"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Jozsef, dr.; FARKAS, Elek, dr.; NYIRGES, Gabor, dr.; [illegible], Jozsef, dr.

Active immunization against measles. Orv. hetil. 106 no.1: 7-11 Ja 3 '65

1. Fovarosi Laszlo Korhaz, I. Gyermekosztaly (foorvos: sapo Jozsef, dr.), Orszages Kozegeszsegugyi Intezet, (folgazgato: Bakacs, Tibor, dr.) Virusosztaly.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI,J.; FARKAS,E.; NYERGES, G.; CSAPO, J.

' asles vaccination. Acta paediat. Acad. sci. Hung. 5 no.3: 435-441 '64

1. First Section of Paediatrics,"Laszlo" Hospital of Infectious Diseases, Budapest, and State Institute of Hygiene, Budapest.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

CSAPO, Jozsef, dr.; BUDAI, Jozsef, dr.; NYERGES, Gabor, dr.

Clinical significance of the substances in cerebrospinal fluid which can be oxidized. Orv. hetil. 106 no.30:1398-1400 25 Jl'65.

1. Fovarosi Laszlo Korhaz, I. Gyermekosztaly (foorvos: Csapo, Jozsef, dr.).

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

BUDAI, K.

17

1 **Therapeutic iron preparation.** Kálmán Budai. *Vegyi Ipar* 37, No. 8-9, 4(1938).—Heat malt ext. on the water bath to remove air, cool to 40-5°, add the required amt. of aq. soln. of purest $FeSO_4.7H_2O$ (traces of Cu and Mn salts also may be added), remove air bubbles by allowing to stand for some hrs., and store the air-free soln. with exclusion of air in suitable glass containers. A content of 400 mg. ferrous iron per kg. is proposed. S. S. de F.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

110

BUDAI, K.

CA

Theory of formation of melee wheat. Kálmán Budai. *Kísérletügyi Közlemények* **44**, 73-6(1941).—Glassy and melee, resp., floury wheat seeds contain glutens of various quality. Glassy wheat has the best gluten and this is the cause of a optimal production period of proteins depending on climatic conditions and soil quality. The various stages of glassiness on the same plot may be explained by differences in the grades and velocities of N assimilation of wheat seeds.

István Pinály

COMMON ELEMENTS

MATERIALS INDEX

OPEN

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Lajos

A 400-line crossbar sub-exchange manufactured by the Beloianniss Telecommunications Factory. Hir techn 13 no.6:201-206 D '62.

1. Hiradastechnikai Tudomanyos Egyesulet tagja, es Beloianniss Hiradastechnikai Gyar.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Lili

LELKES, Kornel, dr; BUDAI, Lili, dr

Stomatological significance of changes in the eosinophil count. Fogorv. szemle 47 no.6:186-190 June 54.

1. Fogorvos Tovabbkepzo Intezet kozlemenye. Igazgato: Kende Janos dr.

(EOSINOPHIL COUNT,
dent. aspects)
(DENTISTRY,
dent. aspects of eosinophil count)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

SAUCIUC, Al.; BUDAI, Margareta; RUSAN, M.; BOSTAN, Rodica

On the presence of heterogeneous penicillin in industrial fermentation with two strains of Penicillium chrysogenum. Studii cerc biochimie 7 no.1:105-108 '64.

1. Antibiotic Plant, Iasi.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, P.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

1/1

34

676.01 373.637.6

83. Polytechnic college students in the paper industry, by P. Budai ("Papir- és Nyomdatechnika" *Paper and Printing* Vol. 2, No. 9, p. 28, Sept., 1950)

About two years ago the *Polytechnic College* established a faculty for the paper industry and printing trade. The first three semesters were devoted mainly to general academic subjects; it was only during the last semester that theoretical questions of the trade were dealt with. From among the new technical intelligentsia participating in this training those proved the most capable in their respective fields of work who had formerly been industrial workers. Therefore, it is not sufficient for the Polytechnic College students to receive an occasional quarter of an hour training in the workshops, but it is most essential that they also become thoroughly acquainted with actual conditions, i. e. breakdown of machinery, bottlenecks, general shortcomings, etc. that prevail in the plants. The question of wages for students training in workshops presented certain difficulties, since it was not always possible to classify them into categories with experienced workers performing the same jobs. In spite of initial difficulties the students succeeded in overcoming the hardships and, in general, proved valuable at the jobs they performed in the workshops.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI R.

RUMANIA/Human and Animal Physiology - Internal Secretion. V-7

Abs Jour : Ref Zhur - Biol., No 2, 1958, 8843

Author : Gr. Benetato, I. Baciu, C. Oprisiu, V. Vasilescu and R. Budai

Inst : ---

Title : The Central Action of Several Hormones. Experimental Studies Using the "Isolated Head" Technique. II. The Central Action of Epinephrine.

Orig Pub : Bul. stiint. Acad. R.P.Romine Sec. med., 1954, 6, No 4, 735-749

Abstract : No abstract.

Card 1/1

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Lajos

Two-sound-frequency toll-line dialing designed by the Beloiannisz, Telecommunications Factory. Musz elet 17 no.21:12 11 O '62.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Laszlo

Achievements and tasks in the rationalization of public administration by trade unions. Munka 4 no.11:19-21 N'54

1. Kozalkalmazottak Szakszervezete titkara.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Nandor, nyuglmazott fomernok

Is the innovation movement timely on collective farms? Ujit lap 15 no.2:6 25 Ja '63.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

RUMANIA / General Problems of Pathology. Allergies U-3

Abs Jour : Ref Zhur - Biol., No. 10, 1958, No 46725

Author : Benetato, Gr.; Vitebschi, V.; Petru Miulescu, V.; Budai, R.

Inst : Academy of Sciences People's Republic of Rumania, Section of Medicine.

Title : The Influence of Anti-Allergic and Neuroplegic Substances upon the Activity of the Mobile and Fixed Phagocytic Systems.

Orig Pub : Studii si cercetari med. Acad. RPR Fil. Cluj, 1956, 7, No. 1-4, 47-60.

Abstract : The function of mobile and fixed phagocytic systems in 74 rats was determined by the method of Uorda and Gal'pern. Chloropromazine and phenegran inhibited the phagocytic function (PhF) of the reticulo-endothelial system (RES) and of mobile phagocytes. Phenothiazine depressed the reaction

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI R.

BENETATO, Gr.; VITEBSCHI, V.; NEUMAN, E.; BUDAI, R.

Study of the neurohumoral mechanism of regulation of immunobiological processes. Bul. stint., sect. med. 8 no.2:327-337 Apr-June 56.

(IMMUNITY
neurohumoral mechanism of regulation of immunobiol. processes, eff. of adrenalectomy, adrenal hormones & neuroplegic drugs, in rats)
(RETICULOENDOTHELIAL SYSTEM, physiol.
(SAME))
(ADRENAL GLANDS, physiol.
eff. on regulation of immunobiol. processes, in rats).
(CHLORPROMAZINE, eff.
on neurohumoral regulation of immunobiol. processes, in rats)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAY, R. [Budai, R.]; GALAKTION-NITSELYA, O. [Galaction-Nitelea, O.]; CHURYA, Ye. [Ciurea, E.]

Refsum's disease heredopathia atactica polyneuritiformis. Zhur. nevr. i psikh. 65 no.8:1139-1142 '65. (MIRA 18:8)

1. Institut nevrologii im. Pavlova (direktor - akademik A. Kreyndler), Bukharest.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Silvia, MD

RUMANIA

PESCARU, Al., MD; BUDAI, Silvia,MD; BADICEL, T., MD; BICLEANU, O., MD

Bucharest, Igiena, No 6, Nov-Dec 63, pp 651-564 (sic)

"Medical Examination of Workers at Time of Hiring."

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ROMASCANU, Mircea, ing.; BUDAI, Teodor, ing.; BEJENARU, Nicolaie, ing.; POPESCU, Anton; SANDULESCU, Mihai, ing.; SMIRNA, Ovidiu

Large panel construction, a rapid, productive, and economical method. Constr Buc 16 no. 743:3 4 April '64

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAI, Vladimir, dr.

Audiologic analysis of patients in the "Institute for Deaf Children" in Sarajevo. Med. arh. 18 no.5:89-97 S-O'64.

1. Otorinolaringoloska klinika Medicinskog fakulteta u Sarajevu (Sef: Prof. dr. Josip Gerc).

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L 39127-66 T JK

ACC NR: AP6030352 SOURCE CODE: RU/0003/65/016/003/0166/0167

AUTHOR: Unterman, W. H.; Budai-Albu, Margareta; Idel, Ana; Rusan, M.

ORG: Research Services, Antibiotics Factory, Iasi (Fabrica de Antibiotice, Serviciul cercetari)

TITLE: Observations concerning the G-penicillin recovered from residual waters

SOURCE: Revista de chimie, v. 16, no. 3, 1965, 166-167

TOPIC TAGS: penicillin, chemical precipitation, recrystallization, paper chromatography, spectrophotometric analysis

ABSTRACT: The authors note that the penicillin G recovered by means of N,N-dibenzylethylenediamine salt from the mother liquor after precipitation of the mother product must be recrystallized in order to obtain a time-stable product free of foreign penicillins and decomposition products. To analyze the purity of the samples, they suggest spectrophotometric measurements of the absorption at 322 millimicrons as well as at 263 and 280 millimicrons in order to detect degradation products, and paper chromatography to detect foreign penicillins. Orig. art. has: 1 figure and 1 table. [Based on authors' Eng. abst.] [JPRS]

SUB CODE: 07 / SUBM DATE: none / ORIG REF: 001 / OTH REF: 003

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

PETRISHCHEVA, P.A., professor; SAF'YANOVA, V.M.; BUDAK, A.P., podpolkovnik meditsinskoy sluzhby; GAYKO, B.A., mayor meditsinskoy sluzhby

New repellents against blood-sucking insects, developed by the Scientific Institute of Fertilizers, Insecticides and Fungicides. Voen.-med.zhur. no.7:49-53 Jl '56. (MLRA 9:11)

1. Chlen-korrespondent Akademii meditsinskikh nauk SSSR (for Petrishcheva)
(INSECT BAITS AND REPELLENTS)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, A.P.

SAF'YANOVA, V.M.; GROKHOVSKAYA, I.M.; BUDAK, A.P.; GAYKO, B.A.; VINOGRADOVA, I.D.; POTOTSKAYA, V.A.

Experiment in treating plants with insecticides to control blood-sucking flies and midges under natural conditions [with English summary in insert]. Zool.zhur. 35 no.9:1335-1341 S '56. (MLRA 9:12)

1. Otdel parazitologii i meditsinskoy zoologii Instituta epidemiologii i mikrobiologii imeni N.F.Gamaleya Akademii meditsinskikh nauk SSSR.
(Diptera) (Insecticides)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ALEKSANDROV, N.I.; GEFEN, N.Ye.; YEZEPCHUK, Yu.V.; BUDAK, A.P.; RUNOVA, V.F.

Study of the optimum conditions for the formation of the protective extracellular anthrax antigen on a milk medium. Zhur.mikrobiol., epid.i immun. 33 no.4:9-14 Ap '62. (MIRA 15:10)
(BACILLUS ANTHRACIS) (ANTIGENS AND ANTIBODIES)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ALEKSANDROV, N.I.; GEFEN, N.Ye.; RONOVA, V.F.; BUDAK, A.P.; YEZEPCHUK, Yu.V.
LEBEDINSKIY, V.A.; FILIPPENKO, A.I.

Improvement of the culture medium and search for a method of purifying the protective anthrax antigen. Zhur. mikrobiol. epid. i immun. 40 no.1:103-107'63. (MIRA 16:10)

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ALEKSANDROV, N.I.; GEFEN, N.Ye.; YEGOROVA, N.B.; KREYNIN, L.S.; SERGEYEV, V.M.; MASLOV, A.I.; SMIRNOV, M.S.; KRAKHT, S.V.; BUDAK, A.P.; GEFEN, G.Ye.

Development of a method for aerosol immunization against typhoid fever and dysentery. Voen.-med. zhur. no.5:54-59 My '61. (MIRA 14:8)

(TYPHOID FEVER) (DYSENTERY) (AEROSOLS)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ALEKSANDROV, N.I.; GEFEN, N.Ye.; BUDAK, A.P.; YEZEPCHUK, Yu.V.; FILIPPENKO, A.I.; RUNOVA, V.F.

Search for effective chemical vaccines against some zoonoses. Report No.1: Production of chemical by deposited anthrax vaccine and study of its effectiveness in animal experiments. Zhur. mikrobiol. epid. i immun. 32 no.5:42-46 My '61. (MIRA 14:6)
(ANTHRAX)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ALEKSANDROV, N.I.; GEFEN, N.Ye.; BUDAK, A.P.; RUNOVA, V.F.; YEZEPCHUK, Yu.V.; BAZHINOV, A.G.

Study of the reactogenicity of chemically precipitated anthrax vaccine in small groups of people. Zhur. mikrobiol., epid. i immun. 40 no.3:32-34 Mr '63. (MIRA 17:2)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M.; VASIL'YEV, F.P.

Convergence and the error involved in using the method of straight lines in the solution of certain percolation problems. Sbor. rab. VTS MGU 2:211-238 '63. (MIRA 17:7)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B. M.

Dispersnyye dinamicheskiye sistemy. M., dissertatsiya (1941).

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A.G.,
Markushevich, A.I.,
Rashevskiy, P.K.
Moscow-Leningrad, 1948

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

Budak, B. M. Moskov. Un. **Dispersive dynamical systems.** Vestnik 1947, no. 8, 135–137 (1947). (Russian)

This is a sh[illegible] summary of the author's Moscow thesis. Let R_n be Eu[illegible]dean n-space. With a differential system $dx/dt = X(x)$, [illegible]ere x and X are n-vectors, there is associated a famil[illegible] of mappings $f(p, t)$: $R_n \to R_n$, one and only one mapping corresponds to a given point t of the real line L: $-\infty \leqq t < +\infty$. Let now R be any metric space, A and B two subsets of R, $U(B, \epsilon)$ an ϵ-neighborhood of B, and define

$$\vec{a}(A, B) = \inf \{\epsilon \mid A \subset U(B, \epsilon)\};$$

$$a(A, B) = \max \{\vec{a}(A, B), \vec{a}(B, A)\}.$$

A dispersive dynamical system is a family of transformations (not necessarily single-valued) $f(p, t): R \to R$ defined for each $t \epsilon L$ and satisfying the following conditions: (I) $f(p, 0)$ is the identity; (II) $f(p, t)$ is a nonempty compactum; (III) $q \epsilon f(p, t)$ implies $p \epsilon f(q, -t)$; (IV) $f(f(p, t_1), t_2) = f(p, t_1 + t_2)$; (V) if $t \to t_0$ then $a(f(p, t), f(p, t_0)) \to 0$ whatever $t_0 \epsilon L$ and $p \epsilon R$; (VI) if $p \to p_0$ and $t \to t_0$ then $\vec{a}(f(p, t), f(p_0, t_0)) \to 0$ whatever $p_0 \epsilon R$ and $t_0 \epsilon L$. A motion through p is a mapping $\varphi_p(t): L \to R$ such that (a) $\varphi_p(0) = p$, (b) if $t^* < t^{**}$ then $\varphi_p(t^{**}) \epsilon f(\varphi_p(t^*), t^{**} - t^*)$. The set $\varphi_p(L)$ is the trajectory through p. The motion $\varphi_p^*(t)$ is dynamically congruent to $\varphi_p(t)$ whenever there is a t^* such that $\varphi_p^*(t) = \varphi_p(t^* + t)$ for all $t \epsilon L$. The ordinary dynamical systems in R_n are dispersive. The author gives criteria for the existence of noncongruent motions on one and the same trajectory and gives examples of such noncongruent motions. Many of the well-known results of G. D. Birkhoff, among others, are extended to dispersive systems. Properties of α- and ω-limiting sets are investigated. *S. Lefschetz* (Princeton, N. J.).

Source: Mathematical Reviews, Vol 10, No. 5

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M.

1-F\W

Math

Budak, B. M. The concept of motion in a generalized dynamical system. Moskov. Gos. Univ. Uč. Zap. 155, Mat. 5 (1952), 174–194. (Russian)

A dispersive dynamical system is a family $f(p, t)$ $(-\infty < t < \infty)$ of one-many mappings of a complete separable metric space into itself, satisfying six conditions, for which see the review of an earlier paper by the author [Vestnik Moskov. Univ. 1947, no. 8, 135–137; MR 10, 309], where the definition of a motion $\varphi_p(t)$ through p is also given. An ordinary dynamical system $dx/dt = X(x)$ in n-space, X merely continuous, is shown to be an example of a dispersive system, where $f(p, t)$ is the set of points reached at time t on some solution curve starting from p. A point p is called a point of continuity of the system if $\alpha(f(p_n, t_n), f(p, t)) \to 0$ whenever $p_n \to p$ and $t_n \to t$, where $\alpha(A, B)$ denotes the infimum of the positive numbers ε such that each of the sets A and B is contained in the ε-neighborhood of the other. The results are largely concerned with the existence and convergence of motions under various hypotheses. Typical are: Theorem 1. If $q \in f(p, t)$ there exists a segment of a motion joining p to q. Theorem 5. If p and the points of a motion $\varphi_p(t)$ corresponding to some set of t-values dense on the real line I

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Budak, B. M.

3

are points of continuity of the system, then for any sequence p_n converging to p there exist motions $\varphi_{p_n}(t)$ issuing from these points which converge uniformly to $\varphi_p(t)$ on any finite t-interval. Other results concern the compactness or connectedness of the funnel (orbit) $f(p, J)$ with vertex p, α- or ω-limiting sets, and quasi-invariant sets F, of two types according as $F \subset f(F, t)$ or $F \supset f(F, t)$ for all t. J. C. Oxtoby (Bryn Mawr, Pa.).

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

Budak, B. M.

4

Budak, B. M. On the solution of boundary problems of parabolic type. Vestnik Moskov. Univ. 10 (1955), no. 8, 33–38. (Russian)

Theorem: For $i=1, 2, 3$, let $U_i(t, x)$ be a solution of the problem: (1) $[\partial/\partial t+f_i(t, x, \partial/\partial x]U_i=0$ in D_i for $0<t<\infty$; (2) $U_i=\Phi_i$ in D_i for $t=0$; (3) $[\Lambda_i(t, x, \partial/\partial x)]U_i=0$ on Σ_i for $0<t<\infty$; where D_i is a domain in Euclidean n_i-space with a "piecewise smooth" (this term is defined and discussed in detail in the paper) boundary Σ_i, and f_i and Λ_i are linear in x, t, and derivatives of arbitrary order in $x_1, \cdots, x_{n_i}$. The the product $U=U_1U_2U_3$, defined on $D=D_1\times D_2\times D_3$ is a solution of the problem: (1) $[\partial/\partial t+f_1+f_2+f_3]U=0$ in D for $0<t<\infty$; (2) $U=\Phi_1\Phi_2\Phi_3$ in D for $t=0$; (3) $\Lambda_1(U)=0$ on $\Gamma_1=\Sigma_1\times D_2\times D_3$ for $0<t<\infty$, and analogously for $i=2, 3$.

The theorem can be used to solve certain problems for the heat equation. *J. Cronin* (Southbridge, Mass.).

I = F/W

Chin Math. Physics Faculty

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M.

SUBJECT USSR/MATHEMATICS/Differential equations CARD 1/1 PG - 608
AUTHOR BUDAK, B.M., SAMARSKIJ A.A., TICHONOV A.N.
TITLE Collection of problems for mathematical physics.
PERIODICAL Moscow: State publication for technical-theoretical literature 684 p. (1956)
reviewed 2/1957

This collection originates in a textbook of Samarskij and Tichonov (The equations of mathematical physics, Moscow 1953) and a smaller collection of problems of Budak (Collection of problems for mathematical physics, MGU-MMI (1952)). But this material is still extended, especially it is represented in a detailed manner. 130 pages contain problems and questions and 530 pages contain solutions and instructions for solutions. Only boundary value problems for partial differential equations of second order are treated. The knowledge of the general theory is assumed. In three chapters the three types of equations are treated, the chapters are subdivided according to methods to be applied. There follow again three chapters with the same busdivision which treat essentially more difficult questions. An important part of the problem consists in deriving the differential equation and its boundary conditions from the given physical problem. The method of solution is given so detailed that a self-study for students is possible. The book represents a source of wealth for the applied mathematician and for the theoretical physicist.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

SUBJECT USSR/MATHEMATICS/Applied mathematics CARD 1/1 PG - 566
AUTHOR BUDAK B.M.
TITLE On the method of straight lines for the solution of some boundary value problems.
PERIODICAL Vestnik. Moskovsk. Univ. 11, 1, 3-12 (1956)
reviewed 2/1957

The author considers the solution of the boundary value problems for the equations

$$u_{xy} = a(x,y)u + f(x,y)$$

$$u_{xy} = A(x,y,u)$$

$$\rho(x)u_{tt} = (\sigma(x)u_x)_x - q(x)u + f(x,t)$$

$$\rho(x)u_t = (\sigma(x)u_x)_x - q(x)u + f(x,t)$$

and for some systems by aid of the method of straight lines due to Michlin and gives estimations for the appearing errors.

INSTITUTION: Lomonossow University, Moscow.

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

SUBJECT USSR/MATHEMATICS/Theory of approximations CARD 1/2 PG - 344
AUTHOR BUDAK B.M.
TITLE On the straight line method for some boundary value problems.
PERIODICAL Doklady Akad. Nauk 109, 9-12 (1956)
reviewed 10/1956

Let be given the boundary value problem

$$u_{xy} = a(x,y)u + f(x,y), \qquad x_0 \leq x \leq X, \qquad y_0 \leq y \leq Y$$

$$u(x_0,y) = \varphi(y), \quad y_0 \leq y \leq Y$$

$$u(x,y_0) = \psi(x), \quad x_0 \leq x \leq X, \qquad \varphi(y_0) = \psi(x_0).$$

Approximative values of the solution on the straight lines $x = x_k = kh$ $(n+1)h = X - x_0$, $k=1,2,\ldots n$ can be obtained by solving the system of ordinary differential equations

$$u'_{k+1}(y) = u'_k(y) + ha_k(y)u_k(y) + hf_k(y)$$

$$y_0 \leq y \leq Y, \qquad k=0,1,2,\ldots n-1$$

$$a_k(y) = a(x_k,y), \quad f_k(y) = f(x_k,y)$$

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Doklady Akad. Nauk 109, 9-12 (1956) CARD 2/2 PG - 344

with the additional conditions

$$u_k(y_o) = \psi(x_k), \quad u_o(y) = \varphi(y).$$

Then $u(x_k,y) \approx u_k(y)$.

The author gives estimations of the error $|u(x_k,y) - u_k(y)|$ in this case and for similarly solved boundary value problems of the equations $u_{xy} = A(x,y,u)$, $\varrho(x)u_{tt} = (\sigma(x)u_x)_x - q(x)u + f(x,t)$ and $\varrho(x)u_t = (\sigma(x)u_x)_x - q(x)u + f(x,t)$.

INSTITUTION: Lomonossow University, Moscow.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

GORBUNOV, A.D.; BUDAK, B.M.

Difference method for solving a nonlinear Goursat problem.
Vest. Mosk.un.Ser. mat. mekh. astron. fiz. khim. 12 no.4:3-8
'57. (MIRA 11:5)
(Difference equations)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M

SUBJECT USSR/MATHEMATICS/Differential equations CARD 1/1 PG - 725
AUTHOR BUDAK B.M.
TITLE On the method of straight lines for boundary value problems for partial differential equations.
PERIODICAL Doklady Akad.Nauk 112, 187-190 (1957).
reviewed 4/1957

Michlin's method of straight lines, treated by the author already several times, here is used for the approximatiove solution of certain partial differential equations (Gursat, telegraph equation etc.). The convergence of the method is proved and its errors are estimated.

INSTITUTION: Lomonossow University, Moscow.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

AUTHOR: BUDAK, B.M., GORBUNOV, A.D. 20-4-3/52

TITLE: On the Difference Method for the Solution of the Nonlinear Goursat Problem (O raznostnom metode resheniya nelineynoy zadachi Gursa).

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 117, Nr 1, pp 559-562 (USSR)

ABSTRACT: The authors use the Difference method for the solution of the Goursat problem

$$u_{xy} = f(x,y,u,u_x,u_y),$$

$$u(x,0) = \varphi(x); \quad 0 \leq x \leq l_x; \quad u(0,y) = \psi(y), \quad 0 \leq y \leq l_y; \quad \varphi(0) = \psi(0)$$

for an arbitrary right side $f(x,y,u,u_x,u_y)$ which only in the region of definition $0 \leq x \leq l_x$, $0 \leq y \leq l_y$, $|u-u^0| \leq l_n$, $|u_x-u_x^0| \leq l_{u_x}$, $|u_y-u_y^0| \leq l_{u_y}$ is assumed to be continuous in all arguments and in u, u_x, u_y it is assumed to be sufficiently smooth. The functions $\varphi(x)$ and $\psi(y)$ are continuously differentiable. With the aid of a general criterion of convergence it is stated that if f satisfies the Lipschitz condition in u_x and u_y, then

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

On the Difference Method for the Solution of the Nonlinear Goursat Problem 20-4-3/52

the problem has a continuously differentiable solution. If the Lipschitz condition is satisfied also in u, then the solution is unique. For the case that f, $\varphi'(x)$ and $\psi'(y)$ satisfy the Lipschitz condition in all arguments, the error is estimated by the steps in x and y and by the maximal values of the functions and their derivatives and by the Lipschitz constant. Finally the results are extended to a system of equations in the m-dimensional space.
3 Soviet and 3 foreign references are quoted.

ASSOCIATION: Moscow State University im.M.V.Lomonosov (Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova)
PRESENTED: By S.L.Sobolev, Academician, 31 May 1957
SUBMITTED: 31 May 1957
AVAILABLE: Library of Congress
Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

AUTHORS: Budak, B.M., and Gorbunov, A.D. SOV/55-58-1-2/33

TITLE: On the Convergence of Some Difference Methods for the Equations $y' = f(x,y)$ and $y'(x) = f[x,y(x),y(x-\tau(x))]$ (O akhodimosti nekotorykh konechno-raznostnykh protsessov dlya uravneniy $y' = f(x,y)$ i $y'(x) = f[x,y(x), y(x-\tau(x))]$)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya fiziko-matematicheskikh i yestestvennykh nauk, 1958, Nr 1, pp 23-32 (USSR)

ABSTRACT: Given the problem

(1) $$y' = f(x,y),$$

(2) $$y(x_0) = y_0 \qquad (x_0,y_0) \in G.$$

The approximate values y_i of y are obtained from the difference equation

(3) $$\sum_{i=0}^{m} \alpha_i y_{k-i} = h \sum_{i=0}^{n} \beta_i f_{k+l-i}, \quad f_i = f(x_i,y_i), \quad x_i = x_0 + ih,$$

where the initial conditions are prescribed by

(4) $$y_i = g(x_i),$$

where $g(x)$ is a continuously differentiable function changing with h. Furthermore the difference equation

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$$(5) \qquad \sum_{i=0}^{m-1} (\alpha_0 + \ldots + \alpha_i)\, \varphi(x_{k-i}) = h\,\psi(x_k)$$

is considered, where $\psi(x_k)$ is defined and finite in the points x_k, $\|\psi\| = \max |\psi(x_k)|$. Let the solution of (5) be written in the form $\varphi_k = hB_h\psi_k$, where B_h is a linear bounded operator,

$\|B_h\| = \max\limits_{0 \le k \le N_h} \sum\limits_{i=0}^{h-1} |\gamma_{ki}|$, $N_h = \left[\frac{x-x_0}{h}\right]$, γ_{k_i} is determined by a fundamental solution of the homogeneous equation (5).

Theorem: Let the coefficients of (3) satisfy the conditions

$$\sum_{i=0}^{m} \alpha_i = 0, \quad \sum_{i=0}^{m-1} (\alpha_0 + \ldots + \alpha_i) = \sum_{i=0}^{n} \beta_i \neq 0.$$

For the uniform convergence of the difference process defined by (3) it is necassary and sufficient that $\|B_h\|$ is uniformly bounded in h, that the absolute values of the simple roots of

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On the Convergence of Some Difference Methods for the Equations $y' = f(x,y)$ and $y'(x) = f[x,y(x),y(x-\tau(x))]$ SOV/55-58-1-2/33

$$\sum_{i=0}^{m-1} (\alpha_0+\ldots+\alpha_i)\lambda^{m-1-i} = 0$$

are smaller or equal to one, and that the absolute values of the multiple roots <1.
The exactness of the difference method is estimated.
There are 10 references, 7 of which are Soviet, 1 German, 1 Swedish, and 1 American.

ASSOCIATION: Kafedra matematiki dlya fizicheskogo f-ta i kafedra vychislitel'noy matematiki mekhaniko-matematicheskogo f-ta (Chair of Mathematics of the Dept. of Physics and Chair of Numerical Mathematics of the Dept. of Engineering Mathematics)

SUBMITTED: June 14, 1957

Card 3/3

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

16(1) SOV/55-58-3-1/30

AUTHORS: Gorbunov, A.D. and Budak, B.M.

TITLE: The Method of Straight Lines for the Solution of a Non-Linear Boundary Value Problem in a Curvilinearly Bounded Domain (Metod pryamykh dlya resheniya odnoy nelineynoy krayevoy zadachi v oblasti s krivolineynoy gradnitsey)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 3, pp 3-12 (USSR)

ABSTRACT: The method of straight lines already applied for several times by the authors [Ref 1-3] is used in order to prove the existence, uniqueness und continuous dependence on the boundary conditions of the solution of the following boundary value problem : A continuously differentiable solution of the equation $u_{xy} = f(x,y,u,u_x,u_y)$ is to be found which satisfies the boundary conditions $u(x,g(x)) = \varphi(x)$, $0 \leqslant x \leqslant l_x$; $u(0,y) = \psi(y)$, $0 \leqslant y \leqslant l_y$. Here f is defined and continuous in $\bar{g}$: $0 \leqslant x \leqslant l_x$, $g(x) \leqslant y \leqslant l_y$, $|u| \leqslant l_u$, $|u_x| \leqslant l_{u_x}$, $|u_y| \leqslant l_{u_y}$ and satisfies the Lipschitz conditions with respect to u_x and u_y ; $g'(x) \geqslant 0$ for

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

The Method of Straight Lines for the Solution of a Non-Linear Boundary Value Problem in a Curvilinearly Bounded Domain SOV/55-58-3-1/30

$0 \leq x \leq l_x$, $g(0) = 0$, $g'(x)$ - continuous, $\varphi'(x)$, $\psi'(y)$ - continuous; the upper bounds of the absolute values of φ, φ' etc. furthermore satisfy certain inequalities.
There are 3 Soviet references.

ASSOCIATION: Kafedra vychislitel'noy matematiki mekhaniko-matematicheskogo f-ta i kafedra matematiki fizicheskogo f-ta (Chair of Computing Mathematics of the Mathematical-Mechanical Department and Chair of Mathematics of the Physical Department)

SUBMITTED: July 17, 1957

Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

B.M. Budak

16(1)

AUTHORS: Skoryy, I.A., University Lecturer, and Kopytov, V.D., Scientific Assistant SOV/55-58-2-33/35

TITLE: Lomonosov - Lectures 1957 at the Mechanical-Mathematical Faculty of Moscow State University (Lomonosovskiye chteniya 1957 goda na mekhaniko-matematicheskom fakul'tete MGU)

PERIODICAL: Vestnik Moskovskogo Universitety. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958 ,Nr 2,pp 241-246 (USSR)

ABSTRACT: The Lomonosov lectures 1957 took place from October 17 - October 31, 1957 and were dedicated the 40-th anniversary of the October revolution.

16. A.D. Gorbunov, Lecturer and B.M. Budak, Lecturer : Difference Methods for the Solution of Hyperbolic Equations.
17. N.S. Bakhvalov : Number of Calculation Operations for the Solution of Elliptic Equations.
18. V.I. Lebedev, Aspirant : Difference Method for the Solution of the Sobolev-System.
19. Professor Ye.B. Dynkin : Markov Processes and Semigroups.
20. A.G. Kostyuchenko, Candidate of Physical-Mathematical Sciences : Decomposition of Differential Operators With Respect to Generalised Eigenfunctions.
21. P.A. Berezin, Candidate of Physical-Mathematical Sciences: Foundations of the Theory of Spherical Harmonics on Manifolds.
22. V.N. Borok, Aspirant : General Properties of Partial Evolution Systems.
23. V.A. Tapenskiy, Candidate of Physical-Mathematical Sciences : On Constructive Mathematical Analysis.
24. P.L. Ul'yanov, Lecturer : Reversal of Terms in Trigonometric Series.
25. I.G. Petrovskiy, Academician and Ye.M. Landis, Senior Scientific Assistant : On the Number of Boundary Cycles of a Differential Equation of First Order With a Rational Right Side.

The contents of all the lectures have already been published.

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(12)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

16(1) 2

AUTHORS: Budak, B.M., and Gorbunov, A.D. SOV/55-58-5-2/34

TITLE: On the Difference Method for the Solution of the Cauchy Problem for the Equation $y' = f(x,y)$ and for the System of Equations $x_i' = X_i(t,x_1,\ldots,x_n)$, $i = 1,\ldots,n$, With Discontinuous Right Sides (O raznostnom metode resheniya zadachi Koshi dlya uravneniya $y' = f(x,y)$ i dlya sistemy uravneniy $x_i' = X_i(t,x_1,\ldots,x_n)$, $i = 1,\ldots,n$ s razryvnymi pravymi chastyami)

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1958, Nr 5, pp 7 - 12 (USSR)

ABSTRACT: Let the Cauchy problem $y' = f(x,y)$, $y(x_0) = y_0$ be set up, where $f(x,y)$ is defined in $|x-x_0| \leqslant A$, $|y-y_0| \leqslant B$ and along certain singular curves suffers jumps in this rectangle, while it is uniformly continuous within each partial domain and satisfies the Lipschitz condition in y. The Eulerian polygonal curves are constructed and their convergence to the sought solution, the uniqueness of the solution and the continuous dependence of the solution on initial values and parameters

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

On the Difference Method for the Solution of the Cauchy Problem for the Equation $y' = f(x,y)$ and for the System of Equations $x_i' = X_i(t,x_1,\ldots,x_n)$, $i = 1,\ldots,n$, With Discontinuous Right Sides SOV/55-58-5-2/34

is proved. The same results are obtained for the system of equations mentioned in the title.
There is 1 Soviet reference.

ASSOCIATION: Kafedra matematiki fizicheskogo fakul'teta i vychislitel'noy matematiki mekhaniko-matematicheskogo fakul'teta (Chair of Mathematics of the Physical Department and Chair of Computing Mathematics of the Mechanical-Matnematical Department)

SUBMITTED: June 23, 1958

Card 2/2

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~~16(1)~~ 16.3400 16.3900 16.6500

AUTHORS: Gorbunov, A.D., Budak, B.M.

SOV/155-58-6-5/36

TITLE: On the Difference Method for the Solution of the Cauchy Problem for the System of Equations $x_i' = X_i(t,x_1,\ldots,x_n)$, $(i = 1,\ldots,n)$ With Discontinuous Right Sides

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki 1958, Nr 6, pp 25-29 (USSR)

ABSTRACT: The authors consider the Cauchy problem

(1) $x_i' = X_i(t,x_1,\ldots,x_n) \qquad i = 1,\ldots,n$

(2) $x_i(t_o) = x_i^o \qquad i = 1,\ldots,n$

where the X_i can be discontinuous. They investigate existence- and uniqueness theorems and the continuous dependence on the initial conditions. The existence theorem is proved with the aid of the Eulerian method of differences which is applied as a homogeneous difference scheme ignoring the position of the discontinuities. The velocity of convergence of the Eulerian

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68004

On the Difference Method for the Solution of the Cauchy Problem for the System of Equations $x_i' = X_i(t, x_1, \ldots, x_n)$, $i = 1, \ldots, n$ With Discontinuous Right Sides SOV/155-58-6-5/36

polygones is investigated. Altogether three theorems are proved. There are 6 references, 5 of which are Soviet, and 1 Italian.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: September 17, 1958

Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

GORBUNOV, A.D.; BUDAK, B.M.

Straight-line method for solving a nonlinear boundary value problem in the region of curved boundary. Vest.Mosk.un.Ser. mat.,mekh.,astron.,fiz.khim. 13 no.3:3-12 '58. (MIRA 12:4)

1. Kafedra vychislitel'noy matematiki i mekhaniko-matematicheskogo fakul'teta i kafedra matematiki fizicheskogo fakul'teta Moskovskogo universiteta.
(Functional analysis)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

AUTHOR: Budak, B.M. and Gorbunov, A.D. 20-118-5-2/59

TITLE: ~~Straight-Line Method~~ for the Solution of a Non-linear Boundary Value Problem in a Domain With Curvilinear Boundary (Metod pryamykh dlya resheniya odnoy nelineynoy krayevoy zadachi v oblasti s krivolineynoy granitsey)

PERIODICAL: Doklady Akademii Nauk, 1958, Vol 118, Nr 5, pp 858-861 (USSR)

ABSTRACT: The authors consider the equation

(1) $u_{xy} = f(x,y,u,u_x,u_y)$

in the domain

$\bar{G}$: $0 \leq x \leq l_x$, $g(x) \leq y \leq l_y$, $|u| \leq l_u$, $|u_x| \leq l_{u_x}$, $|u_y| \leq l_{u_y}$,

where $g(x) \geqslant 0$ for $0 \leq x \leq l_x$ and $g'(x) \geqslant 0$ is continuous. It is assumed that f is continuous in $\bar{G}$ and satisfies the Lipschitz condition with respect to u_x and u_y. A continuously differentiable solution is sought which satisfies the boundary conditions

(2) $u(x,g(x)) = \varphi(x)$, $0 \leq x \leq l_x$; $u(0,y) = \psi(y)$ $0 \leq y \leq l_y$

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

Straight-Line Method for the Solution of a Non-linear Boundary Value Problem in a Domain With Curvilinear Boundary 20-118-5-2/59

where $\varphi'(x)$ and $\psi'(y)$ are continuous and $M\varphi + 2M\psi < 1_u$, $M\varphi' + M\psi' M_{g'} < 1_{u_x}$, $M\psi < 1_u$, $M\psi' < 1_{u_y}$, where $M\varphi, \ldots$ denotes the upper bound of the modulus of $\varphi, \ldots$
Under these assumptions the existence of at least one solution is proved with the aid of the straight-line method. Under additional conditions the uniqueness and continuous dependence on the boundary conditions is shown and the error of the approximative solution is estimated. There are 3 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova (Moscow State University imeni M.V. Lomonosov)

PRESENTED: July 17,1957, by A.A. Dorodnitsyn, Academician

SUBMITTED: July 8,1957

Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BEREZIN, Ivan Semenovich; ZHIDKOV, Nikolay Petrovich; TIKHONOV, A.N., prof., retsenzent; BUDAK, B.M., dotsent, retsenzent; red.; GORBUNOV, A.D., red.; MURASHOVA, N.Ya., tekhn.red.

[Methods of calculations] Metody vychislenii. Moskva, Gos.izd-vo fiziko-matem.lit-ry. Vol.1. 1959. 464 p. Vol.2. 1959. 619 p. (MIRA 13:5)

1. Chlen-korrespondent Akademii nauk SSSR (for Tikhonov).
(Electronic calculating machines) (Numerical calculation)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

GORBUNOV, A.D.; BUDAK, B.M.

Stability of computation processes occurring in solving Cauchy's problem for the equation $dy/dx = f(x,y)$ by means of multiple-point difference methods. Vest. Mosk. un. Ser. mat., mekh., astron., fiz., khim. 14 no.2:15-23 '59 (MIRA 13:3)

1. Kafedry vychislitel'noy matematiki mekhaniko-matematicheskogo fakul'teta i matematiki fizicheskogo fakul'teta Moskovskogo gosuniversiteta.

(Differential equations)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

AUTHOR: Gorbunov, A.D. and Budak, B.M. (Moscow)

20-119-4-5/59

TITLE: On the Convergence of Some Different Processes for the Equations $y'=f(x,y)$ and $y'(x)=f(x,y(x),y(x-\tau(x)))$ (O skhodimosti nekotorykh konechnoraznostnykh protsessov dlya uravneniy $y'=f(x,y)$ i $y'(x)=f(x,y(x),y(x-\tau(x)))$)

PERIODICAL: Doklady Akademii Nauk SSSR, Vol 119, Nr 4, pp 644-647 (USSR)

ABSTRACT: Let the equation $y' = f(x,y)$ and the initial condition $y(x_0) = y_0$, $(x_0,y_0) \in G$ be given. Let y_i denote the approximative value of the ordinate $y(x_i)$ of the solution in the points $x_i = x_0 + ih$.

Theorem: If a difference process defined by the equation

$$\sum_{i=0}^{m} \alpha_i y_{k-i} = h \sum_{i=0}^{n} \beta_i f_{k+e-i} \quad , \quad f_j = f(x_j, y_j)$$

converges, then the following conditions are satisfied:

$$\sum_{i=0}^{m} \alpha_i = 0 \qquad \sum_{i=0}^{m-1} \sum_{j=0}^{i} \alpha_j = \sum_{i=0}^{n} \beta_i \neq 0$$

Card 1/2

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

On the Convergence of Some Different Processes for the Equations $y'=f(x,y)$ and $y'(x)=f(x,y(x),y(x-\tau(x)))$ 20-119-4-5/59

In a second theorem necessary and sufficient conditions for the uniform convergence are set up, e.g. The absolute values of the simple roots of the characteristic equation

$$\sum_{i=0}^{m-1} \sum_{j=0}^{i} \alpha_j \lambda^{m-1-i} = 0$$

must be $\leqslant 1$ and the absolute values of the multiple roots must be <1.

Several special cases are considered. There are 9 references, 6 of which are Soviet, 1 German, 1 American and 1 Swiss.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

PRESENTED: November 22, 1957, by S.L. Sobolev, Academician

SUBMITTED: October 28, 1957

Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

16(1) SOV/20-124-6-3/55

AUTHORS: Budak, B.M. and Gorbunov, A.D.

TITLE: On the Stability of the Calculation Processes Arising in the Solution of the Cauchy Problem for the Equation $dy/dx = f(x,y)$ With the Aid of Multipoint Difference Methods (Ob ustoychivosti vychislitel'nykh protsessov, voznikayushchikh pri reshenii mnogotochechnymi raznostnymi metodami zadachi Koshi dlya uravneniya $dy/dx = f(x,y)$)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 124, Nr 6, pp 1191-1194 (USSR)

ABSTRACT: The approximative solution of the problem

(1) $y' = f(x,y)$, (2) $y(x_0) = y_0$

is sought by means of the difference equation

(3) $\sum_{i=0}^{m} \alpha_i y_{k-i} = h \sum_{i=0}^{n} \beta_i f_{k+l-i}$, $f_j = f(x_j, y_j)$

for the initial conditions

(4) $y_0 = g(x_0, h)$, $y_i = g(x_i, h)$.

If K is the class of the admissible functions $f(x,y)$ and R(K) a certain method according to which the approximative

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On the Stability of the Calculation Processes Arising in the Solution of the Cauchy Problem for the Equation $dy/dx=f(x,y)$ With the Aid of Multipoint Difference Methods

SOV/20-124-6-3/55

solution y^* is found with the aid of (3) and (4), then the totality (3),(4),R(K) is denoted as calculation process which arises in the solution of (1)-(2) by means of the difference method. In a very general way the "convergence of the calculation process" and its "stability of order k" is defined. In five theorems the relations between (uniform) convergence, the stability of order zero and one and the errors are formulated without proof. There are 6 references, 5 of which are Soviet, and 1 is Swedish.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

PRESENTED: November 5, 1958, by S.L.Sobolev, Academician

SUBMITTED: November 3, 1958

Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

RICHTMYER, Robert Davis, 1910- ; BUDAK, B.M. [translator];
GORBUNOV, A.D.[translator]

[Difference methods for initial-value problems] Raznostnye metody resheniia kraevykh zadach. Moskva, Izd-vo inostr. lit-ry, 1960. 262 p. (MIRA 15:5)
(Difference equations) (Numerical calculations)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

16.3500

30854
S/044/61/000/008/031/039
C111/C333

AUTHORS: Gorbunov, A. D. Budak, B. M.

TITLE: On the difference method for the solution of the Cauchy problem for the system of equations $x_i' = X_i(t, x_1, \ldots, x_n)$ $(i=1, \ldots, n)$ with discontinuous right hand sides

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1961, 32, abstract 8V215. ("Nauchn. dokl. vyssh. shkoly. Fiz.-matem. n.", 1958, no. 6, 25-29)

TEXT: The authors consider the Cauchy problem for the system of equations

$$x_i' = X_i(t, x_1, \ldots, x_n) \quad (i = 1, 2, \ldots, n), \tag{1}$$

$$x_i(t_0) = x_i^0 \quad (i = 1, 2, \ldots, n) \tag{2}$$

under the assumption that the right hand sides of (1) can have discontinuities of the jump type on surfaces without contacts. With the aid of Euler's difference method, which is used as a homogeneous scheme independent of the position of the discontinuities, the existence

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On the difference method for the . . . C111/C333

and uniqueness of the solution of the mentioned problem is proved (theorem 1). An estimation of the velocity of convergence of Euler's polygonal method is carried out for the rigorous solution of the equation of differences and for the calculation with rounding-off (theorem 2). The continuous dependence of the solution of (1), (2) on the initial conditions and parameters is proved (theorem 3).

[Abstracter's note: Complete translation.]

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31111

S/208/61/001/006/009/013
B112/B138

16.3500

AUTHOR: Budak, B. M. (Moscow)

TITLE: Straight line method for certain quasi-linear boundary value problems of the parabolic type

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 1, no. 6, 1961, 1105-1112

TEXT: The author reduces the boundary value problem

$$\partial u/\partial t = a(x,t,u)\partial^2 u/\partial x^2 + F(x,t,u,\partial u/\partial x),$$
$$u(0,t) = \varphi_1(t),\ u(1,t) = \varphi_2(t),\ u(x,t_0) = \omega(x)$$

to the following

$$du_i/dt = a(x_i,t,u_i)(u_{i+1} - 2u_i + u_{i-1})/h^2 + F(x_i,t,u_i,(u_{i+1} - u_{i-1})/2h),$$
$$u_0(t) = \varphi_1(t),\ u_n(t) = \varphi_2(t),\ u_i(t_0) = \omega(x_i)\ (x_i = ih,\ nh = 1).$$

For this system of differential-difference equations, the convergence and the stability of the solution are shown. Analogous results are obtained

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B112/B138

Straight line method for certain...

for the following cases of modified boundary conditions:

$$u_x(0,t) = \varphi(t,u(0,t)),\ u(1,t) = \psi(t),$$

and

$$u_t(0,t) = \varphi^*(t,u(0,t),u_x(0,t)),\ u(1,t) = \psi^*(t).$$

There are 5 Soviet references.

SUBMITTED: May 8, 1961

Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M.; GORBUNOV, A.D.

Many-point difference methods of solving Cauchy's problem for the equation y' = f(x, y). Vost.Mosk.un.Ser.1: Mat., mekh. 16 no.4:10-19 Jl-Ag '61. (MIRA 14:8)

1. Kafedra matematiki fizicheskogo fakul'teta Moskovskogo gosudarstvennogo universiteta.
(Calculus, Differential) (Differential equations, Partial)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

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28659

16.3400 16.3900 16.6500 S/020/61/140/002/004/023
C111/C444

AUTHORS: Gorbunov, A. D., Budak, B. M.

TITLE: Multipoint difference methods for the solution of Cauchy's problem in the case of the equation $y'=f(x,y)$

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 2, 1961, 291-294

TEXT: The Cauchy problem

$$y' = f(x,y), \quad (x,y) \in G, \ G \text{ a domain} \tag{1}$$

$$y(x_0) = y_0, \quad (x_0, y_0) \in G, \tag{2}$$

is to be solved approximatively by replacing it by the difference problem

$$\sum_{i=0}^{m} \alpha_i y_{k+i} = h \sum_{i=0}^{n} \beta_i f(x_{k+i}, y_{k+i}), \quad x_j = x_0 + jh, \quad h > 0; \tag{3}$$

$$y_i \approx y(x_i), \ i = 0, 1, \ldots, q-1 \tag{4}$$

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

where $q = \max(m,n)$ is the order of (3). Let $f(x,y)$ belong to the class (A') if it is continuous in G and satisfies the Osgood condition in y. Let $\delta_i = y(x_i) - y_i$. Definition: The difference method (3), (4) converges unconditionally in the class (A'), if under arbitrary convergence to zero of $\max\limits_{0 \leq i \leq q-1} |\delta_i|$ for every $f(x,y) \in (A')$ an interval $x_0 \leq x \leq \bar{x}_f$ exists such that $\delta_i \rightrightarrows 0$ for $h \to 0$, $q \leq i \leq T_h$, where

$$T_h = \left[\frac{\bar{x}_f - x_0}{h}\right] - \frac{1}{2} \operatorname{sign}(n-m) \cdot \left[1 + \operatorname{sign}(n-m)\right].$$

Theorem 1: In order (3), (4) to converge unconditionally in (A') it is necessary und sufficient that

$$\sum_{i=0}^{m} \alpha_i = 0, \quad \sum_{i=0}^{m} i\alpha_i = \sum_{i=0}^{n} \beta_i \neq 0; \qquad (5)$$

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that all simple roots of the characteristic equation

$$\sum_{i=0}^{m-1} \sum_{j=i+1}^{m} \alpha_j \lambda^i = 0 \qquad (6)$$

have a modulus ≤ 1 and that all multiple roots of (6) have a modulus < 1.

If y_i^* is the approximative value of y_i obtained by round-off and if

$$\gamma_k = \sum_{i=0}^{m} \alpha_i y_{k+i}^* - h \sum_{i=0}^{n} \beta_i f(x_{k+1}, y_{k+i})$$

then the stability of the computation process is secured, if the condition (7) $|\gamma|_k \leq O(h)$ for $h \to 0$ is satisfied (Theorem 2).

Let $f(x,y) \in (A'')$, if $f(x,y)$ satisfying the Osgood condition in both arguments. Let $D_k = y(x_k) - y_k^*$.

Theorem 3: If all roots of (6) have a modulus < 1, $f(x,y) \in (A'')$ and

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(5), (7) are satisfied, then outside of an arbitrary small neighborhood of $x = x_0$

$$\frac{\Delta D_k}{h} \rightrightarrows 0 \text{ for } h \to 0 \qquad (8)$$

for an arbitrary convergence to zero of $\max\limits_{0 \leq k \leq q-1} |D_k|$. If besides $\Delta D_k / h \to 0$ for $h \to 0$, $k = 0, 1, \ldots, q - z$, then (8) holds for $0 \leq k \leq T_n$. Theorem 4 brings estimations of $|D_k|$ for the case that $f(x,y)$ in G satisfies the Lipschitz condition with respect to both arguments ($f(x,y) \in (B_0)$). Similar estimations for the case that the derivatives of $f(x,y)$ satisfy certain Lipschitz conditions are brought in theorem 5. In conclussion to theorem 4 and 5 in certain cases there follows the uniform estimation $|D_k| \leq O(h^s)$. In theorem 7 the special equation (3)

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$$y_{k+m} = \sum_{i=0}^{m-1} \alpha_i y_{k+i} + h \sum_{i=0}^{m} \beta_i f(x_{k+i}, y_{k+i}),$$

where $f_y(x,y) \leq 0$, is considered. The theorems 8 and 9 contain a posteriori estimations. Let $\bar{\theta}(x) = \bar{y}'(x) - f(x,\bar{y}(x))$, where $y=\bar{y}(x)$ is the equation of the polygonal line which connects the points (x_i, y_i^*), $i = 0,1,\ldots$,. Let $D(x) = y(x) - \bar{y}(x)$,

$$F^{(D)}(x) = [f(x,y(x)) - f(x,\bar{y}(x))][y(x) - \bar{y}(x)]^{-1},$$

$$\bar{\theta}^+(x) = \begin{cases} \bar{\theta}(x) & \text{for } \bar{\theta}(x) \geq 0, \\ 0 & \text{for } \bar{\theta}(x) < 0, \end{cases} \qquad \bar{\theta}^-(x) = \begin{cases} 0 & \text{for } \bar{\theta}(x) \geq 0 \\ \bar{\theta}(x) & \text{for } \bar{\theta}(x) < 0 \end{cases}$$

Then it holds:

Theorem 8: For $D(x)$ there holds the estimation

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$$|D(x)| \leq |D(x_0)| \exp\left[\int_{x_0}^{x} F^{(D)}(\xi)\,d\xi\right] + \left|\int_{x_0}^{x} \bar{\theta}(\eta) \exp\left[\int_{\eta}^{x} F^{(D)}(\xi)\,d\xi\right] d\eta\right|. \quad (10)$$

There are 7 Soviet-bloc and 2 non-Soviet-bloc references.

The reference to English-language publication reads as follows: V. E. Miln, Chislennoye resheniye differentsial'nykh uravneniy, JL, 1955 [Numerical solution of differential equations].

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V.Lomonosov)

PRESENTED: April 7, 1961, by S. L. Sobolev, Academician

SUBMITTED: April 7, 1961

Card 6/6

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M.; GORBUNOV, A.D.

Multipoint method for solving Cauchy's problem for the equation $y'=f(x,y)$. Vych. mat. i prog. 1:19-46 '62. (MIRA 15:8)
(Difference equations)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

S/055/62/000/002/001/003
D237/D301

AUTHOR: Budak, B. M.

TITLE: Uniform difference-differential systems of the second order of accuracy for the discontinuous equations of parabolic and hyperbolic type

PERIODICAL: Moscow. Universitet. Vestnik. Seriya I. Matematika, Mekhanika, no. 2, 1962, 7-13

TEXT: The author uses the method of rectilinear boundary problems to obtain approximate solutions for the discontinuous equations of the parabolic and hyberbolic type which are replaced by approximate mixed difference-differential equations with initial and boundary conditions suitably adjusted. Then, assuming the existence and a certain behavior of the solutions of differential and difference-differential boundary problems, the author states and proves the theorem on the differences of the corresponding terms of two solutions and shows that they are of the

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order $O(h^2)$ as $h \to 0$. One boundary problem is solved in detail to illustrate the method. There are 7 Soviet-bloc references.

ASSOCIATION: Kafedra matematiki fizicheskogo fakul'teta (Department of Mathematics of the Faculty of Physics)

SUBMITTED: April 20, 1961

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

S/055/62/000/003/001/003
D237/D309

AUTHOR: Budak, B.M.

TITLE: The method of straight lines for solving some quasi-linear discontinuous boundary value problems

PERIODICAL: Moscow. Universitet. Vestnik. Seria I. Matematika, Mekhanika, no. 3, 1962, 3-8

TEXT: The initial partial differential equation is transformed into the system of ordinary differential equations, and the author shows that the differences $\delta(a_i)$ and $\delta(a_i)$ between the solutions of the boundary-value problems for the partial equation and the solutions of Cauchy problems for the corresponding ordinary equations, are either of order $O(h)$ or of order $O(h^2)$, when $h \to 0$.

ASSOCIATION: Kafedra matematiki fizicheskogo fakulteta (Faculty of Physics, Department of Mathematics)

SUBMITTED: April 24, 1961

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B112/B102

AUTHOR: Budak, B. M.

TITLE: Homogeneous differential-difference schemes with an accuracy of the second order for parabolic and hyperbolic equations with discontinuous coefficients

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 5, 1962, 986-989

TEXT: The equations

$$L'(u) \equiv \rho(x,t)\,u_t - (k(x,t)\,u_x)_x - \varkappa(x,t)\,u_x + q(x,t)\,u - f(x,t) = 0,$$
$$0 < x < l, \quad 0 < t < T; \qquad (1,1')$$
$$L''(u) \equiv \rho(x,t)\,u_{tt} - (k(x,t)\,u_x)_x - \varkappa(x,t)\,u_x + q(x,t)\,u - f(x,t) = 0.$$
$$0 < x < l, \quad 0 < t < T, \qquad (1,1'')$$

with the boundary conditions

$$u(0,t) = \varphi_1(t), \; u(l,t) = \varphi_2(t), \; 0 \leqslant t \leqslant T \qquad (1,2a)$$

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or

$$k(0,t)u_x(0,t) = \psi_1(t),\ u(1,t) = \psi_2(t),\ 0 \leqslant t \leqslant T \qquad (1,2b)$$

and the initial conditions

$$u(x,0) = \omega(x),\ 0 \leqslant x \leqslant 1;$$

$$u(x,0) = \omega_1(x),\ u_t(x,0) = \omega_2(x),\ 0 \leqslant x \leqslant 1$$

are approximated by the equations

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$$L_h'(u_i) = \tilde{p}_i \frac{du_i}{dt} - \frac{1}{h^2}\{k_{i+1/2}(u_{i+1} - u_i) - k_{i-1/2}(u_i - u_{i-1})\} - \varkappa_{i+1/2}\frac{u_{i+1} - u_i}{2h} - \varkappa_{i-1/2}\frac{u_i - u_{i-1}}{2h} + \tilde{q}_i u_i - \tilde{f}_i = 0; \quad (2,1')$$

$$L_h''(u_i) = \tilde{p}_i \frac{d^2u_i}{dt^2} - \frac{1}{h^2}\{k_{i+1/2}(u_{i+1} - u_i) - k_{i-1/2}(u_i - u_{i-1})\} - \varkappa_{i+1/2}\frac{u_{i+1} - u_i}{2h} - \varkappa_{i-1/2}\frac{u_i - u_{i-1}}{2h} + \tilde{q}_i u_i - \tilde{f}_i = 0, \quad (2,1'')$$

$\tilde{p}_i = {}^1/_2\,[p(x_i - 0, t) + p(x_i + 0, t)]$, $\tilde{q}_i = {}^1/_2\,[q(x_i - 0, t) + q(x_i + 0, t)]$, $\tilde{f}_i = {}^1/_2\,[f(x_i - 0, t) + f(x_i + 0, t)]$, $k_{i\pm 1/2} = k(x_i \pm h/2, t)$, $\varkappa(x_i \pm h/2, t) = \varkappa_{i\pm 1/2}$, $1 \leqslant i \leqslant n$.

with the boundary conditions

$$u_0(t) = \varphi_1(t),\ u_{n+1}(t) = \varphi_2(t),\ 0 \leqslant t \leqslant T; \quad (2,2a)$$

$$l_h(u_1) \equiv k_{1/2}(u_1 - u_0)/h - \psi_1(t) = 0,\ u_{n+1} = \psi_2(t),\ 0 \leqslant t \leqslant T \quad (2,2b)$$

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and the initial conditions

$$u_i(0) = \omega(x_i),\ i = 0,1,\ldots,n+1;$$
$$u_i(0) = \omega_1(x_i),\ u_i'(0) = \omega_2(x_i),\ i = 0,1,\ldots,n+1.$$

The author derives conditions under which the errors $\delta_i^{(a)} = u^{(a)}(x_i,t) - u_i^{(a)}(t)$ and $\delta_i^{(b)} = u^{(b)}(x_i,t) - u_i^{(b)}(t)$ are of the order of h^2 for $h \to 0$. There are 5 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

PRESENTED: October 14, 1961, by A. A. Dorodnitsyn, Academician

SUBMITTED: October 12, 1961

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ACCESSION NR: AT4006714 S/3043/63/000/002/0146/0161

AUTHOR: Budak, B. M.; Bulat*skaya, T. F.; Vasil'yev, F. P.

TITLE: Numerical solution of a boundary problem for the system of nonlinear integro-differential equations of a supersonic boundary layer

SOURCE: Moscow. Universitet. Vy*chislitel'ny*y tsentr. Sbornik rabot, no. 2, 1963. Chislenny*ye metody* v gazovoy dinamike, 146-161

TOPIC TAGS: boundary value problem, integrodifferential equation, nonlinear equation, supersonic boundary layer, body of revolution, numerical method, computing process scheme, iteration method, variable step net, numerical method convergence, boundary layer, axisymmetric flow, viscous fluid flow

ABSTRACT: A system of equations describing a supersonic boundary layer on a slender body of revolution within an axially symmetric flow of a viscous, heat-conducting gas is rewritten in Dorodnitsy*n variables ξ and η, and the boundary conditions under which the system is to be solved are established. The solution of the boundary value

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

ACCESSION NR: AT4006714

problem is sought in the form:

$$u = \psi(\xi),\ i = i(\xi),\ \xi = \frac{\sqrt{R}\,\eta}{2M\sqrt{\xi}}, \qquad (1)$$

where u and i are velocity and enthalpy functions of the boundary layer respectively, R is the Reynolds number, and M is the Mach number. After substituting (1) into the system of equations and boundary conditions, the boundary value problem for Volterra's nonlinear integro-differential equation is derived. It is to be solved simultaneously with the cubic equation expressing the condition for the existence of solutions of (1). An iterative difference method is used to solve the problem. The scheme for the difference approximation of the boundary value problem and the iterative process for solving it are described in detail. Pecularities of difference approximations of the derivatives, integrals, and particular blocks of the calculation process are presented. Problems of selecting given functions, constants, and initial approximations, also their effect on the number of

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ACCESSION NR: AT4006714

iterations needed to attain a given accuracy of approximation, are analyzed. In order to test this method, the known Blasius case of a boundary layer was calculated and results compared with ones derived by other numerical methods. A series of particular variants of the problem are calculated by means of the described method, and the results are analyzed. Orig. art. has: 47 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 16Dec63 ENCL: 00

SUB CODE: AI NO REF SOV: 004 OTHER: 002

Card 3/3

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M. (Moskva)

Straight line method for some quasi-linear boundary value problems of the parabolic type. Zhur. vych. mat. i mat. fiz. 1 no.6:1105-1112 N-D '61. (MIRA 16:7)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M. (Moskva); USPENSKIY, A.B. (Moskva)

Difference method for solving boundary value problems for a hyperbolic integrodifferential equation with discontinuous coefficients. Zhur. vych. mat i mat fiz. 3 no.6:998-1005 N-D '63. (MIRA 17:1)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

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BUDAK, B.M.; USPENSKIY, A.B.

Difference method for solving boundary value problems for intergrodifferential equations of the parabolic type with discontinuous coefficients. Vest. Mosk. un. Ser. 1: Mat., mekh. 18 no.4:15-26 Jl-Ag '63. (MIRA 16:8)

1. Kafedra matematiki fizicheskogo fakul'teta Moskovskogo universiteta.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, B.M.; VINOGRADOVA, Ye.A.; GLASKO, V.B.; KONONKOVA, G.Ye.; POBORCHAYA, L.V.

Problem of unsteady water movement in a reservoir solved by an electronic computer. Meteor. i gidrol. no.12:14-21 D '63. (MIRA 17:3)

1. Moskovskiy gosudarstvennyy universitet, fizicheskiy fakul'tet.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, Boris Mikhaylovich; FOMIN, Sergey Vasil'yevich; UGAROVA, N.A., red.; GOR'KOV, Yu.A., red.; TIKHONOV, A.N., red.

[Multiple integrals and series] Kratnye integraly i riady. Moskva, Nauka, 1965. 607 p. (MIRA 18:11)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

L 53025-65 EWT(d) IJP(c)

ACCESSION NR: AT5010219 UR/3043/65/000/003/0473/0508

AUTHOR: Budak, B. M.; Uspenskiy, A. B.

TITLE: Difference method for solving boundary problems for quasi-linear integro-differential equations of the parabolic and hyperbolic types with discontinuous coefficients

SOURCE: Moscow. Universitet. Vychislitel'nyy tsentr. Sbornik rabot, no. 3, 1965. Vychislitel'nyye metody i programmirovaniye (Computing methods and programming), 473-508

TOPIC TAGS: boundary problem, difference method, integrodifferential equation, parabolic equation, hyperbolic equation, approximate method

ABSTRACT: The difference method described in the present paper is similar to that used by the authors for analogous boundary value problems for linear integro-differential equations (Vestn. Mosk. un-ta, ser. matem. i mekh. no. 4, 1963; Zhurn. vychisl. matem. i matem. fiz. v. 3, no. 6, 1963). In the earlier papers, however, the methods and the schemes employed were not valid for the case of discontinuous coefficients. Proofs of convergence and estimates of the errors are given for both

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ACCESSION NR: AT5010219

parabolic and hyperbolic equations. Both the procedure and the notation are the same as in the earlier papers. Orig. art. has: 96 formulas.

ASSOCIATION: Vychislitel'nyy tsentr Moskovskogo universiteta (Computation Center, Moscow University)

SUBMITTED: 00 ENCL: 00 SUB CODE: MA

NR REF SOV: 006 OTHER: 001

Card 2/2

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

L 00360-66

ACCESSION NR: AT5013288 UR/3043/65/000/004/0139/0183

38, 39, B+1

AUTHOR: Budak, B. M.; Vasil'yev, F. P.; Uspenskiy, A. B.

44,55 44,55 44,55

TITLE: Difference methods for the solution of certain Stefan-type boundary problems

76,44,

SOURCE: Moscow. Universitet. Vychislitel'nyy tsentr. Sbornik rabot, no. 4, 1965. Chislennyye metody v gazovoy dinamike (Numerical methods in gas dynamics), 139-183

TOPIC TAGS: boundary value problem, difference method, heat conduction, Stefan problem, nonlinear equation, iteration

ABSTRACT: In a review of studies on the problem, the present paper starts with an investigation of difference methods for the solution of single-phase and two-phase Stefan-type problems for the nonlinear parabolic equation with sufficiently generalized nonlinear boundary conditions. For the numerical solutions to these problems the authors propose the use of implicit difference expressions with the phase front trapped at the difference lattice point and the application of the iteration method. Using certain auxiliary limitations imposed on the problem they show also that the approximate solutions converge to the respective (classical) solutions, and this is viewed as the existence proof of such solutions. The article offers a description of numerous existing difference methods for

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ACCESSION NR: AT5013288

3

the solution of multiphase problems which were tested at the computer center of the MGU. They are compared here with the methods outlined in this article. Orig. art. has: 196 formulas.

ASSOCIATION: Vychislitel'nyy tsentr, Moskovskiy universitet (Computer Center, Moscow University) 44,55

SUBMITTED: 00 ENCL: 00 SUB CODE: MA, TD

NO REF SOV: 022 OTHER: 011

Card 2/2

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

L 22013-66 EWT(d) IJP(c)

ACCESSION NR: AP5025110 UR/0208/65/005/005/0828/0840

AUTHOR: Budak, B. M. (Moscow); Solov'yeva, Ye. N. (Moscow); Uspenskiy, A. B. (Moscow) 3/

TITLE: Difference method with smoothing of coefficients for solving Stefan problems B

SOURCE: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 5, no. 5, 1965, 828-840

TOPIC TAGS: difference method, heat conductivity

16,44,55

ABSTRACT: The existing methods for solving Stefan problems are unsuitable in the case of single-front problems where the unknown functions depend on several spatial coordinates and time. The author applies implicit difference schemes combined with smoothing of coefficients of the basic equation to the numerical solution of Stefan problems with any number of phase fronts and of independent variables. The smoothing of coefficients is used as a basis for theoretical consideration about proving the existence of solutions of differential equations with discontinuous coefficients and also for the proof of the existence of solutions of one-dimensional Stefan problems for the case of linear equations of heat

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ACCESSION NR: AP5025110

conductivity with interior phase fronts. The construction of smoothing of coefficients for solving Stefan problems of the one-dimensional nonlinear type

$$c(u)\rho(u)\frac{\partial u}{\partial t}=\frac{\partial}{\partial x}\left(k(u)\frac{\partial u}{\partial x}\right)$$

with both interior and exterior phase fronts is also given. Since smoothing of coefficients involves only u, it is independent of whether the problem is one- or many-dimensional. The theoretical aspects of the difference method with smoothing of coefficients for solving Stefan problems for the case of multidimensional nonlinear equations of heat conductivity are outlined. Orig. art. has: 61 formulas.

ASSOCIATION: none

SUBMITTED: 20Jun64 ENCL: 01 SUB CODE: 12, 20

NO REF SOV: 009 OTHER: 000

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"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

L 29839-66 EWT(d)/EWP(1) IJP(c)

ACC NR: AP6011421 SOURCE CODE: UR/0020/66/167/004/0735/0738

AUTHORS: Budak, B. M.; Gol'dman, N. L.; Uspenskiy, A. B.

ORG: Moscow State University im. M. V. Lomonsov (Moskovskiy gosudarvennyy universitet)

TITLE: Difference systems with rectification of fronts for solution of multifront problems of the Stefan type

SOURCE: AN SSSR. Doklady, v. 167, no. 4, 1966, 735-738

TOPIC TAGS: finite difference method, iterational method, approximation technique, gas dynamics, frontal zone

ABSTRACT: Difference systems are applied to the rectification of fronts in the one-dimensional case for a single parabolic equation, Transition from this case to the multidimensional case is not difficult. The problem with a constant number of phase fronts is stated in the following manner. The basic domain of variation of the independent variables (x,t) is the domain

$$D: \{\tilde{y}(t) < x < \tilde{\tilde{y}}(t),\ t > 0\},$$

where $x = \tilde{y}(t)$ and $x = \tilde{\tilde{y}}(t)$ are the left and right boundaries of the domain; these may be given curves or unknown phase fronts. Within the domain D there are N phase fronts $x = y_i(t)$, $i = 1,2,\ldots,N$, where

$$\tilde{y}(t) = y_0(t) < y_1(t) < \ldots < y_N(t) < y_{N+1}(t) = \tilde{\tilde{y}}(t),\quad t \geq 0.$$

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L 29839-66

ACC NR: AP6011421

If the boundary curves are given, the Stefan problem can be formulated as: find the functions $u_0(x,t)$, $u_1(x,t)$,.., $u_N(x,t)$ and the functions $x = y_1(t)$,.., $x = y_N(t)$ satisfying the conditions

$$a(x, t, u_i)\frac{\partial u_i}{\partial t} = \frac{\partial}{\partial x}\left(k(x, t, u_i)\frac{\partial u_i}{\partial x}\right)$$

$$\text{for } y_i(t) < x < y_{i+1}(t),\ t > 0,\ i = 0, 1, \ldots, N;$$

$$\mu_I k(x, t, u_0)\,\partial u_0/\partial x\big|_{x=\tilde{y}(t)} = -\tilde{q}(t, u_0)\big|_{x=\tilde{y}(t)},\quad t > 0;$$

$$\mu_{II} k(x, t, u_N)\partial u_N/\partial x\big|_{x=\tilde{\tilde{y}}(t)} = -\tilde{\tilde{q}}(t, u_N)\big|_{x=\tilde{\tilde{y}}(t)},\quad t > 0;$$

$$u_{i-1}(y_i(t), t) = u_i(y_i(t), t) = \psi_i(y_i(t), t),\quad t > 0,\quad i = 1, 2, \ldots, N;$$

$$\gamma_i(y_i(t), t, \psi_i(y_i(t), t))\,dy_i/dt = k(x, t, u_i)\,\partial u_i/\partial x\big|_{x=y_i(t)+0} -$$
$$- k(x, t, u_{i-1})\,\partial u_{i-1}/\partial x\big|_{x=y_i(t)-0} + \Phi_i(y_i(t), t, \psi_i(y_i(t), t)),$$
$$t > 0,\ i = 1, 2, \ldots, N;$$

$$y_i(0) = l_i,\quad i = 0, 1, \ldots, N, N+1;$$

$$u_i(x, 0) = \varphi(x),\quad l_i \leqslant x \leqslant l_{i+1},\ i = 0, 1, \ldots, N.$$

The parameters u_I and u_{II} may be 0 or 1, and the functions $\tilde{q}(t,u_0)$ and $\tilde{\tilde{q}}(t,u_N)$ may be zero as well as nonzero. A substitution for the independent variable is made such that the problem is defined in the coordinates (ζ, t) where

$$\zeta_i = (x - y_i(t)) / (y_{i+1}(t) - y_i(t)),\quad t = t,\ i = 0, 1, \ldots, N.$$

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ACC NR: AP6011421

and

$$f(x, t) = f(y_i(t) + \zeta_i[y_{i+1}(t) - y_i(t)]) = f(\zeta_i, t).$$

Difference systems are applied to sets of nodes defined in this coordinate space. An iterational algorithm is established for implementing the solution. A brief discussion of the convergence and accuracy is presented. This paper was presented by A. A. Dorodnitsyn, academician, on 17 July 1965. Orig. art. has: 20 equations.

SUB CODE: 12/ SUBM DATE: 12Jul65/ ORIG REF: 001

Card 3/3

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, M., Dr.; SUDIC, D., dr.

Observations on resistance of Mycobacterium tuberculosis according to 303 experiments. Tuberkuloza, Beogr. 7 no. 2-3:122-127 Mar-June 55.

1. Bolnica za bolesti pluca i tuberkulozu u Zagrebu i Centralni higijenski zavod u Zagrebu.
(MYCOBACTERIUM TUBERCULOSIS, effect of drugs on, resist.)

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5"

"APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307220011-5

BUDAK, M.K.

"Computation methods" by I.S.Berezin, N.P. Zhidkov. Reviewed by B.M. Budak. Zhur. vych. mat i mat fiz. 3 no.6:1140-1141 N-D 63. (MIRA 17:1)

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GAMBURG, A. M. i BUDAK, T. A.

34228. Znacheniye kachestva istorii bolezni pri sudebno-meditsinskoy Ekspertize. Kriminalistika i Nauch - Sudeb. Ekspertiza SB. Z. Kiyev, 1949, c. 207-17

SO: knizhnaya Letopis' No. 6, 1955

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