"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

2/2 Myshis, A. D.

The main result is an extremal property of H, to wit: let u be a continuous function on G admitting on G a continuous Privaloff operator; if v is the solution of the generalized Dirichlet problem for the boundary function $u|\Gamma$, then $H(v) \leq H(u)$. Further, when $v \neq u$ and Γ has a finite number of components, then $H(v) < H(u)$.

In the opinion of the reviewer the theory would be improved by requiring the paths $S_1, S_2, \ldots, S_n$ to have their interior regions contained in G (rectangular paths would suffice). The contribution in (*) corresponding to the boundary components would then be eliminated. This contribution seems merely to obscure the situation, but it could be treated separately if desired. With the resulting modification in the definition of $H(u)$ it can be shown that $H(u)$ is finite if and only if u is an almost δ-subharmonic function whose mass distribution has finite total variation. In fact, the total variation is just $(1/2\pi)H(u)$. The extremal property of H is now obvious from the observation that $H(u)$ is zero for u harmonic but is positive for all other admissible u. Moreover, the hypothesis that u admit a continuous Privaloff operator serves only to ensure δ-subharmonicity of u and can therefore be discarded (for $u \in C'$), along with the requirement that the boundary components be finite in number.

M. G. Arsove (Seattle, Wash.).

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

USSR/Mathematics - Cauchy problem

FD-1172

Card 1/1 Pub. 118-13/30

Author : Myshkis, A. D., and Grinfel'd, U. K.

Title : Continuous dependence of the solution to the Cauchy problem upon the initial data

Periodical : Usp. mat. nauk, 9, No 3(61), 171-174, Jul-Sep 1954

Abstract : The authors state that there is still no clarification as to the connection between the existence and uniqueness of solution of a boundary-value problem, on the one hand, and the continuous dependence of this solution upon the boundary conditions, on the other hand. The authors give an example where the existence and uniqueness of solution of a Cauchy problem for a differential second-order equation holds but the continuity of the dependence of the solution of this problem upon the initial conditions does not exist. No reference.

Institution :

Submitted : August 28, 1953

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

USSR/Mathematics - Qualitative Theory of Differential Equations

Card 1/1 : Pub. 64 - 8/10

FD-833

Author : Myshkis, A. D. (Minsk)

Title : Generalizations of a theorem on the point of rest of a dynamic system inside a closed trajectory

Periodical : Mat. sbor., 34(76), 525-540, May-Jun 1954

Abstract : A well known theorem (the Bendixson theorem) states that if a system of differential equations $dx/dt = P(x,y)$, $dy/dt = Q(x,y)$, is given in some simply connected region, then within each closed trajectory of this system there is at least one singular point. One of the many proofs of this theorem is based on an application of another theorem concerning a fixed point in a mapping of a circle onto itself. This proof permits the immediate transfer of the Dendixson theorem to an n-dimensional space, to the case of multiply-connected regions and to dynamic systems without uniqueness. The purpose of the present article is to give examples of this transfer. Thanks M. G. Zlatomrezheva and A. Ya. Lepin.

Institution : --

Submitted : July 11, 1953

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

USSR/Mathematics - Approximations errors

FD-1428

Card 1/1 : Pub. 64 - 6/9

Author : Myshkis, A. D. (Minsk), and Egle, I. Yu. (Riga)

Title : Evaluation of the error in the method of successive approximations

Periodical : Mat. sbor., 35 (77), pp 481-500, Nov-Dec 1954

Abstract : The authors state the conditions necessary that a general evaluation of the accuracy of any approximate method be effectively applicable to concrete cases. They note that the defect of tediousness in approximate evaluations of error is peculiar to many original methods; e.g. in the text of L. V. Kantorovich and V. I. Krylov, Priblizhennyye metody vysshego analiza [Approximate methods of higher analysis], Moscow-Leningrad, State Technical Press, 1949. Five references, 3 German.

Institution :

Submitted : November 22, 1953

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

Myškis, A. D., and Gil', G. V. On a problem of N. N. Luzin. Uspehi Mat. Nauk (N.S.) 10 (1955), no. 1(63), 143–145. (Russian)

Among the unsolved problems left by the late N. N. Luzin [cf. Fedorov, Uspehi Mat. Nauk (N.S.) 7 (1952), no. 2(48), 7–16; MR 13, 810] is that of the structure of the set of monogenicity of a function $f(z)$ which is continuous in some domain D; the set of monogenicity $\mathfrak{M}_z$ of $f(z)$ at a given point z of D is defined as the intersection $\bigcap_{\epsilon>0} M_\epsilon$, where M_ϵ is the set of all complex numbers

$$\frac{f(z+\Delta z)-f(z)}{\Delta z} \text{ with } z+\Delta z \in D \text{ and } 0<|\Delta z|<\epsilon.$$

It was shown by A. D. Taimanov [ibid. 8 (1953), no. 5(57), 169–171; MR 15, 612] that $\mathfrak{M}_z$ can fill a circle. It is shown in the present note that a necessary and sufficient condition that a given closed set $\mathfrak{M}$ in the plane can be a set of monogenicity of some continuous function at some point z in D is that $\mathfrak{M}$ be connected. *A. J. Lohwater.*

1 - F/W

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D

SUBJECT USSR/MATHEMATICS/Topology CARD 1/2 PG - 98
AUTHOR MYSKIS A.D., BUNT A.Ja.
TITLE On a sufficient condition for the homeomorphism of a continuously differentiable mapping.
PERIODICAL Uspechi mat. Nauk 10, 1, 139-142 (1955)
reviewed 6/1956

A.M.Fomin (Uspechi mat. Nauk 4, 5, 198-199 (1949)) proposed the following conditions for the biuniqueness of a continuously differentiable mapping in the large: Let be defined the system of the continuously differentiable functions

$$y_i = \varphi_i(x_1,\dots,x_n) \qquad (i=1,\dots,n)$$

in the convex region R of the space $x=(x_1,\dots,x_n)$, and the region S be contained in R, then for the biuniqueness of the mapping of S onto $\varphi(S)$ it is sufficient if simultaneously:

a) $J = \det\left(\frac{\partial\varphi_i}{\partial x_j}\right) \neq 0$ in S

b) the matrix $M = \left\|\frac{1}{2}\left(\frac{\partial\varphi_i}{\partial x_j} + \frac{\partial\varphi_j}{\partial x_i}\right)\right\|$ is positive definite or semi-definite in R,

c) the intersection of S with K (K the point set of R on which M is positive semidefinite) is nowhere dense in S.

The authors give a geometric interpretation of Fomin's conditions. They consider

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

On a paper of N.K.Usmanova. Usp.mat.nauk 10 no.2:242 '55.
(MLRA 8:8)
(Differential equations, Partial) (Usmanova, N.K.)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A-D.

Myškis, A. D., and Rabinovič, I. M. The first proof of a fixed-point theorem for a continuous mapping of a sphere into itself, given by the Latvian mathematician P. G. Bohl. Uspehi Mat. Nauk. (N.S.) 10, no. 3(65), 188-192 (1955). (Russian)

1 - F/W

(2)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

2781. Myshkis, A. D., and Panovko, Ya. G., Effect of disturbing forces of variable frequency and amplitude on a linear system with one degree of freedom (in Russian) *Inzhener. Sbornik, Akad. Nauk SSSR* 22, 33–41, 1955.

Using Duhamel's integral [see, e.g., Kármán-Biot, "Mathematical methods in engineering"], the response of the linear system with one degree of freedom to a force that is an arbitrary (under certain conditions) function of time can be obtained. The action of the force may be approximated either by application of a series of steps or a series of impulses.

Author studies the response of the system to a force of one ripple of the sine curve. In the case when the actual disturbing force can be approximately substituted by a series of sine waves of various frequency and amplitude, the principle of superposition (summation) can be used to obtain the response of the system. Paper contains at the same time the limiting process marked out by

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A. D.

the transition from summation to integration of responses to "wave impulses."

In one sense there exists some analogy between the results given in the present paper and the Fourier integral.

In some cases the substitution of the actual disturbing force by a series of sine waves is not admissible. The modification of the method for solving of such more difficult cases is given.

Reviewer would like to point out that the paper is well and simply written and contains a clear idea. By adding some illustrative examples, the value of present paper could be increased.

K. Julis, Czechoslovakia

MT

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A. D.

Myškis, A. D.; and Vigant, È. I. On a connection of proximity spaces with extensions of topological spaces. Dokl. Akad. Nauk SSSR (N.S.) 103 (1955), 969–972. (Russian)

A completely regular space R is called an extension of $M \subset R$ if denoting by $R[A]$ the closure of A in R there exists for $A \subset M$, $B \subset M$ a $C \subset M$ such that $R[A] \cap R[C] = 0$ and $R[B] \cap R[M-C] = 0$; an extension $R \subset M$ is called accessible if, for any $x \in R - M$, there exist $x_n \in M$ with $x_n \to x$. For any proximity space M, a topological space $\tilde{R} = \tilde{R}(M) \supset M$ is defined, points of $\tilde{R} - M$ being "ends" of a special class [cf. Myškis, same Dokl. (N.S.) 84 (1952), 879–882; MR 14, 1001]. A (rather complicated) necessary and sufficient condition is given under which $\tilde{R}$ is an accessible extension of M. This condition is shown to be equivalent with the following property of uM (the compact extension of the proximity space M): if $A \subset M$, $B \subset M$, $R[A] \cap R[B] \neq 0$, then $R[R'] \cap R[A] \cap R[B] = 0$ where $R' \subset uM$ consists of limits of sequences of points from M; it is proved that, in this case, R' is equivalent to $\tilde{R}(M)$.

M. Katětov (Prague).

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Call Nr: AF 1108825

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

Myshkis, A. D. (Minsk), Abolinya, V. E. (Riga), Zhdanovich, V. F. (Minsk), Kostyukovich, YE. Kh., (Minsk), Lepin, A. Ye. (Minsk), Kharitonenko, P. I. (Minsk) and Shlopak, A. S. (Moscow). Mixed Problem for Linear Hyperbolic Systems in a Plane. 61-63

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

Call Nr: AF 1108825

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

Myshkis, A. D. (Minsk), Vigant, Ye. I. (Riga), Lepin, A. Ya. (Minsk). Improper Integrals in n-space. 91-92

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

New publication by the Voronezh University. Usp.mat.nauk 11 no.5: 258-259 S-O '56. (MLRA 10:2)
(Functional analysis)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

SUBJECT USSR/MATHEMATICS/Theory of functions CARD 1/2 PG - 828
AUTHOR MYSHKIS A.D.
TITLE Again on the problem of N.N.Lusin.
PERIODICAL Uspechi mat.Nauk 12, 2, 155-158 (1957)
reviewed 6/1957

Let a complex continuous function $f(z)$ be defined in the domain D of the z-plane. Let M_z be the set of the values of

$$\frac{f(z+\Delta z)-f(z)}{\Delta z}$$

for fixed z and Δz. Let $\mathfrak{M}_z = \bigcap_{|\Delta z| < (0,\varepsilon)} \overline{M}_\varepsilon$ for fixed z. Trochimčuk (Uspechi mat.Nauk 11, 5, 215-222 (1956)) showed that if $\mathfrak{M}_z$ is equal for all $z \in D$, then $\mathfrak{M}_z$ is either a circular line or the whole plane. The question whether the second case can be realized was not answered. Now the author constructs a function $f(z)$ for which actually the second case occurs; here

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Uspechi mat.Nauk 12, 2, 155-158 (1957) CARD 2/2 PG - 828

$$f(x+iy) = \sum_{n=1}^{\infty} \frac{\cos \frac{2\pi x}{\alpha_n}}{2^n} \qquad (-\infty < x < \infty)$$

with $\alpha_1 = 1$, $\frac{\alpha_n}{4\alpha_{n+1}} = \beta_n$ - natural and odd $(n=1,2,\ldots)$ and $\beta_n \frac{\pi n}{8\mu}$ $(n=1,2,\ldots)$. Here μ is the positive minimum of

$$\psi(x) = \max_{l} \left\{ \frac{\cos(x+\frac{\pi l}{2}) - \cos x}{l} \right\} \qquad l=-3,-1,1,3.$$

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A. D.

KRASNOSEL'SKIY, M.A.; KREYN, S.G.; MYSHKIS, A.D.

The broadened sessions of the Voronezh Seminar on Functional Analysis in March 1957. Usp.mat.nauk 12 no.4:241-250 Jl-Ag '57. (MIRA 10:10)

(Voronezh--Functional analysis)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.; GRINFEL'D, A.G.

Transferring S.A. Chaplygin's theorem on differential inequalities to difference inequalities. Uch.zap.BGU no.32:25-28 '57. (MIRA 11:12)

(Inequalities (Mathematics))

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.; LEPIN, A.Ya.

Existence of an invariant set consisting of two points in connection with continuous mappings of a segment onto itself. Uch.zap.BGU no.32:29-32 '57. (MIRA 11:12)
(Functional analysis)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

AUTHORS: Myshkis, A. D. (Minsk) and Shlopak, A. S. (Moscow). 200

TITLE: The mixed problem for systems of differential-functional partial-differential equations with Volterra type operators. (Smeshannaya zadacha dlya sistem differentsial'no-funktional'nykh uravneniy c chastnymi proizvodnymi i operatorami tipa Vol'terra).

PERIODICAL: "Matematicheskiy Sbornik" (Mathematical Symposium), 1957, Vol.41 (83), No.2, pp.239-256 (U.S.S.R.)

ABSTRACT: In (1) the problem of the continuous dependence of the solution of the mixed problem on the boundary condition and the right hand sides of the system is investigated for the system (1) (p.239) with the boundary condition (2) (p.239), where $A_1 \ldots, P_2$ are square matrices of order m (greater than or equal to unity), (a star indicates the transpose), h_1, h_2, ϕ, ψ, are known column matrices, and i, u unknown column matrices of the same order. In ref.(2) theorems are obtained on existence and fundamental properties of the solution for an important special case of eq.(1) - i.e. for the so-called generalised system of telegraph equations under the simplest boundary conditions. In the present paper the results of refs. (1) and (2) are carried over to a system of a more general form (4) (p.239). In this equation T_s is a Volterra type operator transforming the pair of m-dimensional continuous vector functions i,u, into a single m-dimensional continuous vector function.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

The mixed problem for systems of differential-functional partial-differential equations with Volterra type operators. (Cont.) 200

Since the exposition in the present paper is largely similar to that in refs. (1) and (2), then in proofs, only differences from the discussions in these papers is indicated; (on the other hand, theorems on the interchange of derived solutions are given in a more convenient form and the dependence of the solution on the coefficients of the system is given for the first time. This paper has been written on the basis of a doctorate dissertation by one of the authors under the direction of the other. There are eight references, four of which are Russian.

(1) A. D. Myshkis. The continuous dependence on the initial conditions and the right hand sides of the system of the solution of the mixed problem for a system of linear differential equations. Mat. Sbornik. Vol.30 (72) 1952. pp.317-328.

(2) A. D. Myshkis. The simplest boundary problem for generalised systems of telegraphic equations. Mat. Sbornik, Vol.31(73), 1952, pp.335-352.

Submitted 3/2/56.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

AUTHOR: LYUBRIS, A.D. (Khar'kov) and Lepin, A.Ya. (Minsk) 30-3-3/8

TITLE: On the Definition of the Generalized Functions (Ob opredelenii obobshchennykh funktsiy)

PERIODICAL: Matematicheskiy sbornik, 1957, Vol.43, Nr 3, pp.323-348 (USSR)

ABSTRACT: Starting from Khusainov's definition [Ref.4] the authors want to give a general definition of different classes of generalized function (in dependence on their behavior at infinity). Thereby it becomes possible to develop a general method for the introduction of new spaces of primitive functions (by this introduction there arose from Sobolev's original generalized functions [Ref. 1] the distributions of Schwartz [Ref. 2] and the generalized functions of Gel'fand and Shilov [Ref. 3]). The authors' paper is not only of interest from the methodical point of view, but moreover some well-known older results can be seen in a new light. The paper consists of 5 paragraphs.

§ 1. Classes of estimation. An arbitrary family $\mathfrak{M}$ of non-negative functions which satisfies the following conditions is denoted as an estimation class :

1. From $0 \leq m_1(x) \leq m(x) \in \mathfrak{M}$ it follows $m_1(x) \in \mathfrak{M}$; 2. From $m_1(x) \in \mathfrak{M}$ and $m_2(x) \in \mathfrak{M}$ it follows $m_1(x)+m_2(x) \in \mathfrak{M}$; 3. $1 \in \mathfrak{M}$;

Card 1/5

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

4. From $m(x) \in \mathfrak{M}$ it follows $\max_{0 \le t \le 1} m(tx) \in \mathfrak{M}$; 5. From $m(x) \in \mathfrak{M}$ it follows [illegible] $(x) \in \mathfrak{M}$.
The minimum class (contained in all others) is $\mathfrak{M}^0$, the class of the nonnegative functions which for $x \to \infty$ do not increase quicker than a certain power of $|x|$. The maximum class $\mathfrak{M}^1$ comprises all nonnegative functions.
Now the authors consider a series of properties of the estimation classes $\mathfrak{M}$, e.g. that from $m(x) \in \mathfrak{M}$ it follows that

$$\int_a^x m(s)ds \in \quad .$$

§ 2. Generalized Functions according to Mikusinski. These are defined in such a way that the definition for $\mathfrak{M} = \mathfrak{M}^1$ passes over into Mikusinski's definition [Ref.4]. Definition: The sequence of functions $F_n(x)$ converges $\mathfrak{M}$-almost uniformly to $F(x)$ $(F_n(x) \xrightarrow{\mathfrak{M}} F(x))$, if on each finite interval it converges uniformly to $F(x)$ and if it is $\sup_n |F_n(x)| \in \mathfrak{M}$. Definition: The sequence $f = \{f_n(x)\}$ is denoted $\mathfrak{M}$-fundamental, if there exists an integer $k \geq 0$ and

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

On the Definition of the Generalized Functions 79-3-7/3

an $\mathfrak{M}$-almost uniformly convergent sequence of k-times continuously differentiable functions $F = \{F_n(x)\}$, for which it is $F_n^{(k)}(x) = f_n(x)$ $(n=1,2,\ldots)$. Definition: Two $\mathfrak{M}$-fundamental sequences f and ψ are $\mathfrak{M}$-equivalent $(f \sim \psi)$, if there is an integer $k \geq 0$ and sequences $F = \{F_n(x)\}$ and $\Phi = \{\Phi_n(x)\}$, so that $F^{(k)} = f$, $\Phi^{(k)} = \psi$ and $F_n(x) - \Phi_n(x) \underset{\mathfrak{M}}{\to} 0$. Since the $\mathfrak{M}$-equivalence is symmetric, reflexive and transitive, the $\mathfrak{M}$-fundamental sequences are divided into $\mathfrak{M}$-equivalence classes, each of them is denoted now as an $\mathfrak{M}$-generalized function in Mikusinski's sense. Let the set of these $\mathfrak{M}$-generalized functions be $M_{\mathfrak{M}}$ (Mikusinski's real definition concerns the case $\mathfrak{M} \equiv \mathfrak{M}^1$). Now the properties of the $M_{\mathfrak{M}}$ are considered, among others the strong convergence in $M_{\mathfrak{M}}$ (also according to Mikusinski) is introduced.

§ 3. Dual space of primitive functions. Generalizing the definitions of Schwartz, Gel'fand and Shilov now the variety $O_{\mathfrak{M}}$ of the "$\mathfrak{M}$-primitive functions" $s(x)$ is introduced which are differentiable for infinitely many times, whereby $s^{(k)}(x) \cdot m(x)$

Card 3/5

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

for $|x| \to \infty$ tends to 0 $(k = 0,1,\ldots)$ for each $m(x) \in \mathfrak{U}$. $O_{\mathfrak{M}}$ is a linear space, whereby from $s(x) \in O_{\mathfrak{M}}$ it follows: $s'(x) \in O$. In the case $\mathfrak{M} = \mathfrak{U}^1$ the variety of the finite primitive functions arises. In the case $\mathfrak{M} = \mathfrak{U}^0$ $O_{\mathfrak{M}}$ was already considered by Schwartz, lateron by Gel'fand and Shilov. The convergence in $O_{\mathfrak{M}}$ is introduced $(s_n(x) \xrightarrow{\mathfrak{U}} s(x))$ representing a weak convergence with regard to the scalar product $(s,\bar{f})$. The scalar product $(s,\bar{f})$ then allows the introduction of the weak convergence in $M_{\mathfrak{U}}$: for $\bar{f}_n \in M_{\mathfrak{M}}$ $(n=1,2,\ldots)$, $\bar{f} \in M_{\mathfrak{U}}$ it holds $\bar{f}_n \xrightarrow{\text{weak}} \bar{f}$, if for each $s(x) \in O_{\mathfrak{M}}$ it holds: $(s,\bar{f}_n) \to (s,\bar{f})$. Theorem: from $\bar{f}_r \xrightarrow{\text{weak}} \bar{f}$ and $\bar{f}_n \xrightarrow{\text{weak}}$ it follows: $\bar{f} = \bar{f}$.

§ 4. The general form of a linear continuous functional in the space $M_{\mathfrak{U}}$. Theorem: Each linear functional $K(\bar{f})$, $\bar{f} \in M$ which is continuous with respect to the strong convergence can be represented with the aid of a uniquely determined function $s(x) \in O_{\mathfrak{M}}$ in the form of a scalar product $(s,\bar{f})$.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

On the Definition of the Generalized Functions 39-3-3/9

§ 5. The Schwartz space. The Schwartz space $S_{\mathfrak{M}}$ denotes the totality of the linear continuous functionals T in the $S_{\mathfrak{M}}$, whereby ordinary linear operations, differentation $T'(s) = -T(s')$ $(s(x) \in 0_{\mathfrak{M}})$ and weak convergence are introduced. For $\mathfrak{M} = \mathfrak{M}_1$ the usual Schwartz space is obtained. Definition: $\mathfrak{M}$ possesses a denumerable basis, if there exists such a sequence $m_i(x) \in \mathfrak{M}$ $(i=1,2,\ldots)$, that for a certain $i=1,2,\ldots$ an arbitrary estimation function $m(x) \in \mathfrak{M}$ for all x $(-\infty < x < +\infty)$ is not higher than $m_i(x)$. E.g. $\mathfrak{M}^0$ has has the denumerable basis $\{i + |x|^i\}$. Without denumerable basis is the set of the $m(x) \geqslant 0$ for which for $|x| \to \infty$ and $n=1,2,\ldots$ the expression $m(x)\, e^{-|x|}\, |x|^n$ tends to zero. The statement seems to be of interest that the complicatedness of the usual Schwartz space (functionals of infinite order) consists in the fact that the corresponding class estimation $\mathfrak{M}_1$ is very complicated in spite of the simplicity of its definition : it possesses no denumerable basis in the sense mentioned above. 1 Soviet and 7 foreign references are quoted.

Card 5/5

SUBMITTED: 23 May 1956

AVAILABLE: Library of Congress

1. Functions-Theory 2. Functions-Definition

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS A D

PA - 2233

AUTHOR: GIL',G.V., MYSHKIS,A.D.

TITLE: Asymptotic Behavior of Solutions of a Non-linear Boundary Problem in the Boundary Layer Theory (Asimptoticheskoye povedeniye resheniy odnoy nelinenoy krayevoy zadachi teorii pogranichnogo sloya, Russian)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 112, Nr 4, pp 599 - 602 (U.S.S.R.)
Received: 4 / 1957 Reviewed: 5 / 1957

ABSTRACT: In the theory of the boundary layer the following boundary value problem is well-known:

$$y'''(t) + 2y(t)y''(t) + 2\beta(k^2 - [y'(t)]^2) = 0 \quad (0 \leq t < \infty)$$

$$y(0) = y'(0) = 0, \quad y(\alpha) = k, \quad (\beta > 0, \ k > 0)$$

It is the task of the present work to investigate the asymptotic behavior of the solution of this boundary value problem at t . Here it is of interest to obtain a method for the investigation of the asymptotic behavior of the solutions of an extensive class of boundary value problems (which include the above mentioned boundary value problem as a special case).

$y(t)$ $(0 \leq t < \infty)$ is supposed to be a solution of the above boundary value problem. Here the following lemmata, theorems, and corollaries as well as their proofs are given:

Lemma 1: $y'(t) < k$ $(0 \leq t < \infty)$.

Lemma 2: $v'(y) < 0$ $(y_0 < y < \infty)$.

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

PA - 2233

Asymptotic Behavior of Solutions of a Non-linear Boundary Problem in the Boundary Layer Theory.

Lemma 3: The function $v''(y)$ at $y > y_0$ has not more than one zero.
Corollaries: It applies $v'(\infty) = 0$.
Lemma 4: $v''(\infty) = 0$.
Corollaries: $\lim_{y \to \infty} yv'(y) = 0$.
Lemma 5: If $\beta > 0$, it applies that $\lim_{y \to \infty} ((yv'(Y)/v(y)) = -$

Theorem: The solution of the boundary value problem given above as well as its first and second derivation at $t \to \infty$ have the following asymptotic representation:

$$y(t) = kt - C + t^{-2+2\beta+O(1)} e^{-kt^2+2Ct}$$

$$y'(t) = k - t^{-1-2\beta+O(1)} e^{-kt^2+2Ct}$$

$$y''(t) = t^{-2\beta+O(1)} e^{-kt^2+2Ct}$$

Here $C > 0$ denotes a certain constant ($= \lim_{t \to \infty} (kt - y(t))$). The sum of the constant C is, however, unknown. For this constant the following would be necessary: an evaluation or a method for the approximated computation or a development into any series.

ASSOCIATION: Not given.
PRESENTED BY: Menber of the Academy SEDOV,L.I. on 9.11.1956
SUBMITTED: 18.6.1957
AVAILABLE: Library of Congress
Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Myshkis, A D

AUTHOR: MYSHKIS, A.D., LEPIN, A.Ya. (Kharkov) 20-2-4/50

TITLE: On the Definition of the Generalized Functions (Ob opredelenii obobshchennykh funktsiy).

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol.116, Nr 2, pp.177-180(USSR)

ABSTRACT: In the present paper the authors apply the definition of Mikusinski - Korevaar (see J.Korevaar [9]) in order to give a generalized definition of different classes of the generalized functions introduced for the first time by Sobolev. The authors replace the set of all non-negative functions by the set of those negative functions which satisfy certain additional conditions (class of estimation $\mathfrak{M}$).

ASSOCIATION: Kharkov Institute for Aviation (Khar'kovskiy aviatsionnyy institut).

SUBMITTED: October 27, 1956

AVAILABLE: Library of Congress

CARD 1/1

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

NIKOL'SKIY, S.M., otv.red.; ABRAMOV, A.A., red.; BOLTYANSKIY, V.G., red.; VASIL'YEV, A.M., red.; MEDVEDEV, B.V., red.; MISHKIS, A.D., red.; POSTNIKOV, A.G., red.; PROKHOROV, Yu.V., red.; RYBNIKOV, K.A., red.; UL'YANOV, P.L., red.; USPENSKIY, V.A., red.; CHETAYEV, N.G., red.; SHILOV, G.Ye., red.; SHIRSHOV, A.I., red.; GUSEVA, I.N., tekhn.red.

[Proceedings of the Third All-Union Mathematical Congress] Trudy tret'ego Vsesoiuznogo matematicheskogo s"ezda. Vol.3 [Synoptic papers] Obzornye doklady. Moskva, Izd-vo Akad.nauk SSSR, 1958. 596 p. (MIRA 12:2)

1. Vsesoyuznyy matematicheskiy s"yezd. 3d, Moscow, 1956.
(Mathematics--Congresses)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

AUTHOR: ~~Myshkis, A.D. and~~ Khokhryakov, A.Ya. SOV/39-45-3-6/7
(Khar'kov, Izhevsk)

TITLE: Breaking Dynamical Systems. I. Singular Points in the Plane (Bushuyushchiye dinamicheskiye sistemy. I. Osobyye tochki na ploskosti)

PERIODICAL: Matematicheskiy sbornik, 1958, Vol 45, Nr 3, pp 401-414 (USSR)

ABSTRACT: The notion of the "systèmes déferlants" of Vogel [Ref 2-7] is is defined in metric spaces in extraordinary generality. Then the authors restrict themselves, however, to the consideration of n differential equations in the plane with m critical curves, on which the solution of the i-th equation is replaced by the solution of the j-th equation. The correspondence $j = j(i)$ is given. The cases $n = 2$, $m = 1$; $n = 2$, $m = 2$ are considered more detailed. Stability- and instability conditions are set up. As usual in the control theory a multisheet phase plane is introduced in which the partial solutions are combined. A continuation of the paper is said to be dedicated to boundary cycles.
There are 9 references, 3 of which are Soviet, and 6 French.

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Breaking Dynamical Systems. I. Singular Points in the Plane SOV/39-45-3-6/7

SUBMITTED: February 11, 1957

1. Mathematics--Control systems 2. Topology--Applications

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Myshkis, A.D.

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.N. Vasil'yev, B.V. Medvedev, A.D. Myshkis, S.N. 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.

Lobachev, S.V. (Krasnodar). On the generalization of the theory of linear integral equations of N.N. Nazarov 33

Rysovskikh, I.P. (Leningrad). Certain formulas of the Fredholm method and their application to the problem on the evaluation of error of approximate methods of solution of integral equations 34

Myshkis A.D. (Minsk), Ye. G. Guhar' (Mozyr'), and A. Ya. Khokhryakov (Polotsk). Two modifications of the concept of a dynamic system on the plane 35

Panich, O.I. (Odessa). Asymptotic expansions of the solution of partial differential equations in powers of a small parameter at highest derivative 36

Rasulov, M.L. (L'vov). Subtraction method for the solution of boundary value and mixed problems 36

Rutitskiy, Ya. B. (Zhdanov). On integral equations with exponential nonlinearities 37

Card 8/34

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Myshkis, A.D.

16(0) PHASE I BOOK EXPLOITATION SOV/3177

Matematika v SSSR za sorok let, 1917-1957. tom 1: Obzornyye stat'i (Mathematics in the USSR for Forty Years, 1917-1957). Vol 1: Review Articles) Moscow, Fizmatgiz, 1959. 1002 p. 5,500 copies printed.

Eds: A. G. Kurosh, (Chief Ed.), V. I. Bityutskov, V. G. Boltyanskiy, Ye. B. Dynkin, G. Ye. Shilova, and A. P. Yushkevich; Ed. (Inside book): A. P. Lapko; Tech. Ed.: S. N. Akhlamov.

PURPOSE: This book is intended for mathematicians and historians of mathematics interested in Soviet contributions to the field.

COVERAGE: This book is Volume I of a major 2-volume work on the history of Soviet mathematics. Volume I surveys the chief contributions made by Soviet mathematicians during the period 1947-1957; Volume II will contain a bibliography of major works since 1917 and biographic sketches of some of the leading mathematicians. This work follows the tradition set by two earlier works: Matematika v SSSR za pyatnadtsat' let (Mathematics in the USSR for 15 Years) and Matematika v SSSR za tridtsat' let (Mathematics in the USSR for 30 Years). The book is divided into the major divisions of the field, i.e., algebra, topology, theory of probabilities, functional analysis, etc., and contributions and outstanding problems in each discussed. A listing of some 1400 Soviet mathematicians is included with references to their contributions in the field.

Vishnik, M. I., A. D. Myshkis, and O. A. Oleynik, Partial Differential Equations 563

Ch. I. Elliptic-type Equations 566
1. Classical equations of mathematical physics 566
2. Linear elliptic equations of the second order 572
3. Elliptic equations of the plane 575
4. Solution of boundary value problems by means of integral equations 580
5. Embedding theorems 582
6. Variational methods of solving boundary value problems 586
7. Non-self-conjugate problems 589
8. Relaxation methods for elliptic type equations 594
9. Nonlinear elliptic-type equations 597
10. Degenerate cases 599

Ch. II. Hyperbolic and Parabolic-type Equations 604
1. Classical equations of mathematical physics 604
2. Cauchy's problem for linear equations 606
3. Mixed boundary value problem for linear equations 613
4. Relaxation methods for nonstationary equations 619
5. Nonlinear equations 622
6. Degenerate cases 626
7. Nonstationary equations and systems not pertaining to classical types. Various studies 628

Ch. III. Other Problems 631

Lyusternik, L. A. Variational Calculus 637
1. Introduction 637
2. One dimensional problems 638
3. Multidimensional problems 639
4. Variational theory of general nonlinear operators 641
5. Topological methods of the theory of critical points 643
6. Variational calculus in the large and the topology of functional spaces 645
7. Variational methods of solving problems in physics and engineering 647

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

30853
S/044/61/000/008/030/039
C111/C333

16.34.0

AUTHORS: Myshkis, A. D., Shapovalova, Ye. J.

TITLE: On the application of the Taylor formula for the approximative solution of differential equations with lagging argument

PERIODICAL: Referativnyy zhurnal, Matematika, no 8, 1961, 32, abstract 8V214.(" Uch. zap. Belorussk un-t", 1959, vyp 2(51), 65-71)

TEXT: The equation

$$y'(x) = y(x-h) \quad (0 \leq x < \infty) \qquad (1)$$

can be approximately solved if $y(x-h)$ is replaced by the k-th partial sum of the Taylor series in powers of h, whereby the equation is reduced to an ordinary differential equation of order k. L. E. El'sgol'ts has shown (see e. g. R Zh Mat, 1953-1954, 2347) that here k need not be greater than the order of the initial equation with lagging argument (in single cases, k can be greater by one). In the case of equation (1), k must be equal to 1 or 2. The present contribution illustrates this fact. The authors show that for $k \geq 2$ there

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

30153
S/044/61/000/008/030/039
On the application of the Taylor . . . C111/C333

occurs in the general solution of the transformed equation an exponential term, the exponent of which tends to ∞ for $h \to 0$.

[Abstracter's note: Complete translation.]

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

16(1)

AUTHORS: Akhiyezer, N.I., Myshkis, A.D. SOV/42-14-3-19/22

TITLE: Mathematical Life at Khar'kov in the Last Years

PERIODICAL: Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 215 - 220 (USSR)

ABSTRACT: The authors present a list of the lectures given in the scientific section of the Khar'kov Mathematical Society from 1956 (the survey of M.N. Marchevskiy contains the lectures up to 1955, see Istoriko - Matematicheskiye Issledovaniya, 1956, Nr 2, pp 613 - 666). Lectures were given by the following scientists : M.D. Dol'berg, N.I. Akhiyezer, Ya.P. Blank, B.Ya. Levin, A.D. Myshkis, A.Ya. Povzner, Z.S. Agranovich, V.A. Marchenko, I.Ye. Ogiyevetskiy (Dnepropetrovsk), S.G. Kreyn (Voronezh), M.A. Krasnosel'skiy (Voronezh), N.S. Landkof, M.S. Livshits, A.V. Pogorelov, B.V. Gnedenko (Kiyev), V.M. Glushkov, M.G. Kreyn, F.S. Rofe-Beketov, I.V. Sukharevskiy, V.E. Abolinš (Riga), T.M. Karaseva, and Yu.P. Ginzburg (Odessa).

On June 6, 1957 (on the occasion of the 100-th birthday of A.M. Lyapunov) there took place a festive meeting.

At the end of October 1957 an outward session of the Mathematical Section of the Physico-Mathematical Department of the

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Mathematical Life at Khar'kov in the Last Years SOV/42-14-3-19/22

Academy of Sciences of the Ukrainskaya SSR took place on the occasion of the 40-th anniversary of the October revolution. Lectures were given among others by G.N. Savin, B.L. German, Yu.I. Lyubich, Yu.M. Berezanskiy, I.M. Rapoport.
From November 12 - 16, 1957 there took place an extended seminary on mathematical physics at the Khar'kov University with participation of the Khar'kov Mathematical Society. Lectures were given among others by: M.I. Vishik (Moscow), S.L. Sobolev (Moscow), S.K. Godunov (Moscow), S.G. Mikhlin (Leningrad), O.A. Oleynik (Moscow), G.Ye.Shilov (Moscow), G.Ya. Lyubarskiy (Khar'kov), K.I. Babenko (Moscow), I.M. Gel'fand (Moscow), N.D. Vvedenskaya (Moscow), T.D. Venttsel' (Moscow), S.L. Kamenomostskaya (Moscow), Ye.S. Sabinina (Moscow), M.Sh. Birman (Leningrad), O.A. Ladyzhenskaya (Leningrad), I.I. Vorovich (Rostov), A.I. Koshelev (Leningrad), I.M. Glazman (Khar'kov), Yu.L. Daletskiy (Kiyev), I.S. Kats (Kiyev), B.M. Levitan (Moscow), I.S. Sargsyan (Yerevan), M.V. Lomonosov (Khar'kov), and L.D. Faddeyev (Leningrad).

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.;SHAPOVALOVA, Ye.I.

Using the Taylor formula for the approximate solution of differential equations with a retarding argument. Uch. zap. BGU no.51:65-71 '59. (MIRA 14:1)

(Differential equations)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

16(1)

AUTHORS: Myshkis, A.D., Naumovich, A.F. SOV/20-124-5-4/62

TITLE: An Improvement of the Method of Recurrence Sequences for the Investigation of Differential Equations With Lagging Argument (Utochneniye metoda vozvratnykh posledovatel'nostey dlya issledovaniya differentsial'nykh uravneniy s zapazdyvayushchim argumentom)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 5, pp 976-979 (USSR)

ABSTRACT: The authors investigate the equation

(1) $y'(x) = -M(x)y(x-\Delta(x))$, $A \leqslant x < \infty$, $M(x) \geqslant 0$, $\Delta(x) \geqslant 0$

$M(x) \leq M_0 < \infty$; $\Delta(x) \leq \Delta_c < \infty$; $y(x)$ given for

$A - \Delta_0 \leqslant x \leqslant A$, all the functions are continuous. The announced improvement consists in the fact that for the estimation of the increments of the solution the axis is not divided into intervals of the length Δ_0 (like in [Ref 1,2], where Δ_0 is the upper bound of the dead times), but into intervals of the length $\Delta_0/(n-1)$, $n = 2,3,\ldots$. Theorem : Let be $y(x) \leqslant y(A) > 0$ $(A \leqslant x \leqslant B)$ and $y(B) = 0$, $B \in (A, \infty)$. Then

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

An Improvement of the Method of Recurrence Sequences SOV/20-124-5-4/62
for the Investigation of Differential Equations With Lagging Argument

max $y(x)$ is for $A - \Delta_0 \leq x \leq A$ larger than $y(A)$. Theorem : Let be $y(x) \geqslant 0$, $A - \Delta_0 \leq x \leq A$. Then for $A \leq x < \infty$ the set of zeros of the function $y(x)$ is connected (or empty). Theorem: All the solutions of (1) can be of three different kinds : 1. Different from zero for sufficiently large x (not oscillating) 2. The sign on every interval $[D - \Delta_0, D]$, $A \leq D < \infty$ is alternating (oscillating solution) 3. For all sufficiently large x identically equal to zero. For every solution of first kind there holds for large x: $|y(x)| > C\alpha_1^{-(n-1)x/\Delta_0}$ or $|y(x)| < C\alpha_2^{-(n-1)x/\Delta_0}$; $C = \text{const} > 0$.

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

An Improvement of the Method of Recurrence Sequences SOV/20-124-5-4/6
for the Investigation of Differential Equations With Lagging Argument

There are 3 Soviet references.

PRESENTED: October 6, 1958, by I.G. Petrovskiy, Academician

SUBMITTED: October 3, 1958

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MIL'MAN, V.D.; MYSHKIS, A.D.

Stability of motion in the presence of shocks. Sib. mat. zhur. 1 no.2:233-237 Jl-Ag '60. (MIRA 13:12)
(Mathematical physics)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

16.4200 16.6500

22410
S/042/61/016/001/004/007
C 111/ C 333

AUTHOR: Myshkis, A. D.

TITLE: On the effective calculation of Fourier coefficients with the aid of iterations

PERIODICAL: Uspekhi matematicheskikh nauk, v. 16, no. 1, 1961, 155-156

TEXT: For calculating the integral

$$\gamma_n = \frac{2}{\pi} \int_0^{\pi} \frac{a_0 + a_1 \cos x + \ldots + a_r \cos rx}{A_0 + A_1 \cos x + \ldots + A_s \cos sx} \cos nx \, dx \qquad (1)$$

where the coefficients are in general complex and the denominator is $\neq 0$, the author carries out, with the aid of the translation operator $\Delta \alpha_n = \alpha_{n+1}$ and of the formulas

$$\frac{\Delta^k + \Delta^{-k}}{2} \cos nx = \cos kx \cos nx \quad (k=0,1,\ldots,)$$

a reduction to the system

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

22410

S/042/61/016/001/004/007
C 111/ C 333

On the effective calculation ...

$$\left.\begin{aligned} A_0 \gamma_0 + A_1 \frac{\gamma_1 + \gamma_{-1}}{2} + \dots + A_s \frac{\gamma_s + \gamma_{-s}}{2} &= 2a_0 \\ A_0 \gamma_1 + A_1 \frac{\gamma_2 + \gamma_0}{2} + \dots + A_s \frac{\gamma_{s+1} + \gamma_{-s+1}}{2} &= a_1 \end{aligned}\right\} \quad (3)$$

which then is solved by iterations. The method is also applicable to multiple Fourier integrals; e. g. for the case

$$\varepsilon_{m,n} = \frac{4}{\pi^2} \int_0^{\pi}\int_0^{\pi} \frac{P(\cos x, \cos y)}{Q(\cos x, \cos y)} \cos mx \cos ny \, dx \, dy$$

one obtains the system

$$Q\left(\frac{\Delta + \Delta^{-1}}{2}, \frac{\hat{\Delta} + \hat{\Delta}^{-1}}{2}\right)\varepsilon_{m,n} = \frac{4}{\pi^2} \int_0^{\pi}\int_0^{\pi} P(\cos x, \cos y) \cos mx \cos ny \, dx \, dy$$

$$(m, n = 0, 1, \dots), \quad (5)$$

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

22410

S/042/61/016/001/004/007
C 111/ C 333

On the effective calculation ...

where $\Delta \varepsilon_{m,n} = \varepsilon_{m+1,n}$, $\tilde{\Delta} \varepsilon_{m,n} = \varepsilon_{m,n+1}$.

A theoretical investigation of the method is suggested.

There is 1 Soviet-bloc reference.

SUBMITTED: July 5, 1960

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

84755

16.4500

S/042/60/015/004/013/017XX
C111/C222

AUTHOR: Myshkis, A.D.

TITLE: On a Differential-Functional Inequality 16

PERIODICAL: Uspekhi matematicheskikh nauk, 1960, Vol.15, No.4, pp.157-161

TEXT: Let the functions $y(x)$, $a(x)$, $b(x)$ and $\vartheta(x)$ be defined, finite and real for $A \leq x < \infty$, where $x-\vartheta(x) \to \infty$ for $x \to \infty$. Let $\Gamma(x)$ $(A \leq x < \infty)$ be the least upper bound of the values $\bar{x}$ for which $\bar{x}-\vartheta(\bar{x}) < x$. Let the function $y(x)$ be continuous and let it have a continuous derivative for $\Gamma(A) < x < \infty$ which everywhere where $y(x) \neq 0$, satisfies the inequation

(1) $$y'(x) \leq a(x)y(x)+b(x)y(x-\vartheta(x)), \quad \vartheta(x) \geq 0.$$

Theorem 1: Let

(2) $$a(x) \leq 0, \quad a(x)+b(x) \leq 0$$

and $y(x) \geq 0$ $(A \leq x < \infty)$. Then it holds

(3) $$y(x) \leq \max_{A \leq t \leq \Gamma(A)} y(t) \quad (\Gamma(A) \leq x < \infty).$$

Theorem 2: Let $a(x)$ be finite summable,

(6) $$b(x) \leq 0, \quad a(x)+b(x) \geq 0;$$

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

84755

S/042/60/015/004/013/017XX
C111/C222

On a Differential-Functional Inequality

$y(\bar{A}) \leq 0$ and $y(x) \geq y(\bar{A})$ on $A \leq x \leq \bar{A}$ ($\bar{A} \geq \Gamma(A)$). Then $y'(x) \leq 0$ (for $\bar{A} < x < \infty$, $y(x) \not\equiv 0$).

Conclusion: If $a(x)$, $b(x)$ satisfy the conditions of theorem 2, then all solutions of the inequation (1) decompose into two types. 1) Solutions which beginning with an x-value are not positive and not increasing. For these solutions it holds according to (1)

$$y'(x) \leq [a(x)+b(x)]\, y(x)$$

for all sufficiently large x, whereby $y(x)$ can be estimated from above. 2) Solutions being positive on every interval $[\alpha, \beta]$ ($\beta \geq \Gamma(\alpha)$) for which $y(x)$ assumes the minimal value at the right end of the interval.

Theorem 2 is used for the investigation of the equation

$$(10) \qquad y'(x) = -\int_0^\infty y(x-s)\,dr(x,s) \qquad (A \leq x < \infty),$$

where the assumptions and notations of (Ref.1) are used. The author obtains assertions on the decomposition of the set of solutions with respect to their asymptotic behavior for $\Delta_0 > 0$, $M_0 > 0$, $\Delta_0 M_0 < \frac{1}{4}$ which partially

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

84755

S/042/60/015/004/013/017XX
C111/C222

On a Differential-Functional Inequality

exceed the facts obtained in (Ref.1). E.g. if $\Delta_0 M_0 \leq \frac{1}{e}$ and if the solution does not change its sign on $[a-\Delta_0, a]$, $a \geqslant A+\Delta_0$, while $y(a) = 0$, then it holds either $y(x) \equiv 0$ for $a \leq x < \infty$, or there exists a $b \in [a, a+\Delta_0)$ so that $y(x) \equiv 0$ for $a \leq x \leq b$ and $y(x) \neq 0$ for $b < x < \infty$, where in the last case an explicit estimation can be given for $|y(x)|$.
There are 2 Soviet references.

[Abstracter's note: (Ref.1) concerns A.D.Myshkis, Linear Differential Equations With a Lagging Argument, Moscow, 1951]

SUBMITTED: October 20, 1958 16

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

S/042/60/015/04/04/007
C111/C222

AUTHOR: Myshkis, A.D.

TITLE: On Asymptotic Estimation of the Solutions of Linear Homogeneous Systems of Differential Equations With a Lagging Argument

PERIODICAL: Uspekhi matematicheskikh nauk, 1960, Vol. 15, No. 4, pp. 163 - 167

TEXT: The author gives two methods for the estimation of the solutions in question. The first rougher method is valid for arbitrary delays, forms a generalization of the method described in (Ref. 1) and gives the estimation of the absolute value of the solution from above. The second method is valid only for delays bounded from above and bases on the differential-functional inequations of (Ref. 2). With the aid of this method it can be shown that for sufficiently small delays all solutions of the system decompose into the "solutions of the principal class" which are estimated from below, and the "quickly decaying solutions" which are estimated from above. There are 2 Soviet references.

SUBMITTED: October 20, 1958

Card 1/1

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ABOLINYA, V.E. (Riga); MYSHKIS, A.D. (Khar'kov)

Mixed problem for an almost hyperbolic system on a plane. Mat. sbor. 50 no.4:423-442 Ap '60. (MIRA 13:8)
(Differential equations, Partial)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A. D., SHIMANOV, S. N. and YELAGOLTS, L. YE.

"Stability and oscillations of systems with time lag."

Paper presented at the Intl. Symposium on Nonlinear Vibrations, Kiev, USSR, 9-19 Sep 61

Research Technical Physics Low Temperature Institute of the Ukrainian SSR, Academy of Sciences, Kharkov

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

PETROVSKIY, Ivan Georgiyevich; MYSHKIS, A.D.; OLEYNIK, O.A.; GAL'PERIN, S.A.; LANDIS, Ye.M.; MOROZOVA, I.Ye., red.

[Lectures on the theory of ordinary differential equations] Lektsii po teorii obyknovennykh differentsial'nykh uravnenii. Izd.5., dop. Moskva, Nauka, 1964. 2[illegible] p. (MIRA 18:1)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 31301-65 EWT(d) Pg-4 IJP(c)

ACCESSION NR: AR5004801 S/0044/64/000/011/B061/B061

SOURCE: Ref. zh. Matematika, Abs. 11B277

AUTHOR: Myshkis, A. D.

14
B

TITLE: On the maximum region of solvability of the mixed problem for an almost-linear hyperbolic system with two independent variables

16

CITED SOURCE: Materialy k Sovmestnomu sovetsko-amerikanskomu simpoziumu po uravleniyam s chastnymi proizvodnymi, Novosibirsk, avg. 1963. Sib. otd. AN SSSR, Novosibirsk, 1963, 10 str.

TOPIC TAGS: partial differential equation, hyperbolic equation, uniqueness theorem, existence theorem

TRANSLATION: A mixed problem is considered for a weakly nonlinear hyperbolic system in the rectangle

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 31301-65

ACCESSION NR: AR5004801

$$\overline{\Pi} = \{0 < x < l,\ 0 < t < T\}:$$

$$\frac{\partial u_i}{\partial t} + \lambda_i(x, t)\frac{\partial u_i}{\partial x} = f_i(x, t, u),\ u_i(x, 0) = g_i(x),$$

$$i = 1, \ldots, m,$$

$$u_i(0, t) = h_{0i}(t, u^*(0, t)),\ 0 < t < t_{0i},\ u^* = \{u_j : t_{0j} = 0\},$$

$$u_i(l, t) = h_{li}(t, u^{**}(0, t)),\ 0 < t < t_{li},\ u^{**} = \{u_j : t_{lj} = 0\},$$

and it is shown that if the functions f_i, h_{0i}, and $h_{\ell i}$ are continuous in all their arguments and satisfy the Lipschitz condition with respect to u in each finite interval of its variation, then the following situation is possible: either the continuous solution of the problem exists and is unique in the entire rectangle Π, or else it has a "natural" boundary T_0 (0, T) of continuation in t, i.e., the solution exists and is unique in the rectangle $\Pi_0 = \{0 \leq x \leq \ell,\ 0 \leq t < T_0\}$, but

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 31301-65

ACCESSION NR: AR5004801

$$\max_{0<x<l} |u(x, t)| \to \infty, \quad t \to T_0 - 0$$

Some new problems are noted. A. Oskolkov.

SUB CODE: MA ENCL: 00

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

30035
S/041/61/013/004/006/007
B125/B112

AUTHORS: Myshkis, A. D., Chinayev, P. I.

TITLE: Algorithm for determining equivalent initial conditions for linear inhomogeneous differential equations with constant coefficients

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, v. 13, no. 4, 1961, 104 - 109

TEXT: One of the possible algorithms for replacing the solution of a system of linear inhomogeneous differential equations with constant coefficients and zero initial conditions by an approximate solution of a system of homogeneous differential equations with non-zero initial conditions is presented. The algorithm under consideration is based on the rough approximation of the external perturbation by the sum of exponents. A linear inhomogeneous system of differential equations $K(D)X(t) = B(D)F(t)$ (1) is given, where $K(D) = A_0D^n + A_1D^{n-1} + \ldots + A_n$ and $B_0D^n + B_1D^{n-1} + \ldots + B_n$ are matrix polynomials of the operator $D = d/dt$, and A_i, B_i are numerical

Card 1/6

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

matrices of m-th order. In addition, det $A_0 \neq 0$,

$$X(t) = \begin{matrix} x_1(t) \\ x_2(t) \\ \vdots \\ x_m(t) \end{matrix}, \quad F(t) = \begin{matrix} f_1(t) \\ f_2(t) \\ \vdots \\ f_m(t) \end{matrix}.$$

The zero initial conditions of the system (1) read as $X(-0) = X^{(1)}(-0) = \ldots = X^{(n-1)}(-0) = 0$. The following problem has to be solved: Find the linear homogeneous system of equations (with constant coefficients) and the corresponding conditions, so that the solution $\bar{X}(t)$ of this system be equal to the solution $X(t)$ of the initial system with any given degree of accuracy. This problem is first examined for the scalar case. From

$$(a_0D^n + a_1D^{n-1} + \ldots + a_{n-1}D + a_n)\,\bar{x}(t) = (b_0D^n + b_1D^{n-1} + \ldots + b_{n-1}D + b_n)\,f(t) \ldots \tag{2}$$

and $f(t) = \sum_{i=1}^{r} {}_i e^{-i t}$ one obtains the homogeneous equation

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

$$(D - \upsilon_1)(D - \upsilon_2)\ldots(D - \upsilon_r)(a_0 D^n + a_1 D^{n-1} + \ldots + a_{n-1} D + a_n D)\bar{x}(t) = 0 \quad (3).$$

By applying a Laplace transformation with the lower limit x = -0 to (2) and a Laplace transformation with the lower limit x = +0 to (3), equivalent initial conditions are obtained as a solution of the system

$$\begin{aligned}
&a_0\bar{x}(+0) = b_0\sigma_0,\\
&(a_1 + a_0\alpha_1)\bar{x}(+0) + a_0\bar{x}^{(1)}(+0) = b_1\sigma_0 + b_0\sigma_1,\\
&(a_2 + a_1\alpha_1 + a_0\alpha_2)\bar{x}(+0) + (a_1 + a_0\alpha_1)\bar{x}^{(1)}(+0) + a_0\bar{x}^{(2)}(+0) = b_2\sigma_0 + b_1\sigma_1 + b_0\sigma_2,\\
&\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (9)\\
&(a_{n-2}\alpha_r + a_{n-1}\alpha_{r-1} + a_n\alpha_{r-2})\bar{x}(+0) + (a_{n-3}\alpha_r + a_{n-2}\alpha_{r-1} + a_{n-1}\alpha_{r-2} +\\
&+ a_n\alpha_{r-3})\bar{x}^{(1)}(+0) + \ldots + (a_1 + a_0\alpha_1)\bar{x}^{(n+r-3)}(+0) + a_0\bar{x}^{(n+r-2)}(+0) =\\
&= b_{n-1}\sigma_{r-1} + b_n\sigma_{r-2},\\
&(a_{n-1}\alpha_r + a_n\alpha_{r-1})\bar{x}(+0) + (a_{n-2}\alpha_r + a_{n-1}\alpha_{r-1} + a_n\alpha_{r-2})\bar{x}^{(1)}(+0) +\\
&+ (a_2 + a_1\alpha_1 + a_0\alpha_2)\bar{x}^{(n+r-3)}(+0) + (a_1 + a_0\alpha_1)\bar{x}^{(n+r-2)}(+0) +\\
&+ a_0\bar{x}^{(n+r-1)}(+0) = b_n\sigma_{r-1}.
\end{aligned}$$

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

of algebraic equations. If the foregoing is generalized to the system $K(D)X(t) = B(D)F(t)$ with $F(t) \approx \sum_{i=1}^{r} \Lambda_i e^{\nu_i t}$ (10) (Λ_i are the numerical matrix columns, and ν_i scalar numbers),

$$(A_0D^n + A_1D^{n-1} + \ldots + A_{n-1}D + A_n)\overline{X}(t) = (B_0D^n + B_1D^{n-1} + \ldots + B_{n-1}D + B_n)(\Lambda_1 e^{\nu_1 t} + \Lambda_2 e^{\nu_2 t} + \ldots + \Lambda_r e^{\nu_r t}). \quad (11)$$

follows from (10) after substitution. The system of equations resulting from the application of the Laplace transformation has its solution in the desired equivalent initial conditions

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

$$A_0\overline{X}(+0) = B_0(\Lambda_1 + \Lambda_2 + \ldots + \Lambda_r),$$

$$(A_1 + A_0\alpha_1)\overline{X}(+0) + A_0\overline{X}^{(1)}(+0) = B_1(\Lambda_1 + \Lambda_2 + \ldots + \Lambda_r) + B_0(\Lambda_1\beta_{1,1} + \Lambda_2\beta_{1,2} + \ldots + \Lambda_r\beta_{1,r})$$

. . . . . .

$$(A_{n-2}\alpha_r + A_{n-1}\alpha_{r-1} + A_n\alpha_{r-2})\overline{X}(+0) + (A_{n-3}\alpha_r + A_{n-2}\alpha_{r-1} + A_n\alpha_{r-2})\overline{X}^{(1)}(+0) + \ldots + (A_1 + A_0\alpha_1)\overline{X}^{(n+r-3)}(+0) + A_0\overline{X}^{(n+r-2)}(+0) = B_{n-1}(\Lambda_1\beta_{r-1,1} + \Lambda_2\beta_{r-1,2} + \ldots + \Lambda_r\beta_{r-1,r}) + B_n(\Lambda_1\beta_{r-2,1} + \Lambda_2\beta_{r-2,2} + \ldots + \Lambda_r\beta_{r-2,r}).$$

$$(A_{n-1}\alpha_r + A_n\alpha_{r-1})\overline{X}(+0) + (A_{n-2}\alpha_r + A_{n-1}\alpha_{r-1} + A_n\alpha_{r-2})\overline{X}^{(1)}(+0) + \ldots + (A_2 + A_1\alpha_1 + A_0\alpha_2)\overline{X}^{(n+r-3)}(+0) + (A_1 + A_0\alpha_1)\overline{X}^{(n+r-2)}(+0) + A_0\overline{X}^{(n+r-1)}(+0) = B_n(\Lambda_1\beta_{r-1,2} + \Lambda_2\beta_{r-1,2} + \ldots + \Lambda_r\beta_{r-1,r}). \quad (18)$$

Because of its Gaussian form, (18) can easily be solved using the substitution method and a computer.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

S/041/61/013/004/006/007
B125/B112

Algorithm for determining equivalent...

SUBMITTED: June 8, 1961 (Kiyev)

Card 6/6

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

Effective calculation of Fourier coefficients by means of iterations. Usp. mat. nauk 16 no.1:155-156 Ja-F '61. (MIRA 14:6)

(Functional analysis)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A.D.

Remark on G.M.Zhdanov's article "Approximate solution of a system of first-order differential equations with a retarded argument." Usp. mat.nauk 16 no.2:131-133 Mr-Ap '61. (MIRA 14:5)
(Differential equations) (Functional analysis)
(Zhdanov, G.M.)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

S/[illegible]/[illegible]/[illegible]/003/005/005
C[illegible]/C[illegible]

AUTHORS: Aleksandrov P. S., Myshkis A. D., Oleynik O. A.,

TITLE: Ivan Georgiyevich Petrovskiy (on the occasion of his sixtieth birthday).

PERIODICAL: Uspekhi matematicheskikh nauk, v.16 no.1, 1961, 219-230.

TEXT: The authors give a survey in the most important scientific results of the jubilar and some short biographical dates. I. G. Petrovskiy dedicated himself to the following questions:
1.) correctness of the Cauchy problem.

$$\frac{\partial^{n_1} u_1}{\partial t^{n_1}} = \sum_{[illegible]}^{N} \sum_{[illegible] \le M} A^{k}_{[illegible]} \cdots \frac{[illegible]}{[illegible]} - f_1(t, x_1, \ldots, x_s) \qquad (1)$$

$$\frac{\partial^{k} u_1}{\partial t^{k}} \Big|_{t=0} = \psi^{k}_{1}(x_1, \ldots, x_s) \qquad (2)$$

$(i = 1, \ldots, N;\ k = 0, \ldots, [illegible])$

Card 1/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

S/042/6[illegible]/0[illegible]/003/005/00[illegible]
C[illegible]/C444

Ivan Georgiyevich ...

where A(τ), f(τ, x) and φ(x) is sufficiently smooth but usually not analytic. The problem was treated by aid of Fourier transformation of (1) - (2) and led to a statement of sufficient and necessary conditions ("condition A" of Petrovskiy) for the uniform correctness of the problem (1) - (2). It was especially stated that the condition A is satisfied for hyperbolic systems. Further the conception of parabolic (in the Petrovskiy sense) systems was established and it was shown that the Cauchy problem is always correct for them. On the elliptic (in the Petrovskiy sense) systems it was proved that all sufficiently smooth solutions are analytic if the equations are analytic in all arguments.

2.) The dependence of the solution of the Cauchy problem for hyperbolic systems on initial conditions (in connection with the so called wave-diffusion). For linear homogeneous systems with constant coefficients necessary and sufficient conditions for the existence of "stable" (i.e. not vanishing under small changes of the coefficients) gaps were given.

3.) Conditions for the solubility of the first boundary value problem for the heat equation (by aid of the method of "superfunctions" of

Card 2/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

Perron).

4.) Behavior of the solutions of the Cauchy problem for

$$\frac{\partial u}{\partial t} = a^2 \frac{\partial^2 u}{\partial x^2} + F(t) \text{ for } t \to \infty.$$

5.) Sufficient conditions for the fact that near the origin the integral curves of

$$\frac{dx_i}{dt} = \sum_{k=1}^{n} a_{ik} x_k + O\left(\sum |x_s|^2\right) \qquad (i = 1, \ldots, n; \; a_{ik} = \text{const}), \quad (8)$$

behave like the integral curves of the corresponding linear system (without $O(\sum)$).

6.) Research of the number of limit cycles of

$$\frac{dy}{dx} = \frac{P(x, y)}{Q(x, y)}, \qquad (9)$$

where P and Q are polynomials. By extension of the complex and application of the methods of algebraic geometry, an upper bound for the

Card 3/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

S/[illegible]/[illegible]/[illegible]6/003/005/005
C[illegible]/C444

Ivan Georgiyevich ...

number of limit-cycles is obtained, e.g. for P and Q of second degree there exist at most three limit cycles.
7.) A few papers on the field of real functions, probability theory, algebraic geometry.

After the description of his scientific merits, his accomplishments as a pedagogue and organizator are honoured. Petrovskiy was dean of the Mechanical - Mathematical Faculty of the M.G.N. (Moscow State University) during 1940 - 41 and is now rector since 1951. Since 1953 he is a member of the Presidency of the Academy of Sciences.

Biographic dates: He was born January, [illegible] 1901, passed the high school in Sevsk, studied mathematics in Moscow since 1922, since 1925 in the seminary of D. F. Yegorov, since 1929 he taught at the Moscow University.
There is a portrait of the jubilar added to the article as well as a list of his publications (1928-1939) with 47 titles.
The author mentions: I. M. Gel'fand, G. Ye. Shilov, S. N. Bernshteyn, L. A. Lynsternik, A. N. Kolmogorov, N. S. Piskunov, L. A. Chudov, Ye. M. Landis, N. N. Bautin, O. A. Oleynik, A. Ya. Khinchin, S. L. Sobolev, A. N. Tikhonov.

Card 4/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MIL'MAN, V.D.; MYSHKIS, A.D.

Random shocks in linear dynamic systems. Pribl. metod. resh. diff. urav. no.1:64-81 '63 (MIRA 18:2)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 14406-63 EPA(b)/EWT(1)/BDS AEDC/AFFTC/AFMDC/ASD Pd-4

ACCESSION NR: AP3003320 S/0041/63/015/002/0119/0134

58

AUTHOR: Borisenko, A. I.; My*shkis, A. D. (Kharkov)

TITLE: Plane flow of an ideal incompressible fluid of thin profile around a large bend

SOURCE: Ukrainskiy matematicheskiy zhurnal, v. 15, no. 2, 1963, 119-134

TOPIC TAGS: vortex layer, incompressible fluid, thin profile, large bend

ABSTRACT: It is known that the problem of plane flow of an ideal incompressible fluid of thin profile around a small bend, as well as a lattice of such profiles, can be solved by the method of vortex layers. This method considers the unknown flow to be the result of a system of vortices distributed along the chords of the profile, where the density of vortices is determined from the boundary condition on the profile. This leads to an integral equation for this density. In the case of large bends, treated by the authors, the method of vortex layers can also be used if the vortex is situated on the center line of the profile. The method of vortex layers leads to the necessity of effectively solving a singular integral equation for a single profile and one for a lattice of profiles. A single parabolic profile is discussed in detail. In this case the equation assumes another form, and its solution is found in the form of a series with undetermined coefficients which are

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 14406-63

ACCESSION NR: AP3003320

found by means of an infinite system of linear equations whose coefficients are expressed by double Fourier coefficients. A rapidly converging iterational method is indicated for finding the latter; the system of equations is also solved by means of rapidly converging iterations. The method may be extended to polynomial profiles higher than second power and on a lattice of profiles without essential changes. The work does not contain full formal proofs. Orig. art. has: 28 formulas, 1 diagram, and 1 table.

ASSOCIATION: none

SUBMITTED: 28Jan61 DATE ACQ: 24Jul63 ENCL: 00

SUB CODE: PH,MM NO REF SOV: 006 OTHER: 001

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

AKHIYEZER, N.I.; MYSHKIS, A.D.

Mathematics at Kharkov, 1959-1962. Usp. mat. nauk 18 no.3:245-250 My-Je '63. (MIRA 16:10)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

BELYAYEVA, M.A.; MYSHKIS, A.D.; SLOBOZHANIN, L.A.; TYUPTSOV, A.D. (Khar'kov)

"On the equilibrium forms of liquids in capillary vessels"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow 29 Jan - 5 Feb 64.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIS, A. D.; LEPIN, A. Ya.

"Condition for Boundedness of the Derivatives of Differential Equations."

report presented at the 3rd Conf on Nonlinear Oscillations, E. Berlin, 25-30 May 1964.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MOISEYEV, N. N.; MYSHKIS, A. D.; PETROV, A. D.

"Some problems of hydrodynamics arising in the theory of space vehicle movement."

report submitted for 15th Intl Astronautical Cong, Warsaw, 7-12 Sep 64.

Computing Center, AS USSR.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 24242-65 EWT(1)/EWP(m)/EEC(t)/T/ Po-4/Pq-4/Pg-4/Pl-4 IJP(c) WW

ACCESSION NR: AP5002590 S/0179/64/000/005/0039/0046

AUTHORS: Belyayeva, M. A. (Khar'kov); Myshkis, A. D. (Khar'kov); Tyuptsov, A. D. (Khar'kov)

TITLE: Hydrostatics in weak gravitational fields. Equilibrium form of liquid surfaces

SOURCE: AN SSSR. Izvestiya. Mekhanika i mashinostroyeniye, no. 5, 1964, 39-46

TOPIC TAGS: hydrostatic equilibrium, weak field, gravitational field, surface tension, Euler equation, Bessel equation

ABSTRACT: The problem of determining the equilibrium form of the free surface of a liquid, taking into account the surface tension effect in a weak gravitational field, was investigated. A surface separated by two immiscible, incompressible, homogeneous fluids was considered. The condition for equilibrium can be obtained from a variational principle for the potential energy. The Euler equation for this problem takes the form $\sigma_{12}(k_1 + k_2) = ng(\rho_2 - \rho_1)z + \Lambda$, where σ_{12} is the coefficient of surface stress, k_1 and k_2 are the inclinations to the vertical of the principal normals at the points under consideration, n is a dimensionless transfer

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 24242-65

ACCESSION NR: AP5002590

2

coefficient, ρ_1 and ρ_2 are the densities of the two fluids, z is the distance along the vertical, and Λ is a Lagrange multiplier. If r is the radius of curvature of the surface, the following equations can be derived: $b = \frac{ng(\rho_2 - \rho_1)}{\sigma_{12}}$;

$$\lambda = \frac{\Lambda}{\sigma_{12}}; \quad R'' = -W'\left(\varepsilon W - \frac{W'}{R}\right); \quad W'' = R'\left(\varepsilon W - \frac{W'}{R}\right) \quad \left(R'^2 + W'^2 = 1, \; ' = \frac{d}{d\delta}\right);$$

$$R = \sqrt{|b|}\,r, \quad W = \sqrt{|b|}\,w \quad (w = z + \lambda/b); \quad \left(\frac{RW'}{\sqrt{1+W'^2}}\right)' - \varepsilon RW = 0, \quad \varepsilon = \begin{cases} 1 & (b > 0) \\ -1 & (b < 0) \end{cases}.$$

The last equation has a singularity at R = 0 similar to that of a Bessel equation. A power series solution for W is obtained in the following form:

$$W(R) = W_0 + \frac{\varepsilon W_0}{4} R^2 + \frac{W_0 + \varepsilon W_0^3}{64} R^4 + \frac{2\varepsilon W_0 + 20 W_0^3 + 27\varepsilon W_0^5}{4608} R^6 + \ldots$$

$$(W_0 = W(0))$$

Specific examples have been worked out to illustrate the method of obtaining the contour of the surface of separation. The authors thank L. A. Slobozhanin for his collaboration in obtaining part of the results, and also N. N. Moiseyev for the comments which were taken into consideration in the final revision of this paper.

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 24242-65

ACCESSION NR: AP5002590

Orig. art. has: 21 formulas and 10 figures.

ASSOCIATION: none

SUBMITTED: 06May64 ENCL: 00 SUB CODE: ME

NO REF SOV: 008 OTHER: 005

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 20071-65 EWT(1) IJP(c)/ASD(a)-5
ACCESSION NR: AT4049211 P/2519/64/000/005/0165/0170

AUTHOR: Mil'man, V.D. (Khar'kov); Myshkis, A. D. (Khar'kov)

TITLE: Random shocks in linear dynamical systems

SOURCE: Polska Akademia Nauk. Instytut Podstawowych Problemow Techniki. Zagadnienia drgan nieliniowych, no. 5, 1964. Druga Konferencja Drgan Nieliniowych (Second Conference on Non-linear Vibrations), Warsaw, Sept. 18-21, 1962, 165-170

TOPIC TAGS: dynamical system, linear dynamical system, random shock, delta function

ABSTRACT: A linear dynamical system subjected to shocks and described by the equation

$$\frac{d\xi}{dt} = A\xi + \sum_{t_i<t} \Delta_i\xi \cdot \delta(t-t_i), \quad \xi(t_0) = \xi^0.$$

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 20071-65
ACCESSION NR: AT4049211

is considered, where the $\Delta_i\xi$ $(i=1, 2, \ldots)$ are finite sudden variations in the solutions at the time t_i and δ is a delta function. The problem of boundedness of the solution of this equation was studied and the corresponding estimates were given on the assumption of an a priori estimate of the amplitude of shocks $\Delta_i\xi$ in a previous article by V.D. Mil'man and A.D. Myshkis (On the stability of motion in the presence of shocks. Sib. mat. zh-l, vol. 1, no. 2, 1960, 233-237). The aim of this article is to carry out a probabilistic study of the behaviour of the trajectories of the system under the assumption that the shocks do not occur too frequently, their amplitudes are not, in general, small, and the solutions

$$\frac{d\xi}{dt} = A\xi$$

are asymptotically stable. The concepts of weak convergence and strong convergence were introduced for the comparison of weak trajectories.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur, AN UkrSSR, Khar'kov (Physicotechnical Institute of Low Temperatures,

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 20071-65
ACCESSION NR: AT4049211

Academy of Sciences UkrSSR)

SUBMITTED: 03Dec62 ENCL: 00 SUB CODE: ME, MA

NO REF SOV: 003 OTHER: 001

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 45607-65 EWT(d) IJP(c)

ACCESSION NR: AR5008655 S/0044/65/000/001/B033/B033

SOURCE: Ref. zh. Matematika, Abs. 1B147

AUTHOR: Myshkis, A. D.

TITLE: On differential inequalities having locally bounded derivatives

CITED SOURCE: Uch. zap. Khar'kovsk. un-t, v. 138, 1964, Zap. Mekhan.-matem. fak. i Khar'kovsk. matem. o-va, v. 30, 152-163

TOPIC TAGS: ordinary differential equation

TRANSLATION: Inequalities of the form $F(t, x(t), \dot{x}(t)) > 0$, (1) are studied where $x = (x_1, \ldots, x_n)$, the function $F(t, x, y)$ is defined for all t, x, y; and for any t, x the inequality $F(t, x, y) \geq 0$ determines a non-empty closed bounded set $E_{t, x}$ in an n-dimensional space y depending continuously on t, x ($E_{t, x}$ is an α-continuous function of t, x, (see *RZhMat* 1963, 2B157). A continuously differentiable function $x(t)$ which satisfies inequality (1) is called a solution. It is further required that, for any t_0, x_0 and $y_0 \in E_{t_0, x_0}$, there exist a continuous

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 45607-65

ACCESSION NR: AR5008655

vector function $y = \phi(t, x)$ such that $\varphi(t, x) \in E_{t,x}$ for all t, x and $y_0 = \phi(t_0, x_0)$. Sufficient conditions for the existence of such a function and an example of a case in which it does not exist are also indicated. It is proved that for any t_0, x_0 and $y_0 \in E_{t_0, x_0}$ there exists at least one solution of inequality (1) with initial conditions $x(t_0) = x_0$, $\dot{x}(t_0) = y_0$. For the case when F is continuously differentiable and $|F| + |\mathrm{grad}_y F| \neq 0$ the equation or the surface of the integral cone is derived. For an inequality of form $F(x, \dot{x}) > 0$ (2) the concepts of zones of depression and zones of local and non-local transitiveness are derived. These zones are regarded as analogs of special points and closed trajectories of ordinary dynamic systems. Equations for the boundaries of these zones are derived. Inequalities of form (2) are then considered; these are close to the ordinary dynamic systems $\dot{x} = f(x)$, that is, such that inequality (2) is satisfied only for values of x contained in the ρ-neighborhood of point $f(x)$. It is proved in particular that if the compact set K is asymptotically stable for the system $\dot{x} = f(x)$, then for any $\varepsilon > 0$ there is a $\delta > 0$ such that for $\rho < \delta$ any solution of inequality (2) which begins in the δ-neighborhood of the set K will not leave its ε-neighborhood. As simple examples the author considers the behavior of solutions

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 45607-65

ACCESSION NR: AR5008655

of inequality (2) when it is close to the linear system $\dot{x} = Ax$. Several applications of differential inequalities are shown and several unsolved problems are stated.
A. Filippov.

SUB CODE: MA ENCL: 00

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 47187-66 FSS-2/EWT(1)/EWP(m)/EEC(k)-2 TT/WW/GW

ACC NR: AR6021906 SOURCE CODE: UR/0313/66/000/003/0027/0027

AUTHOR: Moiseyev, N. N.; Myshkis, A. D.; Petrov, A. A.

46
B

TITLE: Hydrodynamic problems in astronautics

SOURCE: Ref. zh. Issl kosm prostr, Abs. 3.62.230

REF SOURCE: 15 Internat. Astronaut. Congr., Warsaw, Sept. 1964

TOPIC TAGS: hydrodynamics, fluid equilibrium, cosmic hydrodynamics, space hydrodynamics, space fluid mechanics

ABSTRACT: The authors discuss a series of new problems in hydrodynamics prompted by the tremendous expansion of cosmic studies. These problems are related to the study of the behavior of fluids in a state of weightlessness or under the effect of weak graviational or inertial fields, and to the study of the dynamic effects of fluids, under the above mentioned conditions, on the vessels in which

Card 1/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 47187-66

ACC NR: AR6021906

they are contained. The authors limit themselves to the discussion of problems of types of fluid equilibrium, viscosity, and dynamic interaction. [Translation of abstract] [SP]

SUB CODE: 22/

Card 2/2 egh

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ACCESSION NR: AP4016496 S/0020/64/154/005/1007/1010

AUTHORS: Borok, V.M.; My*shkis, A.D.

TITLE: On solutions of difference equations valid in the whole plane

SOURCE: AN SSSR. Doklady*, v. 154, no. 5, 1964, 1007-1010

TOPIC TAGS: difference equation, linear difference equation, finite difference, functional equation, Cauchy problem

ABSTRACT: Given the difference equations

$$Lu \equiv \sum_{\lambda=1}^{\Lambda} a_\lambda u\,(n_1 + k_{\lambda 1}, \ldots, n_m + k_{\lambda m}) = 0; \qquad (1)$$

$$Lu = \begin{cases} 1 & \text{for } n_1 = \ldots = n_m = 0, \\ 0 & \text{otherwise}. \end{cases} \qquad (2)$$

$$Lu = \psi\,(n_1, \ldots, n_m), \qquad (3)$$

where the unknown $u(n_1, \ldots, n_m)$ and the given $(n_1, \ldots, n_m)$ are integer-valued functions of m 1 variables; k , ..., k ($1 \leq \lambda \leq \Lambda, \Lambda \geq 2$)

Card 1/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ACCESSION NR: AP4016496

fixed integers, and $a_\lambda (\neq 0)$ arbitrary complex constants. The aim is to give a priori conditions on the behavior of u and ψ at infinity, which imply the existence of a unique solution of (1), (2) and (3), valid in the entire plane, as well as solutions of the Cauchy problem for each equation. For $\bar{\zeta} = (\zeta_1, \ldots, \zeta_m)$, let $Q(\bar{\zeta}) = \sum_{\lambda=1}^{\hat{\lambda}} a_\lambda \exp [i(\bar{\kappa}_\lambda, \bar{\zeta})]$ where $\bar{\kappa}_\lambda = (\kappa_{\lambda 1}, \ldots, \kappa_{\lambda m})$, $(\bar{u}, \bar{v}) \equiv \sum_{j=1}^{m} u_j v_j$, and let $a(Q) = \min_{Q(\bar{\xi}+i\bar{\eta})=0} |\bar{\eta}|$ $(\xi_j, \eta_j$ real, $|\bar{\eta}| = \sqrt{\eta_1^2 + \cdots + \eta_m^2})$ Theorem 1. If $d(Q) > 0$, then equation (2) has a solution $\mathcal{E}(\bar{n}) = \mathcal{E}(n_1, \ldots, n_m)$ satisfying an inequality of the form

$$|\mathcal{E}(\bar{n})| \leqslant A_\varepsilon \exp[-(d-\varepsilon)|\bar{n}|]. \qquad (6)$$

for any positive ε. The required $\mathcal{E}(\bar{n})$ is given by the Fourier coefficient of $[Q(\bar{\xi})]^{-1}$.

$$\mathcal{E}(\bar{n}) = (2\pi)^{-m} \int_0^{2\pi} \cdots \int_0^{2\pi} [Q(\bar{\xi})]^{-1} \exp[i(\bar{n}, \bar{\xi})] \, d\xi_1 \ldots d\xi_m.$$

Lemma If $\varphi_1 \in \Phi_\alpha, \varphi_2 \in \Phi_{-|\alpha|-\varepsilon}$, for $\varepsilon > 0$, then $\psi \in \Phi_\alpha$ is defined and belongs to Φ_α.

Card 2/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ACCESSION NR: AP4016496

Theorem 2. Let $d = d(Q) > 0$ and let $-d < \alpha < d$. Then, for any $\psi \in \Phi_\alpha$ equation (3) has a unique solution belonging to Φ_α. The solution is given by: $u|\bar{n}| = \mathcal{E} * \psi$, where $\mathcal{E}$ is the function constructed in Theorem 1. Corollery. A necessary and sufficient condition for equation (1) to have a non-trivial bounded solution is that all roots of the trigonometric polynomial $Q(\bar{\zeta})$ be real. The Cauchy problem for equation (3) consists in finding a solution $u(\bar{n})$ of (3) for values

$$-\infty < n_1, \ldots, n_{m-1} < \infty, \quad N_0 < n_m < \infty \quad (-\infty < N_0 < \infty). \quad (11)$$

such

$$\left.\begin{aligned} &u(\bar{n}', N_0) = \varphi_1(\bar{n}'), \ldots, u(\bar{n}', N_0 + k - 1) = \varphi_k(\bar{n}'), \\ &(\bar{n}' \underset{\text{def}}{=} (n_1, \ldots, n_{m-1}); \ -\infty < n_1, \ldots, n_{m-1} < \infty), \end{aligned}\right\} \quad (12)$$

$\varphi_1(\bar{n}), \ldots, \varphi_k(\bar{n}')$ are given functions. Let $K_m' = \max_\lambda K_{\lambda m}$, where $L'u = \sum_{K_{\lambda m} = K_m'} d_\lambda u(n_1 + K_{\lambda_1}, \ldots, n_m + K_m'), \ldots$ (14),

Card 3/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ACCESSION NR: AP4016496

and let $d'(Q')$ be defined for Q' as $d(Q)$ was for Q. Theorem 3. Let $d' = d'(Q') > 0$ and suppose that for some $\alpha \in (-d', d')$, all the functions $\varphi_1(\bar{n}'), \ldots, \varphi_n(\bar{n}')$ as well as $\psi(\bar{n}', n_m)$ $(N \leq n_m < \infty)$ belong to Φ_α' (defined in the obvious way). Then the Cauchy problem (3), (12) in the half-plane (11) has a unique solution belonging to Φ_α'. All the above results may be extended to systems of linear difference equations.

ASSOCIATION: Akademiya nauk SSSR (Academy of Sciences, SSSR)

SUBMITTED: 09Oct63 DATE ACQ: 12Mar64 ENCL: 00

SUB CODE: MM NR REF SOV: 001 OTHER: 001

Card 4/4

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

TSLAF, L.Ya.; KERIMOV, M.K.; MYSHKIS, A.D.; AMERBAYEV, V.; PANOV, D.Yu.; SOLOMENTSEV, Ye.D.

Book reviews. Zhur. vych. mat. i mat. fiz. 5 no.1:161-168 Ja-F '65. (MIRA 18:4)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 63570-65 EWT(d) Pg-4 IJP(c)

ACCESSION NR: AP5014863 UR/0041/65/017/003/0074/0083

15
B

AUTHORS: Myshkis, A. D. (Khar'kov); Shcherbina, G. V. (Khar'kov)

TITLE: Asymptotic behavior of solutions vanishing at infinity of a class of second order differential equations

16

SOURCE: Ukrainskiy matematicheskiy zhurnal, v. 17, no. 3, 1965, 74-83

TOPIC TAGS: asymptotic property, differential equation

ABSTRACT: As a generalization of a specific problem previously treated, the authors investigate the asymptotic behavior as $x \to \infty$ of solutions $y(x)$ of

$$y'' + \varphi(x, y)y' - \psi(x, y)y = 0, \quad (1)$$

having the property

$$0 < y(x) \leq h \quad (x_0 \leq x < \infty), \quad y(x) \underset{x\to\infty}{\to} 0. \quad (2)$$

Here φ and ψ are continuous in some strip $\overline{\Pi}$: $x_0 \leq x < \infty$, $0 \leq y \leq h$, where x_0 and h are positive. The authors justify linearization using new techniques (standard methods being inapplicable) with an arbitrary choice of exponents in their decompositions. They prove the following Theorem: Let

Card 1/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 63570-65

ACCESSION NR: AP5014863

$$\varphi(x,0)=\sum_{l=0}^{n}a_l x^{p_l}+o(x^{p_n}),\qquad \psi(x,0)=\sum_{l=0}^{n}b_l x^{p_n+p_l}+o(x^{p_n+p_n}) \tag{3}$$

$(x\to\infty)$, where $a_0+b_0>0$. Further, suppose that for certain constants $N>-1$, $A>0$ in $\overline{\Pi}$ the following estimates hold:

$$\varphi(x,y)>Ax^N,\qquad \psi(x,y)>0 \tag{4}$$

or

$$\varphi(x,y)=o(x^N)\quad (x\to\infty),\qquad \psi(x,y)>Ax^{tN}. \tag{5}$$

Finally, suppose, for certain constants $B\geq 0$, $s>0$, $\alpha<N+1$ in $\overline{\Pi}$ there is the inequality

$$|\varphi(x,y)-\varphi(x,0)|+|\psi(x,y)-\psi(x,0)|\leq By^s\exp x^\alpha. \tag{6}$$

Then

$$\frac{y'(x)}{y(x)}=\sum_{l=0}^{n}\alpha_l x^{p_l}+o(x^{p_n}), \tag{7}$$

(where the coefficients α_l are determined from recursion relations which are made explicit in the proof). An example is given. "V. V. Nemytskiy brought certain references to our attention; he also made other valuable comments, for which we are

Card 2/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

L 63570-65

ACCESSION NR: AP5014863

pleased to express our gratitude." Orig. art. has: 28 formulas.

ASSOCIATION: none

SUBMITTED: 20Feb62 ENCL: 00 SUB CODE: MA

NO REF SOV: 006 OTHER: 002

dm

Card 3/3

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

LEPIN, A.Ya.; MYSHKIS, A.D.

Conditions of boundedness of the derivatives of bounded solutions to ordinary differential equations. Dif. urav. 1 no.9:1260-1263 S '65. (MIRA 18:10)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MYSHKIN, [illegible]

[illegible] tial wells. Zhur. [illegible] ch. mat. i mat. fiz. 5 no.3:[illegible]-542 [illegible] '65. (MIRA 18:7

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

MEL'NIK, Z.O. (L'vov); MYSHKIS, A.D. (Khar'kov)

Mixed problem for a two-dimensional hyperbolic system of the 1st order with discontinuous coefficients. Mat.sbor. 68 no.4:632-638 D '65. (MIRA 18:12)

1. Submitted February 2, 1965.

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ACC NR: AP7000779 SOURCE CODE: UR/0208/66/006/006/1054/1063

AUTHORS: Kopachevskiy, N. D. (Khar'kov); Myshkis, A. D. (Khar'kov)

ORG: none

TITLE: Hydrodynamics in weak force fields. On small oscillations of a viscous fluid in a potential mass-force field

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 6, no. 6, 1966, 1054-1063

TOPIC TAGS: incompressible fluid, viscous fluid, boundary value problem, Navier Stokes equation, mathematic model, surface tension, hydrodynamics

ABSTRACT: A mathematical formulation is given for the problem of small oscillations in a vessel of incompressible viscous fluid with a free surface in a potential force field. Surface tension is taken into account. The viscous incompressible fluid partially fills a vessel of finite dimensions, occupying volume Ω in the equilibrium condition. The volume Ω is bounded by the wall Γ_1 and the free surface Γ_0. The linearized Navier-Stokes equation and the equation of discontinuity

$$\frac{\partial \mathbf{u}}{\partial t} = \nu \Delta \mathbf{u} - \nabla p_1,$$

$$\operatorname{div} \mathbf{u} = 0$$

Card 1/2

UDC: 517.9:532

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ACC NR: AP7000779

must be satisfied in volume Ω. Normal oscillations are considered, where it is assumed that the dependence of velocity and pressure upon time is in the form $e^{-\lambda t}$ (λ is generally a complex constant). Limiting cases are considered. It is found that the forces of surface tension exert a fundamental effect on the nature of the natural-frequency spectrum. The authors thank S. G. Kreyn and A. D. Tyuptsov for their valuable discussion. Orig. art. has: 17 formulas and 1 graph.

SUB CODE: 20/ SUBM DATE: 30Dec65/ ORIG REF: 011/ OTH REF: 001

Card 2/2

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6

ACC NR: AP6012423 UR/0039/65/068/004/0632/0638

AUTHOR: Mel'nik, Z.O. (L'vov); Myshkis, A.D. (Khar'kov)

ORG: None

TITLE: A mixed problem for a two-dimensional hyperbolic system of the first order, with discontinuous coefficients

SOURCE: Matematicheskiy sbornik, v. 68, no. 4, 1965, 632-638

TOPIC TAGS: partial differential equation, hyperbolic equation, ~~discontinuous hyperbolic equation, mixed hyperbolic equation problem~~

ABSTRACT: The authors consider a mixed problem for a linear hyperbolic system of partial differential equations on a plane x,t, with a set of p lines with jump discontinuities. The work generalizes certain prior studies of discontinuous coefficients. Existence and uniqueness proofs are developed for the generalized, piecewise continuous solution. The basic system is reduced first to a system of integro-functional equations, and then to a system of $m(1+p)$ Volterra integral equations. The classic method of successive approximations is then used for the proof. Generalizations and outlook for the weakening of conditions imposed at the outset on the basic hyperbolic system are discussed. Comments on further developments are given. Orig. art. has 8 formulas..

SUB CODE: 12/ SUBM DATE: 2Feb65/ ORIG REF: 011

Card 1/1 UDC: 517.945.7

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R001135820014-6"