L 61886-65

ACCESSION NR: AP5019210

2

ured with an accuracy of about 10 Å, which is insufficient for positive identification of the transitions tentatively assigned to these lines in column 4 of the table. A weak oscillation line, observed in a mixture of equal parts of hydrogen and deuterium (46% HD, 27% H_2, and 27% D), measured with an accuracy of about 10 Å, falls within the 1 → 0 band of the electronic transition B - b of the HD molecule. A mechanism responsible for populating the vibrational levels in H_2, D_2, and HD molecules involved in the laser action is discussed in detail in terms of the Franck-Condon principle. A comparison of the theoretical results with the experimental data confirms the mechanism suggested for population inversion in the H_2, D_2, and HD molecules. [CS]

Orig. art. has: 4 figures and 1 table.

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

SUBMITTED: 28Dec64 ENCL: 00 SUB CODE: EC

NO REF SOV: 003 OTHER: 011 ATD PRESS: 4060

Card 2/2

L 2454-66 EWT(l)/EEC(k)-2/EED-2/FCS(k)/EWA(h) LJP(c) WR

ACCESSION NR: AP5016395 UR/0120/65/000/003/0198/0200 58
535.853.4

AUTHOR: Petrash, G. G.; Sizov, V. V. 44,55

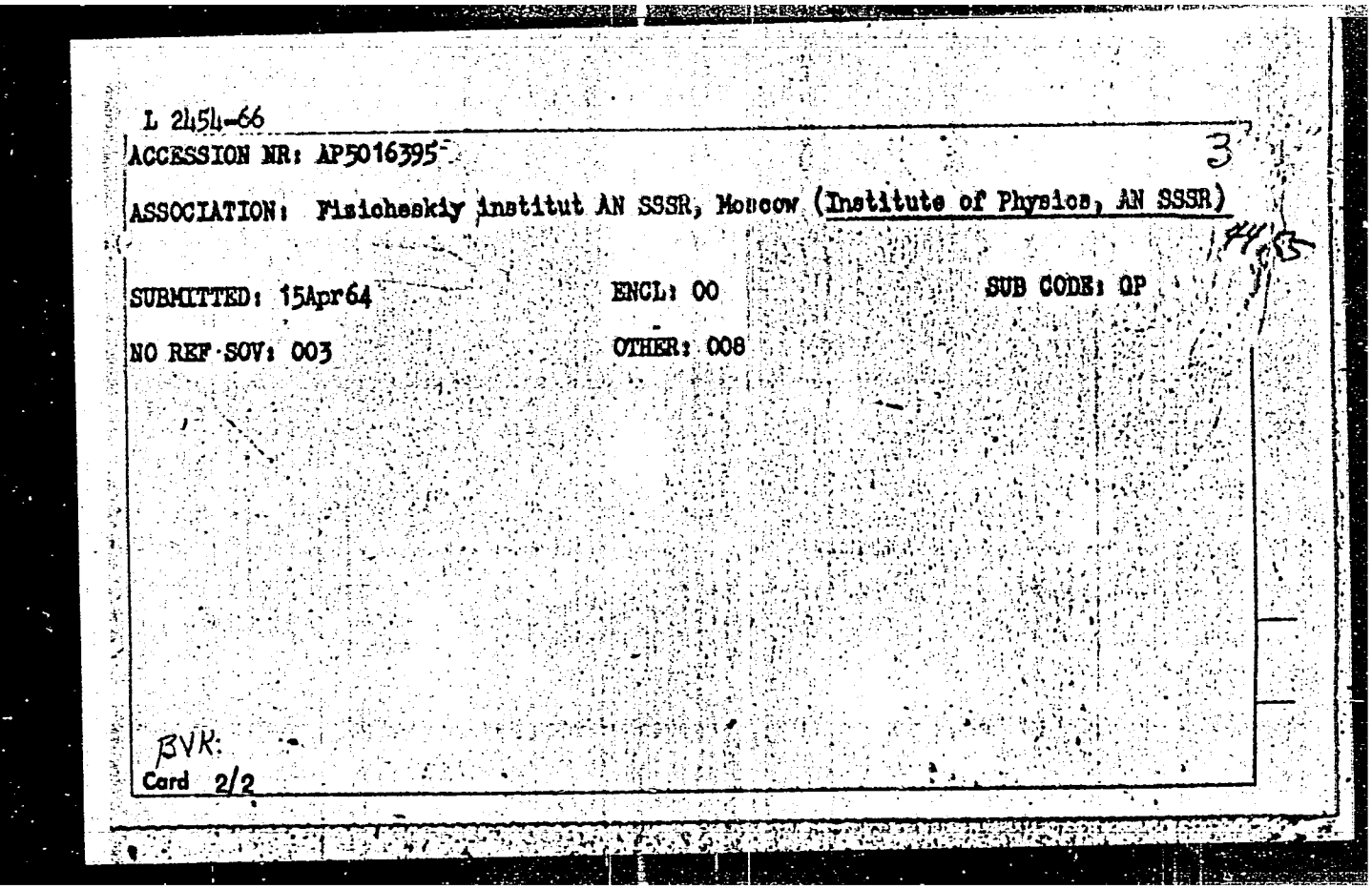
TITLE: System for accurate translation of the mirror in a Michelson interferometer for 500 mm

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1965, 198-200

TOPIC TAGS: interferometer, two beam interferometer

ABSTRACT: The interferometer mirror is fastened to a bridge which is supported by two floats in two parallel liquid-filled channels. The latter are mounted on a 1000x1500-mm true platen. Four guide rails ensure straight translational movement of the mirror. Tests have shown that the mirror can travel for 500 mm with an error in its plane of 0.2—0.3". The system resolution is 0.01 per cm for the entire spectrum (for $\lambda = 1\mu$, the resolution is 10^6)." The authors wish to thank P. A. Bazhulin and B. A. Tayts for their constant attention to the work, V. I. Malyshev and N. S. Tikhomirov for their very valuable advice re the system design, and A. A. Katunin and S. P. Kuryaev for assembling and adjusting the system." Orig. art. has: 1 figure.

Card 1/2



L 2454-66

ACCESSION NR: AP5016395

3

ASSOCIATION: Fizicheskiy institut AN SSSR, Moscow (Institute of Physics, AN SSSR)

SUBMITTED: 15Apr64 ENCL: 00 SUB CODE: GP

NO REF SOV: 003 OTHER: 008

BVK:

Card 2/2

BAZHULIN, P.A.; KNYAZEV, I.N.; PEYRASH, G.G.

Possibility of observing induced radiation in the far-ultraviolet region of the spectrum. Zhur. eksp. i teor. fiz. 48 no.3:975-976 Mr '65. (MIRA 18:6)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.

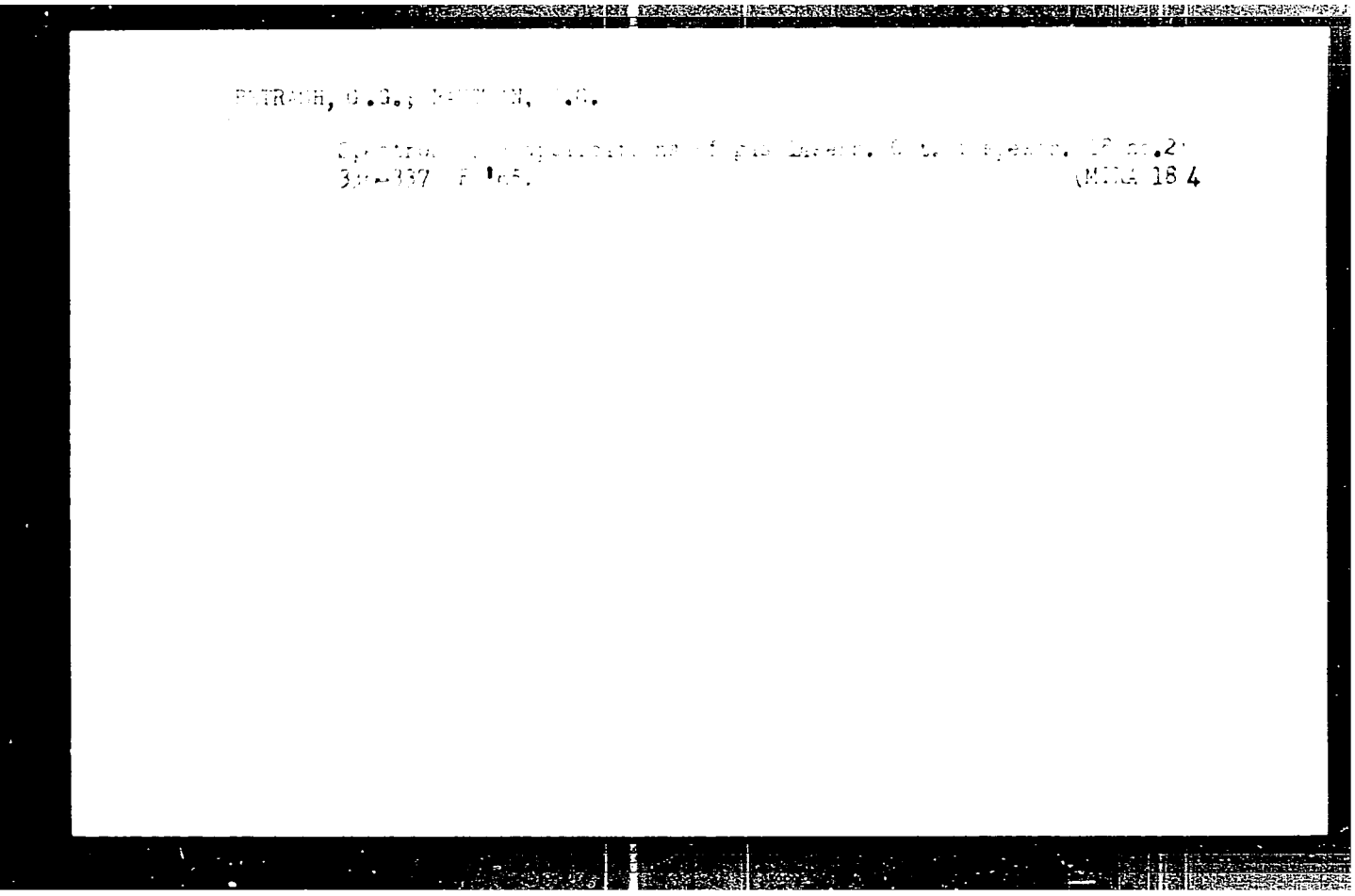
BAZHULIN, P.A.; KNYAZEV, I.N.; PETRASH, G.G.

Pulse generation of a laser operating on molecular hydrogen.
Zhur. eksp. i teor. fiz. 47 no.4:1590-1591 O '64.
(MIRA 18:1)

1. Fizicheskiy institut imeni P.N. Lebedeva AN SSSR.

SIZOV, V.V.; PETRASH, G.G.; TIKHOMIROV, N.S.

Method for the realization of an accurate rectilinearity of displacements up to 500 mm. Izm. tekh. no.3:15-17 Mr '65. (MIRA 18:5)



PETRASH, G.G.; [illegible]

[illegible]
3[illegible]337 F '65. (MIRA 18:4

L 33996-65 EWT(1)/EEC(t [illegible] Pz-4/Pab [illegible]
ACCESSION NR: AT4042135 S/2[illegible]/64/027/000/0003/0062

AUTHOR: Petrash, G. G.

TITLE: The study of instrument induced distortions and methods for their evaluation in infrared spectroscopy 21

SOURCE: AN SSSR. Fizicheskiy institut. Trudy, v. 27, 1964. Issledovaniya po molekulyarnoy spektroskopii (Research in molecular spectroscopy), 3-62

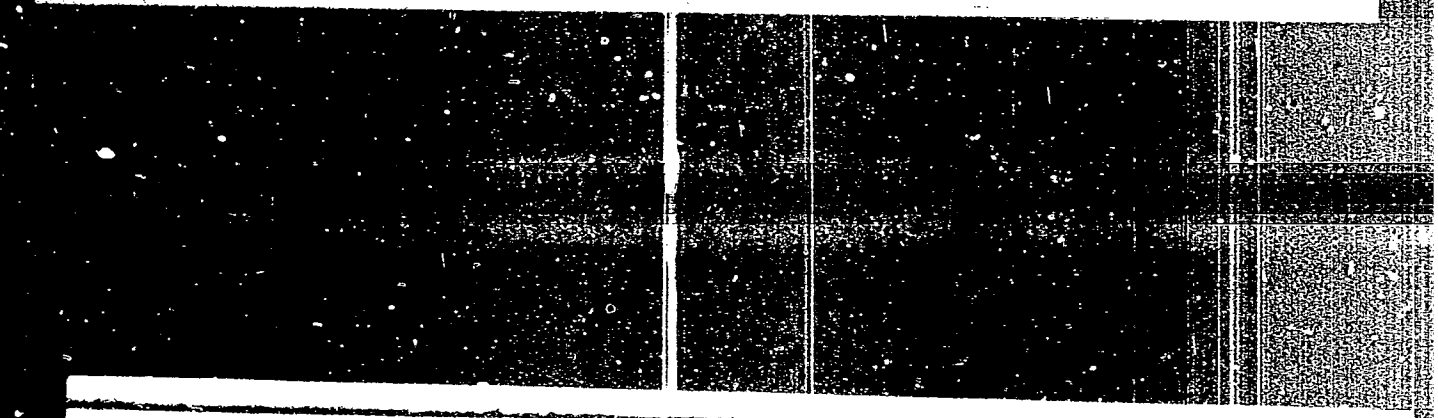
TOPIC TAGS: infrared spectrum distortion, instrument induced distortion, resolving power, instrument function, automatic distortion correction, spectroscopic data processing, infrared spectroscopy

ABSTRACT: Since the times of Rayleigh, who introduced the concept of resolving power, numerous researchers have published such a large number of papers devoted to instrument-induced distortions in absorption spectra that it is almost impossible to produce a complete survey of all these endeavors. Consequently, starting from the known expression for the spectral distribution f(λ) in its integral form

where $\varphi(\lambda')$ is the measured true distribution and a (λ) the instrument function, the author attempted to present the basic achievements in the field and concentrate on those parts most often encountered in practice. The evaluation of the true $\varphi(\lambda)$ from the observed $f(\lambda)$ is called the reduction process. On the basis of the 102 references, he discusses in detail the optimum recording conditions in the absence of reduction, the reduction to the case of an ideal instrument, the resolving power of spectral devices, and the use of digital computers for the automatic correction of instrument-induced distortion. Various correction methods presuppose the knowledge of the properties of the studied spectra, and the properties of spectroscopic instruments. Since, however, such data are for the most part completely lacking, the author carried out extensive original measurements (Avtoref. kand. diss. M., MFTI, 1961. Optika i spektroskopiya, 9, 121, 1960). Table 1 of the Enclosure presents a brief summary of these results. Two of the shapes nearly have a dispersion appearance and may be very convenient for the estimate of the width of the instrument function of devices having moderate dispersion. The author also studied typical infrared instruments and found, e.g., that

to the Gaussian function whose width within the entire working range is for all

Card 2/4



L 33996-65

ACCESSION NR: AT4042135

practical purposes determined exclusively by the width of the monochromator slit. The accuracy characteristic study using the "Ural" digital computer showed that the probability of noise amplitudes within the

and advice. Orig. art. has: 1 formula, 2 figures, and 1 table.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics institute, AN SSSR)

SUBMITTED: 00 ENCL: 01 SUB CODE:OC, OP

NO REF SOV: 053 OTHER: 049

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Table 1. Properties of the absorption spectra of some organic compounds.

Substance	ν_0, cm^{-1}	λ_0, μ	γ_i, cm^{-1}	Obs.	D_m	γ_D, cm^{-1}	Shape
Solid naphthalene							Side bands
Pyridine							Weak side bands
Pyridine							Dispersion
Pyridine							Side band
Cyclohexane							Dispersion
Benzene							Side band
Acetonitrile							Azimuthal

* In (102) γ_D = 1.8 cm^{-1}

** In (102) γ_D = 5.0 cm^{-1}

Here, ν - frequency, λ - wavelength, d - container thickness, λ_0 - absorption at the maximum, D_m - optical density at the maximum, γ_i γ_D - band widths at the half-height of absorption and optical density, respectively.

Card 4/4

PETRASH, G.G.

Ways to allow for instrument errors in infrared spectroscopy.
Trudy Fiz. inst. 27:3-62 '64. (MIRA 17:9)

L 10101-65 EWG(j)/EWA(k)/FBD/EWT(j)/EEC-4/EEC(t)/T/EEC(b)-2/EWP(k)/EWA(h)/
EWA(m)-2 Pn-4/Po-4/Pf-4/P4-4/P4-4/Peb IJP(c)/ARDC(a)/ASD(a)-5/AFETR/ESD(gs)/SSD/
AFMD(c)/AFWL/RAEM(a)/ESD(t)/RAEM(t) WG

ACCESSION NR: AP4047930 S/0056/64/047/004/1590/1591

AUTHOR: Bazhulin, P. A.; Knyazev, I. N.; Petrash, G. G. B

TITLE: Generation of a molecular-hydrogen pulsed laser 25

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 4, 1964, 1590-1591

TOPIC TAGS: pulsed laser, molecular hydrogen laser, advanced laser, hydrogen plasma, hydrogen laser, gas laser

ABSTRACT: The generation of a pulsed laser, which utilizes the plasma discharge in hydrogen as the active substance, was studied experimentally. The laser discharge tube (145 cm long and 15 mm in diameter) was driven by 35 kv at 20 cps. Both dielectric and silver-coated confocal mirrors were used, placed 2 m apart. The emitted radiation was observed by means of a monochromator with a grating made in the authors' laboratory, and the laser output and current pulses were recorded on the DESO-1 oscillograph. Six laser lines were detected, and their wave numbers and lengths are tabulated. The latter

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L 10401-65
ACCESSION NR: AP4047930

were measured with a ± 5° accuracy with the exception of λ=13,100Å for which the error may be higher. The observed lines are due to transitions in the $E^1\Sigma_g^+ \rightarrow B^1\Sigma_u^+$ band system of molecular hydrogen. A correlation of the observed lines to specific transitions is, unfortunately, precluded by the insufficient resolving power of the instrument. An explanation of a possible mechanism of population inversion based on experimental results is given. It is conjectured that this mechanism will find wide application in producing generation due to molecular electron vibrational-rotational transitions. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute AN SSSR)

SUBMITTED: 09Jun64 ATD PRESS: 3116 ENCL: 00

SUB CODE: EC, ME NO REF SOV: 000 OTHER: 002

Card 2/2

L 34865-65 EWG(j)/EWA(h)/FBD/EWT(l)/EPA(sp)-2/EEC(k)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWP(k)/EWA(m)-2/EWA(h) Pn-4/Pz-6/Po-4/Pab-10/Pf-4/Peb/Pi-4/Pl-4 IJP(c) WG/AT
ACCESSION NR: AP5005054 B/0051/65/018/002/0336/0337

AUTHOR: Petrash, G. G.; Rautian, S. G.

TITLE: Spectroscopic applications of gas lasers

SOURCE: Optika i spektroskopiya, v. 18, no. 2, 1965, 336-337

TOPIC TAGS: gas laser, laser action, level population, transition probability, gas discharge plasma

ABSTRACT: The authors discuss possible measurements of the probabilities of spontaneous transitions with the aid of a gas laser. Ordinary spectroscopic methods determine either the product of the Einstein coefficient by the population of one of the levels, or else some other quantity, but not the ratio of the population levels or the population levels themselves. Since the gas laser ceases to operate when the population levels become equal it becomes possible to determine the probability ratios of transitions that begin at different levels,

Other criteria for the equality of the populations may be a direct measurement

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L 34865-65
ACCESSION NR: AP5005054

of the gain and the determination of the conditions at which the gain is close to zero. This method may be preferable in some cases. The change in the spectral composition of the spontaneous emission of the atom in the presence of a strong field in the laser can also be used to determine the absolute values

of the transition probabilities. Orig. art. has: 3 formulas.

ASSOCIATION: None

SUBMITTED: 02Apr64 ENCL: 00 SUB CODE: OP, EC.

NR REF SOV: 001 OTHER: 002

Card 2/2

L 36342-65 EWG(j)/EWA(k)/FBD/EWT(1)/EEC(k)-2/EEC(t)/T/EEC(b)-2/EWP(k)/EWA(m)-2
ACCESSION NR: AP5008759 EWA(h) Pn-4/Po-4/Pf-4/Peb 8/0056/65/048/003/0975/0976
Pi-4/Pl-4 IJP(c) WG
AUTHOR: Bazhulin, P. A.; Knyazev, I. N.; Petrash, G. G.

TITLE: Possibility of obtaining stimulated emission in the far-ultraviolet spectral region

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 3, 1965, 975-976

TOPIC TAGS: laser, stimulated emission, molecular laser, chemical laser, hydrogen laser

ABSTRACT: The possibility of obtaining laser action in the far-ultraviolet region by means of transitions between the upper electronic state $2p\pi\,^1\Pi u$ and the ground state $1s\sigma^2\,^1\Sigma g^+$ of the H_2 molecule (for simplicity, referred to as the C and the X states, respectively) is analyzed. At room temperature, only the lower vibrational level $v'' = 0$ of the ground state (see Fig. 1 of the enclosure) is populated. In the initial stage of the discharge, excitation of vibrational levels and C occurs as a result of collisions between electrons and molecules in their ground states. According to the Franck—Condon principle, due to shifting of the potential terms, the $v' = 1,2,3,4$ states of the C level will be excited most effectively. The probabil-

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L 36342-65

ACCESSION NR: AP5008759

ity of transitions from these levels to upper vibrational levels of the ground state will be relatively high, while the probability of transitions to the latter from the ground state $v'' = 0$ due to collisions with electrons will be very low. Thus, an inverted population should be attained between the C($v' = 1-4$) and ($v'' > 1$) levels during the early stage of the discharge. When the pump power is sufficiently high, stimulated emission should occur on some bands in the spectral region between 1100 Å and 1250 Å due to the transitions shown in Fig. 1 by arrows. Owing to the symmetry of the H_2 molecule, radiative transitions between vibrational levels are forbidden. Also, the lifetime at the upper vibrational levels of the ground state is probably long. Therefore, continuous laser generation should be impossible. It is pointed out that the analysis also applies if the $2p\sigma\,^1\Sigma_u^+$ state rather than $2p\pi\,^1\Pi_u$ state is the upper electronic level. Orig. art. has: 1 figure. [CS]

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

SUBMITTED: 07Dec64 ENCL: 01 SUB CODE: EC, OP

NO REF SOV: 001 OTHER: 004 ATD PRESS: 3220

Card 2/3

T. 36342-65

ACCESSION NR: AP5008759 ENCLOSURE: 01

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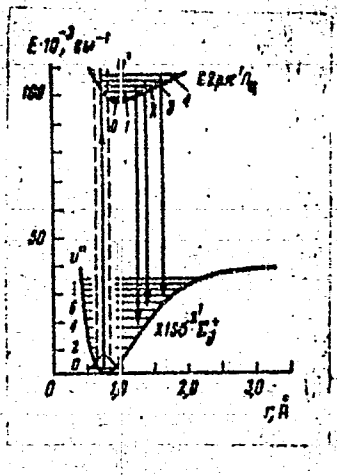

Fig. 1. Potential curves for the C and the X vibrational levels

Card 3/3

PETRASH, I.

Adult Education

Young communication workers acquire knowledge. Sov. sviaz. 3, No. 3, 1953.

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

VORONETSKIY, M.K.; CHALYUK, A.M.; KACHMAR, Yu.D.; KOVALEVICH, V.N.; PETRASH, I.N.; CHEKALYUK, E.B.

Automated free piston. Mash. i neft. obor. no.5:24-26 '65. (MIRA 18:6)

1. Neftepromyslovoye upravleniye "Dolinaneft'", Dolina.

KACHMAR, Ya.D.; PETRASH, I.N.

Practice in hydraulic fracturing along the casing string in fields of the Oil Field Administration of the Dolina Petroleum Trust. Neftepromysl. delo no.7:17-18 '65.

1. Neftepromyslovoye upravleniye "Dolinneft".

BOKSERMAN, A.A.; ORLOV, V.S.; KANYUGA, A.F.; PETRASH, I.N.

Mean formation pressure under conditions of flooding gassy oil and initial data for determining it. Nauch.-tekh. sbor. po dob. nefti no.13:34-39 '61. (MIRA 16:7)

1. Vsesoyuznyy neftegazovyy nauchno-issledovatel'skiy institut, Stanislavskiy TsNIL i Nauchno-issledovatel'skaya laboratoriya neftepromyslovogo upravleniya Dolinanoft'.
(Oil field flooding)

PETRASH, I.N.; VASILECHKO, V.P.

Using field data for calculating the phase permeability of rocks for oil and gas. Nauch.-tekh. sbor. po dob. nefti no.16:30-34 '62. (MIRA 15:9)

1. Neftepromyslovoye upravleniye Dolinaneft'.
(Dolina region (Stanislav Province)—Oil reservoir engineering)

KOVAL'SKAYA, L.P.; VASIL'YEVA, K.V.; ZAKHAROVA, N.V.; PETRASH, I.P.

Effect of ionizing radiation on the afterharvest ripening of fresh fruit, berries and vegetables. Kons. i ov. prom. 18 no.12:21-25 D '63. (MIRA 17:1)

1. TSentral'nyy nauchno-issledovatel'skiy institut konservnoy i ovoshchesushil'noy promyshlennosti.

KOVAL'SKAYA, L.P.; KOROFEYEVA, Ye.V.; PETRASH, I.P.

Effect of the γ rays on the rate of ripening and on the commercial quality of tomatoes. Kon.i ov.prom. 17 no.11:20-23 N '62. (MIRA 15:11)

1. TSentral'nyy nauchno-issledovatel'skiy institut konservnoy i ovoshchesushil'noy promyshlennosti.
(Tomatoes) (Gamma rays)

BERLIN, A.I., prof.; PETRASH, L.G.

Acid-release function of the stomach during PAS therapy in tuberculosis. Probl. tub. 35 no.6:57-90 '57. (MIRA 12:1)

1. Iz fakul'tetskoy terapevticheskoy kliniki Ivanovskogo meditsinskogo instituta i Oblastnogo protivotuberkuleznogo dispansera.
(PARA AMINOSALICYLIC ACID, eff.
gastric acidity in tuberc. ther. (Rus))
(GASTRIC JUICE
gastric, eff. of PAS in tuberc. (Rus))

SOV/137-58-9-19426

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 184 (USSR)

AUTHOR: Petrash, L.V.

TITLE: Cooling Capacity of Quenching Oils (Okhlazhdayushchaya sposobnost' zakalochnykh masel)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Chernaya metallurgiya, 1958, Nr 2, pp 151-155

ABSTRACT: The cooling capacity (CC) of oils (O) of 17 brands was investigated, including three of the most frequently used in quenching, industrial (spindle) oils. The characteristic curves establishing the relationship of the rate of cooling of the center of a 20-mm silver ball to the temperature of its center were used as an evaluation criterion. As a result of the investigation it is established, that the most satisfactory CC from among the O investigated and used in quenching is exhibited by the industrial alkali-treated "20V" grade O , remarkable for its elevated rates of cooling in the region of the low temperatures which determine the quenching capacity of O, by a satisfactory flash point, and a low cost. With continued use the O vary in their CC. The rates of cooling in them in the region of high

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SOV/137-58-9-19426

Cooling Capacity of Quenching Oils

temperatures increase and those in the regions of low temperatures decrease.
Bibliography: 13 references.

A.B.

1. Metallurgy 2. Oils--Metallurgical effects 3. Oils--Test results

Card 2/2

PETRASH, L.V., kand. tekhn. nauk.

Quenching capacity of hardening oils. Izv. vys. ucheb. zav.; chern. met. no.2:151-155 F '58. (MIRA 11:5)

1. Leningradskiy gornyy institut im. G.V. Plekhanova.
(Oils and fats--Testing) (Metals--Hardening)

Petrosh, L. V.

129-3-12/14

AUTHOR: Petrash, L. V., Candidate of Technical Sciences.

TITLE: Hardening media which have a high cooling capacity. (Zakalochnyye sredy vysokoy okhlazhdayushchey sposobnosti).

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, No.3, pp. 56-61 (USSR)

ABSTRACT: The investigations described in this paper were carried out for the purpose of obtaining systematic data on the cooling ability of water and of the most frequently used water-base cooling media, since available literary data are not accurate enough. For obtaining more accurate characteristic curves, particular attention was paid to reducing the inertia of the thermocouple. An experimental thermocouple is described consisting of a 20 mm dia. silver sphere with a 0.3 mm chromel element joined to the centre of the sphere. The thermocouple itself was used as the specimen for determining the cooling speeds in various cooling media. In preliminary experiments it was found that the errors in determining the cooling speed did not exceed ± 4%. The results for static and for circulating water, as well as those for aqueous solutions of common salt of various concentrations and of aqueous solutions of NaOH of

Card 1/3

various concentrations are graphed in Figs. 3-8. It was found that cooling in hot water is characterised by large non-uniformities; at elevated temperatures the cooling speed is very much reduced, whilst in the range of lower temperatures the speeds remain high and, for instance, at 220-120°C hot water cools more rapidly than cold water. Additions of salt and alkali to water reduce and in the case of large enough concentrations, completely eliminate the stage of film boiling and bring about a sharp increase in the cooling speed at high temperatures and also lead to a more uniform process of cooling. The cooling speed in concentrated aqueous solutions of alkali below 300°C and concentrated solutions of common salt below 230°C is lower than it is in pure water; heating of salt and of alkali solutions does not involve a sharp increase of the non-uniformity of cooling, which is a characteristic feature for hot water. It is considered advisable to use cold 10 to 15% aqueous solutions of common salt and, particularly, 15 to 50% aqueous solutions of sodium hydrate for hardening components, the shape of which brings about local over-heating of the quenching

 fluid; the use of these fluids is also recommended for

Hardening media which have a high cooling capacity. 129-3-12/14

discontinuous hardening of small and medium size components. Breaking up of the vapour shell on components hardened in water is not caused by the mechanical effects of the chipping off scale or emanating salt but by the reduction of the temperature of the surface of the component to a critical value below which the vapour shell loses its stability and starts to disintegrate spontaneously; the faster reduction of the temperature of the component surface and destruction of the shell is due to the effect of the films of the oxides and the salts. (which have a reduced thermal conductivity) to the dispacement of the component inside the quenching medium and also to a reduction of the temperature of the quenching medium.

There are 8 figures and 12 references - 7 Russian, 2 German, 2, English, 1 French.

ASSOCIATION: Leningrad Mining Institute (Leningradskiy Gornyy Institut).

AVAILABLE: Library of Congress.

Card 3/3

25(1) PHASE I BOOK EXPLOITATION SOV/2695

Petrash, Leonid Vasil'yevich

Zakalochnyye sredy (Quenching Media) Moscow, Mashgiz, 1959. 111 p. Errata slip inserted. 4,000 copies printed.

Reviewer: N. F. Vyaznikov, Candidate of Technical Sciences; Ed.: M.M. Zamyatnin, Candidate of Technical Sciences; Ed. of Publishing House: I. A. Borodulina; Tech. Ed.: L. V. Shchetinina; Managing Ed. for Literature on the Technology of Machine Building (Leningrad Division, Mashgiz): Ye. P. Naumov, Engineer.

PURPOSE: This book is intended for engineers and technicians; it may also be used by advanced students.

COVERAGE: The author discusses various quenching media in detail describing the special features of cooling for each of them. Data are given on the cooling capacity of the most commonly used water- and oil-base media and on fused metals, salts, and alkalies. There are 43 references: 29 Soviet, 8 German, 4 English, 1 French, and 1 Polish.

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TABLE OF CONTENTS:

AVAILABLE: Library of Congress
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12-4-59

PETRASH, Leonid Vasil'yevich; VYAZNIKOV, N.F., kand.tekhn.nauk, retsenzent; ZAMYATNIN, M.M., kand.tekhn.nauk, red.; BORODULINA, I.A., red.izd-va; SHCHETININA, L.V., tekhn.red.

[Tempering agents] Zakalochnye sredy. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1959. 111 p. (MIRA 12:7)
(Tempering)

PETRASH, O.G. [Petrash, O.H.], starshiy nauchnyy sotrudnik

Use of iodine preparations in treating prematurity in women in a focus of endemic goiter. Ped., akush. i gin. 23 no.3:37-38 '61. (MIRA 15:4)

1. Zakarpatskiy nauchno-issledovatel'skiy institut okhrany materinstva i detstva im. Geroya Sovetskogo Soyuza prof. P.M.Buyka (direktor - kand. med.nauk Ya.V.Stovbunenko).

(ICDINE--THERAPEUTIC USE) (INFANTS (PREMATURE))

GOLOVIN, G.I.; PETRASH, V.V., starshiy nauchnyy sotrudnik

"The North American" testifies. Znan.sila 37 no.4:33 Ap '62.
(MIRA 15:4)

1. Chlen istoricheskoy sektsii Leningradskogo pravleniya nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni A.S.Popova (for Golovin). 2. TSentral'nyy gosudarstvennyy arkhiv Voyenno-morskogo flota SSSR (for Petrash).
(Radio)

PETRASH, Yu. G.

Dissertation defended for the degree of Candidate of Philosophical Sciences at the Institute of Philosophy

"Reasons for the Existence and Ways of Overcoming Remnants of Islam (From Materials of the South of the Kirgiz SSR)."

Vestnik Akad. Nauk, No. 4, 1963, pp 119-145

PETRASHEN', M.I., ABARENKOV, I.V.

Semiempirical method of calculating the probability of optical transitions in monovalent atoms. Vest.Len.un. 9 no.5:141-148 My '54. (MLRA 9:7)
(Atomic theory) (Spectrum, Atomic)

VAVRECKA, Milan, Muc.; PETRASEK, Jan, Muc.

Acetylation test in diagnosis of hyperthyreosis. Cas.lek.cesk. 94 no.19:493-497 6 May 55.

1. Z biochemickych laboratori III. interni kliniky, prednosta prof. Dr J. Charvat.

(HYPERTHYROIDISM, diagnosis,
acetylation test of hyperthyroidosis)
(PARA-AMINOBENZOIC ACID,
acetylation test in diag. of hyperthyroidism)

PETRASH, E. V.

2613* Some Physico-Chemical Properties of Titanium Boride and Nitride Alloys. Nekotorye fiziko-khimicheskie svoistva splavov borida i nitrida titana. (Russian.) G. V. Samsonov and E. V. Petrash. *Metallovedenie i obrabotka metallov*, 1955, no. 4, Oct., p. 19-24.

Examines compositions, melting temperatures, microhardness, thermal coefficient of linear expansion, lattice period, electrical resistance, micro-structure, and resistance to oxidation. Graphs, tables, micrographs, diagram. 10 ref.

(1)

PETRASH, E. V.

Various physicochemical properties of alloys of titanium boride and nitride. G. V. Samsonov and E. V. Petrash. *Metalloved. i Obrabotka Metal.* 1955, No. [illegible]

[illegible] by the [illegible] in a charge [illegible] in various proportions [illegible] sintered. The porosity was [illegible] melting temp. [illegible] off to 2950° at pure TiN. These variations may have been within the exptl. error. Micrography showed that the alloys were 2-phase before annealing but those contg. 3 to 8 mole % TiB_2 became single phase after annealing. The microhardness of each of the 2 phases was almost independent of compn. X-ray data showed little variation of lattice parameter with compn. but indicated mutual terminal soly. The coeff. of linear expansion was almost const. Elec. resistivity increased to a max. at 90 mole % TiN, supporting the idea of limited soly. of TiB_2 in TiN. Tests of oxidation resistance at 700 to 1000° showed that the 40 mole % TiN compn. was most resistant. The soly. of TiB_2 in TiN was judged to be 8 mole %; that of TiN in TiB_2 was slight.

A. G. Guy

PETRASH, O. G., Cand Med Sci (diss) -- "A study of total iodine in the blood of pregnant and parturient women of an endemic goiter focus (Transcarpathia)". Kiev, 1958. 15 pp (Kiev State Order of Labor Red Banner Med Inst im A. A. Bogomolets), 200 copies (KL, No 10, 1960, 137)

SAMSONOV, G.V., kandidat tekhnicheskikh nauk; PETRASH, Ye. V.

Some physico-chemical properties of titanium boride-titanium nitride alloys. Metalloved.i obr.met. no.4: 19-24 O '55. (MLRA 9:3)

1. Mintsvetmetzoloto.
(Titanium alloys)

PETRISHCHEV, A. N.

"Surgical Therapy of Lip Cancer in the Light of Certain Neurohistological Data." Cand Med Sci, Stalingrad State Medical Inst, Min Health RSFSR, Stalingrad, 1954. (KL, No 9, Feb 55)

SO: Sum. No. 631, 26 Aug 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (14)

PETRASHEN' (RASKINA), Anastasiya Konstantinovna

Surgical Treatment of Cancer of the Lip in Light of Some Neuro-Histological Date

Dissertation for candidate of a Medical Science degree. Chair of the Department of Surgery (head, Prof. I.M. Popov'yan) Defending in Soviet Stalingrad Medical Institute, 1955.

ANDREYEV, N.; MAKAROV, G.; MALYUZHINETS, G.; PETRASHEN', G.

Introduction. Probl.dif.i raspr.voln. 1:3-4 '62. (MIRA 15:6)
(Radio waves)

PETRASHEN, G. I.

Mbr., Leningrad Acad., Air Force, -1944-.

"Solutions of Vector Bundary Problems of Mathematical Physics for the Sphere," Dok. AN, 46, No. 7, 1945; "The Oscillations of an Isotropic Elastic Sphere," ibid., 47, No. 3, 1945; "The Establishment of Oscillatory Wave Regimes and the Resonance Phenomenon in the Case of a Spherical Domain," ibid., 51, No. 1, 1946; "Wave Processes in a Spherical Domain in the Case of Normal Absorption," ibid., No. 3, 1946; "The Application of the Method of Spherical Vectors to Problems of Diffraction of Elastic Disturbances," ibid., No. 8. 1946; "Lord Rayleigh's Problem for Surface Waves on a Sphere," ibid., 52, No. 9, 1946; "Lamb's Problem in the Case of Elastic Semispaces," ibid., 64, No. 5, 1949.

PETRASHEN, G.

Petrashen, G. The establishment of oscillatory wave regimes and the resonance phenomenon in the case of a spherical domain. C. R. (Doklady) Acad. Sci. URSS (N.S.) 51, 13–16 (1946).

The solution of the initial value problem for the vector wave equation for a spherical domain leads, as the author has shown [same C. R. 46, 266–269 (1945); these Rev. 7, 16] to a Volterra equation of the second kind with a kernel depending on a difference. In the present paper, the equation is solved by the use of the method of Laplace transforms for a disturbance $a(t)$ specified at radius $r=1$ and starting at time $t=0$. The solution is given in closed form when $a(t)$ is a polynomial. *H. Feshbach*

Source: Mathematical Reviews, Vol 8, No. 4

LFH

PETRASHEN, G.

Petrashen, G. Wave processes in a spherical domain in the case of normal absorption. C. R. (Doklady) Acad. Sci. URSS (N.S.) 51 [87-169 (1945).

The procedures developed in preceding papers [cf. same C. R. 46, 266–269 (1945); these Rev. 7, 16] are now applied to the equation

$$\frac{\partial^2 f}{\partial r^2}+\frac{2}{r}\frac{\partial f}{\partial r}+\frac{n(n+1)}{r^2}f=\frac{\partial^2 f}{\partial t^2}+2\lambda\frac{\partial f}{\partial t}$$

which arises for wave propagation in a spherical domain with absorption. The solutions for arbitrary initial conditions are exhibited in closed form. The solutions are discussed for small λ. *H. Feshbach* (Cambridge, Mass.).

Source: Mathematical Reviews, Vol 8, No. 4

LFH

PETRASHEN, G.

0003

-Petrashen, G. The application of the method of spherical vectors to problems of diffraction of elastic disturbances. C. R. (Doklady) Acad. Sci. URSS (N.S.) 51, 587–590 (1946).

The methods developed earlier [same C. R. 46, 266–269 (1945); these Rev. 7, 16] are now applied to the vector wave equation describing disturbances in an elastic medium.

H. Feshbach (Cambridge, Mass.).

LFH

Source: Mathematical Reviews, Vol 8, No. 4

Petrashen, G.

Petrashen, G. *Lord Rayleigh's problem for surface waves on a sphere.* C. R. (Doklady) Acad. Sci. URSS (N.S.) 52, 757–760 (1946).

The elastic equations of motion are solved exactly for a sphere whose surface is stress-free in terms of the spherical vectors described by the author in previous papers [e.g. same C. R. (N.S.) 40, 266–269 (1943); this Rev. 7, 16]. The amplitude of the solutions is found to decay exponentially as the distance from the surface of the sphere increases. The rate of decrease is a function of the ratio l/R, where l is the order of the spherical vectors involved and R is the radius of the sphere. The transcendental equation determining this function is solved approximately.

H. Pekeris (Cambridge, Mass.).

PETRASHEN', G. I.

33903. Dinamichyeskiye Zadachi, Teorii Uprugosti V Sluchaye Izotropnoy Sfyeri. Uchyen. Zapiski,(Leyningr. Gos. Un-t Im. Zhdanova), Syeriya Matyem. Nauk, Vlp 1",1949, C. 3-27.

SO: Letopis' Zhurnal'nykh Statey, Vol. 46, Moskva, 1949.

PETRASHEN, G. I.

Petrashen, G. Lamb's problem for an elastic half-space

Résumé:

Un problème simple [illegible] nouvelle d'étude des processus dynamiques dans certains corps élastiques. Cette [illegible] en particulier la méthode de [illegible] et [illegible] de [illegible] obtenues permettent de discerner et d'étudier les ondes de Rayleigh et leur [illegible]. (Institut Paris)

Source: Mathematical Reviews [illegible]

PETRASHEN, G.I.

Petrašen', G. The two-dimensional problem of Lamb for an infinite elastic layer bounded by parallel planes. Doklady Akad. Nauk SSSR (N.S.) 64, 783-786 (1949). (Russian)

L'auteur étudie le problème de Lamb pour une couche élastique infinie limitée par deux plans parallèles, en supposant qu'une de ces surfaces ne subit aucun effort et que l'effort sur l'autre surface limite ne dépend que d'une seule variable. En supposant que l'action intense perturbatrice est quasi-ponctuelle dans l'espace et le temps on peut effectivement calculer la propagation des ondes élastiques qui en résultent. L'application de la méthode de séparation incomplète des variables permet d'en déduire toutes les conséquences physiques qui peuvent intéresser le physicien ou le seismologue. *V. A. Kostitzin* (Paris).

Source: Mathematical Reviews, Vol 10, No.10

PETRASHEN', G.I.

Dynamic problems of the theory of elasticity in the case of isotropic spheres. Uch.zap.Len.un. no.114:3-27 '49. (MLRA 10:3)
(Elastic solids) (Dynamics)

PETRASHEN', G. I.

N/5
613.054
.P3

Rasprostraneniye uprugikh voln v sloistо-izotropnykh sredach, razde-lennykh parallel'nymi ploskostyami (Propagation of Elastic Waves in Stratified isotropic media divided by Parallel Planes) Leningrad, Izd-vo Leningradskogo Universiteta, 1952.

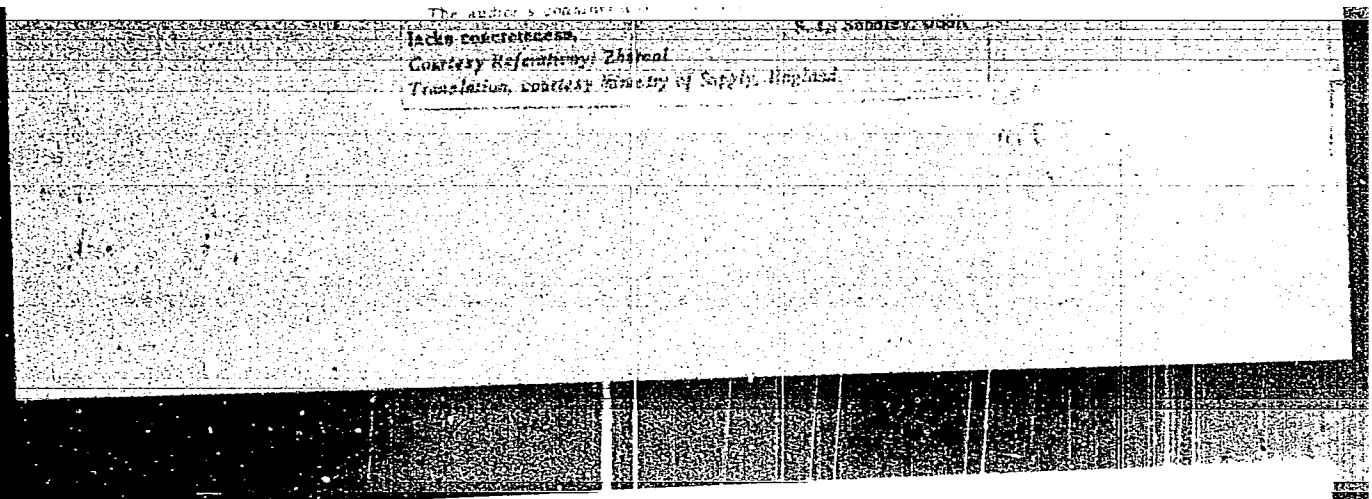
189 p. Diagrs., Tables (Leningrad. Universitet. Uchenyye Zapiski. Seriya Matematicheskikh Nauk, Vyp. 26)

At Head of Title: Dinamicheskiye Zadachi Teorii Uprugosti, 2.

Bibliography: P. 189.

PETRASHEN', G.I.

Dynamic problems in the theory of elasticity. Part 2. Propagation of elastic waves in stratified isotropic media divided by parallel planes. Uch. zap. Len. un. 162:3-187 '52. [Microfilm] (MLRA 7:10)
(Elasticity) (Seismology)



lacks concreteness.

Courtesy Refractories Journal

Translation courtesy Ministry of Supply, England

PETRASHEN', G.I.

Preface. Uch.zap.Len.un. no.177:3-4 '54. (MIRA 8:4)
(Elasticity)

PETRASHEN', G.I.

Statement of a problem and method for the solution concerning seismic screening of waves by thin layers. Uch.zap.Len.un. no.177 '54. (MLRA 8:4)
(Seismology)

PETRASHEN', G.I.

Call Nr: AF 1108825

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.

Nuzhin, M. I. (Kazan') and G. G. Tumashev (Kazan'). Inverse Boundary Problems and Their Application in Mechanics. 208-209

Petrashen', G. I. (Leningrad). On the Investigation of Non-stationary Interference Phenomena in Media With Thin Layers. 209

Piskunov, N. S. (Moscow). On Some Problems of Underground Hydromechanics Leading to Boundary Problems of Partial Differential With Variable Domains. 209-210

Rvachev, V. L. (Osipenko). Design of Infinite Beams on Elastic Half-space. 210

Mention is made of Proktor, G. E. and Gorbunov-Posadov, M. I.

Rogozhin, V. S. (Rostov-na-Donu). Sufficient Conditions for Univalentness of Solution of Hydromechanics Inverse Boundary Problems. 210-211

Card 70/80

PETRASHEN', G.I.; YEHAL'SKIY, V.A.

Some interference phenomena in media containing thin horizontal-parallel layers. Part 1. Izv.AN SSSR. Ser.geofiz. no.9:1009-1020 S '56. (MLRA 9:12)

1. Akademiya nauk SSSR, Leningradskoye otdeleniye Matematicheskogo instituta imeni V.A. Steklova.
(Seismic waves)

PETRASHEN', G.I.; YENAL'SKIY, V.A.

Some interference phenomena in media containing thin horizontal parallel layers. Part 2. Izv.AN SSSR.Ser.geofiz. no.10:1129-1144 O '56. (MLRA 10:1)

1. Akademiya nauk SSSR Leningradskoye otdeleniye Matematicheskogo instituta imeni V.A. Steklova.
(Seismic waves)

Card 2/2

On Certain Interference Phenomena in Media Containing Thin Plane-Parallel Layers, Part III

After suitable transformations the double integrals arrived at in Part I are transformed to a form which is convenient for derivi[illegible] physical [illegible] which can be derived from the here described investigations [illegible] A princi[illegible] [illegible] [illegible] in a [illegible].

By G. I. Petrashen and V. A. Enal'skii.

PETRASHEN', G.I.

Preface. Uch.zap.Len.un.no.208:3 '56. (MLRA 9:9)
(Elasticity)

SOV/124-57-3-3433

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 3, p 116 (USSR)

AUTHOR: Petrashen', G. I.

TITLE: On a Rational Method of the Solution of Problems of the Dynamic Theory of Elasticity for Layerwise Isotropic Regions With Flat Parallel Separation Interfaces (O ratsional'nom metode resheniya zadach dinamicheskoy teorii uprugosti v sluchaye sloisto-izotropnykh oblastey s plosko-parallel'nymi granitsami razdela)

PERIODICAL: Uch. zap. LGU, 1956, Nr 208, pp 5-57

ABSTRACT: The basic problems of the contour-integral method are described. A comparison of this method with the functionally-invariant method of V. I. Smirnov and S. L. Sobolev (Tr. Seismolog. in-ta, 1932, Nr 18 and Nr 20; 1933, Nr 29) is presented in the introduction. It is asserted that the contour-integral method is simpler and more effective than the method of complex solutions. A formal solution is given for a plane dynamic problem of a half-space, first for rectangular (Cartesian) coordinates, and then for cylindrical coordinates. In the first case (half-plane) the boundary stresses are assumed to be given in the form of a(t)f(x); here, the function a(t) can be represented by the

On a Rational Method of the Solution of Problems of the Dynamic Theory (cont.) SOV/124-57-3-3433

Mellin integral and f(x) is the cosine of the Fourier transform. The potentials of the displacement vector are also represented by the Fourier transformants with a subsequent use of the Mellin transformation. Fourier-Bessel transformants are used for the case of cylindrical symmetry. The possibility of obtaining generalized solutions is discussed for cases involving concentrated forces. A further investigation is then carried out for the case where no symmetry exists in the original data (general case of the half-space). Here, a formal solution for both the scalar and the vector potentials is derived by the same method. Then a rigorous substantiation is given for the solutions set up as well as for the proofs of several important lemmas. The mathematical tool therefor is the theory of contour integrals. It is shown that several forms of one and the same solution can be obtained by means of the integral transformation methods. This circumstance is used for the clarification of the various physical properties of wave fields. Bibliography: 30 references.

I. S. Arzhanykh

Card 2/2

SOV/124-57-5-5913

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 5, p 128 (USSR)

AUTHORS: Petrashen', G. I., Uspenskiy, I. N.

TITLE: On the Propagation of Waves in Multilayered Isotropic Elastic Media. Part I. (O rasprostranenii voln v sloisto-izotropnykh uprugikh sredakh. I)

PERIODICAL: Uch. zap. LGU, 1956, Nr 208, pp 58-141

ABSTRACT: The authors investigate wave fields in multilayered isotropic media, wherein the wave fields are generated by various concentrated sources. To begin with, solutions are set up for prob ems relating to the moments in time at which the direct waves have not yet reached the boundary of the medium which is closest to the wave source. These are the problems for an infinite or semi-infinite medium wherein the wave source is situated at the boundary of the medium. The authors examine: 1) a boundary-parallel force, a boundary-normal force, and a center of rotation, all located on the free surface and inside one of the component layers; 2) a concentrated action such as that of a radially directed tangential-force field; and 3) a center of pressure inside one of the component layers. In addition, the basic

On the Propagation of Waves in Multilayered Isotropic Elastic Media. Part I

wave-propagation problems involved are set forth. It is noted that the general solution to the problem proves to be extremely cumbersome for analytical purposes. However, real practical significance is had by the wave fields for only a certain finite period of time, a period which starts as of the moment at which the effect of the source first becomes operative. It is expedient, therefore, to set up solutions that allow for the successive reflections and refractions which the propagating waves incur at the system boundaries. In order to set up these solutions, it proves necessary to utilize the solutions to two auxiliary problems: 1) the problem of the reflection and refraction of waves at the boundary surface of two semi-infinite media in rigid contact with each other, and 2) the problem of the reflection of waves from the free boundary of a semi-infinite medium. Solutions of these two auxiliary problems are given for cases of axisymmetric, tangential, and rotational forces, and formulas are worked out for calculating the displacements in cases of wave propagation in two-, three-, and four layered systems, respectively. A method is adduced for setting up the formulas for a wave following any conceivable path in an n-layered medium, and all the auxiliary expressions needed for setting up such formulas are included. The authors explain briefly how to use the stationary-phase method of evaluating the principal portions of the displacement field of reflected and frontal waves in the vicinity of the wave fronts, and they

On the Propagation of Waves in Multilayered Isotropic Elastic Media. Part I

evolve formulas for such evaluations. The problem of recording these waves on broad-band and frequency type recorders is discussed also. Bibliography: 12 references.

K. I. Ogurtsov

Card 3/3

PETRASHEN, G I

Call Nr: 1119002

AUTHORS: See Table of Contents

TITLE: A Dynamic Theory of the Propagation of Seismic Waves (Voprosy dinamicheskoy teorii rasprostraneniya seysmicheskikh voln) First Collection (Sbornik 1)

PUB. DATA: Gosudarstvennoye nauchno-tekhnicheskoye izdatel'stvo neftyanoy i gorno-toplivnoy literatury, Leningradskoye otdeleniye, Leningrad, 1957, 386 pp., 1900 copies.

ORIG. AGENCY: Ministerstvo neftyanoy promyshlennosti SSSR. Nauchno-issledovatel'skiy institut geofizicheskikh metodov razvedki (NIIGR)

EDITORS: Editors: Polshkova, M. K. and Petrashen', G. I.; Editor-in-Chief: Fedotova, M. I.; Tech. Ed.: Gennad'yeva, I. M.: Corrector: Segal', Z.G.

PURPOSE: This collection is intended for seismologists and particularly exploration seismologists and senior university and graduate students interested in geophysics and in the theories of elasticity and acoustics.

Card 1/6

Call Nr: 1119002

A Dynamic Theory of the Propagation of Seismic Waves (Cont.)

lems in oil-bearing areas diminishes the efficiency of existing techniques. Therefore a careful study of these articles may lead to application of the dynamic theory described in interpreting seismograms. The first article (pp. 7-69) by Petrashen' discusses the most typical problems in wave propagation and the method of their solution. Simplification of the final formulas computed for the components of the fields of displacement is the main consideration. The second article by Petrashen' (pp. 70-163) describes the general quantitative theory of reflected and first-arrival waves. The third article, that by Petrashen' and Manukhov, considers wave intensities and data on the parameters required in composing theoretical seismograms. The fourth and fifth articles examine the method of composing such theoretical seismograms. The concluding articles examine wave propagation in an elastic semi-space. No personalities are mentioned; there are bibliographic references at the end of each article.

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Call Nr: 1119002

A Dynamic Theory of the Propagation of Seismic Waves (Cont.)

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Call Nr; 1119002

A Dynamic Theory of the Propagation of Seismic Waves (Cont.)

Card 5/6

PETRASHEN, G.I.

MATVEYEVA, N.N.; SMIRNOVA, Z.M.; KUSTOVA, Z.M.; VASIL'YEVA, M.V.; GEL'CHINSKIY, B.Ya.; OZEROV, D.K.; MANUKHOV, A.V.; GOL'TSMAN, F.M.; PETRASHEN', G.I., red.; VOLKHOVER, R.S., tekhn. red.

[Papers on the quantitative study of seismic wave dynamic] Materialy kolichestvennogo izucheniia dinamiki seismicheskikh voln. Pod. rukovodstvom i red. G.I.Petrashen'. [Leningrad] Izd-vo Leningr. univ. Vol. 1. 1957. 420 p. Vo.2. 1957. 152 p. (MIRA 11:2)

1. Akademiya nauk SSSR. Matematicheskiy institut, Leningradskoye otdeleniye.
(Seismometry)

SOV/124-58-2-2094

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 2, p 85 (USSR)

AUTHOR: Petrashen', G. I.

TITLE: A Method for the Construction of Solutions for Problems Relating to the Propagation of Seismic Waves in Isotropic Media Comprising Thick Plane-Parallel Layers (Handbook) [Metodika postroyeniya resheniy zadach na rasprostraneniye seysmicheskikh voln v izotropnykh sredakh, soderzhashchikh tolstyye plosko-parallel'-nyye sloi (Spravochnik)]

PERIODICAL: V sb.: Vopr. dinam. teorii rasprostr. seysmich. voln. Vol I. Leningrad, Gostoptekhizdat, 1957, pp 7-69

ABSTRACT: Description of the formulation of problems relating to the propaga tion of seismic waves in stratified media. Methods are given for the construction of the solutions with generic patterns of observation points and various types of sources (nonsymmetrical as well as symmetrical); auxiliary formulas required for such construction are adduced. The author points out methods for the generalization of the results obtained for a viscoelastic medium, also a medium with elastic aftereffect (creep recovery; Transl. Ed. Note). Biblio: 4 Refs

K. I. Ogurtsov

Card 1/1

PETRASHEN', G. I.

49-10-2/10

AUTHOR: Petrashen', G. I.

TITLE: On certain interference phenomena in a two-layer medium. (O nekotorykh interferentsionnykh yavleniyakh v dvukhsloynoy srede).

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1957, No.10, pp.1219-1231 (USSR)

ABSTRACT: In earlier work (Refs.1-3) the author and Yenal'skiy,V.A. investigated interference phenomena occurring in a two-layer medium consisting of a thin layer and of an elastic semi-space which is in rigid contact with the thin layer. The assumption was made that at the surface point a rotary action was applied and formulae were derived for the field of displacements in the points of the surface and also in the depth of the semi-space. The final formulation of the formulae is convenient for deriving physical consequences from them. In this paper an analysis is made of the field of displacements and a full description is given of the fundamental physical processes taking place in a two-layer medium, assuming that the source of oscillations and the receivers are located at points on the surface. Also,a detailed description is given of the fundamental wave phenomena observed in this connection. The case of an

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SOV/54-58-4-12/18

10(2)
AUTHOR: Petrashen', G. I.

TITLE: Papers on the Propagation of Elastic Waves (Raboty po rasprostraneniyu [illegible]prugikh voln). Theory and Its Introduction Into Practice (Teoriya i vnedreniye yeye v praktiku)

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1958, Nr 4, pp 119-136 (USSR)

ABSTRACT: This paper is a summary of a report held at the Otdeleniye fiziko-matematicheskikh nauk Yubileynoy sessii AN SSSR (Section of Physical and Mathematical Sciences of the Anniversary Meeting of the AS USSR) on October 31st, 1957. §1 gives an introduction and a survey concerning the most important achievements of the dynamic theory of elasticity of the time between 1930-1950 and §2 on practical problems and a survey of the results obtained. All possible cases of propagation of waves in elastic media, consisting of thick, plane parallel homogeneous and isotropic layers are investigated as well as the methods of computing them. Among others, the papers by Smirnov and Sobolev are pointed out. The methods of solving the problems in seismology and the investigation of the wave fields are dealt with in §3. The poten-

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Papers on the Propagation of Elastic Waves. Theory and Its Introduction Into Practice

tial field is determined which forms in connection with the passage and the reflexion of a seismic wave through a certain number of layers. Apart from this a general way is given for the case of very accurate determinations of this field. The last § gives a survey on the application of the obtained theoretical results to practical purposes. There are 22 Soviet references.

10(2) SOV/54-58-4-13/18

AUTHORS: Petrashen', G. I., Molotkov, L. A.

TITLE: Several Problems of the Dynamic Elasticity Theory in the Case of a Medium Containing Thin Layers (O nekotorykh problemakh dinamicheskoy teorii uprugosti v sluchaye sred, soderzhashchikh tonkiye sloi)

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1958, Nr 4, pp 137-156 (USSR)

ABSTRACT: This paper is a summary of a report held by the authors on the occasion of the 4. Vsesoyuznaya akusticheskaya konferentsiya (All-Union Conference of Acoustics) in Moscow in June 1958. It is the aim of the present paper to give a short survey on the various directions of research of the problems mentioned in the title as well as to interpret the results dealing with the lowest-frequency oscillations contained in thin layers. These problems are closely related with the engineering-theory of oscillation of thin plates and the problems of dynamic modelling on "plane models". Among the methods dealing with the investigation of wave fields Fourier's method is emphasized, the method of contour integrals, which has much in common with the method men-

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Several Problems of the Dynamic Elasticity Theory in the Case of a Medium Containing Thin Layers

tioned first, with the exception that the latter also takes the non-stationary problem into account. For their investigations the authors used always the second method. Among the bases for the problems of the dynamic elasticity theory as given in publications especially that by Epstein (Ref 6) is pointed out; an own paragraph is devoted to its explanation. The authors themselves prove the engineering theory rigorously. In this connection to begin with the problems are solved for the simpler systems, as in our case for the external surfaces: $R_1 = R_2 = \infty$. The results obtained are compared with the results of reference 6 for this special case, then the applicability of the results of reference 6 is investigated under special consideration of this case and then the conditions of applicability are extrapolated to a broader class of external surfaces. Thus, it is possible to subject the findings of the engineering theory of oscillation of thin plates to a thorough investigation and to demonstrate the field of applicability. Besides, it was also proved that the laws of wave propagation can under certain conditions be applied

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Several Problems of the Dynamic Elasticity Theory in the Case of a Medium Containing Thin Layers

in plane problems of dynamic electricity theory to models consisting of plates with a uniform thickness. There are 8 references, 6 of which are Soviet.

Card 3/3

PETRASHEN', G.I.; NIKOLAYEV, B.G.; KOUZOV, D.P.

Method of series in the theory of diffraction of waves by plane corner regions. Uch.zap. LGU no.246:5-70 '58. (MIRA 12:2)

1. Leningradskoy otdeleniye Matematicheskogo institut im. V.A. Steklova, Leningradskiy gosudarstvennyy universitet.
(Waves--Diffraction)

PETRASHEN', G.I.; MOLOTKOV, I.A.

Remarks on the paper "Asymptotic representation of cylindrical functions." Uch.zap. LGU no.246:347-352 '58. (MIRA 12:2)
(Functions)

BUROVA, A.V.; VORONIN, Yu.A.; GEL'CHINSKIY, B.Ya.; MANUKHOV, A.V.; PETRASHEN', G.I., red.; VOLKHOVER, R., tekhn.red.

[Materials on a quantitative study of seismic wave dynamics] Materialy kolichestvennogo izucheniia dinamiki seismicheskikh voln. Pod rukovodstvom i red. G.I.Petrashen'. Leningrad, Izd-vo Leningr. univ. Vol.3.[Atlases of graphs representing moduli and arguments of complex reflection-refraction coefficients of elastic waves, directivity functions of basic point sources, coefficients of reflection from a diurnal surface, coefficients of conversion, and nomograms of auxiliary coefficients necessary for computing geometrical divergences of rays] Atlasy grafikov modulei i argumentov kompleksnykh koeffitsientov otrazheniia-prelomleniia uprugikh voln, funktsii napravlennosti osnovnykh tochechnykh istochnikov, koeffitsientov otrazheniia ot dnevnoi poverkhnosti, koeffitsientov konversii i nomogrammy vspomogatel'nykh koeffitsientov, neobkhodimykh dlia vychisleniia geometricheskikh raskhozhdenii luchei. 1958. 323 p. (MIRA 13:1)

1. Akademiya nauk SSSR. Matematicheskiy institut. Leningradskoye otdeleniye.

(Seismology--Tables, etc.)

VALLANDER, S. V.; LINNIK, Yu. V.; PETRASHEN', G. I.; POLYAKHOV, N. N.; SMIRNOV, V. I.; FADDEYEV, D. K.

Aleksandr Danilovich Aleksandrov; on his 50th birthday. Vest. LGU 18 no.1:7-9 '63. (MIRA 16:1)

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MOLOTKOV, L.A.; PETRASHEN', G.I. (Leningrad)

"On the methods of deriving engineering equations for vibrations of thin plates, bars and certain shells".

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ORG: none

TITLE: Mathematical methods in geophysics and geology

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TOPIC TAGS: upper mantle, seismology, seismic prospecting

ABSTRACT: Mathematical and computer techniques developed in the V. A. Steklov Mathematical Institute of the Academy of Sciences USSR have yielded promising results in specialized fields of geophysics and geology that hitherto had only been investigated by traditional classical methods.

In geophysics, in the fields of seismology, seismic prospecting, and hydroacoustics, the laws of wave propagation have been reexamined in the light of the newly introduced "dynamic theory of seismic and acoustic wave propagation." This theory, which is based on quantitative analysis of the complete system of equations of the theory of elasticity and which includes geometric seismics, makes it possible to extract

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far more information than before from primary seismic data on the structure and geologic characteristics of the region under study, as well as to determine both the dynamic wave characteristics (amplitude, polarization, form of oscillation, etc.) and the kinematic characteristics. It also permits the examination of many stratified heterogeneous media with curvilinear interfaces excited by arbitrary point sources. Most importantly, the method makes it possible to calculate wave fields on computers and, in so doing, makes possible a dynamic interpretation of seismic observations.

The system of programming wave-field computations with models of different seismic media and the correlation of experimental data with the results of theoretical computations form the basis for the method of dynamic interpretation of seismic observations. Two such programming systems are the one used to compute the wave fields in stratified heterogeneous media with plane parallel interfaces, employing the M-20 and BESM-2 computers, and the one used to compute fields in media with arbitrary plane interfaces in structures having unconformities. Here, too, the BESM-2 is used.

Two methods are currently in use to identify "useful" or information-bearing waves on seismograms. The first, based on mathematical

statistics, makes it possible to assign algorithms to the useful waves, to estimate the reliability of the results obtained, and to program machine computations. This method is gradually replacing the second method which consists in relying solely on experienced personnel to interpret the seismograms.

The processing of the seismic material proceeds in two stages. The first, differing little from established procedures in seismic prospecting, consists in analyzing the wave kinematics (travel-time curves) and in establishing the interfaces and the velocity profile of the medium. Since, however, a large number of different interpretations of the structure of the medium may theoretically be possible from the data, a second stage of processing, selecting the variant that best reflects the actual conditions, becomes necessary. It is in the second stage of processing that modern procedure departs from previous practice when machine techniques replace the subjective judgement of the analyst.

Each of the possible variants is characterized by geometric and velocity parameters that change within certain limits. Therefore, machine computations are made of the wave fields for the whole complex of media of each of the variants. The theoretical wave patterns are divided into two groups. Group I consists of those with characteristics

that are stable within each variant but which differ for media belonging to different variants of the structure of the medium. Group II consists of those with characteristics that change markedly when the parameters of the medium change. The theoretical computations based on Group-I waves for all possible variants are then correlated with experimental data, and the single variant of the structure of the medium that best corresponds to the experimental data is identified. The values of its geometric and velocity parameters are then refined by correlating the experimental data with the theoretical data derived from the Group-II waves of the structure variant under study. It is hoped that this method will be further simplified after the computer seismic-data input and output processes have been automated.

In that part of seismology associated with the studies of the upper mantle, a program has been worked out for computing the kinematic and dynamic characteristics of body (longitudinal, transverse, composite) waves generated by point sources in a spherical heterogeneous earth. This program has been used to explain the empirical laws of seismic-wave propagation in the upper mantle and to solve inverse problems of the upper mantle in order to determine more precisely the velocity profile of the earth. The method now being used is controlled machine sorting and selection from the entire complex (embracing all con-

ceivable structural variants) those models of the media which differ from each other according to the empirical laws for variation of wave propagation velocity with depth. The necessary wave parameters are computed for each model medium from the complex. Then the machine compares the results of the computations with experimental data and selects the medium that best corresponds to reality. This method was first applied using solely the travel-time curves of longitudinal waves in agreement with the data of I. Leman for Central Europe and those of S. A. Fedotov for the Soviet Far East. As a result, it was possible to obtain a comparatively broad range of velocity values v_p in the upper mantle. On the basis of data for Central Europe an attempt was then made, using the machine-sorting method, to determine not only the kinematic but also the dynamic wave characteristics. It was shown that by using the dynamic wave characteristics it was possible to narrow the range of possible velocity values.

The effectiveness of the machine-sorting method is, of course, directly proportional to the volume of information available for analysis. In examining deep-focus earthquakes in the Pamir-Hindu Kush zone, for example, systems of experimental travel-time curves of longitudinal waves corresponding to different foci depths in the same epicentral zone had been obtained. Using these data in the machine-sorting method,

a quite accurate determination of the velocity profile of the upper mantle was obtained without even utilizing dynamic characteristics. It was even possible to establish the existence in the mantle of a low-velocity layer for longitudinal and transverse waves.

The Department of Mathematical Problems of Geology and Geophysics of the Steklov Mathematical Institute has also achieved some success in introducing mathematical and computer techniques in geology, though progress here has been less rapid. Broadly speaking, attempts are now being made to formalize typical geological problems, to select the most suitable mathematical and computer approaches for their solution, and to establish fields of applicability as well as the prospects of success in the use of such methods. To date, the main emphasis of such efforts in geology has been in the construction and testing of probability models of geological processes and in the development of models. Again the M-20 and BESM-2 computers are employed in these investigations.

Thus, while progress in the introduction of computer techniques in seismology and seismic prospecting has already been substantial and the prospects of further application most promising, advance

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along the same lines in geology has been slower. Further progress in this matter will depend, to a considerable extent, both on improved computer technology and on the quality and skill of the analyst. Ideally, the analyst should be knowledgeable in mathematics, geology, and geophysics. In practice, the same results can be achieved through the cooperation between experts in each field. [FSB: v.2, no.9]

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TITLE: The modeling of the processes of seismic wave propagation

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ABSTRACT: To explain the laws of propagation of seismic waves, one must establish the causal connections between the peculiarities of the observed seismic field and the structural elements of the medium within which the waves propagate. However, in view of the