KOROLEV, F.A.; YERSHOV, A.G.; KULIKOV, O.F.

Experimental study of electron oscillations in cyclic accelerators.
Dokl.AN SSSR 134 no.2:314-317 S '60. (MIRA 13:9)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
Predstavleno akad. N.N.Bogolyubovym.
(Electrons) (Particle accelerators)

YERSHOV, A. G.

S/020/60/133/03/03/013
B019/B056

AUTHORS: Yershov, A. G., Korolev, F. A., Kulikov, O. F., Shkurskiy, B. I.

TITLE: Experimental Investigations of the Compression of the Electron Cluster in a 280-Mev Synchrotron

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 3, pp. 554 - 557

TEXT: In the present paper, a new method of studying the cross section of the electron cluster in acceleration is suggested, and several experimental results concerning the compression of the electron cluster are given. The experiments were carried out on the synchrotron of the Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Institute of Physics imeni P. N. Lebedev of the AS, USSR). Several formulas for calculating the betatron oscillations are mentioned and discussed. When carrying out the experiments the electron radiation in a porcelain chamber was observed through a window and photographed by means of a motion-picture camera. The blackening of the pictures was measured by means of a microphotometer.

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and Fig. 1 shows the photograph of an electron cluster and the results of measurement. The elliptical shape of the cluster corresponds to the cross section of the chamber of the accelerator. In Fig. 2 the experimental results are compared with the theoretical calculations of the dependence of the relative amplitudes of the oscillation types on the duration of acceleration. It is found that the radial dimension of the cluster of the accelerated electrons decreases rapidly according to the adiabatic law. Besides, the center of the cluster is compressed more rapidly than the peripheral parts. The perpendicular diameter of the cluster decreases approximately according to the adiabatic law. Further experiments showed that the compression of the electron cluster in a progressive electron drift is the same as when no premeditated drift of the electrons exists. The authors thank M. S. Rabinovich, Doctor of Physical and Mathematical Sciences, and Professor P. A. Cherenkov for making work on the accelerator possible. There are 2 figures and 7 references: 6 Soviet and 1 American.

VC

Experimental Investigations of the Compression of the Electron Cluster in a 280-Mev Synchrotron

S/020/60/133/03/03/013
B019/B056

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

PRESENTED: March 5, 1960, by N. N. Bogolyubov, Academician

SUBMITTED: March 2, 1960

Card 3/3

KOROLEV, F.A.; YERSHOV, A.G.; KULIKOV, G.F.

Investigating variations in the axial and radial dimensions of an electron cluster in synchrotron acceleration. Zhur. eksp. i teor. fiz. 40 no.6:1644-1652 Je '61. (MIRA 14:8)

1. Moskovskiy gosudarstvennyy universitet.
(Photogrammetry)
(Electron beams)
(Synchrotron)

GRIGOR'YEV, B.A.; YERSHOV, A.G.; UVAROV, V.A.

Reflection of radiation from an unbounded plane surface irradiated by a point emitter. Part 2: Particular cases of importance for practical applications. Opt. i spektr. 10 no.2:198-208 F '61. (MIRA 14:2)

(Radiation) (Reflection (Optics))

S/[illegible]/000/000/008/008
B[illegible]/B180

AUTHORS: Korolev, F. A., Yershov, A. G., Kulikov, O. F.

TITLE: Experimental investigation of the electron oscillations in the 680 Mev synchrotron

SOURCE: Uskoritel' elektronov na 680 Mev; sbornik statey. Ed. by V. D. Andreyenko. Moscow, Gosatomizdat, 1962. 75-87

TEXT: The radiation of relativistic electrons with energies above 100 Mev can be directly observed or photographed, through an optical sight glass in the vacuum chamber. The system uses a mirror inside the chamber, for observation in the direction of the beam axis. With the high-speed camera CKL-1 (SKS-1), 150 to 4000 frames can be shot per second. A series of photographs, shows that at 100 Mev the beam has a slightly elliptic cross section with the major axis in the radial direction. When about 185 Mev is reached the second acceleration stage begins, and strong radial synchrotron oscillations appear, greatly increasing the radial major axis, while the beam cross section becomes dumbbell-shaped rather than elliptic. With increasing energy, the damping of synchrotron and betatron

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Experimental investigation of the ...

oscillations causes contraction, and the minimum radial cross section is found at 433 Mev, and 506 Mev for the vertical cross section. In the last stage the beam cross section is slightly increased again. The mean square radial and axial oscillation amplitudes were determined from the photographs, and compared with theoretical predictions. The theory of Kolomenskiy and Lebedev, which takes radiation damping into account, is found to be in good agreement with the experiment. Slight deviations are due to the experiments being made in a real synchrotron, while the theory assumes an ideal one. One reason for the undamped axial oscillations may be the warping of the magnetic symmetry plane in the real synchrotron with consequent amplification of axial oscillations under the influence of the quantum excitation of radial oscillations. Synchrotron oscillations appearing in between the first and second acceleration stages are damped more slowly than predicted. This may be because the theory assumes small amplitudes, while they are actually commensurate with the range of stability. The predicted radiation damping of electron oscillations and excitation of radial synchrotron and betatron oscillations by quantum fluctuations of the electron radiation at high energies are at any rate confirmed experimentally. There are 8 figures.

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S/056/62/042/002/044/055
B108/B138

AUTHOR: Yershov, A. G.

TITLE: Determination of the amplitudes of betatron and synchrotron oscillations of electrons by high-speed filming

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 606 - 609

TEXT: In order to work out a method of determining the amplitudes of the betatron and synchrotron oscillations of electrons, the author calculated the axial and radial intensity distributions of the electron emission. The calculated relative intensity $B(u) = \exp(-u^2)$ for stationary Rayleigh-Gaussian distribution agrees very well with both the radial and axial distributions of intensity determined from the electron motion at the C-60 (S-60) synchrotron of the FIAN. The above formula shows that the half-width of the intensity distribution at the level 0.368 from the maximum equals the root mean square amplitude:
$0.5\,\Delta x_{0.368} = \sigma = (\overline{a^2})^{1/2}$. The distribution B(u) calculated with an

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harmonically variable Rayleigh-Gaussian electron distribution has a characteristic minimum at the B axis. Also this result is in agreement with the experimental one. It is therefore possible to determine the betatron and synchrotron oscillation amplitudes from the experimental intensity distributions. From the radial intensity distribution it was found that the experimental attenuation of the synchrotron oscillations directly after recapture is less than the calculated attenuation. This is due to the fact, however, that the attenuation was calculated from a formula for small amplitudes, whereas the amplitudes of the electron bunch oscillations on recapture may reach considerable values. Measurement of the root mean square amplitude of the radial oscillations and of its attenuation yielded results which are in good agreement with those calculated with consideration of radiation attenuation. A. N. Lebedev is thanked for advice. There are 4 figures and 4 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: September 15, 1961

L 12816-66 FBD/EWT(1)/EWP(e)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) SCTB/IJP(c)

ACC NR: AP6001771 WG/WW/GG/WH SOURCE CODE: UR/0386/65/002/010/0458/0463

AUTHOR: Akhmanov, S. A; Yersiyy, A. G.; Fadeyev, V. V.; Khokhlov, R. V.; Chunayev, O. N.; Shvom, Ye. M.

ORG: Physics Department of the Moscow State University (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: Observation of two-dimensional parametric interaction of light waves

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 10, 1965, 458-463

TOPIC TAGS: ruby laser, laser modulation, parametric amplifier, laser emission coherence

ABSTRACT: The authors report the results of an experiment in which two-dimensional parametric interaction was realized in the optical band, using a ADP nonlinear crystal. The pump was the second harmonic of ruby laser emission ($\lambda_p = 0.3471\ \mu$), and the signal was the laser emission itself ($\lambda_s = 0.6943\ \mu$). A degenerate interaction mode was thus realized ($\omega_s = \omega_1 = \omega_2 = \omega_p/2$). The two-dimensional interaction of the signal wave with the pump in the ADP crystal gave rise to still another wave at frequency ω_{sup} (the supplementary wave), the wave vector of which k_{sup} had a direction determined by the relation $\vec{k}_1 + \vec{k}_2 = \vec{k}_p$ and by the dispersion characteristics of the crystal. The tuning curves of the parametric amplifier are presented and expressions for the signal and supplementary power are derived. It is noted that whereas the process of degenerate parametric amplification in one-dimensional interaction is de-

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termined essentially by the phase shift between the pump and the signal, the phase dependence disappears for the two-dimensional degenerate interaction. A block diagram of the experimental setup is shown in Fig. 1. The Q-switched ruby laser excites an optical frequency doubler (with a KDP crystal 2 cm long) and is simultaneously the generator of the amplified signal. The unfocused pump and signal waves interact in the ADP crystal (3 cm long); the way the two-dimensional interaction is realized is clear from the figure. The experiment yielded $P_{sup}/P_s(0) = 0.02$ and $P_s/P_s(0) = 0.8$, as against the theoretical $P_{sup}/P_s(0) = 0.2$ and $P_s/P_s(0) = 1.0$. The angular aperture of the two-dimensional parametric interaction exceeds the corresponding value for the one-dimensional amplification, and is equal to the angular aperture of the pump beam. In the experiment the divergence of the pump was 2', equal to the divergence of the supplementary wave. The theoretical value of the capture angle calculated for the conditions of the experiment is 10". Authors thank V. G. Dmitriyev, with whom the theoretical research was carried out, G. V. Venkin for help in the experiment, and V. V. Yurlov for the KDP and ADP crystals. Orig. art. has: 3 figures and 4 formulas. [02]

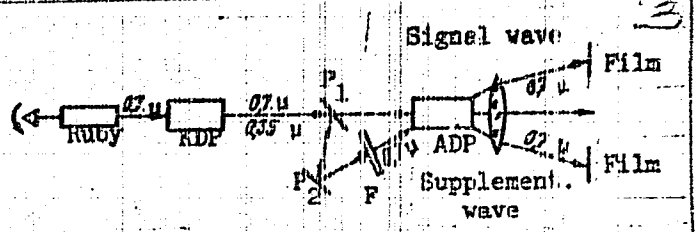

Fig. 1. Block diagram of experimental setup. P_1 and P_2 - plane-parallel plates, F - filter absorbing the pump radiation ($\lambda_p = 0.3471\ \mu$).

SUB CODE: 20/ SUBM DATE: 23Jul65/ ORIG REF: 002/ OTH REF: 007/ ATD PRESS 4183

L 29843-66 EWT(m)/EWP(j)/T IJP(c) WW/RM

ACC NR: AP6012687 SOURCE CODE: UR/0170/66/010/004/0552/0556

67

AUTHOR: Yershov, A. I.; Gukhman, L. M.

B

ORG: Thermophysics Institute im. S. M. Kirov, Minsk (Tekhnologicheskiy institut)

TITLE: Increasing the rate of heat and mass transfer processes with reaction of gas-liquid systems

SOURCE: Inzhenerno-fizicheskiy zhurnal, v. 10, no. 4, 1966, 552-556

TOPIC TAGS: heat transfer, mass transfer, chemical reaction, rotational flow

ABSTRACT: The article is a review of the work of other authors and brings forward no new experimental data. It is mainly concerned with published experimental data on the effect of a rotating flow on the heat transfer rate. It is concluded that the use of a rotating or twisting flow makes possible an increase in the heat transfer rate. The effectiveness of the twisted flow and the hydraulic resistance depends on the degree of twisting of the flow. Use of a twisting flow also increases the rate of the mass transfer process. In particular, in the absorption of a difficultly soluble gas, the process is accelerated by

Card 1/2 UDC: 536.242

L 29843-66

ACC NR: AP6012687

2-2.5 times. Use of a twisting flow makes it possible to obtain considerable velocities of the gas phase in contact equipment, over the whole cross section. Orig. art. has: none.

SUB CODE: 20/ SUBM DATE: 26Nov65/ ORIG REF: 015/ OTH REF: 003

Card 2/2

YERSHOV, A.I.

On osteoplastic pneumopathy. Probl.tub. 39 no.1:103-105 '61.
(MIRA 14:1)

1. Iz Ramenskoy gorodskoy bol'nitsy (glavnyy vrach S.A. Syagayev) i protivotuberkuleznogo dispansera (glavnyy vrach A.P. Kurashova)
(LUNGS—DISEASES) (HAND—DISEASES)

YERSHOV, A.I.

Course of tuberculosis in alcoholism. Probl. tub. 38 no. 5:11-16 '60. (MIRA 14:1)

(TUBERCULOSIS) (ALCOHOLISM)

YEMSHOV, A. I.

Clinical aspects of pulmonary tuberculosis in alcoholism. Probl. tub. 40 no.5:39-45 '62. (MIRA 15:7)

1. Iz kafedry tuberkuleza (zav. - chlen-korrespondent AMN SSSR prof. F. V. Shebanov) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I. M. Sechenova.

(TUBERCULOSIS) (ALCOHOLISM)

32533
S/096/62/000/001/002/008
E194/E955

12.7000

AUTHORS: Kozulin, N.A., Doctor of Technical Sciences, Professor, Yershov, A. I., Engineer

TITLE: The influence of a solid phase on the flow aerodynamics and resistance of cyclones

PERIODICAL: Teploenergetika, no.1, 1962, 18-20

TEXT: There is no generally accepted explanation for the lower effective resistance of cyclones when handling dusty gas. Accordingly, work was carried out on a cyclone 200 mm diameter generally similar to cyclone ЦН-15 of НИИОГАЗ design but with a flat end, using sand and apatite dusts of different particle size distribution but both passing a 250 micron sieve. The dust concentrations ranged up to 120 g/m³. Speed and pressure distribution diagrams indicated that the flow is everywhere retarded by the walls. Initially the dust is uniformly distributed; the greatest retardation of solid particles occurs in the conical section where speeds are 2½ to 3 times the inlet speed, and there is considerable dissipation of mechanical energy. Here even a slight reduction of speed has considerable effect on the resistance. Plots of total

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The influence of a solid ...

pressure change show that the overall frictional resistance is much less than the local values and that the greatest pressure drop occurs on transition from the outer zone of rotation to the inner. It is in this region that the greatest difference is observed between the losses of clean and dusty flows, which confirms that dustiness mainly affects flow aerodynamics and resistance only after most of the particles have become concentrated near the cyclone walls. It was found that the overall resistance falls with increasing dust concentration and with 120 g/m^3 dust the resistance is about half that with clean air. Fig.4 shows a graph of cyclone resistance as a function of dust concentration in g/m^3. The left hand y-axis plots nominal gas speed and the right hand y-axis inlet speed. Points 1 correspond to sand and 2 to apatite. The resistance change depends negligibly on the size and specific

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gravity of the particles, which shows that the energy dissipated by the particles depends mainly on their concentration by weight in the flow. There are 4 figures, no tables and 4 references: 3 Soviet bloc and 1 non-Soviet-bloc.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut (Leningrad Technological Institute)

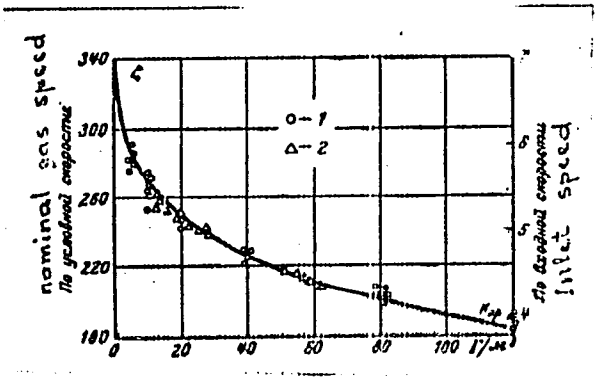

Fig. 4

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1. YERSHOV, A.I.

2. USSR (600)

4. Frozen Ground

7. Diminishing the freezing and removal of the frozen layer of peat deposits in bottom peat production areas. Torf. prom. 29, no. 10, 1952.

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

HALCHAN, Ashot Gedeonovich; FEDOTENOK, A.A., kandidat tekhnicheskikh nauk, retsenzent; YERSHOV, A.I., inzhener, retsenzent; OLIZAROV, P.V., inzhener, redaktor; BALANDIN, A.V., inzhener, redaktor izdatel'stva; MODEL', B.O., tekhnicheskiy redaktor; TIKHONOV, A.Ya., tekhnicheskiy redaktor

[Machine tools] Metallorezhushchie stanki. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 664 p. (MLRA 9:11)
(Machine tools)

YERSHOV, A. M.

Improvement in the PT-1M repeater. Avtom., telem.i sviaz 2 no.4:36 Ap '58. (MIRA 12:12)

1. Starshiy elektromekhanik Mikun'skoy distantsii signalizatsii i svyazi Pechorskoy dorogi.
(Pulse techniques (Electronics))

YERSHOV, A.N. (Gor'kovskaya oblast')

Theorems pertaining to the sum of the external angles and to the sum of the internal angles of a convex polygon. Mat. v shkole no.5:64-65 S-O '59. (MIRA 13:2)
(Polygons) (Geometry, Plane--Study and teaching)

YERSHOV, A.N.

Prospects for the development of public eating places. Gor.khoz. Mosk. 35 no.9:32-34 S '61. (MIRA 14:10)

1. Nachal'nik Glavnogo upravleniya obshchestvennogo pitaniya Ispolkoma Mossoveta.
(Moscow--Restaurants, lunchrooms, etc.)

1-2360 AC01573

21891
S/193/61/000/005/003/006
A004/A104

AUTHORS: Glebov, L. V., and Yershov, A. N.

TITLE: The MSL (MSL)-500-4 and MSL-800 machines for the butt welding of strip

PERIODICAL: Byulleten' tekhniko-ekonomicheskoy informatsii, no. 5, 1961, 22-26

TEXT: The new strip butt welding machines have been developed and built in 1950 by the Leningrad "Elektrik" Plant and are intended for operation in flow lines of rolling mills of metallurgical plants. Strip welding on the MSL-500-4 machine is effected automatically by the continuous flash welding method. Centering and clamping of the strip is carried out by the operator with the aid of control buttons. To facilitate the setting of the strip in the machine jaws the latter are fitted with a setting ruler. The flashing of the strip ends during the welding process is effected by an electromotor drive. Upsetting of the strip at the end of the welding process is taking place at great speed with the aid of a pneumatic-hydraulic device. The machine consists of a welded box-shaped casing on which all machine units are mounted. The welding transformer is placed within the casing. The clamping device of radial type with an axis of rotation which is

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The МСЛ (MSL)-500-4 and MSL-800 machines ...

perpendicular to the strip axis ensures the lower and upper jaws being parallel when clamping strip of different thickness or in the case of wear. The strip is clamped with the aid of a pneumatic-hydraulic device and unclamped by springs. The strip is set by centering devices which make it possible to effect a horizontal adjustment of the strip prior to welding. Moreover the machine is fitted with a mechanism for the lifting of the strip and its free passing over the current-carrying jaws and with a receiving table for the supply of strip being welded. The strip dimensions which can be welded on the machine are given in the table below.

1) Сплавы	2) Ленты	
	3) ширина	4) толщина
5) Медные Бр ОФ-6,5-0,15; Бр ОЦС-4-4-4; Бр ОЦС-4-4-2,5	90—350	1,6—6
6) Из углеродистых и легированных сталей У7А; У12А; ХО5; 65Г и др.	90—350	1,6—3
7) Из малоуглеродистых сталей	90—550	1,6—8

Table:
1) alloys; 2) strips; 3) width; 4) thickness; 5) copper bronzes Бр ОФ-

The MCM (MSL)-500-4 and MSL-800 machines ...

6.5-0.15 (Br OF-6,5-0,15); Бр ОЦС-4-4-4 (Br OTsS-4-4-4); Бр ОЦС-4-4-2,5 (Br OTsS-4-4-2,5); 6) of carbon and alloyed steel grades У7А (U7A); У12А (U12A); Х05 (Kh05); 65Г (65G) and others; 7) of low-carbon steels.

The MSL-800 machine is intended for the automatic resistance welding by the continuous flashing method of carbon steel strip 1.5-5 mm thick and 200-1,000 mm wide. A movable and a stationary clamping device are mounted on the bed devised for the dependable clamping of the strip ends being welded. The stationary clamping device is fixed directly to the bed while the movable one is able to travel along the bed on two rectangular guides whose ends are sliding in stationary bearings. The flashing and upsetting drive consists of a d-c electromotor whose revolutions can be steplessly regulated and a reducer whose output shaft carries cams. The revolving cams are pressing on the support rollers mounted on the movable clamping device imparting the latter the speed necessary during the flashing and upsetting process. The strip ends are clamped by traverses, preliminary clamping is effected with the aid of pneumatic cylinders. Since in the operation process the lower jaws are subjected to wear, special regulating wedges have been provided for to preserve the equal height of the lower jaws of the movable and stationary clamping devices. The welding transformer is placed in the bed and is connected to the lower jaws with the aid of flexible bars assembled from copper foil. The

The MCM(MSL)-500-4 and MSL-800 machines ...

machine has two centering devices to adjust the face ends of the strip being butt-welded in the horizontal plane. A wedge-shaped support mechanism ensures the clearance between the strip-ends being welded. The technical specifications of the MSL-500-4 and MSL-800 machines are given in the table below.

Table:

1) indices; 2) models; 3) rated power, kva; 4) duration of switching on,%; 5) primary voltage, v; 6) secondary voltage, v; 7) primary rated current, amp; 8) secondary short-circuit current on the rated stage (distance between terminals 25 mm), amp; 9) number of regulation stages; 10) output, welds/h; 11) maximum upsetting force, tons; 12) maximum clamping force, tons; 13) maximum distance between clamps, mm; 14) cooling water consumption, liter/h; 15) air consumption per weld, m^3; 16) compressed air pressure, kg/cm^2; 17) overall dimensions, mm: a) length, b) width, c) height; 18) weight, tons.

There are 2 figures and 2 tables.

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S/193/61/000/005/003/006
A004/A104

The (MSL)-500-4 and MSL-800 machines ...

Table:

1) Показатели	2) Модели	
	МСЛ-500-4	МСЛ-800
3) Номинальная мощность, *ква*	500	800
4) Продолжительность включения (ПВ), %	20	20
5) Первичное напряжение, *в*	380	380
6) Вторичное напряжение, *в*	3,66—11,2	8—16
7) Первичный номинальный ток, *а*	1320	2100
8) Вторичный ток короткого замыкания на номинальной ступени (расстояние между зажимами 25 *мм*), *а*	126 500	150 000
9) Число ступеней регулирования	16	16
10) Производительность, *сварок/ч*	60	25
11) Максимальное усилие осадки, *т*	32	50
12) Максимальное усилие зажатия, *т*	78	100
13) Максимальное расстояние между зажимами, *мм*	80	38
14) Расход охлаждающей воды, *л/ч*	1500	1500
15) Расход воздуха на одну сварку, $м^3$	0,2	0,3
16) Давление сжатого воздуха, $кГ/см^2$	5	5
17) Габаритные размеры, *мм*:		
а) длина	4010	4880
б) ширина	1917	2800
с) высота	2395	3000
18) Вес, *т*	7,8	28,5

Card 5/5

ZABASHTA, V.N.; YERSHOV, A.P.; KHARKHAROV, A.A.

Changes in the absorption spectrum related to the changes in the dye and fiber bond. Izv. vys. ucheb. zav.; tekh. tekst. prom. no.6:98-102 '64. (MIRA 18:3)

1. Leningradskiy institut tekstil'noy i legkoy promyshlennosti imeni Kirova.

ERSHOV, A.P.

USSR/Mathematics - Matrices

Card 1/1 Pub. 22 - 4/52

Authors : Ershov, A. P.

Title : About a method of conversion of matrices

Periodical : Dok. AN SSSR 100/2, 209-211, Jan 11, 1955

Abstract : A method of matrix conversion is presented. This method is derived basically from a lemma the proof of which is given and constructed on an idea which, though different from that in the algorithm for elimination of unknowns, is still very close to it. One USSR reference (1950).

Institution : Moscow, M. V. Lomonosov, State University

Presented by: Academician S. L. Sobolev, November 12, 1954

YERSHOV, A. P.

"Programming Program for the BESM of the Academy of Sciences USSR" a paper presented at the Conference on Methods of Development of Soviet Mathematical Machine-Building and Instrument-Building, 12-17 March 1956.

Translation No. 596, 8 Oct 56

YERSHOV, A. P.

"On simulating the Process of Producing Conditioned Reflexes on the EDSAC computer" (14 Nov. 1955)

Paper presented at the Seminars on Cybernetics at Moscow University during the 1955-56 school year.

So: Problemy Kibernetiki, No. 1, 1958, pp. 265-66

YERSHOV, A. P.

"Automatic Programming,"

paper presented at the Conference on Mechanization ofThought Processes, Teddington, UK, Nov 1958.

also presented an impromptu talk on Mechanical translation in the USSR.

YERSHOV, A.P.

16(0); 20(2) PHASE I BOOK EXPLOITATION SOV/3565

Akademiya nauk Azerbaydzhanskoy SSR

Tezisy dokladov Soveshchaniya po vychislitel'noy matematike i primeneniyu sredstv vychislitel'noy tekhniki (Outlines of Reports of the Conference on Computational Mathematics and the Use of Computer Techniques) Baku, 1958. 63 p. 400 copies printed.

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

No contributors mentioned.

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

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

PHASE I BOOK EXPLOITATION 993

Yershov, Andrey Petrovich

Programmiruyushchaya programma dlya bystrodeystvuyushchey elektronnoy schetnoy mashiny (Data-processing Program for The High-speed Electronic Computer) Moscow, Izd-vo AN SSSR, 1958. 115 p. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Vychislitel'nyy tsentr.

Resp. Ed.: Dorodnitsyn, A.A., Academician; Ed. of Publishing House: Shteynbok, G. Yu.; Tech. Ed.: Polyakova, T.V.

PURPOSE: The book is intended for scientists and engineering personnel dealing with problems of mathematical calculation. It is also designed for teachers and students in the mechanics and mathematics department of vuzes.

COVERAGE: The monograph describes an experiment in the automation of programming for digital computers. It gives rules for coding the information and discusses basic algorithms of programming. The experiment was conducted at the Institute of Precision Instruments and Computer Engineering and at the Computer Center of the USSR Academy of Sciences. The basic principles of programming the arith-

Card 1/5

metic operators used in the experiment were developed by L.N. Korolev. L.D. Panova and V.D. Podderyugin worked on coding. V.M. Kurochcin offered valuable advice and is credited with the final version of the algorithm for economization of operating locations. There are no references.

TABLE OF CONTENTS:

Data-processing Program for (Cont.) 993

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PART III. DESCRIPTION OF THE DATA-PROCESSING PROGRAM

Card 4/5

YERSHOV, A.P.

20-3-2/59

AUTHOR: YERSHOV, A.P.

TITLE: On Programming of Arithmetic Operators (O programmirovanii arifmeticheskikh operatorov)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol.118, Nr.3, pp.427-430 (USSR)

ABSTRACT: The author describes a three-stage algorithm for the programming of arithmetic operators. The paper joins the just published book of the author (Programming Program for BESM, Moscow 1958) and contains proposals for the acceleration and simplification of the work of the calculating process. There are 3 figures and 1 Soviet reference.

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

PRESENTED: By S.L.Sobolev, Academician, 2 July 1957
SUBMITTED: 27 June 1957
AVAILABLE: Library of Congress

Card 1/1

AUTHOR: Yershov, A.P.

SOV/20-122-6-3/49

TITLE: On Operator Algorithms (Ob operatornykh algorifmakh)

PERIODICAL: Doklady Akademii nauk,SSSR,1958,Vol 122,Nr 6,pp 967-970 (USSR)

ABSTRACT: For the formal description of algorithms the author proposes a new method, on the basis of which according to the author's opinion the mathematical methods for solving different theoretical problems of programming can be developed. The notion of the operator algorithm is introduced and its relation with normal algorithms in the sense of Markov and with the partially recursive functions is investigated. There are 2 references, 1 of which is Soviet, and 1 American.

ASSOCIATION: Vychislitel'nyy tsentr AN SSSR (Computation Center, AS USSR)

PRESENTED: June 7, 1958, by S.L. Sobolev, Academician

SUBMITTED: May 30, 1958

Card 1/1

YERSHOV, A. P.: Master Phys-Math Sci (diss) -- "Some problems in the theory of algorithms connected with programming. Operator algorithms". Moscow, 1959. 7 pp (Moscow Order of Lenin and Order of Labor Red Banner State U im M. V. Lomonosov, Mech-Math Faculty), 150 copies (KL, No 14, 1959, 117)

PODDERYUGIN, V.D.; YERSHOV, A.P., otv. red.; YAKOVKIN, M.V., red.; POPOVA, N.S., tekhn. red.

[Program control for the "Strela-3" computer (recording changing commands)] Programma kontrolia dlia "Strely-3" (PIK). Moskva, Vychislitel'nyi tsentr AN SSSR, 1960. 20 p. (MIRA 14:7)
(Programing (Electronic computers))

PODDERYUGIN, V.D.; YERSHOV, A.P., otv. red.; YAKOVKIN, M.V., red.; POPOVA, N.S., tekhn. red.

[Program control for the "Strela-3" computer (recording linear sections)] Programma kontrolia dlia "Strely - 3" (LUCH). Moskva, Vychislitel'nyi tsentr AN SSSR, 1960. 21 p. (MIRA 14:7)
(Electronic calculating machines) (Programing (Electronic computers))

BEKUS, Dzh.V. [Backus, T.W.]; BAUER, F.L.; GRIN, Dzh. [Green, T.]; KETTS, S. [Katz, C.]; MAK-KARTI, Dzh. [McCarthy, T.]; NAUR, Peter; PERLIS, E.Dzh. [Perlis, A.T.]; RUTISKHAUZER, Kh. [Rutishauser, H.]; ZAMEL'ZON, K. [Samelson, K.]; VOKUA, B. [Vauquois, B.]; UEGSTEYN, Dz. [Wegstein, T.H.]; VAN-VENGAARDEN, A. [Wijngaarden, A. van]; VUDZHER, M. [Woodger, M.]; KOZHUKHIN, G.I. [translator]; YERSHOV, A.P., red.; KORKIN, A.I., tekhn.red.

[Report on the algorithmic language ALGOL 60] Soobshchenie ob algoritmicheskom iazyke ALGOL 60. Pod red. Petera Naura. Moskva, Vychislitel'nyi tsentr AN SSSR, 1960. 66 p. (ALGOL bulletin supplement, no.2). (MIRA 13:12)

(Logic, Symbolic and mathematical)
(Information theory)

16.6800

S/044/61/000/007/049/055
C111/C222

AUTHOR: Yershov, A.P.

TITLE: Inversion of a matrix

PERIODICAL: Referativnyy zhurnal. Matematical, no. 7, 1961, 47, abstract 7 V 308. ("Sb. standardn. i tipovykh programm dlya БЭСМ" (BESM). M., AN SSSR, 1960, 21-26)

TEXT: The author gives the scheme of operation and the program for the inversion of a matrix of n-th order. The program is based on a method given in an earlier paper by the author. The program is a standard program for the machine BESM of the AN SSSR (Academy of Sciences of the USSR).

[Abstracter's note : Complete translation.]

Card 1/1

i/B

S/582/60/000/003/001/009
D234/D305

16,4600

AUTHOR: Yershov, A.P. (Moscow)

TITLE: Operational algorithms. I

SOURCE: Problemy kibernetiki, no. 3, Moscow, 1960, 5 - 48

TEXT: The purpose of the paper is to make the notion of an algorithm more exact, taking into account the requirements referring to it. The author considers only the algorithms usually called the operational ones. A general definition of these is given, preceded by detailed treatment of the notions of constructive objects, variables, operations, operators. Examples of these algorithms are given. The other subjects considered are characteristics of the operational algorithms (values of the algorithms, functions realized by them, S-representation of their values, i.e. representation of resulting variables in the form of superpositions of elementary operations on the initial data); algorithms of zero rank, L.A. Kaluzhin's diagrams; connection with partly recursive functions (definition of the latter, relation of operational algorithms, diagrams

Card 1/2

Operational algorithms. I

S/582/60/000/003/001/009
D234/D305

defined as cyclic trees, a method of constructing diagrams of the carriers of algorithms called the C-representation; the author establishes a theorem that any function realized by any algorithm belonging to a specified class is a partly recurrent function but only proves a weaker theorem); definition of normal algorithms of A.A. Markov, their connection with operational algorithms (a correspondence between a normal algorithm and an operational one is established); problem of the operations which are independent of the alphabet. There are 18 figures and 18 references: 17 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: H.G. Rice, Trans. Amer. Math. Soc. 74, 2, 1953, 358-366.

VB

SUBMITTED: February 4, 1958

Card 2/2

[illegible]

N. I. [illegible], Second International Congress on Cybernetics (3 March 1958); contents of the paper were published in the second issue of Problemy kibernetiki in the "Khronika" section.

Discussion of I. A. Poletayev's book Signal (17 October 1958).

S. I. [illegible] and O. Ya. Kobrinskaya, Investigation of the Physiological Mechanism of a Complex Reflex in Mice Under Labyrinth Conditions (31 October 1958).

A. N. [illegible], Report on the Mission to the US (1[illegible] November 1958).

A. A. Lyapunov, and S. V. Yablonskiy, Problem of the Systematization of the Basic Concepts of Cybernetics (26 November 1958).

[illegible], Conference on Automation in Railroad Transportation (12 December 1958).

Yu. A. Shreyder, Means of Developing the Structure of Computers (26 December 1958).

A. P. Yershov, Report on the Cybernetics Symposium in London (26 December 1958).

M. G. Gaaze-Rapoport, Certain Problems of the Behavior of Living Organisms (13 (February 1959).

N. Ye. Kobrinskiy, Cybernetic Problematic Topics in Economics (27 February 1959).

D. I. Volovaya, The Basis of Technical Norms of Weight and Speed of River Craft with the Aid of Electronic Digital Computers (13 March 1959).

G. V. [illegible], Electrical Simulation of Certain Self-Adaptive Systems (10 April 1959; a part will be published in Problemy kibernetiki, No 4).

A. A. Lyapunov, O. S. Kulagina, and T. N. Moloshnaya, Report on the Leningrad Conference on Mathematical Linguistics (24 April 1959, cf., pp 273-27[illegible] of this book).

Report presented at the Moscow University Seminar on Cybernetics during 1958-59 school year. (under direction of A. A. Lyapunov)
(reported in Problemy kibernetiki, No. 3, 1960, p. 273)

VOLOSHIN, Yu.M.; YERSHOV, A.P., red.

[Bibliography on automatic programming] Bibliografiia po avtomaticheskomu programmirovaniiu. Novosibirsk, Akad. nauk SSSR Sibirskoe otd-nie. In-t matem. s Vychislitel'nym tsentrom, 1961. 37 p. (MIRA 15:6)
(Bibliography--Automatic control)
(Bibliography--Programming (Mathematics))

YERSHOV, A.P.;KIM, K.V.; PODDERYUGIN, V.D., otv. red.; ORLOVA, I.A., red.; KORKINA, A.I., tekhn. red.

[Programming program for the "Strela-3" computer; a manual] Programmiruiushchaia programma dlia vychislitel'noi mashiny "Strela-3" (PPS); rukovodstvo dlia pol'zovaniia. Moskva, Vychislitel'nyi tsentr AN SSSR. 1961. 61 p. (MIRA 15:1)

1. Otdel teoreticheskogo programmirovaniya Vychislitel'nogo tsentra AN SSSR (for Yershov, Podderyugin).
(Programming (Electronic computers))

9,7000

S/044/62/000/008/072/073
0111/0333

AUTHORS: Yershov, A. P., Kim, K. V.

TITLE: The programming program for the computer "Strela-3" (PPS).(Directions for the use)

PERIODICAL: Referativnyy zhurnal, Matematika, no. 8, 1962, 67, abstract 8V393K. (Vychisl. tsentr AN SSSR, M., 1961, 63 p.)

TEXT: One describes very detailed rules for the writing down of the operator schemes of the programs which shall be programmed for the computer "Strela" by aid of the programming program. Examples are given.

[Abstracter's note: Complete translation.]

Card 1/1

YERSHOV, A.P.; KOZHUKHIN, G.I.; VOLOSHIN, Yu.M.

[Input language for an automatic programming system; preliminary information] Vkhodnoi iazyk sistemy avtomaticheskogo programmirovaniia; predvaritel'noe soobshchenie. Moskva, Vychislitel'nyi tsentr AN SSSR, 1961. 173 p. (MIRA 14:8)
(Programming(Electronic computers))

YERSHOV, Andrey Petrovich, red.; BEZBORODOV, Yu.M., red.; MURASHOVA, N.Ya., tekhn. red.

[Automation of programming; translated articles] Avtomatizatsiia programmirovaniia; sbornik perevodov. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1961. 368 p. (MIRA 15:2)
(United States—Programming (Electronic computers))

S/194/61/000/012/017/097
D201/D303

9.7150

AUTHORS: Yershov, A. P. and Kurochkin, V. M.

TITLE: Certain problems of automatic programming

PERIODICAL: Referativnyy zhurnal, Avtomatika i radioelektronika, no. 12, 1961, 3, abstract 12B12 (Tr. Vses. soveshcheniya po vychisl. matem. i primeneniyu sredstv vychisl. tekhn. Baku, AN Azerb SSR, 1961, 72-80)

TEXT: Certain problems, resulting from further development of automatic programming by programming programs (PP) are considered, the PP being based on operator programming. The discussed problems are of different degrees of difficulty. The factor common to all problems is that the solution of any one of them results in increasing efficiency and the ease of PP application. All problems, arising from exploitation of existing types of PP, are treated uniformly. The main problem is that of control of output information. The following is considered. As a rule, output information about the programming problem contains a certain number of errors. As a con-

Card 1/3

Certain problems of ...

sequence, in processing the false output information, the PP does not end and either goes into a repetitive cycle or ends at the so-called "control check"; such an error is sometimes difficult to detect. An exact algorithm may be worked out which for any output information would produce the answer to the questions whether the output information contains a formal error or not and which would pinpoint the position of this error in the output information. The design of programmed control represents considerable difficulties and requires a careful analysis as to the means by which the output information has to be obtained and as to the nature of the PP itself. The problems of supplying the initial information are considered. In this chapter all problems are considered, whose solutions result in a simplified presentation and are as near as possible to the usual form of initial information. It is shown that the method of secondary circuits, already in use in several PP's, may be used for deciphering new symbols in output information. From all the problems of setting up new algorithms of programming, only the two most important, from the practical point of view, are consi-

Card 2/3

Certain problems of ...

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D201/D303

dered: the analysis and transformation of the program circuits and increase of the PP operating speed. [Abstractor's note: Complete translation.]

Card 3/3

32903

S/194/61/000/011/016/070
D209/D302

9,7100

AUTHORS: Velikanova, T.M., Yershov, A.P., Kim, K.V., Kurochkin, V.M., Oleynik-Ovod, Yu.A. and Podderyugin, V.D.

TITLE: Programming program for machines

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 11, 1961, 3, abstract 11 B14 (Tr. Vses. soveshchaniya po vychisl. matem i primeneniyu sredstv vychisl. tekhn., Baku, AN AzerbSSR, 1961, 81-93)

TEXT: It is shown that in 1957 in the Computing Center of the Academy of Sciences of the USSR, work on forming the system programming program (SPP) was completed. By using SPP the need for formulating programs of actual problems is avoided and this process is replaced by the process of compiling the information for SPP concerning the problem being solved. In working out the method of providing information about the problem for SPP the following points were observed: a) If possible, to provide the best approximation of

Card 1/4

Programming program for machines

the information to mathematical formulation of problems (i.e. to calculated formulae); b) reduction of the volume of auxiliary and purely technical work connected, as a rule, with the mathematical formulation of the problem and with the specific character of work on universal computing machines; c) that from the information one could see more or less accurately the structure of the completed program; d) reduction of volume of total information in order to make it more descriptive and easily surveyed. The information for SPP consists of five parts: 1) Program scheme - basic part of the information; 2) operators (0); 3) information about magnitudes; 4) information about memory blocks; 5) blocks. Except for the program scheme all the remaining parts of the information do not have to be given in an actual problem. The whole terminology used in this paper is explained. The program scheme is given. It is shown that the scheme can include 0's of the following types: 1) Arithmetical 0's; 2) restoration 0's; 3) non-standard 0's; 4) re-addressing 0's; 5) double counting 0's. Each operator in the scheme is represented by a letter giving the type of the 0 followed by the

S/194/61/000/011/016/070
D209/D302

Programming program for machines

information about the given 0. The arithmetical 0's and certain non-standard 0's of special form are the exceptions. The popularity of the program scheme, the nearness of its form to the form of the mathematical formulation of the problem are obtained basically by a specific solution of the registration of mathematical formulae in arithmetical 0 and preservation in the program scheme. Examined in detail is an arithmetical 0 which realizes a single calculation to a certain sequence of formulas of the type $F(x_1, x_2, \ldots x_n) \Rightarrow y$, where the symbol - "$\Rightarrow$" indicates that y is a result of calculation according to the formula F. Further on, logical 0's non-standard 0's, cycles, re-addressing 0's, restoration 0's and double counting 0's are examined. Finally, an example of integration of a parabolic equation of the type

$$\frac{\partial z}{\partial t} = 0.75 \sqrt{x(1 - x)(t^2 + 2)}\, \frac{\partial^2 z}{\partial x^2},$$

$$z(x,0) = 0; \quad z(0,t) = 0; \quad z(1,t) = t$$

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S/194/61/000/011/016/070
D209/D302

Programming program for machines

up to the moment when t = T is given. One of the possible calculated formulas is shown. Information is provided about the block and the program scheme. [Abstracter's note: Complete translation]

Card 4/4

ERSHOV, A. P., KRINITSKIY, N. A., and PODLOVCHENKO, R. I.

"Review of Work on Logical Schemes of Algorithms."

presented at the All-Union Conference on Computational Mathematics and Computational Techniques, Moscow, 16-28 November 1961

So: Problemy kibernetiki, Issue 5, 1961, pp 289-294

YERSHOV, A. P.

"On the Project of International Algorithmic Language ALGOL"

presented at the All-Union Conference on Computational Mathematics and Computational Techniques, Moscow, 16-28 November 1961

So: Problemy kibernetiki, Issue 5, 1961, pp 289-294

YERSHOV, A. P.

"On the Project of International Programming Language ALGOL" (23 October, 13 November 1959)

report delivered at a seminar on cybernetics, Moscow State University

So: Problemy kibernetiki, Issue 5, 1961, pp. 289-294

ERSHOV, A. P. and SHURA-BURA, M. R.

"Modern Status of Automatization of Programming"

presented at the All-Union Conference on Computational Mathematics and Computational Techniques, Moscow, 16-28 November 1961

So: Problemy kibernetiki, Issue 5, 1961, pp. 289-294

S/199/61/002/006/001/003
B112/B138

16.6800

AUTHOR: Yershov, A. P.

TITLE: Fundamental principles for the setup of a programming program at the Mathematical Institute of the Siberian Department of the Academy of Sciences USSR

PERIODICAL: Sibirskiy matematicheskiy zhurnal, v. 2, no. 6, 1961, 835-852

TEXT: The author outlines a large program-automating program (PP) which has been developed at the Mathematical Institute of the Siberian Department of the Academy of Sciences USSR. Although based on ALGOL 60, the language of PP contains multidimensional quantities and operations (vectors and matrices). It is called "entering language" (cf. Yershov A.P., Kozhdukhin G. I., Volozhin Yu. M., Vkhodnoy yazyk sistemy avtomatizatsii programmirovaniya (Predvaritel'noye soobshcheniye), VTs Ak. nauk SSSR, M., 1961). The formulas of substitution are described as follows:
(a) description of the initial value of a variable: x = E, where x is a variable that can be localized within the block of descriptions given, and E is an expression containing constants or variables that are not

Card 1/2

Fundamental principles for the...

localized within this block. (b) Description of functional expressions: $F(X) = E$, where F is the functional identifier, X is the list of formal arguments, and E computes F. (c) Description of the identity: $x = y$, where x and y are variables. Special requirements and ways of satisfying them are discussed. A. A. Lyapunov (O logicheskikh skhemakh programm, Problemy kibernetiki, vyp. 1, Fizmatgiz, M., 1958) is mentioned. There are 12 Soviet references.

SUBMITTED: April 7, 1960

Card 2/2

34468
S/020/62/142/004/005/022
B112/B102

16.6800 (1024, 1121, 1327)

AUTHOR: Yershov, A. P.

TITLE: The problem of memory distribution in programming the problem of vertex coloration of graphs

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 4, 1962, 785 - 787

TEXT: Admissible transformations of schemes Z into schemes Z' are investigated. Several definitions of admissibility are given. An operator scheme can be regarded as an oriented graph whose vertices are operators. A classification of the domains of action of the scheme Z with respect to their weights yields a certain graph G(Z). For a given coloration R of the vertices of the graph G(Z) there is a graph g(Z, R) whose vertices are the sets of all equally colored vertices of the graph G(Z). The coloration R is said to be orderable if the vertices of the graph g(Z, R) can be ordered into a sequence U such that the set of all vertices of g(Z, R) with the same domain of action constitute an interval of the sequence U. The main result of the paper is the following: An arbitrary orderable coloration of a graph G(Z) by q colors effects a certain admissible trans-

Card 1/2

formation of the scheme Z into a scheme with the weight q. Conversely, each admissible transformation of the scheme Z into a scheme with the weight q effects a certain orderable coloration of the graph G(Z) by q colors. There is 1 Soviet reference.

ASSOCIATION: Institut matematiki s vychislitel'nym tsentrom Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Mathematics with Computer Center of the Siberian Branch of the Academy of Sciences USSR)

PRESENTED: October 2, 1961, by S. L. Sobolev, Academician

SUBMITTED: September 27, 1961

YERSHOV, A. P.

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

1962

"Operator Algorithms."

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

S/582/62/000/008/003/013
D405/D301

AUTHOR: Yershov, A. P. (Novosibirsk)

TITLE: Operator algorithms. II (Description of basic programming structures)

SOURCE: Problemy kibernetiki. no. 8, Moscow, 1962, 211-233

TEXT: The possibility of representing programs and logical schemes of programs in the form of operator algorithms is considered. It is shown that for any computer (of a fairly wide class of computers) it is possible to construct a class of operator algorithms such that any program, written in the instruction code of the given computer, can be regarded as an operator algorithm of the class constructed. This assertion is not proved as a theorem, but illustrated by a typical example; as such, A. A. Lyapunov's conventional computing machine (CCM) is taken (which is described in the references). The definition of an operator algorithm is supplemented in two respects (as compared to the definition given in an earlier work by the author); the technical difficulties which arose in

Card 1/ 3

constructing certain classes of concrete operator algorithms brought about the inclusion of some sort of a decoder in the definition of an operator algorithm; thereby it became possible to select the values assumed by the operator variables in a way most appropriate for the given class. Further, the CCM is described in terms of operator algorithms; a special class of such algorithms is constructed, coinciding exactly with the totality of all the programs written for the CCM. The class of operator algorithms is obtained by constructing the set of variables and the set of operations. The decoding operation is also described. The routines for the CCM are given in the form of operator algorithms. The logical schemes, in terms of operator algorithms, are simpler and also more perfect than the corresponding logical schemes (the programming routine) for the computer "Strela". The logical schemes are illustrated by an example (the operator algorithm for the solution of a system of 2 linear equations). Further, the equivalence of operator algorithms is discussed. If the equivalence is defined on the basis of utilizing the S-representation of variables as the output, then two

algorithms are said to be equivalent with respect to the specified variables if the corresponding variables in coinciding inputs are calculated by the same formulas. There are 3 tables.

SUBMITTED: September 10, 1960

Card 3/3

32825

16.6500

S/020/62/142/002/003/029
C111/C222

AUTHORS: Yershov, A. P and Kozhukhin, G. I.

TITLE: Estimates of the chromatic number of connected graphs

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 142, no. 2, 1962, 270-273

TEXT: The author examines the dependance of the chromatic number of a connected graph upon the number n of its vertices and the number p of its edges. Let $\mathcal{G}(n,p)$ be the class of all connected graphs with n vertices and p edges without loops or parallel edges. The upper and lower chromatic numbers $X(n,p)$ and $\chi(n,p)$, respectively, of class $\mathcal{G}(n,p)$ are those numbers of a $\mathcal{G}(n,p)$ which are not smaller or greater, respectively, than the chromatic number of an arbitrary graph from $\mathcal{G}(n,p)$.

The following theorem is proven:

$$X(n,p) = \left[\frac{3+\sqrt{9+8(p-n)}}{2}\right] ; \qquad (2)$$

Card 1/2

$$\chi(n,p) = -\left[-\frac{n}{\left[\frac{n^2-2p}{n}\right]}\left(1-\frac{\left\{\frac{n^2-2p}{n}\right\}}{1+\left[\frac{n^2-2p}{n}\right]}\right)\right] \qquad (3)$$

where $[\ ]$ denotes the integral part of the number, and $\{\ \}$ the fractional part thereof.

The author thanks Yu. M. Voloshin for advice.

There is one non-Soviet-bloc reference.

ASSOCIATION: Institut matematiki s vychislitel'nym tsentrom Sibirskogo otdeleniya Akademii nauk SSSR(Insitute of Mathematics with Computing Center of the Siberian Department of the Academy of Sciences USSR)

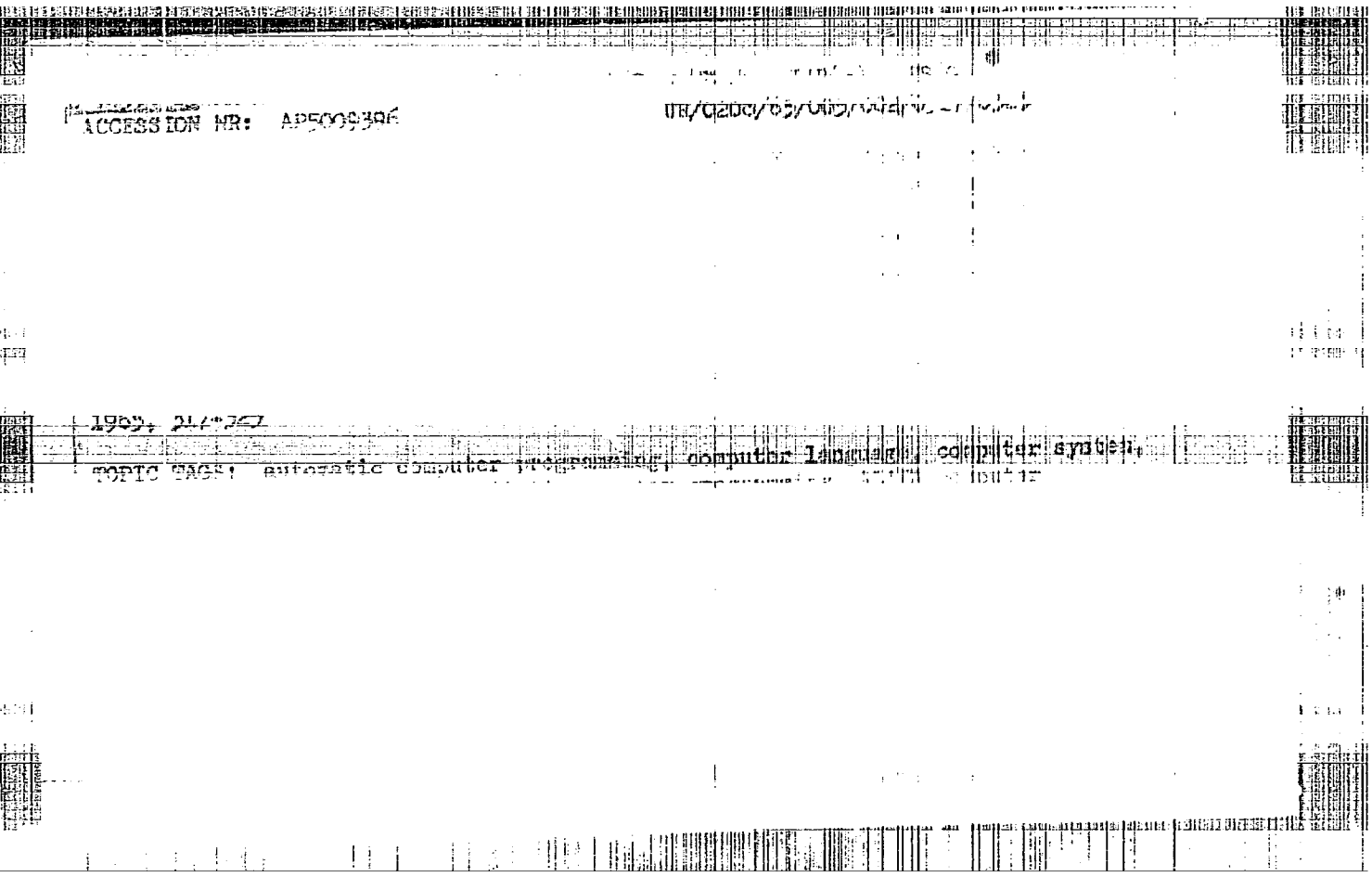
PRESENTED: August 11, 1961, by A. I. Mal'tsev, Academician

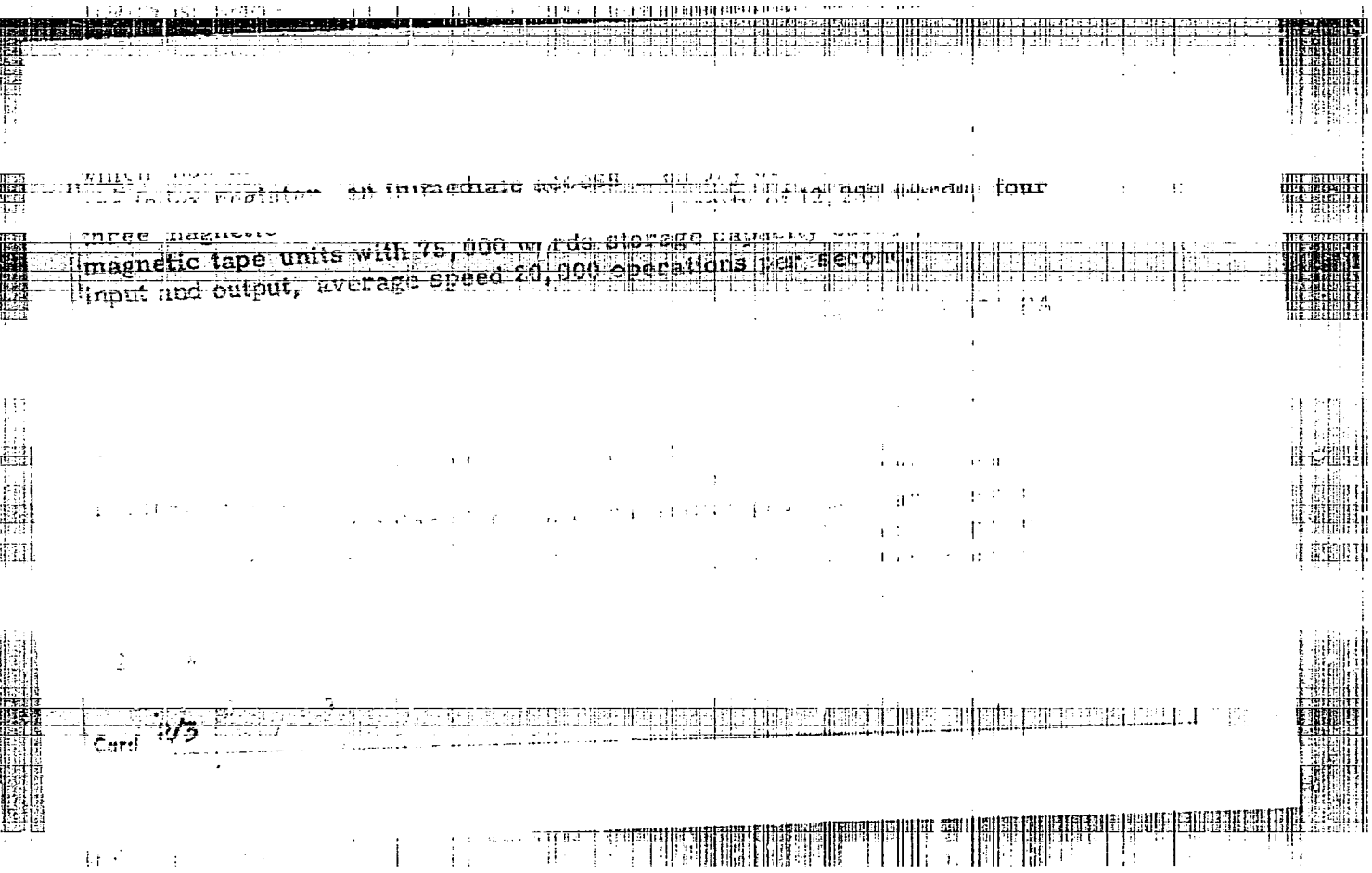
SUBMITTED: August 28, 1961

GLUSHKOV, V.M., otv. red.; KUKHTENKO, A.I., zam. otv. red.; BLAGOVESHCHANSKIY, Yu.V., red.; DORODNITSYN, A.A., red.; YERSHOV, A.P., red.; LYAPUNOV, A.A., red.; MOSKALEV, I.S., red.; PUKHOV, G.Ye., red.; ROSTUNOV, T.I., red.; SAMOKHVALOV, K.G., red.; STOGNIY, A.A., red.; TIMOFEYEV, B.B., red.; SHCHERBAN', A.N., red.; LETICHEVSKIY, A.A., red.; KAPITONOVA, Yu.V., red.; MEL'NIK, T.S., red.

[Problems of thecretical cybernetics] Voprosy teoreticheskoi kibernetiki. Kiev, Naukova dumka, 1965. 209 p. (MIRA 18:9)

1. Akademiya nauk URSR, Kiev.





Card 1/3

ACCESSION NR: AP5009990

It is indicated that scientists were working on the development of the

SUBMITTED: 05Oct64 ENCL: 00

Card 3/3

KHARKHAROV, A.A., prof.; YERSHOV, A.P., dotsent

Colorists of finishing factories. Tekst. prom. 25 no.12:73-75 D '65. (MIRA 19:1)

1. Sotrudniki Leningradskogo instituta tekstil'noy i legkoy promyshlennosti imeni S.M. Kirova.

TYMOVSKIY, Leonid Georgiyevich; MEL'NIKOV, N.V., professor, retsenzent; YERSHOV, A.S. retsenzent; GRAUDIN, E.K., retsenzent; SHESHKO, Ye.F., professor, doktor tekhnicheskikh nauk, redaktor; YEZDOKOVA, M.L., redaktor izdatel'stva; EVERSON, I.M., tekhnicheskiy redaktor

[Bline winzes in deep pits] Tupikovye s"ezdy v glubokikh kar'erakh. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 79 p. (MLRA 10:7)

1. Chlen-korrespondent Akademii nauk SSSR (for Mel'nikov). 2. Nachal'nik otdela transporta i gemplanov Instituta Giproruda (for Yershov). 3. Glavnyy tekhnolog gornogo otdela Instituta Giproruda (for Graudin)
(Strip mining)

SLEDZYUK, P.Ye., gornyy inzh.; YERSHOV, A.S., inzh.

Accelerate the design and construction of trains with alternating current motorcars for open-pit mines. Gor.zhur. no.7:12-14 Jl '60. (MIRA 13:7)

1. Institut Giproruda, Leningrad.
(Mine railroads--Electric driving)
(Railroad motorcars)

YERSHOV, A.V.; PUZYREV, I.V.; BELYAKOV, N.A.

High-capacity carding machine designed by the Ivanovo Scientific Research Institute of the Textile Industry. Tekst. pron. 18 no.1: 22-23 Ja '58. (MIRA 11:2)

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