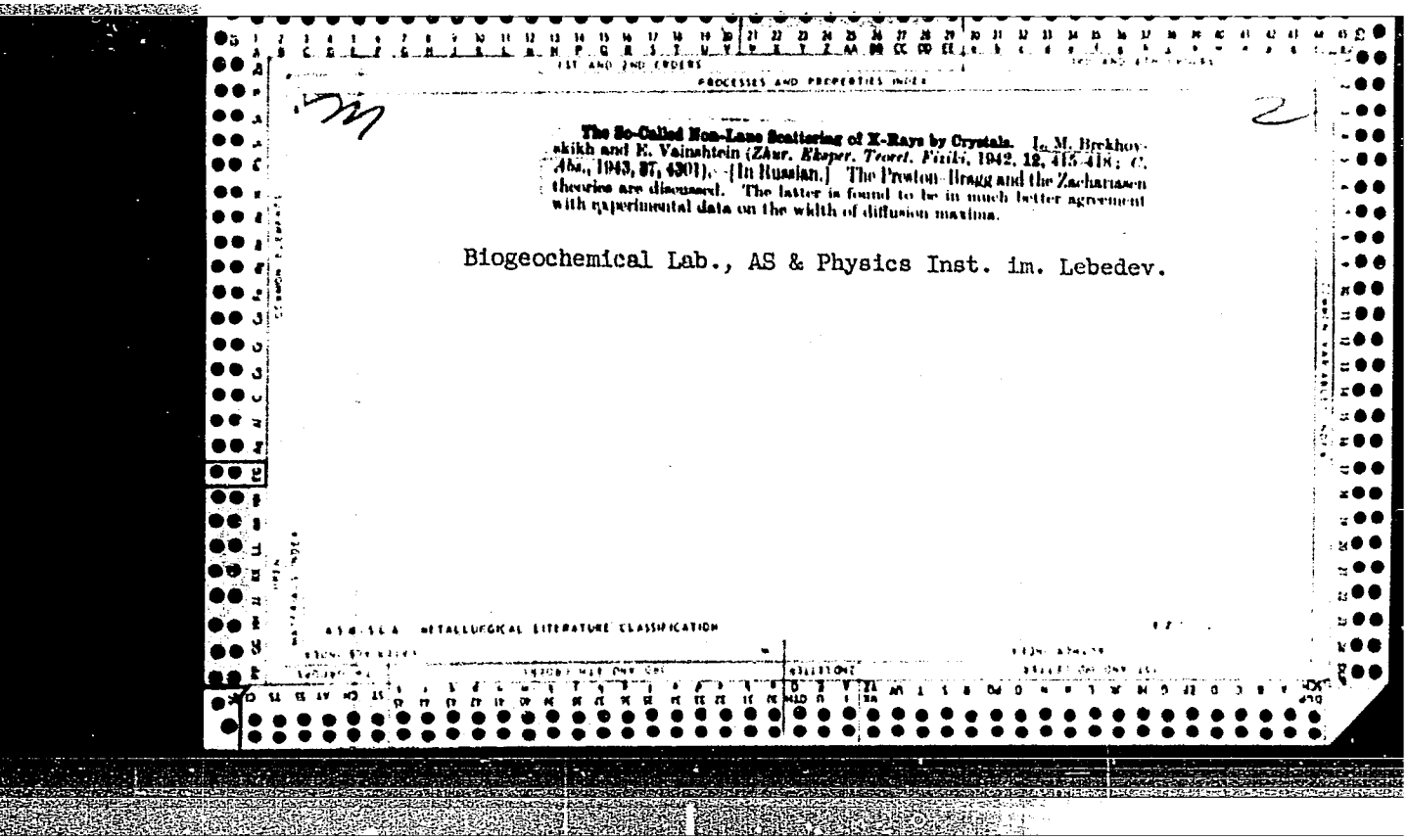


PROCESSES AND PROPERTIES INDEX

Calculation of the Effect of the Thermal Oscillation of the Atoms on the Scattering of X-Rays by Polycrystals. L. M. Brekhovskikh (*Zhur. Eksper. Teoret. Fiziki*, 1942, **12**, (7/8), 287-310).—[In Russian]. An attempt is made to arrive at a theory of the scattering of X-rays in a polycrystalline specimen on the basis of the thermal oscillation of the atoms. The conditions are considered under which the thermal oscillations can be neglected. —D. A.

Physical Institute, AS.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

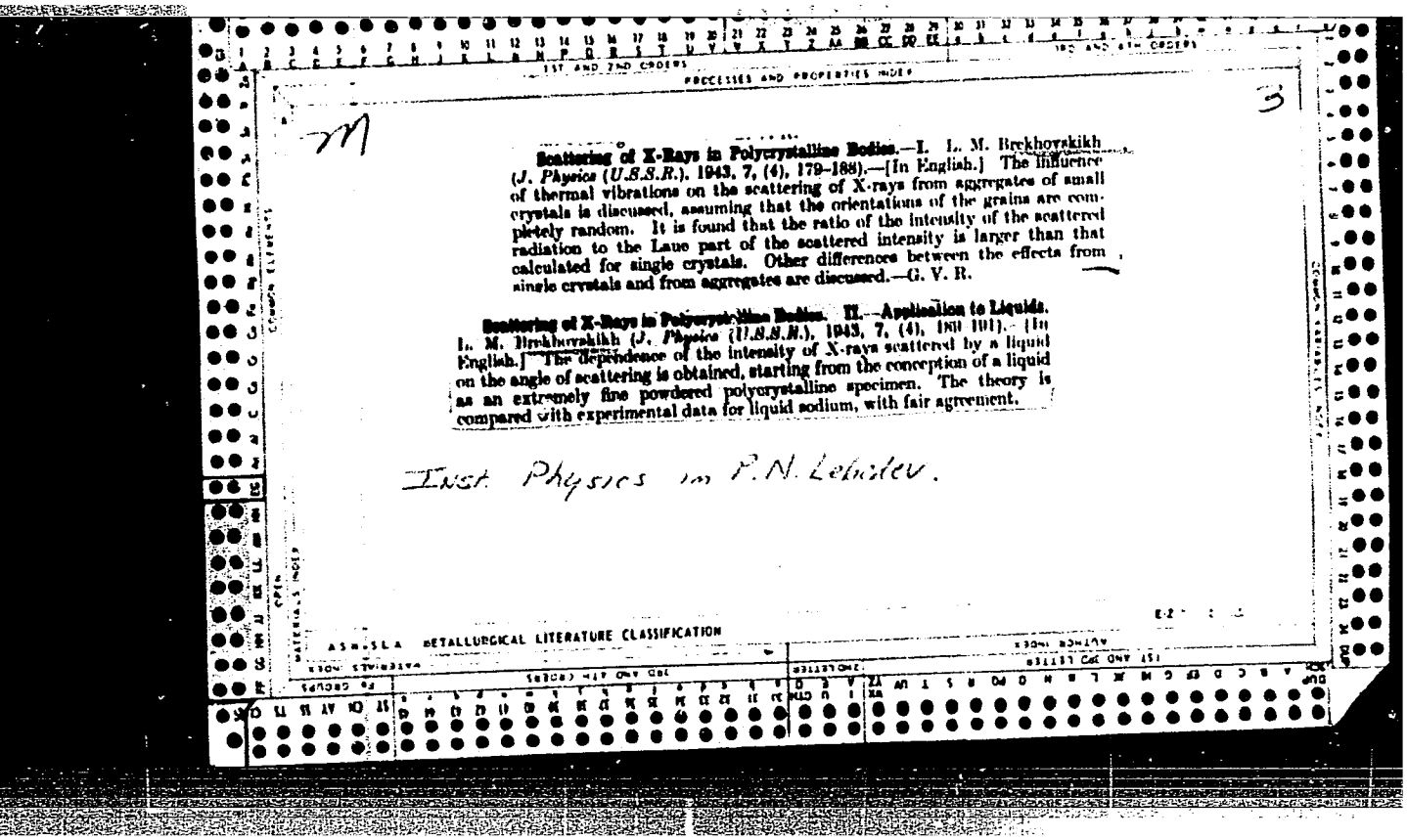


PROCESSES AND PROPERTIES INDEX

The So-Called Non-Laue Scattering of X-Rays by Crystals. L. M. Brekhovskikh and E. Vainshtein (*Zhur. Eksper. Teoret. Fiziki*, 1942, **12**, 415–418; *C. Abs.*, 1943, **37**, 4301). [In Russian.] The Preston–Bragg and the Zachariasen theories are discussed. The latter is found to be in much better agreement with experimental data on the width of diffusion maxima.

Biogeochemical Lab., AS & Physics Inst. im. Lebedev.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

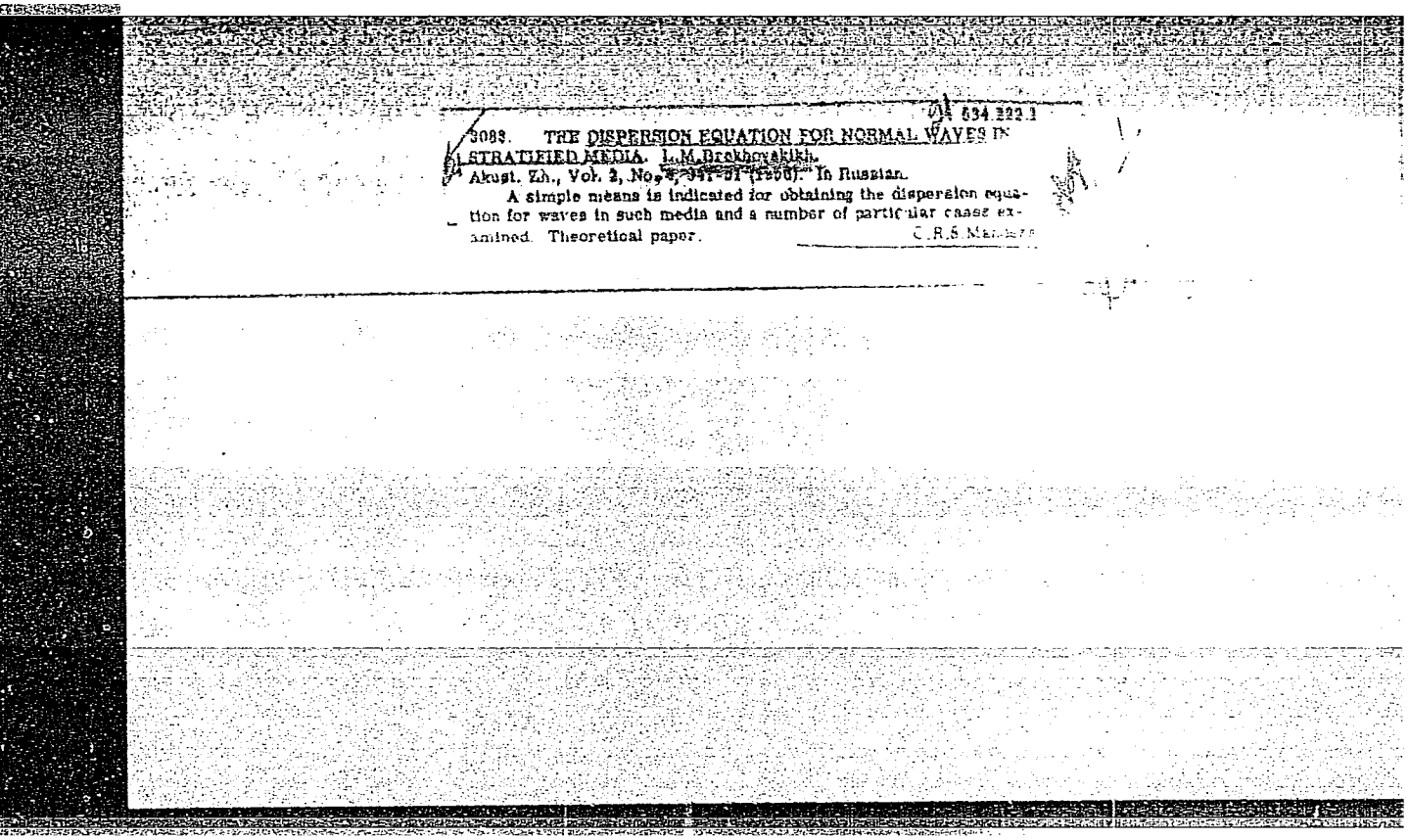
3

Scattering of X-Rays in Polycrystalline Bodies.—I. L. M. Brekhovskikh (*J. Physics (U.S.S.R.)*, 1943, 7, (4), 179–188).—[In English.] The influence of thermal vibrations on the scattering of X-rays from aggregates of small crystals is discussed, assuming that the orientations of the grains are completely random. It is found that the ratio of the intensity of the scattered radiation to the Laue part of the scattered intensity is larger than that calculated for single crystals. Other differences between the effects from single crystals and from aggregates are discussed.—G. V. R.

Scattering of X-Rays in Polycrystalline Bodies. II.—Application to Liquids. L. M. Brekhovskikh (*J. Physics (U.S.S.R.)*, 1943, 7, (4), 180–191).—[In English.] The dependence of the intensity of X-rays scattered by a liquid on the angle of scattering is obtained, starting from the conception of a liquid as an extremely fine powdered polycrystalline specimen. The theory is compared with experimental data for liquid sodium, with fair agreement.

Inst. Physics im P.N. Lebedev.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION



QA 634 .B22 1

3088. THE DISPERSION EQUATION FOR NORMAL WAVES IN STRATIFIED MEDIA. L.M.Brekhovskikh. Akust. Zh., Vol. 2, No. 3, 233-41 (1956). In Russian.

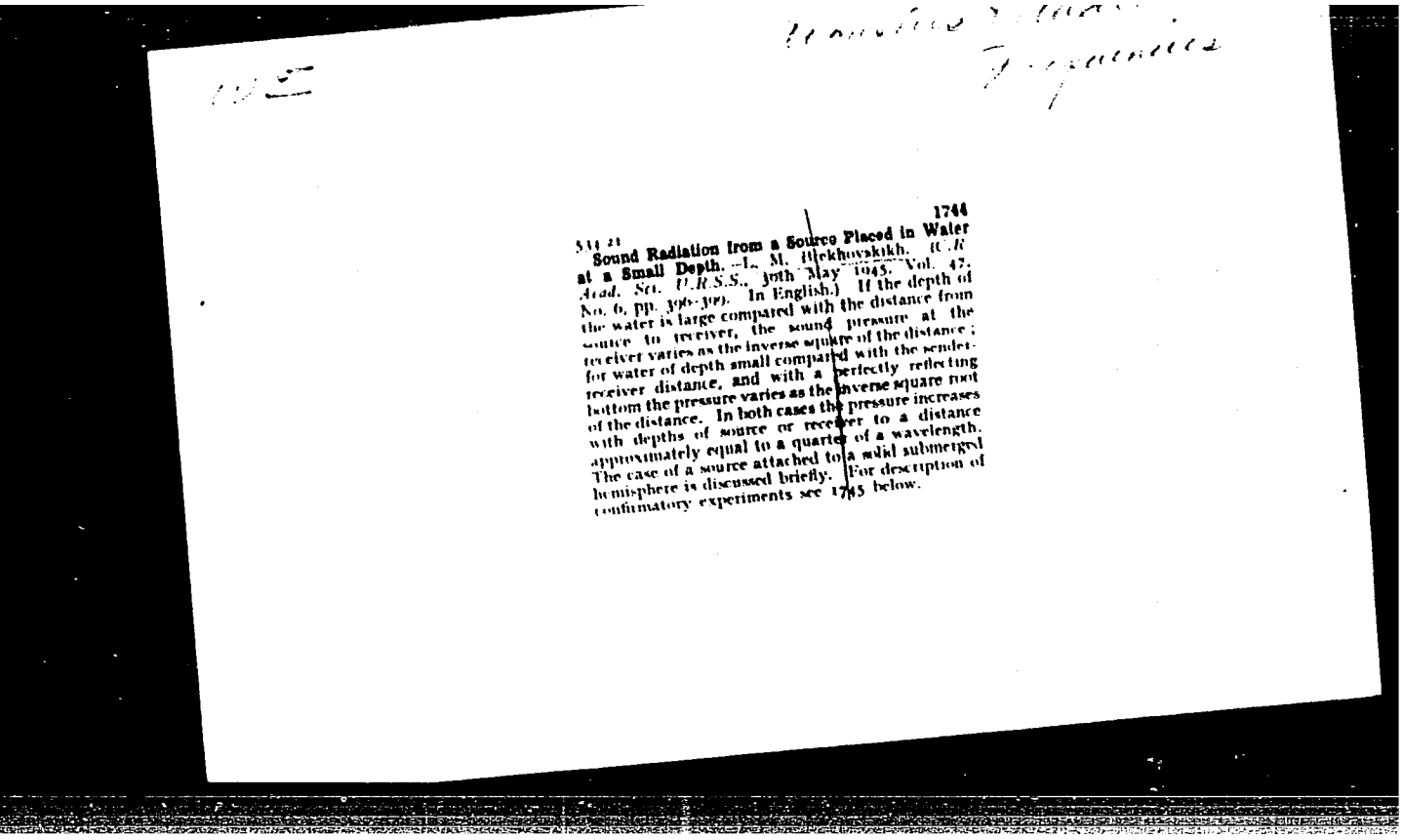
A simple means is indicated for obtaining the dispersion equation for waves in such media and a number of particular cases examined. Theoretical paper.

C.R.S Mathers

BREKHOVSKIKH, L. M.

"Propagation of Waves of A Bend over Plates," Zhur. Tekh. Fiz., 14, No. 9, 1944.

Physical Inst. im. P. N. Lebedev, AS SSSR



1744

534.21

Sound Radiation from a Source Placed in Water at a Small Depth.—L. M. Brekhovskikh. (*C.R. Acad. Sci. U.R.S.S.*, 30th May 1945, Vol. 47, No. 6, pp. 396–399. In English.) If the depth of the water is large compared with the distance from source to receiver, the sound pressure at the receiver varies as the inverse square of the distance; for water of depth small compared with the sender-receiver distance, and with a perfectly reflecting bottom the pressure varies as the inverse square root of the distance. In both cases the pressure increases with depths of source or receiver to a distance approximately equal to a quarter of a wavelength. The case of a source attached to a solid submerged hemisphere is discussed briefly. For description of confirmatory experiments see 1745 below.

1VE

Acoustics / Audio Frequencies

534.21 1422

Propagation of Sound Waves in a Liquid Layer between Two Absorbing Half-Spaces.—L. M. Brekhovskikh. (*C. R. Acad. Sci. U.R.S.S.*, 1945, Vol. 48, No. 6, pp. 397-400. In English.) Theoretical analysis of a problem in sound wave propagation which "may find application in geophysics (propagation through an oil layer), in architectural acoustics and in hydroacoustics (propagation of sound through the sea)".

Brekhovskikh, L. M. Radiation of gravitational waves by electromagnetic waves. C. R. (Doklady) Acad. Sci. URSS (N.S.) 49, 482–485 (1945).

The author obtains approximate solutions of the joint system of gravitational and electromagnetic field equations and uses these solutions to calculate an approximate expression for the loss of energy by an electromagnetic wave due to gravitational radiation. In a cylindrical type world it is found that there is no analogue for the Cherenkov effect and that the magnitude of the gravitational radiation is not large enough to be detected by experiment.

M. Wyman (Edmonton, Alta.).

Source: Mathematical Reviews, Vol 8, No. 5

Propagation of Waves

621.396.11 2869

On the Field of Radio Waves between Two Semi-conducting (imperfectly conducting) Surfaces.

P. A. Ryazin & L. M. Brekhovskikh. (*Bull. Acad. Sci. U.R.S.S., sér. phys.*, 1946, Vol. 10, No. 4, pp. 483–493. In Russian.) Starting from Maxwell's equations and boundary conditions (2), the case is discussed where the field is excited by a vertical dipole located in the intermediate non-conducting space at any arbitrary height above the lower medium. The boundary surfaces of the media are assumed to be flat and parallel (Fig. 1). The problem is thus similar to that of the propagation of radio waves between the surface of the earth and the ionosphere if the above assumptions can be applied to the latter case.

The main results obtained are: (a) At large distances the waves in the intermediate air layer are of the surface type as distinct from the space type. (b) The variation of the intensity and phase of radio waves near the earth's surface is calculated. Sommerfeld's solution taking into account only one boundary surface is a particular case of the more general theory developed in this paper. (c) The phase velocity of waves, at least of the longest wavelengths, exceeds the velocity of light. (d) It is confirmed that the attenuation factor in Austin's and other empirical formulae is of exponential form.

BREKHOVSKYKH, L. M.

PA 12T79

USSR/Radio Waves - Propagation May 1946
Sound waves

"Propagation of Sound and Radio Waves in Layers," L. M. Brekhovskykh, 14 pp

"Izv Ak Nauk Ser Fiz" Vol X, No 5/6

Setting of the partial differential equations descriptive of propagation. Solution and graph. Values of characteristic coefficients of propagation, in series and as inequalities.

12T79

BREKHOVSKIKH, L.

"On the Forced Oscillations of an Infinite Plate in Contact with Water," Zhur. Tekh. Fiz., 16, No. 8, 1946.

Physics Inst. im. P. N. Lebedev, AS SSSR.

BREKHOVSKIY, L. M.

"Theory of Propagation of Sound and Radio Waves in Strata."
Sub 23 Apr 47, Physics Inst imeni P. N. Lebedev, Acad Sci USSR

Dissertations presented for degrees in science and engineering in Moscow in 1947.

SO: Sum. No. 457, 18 Apr 55

BREKHOVSKIKH, L.

PA 38T93

USSR/Physics
Acoustics
Sound - Fields

Nov 1947

"Limits to Which Approximate Methods Can Be Utilized in Field of Acoustics," L. Brekhovskikh, Physics Institute imeni P. N. Lebedev, Academy of Sciences of the USSR, 4 pp

"Dok Ak Nauk" Vol LVIII, No 4

Discusses three questions frequently met in acoustics particularly in architectural acoustics: 1) problem of the sound field (in a room) which is generally the result of superposition on a direct spherical wave by an unlimited number of waves, which are reflected

38T93

USSR/Physics (Contd) Nov 1947

from the walls of the room; 2) problem where the surfaces of the reflecting walls are covered with different types of material; and 3) study of acoustics for various materials which will lead to a widespread understanding of impedance. Submitted by Academician S. I. Vavilov, 12 May 1947.

XXXXXXXXXXXXXXXXXXXXXXXXXXX

38T93

BREKHOVSKIKH, L. M.
25360

Pole Prelomlo-Mlennbkh Elektromagnitnykh Voln V Zadache O Tochechnom Izluchatele [Soderzhanie Chasti Doklada Na Konfcrentsii Vsesoyuz Nauch Soveta Po Radiofizike I Radiotekhnike Pri Otd-Nii Fiz-Matem. Nauch. An SSSR 12 Dek. 1947 G] Izvestiya Akad. Nauk. SSSR, Seriya Fiz., 1948, No 3, s 322-34-Biblnogr: 13 Nazv.

SO: LETOPIS NO. 30, 1948

BREKHOVSKIKH, L.

USSR/Geophysics Mar/Apr 1948
Electromagnetic Waves
Earth - Electrical Properties

PA 41T45

"Concerning V. G. Gogoladze's Article, 'The Distribution of Electromagnetic Waves in Different Media That Are Adjacent along a Plane'," L. Brekhovskikh, 1½ pp

"Izv Akad Nauk SSSR, Ser Geograf i Geofiz" Vol XII, No 2

Shows that in Gogoladze's article on the theory of the propagation of electromagnetic waves based on the equation $N = k^2 b^2 \sigma + k_0^2 b$, where $b_0 = \sqrt{\lambda^2 - \kappa_0^2}$ and $b = \sqrt{\lambda^2 - \kappa^2}$ there is no root for λ, to satisfy the needs of the functions:

$Re\, b_0 > 0$ and $Re\, b > 0$.

41T45

USSR/Geophysics (Cont'd) Mar/Apr 1948

41T45

Brekhovskih, L. M. The field of refracted electromagnetic waves in the problem of point radiation. Izvestiya Akad. Nauk SSSR. Ser. Fiz. 12, 322–334 (1948). (Russian)

Let the point source be a vertical dipole, placed at the height z_0 with respect to a horizontal plane separating two media of wave numbers k_0 and k, respectively ($k/k_0=n$). The Hertz vector for this dipole may be written in the form:

$$(1)\quad \Pi_0=\frac{e^{ikR_0}}{R_0}=\frac{1}{2}\int_{-\infty}^{\infty}H_0^{(1)}(\xi r)e^{\pm i(z-z_0)(k^2-\xi^2)^{\frac{1}{2}}}(k^2-\xi^2)^{-\frac{1}{2}}\xi d\xi,$$

the receiver being placed at the height z and at the distances R_0 from the dipole and r from its axis. By means of the integral representation of the Hankel function one sees that (1) is the superposition of plane waves having different angles of incidence on the limiting horizontal plane. Multiplying then each term in the integral by its corresponding Fresnel reflection or refraction coefficient one obtains the reflected and refracted fields, Π_1 and Π', respectively. It follows that $\Pi=\Pi_0+\Pi_1$ in the upper medium and $\Pi=\Pi'$ in the lower one. The resulting integrals may be evaluated in the case $k_0r\gg 1$ by taking the asymptotic expansion of the Hankel function and then applying the method of steepest descent. A detailed discussion is needed in order to prevent the path of integration from passing through a pole of the integrand during its deformation. In every case, if E_r', E_z' indicate the components of the electric field at a point of the lower medium and E_r, E_z the components in the upper medium for the same r and $z=0$, one finds the following relations:

$$E_r'=E_r e^{-ikz(n^2-\cos^2\chi)^{\frac{1}{2}}},\quad n^2E_z'=E_z e^{-ikz(n^2-\cos^2\chi)^{\frac{1}{2}}},$$

where $\tan\chi=z_0/r$. Two identical formulas may be proved for a horizontal dipole. The same relations are shown to remain valid also in the case $|n|\to\infty$, where a pole of the integrand approaches the stationary point of the path of steepest descent. *G. Toraldo di Francia* (Florence).

Source: Mathematical Reviews, Vol 10 No. 4

BREKHOVSKIKH, L.

USSR/Physics
Sound - Reflection
Radio Waves - Reflection

Apr 1948

"Reflection of Spherical Waves From a Plane Boundary Between Two Media," L. Brekhovskikh, Phys Inst, Acad Sci USSR, 17½ pp

"Zhur Tekh Fiz" Vol XVIII, No 4

Studies both sound and electromagnetic waves. Case of electromagnetic waves has been exhaustively studied, however, only for strictly defined boundaries. Describes setting up the experiment, and the primary results toward solution of the problem, optical geometry as method for preliminary approximation, the so-called "lateral" waves, and the reflection of waves at angles approaching the angles of full internal reflection. Submitted 17 Nov 1947. Submitted for publication in "Journal of Experimental and Theoretical Physics" 30 Jul 1947.

Also: Per Ab. #64, 19 Aug 48
Also: Zhur. Tekh. Fiz., 18, No. 4, 1948.

6495

BREKHOVSKIKH, L.

PA 64T96

USSR/Physics Apr 1948
Sound - Reflection
Radio Waves - Reflection

"The Reflection of Spherical Waves From 'Thin' Boundary Layers," L. Brekhovskikh, Phys Inst, Acad Sci USSR, 9½ pp

"Zhur Tekh Fiz" Vol XVIII, No 4

Studies the field of point emitter of sound or radio waves on a plane boundary layer when the properties of the media on both sides of the boundary are closely related to one another. Obtained criterion whose satisfaction will result in substitution of the boundary by transfer layer. Submitted 17 Nov 1947. Submitted to "Journal of Experimental and Theoretical Physics" 9 Oct 1947.

64T96

BREKHOVSKIKH, L. M.

USSR/Physics
Sound - Propagation
Sound - Speed

Oct 48

"Propagation of Sound in a Liquid Layer of a Constant Gradient of Propagation Speed," L. M. Brekhovskikh, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 3 pp

"Dok Ak Nauk SSSR" Vol LXII, No 4

Discusses several problems connected with propagation of sound in deep seas. Considers increase in sonic speed with depth, occurring because of increase in hydrostatic pressure. Submitted by Acad S. I. Vavilov, 27 Jul 48.

33/49T99

BERKHOVSKIKH, L.M.

PHYSICS* WAVES
RADIO WAVES

New Method of Solving the Problem Regarding the Field of Point Radiator in a Laminated Non-homogeneous Medium," L.M. Berkhovskikh, Phys Inst imeni P.N. Lebedev, Acad Sci USSR, 12 pp

"Iz Ak Nauk SSSR, Ser Fiz". Vol 13, No 4. Jul/ Aug 49.

Point radiator of sonic or radio waves is assumed to radiate spherical waves expressible in complex notation thus: (1/R) . exp i (kR-wt), where R is the distance from the radiator. Problem is sloved for the case of a field to a radiator in a homogeneous layer bound by two arbireary laminated senispaces. Method of "steepest descent" is t en used to fine the discrete spectrum and the lateral, or "marginal" waves.

Submitted 26 Aug 49.

USSR/Physics - Waves Sep/Oct 49
Radio Waves

"The Field of a Point Radiator in a Laminar-Nonhomogeneous Medium," L. M. Brekhovskikh, Phys Inst imeni Lebedev, Acad Sci USSR, 40 pp

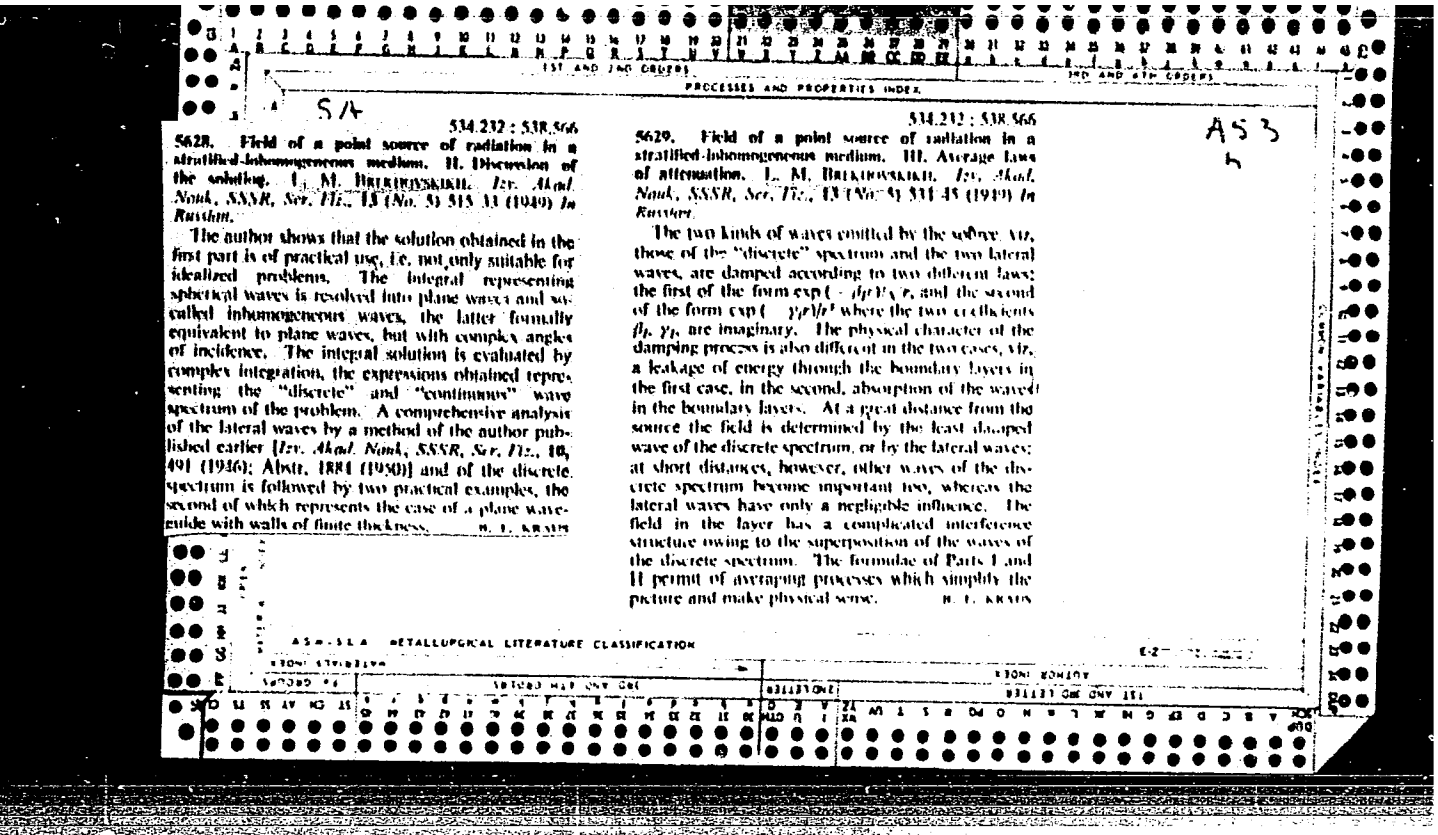
"Iz Ak Nauk SSSR, Ser Fiz" Vol XIII, No 5

Basic results of this work were presented at 26 Sep 49 session of Dept of Physicomath Sci, Acad Sci USSR, and were printed in "Iz Ak Nauk SSSR, Ser Fiz" Vol XIII, No 4, p 409, 1949. Discusses: setting up of the problem involving the dielectrical constant $\varepsilon(z)$ and the spherical wave $(1/R) \cdot \exp(ikR)$, which is finally set in an integral form; propagation of a wave in a homogeneous layer bound by two planes z_1, and z_2, with a radiator and receiver disposed within; scheme for determining the phase of a wave for a different number of reflections from the boundaries of a layer; four cases corresponding to waves with the least number of reflections from the boundaries; scheme for determining the phases of various waves composing the complete field in the lower half-space; complex contour integrals for solving the integral equation; lateral waves; the discrete spectrum; interpretation of results by geometrical optics; limits of applicability of the results. Submitted 29 Oct 48 and 28 Apr 1949.

PA 152T101

BREKHOVSKIKH, L. M.

152T101



PROCESSES AND PROPERTIES INDEX

534.232 : 538.566

5628. Field of a point source of radiation in a stratified-inhomogeneous medium. II. Discussion of the solution. L. M. Brekhovskikh. *Izv. Akad. Nauk, SSSR, Ser. Fiz.*, **13** (No. 5) 515–33 (1949) *In Russian.*

The author shows that the solution obtained in the first part is of practical use, i.e. not only suitable for idealized problems. The integral representing spherical waves is resolved into plane waves and so-called inhomogeneous waves, the latter formally equivalent to plane waves, but with complex angles of incidence. The integral solution is evaluated by complex integration, the expressions obtained representing the "discrete" and "continuous" wave spectrum of the problem. A comprehensive analysis of the lateral waves by a method of the author published earlier [*Izv. Akad. Nauk, SSSR, Ser. Fiz.*, **10**, 491 (1946); Abstr. 1881 (1950)] and of the discrete spectrum is followed by two practical examples, the second of which represents the case of a plane waveguide with walls of finite thickness. M. I. KRAUS

534.232 : 538.566

5629. Field of a point source of radiation in a stratified-inhomogeneous medium. III. Average laws of attenuation. L. M. Brekhovskikh. *Izv. Akad. Nauk, SSSR, Ser. Fiz.*, **13** (No. 5) 531–45 (1949) *In Russian.*

The two kinds of waves emitted by the source viz, those of the "discrete" spectrum and the two lateral waves, are damped according to two different laws; the first of the form $\exp(-\beta_1 r)/r$, and the second of the form $\exp(-\gamma_2 r)/r^2$ where the two coefficients β_1, γ_2 are imaginary. The physical character of the damping process is also different in the two cases, viz, a leakage of energy through the boundary layers in the first case, in the second, absorption of the waves in the boundary layers. At a great distance from the source the field is determined by the least damped wave of the discrete spectrum, or by the lateral waves; at short distances, however, other waves of the discrete spectrum become important too, whereas the lateral waves have only a negligible influence. The field in the layer has a complicated interference structure owing to the superposition of the waves of the discrete spectrum. The formulae of Parts I and II permit of averaging processes which simplify the picture and make physical sense. M. I. KRAUS

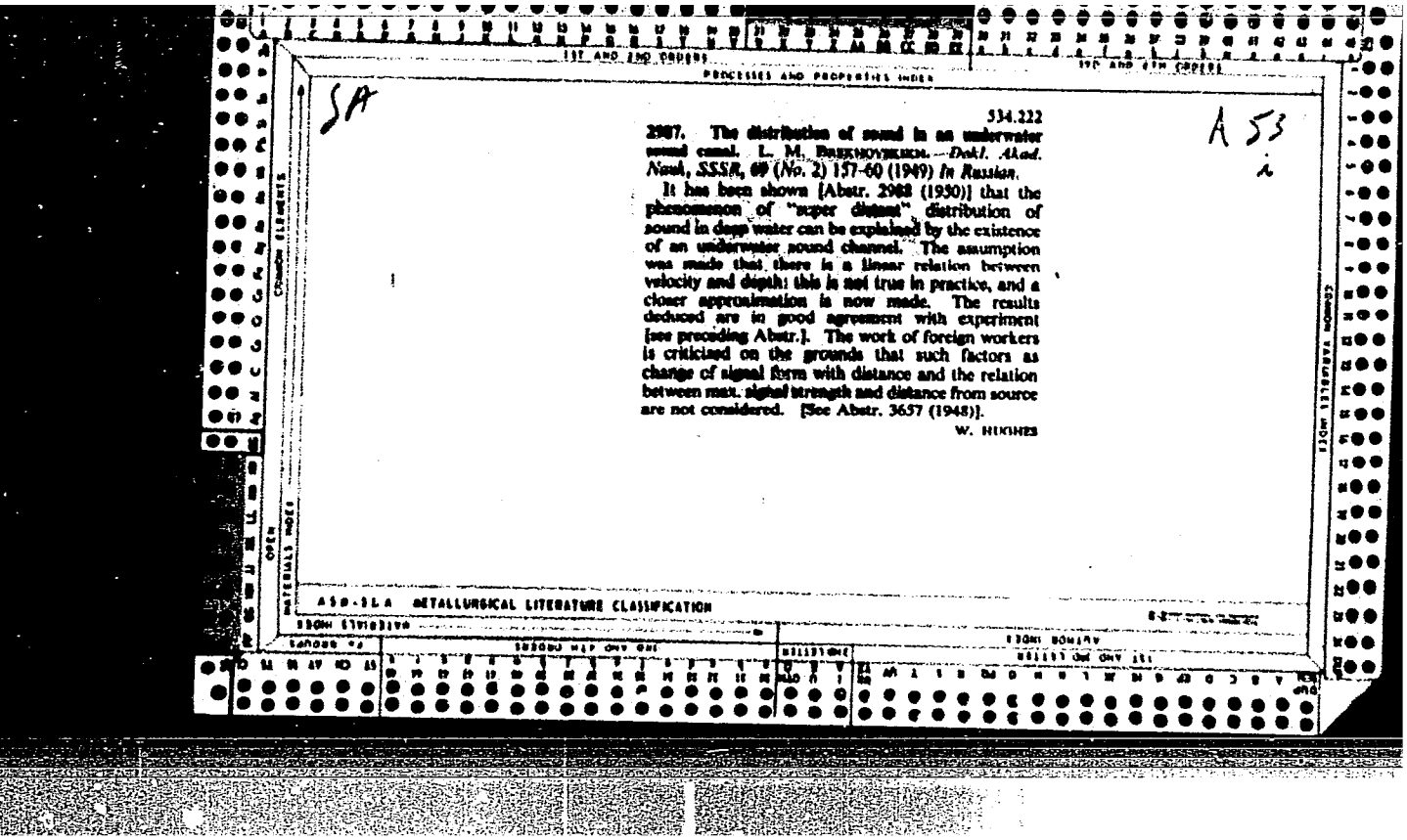
BREKHOVSKIKH, L. M.

On the Propagation of Sound in an Underwater Sound Channel

Dok Akad Nauk, 68, 1949, 2, 157-160

Also: ibid. 69, No. 2

Translation 2524467, 30 Apr 54



534.222

2987. The distribution of sound in an underwater sound canal. L. M. BREKHOVSKIKH. —*Dokl. Akad. Nauk, SSSR*, 69 (No. 2) 157-60 (1949) *In Russian.*

It has been shown [Abstr. 2988 (1950)] that the phenomenon of "super distant" distribution of sound in deep water can be explained by the existence of an underwater sound channel. The assumption was made that there is a linear relation between velocity and depth: this is not true in practice, and a closer approximation is now made. The results deduced are in good agreement with experiment [see preceding Abstr.]. The work of foreign workers is criticized on the grounds that such factors as change of signal form with distance and the relation between max. signal strength and distance from source are not considered. [See Abstr. 3657 (1948)].

W. HUGHES

BREKHOVSKIKH, L.M.

VAN 3/50 W-12746

Dr. Phys Math Sci L.M. Brekhovskikh for his works "Theory of the Propagation of Sound and Radio Waves in Layers," "Field of Deffraction of Electromagnetic Waves in the Problem of the Point Emitter," and "Reflection of Spherical Waves from a Plane Boundary between two Media," shared the N.D. Papaleksi Prize (20,000rubles) with Dr Phys Math Sci S.Z. Belen'kiy.

1. BREKHOVSKIY, L. M.

2. USSR (600)

4. Physics and Mathematics

7. Sound Waves in Air, Water, and Solids, V. A. Krasil'nikov. (Moscow-Leningrad, State Technical Press, 1951). Reviewed by L. M. Brekhovskiy, Sov. Kniga, No. 4, 1952.

9. [redacted] Report U-3081, 16 Jan 1953, Unclassified.

BREKHOVSKIKH, L. M.

"Theory of Complete Internal Reflection," a paper presented at the conference of the Acoustics Commission, AS USSR held in Leningrad 1-3 Feb 51.

W-21610, 25 Feb 52

IVANOV, I.D. [translator]; BREKHOVSKIKH, L.M., red.; GESSEN, L.V., red.; NIKIFOROVA, A.N., tekhn.red.

[Propagation of sound in the ocean. Translations of periodical articles from English] Rasprostranenie zvuka v okeane; sbornik statei. Pod red. L.M.Brekhovskikh. Moskva, Izd-vo inostr.lit-ry, 1951. 214 p. (MIRA 12:5)

(Underwater acoustics)

BREKHOVSKIKH L. M.

PA. 194T91

USSR/Physics - Light Reflection Aug 51

"Theory of Displacement of Rays at Full Internal Reflection of Spherical Wave," L. M. Brekhovskikh, Phys Inst imeni Lebedev, Acad Sci USSR

"Zhur Tekh Fiz" Vol XXI, No 8, pp 874-880

Author discusses and explains previously found peculiarities ("Zhur Tekh Fiz" 18, 455, 1948 and "Uspekh Fiz Nauk" 38, 1, 1949) of field near angle of full reflection on basis of concepts of radiation. He proves in particular that the reflected wave has a caustic curve. Submitted 31 Dec 50.

194T91

BREKHOVSKIKH, L. M.

Brekhovskih, L. M. The diffraction of sound waves from an uneven surface. Doklady Akad. Nauk SSSR (N.S.) 79, 585–588 (1951). (Russian)

The problem is that of a plane wave incident upon a doubly-corrugated surface, given in rectangular coordinates by $X_3=f(X_1, X_2)$ where f is periodic in both arguments. It he substitutes for φ the sum of the incident and reflected waves with a general reflection coefficient; the limits of applicability of this procedure are specifically excluded from the investigation. For $\exp(jkR)/R$ he substitutes a double integral in terms of plane waves. After some formal manipulations there results an expression for φ as a double series of plane waves. A procedure is given for determining the amplitudes of these waves. Special cases discussed include the case of a small ripple upon a large one.

F. V. Atkinson (Ibadan).

the formula

$$\varphi(P)=\frac{1}{4\pi}\int\int\left[\varphi\frac{\partial}{\partial n}\left(\frac{e^{jkR}}{R}\right)-\frac{e^{jkR}}{R}\frac{\partial\varphi}{\partial n}\right]dS$$

Source: Mathematical Reviews, Vol. 13 No. 6

BREKHOVSKIKH, L. M.

Brekhovskih, L. M. Diffraction of electromagnetic waves from an uneven surface. Doklady Akad. Nauk SSSR (N.S.) 81, 1023–1026 (1951). (Russian)

This paper extends to the electromagnetic case the method of an earlier paper on sound diffraction [same Doklady 79, 583–588 (1951); these Rev. 13: 599]. The author confines himself to the case of a perfectly conducting surface. In a foot note he corrects some minor errors in the previous paper.

F. V. Atkinson (Ibadan).

Source: Mathematical Reviews, Vol 13 No. 6

Phys. Inst. im. P.N. Lebedev, Acad. Sci USSR.

BREKHOVSKIKH, PROF L. M.

USSR/Physics - Ultrasonic Waves Nov 52

"A Procedure for Determining Absorption of Ultrasonci Waves in Metals," N. F. Otpushchennikov

"Zhur Tekh Fiz" Vol 22, No 11, pp 1867-1870

Proposes a new method for detg the absorption of ultrasonic waves in metals. Presents data on subject absorption in the following substances: zinc, lead, tin, rosin, and methylmetacrylate. Measurements were conducted for the frequency 3.5×10^6 cps.

Acknowledges aid of N. N. Andreyev, Corr Mem, Acad Sci USSR, and Prof L. M. Brekhovskikh. Cites related works of S. Ya. Sokolov, B. E. Korlin, I. Livshits, G. Prakhomovskiy, M. A. Iskovich.

PA 236T104

BREKHOVSKIKH, L. M.

Focusing of Sound Waves in a Nonhomogeneous Medium. Ak. Zh. #2, p 124, 1952.

USSR/Physics - Wave Diffraction Sep 52

"Diffraction of Waves on an Uneven Surface. Part II. Applications of the General Theory," L.M. Brekhovskikh, Phys Inst imeni Lebedev, Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol 23, No 3, pp 289-304

A number of concrete cases of diffraction of sonic and electromagnetic waves on ripple surfaces of various type are analyzed. Finite size of the area on which diffraction occurs is taken into account. In the case where unevenness is sinusoidal, results are obtained by 2 different methods and compared. Ye. Zezyukina processed computation and constructed diagrams for the article. Received 21 May 52.

BREKHOVSKIKH, L. M.

(PA 56 no. 668: 5422 '53)

227T85

BREKHOVSKIKH, L. M.

USSR/Physics - Wave Diffraction Sep 52

"Diffraction of Waves on an Uneven Surface. Part I. General Theory," L.M. Brekhovskikh, Phys Inst imeni Lebedev, Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol 23, No 3, pp 275-288

Suggests approx method for computing the diffraction of sonic and elecromagnetic waves on an uneven surface. States that this method may be applied in cases where at all surface points the radius of curvature is sufficiently large in comparison with wave length. As for the rest,

227T84

author notes, the type of unevenness and the physproperties of the medium bound by the uneven surface may be arbitrary. Received 21 May 52.

(PA 56 no.668: 1421 53)

227T84

BREKHOVSHIKH, L. M.

USSR/Physics - Wave Propagation 1 Apr 52

"Extending the Boundaries of the Applicability of the Ray Theorem in Investigations of the Propagation of Waves in Laminar Media," L. M. Brekhovskikh, I. D. Ivanov

"Dok Ak Nauk SSSR" Vol 83, No 4, pp 545-548

Considers the problem concerning the complete reflection of a wave radiated by a point radiator A from laminar-nonhomogeneous half space $z>0$. Shows that the ray method of computing the field at the points lying in a homogeneous medium can be extended without requiring that the gradient be necessarily small, as

234T97

in previous cases. Expresses the formula for the spherical reflected wave. Submitted 6 Feb 52 by Acad M. A. Leontovich.

(PA 56 no. 668:5375 '53)

234T97

1. BREKHOVSKIY, L. M.

2. USSR (600)

4. Sound Waves

7. One instant of sound propagation in a heterogenous medium. Dokl. AN SSSR 87 no. 5 1952.

Considers a sonic field in a laminar-nonhomogeneous medium where the velocity of sound depends on coordinate z thus: $c - c_0 \cdot (1 - 2a(z-h))^{-\frac{1}{2}}$ for z between h and infinity; velocity remains invariable in planes perpendicular to z. Subject case of h - 0 is of interest in investigating propogation of sound in the sea. Author finds only the attenuation of the sonic field with distance. Presented by Acad M.A.Leontovich 20 Oct 52 254T103

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

Aug. 55

BREKHOVSKIKH, L. M.

USSR/Physics - Wave Reflection

"Reflection of Bounded Wave Beams and Pulses," L. M. Brekhovskikh

Usp Fiz Nauk, Vol 50, No. 4, pp 539-576

Analyzes reflection of bounded beam and pulses from a plane boundary. Particularly studies case where incident angle approaches full internal reflection, which produces phenomena in variance with reflection of plane waves, such as displacement of beams along boundary or distortion of pulse. Describes results of reflection from unhomogeneous layers.

263 T 105

BREKHOVSKIKH, L. M.

2392. Brekhovskikh, L. M., and Ivanov, I. D., On one special form of damping in wave propagation in laminar inhomogeneous media (in Russian), Acoustics Inst., Akad. Nauk SSSR, Nov. 1954 (translated from Russian by M. D. Friedman, 572 California St., Newtonville, Mass., 12 pp.)

From solutions by first author in previous papers, solution of wave equation is constructed for a two-layer model: bottom layer is homogeneous; in upper layer, wave velocity decreases linearly with distance from interface. The greater this rate of decrease, the more energy is "drawn off" through refraction into the upper layer, and therefore the greater the departure of attenuation in the homogeneous layer from the inverse square law. Some numerical values for this damping are given.

M. Wurtele, USA

BREKHOVSKIKH, L.M., doktor fiziko-matematicheskikh nauk; BYALOVA, V.V.; IVANOV, I.D., kandidat fiziko-matematicheskikh nauk; ISAKOVICH, M.A., doktor fiziko-matematicheskikh nauk, redaktor; RABINOVICH, N.Ya., redaktor; ROZENBERG, L.D., doktor tekhnicheskikh nauk, redaktor; TARTAKOVSKIY, B.D., kandidat tekhnicheskikh nauk. GUROV, K.P., redaktor; GRAKOVA, Ye.D., tekhnicheskiy redaktor.

[Scientific literature on acoustics during the years 1945-1949] Nauchnaia literatura po akustike za 1945-1949 gg. Moskva, 1955. 276 p. (MLRA 8:12)

1. Akademiya nauk SSSR. Komissiya po akustike. 2. Chlen-korrespondent AN SSSR (for Brekhovskikh)
(Bibliography--Sound)

BREKHOVKIKH, L. M.

"Present State of the Theory of Propagation of Sound Waves".

Acoustic Institute, Academy of Sciences USSR

A report delivered at a conference on Elestro-acoustics held by the Acoustic Commission, the Acoustic Institute of the Academy of Sciences USSR, and the Kiev Order of Lenin Polytechnic Inst., from 1-5 July 1955 in Kiev.

SO: Sum 728, 28 Nov 1955.

BREKHOVSKIKH, L. M.

"Focusing of Sound Waves in Inhomogeneous Media," paper presented at the Second International Congress on Acoustics, Cambridge, Mass., 17-23 Jun 56.

Acoustical Institute of the Academy of Sciences of the USSR, Moscow, USSR.

1 - P/H

Brehovskih, L. M., and Ivanov, I. D. On a special form of damping in propagation of waves in stratified nonhomogeneous media. Akust. Z. 1 (1955), 23–30. (Russian)

Let the velocity of propagation be $c=c_0$ for $0\leq z\leq h$, $c=c_0[1+2a(z-h)]^{-\frac{1}{2}}$ for $z\geq h$, where a is a small parameter. The general theory developed in a memoir of the first author [Izv. Akad. Nauk SSSR. Ser. Fiz. 13 (1949), 505–514, 515–533, 534–545; MR 11, 563, 564] is applied to the problem of attenuation of the field due to leakage of energy from the homogeneous layer ($0\leq z\leq h$) to the inhomogeneous medium ($z\geq h$) for the case of the above velocity gradient. Estimates of the distance over which the sound field is determined principally by the normal modes, that is the distances over which the layer is effective as a sound channel, are given. *R. N. Goss.*

On Tsunami Phenomena and Observations on Long-distance Propagation (cont.)

explosions. Several examples are used to illustrate the great accuracy of the data provided by that service.

N. N. Moiseyev

SOV/124-58-1-252

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 29 (USSR)

AUTHOR: Brekhovskikh, L. M.

TITLE: On Tsunami Phenomena and Observations on Long-distance Propagation of Sound in the Ocean (O tsunami i nablyudeniyakh nad sverkhdal'nim rasprostraneniyem zvuka v okeane)

PERIODICAL: Byul. Soveta po seysmol. AN SSSR, 1956, Nr 2, pp 8-11

ABSTRACT: A review-type paper devoted to the description of the phenomenon of long-distance sound propagation under water which was first discovered by Rozenberg in 1946 and received an explanation in researches performed by Brekhovskikh. The existence of a sonic duct at a substantial depth beneath the ocean surface along which virtually no dissipation of sonic waves is observed enables one to predict the approach of a tsunami, since the sonic propagation is considerably faster than that of the gravitational waves. A qualitative explanation of the formation of sonic ducts is provided. Data are given on the American "Sofar" service, consisting of a number of hydroacoustic observation posts capable of recording the various noises obtaining in the ocean and, in particular, those emanating from underwater

Card 1/2

BREKHOVSKIKH, L.M.

Category : USSR/Acoustics - Sound vibrations and waves J-2

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 2105

Author : Brekhovskikh, L.M.
Inst : Acoustics Institute, Academy of Sciences USSR
Title : Focusing of Sound Waves by Inhomogeneous Media

Orig Pub : Akust. Zh., 1956, 2, No 2, 124-132

Abstract : The field of a point-source radiator in a stratified-inhomogeneous medium is represented in an integral form, which contains the coefficient of reflection of plane waves. If the frequency is high enough, the reflection coefficients can be computed with the BKW (Brillouin-Kramers-Wentzell) method. Subsequent application of the saddle-point method to the integral yields a ray approximation for the field. Further development of the theory makes it possible to derive the equation of the caustic surface, to find the sound pressure near the caustics and in the region of their points of tangency. It is not necessary here, as was done by Haskell (Haskell, N.A. J. Appl. Phys. 1951, 22, 157-168), to find first the solution in the form of a sum of normal waves. Examples are cited.

Card : 1/1

BREKHOVSKIKH, L. M.

USSR / Acoustics. Sound Vibrations and Waves J-2

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12675

Author : Brekhovskikh, L.M.

Inst : Acoustics Institute, Academy of Sciences, USSR, Moscow

Title : Propagation of Sound in Inhomogeneous Media.

Orig Pub : Akust. zh., 1956, 2, No 3, 235-243

Abstract : Survey article, delivered at the Second International Acoustical Congress on 21 June 1956, in Cambridge, (Mass., US) (see Abstract 12661). It is noted, that the propagation of sound in inhomogeneous media is connected with an extensive class of physical phenomena. A detailed examination is made of two branches -- the propagation of sound waves in so-called inhomogeneous layered media, and

Card : 1/6

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12675

: dent and reflected waves. Such a separation is not unique. In connection with this, an error is pointed out in the work by Gans (Gans, R., Ann. Physik, 1915, 74, 709), who was one of the first to analyze in 1915 the laws of total reflection of waves in an inhomogeneous medium.

A method is developed for treating problems in the propagation of waves in inhomogeneous layered media, first developed by the author of this survey. In the case of propagation of waves radiated by point non-directional sources, great mathematical difficulties arise owing to the difference in the symmetry of the medium and of the radiated wave. The medium is plane-layered, and the source radiates a spherical wave. A rational method for examining this problem would be to expand the spherical waves into plane waves, more so, sin-

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12675

: zone near the radiator. The third part consists of two waves, called the "side waves".

It is emphasized that practically all cases of propagation of waves in inhomogeneous-layered media are quite distinctly separated into two classes, which the author calls "waveguide" and "antiwaveguide" propagation. The phenomenon of the so-called "superdistant sound propagation," when the sound from the explosion of a charge of TNT weighing several kilograms can be recorded at a distance of more than 5,000 km, pertains to waveguide propagation.

An example is given of antiwaveguide propagation in connection with which the concept of the so-called transverse diffusion of sound energy is discussed. It is indicated that

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12675

: to describe the propagation of sound in a statistically inhomogeneous medium it is necessary to know the so-called coefficient ofcorrelation. When the fluctuations are relatively small, the problem can be solved by perturbation method. It is emphasized that a very fruitful method in the theory is the modified perturbation method, proposed by S.M. Rytov (Izv. AN SSSR, ser. fiz., 1937, 2, 223) and developed by A.I. Obukhov (Izv. AN SSSR, ser. geofiz., 1953, 2, 155). For this method it is necessary that the perturbations of the phase be small on the wavelength. A brief report is made of the fundamental results, obtained by Soviet scientists in recent times in the study of the propagation of sound in statistically inhomogeneous media. It is emphasized that the new problem of the propagation of sound in a media, were there simultaneously inhomogeneities of the above two types, is very important and vital. Bibliography, 13 titles.

BREKHOVSKIKH, L.M.

Category : CHINA/Acoustics - General Problems J-1

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4702

Author : Brekhovskikh, L.M.
Title : Research in Acoustics in the Soviet Union

Orig Pub : Kesyue tunbao, 1956, No 5, 37-42

Abstract : Survey of basic research in acoustics in the Soviet Union with a brief indication of the trends and of the organizations.

1. Acoustics of rooms and structures (development of methods for the design of radio studios, auditoriums, concert halls, and motion picture theaters; design of sound systems for large areas and stadiums; acoustics of residences). Basic organizations carrying out the work: Academy of Architecture and Construction, Moscow Electrotechnical Institute of Communication, Scientific-Research Institute of Cinematography and Photography, Central Institute of Industrial Structures, Acoustic Institute of the Academy of Sciences of the USSR, and others.

2. Work in the field of communication (improvement of the acoustic quality of telephone communication; investigation of the sounds in Russian speech and intelligibility of speech as functions of various

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factors). Work is carried out by the Institutes of Administry of Radio-technical Industry, the Academy of Communications, and other organizations.

3. Investigation and the development of electroacoustic apparatus (loudspeaker equipment for high fidelity reproduction of speech and music; apparatus for sound recording; instruments for band frequency analysis; investigation of various kinds of distortion and of noise in electro-acoustics apparatus). Basic organizations: Institute of Radio Reception and Acoustics, Scientific-Research Institute of Cinematography and Photography, Kiev Polytechnic Institute, Institute of Sound Recording, Institute of the Ministry of Communication, etc.

4. Ultrasonics (fundamental research, creating a scientific-technical base for various applications of ultrasonics; ultrasonic defectoscopy; methods for control and automatization of manufacturing processes with the aid of ultrasonics; ultrasonic cleaning; machining of superhard material; soldering and tinning; use of ultrasonics for dyeing cloth, tanning skins, etc.; applications to metallurgy; smoke precipitation with the aid of ultrasonics; applications to medicine for diagnosis and treatment of various diseases). Basic organizations, performing the

work: Acoustic Institute, Academy of Sciences of the USSR; Leningrad Electrotechnical Institute, Moscow University, Laboratory for Anisotropic Structures of the Academy of Sciences of the USSR; Scientific Research Institute of the Aviation Industry, Scientific Research Institute for Reinforced Concrete, Central Scientific Research Institute for Heavy Machine Building, Scientific Research Institute for Railroad Transport, Scientific Research Institute for Radio Industry, Laboratory for Physical-Chemical Methods of Investigation in Boiler Inspection of the Ministry of Electric Stations of the USSR, Scientific Research Institute of the Ministry of Industry of Widely-Used [consumers] Goods, Central Scientific Research Institute for Ferrous Metallurgy, and others. Many organizations (Moscow Pedagogical Institute, Leningrad University, Physics Institute of the Academy of Sciences of the USSR, and others) carry out ultrasonic investigations connected with molecular structure of substances.

5. Work in the field of noise suppression is carried out by the Leningrad Institute for Protection of Labor of the All-Union Central Council of Trade Unions and other organizations.

BREKHOVSKIKH, L.M.

USSR /Acoustics. General Problems

J-1

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12661

Author : Brekhovskikh, L.M.

Inst : Not given

Title : Second International Acoustic Congress

Orig Pub : Vestn. AN SSSR, 1956, No 10, 48-51

Abstract : Report of the Congress, held in Cambridge (US) in June 1956. Three plenary sessions were devoted to the influence of noise on the human organism and means of combatting noise, to architectural and musical acoustics, to physical acoustics, and to ultrasonics. In addition to the plenary sessions, 27 section meetings were held. Notice is taken of the work on a section of psychophysiological and biological acoustics, sections on the study of speech and on means of combatting

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Category : CHINA/Acoustics - General Problems J-1

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 4702

6. Physical acoustics (methods of acoustical quality control of musical instruments; study of the physical properties and methods of manufacture of high-grade musical instruments). Work is carried on by the Experimental Factory for Musical Instruments of the Ministry of Local Industry of the USFSR.

7. Work on physiological acoustics (study and development of new methods of measurement of human hearing, study of the physiology of hearing, determination of permissible noise levels). Work is carried on by the Institutes of Physiology and of Biophysics of the Academy of Sciences of the USSR, the Institute of Ministry of Health of the RSFSR, and others.

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BREKHOVSKIKH, L.M.; RYTOV, S.M., doktor fiziko-matematicheskikh nauk, otvetstvennyy redaktor; GUROV, K.P., redaktor izdatel'stva; PAVLOVSKIY, A.A., tekhnicheskiy redaktor.

[Waves in laminated media] Volny v sloistykh sredakh. Moskva, Izd-vo Akad.nauk SSSR, 1957. 501 p. (MLRA 10:6)
(Waves)

USSR /Acoustics. General Problems J-1

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12661

: various noises (in particular, a special section on combatting noises from jet aircraft), a section on general physical acoustics, and sound propagation, a section on the application of ultrasonics in medicine and technology, a section on musical acoustics, on the recording and reproduction of sound. Briefly described are the acoustical laboratory of the Massachusetts Institute of Technology, of the RCA, Brown, Columbia, Harvard, and Catholic universities, inspected by the delegates of the Academy of Sciences, USSR, at the invitation of the American scientists. See Referat Zhurnal-Fizika, 1957, No 4701, 10121, 10122.

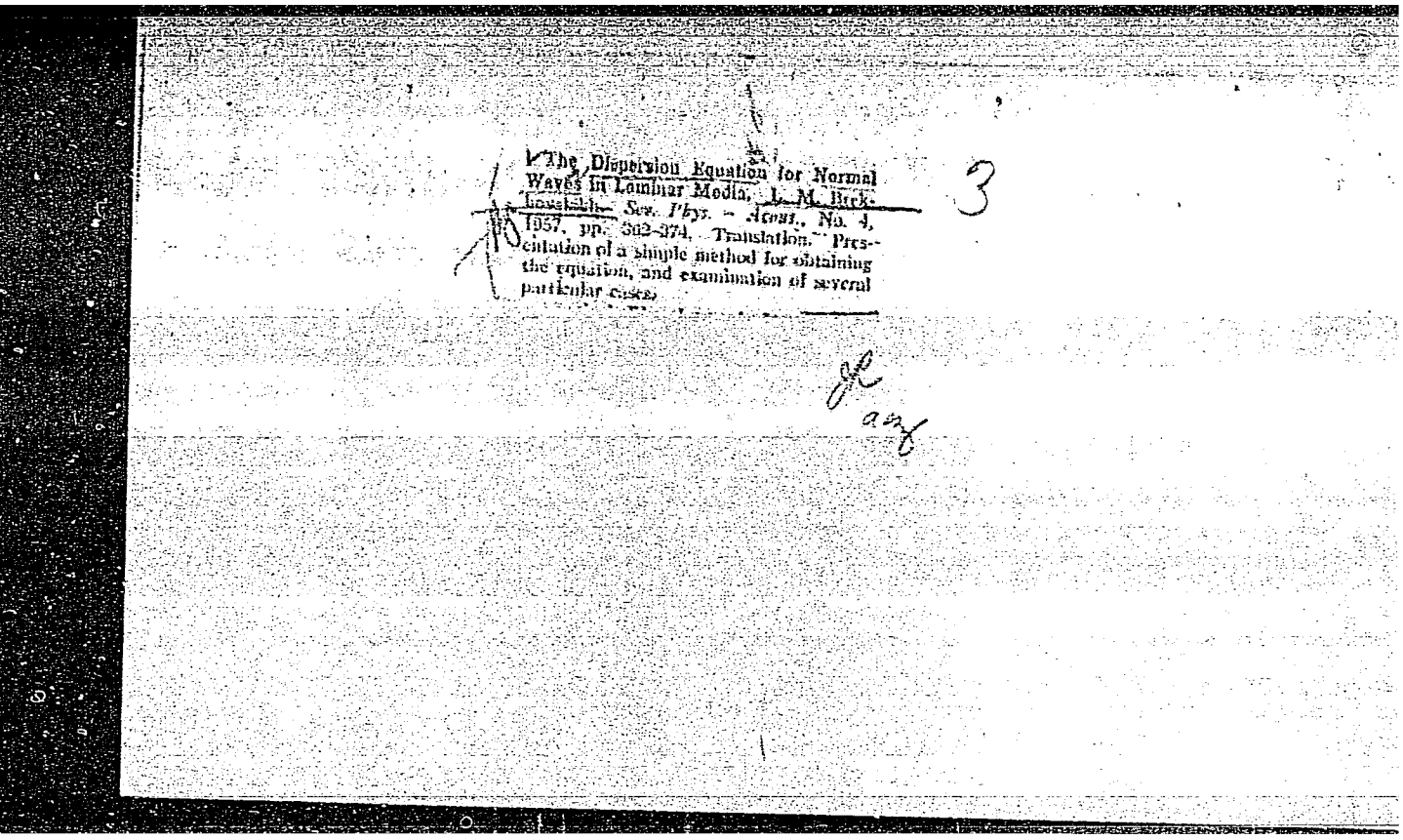
Correa., Mbr., (USSR) Acad. Sci.

Card : 2/2

BREKHOVSKIKH, L. M.

"Rayleigh Wave Propagation Along a Rough Boundary."

paper presented at 4th All-Union Acoustics Conf., Moscow, 26 May 58- 4 June 58.



"The Dispersion Equation for Normal Waves in Laminar Media, L. M. Brekhovskikh. *Sov. Phys. – Acoust.*, No. 4, 1957, pp. 362-374. Translation." Presentation of a simple method for obtaining the equation, and examination of several particular cases.

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BREKHOVSKIKH, L., otvetstvennyy red.; POLENOVA, T.P., tekhn.red.

[Abstract of reports at the Fourth All-Union Acoustical Conference] Referaty dokladov. Moskva, Izd-vo Akad. nauk SSSR, 1958. 102 p. (MIRA 11:6)

1. Vsesoyuznaya akusticheskaya konferentsiya. 4th, Moscow, 1958.
2. Chlen-korrespondent AN SSSR (for Brekhovskikh)
(Sound--Congresses)

BREKHOVSKIKH, L.M., otvetstvennyy red.

[Abstracts of reports at the Fourth All-Union Acoustical Conference] Referaty dokladov. Otv.red. L.M.Brekhovskikh. Moskva, Akad. nauk SSSR. Pt.2. 1958. 44 p. (MIRA 11:6)

1. Vsesoyuznaya akusticheskaya konferentsiya. 4th, Moscow, 1958. 2. Chlen-korrespondent AN SSSR.
(Sound--Congresses)

BREKHOVSKIKH, L.M.

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PHASE I BOOK EXPLOITATION SOV/3528

Moscow. Dom nauchno-tekhnicheskoy propagandy

Primeneniye ul'trazvuka v promyshlennosti; sbornik statey (Industrial Use of Ultrasound; Collection of Articles) Moscow, Mashgiz, 1959. 301 p. 8,000 copies printed.

Sponsoring Agency: Obshchestvo po rasprostraneniyu politisheskikh i nauchnykh znaniy RSFSR.

Ed. (Title page): V.F. Nozdrev, Doctor of Physical and Mathematical Sciences, Professor; Ed. (Inside book): G.F. Kochetova, Engineer; Tech. Ed.: V.D. El'kind; Managing Ed. for Literature on Machinery and Instrument Manufacturing (Mashgiz): N.V. Pokrovskiy, Engineer.

PURPOSE: This book is intended for engineers and technicians engaged in the application of ultrasonics in machinery manufacture and in other branches of industry.

COVERAGE: This is a collection of papers read at the first all-Union conference on the use of ultrasonics in industry. Attention

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BREKHOVSKIKH, L. M.,

"Long-ranged propagation of sound waves in the natural wavefuides,"

paper to be submitted at the International Union of Physics (Pure & Applied) (IUPAP) - Third International Congress on Acoustics - Stuttgart, GFR, 1-8 Sep 59.

AUTHOR: Brekhovskikh, L.M. SOV/46-5-1-1/24

TITLE: Surface Waves in Acoustics. A Review. (Poverkhnostnyye volny v akustike. Obzor.)

PERIODICAL: Akusticheskiy Zhurnal, 1959, Vol 5, Nr 1, pp 4-13, (USSR)

ABSTRACT: The paper gives the gist of a review read at the plenary session of the Fourth All-Union Conference on Acoustics held in June, 1958. The author discusses plane acoustic surface waves propagated in solids along plane and corrugated surfaces. He shows that in the latter case standing waves may be established between the corrugations. The author deals also with symmetrical surface waves, such as those propagated along a smooth circular cylinder with a surrounding gaseous sheath (Fig 4) or along a corrugated cylinder (Fig 5). Excitation and emission of surface waves are discussed. The paper is entirely theoretical. There are 7 figures and 4 references, 3 of which are Soviet and 1 English.

ASSOCIATION: Akusticheskiy institut AN SSSR, Moskva (Acoustics Institute, Academy of Sciences, U.S.S.R., Moscow)

SUBMITTED: September 9, 1958

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Industrial Use (Cont.)

is focused mainly on the description of ultrasonic equipment and on the use of ultrasound for the machining of hard materials and for flaw detection. The effect of ultrasound on metal-crystallation processes is also discussed. No personalities are mentioned. References accompany many of the papers.

TABLE OF CONTENTS:

On the Propagation of the Rayleigh Surface Waves Along a Rough Boundary of an Elastic Body

represents a quantity h, which is the ratio of the shear wavelength to the space period of sinusoidal non-uniformities. Fig 2 shows that at certain values of h the attenuation coefficient rises to a sharp peak (there are two such peaks on each curve). The paper is entirely theoretical. There are 2 figures, 1 table and 5 references, 4 of which are Soviet and 1 Japanese.

ASSOCIATION: Akusticheskiy institut AN SSSR, Moskva (Acoustics Institute, Ac.Sc. USSR, Moscow)

SUBMITTED: November 14, 1958