"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

STARODUBOV, K.F.; BABICH, V.K.; SIUKHIN, A.F.

Effect of the tempering temperature on the properties of hardened low-carbon steel. Izv.vys.ucheb.zav.; chern.met. 8 no.6:137-139 '65. (MIRA 18:8)

1. Dnepropetrovskiy metallurgicheskiy institut.

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

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LITVINOV, I.R.; ZAZHIRKO, V.N., assistont; BABICH, V.M., starshiy prepodavatel'

Slippage-preventive circuit of N8 series electric locomotives. Elek. i tepl. tiaga 4 no. 9:8-11 S '60. (MIRA 13:12)

1. Glavnyy inzhener sluzhby lokomotivnogo khozyaystva Tomskoy dorogi (for Litvinov). 2. Tomskiy elektromekhanicheskiy institut inzhenerov zheleznodorozhnogo transporta (for Zazhirko, Babich).

(Electric locomotives)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

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BABICH, V.M.

2

Mathematical Reviews
Vol. 15 No. 2
Feb. 1954
Analysis

8-10-54
LL

Babič, V. M. On the extension of functions. Uspehi Matem. Nauk (N.S.) 8, no. 2(54), 111–113 (1953). (Russian)

Let be a closed bounded region in E_n whose boundary is piecewise of class $C^{(k)}$, and let $f(p)$, $p \in A$, be a function defined in A and of class $C^{(k)}$ in A, i.e., f is continuous with all its partial derivatives of order k in A. H. Whitney [Trans. Amer. Math. Soc. 36, 63–89 (1934)] and M. R. Hestenes [Duke Math. J. 8, 183–192 (1941); these Rev. 2, 219] have proved various theorems on the extension of functions, in particular that every function of class $C^{(k)}$ in A has an extension which is of class $C^{(k)}$ in E_n. The author says that a function f is of class $W_p^{(k)}$ if the continuity requirement of the partial derivatives of order k in the definition of class $C^{(k)}$ is replaced by L^p-integrability. Then he proves that every function f of class $W_p^{(k)}$ in A has an extension which is of class $W_p^{(k)}$ in E_n. Hestenes' method based on a modified form of reflection principle is used. *L. Cesari.*

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M. (Leningrad); RUSAKOVA, N.Ya. (Leningrad)

Propagation of Rayleigh waves along the surface of an inhomogeneous elastic body of arbitrary shape. Zhur.vych.mat.i mat. fiz. 2 no.4:652-665 Jl-Ag '62. (MIRA 15:8)
(Elasticity) (Waves)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.

550.341

5171. Screening action of a thin elastic layer. V. Babich and A. Alekseev. *Dokl. Akad. Nauk SSSR*, 91, No. 4, 763–5 (1953) *in Russian*. English translation, *U.S. National Sci. Found. NSF-tr-131*.

When a wave is propagated in laminated media, it occasionally occurs that the wave is incident on a thin layer at an angle exceeding that for total internal reflection but, in spite of this, the disturbance partially penetrates the screening layer. The penetration becomes greater when the thickness of the layer is reduced and the angle of incidence approaches the critical value. The problem is studied theoretically in the present paper, the solution of the problem in the theory of elasticity being constructed by the method of incomplete separation of variables. For simplicity, it is assumed that the velocities in the material above and below the screening layer are equal and lower than that in the layer. It is found that the results obtained cannot be explained by theories based on geometrical optics and it is concluded that future progress in this field of geophysics depends on the full application of the dynamical theory of elasticity.

A. C. WHIFFIN

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V. M.

USSR/Mathematics - Theory of Elasticity

Card : 1/1

Authors : Babich, V. M.

Title : Solution of the Cauchy problem for the system of equations of the theory of elasticity of a heterogeneous elastic medium

Periodical : Dokl. AN SSSR, 96, Ed. 6, 1125 - 1128, June 1954

Abstract : Author recommends the S. L. Sobolev method for the derivation of a solution of the Cauchy problem for the system of equations of the elasticity theory. A study of generalized functions showed that the basis of the Sobolev method is exactly the same as that of the Adamar method. The formulation of a fundamental solution which would be accurate for the case of constant equation coefficients is also applicable in the case of variable but sufficiently smooth coefficients. Six references.

Institution : The A. A. Zhdanov State University, Leningrad

Presented by : Academician V. I. Smirnov, April 5, 1954

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M.

USSR/ Mathematics - Theory of Elasticity

Card : 1/1

Authors : Babich, V. M.

Title : On equations of motion of a nonlinear elastic medium

Periodical : Dokl. AN SSSR, Vol. 97, Ed. 1, 41 - 44, July 1954

Abstract : The author proposes a solution of Henke-Schmidt equations, relative to the motion of a consolidated plastic medium, basing the method of their solution on the theory of coincident kinematic and dynamic conditions. A detailed examination is made of the form and speed of the waves propagated as a result of the motion (maximum, medium and minimum waves). Five references; four of these, USSR references, of which the last one is of 1951.

Institution : The A. A. Zhdanov State University of Leningrad

Presented by : Academician, V. I. Smirnov, April 1954

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~~BABICH, V.M.~~ BABICH, V. M.

SUBJECT USSR/MATHEMATICS/Differential equations CARD 1/1 PG - 655
AUTHOR BABIČ V.M.
TITLE On some papers of V.M. Panferov on the domain of the theory of elasto-plastic deformations.
PERIODICAL Priklad.Mat.Mech. 20, 767-771 (1956)
reviewed 3/1957

The author criticizes sharply a series of Panferov's publications during the years 1949-1952 (Priklad.Mat.Mech. 13, 1; ibid. 16, 2; ibid. 16, 3; Vestnik MGU 8, (1952)). The author detects many inexactnesses and incorrect conclusions, among others an unwarranted application of the methods of Ritz and Galerkin.

INSTITUTION: Leningrad.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

SLOBODETSKIY, L.N.; BABICH, V.M.
[redacted]

Boundedness of the Dirichlet integral. Dokl.AN SSSR 106 no.4: 604-606 F '56. (MIRA 9:6)

1.Leningradskiy pedagogicheskiy institut. Predstavleno akademikom V.I.Smirnovym.
(Integrals)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V. M.

"A Radial Method for Computing the Intensity of Wave Fronts," by V. M. Babich, Leningrad State University imeni Zhdanov, presented by Academician V. I. Smirnov, Doklady Akademii Nauk SSSR, Vol 110, No 3, 1956, pp 355 — 357

For a full picture of dynamic seismology in the case of a heterogeneous wave, the writer considers it necessary to analyze separately longitudinal and transverse wave intensities. Such computations are facilitated by analyzing the correlations formed by characteristic manifold equations expressing undulatory processes. For the solution of these equations the writer introduces equations of elasticity theory expressing a wave front with a discontinuity. The propagation direction of longitudinal waves the writer calls "rays." In the case of small dimensions, the assumption is made in the first approximation that the heterogeneous medium is homogeneous and the curvilinear front is rectilinear, which simplifies the solution.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V. M.

"Ray Theory of Wave Front Intensity, "

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

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

Babich, V. M.

49-1-2/16

AUTHORS: Babich, V.M. and Alekseyev, A.S.

TITLE: On the Ray Method of Calculating the Intensity of Wave-fronts (O luchevom metode vychisleniya intensivnosti volnovykh frontov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geofizicheskaya, 1958, Nr 1, pp.17-31 (USSR)

ABSTRACT: The growth of dynamic seismology leads to the necessity of calculating the intensity of longitudinal and transverse waves in inhomogeneous media at the reflection of the waves from curvilinear boundaries. Such calculations can be carried out by considering the relations obtaining on the characteristic manifolds of the equations describing the wave processes. Analogous considerations lie at the basis of the methods of Hadamard (Ref.1) and Sobolev (Ref.2) for the solution of the Cauchy problem for hyperbolic equations. The method described in this paper has previously been applied to Maxwell's equations (Refs.3-5) and to the wave equation (Refs.6-9). Levin and Rytov (Ref.10), and Zvolinskiy and Skuridin (Refs.11 and 12) have applied ray considerations to the equations of the

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On the Ray Method of Calculating the Intensity of Wavefronts.

theory of elasticity, but in none of these papers are to be found the equations 4.2, 4.3, 4.5 and 4.7, which are at the basis of the method described. The method of describing the function $f(\alpha_1, \alpha_2)$ for a concentrated source, which is an important part of the method, is also new. Let $t = \tau(x, y, z)$ be the equation of the wavefront at time t. Let the wave process under consideration be described by the scalar or vector function $U(x, y, z, t)$ where it is assumed that

$$U(x,y,z,t) = U_0(x,y,z)f_0(t - \tau) + U_1(x,y,z)f_1(t - \tau) + 0(f_2(t - \tau)) \qquad \text{(Eq.1.1)}$$

in which

$$f_2'(t) = f_1(t), \quad f'_1(t) = f_0(t) \quad .$$

It is assumed that in some sense the function $f_2(t)$ can be neglected in comparison with its derivative. If Eq.(1.1) is substituted into

$$U_{xx} + U_{yy} - \frac{1}{c^2(x, y)} U_{tt} = 0 \qquad \text{(Eq.2.1)}$$

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On the Ray Method of Calculating the Intensity of Wavefronts.

and the coefficient of f'_0 equated to zero, there results

$$2 \text{ grad } \tau \text{ grad } U_0 + U_0 \Delta \tau = 0 \qquad \text{(Eq.2.4)}$$

which is studied in some detail. Equations analogous to Eq.(2.4) for the case of an inhomogeneous elastic medium are derived by substituting the expression for the vector $\underline{U}(x, y, t)$ from Eq.(1.1) into the two-dimensional differential equations of motion of an inhomogeneous elastic medium. Thus we have

$$-(\lambda + \mu)(\text{grad } \tau \underline{U}_0) \text{grad } \tau - \mu \underline{U}_0 (\text{grad } \tau)^2 + \rho \underline{U}_0 = 0, \qquad \text{(Eq.2.6)}$$

$$\underline{M}(\underline{U}_0, \tau) - (\lambda + \mu)(\text{grad } \tau U_1) \text{grad } \tau - \mu U_1 (\text{grad } \tau)^2 + \rho U_1 = 0 \qquad \text{(Eq.2.7)}$$

where

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On the Ray Method of Calculating the Intensity of Wavefronts.

$$\underline{M}(\underline{U}_o, \tau) = (\lambda + \mu)\left[(\text{div } \underline{U}_o)\text{grad } \tau + \text{grad } (\underline{U}_o \text{grad } \tau)\right] +$$
$$+ \mu\left[\underline{U}_o \Delta\tau + 2(\text{grad } U_{ox} \text{grad } \tau)i + 2(\text{grad } U_{oy} \text{ grad } \tau)j\right] +$$
$$+ \text{grad } \lambda \ (\underline{U}_o \text{ grad } \tau) + (\text{grad } \mu \underline{U}_o)\text{grad } \tau + (\text{grad } \mu \text{ grad } \tau)\underline{U}_o \quad \text{(Eq.2.8)}$$

and $\underline{U}_o = \{U_{ox}, U_{oy}\}$; i, j are unit vectors in the directions of x and y respectively. Eq.(2.6) is a system of two homogeneous equations in the two unknowns U_{ox} and U_{oy}, and it can be shown that the determinant of this system only vanishes in two cases. These are:

(a) when $|\text{grad } \tau|^2 = \frac{1}{a^2} = \frac{\rho}{\lambda + 2\mu}$ (longitudinal wave) in which case we shall write τ_a for τ ; and

(b) $|\text{grad } \tau|^2 = \frac{1}{b^2} = \frac{\rho}{\mu}$ (transverse wave) in which case we shall write τ_b for τ. In the first case it can be shown that:

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On the Ray Method of Calculating the Intensity of Wavefronts.

$\underline{U}_o = \varphi_o \operatorname{grad} \tau_a$ (Eq.3.1) where φ_o is a scalar function of position. Eq.(2.7) can also be regarded as an algebraic system of equations for the unknown components of the vector $\underline{U}_1$. Again there are two conditions for solution, the first of which can be written in the form :

$$\underline{M}(\underline{U}_o, \tau_a) \operatorname{grad} \tau_a = 0 \quad \text{(Eq.3.3)}$$

If Eq.(3.1) is substituted into Eq.(3.3), after some simplification

$$2\frac{\partial \varphi_o}{\partial \tau_a} + \left[a^2 \Delta \tau_a - (\lambda + 2\mu)\left(\operatorname{grad} \frac{1}{\rho} \operatorname{grad} \tau_a\right)\right]\varphi_o = 0 \quad \text{(Eq.3.6)}$$

is obtained. In Eq.(3.6) the derivative is calculated along the ray of the longitudinal wave. If U_n and U_ν

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are the components of the U_0 along the normal and the binormal to a ray of the transverse wave, then the condition for the solubility of the system 2.7 can be written in the form:

$$\left.\begin{aligned} &2\frac{\partial U_n}{\partial \tau_b} + 2TbU_\nu + \left(b^2\Delta\tau_b + \frac{1}{\rho}\,\mathrm{grad}\,\mu\,\mathrm{grad}\,\tau_b\right)U_n = 0\,, \\ &2\frac{\partial U_\nu}{\partial \tau_b} - 2TbU_n + \left(b^2\Delta\tau_b + \frac{1}{\rho}\,\mathrm{grad}\,\mu\,\mathrm{grad}\,\tau_b\right)U_\nu = 0 \end{aligned}\right\}(3.8)\,.$$

Suppose that a point on the ray is characterized by the quantity τ , and the ray itself by the parameter α , and let $x = x(\alpha, \tau)$, $y = y(\alpha, \tau)$; or, in vector form, $X = X(\alpha,\tau)$. Eq.(2.4) can be written in the form

$$\frac{2}{c^2}\frac{\partial U_0}{\partial \tau} + \frac{U_0}{c|\underline{X}_\alpha|}\frac{\partial}{\partial \tau}\left(\frac{|\underline{X}_\alpha|}{c}\right) = 0$$

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On the Ray Method of Calculating the Intensity of Wavefronts.

and it can be shown that by a method analogous to that used by Umov (Ref.23, pp.161-163) this equation has the solution:

$$|U_0| = \sqrt{\frac{c}{|\underline{X}_\alpha|}}\; f(\alpha) \qquad \text{(Eq.4.1)}$$

where $f(\alpha)$ is an arbitrary function of the parameter α. In a similar manner, from Eq.(3.6) we obtain:

$$|U_0| = \frac{1}{\sqrt{|\underline{X}_\alpha|\rho a}}\; f(\alpha) \qquad \text{(Eq.4.2)}$$

where α characterizes a ray from the longitudinal wave. Similar considerations lead to the expression for the intensity of transverse waves:

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$$|U_o| = \frac{1}{\sqrt{|X_\beta| \rho b}} f(\beta) \qquad \text{(Eq.4.3)}$$

In the three-dimensional case a ray is characterized by the two parameters α_1 and α_2, and Eqs.(4.2) and (4.3) have their analogies in:

$$|U_o| = \frac{1}{\sqrt{J_a \rho a}} f(\alpha_1, \alpha_2) \qquad \text{(Eq.4.5)}$$

and:

$$|U_o| = \frac{1}{\sqrt{J_b \rho b}} f(\beta_1, \beta_2) \qquad \text{(Eq.4.7)}$$

where $J = [X_{\alpha_1} X_{\alpha_2}]$. The authors conclude by considering three examples: (1) The reflection of waves from a curvilinear boundary; (2) Media whose inhomogeneity depends on 1 coordinate; (3) The diffraction of a cylindri-

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49-1-2/16

On the Ray Method of Calculating the Intensity of Wavefronts.

cal wave at a wedge.
There are 3 figures and 28 references, 21 of which are Slavic.

ASSOCIATION: Ac. of Sciences of the USSR, Leningrad Branch of the Mathematical Institute imeni V.A.Steklov (Akademiya nauk SSSR, Leningradskoye otdeleniye Matematicheskogo instituta im. V.A. Steklova)

SUBMITTED: July 29, 1956.

AVAILABLE: Library of Congress.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M.

Propagation of unstationary waves and the caustic. Uch.zap. LGU no.246:228-260 '58. (MIRA 12:2)

1. Leningradskiy gosudarstvennyy universitet.
(Wave motion, Theory of)

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C111/C222

16.7300

AUTHOR: Babich, V.M.

TITLE: The propagation of instationary waves and the caustic

PERIODICAL: Referativnyy zhurnal. Matematika, no.7, 1960, 119. Abstract no.7718. Uch.zap.LGU, 1958, no.246, 228-260

TEXT: Let a wave process be described by the equation $\frac{1}{c^2(x,y)} u_{tt}-u_{xx}-u_{yy} = 0$ with the variable velocity $c(x,y)$, which is sufficiently smooth and satisfies the condition $0 < c(x,y) < \psi(r)$, where $\int_0^\infty \frac{dr}{\psi(r)} < +\infty$. In the neighborhood of the wave front with the equation $\tau(x,y) = 0$, for a fixed time $t = 0$ the author constructs the field of the extremals of the integral $\int \frac{ds}{c}$ which orthogonally intersect the curve $\tau(x,y)$. The wave fronts and the constructed extremals (rays) form a natural system of coordinates (α, τ) (α=const gives the ray, τ= const gives the wave front). The transition from the coordinates α, τ to x,y is made according to the formula $x = x(\alpha, \tau)$. The geometrical locus of the points $x_\alpha = 0$ is called the caustic.

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The propagation of instationary waves...

The author obtains some relations of geometrical kind which are connected with the caustics. In particular it is proved that if on the wave front which corresponds to the central field of rays, in a certain moment there appeared a singularity $\varkappa_{\alpha} = 0$, then this singularity exists on the wave front also in the subsequent moments.
With the example of special problems it is stated that for the passage through the caustic the type of the discontinuity changes on the wave front: the jump of the solution changes to a logarithmic discontinuity. It is shown that this phenomenon is the same at least for all processes which are described by the considered equation.

[Abstracter's note: The above text is a full translation of the original Soviet abstract.]

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BABICH, V.M.

16(1) PHASE I BOOK EXPLOITATION SOV/2660

Vsesoyuznyy matematicheskiy s"yezd. 3rd, Moscow, 1956

Trudy. t. 4: Kratkoye soderzhaniye sektsionnykh dokladov. Doklady inostrannykh uchenykh (Transactions of the 3rd All-Union Mathematical Conference in Moscow. vol. 4: Summary of Sectional Reports. Reports of Foreign Scientists) Moscow, Izd-vo AN SSSR, 1959. 247 p. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Matematicheskiy institut.

Tech. Ed.: G.N. Shevchenko; Editorial Board: A.A. Abramov, V.G. Boltyanskiy, A.M. Vasil'yev, B.V. Medvedev, A.D. Myshkis, S.M. Nikol'skiy (Resp. Ed.), A.G. Postnikov, Yu. V. Prokhorov, K.A. Rybnikov, P. L. Ul'yanov, V.A. Uspenskiy, N.G. Chetayev, G. Ye. Shilov, and A.I. Shirshov.

PURPOSE: This book is intended for mathematicians and physicists.

COVERAGE: The book is Volume IV of the Transactions of the Third All-Union Mathematical Conference, held in June and July 1956. The book is divided into two main parts. The first part contains summaries of the papers presented by Soviet scientists at the Conference that were not included in the first two volumes. The second part contains the text of reports submitted to the editor by non-Soviet scientists. In those cases when the non-Soviet scientist did not submit a copy of his paper to the editor, the title of the paper is cited and, if the paper was printed in a previous volume, reference is made to the appropriate volume. The papers, both Soviet and non-Soviet, cover various topics in number theory, algebra, differential and integral equations, function theory, functional analysis, probability theory, topology, mathematical problems of mechanics and physics, computational mathematics, mathematical logic and the foundations of mathematics, and the history of mathematics.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

16(1) 16.3500

66437
SOV/20-129-3-1/70

AUTHOR: Babich, V.M.

TITLE: Elementary Solutions of Hyperbolic Equations

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 3, pp 479-481 (USSR)

ABSTRACT: The author considers the equation

$$(1)\quad Lu \equiv \frac{\partial^n u}{\partial t^n} + \sum_{\substack{\Sigma k \leq n \\ k_o < n}} a_{k_o \ldots k_m} \frac{\partial^{k_o + \ldots + k_m}}{\partial t^{k_o} \ldots \partial x_m^{k_m}} u = 0$$

which is hyperbolic in the sense of I.G.Petrovskiy, with analytic coefficients $a_{k_o \ldots k_m}$. The elementary solution is defined as a generalized function of the variable x which depends on t as a parameter which satisfies (1) for $t > t_o$ and which satisfies the initial conditions

$$(2)\quad h\Big|_{t=t_o} = 0, \ldots, \frac{\partial^{m-2} h}{\partial t^{m-2}}\Big|_{t=t_o} = 0; \quad \frac{\partial^{m-1} h}{\partial t^{m-1}}\Big|_{t=t_o} = \delta(x - x^o)$$

for $t = t_o$. The construction of the elementary solution for the

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Elementary Solutions of Hyperbolic Equations SOV/20-129-3-1/70

case of constant coefficients was given in [Ref 1]. The author generalizes the method of [Ref 1] to the case of analytic coefficients. At first the solution is constructed in a small neighborhood of the characteristic conoid and then it is continued analytically, where for the transition through a singular point the type of discontinuity changes.
The author thanks V.A.Borovikov for showing his dissertation.
There are 7 references, 5 of which are Soviet, 1 American, and 1 French.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet imeni A.A.Zhdanova (Leningrad State University imeni A.A.Zhdanov)

PRESENTED: June 11, 1959, by V.I.Smirnov, Academician

SUBMITTED: May 26, 1959

Card 2/2

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C111/C222

16.3500

AUTHOR: Babich, V.M.

16 16

TITLE: Fractional Degrees of Laplace's Operator and S.L. Sobolev's Spaces of Fractional Order

PERIODICAL: Vestnik Leningradskogo universiteta, Seriya matematiki, mekhaniki i astronomii, 1960, No. 13, pp. 94 - 114

TEXT: Let $W_2^{(1)}$ ($1 > 0$, not necessarily integral) be the space introduced by L.N. Slobodetskiy (Ref. 1). Let Δ be the Laplace operator in the space of quadratically integrable functions defined in the whole space or in a bounded domain Ω. Then $-\Delta$ is a positive selfadjoined operator in the L_2. In the usual manner fractional powers of this operator can be introduced with the aid of the spectral decomposition. It is stated that the spaces $W_2^{(1)}$ result in a natural manner if one tries to describe the character of smoothness of the functions which belong to the region of definition of $(-\Delta)^{1/2}$. If $\varphi \in D(-\Delta)^{1/2}$, then $\varphi \in W_2^{(1)}(\Omega')$, where Ω' is a strong

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Fractional Degrees of Laplace's Operator and S.L. Sobolev's Spaces of Fractional Order

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subdomain of Ω Inversely: If in Ω' a function $\varphi \in W_2^{(1)}(\Omega')$ is given, then it can be extended on the whole Ω so that the extended function belongs to $D(-\Delta)^{1/2}$. Furthermore it is shown that the operators I^α of M. Riesz (Ref. 7) are powers of $-\Delta$; $I^\alpha = (-\Delta)^{-\alpha/2}$. The author obtains an integral representation for the functions of $W_2^{(1)}(\Omega)$, and with the aid of it he proves theorems analogous to the imbedding theorems of S.L. Sobolev. Some applications of the $W_2^{(1)}$ to the theory of Fourier series are considered.

The author mentions M.A. Krasnosel'skiy, Ye.I. Pustyl'nik, S.G. Kreyn, V.P. Glushko, I.A. Kipriyanov, S.N. Bernshteyn and V.A. Il'in.

There are 13 references: 11 Soviet, 1 Swiss and 1 Swedish.

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16.3500

AUTHOR: Babich, V.M. (Leningrad)

16

TITLE: Fundamental Solutions of Hyperbolic Equations With Variable Coefficients

PERIODICAL: Matematicheskiy sbornik, 1960, Vol.52, No.2, pp.709-738

TEXT: The author constructs and investigates the fundamental solution of the equation with analytic coefficients

$$(1.1)\qquad \frac{\partial^m u}{\partial t^m} + \sum_{k_0+k_1+\dots+k_n\leq m} a_{k_0 k_1 \dots k_n}(t,x) \frac{\partial^{k_0+k_1+\dots+k_n} u}{\partial t^{k_0}\partial x_1^{k_1}\dots\partial x_n^{k_n}} = 0$$

which is hyperbolic in the sense of I.G. Petrovskiy. The fundamental solution is constructed according to a method proposed by I.M. Gel'fand and Z.Ya. Shapiro in (Ref. 5,6) with the aid of generalized plane waves. The method can be interpreted as a generalization of the classical methods of Hadamard (Ref. 1) to general hyperbolic equations. The expressions obtained

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Fundamental Solutions of Hyperbolic Equations With Variable Coefficients

for the fundamental solution are used in order to extend the results of V.A. Borovikov, on the singularities of the fundamental solutions of equations with constant coefficients, to the considered case. The results overlap partially with the former results of Theodresco (Ref. 3) and partially with those of the new papers of Lax (Ref. 7,12).
There are 12 references: 6 Soviet, 5 American, and 1 Roumanian.

SUBMITTED: February 24, 1959

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D228/D307

AUTHORS: Alekseyev, A. S., Babich, V. M. and Gel'chinskiy, B. Ya.

TITLE: Radial method of calculating the wave front intensity

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 9, 1962, 29-30, abstract 9A192 (In collection: Vopr. dinamich. teorii rasprostr. seysmich. voln, 5, L., Leningr. un-t, 1961, 3-24)

TEXT: Equations are derived for successive approximations of the radial method in the case of an inhomogeneous elastic medium with smoothly changing parameters. It is shown that the reflection and the refraction of waves at the boundaries of elastic media should be considered in the limits of the radial method. When a wave is reflected from boundaries, at which the parameters change with a jump, the isolated element principle is correct for the radial method's zero approximation. At each point of the boundary the incident wave is reflected at the same angle of incidence on the

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flat interface of homogeneous semispaces, whose parameters coincide with the corresponding parameters of contiguous media around the reflection point. In the case of so-called weakly reflecting boundaries -- at which the actual environmental parameters and their (n-1) derivatives are continuous, and the n derivative has a final jump -- radial expansion terms, starting with the n-th, are present in the reflected wave. On this occasion the reflected wave has a smoother character than the incident wave (the reflected wave's form can be obtained by integrating n times the function representing the incident wave's form). It is pointed out that diffracted waves must arise at points, where the radii of the boundary's curvature or their derivatives undergo rupture. [Abstracter's note: Complete translation.]

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AUTHOR: Babich, V.M.

TITLE: On the convergence of the series of the ray method for calculating the intensity of wave fronts

PERIODICAL: Referativnyy zhurnal, Matematika, no. 4, 1962, 62, abstract 4B290. (Vopr. dinamich. teorii rasprostr. seysmich. voln." 5. L., Leningr. un-t, 1961, 25 - 35)

TEXT: The convergence of the ray series constructed in the paper by A.S. Alekseyev, V.M. Babich and B.Ya. Gel'chinskiy (Ref. 4B289) is proven herein. The proof is conducted with the help of the classic majorant method.

[Abstracter's note : Complete translation.]

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BABICH, V.M.

Radial method of calculating the intensity of wave fronts in case of elastic inhomogeneous anisotropic media. Vop. din. teor. raspr. seism. voln no.5:36-46 '61. (MIRA 14:11)
(Seismic waves)

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AUTHOR: Babich, V. M.

TITLE: Analytical nature of the unstationary wave field around a caustic

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 9, 1962, 14, abstract 9A93 (In collection: Vopr. dinamich. teorii rasprostr. seysmich. voln, 5, L., Leningr. un-t, 1961, 115-144)

TEXT: The analytical nature of the function u(x, y, t)(of the wave field), which solves the problem

$$\frac{1}{c^2(x, y)} u_{tt} = \Delta u,$$

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$$u = A(x, y, t)(t - \tau - i0)^{\lambda}$$

is investigated around a caustic when $t < 0$. [Abstracter's note: Complete translation.]

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AUTHOR: Babich, V.M.

TITLE: The analytic continuation of the solutions of the wave equation into the complex domain and the caustics

PERIODICAL: Referativnyy zhurnal, Matematika, no. 4, 1962, 62, abstract 4B292.("Vopr. dinamich. teorii rasprostr. seysmich. voln." 5. L., Leningr.un-t, 1961, 145 - 152)

TEXT: Considered is the possibility of a ray development for the solution of the wave equation with variable analytic coefficients in the vicinity of the caustic (cf. Ref. 4B291 for the definition of caustic). Ray series of type

$$u = \sum_{k=0}^{\infty} u_k(\tau, \lambda) f_k(t - \tau) ,$$

$$f_k(t - \tau) = \frac{(t - \tau - i0)^{\lambda + k}}{\Gamma(\lambda + k + 1)}$$

$$(\lambda \neq -1, -2, \ldots)$$

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are considered.
It is shown : To obtain the ray series behind the caustic, the series mentioned above must be analytically continued on a path which in the lower half-plane of the complex variable τ circles around the point $\tau = \tau_0$ lying on the caustic.

[Abstracter's note : Complete translation.]

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16.7300

AUTHOR: Babich, V. M. (Leningrad)

TITLE: The fundamental solutions of the dynamic equations of the elasticity theory for an inhomogeneous medium

PERIODICAL: Prikladnaya matematika i mekhanika, v. 25, no. 1, 1961, 38-45

TEXT: The present paper determines the fundamental tensor for the dynamic equations of the elasticity theory for an inhomogeneous medium. This problem has already been raised in a previous paper by S. G. Mikhlin. It is assumed that at point M_0 a force having the absolute value $\chi(t)$ acts in the direction of the x_j-axis. Here only the case with concentrated momentum is to be investigated if $\chi(t) = 0$ holds, where $\delta(t)$ is the Dirac function. The displacement vector $\vec{u}_j$ is, with arbitrary $\chi(t)$, expressed here by the displacement vector $\vec{h}_t$ corresponding to a momentum according to the formula $\vec{u}(M,t) = \int_0^t \vec{h}_j(M,t - t')\chi(t')dt'$. The components of $\vec{h}_i(M,t)$

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form the fundamental tensor $H(M,t) = \|h_{ij}(M,t)\|$ of the elasticity theory. The author then raises the mathematical problem of determining the vectors $\vec{h}_j$. $u_i(x_1,x_2,x_3,t)$ are assumed to be the components of the displacement vector, $\lambda = \lambda(x_1,x_2,x_3)$, $\mu = \mu(x_1,x_2,x_3)$ - the Lamé parameters, $\varrho = \varrho(x_1,x_2,x_3)$ - the density of the medium. The equations of the elasticity theory then read as follows:

$$\vec{L}\vec{u} = \varrho\vec{u}_{tt} - (\lambda+\mu)\,\mathrm{grad}\,\mathrm{div}\,\vec{u} - \mu\Delta\vec{u} - \mathrm{div}\,\vec{u}\,\mathrm{grad}\,\lambda - 2D\,\mathrm{grad}\,\mu = \vec{K} \quad (1.1).$$

Here $D = \|\varepsilon_{ij}\| = \left\|\frac{1}{2}\left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i}\right)\right\|$ - the deformation tensor. The author then puts $\vec{u} = 0$ with $t < 0$ and investigates the sequence of vectors of the volume forces $\vec{K}_\varepsilon$, so that $\vec{K}_\varepsilon = 0$, $r = |MM_0| > \varepsilon$, $M = M(x_1,x_2,x_3)$ $M_0 = M_0(x_1^0,x_2^0,x_3^0)$, $\int \vec{K}_\varepsilon dx_1 dx_2 dx_3 = \chi(t)\vec{i}_j$ holds. The vector of the volume forces then goes over into $\vec{K} = \delta(M - M_0)\chi(t)\vec{i}_j$ (1.2), where $\delta(M - M_0)$ is

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the δ-function referred to M_0. $\vec{h}_j$ may then be determined as solution of the Cauchy problem: $\vec{L}\vec{h}_j = 0$, $\vec{h}_j\big|_t = 0$, $\frac{\partial h_j}{\partial t}\Big|_{t=0} = \frac{1}{\varrho(M_0)}\delta(M - M_0)\vec{i}_j$ (1.3).

When solving the Cauchy problem of the elasticity theory, after some steps

$$\vec{u} = \frac{\partial}{\partial t_0}\int H(M - M_0 . t_0)\vec{u}_0(M)dM + \int H(M - M_0 . t_0)\vec{u}_1(M)dM + \int_{0 \leqslant t \leqslant t_0} H(M - M_0 . t_0 - t)\vec{K}(M, t)dMdt \quad (1.6)$$

is found, where $H = \|h_{ij}\|$ denotes the fundamental tensor. For determining H is suffices to solve the Cauchy problem (3). The second part deals with the "ray-like" solutions of the equations of the dynamics of an elastic body. Let f_0 be an arbitrary function and f_k the integrals obtained by successive approximation: $f_k(x) = \int f_{k-1}(x)dx$ (2.1). The solution of $\vec{L}\vec{u} = 0$ is then set up as $\vec{u} = \sum_{k=0}^{\infty} \vec{u}_k(x_1, x_2, x_3, t) f_k(\gamma(x_1, x_2, x_3, t))$ (2.2), where γ is a fixed function. By substituting (2.2) into (1.1) with $\vec{K} = 0$, $\vec{N}\vec{u}_{k+2} + \vec{M}u_{k+1} + \vec{L}\vec{u}_k = 0$ $(u_{-1} = u_{-2} \equiv 0)$ $(k = -2, -1, 0, 1, 2, \ldots)$ is obtained by

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comparing coefficients. The operators N and M are defined by (2.4), (2.5) and (2.6). With k = -2, $N\vec{u}_0 = 0$ is obtained from (2.3). With $\vec{u}_0 \neq 0$ $(\mathrm{grad}\,\gamma)^2 = \frac{1}{a^2}\gamma_t^2$, $a = \sqrt{\frac{\lambda+2\mu}{\rho}}$, $\vec{u}_0 \parallel \mathrm{grad}\,\gamma$ (2.7) $(\mathrm{grad}\,\gamma)^2 = \frac{1}{b^2}\gamma_t^2$, $b = \sqrt{\frac{\mu}{\rho}}$, $\vec{u}_0 \perp \mathrm{grad}\,\gamma$ (2.8) holds. The extremals of the Fermat functional $\tau = \int_{M_1}^{M} \frac{ds}{c}$ play an important part in the investigation of the equation

$(\mathrm{grad}\,\gamma)^2 = \frac{1}{c^2(x,y,z)}\gamma_t^2$ (2.9). By τ the points on the extremal may be characterized. First, the longitudinal waves are investigated, where $\mathrm{grad}\,\gamma\left[\vec{M}(u^0_{k+1} + \varphi_{k+1}\ \mathrm{grad}\ \cdot) + \vec{L}\vec{u}_{k+1}\right] = 0$; $\vec{u}^{\,0}_{k+2} = -\frac{\vec{M}(\vec{u}_{k+1}) + \vec{L}(\vec{u}_k)}{(\lambda+\mu)(\mathrm{grad}\,\gamma)^2}$ (2.14) is obtained. The first one of these equations may be written down as

$$2\rho(\mathrm{grad}\,\gamma)^2\left(\frac{\partial}{\partial t}\varphi_{k+1}\frac{\partial}{\partial t}\gamma - a^2\,\mathrm{grad}\,\varphi_{k+1}\mathrm{grad}\,\gamma\right) + A\varphi_{k+1} + \mathrm{grad}\,\gamma\left(\vec{M}(\vec{u}^{\,0}_{k+1}) + \vec{L}(\vec{u}_{k+2})\right) = 0 \quad (2.15)$$

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For transversal waves, (2.18) and (2.20) holds. A,B,C,D here denote regular functions of α, β, τ_b. From (2.3) there follows also $\vec{u}^{\,0}_{k+2} = \frac{L(\vec{u}_k) + M(\vec{u}_{k+1})}{(\lambda+\mu)(\mathrm{grad}\,\gamma)^2}$ (2.21). The solution of the Cauchy problem (1.7), (1.8) is set up as (3.2). After some steps (3.6) is found, where $\vec{v}_{\omega aj}$ and $\vec{v}_{\omega bj}$ are vectors with regular components. The fundamental tensor is thus calculated as the sum of generalized plane waves of the form (3.2). By employing the methods of V. A. Borovikov, the author investigates a hyperbolic system in the sense of I. G. Petrovskiy. With $\tau_a < t < \tau_b$ and $\tau_b < t$, the components of the fundamental tensor are analytical functions of their arguments and with $t = \tau_b$ they have a δ-shaped singularity, viz.

$$h_{jk}(t, M, M_0) = V_{jka}\delta(t-\tau_a) + V_{jkb}\delta(t-\tau_b) + W_{jka}\varepsilon(t-\tau_a) + W_{jkb}\varepsilon(t-\tau_b) \quad (j, k = 1, 2, 3) \tag{4.1}$$

V_{jka}, V_{jkb}, W_{jka} and W_{jkb} are regular functions of t, M, M_0. ε is the

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Heavyside-function. In the plane case (4.2) holds, where V_{jka} and V_{jkb} are regular functions of their arguments. There are 11 references: 10 Soviet-bloc and 1 non-Soviet-bloc.

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C 111/ C 333

AUTHOR: Babich, V. M.

TITLE: Propagation of Rayleigh waves along the surface of a homogeneous elastic body of arbitrary shape

PERIODICAL: Akademiya nauk SSSR. Doklady, v.137, no.6, 1961, 1263-1266

TEXT: The author constructs solutions of the dynamic equations of the elastic body which generalize the well-known solutions of Rayleigh. The "classical" waves of Rayleigh form a superposition of two complex plane waves. If the plane wave is replaced by a "ray solution" and the half space, the surface of which is free of stress, by an arbitrary analytic surface, then one obtains the generalization mentioned.

Let $f_o(\zeta)$ be a function of the complex variable ζ and regular in the upper semiplane; let $f_k(\zeta)$ be successive integrals of $f_o(\zeta)$. As a longitudinal ray solution of the elastic equations (see V.M. Babich (Ref.2: DAN 110, No. 3, (1956)) and F. C. Karal, J. B. Keller (Ref.3: J. Acoust. Soc. Am., 31, No. 6, 694 (1959))) the author denotes the series

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$$u = \sum_{k=o}^{+\infty} u_{ka}(x,y,z)\, f_k(t - \tau_a(x,y,z)) \tag{1}$$

where

$$(\nabla \tau_a)^2 = \frac{1}{a^2}\left(a^2 = \frac{\lambda + 2\mu}{\rho}\right) \tag{2}$$

$$u_{ka} = u^o_{ka} + \varphi_k \nabla \tau_a;\ u^o_{ka} \perp \nabla \tau_a;\ u^o_{ka} = \frac{-M(u_{k-1,a}) + L(u_{k-2,a})}{\lambda + \mu} a^2 ; \tag{3}$$

$$(\lambda + 2\mu)(2 \nabla \varphi_k \nabla \tau_a + \varphi_k \Delta \tau_a) + (M(u_{ka}) - L(u_{k-1,a}))\nabla \tau_a = 0 \tag{4}$$

$$u_{-1} \equiv u_{-2} \equiv 0$$

where λ and μ are Lamé parameters

$$L(u) = (\lambda + \mu)\nabla(\nabla u) + \mu \Delta u,$$

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and $\mathbf{M}$ is the operator defined in (Ref.2).

The transverse ray solution is

$$u_b = \sum_{k=0}^{+\infty} u_{kb}(x,y,z)\, f_k(t - \tau_b(x,y,z)) \qquad (5)$$

where

$$(\nabla \tau_b)^2 = \frac{1}{b^2}, \quad b^2 = \frac{\mu}{\rho} \qquad (6)$$

$$u_{kb} = u^{o}_{kb} + u^{1}_{kb};\; u^{o}_{kb} \parallel \nabla \tau_b;\; u^{1}_{kb} \perp \nabla \tau_b;\; u^{o}_{kb} = \frac{\mathbf{M}(u_{k-1,b}) - \mathbf{L}(u_{k-2,b})}{\lambda + \mu}\, b^2 \qquad (7).$$

Instead of the condition (4) here it is postulated that the component vertical to $\nabla \tau_b$ of the vector

$$\mathbf{M}(u^{o}_{kb} + u^{1}_{kb}) - \mathbf{L}(u_{k-1,b}) \qquad (8)$$

vanishes.

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The elastic body is assumed to be bounded by the analytic surface S. As τ_a and τ_b there are taken solutions of (2) and (6) which satisfy

$$\tau_a\Big|_S = \tau_b\Big|_S = \tau_c; \quad \mathrm{Im}\,\frac{\partial \tau_a}{\partial \nu}\Big|_S < 0; \quad \mathrm{Im}\,\frac{\partial \tau_b}{\partial \nu}\Big|_S < 0 \qquad (9)$$

$$\mathrm{Im}\,\tau_c = 0, \quad \nabla(\tau_c, \tau_c) = \frac{1}{c^2} \qquad (10)$$

where ν--interior normal, $\nabla(\tau_c, \tau_c)$--first differential parameter of τ_c on S, c--velocity of the Rayleigh waves. On S a geodesic is led through every point of a fixed analytic curve $\gamma = \gamma(\alpha)$ then has two coordinates: $\tau = s/c$, where s is the length of the geodesic from $\gamma = \gamma(\alpha)$ to M, and α. For points outside of S as third coordinate ν the distance from the surface is taken.

The vector u'_{kb} is sought with the set up

$$u^1_{kb} = \psi_K \vec{\xi} + \psi_{K\eta} \vec{\eta} \qquad (12)$$

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where

$$\vec{\xi} = -\frac{1}{b\sqrt{1-b^2(\partial\tau_b/\partial\nu)^2}}\left(\vec{\nu}^0 - b^2\nabla\tau_b(\nabla\tau_b\vec{\nu}^0)\right) \qquad (13)$$

$$\vec{\eta} = \vec{\alpha}^0 - b^2\nabla\tau_b(\nabla\tau_b\vec{\alpha}^0) \qquad (14)$$

where $\vec{\nu}^0$ and $\vec{\alpha}^0$ have the contravariant components (0,0,1) and (0,1,0) in the system τ, α, ν.

Now the author gives conditions that $\mathcal{M} = u_a + u_b$ on S satisfies the condition of vanishing stress. After having introduced (3), (7), (12) into these conditions, one can determine φ_{k+1}, ψ_{k+1} and analogously φ_k, ψ'_k. The author states that φ_k and ψ'_k are determined except the summands

$$\bar{\varphi}_k = e\chi_k, \; \bar{\psi}_k = e_2\chi_k, \; e_1 = \frac{1}{b^2} - \frac{2}{c^2}, \; e_2 = \frac{2i}{c}\sqrt{\frac{1}{c^2} - \frac{1}{a^2}} \; .$$

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For the solubility of the problem the author obtains the sufficient and necessary conditions

$$A_1 \chi_k + A_2' \frac{d\chi_k}{ds} + A_3 \frac{\partial \varphi_k}{\partial \nu} + A_4 \frac{\partial \psi_k}{\partial \nu} + \dots = 0 .$$

These are explicitly given for the case k = 0:

$$A \frac{d\chi_0}{ds} + \left(B \frac{d \ln g_{\alpha\alpha}}{ds} + C \frac{b_{\tau\tau}}{c^2} + D \frac{b_{\alpha\alpha}}{g_{\alpha\alpha}} \right) \chi_0 = 0 \qquad (18)$$

where $g_{\alpha\alpha}, \dots, b_{\alpha\alpha}, \dots$ are the coefficients of the first and second Gaussian form,

$$A = -\frac{8}{c}\left(\frac{1}{b^2} - \frac{2}{c^2}\right)^2 + \frac{4}{c}\left(\frac{1}{b^2} - \frac{2}{c^2}\right)\left(\frac{1}{a^2} - \frac{2}{c^2}\right)\frac{\sqrt{1/c^2 - 1/b^2}}{\sqrt{1/c^2 - 1/a^2}} + \frac{4}{c}\left(\frac{1}{b^2} - \frac{2}{c^2}\right)^2 \frac{\sqrt{1/c^2 - 1/a^2}}{\sqrt{1/c^2 - 1/a^2}}, \quad B = \frac{1}{4} A; \qquad (19)$$

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$$C = \left(\frac{1}{b^2} - \frac{2}{c^2}\right) \frac{C_1 \partial \tau_a / \partial \nu + C_2 \partial \tau_b / \partial \nu}{(1/c^2 - 1/a^2)(1/c^2 - 1/b^2)}, \tag{20}$$

$$\begin{aligned} C_1 &= 2\left(\frac{1}{c^2} - \frac{1}{a^2}\right)\left(\frac{1}{c^2 b^2} - \frac{1}{b^4} - \frac{1}{c^4}\right), \\ C_2 &= \left(\frac{1}{b^2} - \frac{2}{c^2}\right)\left(\frac{1}{c^2} - \frac{1}{a^2}\right)\left(\frac{1}{c^2} - \frac{3}{2b^2}\right) + \frac{2}{c^2}\left(\frac{1}{c^2} - \frac{1}{b^2}\right)\left(\frac{2}{c^2} - \frac{3}{a^2}\right), \\ D &= \left(\frac{1}{b^2} - \frac{2}{c^2}\right) \cdot 2 \cdot \left(\frac{1}{b^2} - \frac{b^2}{c^4}\right)\frac{\partial \tau_a}{\partial \nu} + \left(\frac{1}{b^2} - \frac{2}{c^2}\right)\frac{b^2}{2}\left(\frac{1}{b^4} + \frac{4}{c^4}\right)\frac{\partial \tau_b}{\partial \nu}. \end{aligned} \tag{21}$$

Here A > 0, C and D--purely imaginary, therefore

$$|\chi_0(M)| = |\chi_0(M_0)| \sqrt{\frac{J(M_0)}{J(M)}} \tag{22}$$

where $J(M) = \sqrt{g_{\alpha\alpha}} \cdot |\chi_0(M)|^2$ is denoted as the intensity of the Rayleigh waves.

There are 3 Soviet-bloc and 3 non-Soviet-bloc references. The two

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Propagation of Rayleigh waves . . .   23842
S/020/61/137/006/001/020
C 111/ C 333

references to English-language publications read as follows:
F. C. Karal, J. B. Keller, J. Acoust. Soc. Am., 31, No. 6, 694 (1959); J. B. Keller, F. C. Karal, Excitation and Propagation of Surface Waves, Inst. of Math. Sci. Div. EM Res. Research Report NEM - 128, Febr. 1959.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet imeni A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

PRESENTED: November 28, 1960, by V. J. Smirnov, Academician

SUBMITTED: November 2, 1960

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APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V. M.

Dissertation defended for the degree of Doctor of Physicomathematical Sciences at the Joint Scientific Council on Physicomathematical and Technical Sciences; Siberian Branch

"Geometro-Optical Methods in the Theory of Nonstationary Waves and the Fundamental Solutions of Hyperbolic Equations."

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

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M.; KOVALEV, B.N.; LOZANOVSKAYA, L.Y.

Study of the singularities of fundamental solutions to regular equations near special points of the characteristic conoid. Vest. LGU 17 no.19:5-14 '62. (MIRA 15:10)
(Differential equations, Partial)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M.

Short-wave asymptotic behavior of Green's functions outside of a bounded convex region. Dokl. AN SSSR 146 no.3:571-573 S '62. (MIRA 15:10)

1. Leningradskiy gosudarstvennyy universitet im. A.A.Zhdanova. Predstavleno akademikom V.I.Smirnovym.
(Potential, Theory of) (Spaces, Generalized)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M.

Principle of interdependence for dynamic equations of the theory of elasticity. Vop. din. teor. raspr. seism. voln no.6:60-74 '62. (MIRA 16:7)

(Elasticity) (Seismic waves)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M.; KAPILEVICH, M.B.; MIKHLIN, S.G.; NATANSON, G.I.; RIZ, P.M.; SLOBODETSKIY, L.N.; SMIRNOV, M.M.; LYUSTERNIK, L.A., red.; YANPOL'SKIY, A.R., red. MIKHAYLOVA, T.N., red.

[Linear equations in mathematical physics] Lineinye uravneniia matematicheskoi fiziki. [By] V.M.Babich i dr. Moskva, Izd-vo "Nauka," 1964. 368 p. (MIRA 17:7)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M.

Estimation of a Green function for the Helmholtz equation in the shadow zone. Vest. LGU 20 no.7:5-15 '65. (MIRA 18:5)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M. (Leningrad)

Short-wave asymptotic behavior of Green's function for a Helmholtz equation. Mat. sbor. 65 no.4:576-630 D '64. (MIRA 18:3)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

ACC NR: AP6021404 (N) SOURCE CODE: UR/0387/66/000/006/0034/0038

AUTHOR: Babich, V. M.; Molotkov, I. A.

ORG: Academy of Sciences SSSR, Mathematics Institute im. V. A. Steklov (Akademiya nauk SSSR, Matemeticheskiy institut)

TITLE: Propagation of Love waves in an elastic half-space which is inhomogeneous in two coordinates

SOURCE: AN SSSR. Izvestiya. Fizika zemli, no. 6, 1966, 34-38

TOPIC TAGS: elastic wave, wave propagation, seismic wave

ABSTRACT: The dependence of Love waves on the coordinates and on the frequency is determined by the parabolic-equation method, first for an elastic half-space ($z \geq 0$) with Lame parameters λ, μ and density ρ that depend only on z, and then modifying the solution for a dependence on both z and x. The solution is obtained in the form

$$u(x, z, t) = \exp[-i\omega(t - xv_\Phi^{-1})]U(z, \omega)\mathbf{j},$$

where j is a unit vector in the y direction, so that the equation for U turns out to be

$$\frac{d}{dz}\left[\mu(z)\frac{dU}{dz}\right] + \omega^2\left[\rho(z) - \frac{\mu(z)}{v_\Phi^2}\right]U = 0. \qquad (4)$$

subject to the boundary condition that the derivation of U with respect to z vanishes at z = 0. In addition it is assumed that near the boundary of the half-space

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ACC NR: AP6021404

$$\frac{\partial b(x,z)}{\partial z} > 0, \quad b = \sqrt{\frac{\mu}{\rho}}, \qquad (1)$$

Since the phase velocity is always larger than the minimum of the transverse velocity b(z), the problem is restricted to the determination of the slowest Love waves among the waves for which

$$v_\Phi > b(0), \quad \frac{v_\Phi}{b(0)} - 1 \ll 1. \qquad (6)$$

It is shown that as the frequency becomes infinite, the solution of (4) can be expressed in terms of Airy functions. The final solution is obtained in the form

$$u_s(x,z,t) = \exp\{-i\omega[t - xb^{-1}(0)]\}\, U_s(x,z,\omega)\}, \qquad (12)$$

$$U_s(x,z,\omega) = c_s \exp\left(-\frac{i}{2}\omega^{1/3}\beta_0^{2/3}\xi_s x b(0)\right) v[\omega^{2/3}\beta_0^{1/3}(z - h_s)][1 + O(\omega^{2/3})],$$

in the case of inhomogeneity in the z direction only, and

$$u_s(x,z,t) = \exp\{-i\omega[t - \tau(x)]\}\, U_s(x,z,\omega)\}, \qquad (23)$$

$$U_s(x,z,\omega) = c_s \frac{n_z^{1/6}}{\mu^{1/2} n^{1/3}} \exp\left[-\frac{i\omega^{1/3}\xi_s}{2^{1/3}} \int_0^x \frac{|n_z(x,0)|^{2/3}}{n^{1/3}(x,0)}\, dx\right] \times$$

$$\times\, v[\omega^{2/3}\alpha^{1/3}(x)(z - h_s(x))][1 + O(\omega^{-1/3})], \qquad (24)$$

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ACC NR: AP6021404

in the case of inhomogeneity in both the x and z directions. The expression obtained for the phase velocity of the s-th Love wave is

$$v_\phi^{(s)}(x) = \frac{1}{\frac{d}{dx}\left[\tau(x) - \omega^{-2/3}\frac{\xi_s}{2^{1/3}}\int\limits_0 \frac{|n_z(x,0)|^{2/3}}{n^{1/3}(x,0)}dx + O(\omega^{-4/3})\right]} =$$

$$= b(x,0) + \omega^{-2/3}\frac{\xi_s}{2^{1/3}}\frac{|n_z(x,0)|^{2/3}}{n^{1/3}(x,0)} + O(\omega^{-4/3}). \quad (26)$$

and for the depth of penetration

$$h_s(x) = \omega^{-2/3}a^{-1/3}(x)\xi_s, \quad (25)$$

Orig. art. has: 26 formulas.

SUB CODE: 20, 08/ SUBM DATE: 20Jul65/ ORIG REF: 004

Card 3/3

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

L 31168-66 EWT(l)/EWT(m)/EWP(t) IJP(c) JD

ACC NR: AP6006820 SOURCE CODE: UR/0181/66/0080/02/0397/0401

AUTHOR: Barnanskiy, P. I.; Babich, V. M.

ORG: Institute of Semiconductors AN UkrSSR, Kiev (Institut poluprovodnikov AN UkrSSR)

TITLE: Anisotropy in the transverse magnetoresistance of n-Ge in strong pulsed magnetic fields

SOURCE: Fizika tverdogo tela, v. 8, no. 2, 1966, 397-401

TOPIC TAGS: germanium semiconductor, magnetic anisotropy, strong magnetic field, pulsed magnetic field, magnetoresistance

ABSTRACT: Since previous works on transverse magnetoresistance of *n*-germanium have been devoted basically to the temperature characteristics of this effect, the authors attempt to fill a gap in the literature by studying the anisotropy of this phenomenon in strong pulsed magnetic fields. Magnetic fields of 20,000-400,000 oersteds were generated by discharging a capacitance of 1800 μf through a solenoid with an internal diameter of 5 mm. A double oscillograph was used for the measure-

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ACC NR: AP6006820

ments. Antimony-doped germanium crystals with a resistivity of 10.5 Ω·cm were studied at room temperature. Curves are given showing the transverse magnetoresistance as a function of magnetic field strength for fields parallel to directions [100], [111] and [110]. Data for the saturation values of the transverse magnetoresistance for fields directed along axis [111] are applied in formulas from classical theory. The parameter for anisotropy is found to be 17 ± 0.5. It is found that the parameter for anisotropy of relaxation time is 1.14. A table is given showing minimum quantizing magnetic field intensities. The authors thank Ye. G. Miselyuk for constant interest in the work and useful discussion of the results. Orig. art. has: 3 figures, 2 tables.

SUB CODE: 20/ SUBM DATE: 07Jul65/ ORIG REF: 014/ OTH REF: 023

Card 2/2

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.M., inzh.

Current distribution between the ignitrons of electric locomotives by means of anode current dividers and current limiting reactors. Trudy TSNII MPS no.286:140-159 '65.

(MIRA 18:8)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.P., inzh.

Using electronic computers for automatic calculation of the output capacity of technological equipment of a machinery plant. Mashinostroenie no.4:7-9 Jl-Ag '65. (MIRA 18:8)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.P.

Methods for calculating the durability of the optimum repair cycle of industrial equipment. Mashinostroenie no.5:94-97 S-O '64. (MIRA 18:2)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

KOLEGAYEV, R.N., kand. ekonomicheskikh nauk; BARICH, V.P.

Norms for the compulsory planned repair system require economic verification. Mashinostroitel' no.4:5-7 Ap '65. (MIRA 18:5)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.V.

Calculating the rigidity of the jibs of construction cranes. Sbor. nauch. trud. Dnepr. inzh.-stroi. inst. no.31:82-93 '63 (MIRA 18:1)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, V.V., inzh.

Increasing the hoisting capacity of gantry cranes. Mont. i spets. rab. v stroi. 24 no.5:24-25 My '62. (MIRA 15:5)

1. Trest Dneprostal'konstruktsiya.
(Cranes, derricks, etc.)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

TARUSHKIN, P.A.; BABICH, V.V.

Assembling the structural elements in a plant for ball bearing pipes. Prom. stroi. 41 no.4:22-25 Ap '64. (MIRA 17:9)

1. Trest Dneprostal'konstruktsiya.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

KOZLOVA, N.M., inzh.; BABICH, V.V., inzh.

Practices in assembling structural elements for the complex of a sintering plant. Prom. stroi. 41 no.5:9-12 My '64. (MIRA 18:11)

1. Trest Dneprostal'konstruktsiya.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

YAVORSKIY, N.P. [IAvors'kyi, M.P.]; BABICH, Ye.M. [Babych, IE.M.]; KOREN'KOVA, E.P.

Photocolorimetric method for determining quinosol in some drugs. Farmatsev. zhur. 19 no.4:29-34 '64. (MIRA 17:11)

1. Kafedra farmatsevticheskoy khimii L'vovskogo meditsinskogo instituta (zaveduyushchiy kafedroy - prof. M.M. Turkevich).

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

MAKARENKO, L.P., kand.tekhn.nauk; BABICH, Ye.M., inzh.

Experimental investigations of the creep and elasticity of concrete under constant and diminishing stress. Stroi.konstr. no.2:109-118 '65. (MIRA 18:12)

1. Poltavskiy inzhenerno-stroitel'nyy institut.

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СЕАБІСН, YE. [P.]

9

Substituting anthracite for coke in the cupola furnace. E. Babich. *Domez* 1930, No. 12, 125-06.—Expts. were conducted to det. conditions for smelting iron in cupola furnaces with anthracite coal instead of with coke. The product obtained is satisfactory from the point of view of casting and machining properties, purity and mech. strength. However, to get good results, the following conditions must be observed. (1) A careful selection of the coal must be made by means of standardization. (2) The amt. and pressure of the wind must be controlled by means of proper instruments. (3) The wind should be at about 8 cu. m. per kg. of fuel at 600-700 mm. pressure (on water scale). (4) Coal lumps should be in the limits 3-5 in., depending on the kind of anthracite and diam. of furnace. (5) The tuyère should have a cross section 0.25-0.20 of that of the furnace. The ratio between fuel and cast iron is approx. the same as when coke is used. Smelting with anthracite gives a saving of 20% in the cost of fuel. Numerous tables and curves are given, showing results of the various tests.

S. L. Madorsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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BABICH, YE. P.

CA

9

PROCESSES AND PROPERTIES

Experiment in manufacture of alkali-resistant cast-iron kettles. E. P. Babich. *Khimicheskoe Mashinostroenie* 1933, No. 7, 9-15.—Admixts. which displace C in iron, such as Si, P and Ni, harm its alkali-resistivity. On the contrary, elements such as Mn, Cr, S, W and Mo, which assist in retaining the C in a combined state, are beneficial when used in a definite quantity. Walter P. Ericks

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

BABICH, YE. P.

Simple method for making pearlitic iron. E. Babich. *Liteinoe Delo* **8**, No. 10, 32-40(1937); *Met. Abstracts* (in *Metals & Alloys*) **9**, 352(1938). — Extended exptl. study of the influence of adding borings to the cupola charge. Borings were added as briquets, made by mixing them with cement and water and drying for a week in air. Prepn. and properties of briquets so produced are discussed. Addn. to the charge of 20-30% of borings lowers C content of the metal 8-10%, assures pearlitic structure with finely divided graphite, increases the strength of the metal and increases its wear resistance. The use of this amt. of borings results in total metal losses of 2%, Si drop of 18-20% while Mn loss and S absorption remain the same as in regular operation. Casting and other phys. properties improve with this practice. M. W. R.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, E.P.

9

ca

PROCESSES AND PROPERTIES INDEX

Briquetting metal shavings. E. P. Babich. Russ. 55,173, June 30, 1939. Metal shavings are mixed with 5-10% powd. chalk, heated to about 200°, treated with a mixt. of 80-90% coal tar pitch and 10-20% anthracene oil, and pressed.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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L 19183-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

ACCESSION NR: AR3004208 S/0276/63/000/005/G049/G050

SOURCE: RZh. Tekhnologiya mashinostroyeniya, Abs. 5G317

AUTHOR: Babich, Ye. P.; Voloshina, A. S.; Maksimova, L. N.; Saburov, V. P.; Topallor, A. N.

TITLE: Study of causes of formation of sievelike porosity in cast steel

CITED SOURCE: Sb. Liteyn. proiz-vo. Omsk, 1962, 51-74

TOPIC TAGS: sievelike porosity, cast steel, porosity formation, sievelike porosity

TRANSLATION: Results of experiments confirmed the theory of sievelike porosity formation (SP). Conditions for formation of sievelike porosity are: simultaneous presence in liquid steel of hydrogen and ferrous oxide in quantities greater than critical at the time of formation of a hard skin on the cast; as well as a long time interval between filling the mold and skin formation on the surface of the cast. SP has been successfully artificially created by introducing as oxidizer manganese peroxide into normally oxidized steel. A method has been developed for detection of SP by means of etching the cast surface after removing from it a 2 mm. layer. By utilizing the method of artificially obtaining SP and the method of its

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detection the effect of a number of factors affecting the formation of SP has been established and tested. These factors may be divided into those that contribute to the formation of SP (presence of humidity in the mold, additions etc; increase in filling density and hence a decrease in gas permeability of the mold; high temperature of casting), and those which either impair SP formation or completely eliminate it (increasing carbon content in steel, increase in ferrostatic pressure, sufficient thickness of cast walls and qualitative deoxidation of metal in the furnace, with a necessary quantity of aluminum in the ladle). Eight figures, twelve references.

DATE ACQ: 21Jun63 SUB CODE: IE, MA ENCL: 00

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

S/128/62/000/005/003/005
A004/A127

AUTHORS: Babich, Ye.P.; Saburov, V.P.; Postyka, V.V.

TITLE: Formation of screen-like porosity in steel castings

PERIODICAL: Liteynoye proizvodstvo, no. 5, 1962, 30 - 32

TEXT: The authors describe the phenomenon of screen-like porosity in steel castings and a number of characteristic features connected with it. They refer to extensive investigations carried out to elucidate the various factors leading to a formation of screen-like porosity. The process of screen-like porosity formation consists of four periods, the first of which lasts from the moment of the liquid metal being poured into the mold up to the formation of a solid skin on the casting surface. The second period starts simultaneously with the first and extends from the beginning of the interaction between the mold humidity and the liquid metal to the point when the molding sand becomes completely dry. The third period sets in immediately after the second when the free hydrogen either escapes into the air or dissolves in the metal, where its concentration might attain 0.0024%. The fourth period begins when the first is

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A004/A127

Formation of screen-like porosity in steel castings

drawing to a close, and if this occurs prior to the termination of the second and third period, a high hydrogen concentration remains underneath the forming solid skin. The authors give a detailed description of the mechanism and the conditions of the formation of screen-like porosity, comment on tests being carried out with specially prepared specimens and point out that the greatest amount of pores formed with a medium wall thickness of the casting, which corresponds to the conditions of the peculiar maximum of screen-like porosity. If the carbon content of the steel casting is raised, the possibility of the formation of screen-like porosity is considerably reduced on account of the increased tendency of low-carbon steels to oxidation and a reduction of the melting temperature of steels with an elevated carbon content. The harmful effect of a high humidity of the mold is also emphasized and was confirmed in appropriate tests. If the steel is poured into dry molds the necessary conditions for the formation of screen-like porosity do not prevail, and the specimens cast in dry molds were free from porosity. In their conclusion, the authors stress the point that the formation of screen-like porosity is caused by the simultaneous presence in the steel of hydrogen and ferrous oxide during the formation of the solid skin, i.e., in amounts which exceed the critical magnitude, and by the duration of the in-

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S/128/62/000/005/003/005
A004/A127

Formation of screen-like porosity in steel castings

terval between the pouring and the formation of the solid skin on the casting surface. There are 4 figures. The English-language reference reads as follows: Sims, C.E. "Foundry", 69, 1, 1941.

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

SHEVTSOV, A.L.; BABICH, Ye.P. [deceased]

Indice of the technological properties of G13L steel. Lit. proizv. no.8:5-6 Ag '64. (MIRA 18:10)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

15-57-3-4019

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 3, p 211 (USSR)

AUTHORS: Motyakov, V. I., Babich, Yu. A.

TITLE: Experimental Investigations in Secondary Recovery Methods of Oil Fields Using an Electric Model (Eksperimental'nyye issledovaniya po vtorichnym metodam razrabotki neftyanykh mestorozhdeniy na elektricheskoy modeli EM-8 UMNP)

PERIODICAL: Izv. AN AzerbSSR, 1955, Nr 10

ABSTRACT: Bibliographic entry

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APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

MOTYAKOV, V.I.; BABICH, Yu.A.

Experimental study of secondary recovery methods in oil fields on the EM-8 UMNP electric model. Izv.AN Azer.SSR no.10:33-40 O '55.
(Oil field flooding--Electromechanical analogies) (MLRA 9:4)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

ALESKEROV, S.A.; BABICH, Yu.A.; MOTYAKOV, V.I.; CHAL'YAN, K.M.

Experimental study on electrical models of individual problems of geological and technological projections of an alternating sandy--clay horizon. Izv.AN Azerb.SSR no.8:21-29 Ag '56. (MLRA 9:11)
(Petroleum geology--Electromechanical analogies)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

SOV/124-57-4-4474

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 4, p 87 (USSR)

AUTHOR: Babich, Yu. A.

TITLE: The Effect of Nonuniform Permeability of the Roof of a Reservoir on the Leakage of a Liquid From the Reservoir (Vliyaniye neodnorodnoy pronitsayemosti krovli plasta na utechku iz nego zhidkosti)

PERIODICAL: Dokl. AN AzerbSSR, 1956, Vol 12, Nr 3, pp 169-171

ABSTRACT: A presentation of the results of an experimental investigation dealing with the effects of the nonuniform permeability of the roof of a reservoir on possible leakage of liquid from it into a layer at a higher level. The investigations were carried out on an electric analog computer EM-8. The roof of the reservoir consisted of an argillaceous diaphragm composed of two sections of different permeability. It is concluded that a significant degree of leakage from the reservoir being exploited to a layer situated at a higher level is possible if the more permeable portion of the argillaceous arch is located in the vicinity of an injection well; if, however, it is located in a region of producing wells, the leakage is even smaller than it would be in the case of uniform permeability (of the same magnitude) of the overburden.

T. I. Matveyenko

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, Yu.A.

Experimental study of the effect of roof rock permeability on leakage of fluid from the oil sands. Neft.khoz.34 no.6:35-38 Je '56. (MIRA 9:9)
(Petroleum geology) (Permeability)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, Yu. A.

124-11-12925

Translation from: Referativnyy Zhurnal, Mekhanika, 1957, Nr. 11, p. 92 (USSR)

AUTHORS: Aleskerov, S. A., Babich, Yu. A., Motyakov, V. I., Chal'yan, K. M.

TITLE: Experimental Solution of Problems Described by Fourier's Equation on an EM-8 Electrical Analog Computer. (Opytnoye reshenie zadach, opisyvayemykh uravneniyem Fur'ye, na elektricheskoy modeli EM-8).

PERIODICAL: Izv. A. N AzSSSR, 1957, Nr. 1, pp 21-29

ABSTRACT: The paper presents the results of several experimental investigations on the EM-8 electrical analog computer, the prototype of which was developed and constructed at the Institute for Exact Mechanics and Computer Techniques of the USSR Academy of Sciences. The device was used to derive a number of experimental solutions for differential equations of the parabolic type

$$\frac{\partial}{\partial x}\left(A\frac{\partial U}{\partial x}\right)+\frac{\partial}{\partial y}\left(B\frac{\partial U}{\partial y}\right)=C\frac{\partial U}{\partial t},$$

where A, B, and C are known functions of a point (x, y). The

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БАБИЧ, Ю.А.

MIRZADZHANZADE, A.Kh.; BABICH, Yu.A.; SHAPIRO, B.A.

Effect of silt accumulation in filters on the production of wells.
Azerb. neft.khoz. 36 no.9:17-20 S '57. (MIRA 11:2)
(Silt) (Oil wells)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, Yu.A.

16(0); 28(2) PHASE I BOOK EXPLOITATION SOV/3365

Akademiya nauk Azerbaydzhanskoy SSR

Tezisy dokladov Soveshchaniya po vychislitel'noy matematike i primeneniyu sredstv vychislitel'noy tekhniki (Outlines of Reports of the Conference On Computational Mathematics and the Use of Computer Techniques) Baku, 1958. 65 p. 400 copies printed.

Additional Sponsoring Agencies: Akademiya nauk SSSR. Vychislitel'nyy tsentr, and Akademiya nauk SSSR. Institut avtomatiki i telemekhaniki.

No contributors mentioned.

PURPOSE: This book is intended for pure and applied mathematicians, scientists, engineers and scientific workers, whose work involves computation and the use of digital and analog electronic computers.

COVERAGE: This book contains summaries of reports made at the Conference on Computational Mathematics and the Application of Computer Techniques. The book is divided into two main parts. The first part is devoted to computational mathematics and contains 19 summaries of reports. The second section is devoted to computing techniques and contains 20 summaries of reports. No personalities are mentioned. No references are given.

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APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

PIRVERDYAN, A.M.; BABICH, E.S.; BABICH, Yu.A.

Approximate method for calculating fluid flow toward a circular array of wells operating under original pressure. Izv. vys. ucheb. zav.; neft' i gaz no.6:55-60 '58. (MIRA 11:9)

1. Azerbaydzhanskiy industrial'nyy institut im. M. Azizbekova, Azerbaydzhanskiy nauchno-issledovatel'skiy institut dobychi nefti i gaza i AN Azerbaydzhanskoy SSR.
(Oil field flooding)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, Yu.A.

Use of Schwartz' method in solving problems in underground hydraulics. Izv. AN Azerb. SSR. Ser. fiz. tekh. i khim. nauk no.2:61-66 '59. (MIRA 12:8)
(Oil reservoir engineering)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, Yu.A.; NIKITIN, P.I.; PIRVERDYAN, A.M.

Study of the process of intraboundary flooding of a pool on an EM-8 electric model. Izv. vys. ucheb. zav.; neft' i gaz 3 no.7: 47-51 '60. (MIRA 15:5)

1. Azerbaydzhanskiy institut nefti i khimii imeni M. Azizbekova, AN Azerbaydzhanskoy SSR, i Azerbaydzhanskiy nauchno-issledovatel'skiy institut po dobyche nefti.

(Oil field flooding--Models)

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"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

BABICH, Yu.A.; NIKITIN, P.I.; PIRVERDYAN, A.M.

Dynamics of oil well flooding in nonuniform strata. Azerb. neft. khoz. 39 no.3(405):20-22 Mr '60. (MIRA 14:9)
(Oil field flooding)

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0"

"APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000102820017-0

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PHASE I BOOK EXPLOITATION SOV/5962

Vsesoyuznoye soveshchaniye po vychislitel'noy matematike i primeneniyu sredstv vychislitel'noy tekhniki, Baku, 1958.

Trudy (Transactions of the All-Union Conference on Computer Mathematics and Applications of Computers) Baku, Izd-vo AN Azerbaydzhanskoy SSR, 1961. 254 p. 500 copies printed.

Sponsoring Agency: Akademiya nauk Azerbaydzhanskoy SSR. Vychislitel'nyy tsentr.

Eds.: A.A. Dorodnitsyn, S.A. Aleskerov, and K.F. Shirinov; Ed. of Publishing House: A. Til'man; Tech. Ed.: T. Ismailov.

PURPOSE: The book is intended for mathematicians and other specialists interested in computer theory and uses for computers.

COVERAGE: The book contains the texts of 24 papers presented at the All-Union Conference on Computer Mathematics and Applications of Computers held in Baku, 3-8 Feb 1958. The "Resolution"

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of the conference, consisting of proposals for accelerating the development of computer mathematics and computer engineering, is also included.

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