POL/22-59-8-3/8

Remote Guidance of Missiles

and illustrated by diagrams. The author also explains three methods of intercepting: following the target, aligning the missile against the target ("covering" the target from outside), or guiding with anticipation of the target's movement. The range of action: air to air - the shortest range, but the highest accuracy needed; air to ground - 15-30 km, high accuracy not needed; ground to air - very high accuracy needed at a distance amounting to tens of kilometers; ground to ground - with movable targets the range is comparatively short (up to 10 km), against stationary targets the range may reach thousands of kilometers, the accuracy depending on the extent of the target and the method of guidance.
There are 19 schematic diagrams and 16 references of which 4 are Soviet, 1 German, and 11 English.

ASSOCIATION: Katedra Techniki Fal Ultrakrótkich, Politechniki Warszawskiej (Chair of Ultra-Short Waves, Polytechnic of Warsaw)

16(1) SOV/20-126-4-3/62

AUTHOR: Lizorkin, P.I.

TITLE: Boundary Value Properties of a Certain Class of Functions

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 4, pp 703-706 (USSR)

ABSTRACT: Let G be a bounded domain with a sufficiently smooth boundary Γ; let $\sigma(x,y)$ be a bounded measurable function; $c_1 \varrho^{\alpha} \leqslant \sigma(x,y) \leqslant c_2 \varrho^{\alpha}$, ϱ - distance of the point (x,y) from the boundary. The author considers functions u(x,y) summable in G and there having generalized (in the sense of S.L.Sobolev) derivatives $\frac{\partial u}{\partial x}$, $\frac{\partial u}{\partial y}$, where the integral

$$D_{p,\sigma}(u,G) = \iint\limits_G \sigma(x,y) |\mathrm{grad}\ u|^p \, dxdy$$

is finite.
It is stated that for $1 < p < \infty$; $0 \leqslant \alpha < p-1$ the function u(x,y) has boundary values ("trace" on the boundary) $u(x,y)|_{\Gamma} = \varphi(s)$ (in the sense of the almost-everywhere-convergence in the normal direction), being summable in the power p.
Principal theorem: In order that $\varphi(s)$ is the trace of u(x,y) it is necessary and sufficient that $\varphi(s)$ is summable on Γ and that

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Boundary Value Properties of a Certain Class of Functions SOV/20/126-4-3/...

$$\iint\limits_{\Gamma\times\Gamma} \frac{|\varphi(t) - \varphi(\tau)|^p}{|t-\tau|^{p-\alpha}}\, dt\, d\tau < \infty .$$

The author mentions S.L.Sobolev, V.I.Kondrashov, S.M.Nikol'skiy, L.D.Kudryavtsev, and A.A.Vosharin.
There are 9 references, 6 of which are Soviet, 1 Italian, 1 French, and 1 Polish.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering-Physical Institute)

PRESENTED: February 24, 1959, by S.L.Sobolev, Academician

SUBMITTED: February 9, 1959

Card 2/2

LIZORKIN, P. I. Cand Phys-Math Sci -- "Boundary properties of functions of ~~the~~ weight classes ~~weighting categories~~ and their application to certain problems of mathematical physics." Mos, 1960. (Math Inst im V. A. Steklov) (KL, 1-61, 179)

S/020/60/132/03/07/066

AUTHOR: Lizorkin, P.I.

TITLE: Boundary Properties of Functions From 4 "Weight" Classes

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 3, pp. 514-517

TEXT: The present paper originated in the seminar of S.M. Nikol'skiy, V.I. Kondrashov and L.D. Kudryavtsev in the Mathematical Institute AS USSR and is a continuation of the author's investigations (Ref. 4) on the boundary properties of functions of the W_p^r, where $r \geqslant 0$ must not necessarily be integral.
Six long theorems without proof are formulated. The theorems 1,4 and 6 are already published by S.V. Uspenskiy (Ref. 15). In a special case theorem 3 is contained in a paper of A.A. Vasharin (Ref. 5). Theorem 2 asserts that in the E_n there exists a function the derivatives of which have certain prescribed boundary values. Theorem 5 contains a special assertion of imbedding. The author mentions S.L. Sobolev. There are 15 references : 13 Soviet, 1 French and 1 English.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering-Physical Institute)

PRESENTED: January 20, 1960, by S.L. Sobolev, Academician

SUBMITTED: January 5, 1960

Card 1/1

86402
S/020/60/134/004/028/036XX
C111/C333

16.3500

AUTHOR: Lizorkin, P.I.

TITLE: Dirichlet Principle for Beltrami Equation in a Semispace

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 4, pp. 761-764

TEXT: A twice continuously differentiable function $u(x_1,\ldots,x_n) \equiv u(x)$ is sought which satisfies the equation

(1) $$\sum_{i=1}^{n} \frac{\partial^2 u}{\partial x_i^2} + \frac{\mu}{x_n}\frac{\partial u}{\partial x_n} \equiv \Delta u + \frac{\mu}{x_n}\frac{\partial u}{\partial x_n} = 0$$

for $x_n > 0$, where $|\mu| < 1$, the trace of which is the function $\varphi(x_1,\ldots,x_{n-1}) \equiv \varphi(x)$ for $x_n = 0$ (i.e. for almost all x of the hyperplane E_{n-1} $(x_n=0)$ it holds $\lim\limits_{x_n \to 0} u(x_1,x_2,\ldots,x_{n-1},x_n) = \varphi(x_1,\ldots,x_{n-1})$), and which possesses a finite weight integral

(2) $$\int\limits_{E_n^+(x_n>0)} x_n^{\mu} (\text{grad } u)^2 \, dX.$$

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Dirichlet Principle for Beltrami Equation in a Semispace

Fundamental result: Theorem 1: The problem possesses a solution, and a unique one, if and only if $\varphi(x) \in W_2^{1-\frac{1+\mu}{2}}(E_{n-1})$. The solution can be obtained, if the functional (2) is minimized in the class of all functions of $\hat{W}^1_{2,\mu}(E_n^+)$ with the trace $\varphi(x)$.

The theorem completes the results of L.D.Kudryavtsev (Ref. 2,3). The set of the functions u(X) locally summable in $E_n^+(x_n > 0)$ which possess in E_n^+ generalized derivatives $\partial u/\partial x_i$ with finite weight integral $D_{2,\mu}(u) = \int_{E_n^+} x_n^{\mu} \sum \left(\frac{\partial u}{\partial x_i}\right)^2 dX$ and the traces of which $u(X)\big|_{x_n=0} \equiv \varphi(x)$ on E_{n-1} are square summable $(\varphi(x) \in L_2(E_{n-1}))$ is denoted by $W^1_{2,\mu}(E_n^+)$. By introducing the norm $\|u\|^2_{\hat{W}^1_{2,\mu}} = \|\varphi\|^2_{L_2(E_{n-1})} + D_{2,\mu}(u)$ this set is transformed into a

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S/020/60/134/004/028/036XX
C/111/C333

Dirichlet Principle for Beltrami Equation in a Semispace

complete normed space. For proving the uniqueness the author uses the lemma: Let the twice continuously differentiable function $U(X) \in \hat{W}^1_{2,\mu}$ satisfy (1). Then $D_{2,\mu}(U,\psi) = \int_{E_n^+} x_n^{\mu}$ (grad U grad ψ)dX is equal to zero for every $\psi(X) \in \hat{W}^1_{2,\mu}$ with vanishing trace on E_{n-1}.

Finally the author gives the following - partially known - result (formula (4) is taken from (Ref. 7)) : Theorem :

Let the function $\dfrac{\varphi(x)}{(1+|X|^2)^{\frac{n-\mu}{2}}}$ be summable in E_{n-1}. Then

$$(4) \quad U_{\mu}(X) = \pi^{\frac{1-\mu}{2}} \frac{\Gamma\left(\frac{n-\mu}{2}\right)}{\Gamma\left(\frac{1-\mu}{2}\right)} x_n^{1-\mu} \int_{E_{n-1}} \frac{\varphi(y)dy}{\left(|x-y|^2+x_n^2\right)^{\frac{n-\mu}{2}}}$$

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Dirichlet Principle for Beltrami Equation in a Semispace

is the solution of (1) and has the trace $\varphi(x)$. If, moreover, $\varphi(x) \in W_p^{(r)}(E_{n-1})$, $r = \bar{r} - \frac{1+\alpha}{p}$, $\bar{r} \geq 1$ integer, $-1 < \alpha < p-1$, then it holds

$$(5) \quad \int_{E_n^+} x_n^{\alpha+pl} \sum_{\alpha_1+\ldots+\alpha_n=\bar{r}+1} \left| \frac{\partial^{\bar{r}+1} u_\mu}{\partial x_1^{\alpha_1} \ldots \partial x_n^{\alpha_n}} \right|^p dX \leqslant$$

$$\leq c_1 \sum \int_{E_{n-1}} dx \int \frac{|\varphi^{(\bar{r}-1)}(x) - \varphi^{(\bar{r}-1)}(y)|^p}{|x-y|^{n-2+p-\alpha}} dy, \quad l = 0,1,\ldots,$$

where C_1 does not depend on φ and the sum on the right side is taken over all derivatives of order $\bar{r} - 1$ of φ.
S.M. Nikol'skiy is mentioned in the paper.
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S/020/60/134/004/028/036XX
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Dirichlet Principle for Beltrami Equation in a Semispace

There are 7 references : 6 Soviet and 1 English.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering Physics Institute)

PRESENTED: May 17, 1960, by S.L. Sobolev, Academician

SUBMITTED: April 30, 1960

Card 5/5

S/020/61/137/005/003/026
C111/C222

16.3500

AUTHORS: Vasharin, A.A., and Lizorkin, P.I.

TITLE: Certain boundary value problems for elliptic equations with a strong degeneration at the boundary

PERIODICAL: Akademiya nauk SSSR.Doklady, vol.137,no.5,1961,1015-1018

TEXT: Let G be a simply connected region with a piecewise smooth boundary Γ which contains the piece Γ_0 of the Ox-axis. In G the authors consider

$$L(u) = \frac{\partial}{\partial x}\left[\sigma^k(x,y)\frac{\partial u}{\partial x}\right] + \frac{\partial}{\partial y}\left[\sigma^k(x,y)\frac{\partial u}{\partial y}\right] = 0, \quad (2)$$

where $\sigma(x,y)$ is sufficiently smooth and positive, where $c_1 y < \sigma(x,y) < c_2 y$, $c_1, c_2 > 0$. The degeneration on Γ_0 is called strong for $k \geq 1$ and weak for $k < 1$; $k = 1$ is called the critical case.

Let $k > 1$.

Problem A: Determine a solution of (2) two times continuously differentiable in G which in the mean on Γ assumes the values

$$\lim_{(x,y)\to M\in\Gamma}\left[\sigma^{k-1}(x,y)u(x,y)\right] = \varphi(M). \quad (3)$$

Card 1/4

Theorem 1: Let Γ does not touch the axis Ox and let it have no degenerated corners. If $1 < k < 2$, if $\sigma(x,y)$ is 4 times boundedly differentiable and $\Delta\sigma \geqslant 0$ then the problem A has a unique solution if the postulates

$$a)\ \varphi(M) \in L_2(\Gamma); \qquad b)\ \int_\Gamma ds_M \int_\Gamma \frac{|\varphi(M) - \varphi(Q)|^2}{|MQ|^2}\, \omega^{2-k}(M,Q)\, ds_Q < \infty \tag{4}$$

are satisfied, where $\omega(M,Q)$ is the distance $|MQ|$ between the points M and Q if at least one of the points lies on Γ_0 and in the other case it is equal to the smaller of the distances of these points from the Ox-axis.

The restriction $k < 2$ is caused by the proof.

As an example the authors consider the problem A for

$$\frac{\partial}{\partial x}\left[y^k \frac{\partial u}{\partial x}\right] + \frac{\partial}{\partial y}\left[y^k \frac{\partial u}{\partial y}\right] = 0 \tag{1}$$

in the halfplane $y > 0$. Putting $y^{k-1}u = v$ then one obtains the equation

$$\frac{\partial}{\partial x}\left(y^{2-k}\frac{\partial v}{\partial x}\right) + \frac{\partial}{\partial y}\left(y^{2-k}\frac{\partial v}{\partial y}\right) = 0,$$

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R000930310019-5"

and the solution is given by

$$u_o(x,y) = \frac{1}{\sqrt{\pi}} \frac{\Gamma(k/2)}{\Gamma((k-1)/2)} \int_{-\infty}^{\infty} \frac{\varphi(\xi)d\xi}{[(x-\xi)^2+y^2]^{k/2}} \qquad (6)$$

for all $k>1$.
Let $k = 1$ and for reasons of simplicity $\sigma \equiv y$.
Problem B: Find in G a two times continuously differentiable solution of

$$L_1(u) = y\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right) + \frac{\partial u}{\partial y} = 0$$

which on the boundary in the mean assumes the values

$$\left[\frac{1}{\ln \frac{M}{y}} \; u(x,y)\right]_{(x,y)\to P\in\Gamma} = \varphi(P)$$

and which possesses the finite integral

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R000930310019-5"

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C111/C222

Certain boundary value problems...

$$\iint_G y \ln^2 \frac{M}{y} \left\{ \left[\frac{\partial}{\partial x} \left(\frac{1}{\ln \frac{M}{y}} u \right) \right]^2 + \left[\frac{\partial}{\partial y} \left(\frac{1}{\ln \frac{M}{y}} u \right) \right]^2 \right\} dx\, dy,$$

where M = const is greater than the diameter of the region.
Let G satisfy the postulates of theorem 1 and let $\omega(P,Q)$ have the same sense.
Theorem 2: In order that problem B has a solution it is necessary and sufficient that $\varphi(P)$ satisfies the conditions

$$\text{a)}\ \varphi(P) \in L_2(\Gamma); \quad \text{b)} \int_\Gamma ds_P \int_\Gamma \frac{|\varphi(P) - \varphi(Q)|^2}{|PQ|^2}\, \omega(P,Q)\, ds_Q < \infty. \qquad (7)$$

There are 6 Soviet-bloc and 1 non-Soviet-bloc references.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering-Physical Institute)

PRESENTED: November 25, 1960, by S.L.Sobolev, Academician

SUBMITTED: November 11, 1960

Card 4/4

16.3500

27253
S/020/61/139/005/003/021
C111/C222

AUTHOR: Lizorkin, P.I.

TITLE: Green's E-function of Beltrami's operator and some variation problems

PERIODICAL: Akademiya nauk SSSR, Doklady., v.139, no. 5, 1961, 1052 - 1055

TEXT: Problem E : In the region Ω^+ being adjacent to the x-axis, determine a two times continuously differentiable and bounded solution of

$$B_k(u) = \frac{\partial}{\partial x}\left\{ y^k \frac{\partial u}{\partial x}\right\} + \frac{\partial}{\partial y}\left\{ y^k \frac{\partial u}{\partial y}\right\} = 0 \quad , \qquad (1)$$

where $k > 1$, which on the part Γ^+ of the boundary $\partial\Omega^+$ of Ω^+ lying in the upper halfplane assumes prescribed continuous values F(M).
In the case of a semicircle $K^+\{x^2 + y^2 < R^2 \ , \ y > 0\}$ the solution can be found with the aid of the fundamental solution $G(x,y;\xi,\eta)$ of (1) which has the following properties :

a) $G(x,y\ ;\xi,\eta) = G(\xi,\eta;\ x,y)$

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APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R000930310019-5"

b) $G(x,y\ ;\ \xi,\ \eta) = 0$ on $\Gamma^{+}\left\{x^2 + y^2 = R^2\ ,\ y > 0\right\}$

c) $G|_{y=0}$ bounded ; $\partial G/\partial y|_{y=0} = 0$.

This solution here is called the Green's E-function for K^{+}.
For constructing G, the author starts from the fundamental solution

$$g(x,y\ ;\ \xi,\ \eta) = \int_0^{\pi} \frac{\sin^{k-1}\alpha\, d\alpha}{\left[(x-\xi)^2 + \eta^2 + y^2 - 2y\eta\cos\alpha\right]^{k/2}}$$

found in (Ref. 2: J.B. Diaz, A. Weinstein, Stud. in Math. and Mech., no.4 (1954)). With the aid of an electrostatic method then it follows

$$G(x,y\ ;\ \xi,\ \eta) = \frac{1}{2\pi}\left\{- g(x,y\ ;\ \xi,\ \eta) + \left(\frac{R}{\varrho}\right)^k g(x,y\ ;\ \xi^{*},\ \eta^{*})\right\}\ ,$$

where $\varrho = \sqrt{\xi^2 + \eta^2}$ and (ξ^{*}, η^{*}) is the point inverse to (ξ, η) with respect to $x^2 + y^2 = R^2$.

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For the solution of problem E herefrom it follows the explicit expression

$$u_R(\xi, \eta) = \tag{2}$$

$$= \frac{kR^k}{2\pi} \int_0^{\pi} \sin^k \varphi \cdot F(\varphi) \left\{ \int_0^{\pi} \frac{(R^2 - \xi^2 - \eta^2) \sin^{k-1} \alpha \, d\alpha}{\left[(R\cos\varphi - \xi)^2 + R^2 \sin^2 \varphi + \eta^2 - 2R\eta \cos\alpha \cdot \sin\alpha\right]^{(k+2)/2}} \right\} d\varphi .$$

Let Ω^+ be simply connected, let the boundary decompose into the part Γ_0 on the x-axis and the part Γ^+ in the upper half plane. The trace of a function u(x,y) defined in Ω^+ on the smooth piece $\gamma \subset \Gamma$ is a function F(M) for which $\lim\limits_{\substack{\mathfrak{a} \\ (x,y)\to M}} u(x,y) = F(M)$ for almost all $M \in \gamma$ ($\mathfrak{a} = \mathfrak{a}(x,y)$ denotes the directional field being non-tangential to γ).

Problem E_{var}: Find an (analytic) solution u(x,y) of (1) which as the trace on Γ^+ has the given function F(M) and which has the finite integral

$$D_k(u) = \iint_{\Omega^+} y^k \left\{ \left(\frac{\partial u}{\partial x} \right)^2 + \left(\frac{\partial u}{\partial y} \right)^2 \right\} dxdy, \quad k > 1 . \qquad (3)$$

Theorem 1: Necessary and sufficient for the existence of a solution of the problem E_{var} is

$$1) \int_{\Gamma^+} y^k |F(M)|^2 ds < \infty ; \qquad (4)$$

$$2) \int_{\Gamma^+} ds_M \int_{\Gamma^+} \frac{|F(M) - F(Q)|^2}{|MQ|^2} \omega^k(M,Q) ds_Q < \infty ,$$

where $\omega(M,Q)$ is the less of the distances of the points M and Q from the x-axis.

Theorem 2 : The solution of E_{var} is unique.

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Green's E-function of Beltrami's ... C111/C222

Finally it is shown that the solution u of E_{var} in the classical sense satisfies the condition $\partial u/\partial y|_{y=0} = 0$.

The author mentions : M.V. Keldysh, L.D. Kudryavtsev and S.L. Sobolev. There are 5 Soviet-bloc and 2 non-Soviet-bloc references. The references to the two English-language publications read as follows : J.B. Diaz, A. Weinstein, Stud. in Math. and Mech., no. 4 (1954) ; G. Hardy, D. Littlewood, G. Polya, Neravenstva (Inequalities) 1948.

ASSOCIATION: Moskovskiy inzhenerno-fizicheskiy institut (Moscow Engineering-Physical Institute)

PRESENTED: April 1, 1961, by M.A. Lavrent'yev, Academician

SUBMITTED: March 23, 1961

X

Card 5/5

LIZORKIN, P.I.

Embedding theorems for functions from L_p^r spaces. Dokl. AN SSSR 143 no.5:1042-1045 Ap '62. (MIRA 15:4)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Predstavleno akademikom S.L.Sobolevym.
(Topology) (Functions, Continuous)

LIZORKIN, P.I.

$L^r_p(\Omega)$ spaces; continuation and imbedding theorems. Dokl.AN SSSR 145 no.3:527-530 Jl '62. (MIRA 15:7)

1. Matematicheskiy institut imeni V.A.Steklova AN SSSR. Predstavleno akademikom I.M.Vinogradovym.
(Topology)

LIZORKIN, P.I.

"Methods of mathematical physics." Vol.2 by R.Courant, D.Hilbert. "Partial differential equations" by R.Courant. Reviewed by P.I. Lizorkin. Zhur.vych.mat.i mat.fiz. 3 no.2:411-412 Mr-Ap '63. (MIRA 16:4)

(Mathematical physics) (Differential equations)
(Courant, R.) (D.Hilbert)

LIZORKIN, P.I. (Moskva)

Generalized Liouville differentiation and L_p^r (E_n) functional spaces; imbedding theorems. Mat. sbor. 60 no.3:325-352 Mr '63. (MIRA 16:3)

(Functions) (Spaces, Generalized)

LIZORKIN, P.I.

Characteristics of boundary values of functions from $L_p^r(E_n)$ on hyperplanes. Dokl. AN SSSR 150 no.5:984-986 Je '63. (MIRA 16:8)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Predstavleno akademikom M.A.Lavrent'yevym.

(Functions of several variables)

LIZORKIN, P.I.

(L_p, L_q)-multipliers of Fourier integrals. Dokl. AN SSSR 152 no.4:808-811 O '63. (MIRA 16:11)

1. Matematicheskiy institut im. V.A. Steklova AN SSSR. Predstavleno akademikom I.M. Vinogradovym.

LIZORKIN, P.I. (Moskva)

Hirschman type functions and the relations between $B^r_p(E_n)$ and $L^r_p(E_n)$ spaces. Mat. sbor. 63 no.4:505-535 Ap '64. (MIRA 17:6)

0515

Nikol'skiy, S. M.; Lizorkin, P. I.

[illegible] with strong degeneration [illegible] the boundary

AN SSSR. Doklady*, v. 159, no. 3, 1964, 512-515

boundary value problem, Poincare equation, elliptic equation, variational method

The authors give a Poincare-type inequality for functions whose [illegible]atives are p-summable in the region G with certain weights. The value of [illegible] inequalities lies in their application to the theory of boundary value [illegible] [illegible] of the region [illegible]

[illegible] of the corresponding form [illegible] to the boundary. [illegible] form vanishes as some power [illegible] of the distance to the boundary; this is [illegible] degeneration along the entire boundary. [illegible] proofs are done by a vari-

Card 1/3

...al method. The case of inhomogeneous degeneration is also considered. In ... , let

... $f \in W^{(r)}_{p,\alpha}(g)$ if

$$\|f\|_{\dots} = \|f\|_{\dots} + \sum \dots < \infty \qquad (2)$$

Theorem 1. For the functions $f \in W^{(r)}_{p,\alpha}(g)$,

$$\|f\|_{L_p(g)} \leqslant c\left(\sum \left\|\frac{\partial^l f}{\partial n^l}\right\|_{L_p(\Gamma)} + \sum_{|k|=r} \left\|\frac{\partial^k f}{\partial x^k}\right\|_{L_p(g)}\right) \qquad (3)$$

where c is independent of f. Now let

$$E(f,h) = \int_g \sum_{|k|,|l| \leq r} a_{kl}(x) f^{(k)}(x) h^{(l)}(x)\,dx, \qquad (4)$$

and let $\mathfrak{M}$ be the class of functions $f \in W^{(r)}_{2,\alpha}(g)$ with boundary values

$$\left.\frac{\partial^l \Phi}{\partial n^l}\right|_{\Gamma} = \varphi_l \in B_2^{(r-\alpha-l-1/2)}(\Gamma). \qquad (5)$$

Card 2/3

ACCESSION NR: AP4049912

Problem A: Find the minimum of the functional

$$E(f, f) - 2(F, f) \quad (6)$$

... class $\mathfrak{M}$, where $f \in L_2(g)$ and (F, f) denotes scalar product in $L_2(g)$. ... Problem A has a unique solution ... The function u satisfies ... conditions (5) and is a generalized solution of

$$L(u) \equiv \sum ... = F(x) \quad (7)$$

in the sense that

$$E(u, v) - 2(F, v) = 0 \quad (8)$$

for any function $v \in W_{2,\alpha}^{(p)}$ having zero boundary values (5) ($\equiv v \in \mathfrak{M}_0$). Orig. art. has: 16 formulas.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova, Akademii nauk SSSR (Mathematical Institute, Academy of Sciences, SSSR)

SUBMITTED: 14May64 ENCL: 00

SUB CODE: MA NO REF SOV: 007 OTHER: 001

LIZORKIN, P.I.; NIKOL'SKIY, S.M.

Classification of differentiable functions on the basis of spaces with a dominating mixed derivative. Trudy Mat. inst. 77:143-167 '65. (MIRA 19:1)

L 4124-66 EWT(d) IJP(c)

ACC NR: AP5028871 SOURCE CODE: UR/0038/65/029/001/0109/0126

AUTHOR: Lizorkin, P.I. 49,55

ORG: none

16,44,55 16 B

TITLE: Evaluation of trigonometric integrals and Bernstein inequality for fractional derivatives

SOURCE: AN SSSR. Izvestiya. Seriya matematicheskaya, v. 29, no. 1, 1965, 109-126

TOPIC TAGS: trigonometry, integral calculus, integral function, mathematic operator

ABSTRACT: The article concerns evaluations of a known type of trigonometric integrals. The author also calculates the norms of certain multiplicative operators which operate in a class of integral functions of finite degree p, which are integrated with respect to a space. Orig. art. has: 54 formulas. [JPRS]

SUB CODE: MA / SUBM DATE: 31Mar64 / ORIG REF: 004 / OTH REF: 004

Card 1/1 UDC: 517.512

LIZORKIN, P.I.

Fourier transformation in Besov spaces. Zero scale of $B^{0}_{p,\theta}$.
Dokl. AN SSSR 163 no.6:1318-1321 Ag '65.
(MIRA 18:8)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Submitted January 29, 1965.

L 34651-66 EWT(d)/T IJP(c)

ACC NR: AT6024714 SOURCE CODE: UR/2517/65/077/000/0143/0167

AUTHOR: Lizorkin, P. I.; Nikol'skiy, S. M.

ORG: none

31
B+1

TITLE: Classification of differentiable functions on the basis of spaces with dominant mixed derivatives

SOURCE: AN SSSR. Matematicheskiy institut. Trudy, v. 77, 1965, 143-167

TOPIC TAGS: function analysis, minimization, mathematic space, coordinate system, functional equation

ABSTRACT: In the study of functions of several variables their smoothness may be characterized by specifying their differential properties along the coordinate axes. Such an approach has led to the functional spaces $W_p(r_1, \dots, r_n)$, $H_p(r_1, \dots, r_n)$, $B_p(r_1, \dots, r_n)$, and L_p^r (see, e.g., P.I. LIZORKIN, Matem. sb. /Mathematics Symposium/, 1963, v. 60(102):3, pp 325-353). However, during certain operations like the minimization of the functional

$$\iint\left[\left(\frac{\partial u}{\partial x}\right)^2+\left(\frac{\partial u}{\partial y}\right)^2+\left(\frac{\partial^2 u}{\partial x\partial y}\right)^2\right]dx\,dy,$$

one encounters the need for the study of different types of spaces.

L 34651-66

ACC NR: AT6024714

In the above-quoted example, one must investigate a space dominated by the role of mixed derivatives. Consequently, instead of specifying the derivatives along the coordinate axes, one is required in the more general case to determine the functional space by specifying a certain set of derivatives (see, e.g., S.M. NIKOL'SKIY, Sib. matem. zhurnal /Siberian Mathematics Journal/, 1963, v. IV, No. 6, pp 1342-1363; Matem. sb. /Mathematics Symposium/, 1963, 61(103): 2, pp 224-252; N.S. BAKHLOV, Vestnik MGU (Bulletin of the Moscow State University/, ser. I, Matem. mekh. /Series I, Mathematics and Mechanics/, 1963, No 3, 7-16). The present paper is, in a sense, a continuation of the above papers. The authors study the spaces of the function $S_p^{r^1, \ldots, r^N}$ defined in E_n (in particular, the periodic cases), p - additive together with their generalized derivatives and belonging to a certain set $\mathfrak{M} = \{D^{r^1}f, \ldots, D^{r^N}f\}$ of derivatives which are not necessarily of integral order. To avoid certain pathological properties, they impose the requirement that, together with the $D^{r^1}f$ derivatives $\vec{r}^1 = (r_1^1, \ldots,$

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ACC NR: AT6024714

r_n^1), $i \in \{1, \ldots, N\}$ contains also all derivatives corresponding to the projection of r^i on all the possible coordinate hyperplanes. All conditions of the $S_p^{r^1, \ldots, r^N}$ are "convex" - as are those of of the space L_p^r, which is a special case of those under study. Basic "bricks" of the $S_p^{r^1, \ldots, r^N}$ space are $S_p^{r^1}$ spaces with a dominant mixed derivative $D^{r^1}f$, for which the set $\mathfrak{M}$ consists - in addition to the D^{r^1} of the "supporting" $D^{r^1}f$ derivatives discussed above. The first section outlines the auxiliary information, presents basic definitions, establishes the $S_p^r(\Delta)$ space for the periodic case, and derives the integral representation of the functions in $S_p^r(\Delta)$. The second section investigates functions addible with a power in E_n. The generalized derivative is defined in the sense of an earlier discussion (first quoted reference) using the theory of generalized functions. The last section is devoted to the spaces $S_p^{r^1, \ldots, r^N}$ in general. Orig. art. has: 43 formulas. [JPRS]

SUB CODE: 12 / SUBM DATE: none / ORIG REF: 009

Card 3/3

LIZORKIN, V.; MAKAROVA, Ye.; KHROMCHENKO, L.; SINTSOVA, A.; VINOKUROVA, V.

Rapid method for curing meat for sausage manufacture. Mias. ind.SSSR 30 no.1:13 '59. (MIRA 12:4)

1. Nauchno-issledovatel'skoye byuro Stalingradskogo myasotresta.
(Sausages)

LIZORKIN, V., inzh.

Intensify the inspection instead of lessening it. Mias. ind. SSSR 30 no.3:30 '59. (MIRA 12:9)

1. Stalingradskiy myasotrest.
(Hides and skins)

LIZORKINA, I.I.

Cabbage family. Biol. v shkole no.4:16-13 Jl-Ag '63. (MIRA 16:9)

1. Vos'miletnyaya shkola No.6, g. Mozhga Udmurtskaya ASSR. (Brassicaceae)

LIZUN, V.

LIZUN, V., direktor shkoly; VAYS, V., prepodavatel' praktikuma; BULAVINA, V., prepodavatel' biologii.

Remarks on programs. Politekh. obuch. no.9:94-96 '57. (MIRA 10:9)

1. Severo-Kazakhstanskaya oblast', Beslesovskaya semiletnyaya shkola.
(Manual training)

ALEKSANDROV, I.A.; SHEYNMAN, V.I.; KOGAN, Yu.S.; SHVETS, Ye.M.;
Prinimali uchastiye: VOL'SHANCK, Yu.Z.; LIZUNKOV, V.P.;
SEREGINA, A.P.; KAZAKOVA, L.I.; MUSATOVA, Z.D.

Hydrodynamics of plates made of S-shaped elements. Khim.
i tekh.topl.i masel 6 no.7:38-44 Jl '61. (MIRA 14:6)

1. Gipproneftemash.
(Plate towers)

SHEYNMAN, V.I.; ALEKSANDROV, I.A.; KOGAN, Yu.S.; VOL'SHONOK, Yu.Z.; LIZUNKOV, V.P.; SHVETS, Ye.M.

New design of a plate for rectifications columns. Khim.i tekh. topl.i masel 7 no.5:54-60 My '62. (MIRA 15:11)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut neftyanogo mashinostroyeniya.

(Plate towers)

ISICHENKO, N.A.; LIZUNKOVA, L.P. (Moskva)

Method of determining gas exchange in small animals. Probl. endok. i gorm. 9 no.3:50-54 My-Je '63. (MIRA 17:1)

1. Iz otdela patofiziologii (zav. - prof. S.M. Leytes) Vsesoyuznogo instituta eksperimental'noy endokrinologii (dir. - prof. Ye.A. Vasyukova).

GORDON, Lev Vladimirovich; FEPILOV, Vladislav Vasil'yevich; SKVORTSOV, Semen Osipovich; ATAMANCHUKOV, Georgiy Dmitriyevich; PLATUNOV, N.A., retsenzent; CHASHCHIN, A.M., retsenzent; LIZUNOV, A.A., inzh., red.; PROTANSKAYA, I.V., red.izd-va; PARAKHINA, N.L., tekhn.red.

[Technology of the wood-chemistry industries] Tekhnologiia lesokhimicheskikh proizvodstv. Izd.2., perer. Pod red. A.A.Lizunova. Moskva, Goslesbumizdat, 1960. 418 p. (MIRA 14:1)
(Wood—Chemistry)

LIZUNOV, D.V.

Controlling dust in Moscow Basin mines. Bor'ba s sil. 5:116-122 '62. (MIRA 16:5)

1. Podmoskovnyy nauchno-issledovatel'skiy ugol'nyy institut.
(Moscow Basin--Mine dusts)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R000930310019-5"

LIZUNOV, D.V., inzh.

Power characteristics of coal cutter-loaders in relation to their efficiency. Ugol' 40 no.3:50-51 Mr '65.

(MIRA 18:4)

1. Podmoskovnyy nauchno-issledovatel'skiy i proyektno-konstruktorskiy ugol'nyy institut.

LIZUNOV, D.V., inzh.

Protection from short-circuits to ground of 6 kv. networks in coal seam sites. Prom.energ. 19 no.7:32-35 Jl '64.

(MIRA 18:1)

POKHVISNEV, A.N. (Moskva); YUSFIN, Yu.S. (Moskva); LIZUNOV, G.I. (Moskva)

Magnetic analysis of iron ores. Izv. AN SSSR. Met. i gor. delo no.5:13-17 S-O '63. (MIRA 16:11)

LIZUNOV, G.I.

Insertion gutter in the main hearth pit. Metallurg 8 no.3:5-6 Mr '63.
(MIRA 16:3)

(Blast furnaces—Design and construction)

LIZUNOV, G.I.

Work organization in blast furnace plants with ten tappings of cast iron every 24 hours. Metallurg 8 no.5:4-6 My '63. (MIRA 16:7)

(Blast furnaces—Management)

BANNYY, N.P.; LIZUNOV, G.I.

Economy of coke in high-capacity blast furnaces on achieving the optimum degree of direct reduction. Izv. vys. ucheb. zav.; chern. met. 8 no.1:185-192 '65 (MIRA 18:1)

1. Moskovskiy institut stali i splavov.

SHEVTSOV, V.Ye.; LIZUNOV, G.I.

Chromatographic analysis of blast furnace gas. Izv. vys. ucheb. zav.; chern. met. 8 no.5:204-209 '65. (MIRA 18:5)

1. Moskovskiy institut stali i splavov.

LIZUNOV, G.I.

Analysis of reduction processes in blast furnaces with the injection of natural gas. Izv. vys. ucheb. zav.; chern. met. 8 no.9:34-38 '65. (MIRA 18:9)

1. Moskovskiy institut stali i splavov.

YUSFIN, Yu.S.; LIZUNOV, G.I.; YUSUPKHODZHAYEV, A.A.

Method of rapid control of metallic iron content. Izv. vys. ucheb. zav.; chern. met. 8 no.11:180-182 '65. (MIRA 18:11)

1. Moskovskiy institut stali i splavov.

LIZUNOV, G.I.; KARABAN[illegible], Yu. [illegible]; [illegible], A.N.; YUSFIN, Yu.S.

Unit for determining the softening and reducibility temperature for iron ore materials. Zav. lab. 31 no.3:385-386 '65. (MIRA 18:12)

1. Moskovskiy institut stali i splavov.

LIZUNOV, G.I., inzh.

Torpedoing water wells in water-bearing soils. Nov.tekh.mont.i spets.rab.v stroi. 21 no.11:21-23 N '59. (MIRA 13:2)

1. Khar'kovskiy Giprotrans.
(Wells) (Boring)

LIZUNOV, K., kapitan

Approach the matter creatively. Komm. Vooruzh. Sil 5 no.14:66 O '64. (MIRA 17:12)

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R000930310019-5"

OFITSEROV, V.Ya., inzh.; LIZUNOV, K.D., inzh.

Remote control of the position of a cutter-loader in an automated stoping system. Ugol' 40 no.12:45-48 D '65.

(MIRA 18:12)

1. Podmoskovnyy nauchno-issledovatel'skiy ugol'nyy institut.

PROCESSES AND PROPERTIES INDEX

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Platinoids in the ultrabasic rocks of the Urals. A. A. Ivanov and N. V. Liznnoy. *Bull. acad. sci. U.R.S.S., Ser. Géol.* 1944, No. 5, 78-86 (English summary). It is pointed out that besides dunite there are peridotite and pyroxene deposits carrying the platinum group of metals. In the dunite Pt predominates; in the peridotite Pd accompanies the Pt, but in the eastern deposits there are also Os and Ir with little Pt or Pd. J. S. Joffe

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

LIZUNOV, N. V. Cand. Geolog-Mineralog Sci.

Dissertation: "Rare Elements in the Ural Sulfide Ores and Certain Problems of Thallium Geochemistry by Data of Spectrum Analysis." Inst. of Geological Sciences, Acad. Sci. USSR 30 May 47.

SO: Vechernyaya Moskva, May 1947. (Project #17836)

LIZUNOV, N. V.

1. ZAMA'ZON, Ye. S.; LIZUNOV, N. V.

2. USSR (600)

4. Petrology

7. Comparibility of data in chemical and spectral analysis in lithological studies. Dokl. AN SSSR 86 no. 6 '52., p. 1163-6

Areport of the analysis of 90 samples from a series of wells of Secondary Baku. The intensities of the spectral lines were evaluated visually. The chem. and spectroscopic data led to the same conclusion.

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

[illegible]

AGAFONOVA, T.M. [Ahafonova, T.M.];LIZUNOV, M.V. [Lyzunov, M.V.]

Geochemical characteristics of Ukrainian labradorites. Nauk. zap.Kyiv.un. 16 no.14:179-188 '57. (MIRA 13:4)
(Ukraine--Labradorite)

AUTHORS: Borisenko, L. F., Lizunov, N. V.

TITLE: On the Distribution of Scandium in Wolframites (K voprosu o raspredelenii skandiya v vol'framitakh)

PERIODICAL: Geokhimiya, 1958, Nr 3, pp. [illegible] - 227 (USSR)

ABSTRACT: First the paper gives a short survey of the papers hitherto published on the scandium content of wolframites. Wolframites with the highest scandium content are usually found in pneumatolytical-hydrothermal deposits of the Greisen-type. In the Soviet Union such deposits are to be found in Central Kazakhstan (Akchatau, Baynazar, Maytas), in Vostochnoye Zabaykal'ye (Sherlova gora) and in northeastern Asia (Polyarnoye). The structure and the mineral content of such deposits is discussed. Approximately 450 wolframite samples from 47 various deposits were investigated by means of spectral analysis. Control analyses which were carried out by N.P.Men'shova in the State Institute of Rare and Trace Metals (Gosudarstvennyy institut redkikh i malykh metallov) showed a good agreement. The results are compiled according to groups in tables and then are discussed. The following conclusions can be drawn from the paper: 1) An increase of the scandium content (0.02 to 0.2% Sc_2O_3)

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On the Distribution of Scandium in Wolframites [illegible]

occurs as a rule in wolframites which are from pneumatolytical-highly hydrothermal deposits of the Greisen-type. 2) The mean scandium content in wolframites from pneumatolytical-hydrothermal deposits (0.04% Sc_2O_3) is at least one order of magnitude greater than the content of the wolframites from low-hydrothermal deposits (~ 0.00[illegible]% Sc_2O_3). 3) Scandium usually occurs in wolframites and ferberites (up to 0.[illegible]% Sc_2O_3), hubnerite has a lower content (up to 0.02% Sc_2O_3). There are [illegible] figures, [illegible] tables, and [illegible] references, 7 of which are Soviet.

ASSOCIATION: Institut mineralogii, geokhimii i kristallokhimii redkikh elementov, AN SSSR, Moskva (Moscow Institute of Mineralogy, Geochemistry and the Crystal Chemistry of Rare Elements, AS USSR)

SUBMITTED: January 14, 1958

1. Scandium--Abundance 2. Scandium--Sources
3. Tungsten ores--Analysis

Card 2/2

3(0)

AUTHORS: Borisenko, L. F., Lizunov, N. V. SOV/7-58-6-8/16

TITLE: On the Distribution of Scandium and Niobium in Wolframites (K voprosu o raspredelenii skandiya i niobiya v vol'framitakh)

PERIODICAL: Geokhimiya, 1958, Nr 6, pp 582 - 586 (USSR)

ABSTRACT: V. M. Gol'dshmidt explained the scandium content of wolframites by the isomorphic substitution of $ScNbO_4$ and $ScTaO_4$ for $FeWO_4$ and $MnWO_4$ (Ref 1). F. Leutwein opposed this assumption (Ref 2). His thesis is proved by the authors' investigations: 350 wolframite samples from 48 deposits of the Soviet Union were analyzed. Among 234 scandium bearing samples, 59 did not contain niobium, 69 contained niobium and no scandium, 54 samples none of the two elements (Table 1). Scandium and niobium content do not run parallel (Fig 1). It is assumed that the excess is compensated by titanium or that Sc^{3+} is substituted for Fe^{2+} without compensation. A classification of the deposits according to the conditions of formation (Table 3) has the following result: Wolframites from high temperature deposits of the greisen type contain scandium, whereas niobium is absorbed by wolframite under both pneumatolytic

Card 1/2

On the Distribution of Scandium and Niobium in Wolframites SOV/7-58-6-8/16

and hydrothermal conditions. There are 1 figure, 3 tables, and 3 references, 2 of which are Soviet.

ASSOCIATION: Institut mineralogii, geokhimii i kristallokhimii redkikh elementov AN SSSR, Moskva (Institute of Mineralogy, Geochemistry and Crystallochemistry of Rare Elements, AS USSR, Moscow)

SUBMITTED: April 12, 1958

SOV-132-58-8-3/16

AUTHORS: Zalashkova, N.Ye., Lizunov, N.V. and Sitnin, A.A.

TITLE: Experience With the Metallometric Surveying of Beryllium in the Region of Beryllium Bearing Pegmatites Covered with Sediments (Opyt Metallometricheskoy s"yemki na berilliy v rayone razvitiya berillonosnykh pegmatitov zakrytykh nanosami)

PERIODICAL: Razvedka i okhrana nedr, 1958, Nr 8, pp 9-14 (USSR)

ABSTRACT: Metallometric surveying methods, coupled with spectral analysis, were applied by the author while prospecting for beryllium sediments. According to A.Ye. Fersman (ref 5) beryllium has slow migratory properties under hypogenic conditions and A.A. Beus (ref. 1 and 2) stresses that beryllium can easily be trapped in dispersed and colloidal systems near its source, because of its high ionic potential. A region where the beryllium bearing pegmatites were covered with a thick alluvial layer, was chosen for the experiment. The magnitude of alluvial layers varied from 0.5 to 0.7 m on elevated places, and reached 2 m and more on the slopes. Pegmatite formations were found among metamorphic micaceous slates extending in a north-easterly direction. Metallo-

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SOV-132-58-8-3/16

Experience With the Metallometric Surveying of Beryllium in the Region of Beryllium Bearing Pegmatites Covered with Sediments

metric surveying was conducted on lines traced across the pegmatite belt. Samples were taken from depths of 20-25 cm from soil and subsoil layers. Spectral analysis was then used in testing of samples. The operation is described in detail. It was also found that in the samples taken from depths of 50-70 cm no trace of beryllium was found. The results of metallometric surveying were plotted on a map. This map also showed all pegmatite veins as peaks, clearly defining the aureoles with increased contents of beryllium. Moreover, tests were made in analyzing ashes from trees taken from the sectors where beryllium deposits were found. It was found that beryllium was mainly concentrated in the leaves and to a lesser degree, in the roots of those trees. The presence of the beryllium, mainly in the soil and subsoil layers, could be thus explained by the role of trees which help to transport beryllium from the depth and then deposit it in the upper layers of the earth. Consequently,

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SOV-132-58-8-3/16

Experience With the Metallometric Surveying of Beryllium in the Region of Beryllium Bearing Pegmatites Covered with Sediments

the examination of ashes of trees growing in the regions of beryllium bearing pegmatites could help to locate beryllium deposits. There is 1 map, 1 table and 5 Soviet references.

ASSOCIATION: IMGRE

1. Beryllium--Avaiability 2. Beryllium--Sources 3. Beryllium --Test results 4. Spectrographic analysis--Applications

Card 3/3

3(8), 3(0) SOV/7-59-1-8/14

AUTHORS: Borisenko, L. F., Lizunov, N. V.

TITLE: On the Occurrence of Scandium and Some Other Rare Elements in Cassiterite (K voprosu o nakhozhdenii skandiya i nekotorykh drugikh redkikh elementov v kassiterite)

PERIODICAL: Geokhimiya, 1959, Nr 1, pp 64-68 (USSR)

ABSTRACT: Samples from 52 different deposits in the Soviet Union and 22 deposits in other countries were investigated. In all, more than 300 analyses were carried out which were devoted in the main to the determination of scandium and niobium (Tables 2 and 3). Cassiterites from pneumatolytic-hydrothermal deposits of the greisen type contain, on average, about 0.05% Sc_2O_3 and, at the most 0.17%. Cassiterites from pegmatite- and sulfide-cassiterite veins hardly ever contain scandium. All scandium carrying cassiterites contain niobium (up to 2-3% Nb_2O_5), tungsten and zirconium, some tantalum (tenths or hundredths of per cent). Niobium-carrying cassiterites, however, do not necessarily contain scandium (Table 1 and Diagram) which is especially apparent from cassiterites found in pegmatite deposits. Most probably isomorphous Sc^{+3}

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SOV/7-59-1-8/14

On the Occurrence of Scandium and Some Other Rare Elements in Cassiterite

replaces Sn^{+4} whereby the charge may be balanced out by Nb^{+5} ions. There are 1 figure, 3 tables, and 8 references, 6 of which are Soviet.

ASSOCIATION: Institut mineralogii, geokhimii i kristallokhimii redkikh elementov AN SSSR, Moskva
(Institute of Mineralogy, Geochemistry, and Crystallochemistry of Rare Elements, AS USSR, Moscow)

SUBMITTED: September 19, 1958

KUZNETSOV, K.F.; MEYTUV, G.M.; CHITAYEVA, N.A.; LIZUNOV, N.V.

Regularities in the distribution of rare elements in complex ore deposits of eastern Transbaikalia. Trudy Inst. min., geokhim. i kristallokhim. red. elem. no. 3:162-179 '59. (MIRA 14:5)
(Transbaikalia--Chemical elements)

3(8)

SOV/7-59-4-5/9

AUTHORS: Ivanov, V. V., Lizunov, N. V.

TITLE: Indium in Some Deposits of Tin-ore in the Yakutiya (Indiy v nekotorykh olovorudnykh mestorozhdeniyakh Yakutii)

PERIODICAL: Geokhimiya, 1959, Nr 4, pp 336 - 345 (USSR)

ABSTRACT: The following deposits of tin-ore were investigated: cassiterite-quartz deposits (greisen type): Kester, Polyarnoye-Omchikanda. Cassiterite-sulfide deposits: Deputatskoye, Ilintas, Alys-Khaya, Burgochan, Ege-Khaya, Khaton-Khaya. Polymetallic deposit: Bulatskoye. The deposits of the greisen type are without interest with respect to the indium tenor. All together 2500 indium analyses were carried out; the polarographic determinations by A. A. Rozbianskaya and the chemical determinations by L. Ye. Novorossovaya gave results in agreement with the spectrum analyses which were carried out by N. V. Lizunov with the quartz-spectrograph ISP-22 in laboratoriya spektral'nogo analiza IMGRE AN SSSR (Laboratory of Spectrum Analysis IMGRE AS USSR). The indium tenor in sphalerite (Table 2), chalcopyrite (Table 3), stannite (Table 4), cassiterite (Table 5) and wolframite (Table 6) were determined. Besides

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Indium in Some Deposits of Tin-ore in the Yakutiya SOV/7-59-4-5/9

indium was found in some samples of franckeite, arsenopyrite and manganosiderite. Numerous other minerals were found to be free of indium (determination limit of the procedure 0.001% In). An investigation of the behavior of indium in the ore formation in the cassiterite-sulfide deposits (Table 7) shows that the main quantity of indium is concentrated in the second (sulfide-quartz-) and in the third (sulfide-carbonate-) stage of the mineralization. The indium tenor in cassiterite and wolframite amount to 0.001 - 0.005 %, in the sulfides higher by one to two tenth powers; in sphalerites 0.3 % at the most. There are 7 tables and 10 references, 7 of which are Soviet.

ASSOCIATION: Institut mineralogii, geokhimii i kristallokhimii redkikh elementov Akademii nauk SSSR, Moskva (Institute of Mineralogy, Geochemistry and Crystal-Chemistry of the Rare Elements of the Academy of Sciences, USSR, Moscow)

SUBMITTED: December 12, 1958

Card 2/2

3 (0)

AUTHORS: Ivanov, V. V., Borisenko, L. F., Lizunov, N. V.

SOV/20-125-3-40/63

TITLE: Scandium in the Minerals of the Quartz Veins and Greisens of One of the Intrusions of the Polousnyy Range (Skandiy v mineralakh kvartsevykh zhil i greyzenov odnoy iz intruziy khr. Polousnogo)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 3, pp 608-610 (USSR)

ABSTRACT: Scandium is usually widely disseminated in nature; however, in the last stages of crystallization, while pegmatite and pneumatolytic-hydrothermal processes reign, scandium can become concentrated. The formation of wolframite-cassiterite are, in this consideration, most interesting. A review of the publications on such scandium concentrations is given (Refs 1-4). In 1955 the authors found scandium in quartz-tin-tungsten veins of the granite massif of the Polousnyy Range. With respect to the genesis and mineralogical-geochemical characteristics, these occurrences have much in common with those of Zinnwald (Erzgebirge). The massif in concern is described. The primary vein minerals are: quartz, topaz, zinnwaldite, muscovite, and fluorite.

Scandium in the Minerals of the Quartz Veins and Greisens of One of the Intrusions of the Polousnyy Range SOV/20-125-3-40/63

Ore minerals are: wolframite, arsenopyrite, sphalerite, molybdenite, minor galena, pyrite, chalcopyrite, bismuthite and native bismuth. Scandium was found in wolframite, cassiterite, and zinnwaldite (Table 1, Figs 1-3). The chemical analysis (analysist: S. N. Fedorchuk,) shows, after adapting to the chemical formula, that huebnerite molecules predominate over ferberite molecules. The minimum amount of Sc_2O_3 in wolframite was ~0.05%, the maximum ~0.1%, the average ~ 0.07%. Noteworthy amounts of niobium (~0,2%) and titanium (up to 0.05% TiO_2) were also found in all the samples. In individual sample tantalum was found. The scandium content is also given for the two other minerals in which it is found. There are 3 figures, 1 table, and 4 references, 2 of which are Soviet.

ASSOCIATION: Institut mineralogii, geokhimii i kristallokhimii redkikh elementov Akademii nauk SSSR (Institute for Mineralogy, Geochemistry, and Crystal Chemistry of the Rare Elements, of the Academy of Sciences, USSR)

Card 2/3

PHASE I BOOK EXPLOITATION SOV/4544

Ivanov, V.V., V.Yu. Volgin, A.A. Krasnov, and N.V. Lizunov

Talliy; osnovnyye cherty geokhimii i mineralogii, geneticheskiye tipy mestorozhdeniy i geokhimicheskiye provintsii (Thallium; Basic Features of Its Geochemistry and Mineralogy, Genetic Types of Deposits, and Geochemical Provinces) Moscow, Izd-vo AN SSSR, 1960. 154 p. Errata slip inserted. 3,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut mineralogii, geokhimii i kristallokhimii redkikh elementov.

Chief Ed.: K.A. Vlasov, Corresponding Member; Resp. Ed.: A.A. Beus, Doctor of Geological and Mineralogical Sciences; Ed. of Publishing House: S.M. Simkin; Tech. Ed.: G.S. Simkina.

PURPOSE: This book is intended for geochemists and mineralogists.

COVERAGE: This book is the first Soviet publication on the geology and geochemistry of thallium. Much of the data published here was accumulated by the IMGRE AN SSSR - Institute mineralogii, geokhimii i kristallokhimii redkikh elementov AN SSSR

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(Institute of the Mineralogy, Geochemistry and Crystallochemistry of Rare Earth Elements, AS USSR) in the process of studying the rare earth metal deposits of the Soviet Union. This institute carried out the analysis for thallium content of a great number of types of minerals and ores (especially the sulfides and the sulfo salts) from many deposits of different genesis. Data are given on tens of thousands of semiquantitative and quantitative determinations of thallium in monomineral, lump and average ore samples made at the spektral'naya laboratoriya (Spectral Analysis Laboratory) of the institute. The monomineralic fractions were sorted out with a type MBS-1 binocular microscope, and when necessary, the selected fractions were microscopically checked for purity. The spectral determinations of thallium were made by N.V. Lizunov and L.I. Sazhina, and the chemical and polarographic determinations by A.A. Rozbianskaya, Z.M. Piskova, and Ye.N. Zakharova. The following sections of the book were composed by the authors as indicated: Introduction by V.V. Ivanov, Ch. I by V.Yu. Volgin and V.V. Ivanov, Ch. II by A.A. Krasnov and V.Yu. Volgin, Ch. III by V.Yu. Volgin and V.V. Ivanov (the part on the distribution of thallium in rock was written by A.A. Krasnov), Chs. IV and V by V.V. Ivanov. (V.Yu. Volgin collaborated in writing the section on the "Distribution of thallium in certain foreign deposits"). The spectral analysis methods used were described by N.V. Lizunov, and the chemical methods for the determination of thallium by A.A. Rozbianskaya and Z.M. Piskova. The authors thank G.B. Kosov for supplying material on the thallium economy, and the following for helping prepare the manuscript: A.A. Beus, Thallium: Basic Features of its Geochemistry (Cont.) .../4544

N.I. Vlodavets, K.F. Kuznetsov, K.A. Nenadkevich, F.I. Vol'fson, A.D. Kalenov, and V.V. Shcherbina. There are 265 references: 155 Soviet, 53 English, 45 German, 4 Italian, 3 Polish, 2 French, 2 Swedish, and 1 Hungarian.

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IVANOV, V.V.; VOLGIN, V.Yu.; KRASNOV, A.A.; LIZUNOV, N.V.; VLASOV, K.A., glavnyy red.; BEUS, A.A., doktor geol.-mineral.nauk, otv.red.; SIMKIN, S.M., red.izd-va; SIMKINA, G.S., tekhn.red.

[Thallium; its geochemistry, mineralogy, genetic types of its deposits, and its geochemical characteristics] Tallii; osnovnye cherty geokhimii i mineralogii, geneticheskie tipy mestorczhdenii i geokhimicheskie provintsii. Moskva, Izd-vo Akad.nauk SSSR, 1960. 154 p. (MIRA 13:7)

1. Institut mineralogii, geokhimii i kristallokhimii redkikh elementov (for Ivanov, Volgin, Krasnov, Lizunov).
(Thallium)

SERDOBOVA, L.I.; LIZUNOV, N.V., otv. red.; SHILLER, V.A., otv. za vypusk

[Spectrum determination of thallium and germanium in sulfide minerals] Spektrograficheskoe opredelenie talliia i germaniia v sul'fidnykh mineralakh. Moskva, 1960. 18 p. (Akademiia nauk SSSR. Institut mineralogii, geokhimii i kristallokhimii redkikh elementov. Metodicheskie materialy, no.4) (MIRA 15:6)
(Thallium—Spectrum) (Germanium—Spectrum) (Sulfides)

IVANOV, V.V.; LIZUNOV, N.V.

Some characteristics of the distribution of indium in endogenous deposits. Geokhimiia no.1:45-54 '60. (MIRA 13:6)

1. Institute of Mineralogy, Geochemistry and Crystalochemistry of rare elements, Academy of Sciences, U.S.S.R., Moscow. (Indium)

S/081/62/000/003/026/090
B150/B101

AUTHORS: Ivanov, V. V., Volgin, V. Yu., Lizunov, N. V.

TITLE: Rules governing the distribution of indium concentrations

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 3, 1962, 117, abstract 3G18 (Sb. "Zakonomernosti razmeshcheniya polezn. iskopayemykh". v. 3, M., AN SSSR, 1960, 550 - 587)

TEXT: On the basis of data in technical literature and numerous new spectroscopic and chemical determinations of indium, an examination is made of the rules governing the distribution of deposits with high indium concentrations, and the regions with the optimum prospects of discovering them were separated. Tables are given showing the In contained in mineral deposits of various types. The authors reach the following conclusions: (1) Indium is not at all typical of shields and platforms; (2) concentrates of In are paragenetically combined with moderately acid and acid granitoids which have been formed in the final stages of formation of geosynclines; (3) the amount of concentration of In in deposits of geosynclinal zones of different ages increases from the

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Rules governing the distribution...

older to the younger, while at the same time the Hercynian folding can be considered as a fracture; (4) the following can be designated as indium provinces in the range of areas of Paleozoic age: Talassko-Terskeyskaya and Kirgizskaya polymetallic zones, the North Balkhash polymetallic belt; in the range of the Meso-Cenozoic age - the Eastern Transbaikal'skaya, Soviet Far Eastern and North Eastern provinces; in contrast to the usual nonconcentrated deposits of Caledonian and Hercynian metallogeneous periods, deposits with high concentrations of In of the Meso-Cenozoic age are referred to the Pacific Ocean belt; (5) in the ancient metallogeneous periods single cases of concentrations of In are known in the most varied types of hydrothermal and mainly sulfide deposits; in the Meso-Cenozoic period practically all the highest concentrations of In deposits are referred to the cassiterite-silicate-sulfide and the tin-polymetallic formations; (6) a favorable indication for the discovery in given deposits of high concentrations of In is the presence in sulfide ores of marmatite, in which is revealed by the microscope an emulsion dissemination of pyrrhotine and chalcopyrite, associating with cubanite, wallerite, and chalcopyrrhotine, and in Sn deposits - the presence of chalcopyrite of pyrrhotine paragenesis.

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Regularities in the distribution of indium concentrations. Zakon.razmlpolezn.iskop. 3:550-587 '60. (MIRA 14:11)

1. Institut mineralogii i geokhimii redkikh elementov AN SSSR.

(Indium)

KOGAN, B.I.; KAL'ZHANOVA, Ye.G.; SAL'TINA, L.V.; SOLODOV, N.A.; DMITRIYEVA, O.P.; Prinimali uchastiye: UKHANOVA, N.I.; PERVUKHINA, A.Ye.; KAZANTSEVA, V.G.; ULANOVSKAYA, V.D.; VLASOV, K.A., glav. red.; LIZUNOV, N.V., otv. red.; PYATENKO, Yu.A., otv. red.; SALTYKOVA, V.S., otv. red.; SLEPNEV, Yu.S., otv. red.; FABRIKOVA, Ye.A., otv. red. PODOSEK, V.A., red. izd-va; GOLUB', S.I., tekhn. red.

[Rare alkali metals (lithium, rubidium, and sesium); a bibliography on their geochemistry, mineralogy, crystal chemistry, geology, the analytic methods of their determination, and their economics]Redkie shchelochnye metally (litii, rubidii i tsezii); bibliografiia po geokhimii, mineralogii, kristallokhimii, geologii, analiticheskim metodam opredeleniia i ekonomike. Sost. B.I.Kogan i dr. Moskva, Izd-vo Akad. nauk SSSR, 1962. 327 p. (MIRA 16:2)

1. Akademiya nauk SSSR. Institut mineralogii, geokhimii i kristallokhimii redkikh elementov. 2. Chlen-korrespondent Akademii nauk SSSR (for Vlasov).

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KUGUK, V.P. [Kuhuk, V.P.], shofer; LIZUNOV, P.I., shofer

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LIZUNOV, S.D., inzh.

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1. Moskovskiy elektrozavod.
(Electric transformers—Windings)

LIZUNOV, S.D., kand. tekhn. nauk

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Methods and examples of establishing advanced time norms for mechanized loading and unloading of liquid petroleum products from cars. Trudy TSNII MPS no.151:203-240 '58. (MIRA 11:12)
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LIZUNOV, V.A., inzh.

Basic principles of the design of systems for the heating of tank cars in the discharging of highly viscous products. Vest. TSNII MPS 24 no.3:53-55 '65. (MIRA 18:8)

LIZUNOV, V.A., inzh.; Prinimali uchastiye: SMIRNOV, Ye.K., kand.tekhn. nauk; KOROL'KOV, V.V., mekhanik; KLEYMENOV, Ye.I., inzh.

Use of radiant heat in discharging highly viscous materials. Vest.TSNII MPS 21 no.3:39-41 '62. (MIRA 15:5)
(Radiant heating) (Material handling)

KIDIN, I.N.; PAISOV, I.V.; BELYAKOV, B.G.; LIZUNOV, V.I.

Heat treatment of bore rods made of U7 and 55C2 steel. Izv.vys. ucheb.zav.; chern.met. 4 no.9:138-142 '61. (MIRA 14:10)

1. Moskovskiy institut stali.
(Tool steel—Heat treatment) (Rock drills)

KIDIN, I.N.; LIZUNOV, V.I.

Electric heat treatment of 30Kh8 steel. Izv. vys. ucheb. zav.; chern. met. 7 no.7:171-175 '64 (MIRA 17:8)

1. Moskovskiy institut stali i splavov.

ACCESSION NR: AP4042548 S/0148/64/000/007/0171/0175

AUTHOR: Kidin, I. N., Lisunov, V. I.

TITLE: Electrical heat treatment of 30Kh8 steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 7, 1964, 171-175

TOPIC TAGS: heat treatment, electrical heat treatment, steel hardening, steel annealing, steel tempering, steel strength, alloy steel strength, induction heat treatment

ABSTRACT: The strength of steel alloys may be increased in comparison with the usual methods by induction heat treatment with correct timing of hardening and tempering. The authors therefore investigated the effect of electrical heat treatment on the properties of 30Kh8 steel. The 8 x 20 mm sample sheets from an induction furnace were hot rolled to a thickness of 2 mm and annealed for 2 hours at 700C. Further vacuum annealing of 0.4 x 5.0 x 110 mm samples for 1 hour at 900C resulted in a regular perlite-ferrite structure. The samples were heated by the contact method while the temperature was measured by a chromel-alumel thermocouple. The results of tests after the usual and electrical methods

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of heat treatment are compared in Fig. 1 of the enclosure. The sharp drop in hardness for electrical heat treatment after tempering above 400C is caused by rapid redistribution of chromium, by further lowering of the C concentration in the solid solution and by carbide coagulation. The change in specific electrical resistance depending on tempering conditions also shows that the martensite structure changes insignificantly at temperatures below 400C. Rapid disintegration of the solid solution above 400C results in a sharp drop in specific electrical resistance. Similar results were obtained when measuring the elastic limit. Below 300C the variations were connected with polygonization processes caused by thermal plastic deformations with stress relaxation in the stressed martensite formed during hardening. On the basis of the test results, electrical heat treatment improves the properties of 30Kh8 steel in comparison with the usual hardening process. For optimal results, a low short-time tempering process (at 100C for 30 minutes) is needed. The hardness improves by 6-8 HRC, and the elastic limit is 10-15 kg/mm^2 higher than after the usual heat treatment (furnace hardening, 400C tempering for 1 hour). Orig. art. has: 8 figures.

ACCESSION NR: AP4042548

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Steel and Alloy Institute)

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ACCESSION NR: AP4042548

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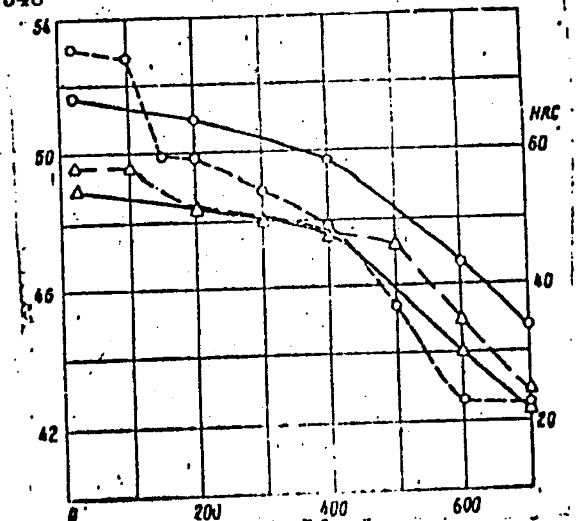

Fig. 1. Features of 30Kh8 steel after tempering:

----------usual hardening, - - - - - - - - electrical hardening, 0 hardness, Δ specific electrical resistance, Abscissa = Tempering temperature, °C.

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EWP(z)/EWP(b)/EWA(h) Pf-4/Peb MJW/JD/WB/EM
ACCESSION NR: AP5008390 S/0148/65/000/003/0157/0160

AUTHOR: Andreyev, Yu. G.; Zakharov, Ye. K.; Kidin, I. N.; Lizunov, V. I.; Maksimova, O. V.; Shtremel', M. A.

TITLE: Heat treatment by electrical heating of high-strength steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 3, 1965, 157-160

TOPIC TAGS: high strength steel, electrical heating, superstrength steel, steel heating, low alloy steel, complex alloy steel, steel heat treatment, conventional heating, steel strength, steel ductility, steel hardness

ABSTRACT: Conventional heat treatment of large welded superstrength shells presents difficulties since the shells require protection against oxidation and decarburization. Therefore, an attempt has been made to use rapid-rate electric heating without a protective atmosphere or vacuum. Specimens of cold-rolled, annealed VKS-1 (Kh2GSNM) superstrength steel, 3.3 x 9.2 x 320 mm, were resistance heated with an alternating current of 50 cps to temperatures of up to 250C at a rate of 75C/sec and air cooled at a rate varying from

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50 to 80C/sec. The resulting steel structure and properties were compared with those obtained with conventional heat treatment (austenitizing at 940C for 4[illegible] min in a vacuum of [illegible] mm Hg followed by air cooling). It was found that the surface microhardness was [illegible] lower than the core microhardness [illegible] [illegible] to 1100C, as compared [illegible] treated; but in both cases [illegible] [illegible] of 0.04 mm. The [illegible] [illegible] for 1 hr (at [illegible]), [illegible] in the microstructure of [illegible] [illegible] specimens was observed [illegible] specimens, however, had a mean grain diameter of [illegible], as compared with 11 μ in conventionally heat treated specimens. The hardness obtained by conventional hardening from [illegible] can be achieved by electrical heating to 1100C. Specimens electrically heated at a rate [illegible] /sec to 1100C, air cooled, and [illegible] tensile strength of 192 kg/mm², an [illegible] area of 34%, and a bend angle of [illegible] [illegible] kg/mm², [illegible]%, 33%, and 26° in conventionally heat treated steel. There are two groups of martensitic steels with a tensile strength of up to

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