

KOZODAYEV, M.S.; TYAPKIN, A.A.; BAYUKOV, Yu.D.; MARKOV, A.A.; PROKOSHKIN, Yu.D.

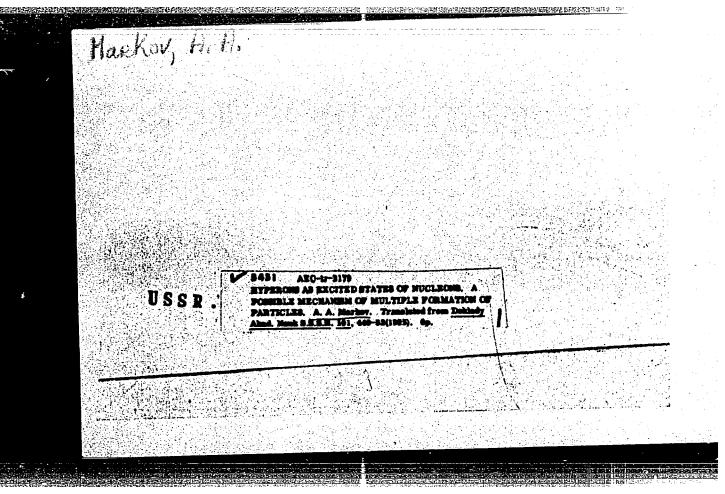
Production of neutral mesons by high-energy nucleons, Izv.AN SSSR, Ser. fiz.19 no.5:589-603 S-0 155. (MIRA 9:4)

1.Institut yadernykh problem Akademii nauk SSSR. (Cesmic rays) (Nuclear physics)

Measuring Tromesen lifetime. Izv.AN SSSR.Ser.fiz.19 no.6:
715-719 N-D '55. (MLRA 9:4)

l.Institut yadernykh preblem Akademii nauk SSSR.

(Cesmic rays) (Buclear physics)



 。 1976年中的新的特別的新聞舞<mark>時期的問題。由此時代的</mark>其他由於

MARKOV, A. A.

"Inversion of Complicated Systems of Functions."

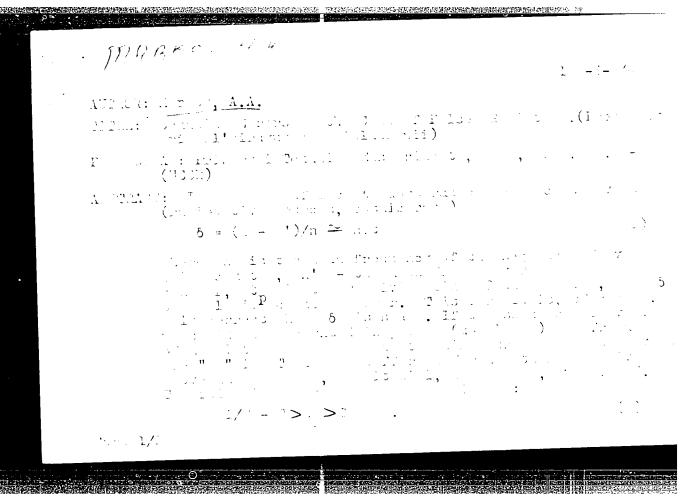
report presented at All-Union Conference in Problems in the Theory of Relay Devices, Inst. for Automation and Femote Control AN USSR, 3-9 Oct 1957.

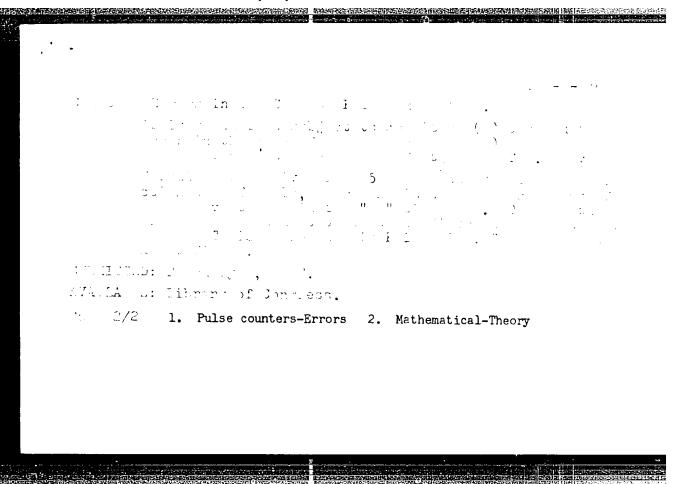
Vestnik AN SSSR, 1950, No. 1, v. 28, pp. 131-132. (author Ostianu, V. M.)

MARKOV, A. A.

"Errors in Colonations of infrating Irradiation," paper presenter at the 4th International Electronics and Nuclear Energy Exhibition and Conference in Rome, **Italt** Italy, 22 Jun-6 Jul 1957

B-3,000,612, 25 Oct 57





30V-120-53-3-33/33

AUTHORS: Markov, A. A. and Sofiyov G. N.

TIPLE: What should be been not a meas-implement of a more for Work wit. An live an Analyse s (Keki, 1915 of 1997) seriynyy generator impulisov dlya raboty a same activity i analizatorami)

PERIODICAL: Pribory i Tellmise Edsperimenta i 5, Nr 6 (USSR)

ABSTRACT: A specification is given for a generator discussion for work with amplitude analysers. The specification works of 51 items and a block diagram (Fig.1). The last figure, no cables and no references.

SUBMITIED: September 9, 1957.

1. Pulse generators--Design 2. Pulse generators--Specifications

Card 1/1

30V/120-58-6-4/32

- AUTHORS: Bayukov, Yu D. Kozodayev M.S., Markov A.A. Sinayev A. N., Tyapkin A.A.
- TITLE: A Multichannel Pair γ-Spectrometer, I. Calculation of the Main Characteristics of the γ-Spectrometer (Mnogokanal nyy parnyy gamma-spektrometr, I. Raschet osnovnykh kharakteri stik-gamma-spektrometra)
- PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6 pp 23 29 (USSR)
- ABSTRACT. In a pair γ -spectrometer the energy of the quanta is determined by measuring the total energy of the components of the electron positron pair formed in a thin converter. The first 2-channel pair spectrometer was built by Dzhelepov (Ref.). Later spectrometers built on this principle were widely used in measuring the spectra of hard γ -rays (Refs.) widely used in measuring the positron leaving the converter were deflected by a magnetic field in different directions and for certain values of their energy they enter ionisation counters connected in coincidence. For a given intensity of the magnetic field and a fixed position of the counters such a spectrometer will record a fraction of the pairs produced by γ -rays in a given energy range. In a simple 2-channel spectrometer in which one channel records the electrons and

A Multichannel Pair γ -spectrometer. I Calculation of the Main Characteristics of the γ -spectrometer

the other the positrons an increase in the accuracy of measurement is associated with a marked decrease in the efficiency. Good energy resolution and high efficiency can only be a multaneously achieved in a multipharmel spe meter. In such a spaitnometer the efficiency may be incleased by a factor rung without loss of resolution where in no are the numbers of spectner and positron counters such a spectrimere, serecal energy invervals may be at the same time. A number of such multichannel spect meters have been described (Refs. 5 6 and 8). The car of a Y-spect theman as a measuring instrument is inteby its efficiency and energy as sensitivity. In multichannel system it is necessary to take into a characteristics for the various pairs of channels of the spectrum. In this connection a discussion is given in the present paper of the dependence of the efficiency and spe:tral sensitivity of the separate pairs of channels on variou

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301/120-58-6-4/32

A Multichannel Pair γ -spectrometer. I, Calculation of the Main Characteristics of the γ -spectrometer

> parameters of the spectrometer: 1) Spectral sensitivity: the basic diagram of a γ-spectrometer considered in this paper is shown in Fig.l. in which the meanings of the symbols employed are indicated. In view of the finite width of the counters, the spectrometer records γ -quanta in a certain energy interval from E_{γ} min The corresponding spectral sensitivity curve is then shown in Fig. 2a and is of triangular form with a dispersion given by

 $\sigma_{l^{\perp}} = 1/6 \mathcal{L}_c^2/(r_1 + r_2)^2$ where \mathcal{L}_c is the width of a

counter and r_1 and r_2 are the distances from the converter to the centres of the counters, respectively. effect of the width of the converter upon the spectral sensitivity is examined and it is shown that a converter of a finite width introduces a spread into the spectral line in the high energy region of $\gamma\text{-quanta}$. As the angle ϕ between the direction of motion of the $\gamma\text{-quanta}$ and the Card 3/6 straight line connecting the centre of the converter with

SUV/12U-58-6-4/32

A Multichannel Pair $\gamma\text{-spectrometer}.$ I. Calculation of the Main Characteristics of the $\gamma\text{-spectrometer}$

the counter increases, the spread of the spectral line decreases. At $\phi=90^\circ$ the width of the spectral sensitivity curve is independent of the converter width. The effect of the converter width gives a distribution of the form shown in Fig.2b, which has a dispersion given by:

$$\sigma_2^2 = \frac{\ell_k^4 c t g^4 \phi}{180 r_1^2, r_2^2}$$
. The effect of multiplier

scattering in the converter is estimated and express are derived for this effect also. Finally, an estimate given for the radiation loss experienced by the electronpositron pair on traversing the converter. 2) Efficiency: in this section the Bethe-Heitler expression for the probability of formation of a pair by a γ -quantum of

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SOV/120-53-6-4/32

A Multichannel Pair γ -spectrometer, I. Calculation of the Main Characteristics of the γ -spectrometer

energy E $_{\gamma}$ is used (Ref 13) with a modification described by Bethe $_{\gamma}$ et al in Ref 22.

3) Multichannel system: in a multichannel spectrometer the electrons and positrons formed by γ-quanta of a given energy are recorded by a number of combinations of pairs of counters The electronic circuit of such a spectrometer should record coincidences between pulses from each electron counter with pulses from any positron counter. Thus, any combination of one electron counter and one positron counter is, in fact, a 2-channel spectrometer. For a given geometry a spectrometer containing n channels records γ-quanta in n-l energy intervals of different mean energy. In practice, one seeks to find the form of the spectrum and the absolute intensity in one of the energy intervals. To find the form of the spec trum it is sufficient to know the relative efficiency of recording for the different energy intervals, and this is given by Eq.(10). In order to obtain the absolute intensity in one of the energy intervals it is necessary to know the total absolute efficiency of recording of \u03c4-quanta in one of the energy intervals. This problem is not treated.

Card 5/6

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SOV/120-58-6-4/32

A Multichannel Pair γ -spectrometer. I. Calculation of the Mair Characteristics of the γ -spectrometer

V. V. Mel'nikov is thanked for carrying out a number of calculations. There are 2 figures and 22 references of which 4 are Soviet i German 1 Soviet translated from English and the rest are English.

ASSOCIATION: Obeyedinermyv institut yacernykh issledovaniy (United Institut: for Nuclear Studies)

SUBMITTED: December 27 195%

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SOV/120-58-6-5/32

AUTHORS: Bayukov, Yu. D., Kozodayev, M. S., Markov, A. A. Sinayev A Tyapkin, A. A.

TITLE: A Multichannel Pair γ-Spectrometer. II. Description of a 12-channel Spectrometer (Mnogokanal'nyy parnyy gamma-spektrometr. II. Opisaniye dvenadtsatikanal'nogo spektrometra)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6 pp 30-40 (USSR)

Application of a multichannel pair spectrometer in synchr ABSTRACT: cyclotron work presents a number of specific requirements as far as counters of the ionising particles and the electronic system of the spectrometer are concerned. Since the beam intensity is high and consists of short pulses of 200 to 300 µs each at a repetition frequency of 40 to 80 pulses per sec, it follows that the apparatus must be very fast. It is desirable that the input blocks should have resolving times not greater than 1 µs. The large background intensity in synchro-cyclotron work means that it is always necessary to use a special selection system which records only electronpositron pairs. For this reason, in the spectrometer each component of a pair should be recorded by a number of counter in coincidence with sufficiently low resolving time. The Card 1/7 present paper describes a 12-channel \u03c4-spectrometer which has

A Multichannel Pair γ -Spectrometer. II. Description of a 12-channel Spectrometer

been used over a number of years in studying the spectra of hard γ -rays and neutral M-meson decays (Refs.2-6). The first variant of the spectrometer was built in 194%. In 195 and 1954 the spectrometer was modified to improve its marac teristics. The spectrometer described here satisfies completely the above requirements and is based on the design calculations given in the previous paper (Ref.1) in the issue.

2. 1. 等於學術。以表表表表的物質對於實施的表面。

1) Magnetic system and geometry of the instrument The magnetic field is produced by an SP-56 electromagner Fig.1 shows the disposition of the counters for two two demountable pole pieces. The gap between the poles and the maximum field in the gap is 18 000 cerster electromagnet current is stabilised to 0.1%. In studies of γ -ray spectra in the energy region 20 to 200 MeV, $2\phi = 180^{\circ}$ (Fig.1b) and in the energy region 100 to 450 MeV, $2\phi = 90^{\circ}$ (Fig.1a). In the former case semi-circular focussing of

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A Multichannel Pair γ -Spectrometer. II. Description of a 12-channel Spectrometer

electrons and positrons was used, and this led to increased efficiency (Ref.1) because it was possible to use wider and thicker converters. For \u03c4-quanta in the energy range 450-600 MeV, $2\varphi = 90^{\circ}$ but the counters were at a larger distance from the converter. Copper converters were used (0.1, 0.3 and 0.5 mm, depending on the energy). 2) Resolving power and efficiency. Fig. 2 shows curves of the total spectral sensitivity for the 7th energy interval for various values of Eyo and thicknesses T_k of the copper converters. These curves are based on the theoretical data given in the previous paper and are obtained by a statistical combination of the partial distributions due to a) width of the counters, b) width of the converter, c) multiple scattering and d) radiation. As can be seen, the form of the total spectral sensitivity curve is **Very** nearly triangular, which means that the total spectral sensitivity is governed mainly by the width of the channels \mathcal{L}_{α} (see Fig.1 of previous paper, p 24, this issue).

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A Multichannel Pair γ -Spectrometer. II. Description of a 12-channel Spectrometer

3) Counters and selection system. The counters used were proportional counters having a cylindrical stainless steel cathode, 10 mm in diameter and a molybdenum filament 0.1 mm in diameter. They were filled with (CH₂(OCH₃)₂) at a

pressure of 160 to 200 mm. The working voltage was 1600 to 2000 V. The counters have an effective dead time not exceeding 10 sec. The efficiency of the counters for particles with relativistic ionisation reaches 98% in a circular cidence scheme with a resolving time of 5 x 10 sec. The delay of the pulses due to drift of electrons through the counter gas is less than 10-7. The counters give electrical pulses with amplitudes between 10-4 and 1 V. The counters having a wide dynamic range and an amplification of a few thousands. 6-fold coincidences were used and the number of random coincidences in each 6-fold channel was 0.02 pulses per sec. The number of electron-positron pairs recorded per

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A Multichannel Pair γ -Spectrometer. II. Description f a 12-channel Spectrometer

sec depended on the efficiency of the spectrometer with respect to the γ -quanta in the measured energy interval and the form of the spectrum and was in the range 0.1 to 10 pair per sec.

4) Electronic scheme. A block diagram of the electronic part of the spectrometer i shown in Fig.3. The left-hand portion of this diagram shows 6 co-ordinate counters of the electron series $(a_1 - a_6)$, 6

co-ordinate counters of the positron series $(\bar{b}_1 - \bar{b}_6)$ and 4 selection counters (A', A", b' and b"). Each of these counters in practice consists of a group of counters whose filaments are connected. A recorded electron or positron should pass through 3 counters (1 co-ordinate and 2 selectic counters). A pair is recorded if a 6-fold coincidence takes place. Negative-going pulses from each counter are amplified by a corresponding amplifier-converter (Fig.4). These amplifiers have a rise time of 2×10^{-4} sec. Pulses from all the 16 amplifier-converters are applied to the main bloc which is at a distance of 1.5 m from the amplifier-converted (Fig. 5). Pulses from the selection counters are applied to

A Multichannel Pair γ -Spectrometer. II, Description of a 12-channel Spectrometer

4-fold coincidence scheme while pulses from the co-ordinate counters are applied to mixers and in addition through delay lines to a hodoscopic system consisting of 2-fold coincidenc circuits and output univibrators. The pulse at the output of a mixer appears in the presence of a pulse in at least on of the co-ordinate counters of a given series. Pulses from both the mixers and also from the 4-fold coincidence scheme are applied to a 3-fold coincidence scheme which produces the final output pulse. It follows that the latter pulse appear when a 6-fold coincidence takes place, i.e. when a particle passes through at least one of the co-ordinate counters in the electron series, through one of the co-ordinate counters of the positron series, and all the counters of the selection system. The resolving time of the above coincidence schemes is 5 x 10-7.

5) Method of measurement and treatment of results.
Fig.7 shows the experimental arrangement. In this figure 1 is the proton trajectory, 2 is the target, 3 is the synchrocyclotron chamber, 4 is a concrete wall, 5 is a collimator.

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A Multichannel Pair γ -Spectrometer. II. Description of a 12-channel Spectrometer

6 is a diaphragm, 7 is a clearing magnet which removes electrors and positrons from the beam, 8 is an additional screen, 9 is the convertor and 10 is the spectrometer electro magnet. Fig.8 shows a typical result obtained for the energy spectrum of γ-quanta from neutral W-meson decays. The mesons were produced by 660 MeV protons at a carbon targe ion of motion of the protons. G.P.Zorin, B.A.Krasnovidov, L. A.Fadeyev and G.N.Stepanov are thanked for their assistance. There are 8 figures, 4 tables and 7 Soviet references.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute for Nuclear Studies)

SUBMITTED: December 27, 1957.

Card 7/7

SOV/120-59-1-38/50

AUTHOR: Markov, A. A.

TITLE: A Method for the Measurement of the Ratio of Pulse Reagues

(Metod izmereniya otnosheniya amplitud impul'sov)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, p 158 (USSR)

ABSTRACT: In experimental nuclear physics it is sometimes necessary to measure the ratio of pulse heights of coincident pulses. This problem may be solved by means of the apparatus snown diagrammatically in Fig 1. Short pulses whose heights are are applied to the two inputs and the condenser: $C_{\overline{h}}$ are charged to roughly the same values through $C_{\mathbf{a}}$ andthe two diodes and then begin to discharge through R_{α} and . Assuming that $R_{\underline{a}}C_{\underline{a}}$ and $R_{\overline{b}}C_{\overline{b}}$ are both equal to say and that the latter time constant is much greater than the pulse length one finds that the voltages across the condense: will fall off exponentially with a time constant equal to RC These voltages are applied to two palse height discriminators with the same threshold E . The voltages across the conder sers will be equal to the threshold voltage at lifferent time

Card 1/3

SOV/120-59-1-38/50

A Method for the Measurement of the Ratio of Pulse Heighto

t and th so that

$$E = u_a \exp \left(-\frac{t_a}{RC}\right) = u_b \exp \left(-\frac{t_b}{RC}\right)$$

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This is illustrated in Fig 2. The difference between the times when the voltages are across the two condensers become equal to the threshold of the discriminators is then given by

$$t_a - t_6 = RC \log(u_a/u_6)$$
.

It follows that the logarithm of the ratio of the pulse heights is proportional to the time difference and thus may be determined using one of the well-known time interval analyzers. The method was suggested in 1956 and was recorded

Card 2/3

30V/120-59-1-38/50

A Method for the Measurement of the Ratio of Pulse Heights at the All-Union Conference on Analyzers in 1957. There are 2 figures.

SUBMITTED: January 31, 1950.

Card 3/3

CIA-RDP86-00513R001032420014-4 "APPROVED FOR RELEASE: 09/19/2001

24 (4), 21 (8) AUTHORS:

Vasil'yev, G. Ya., Usatiy, A. F.,

SOV/20-125-6-11/61

Lazurkin, Yu. S., Markov, A. A.

TITLE:

Measurement of the Luminescence and Darkening of Glass During

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the Process of Their Irradiation in a Nuclear Reactor

(Izmereniye lyuminestsentsii i potemneniya stekol v protsesse

ikh oblucheniya v yadernom reaktore)

PERIODICAL:

Doklady Akademii nauk SCSR, 1959, Vol. 125, Nr. 6,

pp 1219-1222 (USSR)

ABSTRACT:

The present paper is intended to work out the construction of device for the simultaneous measurement of the luminescence and darkening of transparent materials in a nuclear reactor and to deal with the carrying out of experiments by means of this apparatus. The usefulness of parallel measurements of the yield of the luminescence and of the darkening of the sample may be seen from the close connection between these phenomena during irradiation. The device consists of an aluminum tube of 5 m length and 60 mm diameter, inside of which two tubes of the darkening tract (polished inside) and one polished tube of the luminescence tract were fitted.

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Further details of the apparatus are described. Luminescence

CIA-RDP86-00513R001032420014-4" APPROVED FOR RELEASE: 09/19/2001

Measurement of the Luminescence and Darkening of SCV/20-125-6-11/61 Glass During the Process of Their Irradiation in a Nuclear Reactor

and darkening were measured in the perpendicular, dry, channel of 65 mm (with external water-cooling) of the experimental reactor VVR. In this reactor ordinary water is used as moderator and coolant. The channel was near the active zone of the reactor. By variation of the power of the reactor various values are obtained for the differential dose. In the case of all experiments temperature remained below 35° . The samples consisted of 10 mm thick disks with a diameter of 20 mm. The following quantities were measured by remote contro a) the brightness of luminescence and its time dependence at various differential doses. b) The darkening of the samples and their time dependence at various differential doses c) Measurement of darkening after irradiation was stopped Measurements were carried out on various types of quartz, pyrex glass, cerium glass, polymethylmethacrylate, and polystyrene. In the case of all quartz samples, the relation $B = \beta P$ holds up to a differential dose of P = 2000 rad/sec, where \$\beta\$ denotes the specific brightness coefficient of luminescence. In the case of polymethylmethacrylate and polystyrene the brightness of luminescence increases with progressin

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Measurement of the Luminescence and Darkening of SOV/20-125-6-11/61 Glass During the Process of Their Irradiation in a Nuclear Reactor

time and increasing integral dose. The optical density D for some dozens of minutes remains on the equilibrium level, the amount of which depends on the differential dose, and changes only little with an increase of the integral dose. The measurements carried out in the course of this investigation are only the first part of a series of measurements which is planned. There are 3 figures and 2 Soviet references

PRESENTED:

January 8, 1959, by A. P. Aleksandrov, Academician

SUBMITTED:

September 23, 1958

Card 3/3

MARKOV, A. A., DYAKOV Yu. Ye., SAKALYAN, K., and SHEBESHTEN, B.

"Impulse Scaling Circuit Using new System with Multiple Equilibrium States"

Joint Institute of Nuclear Reseach, Dubna, USSR.

report submitted for the IAEA conf. on Nuclear Electronics. Belgrade, Yugoslavia 15-20 May 1961

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AUTHOR: Narkov, A.A.

TITLE: Difference measurements in multichannel spectrometers

FLRICHICAL: Pribory i tekhnika eksperimenta, no.3, 1962, 30-35

TEXT: It is pointed out that low-intensity photopeaks at low chergies may become masked by the Compton distributions belonging to higher energy photopeaks. Such photopeaks can be separated by subtracting from the overall spectrum the high-energy components. The present author gives a general description of a procedure whereby this may be done (semi-automatically) in practice. Thus, once the main peaks in the spectrum under investigation have been identified, pure sources are introduced in place of the specimen under investigation and their spectra subtracted from the original spectrum. Background and statistical errors must be taken into account in such procedures and the author gives a general analysis of them. The discussion is concerned both with amplitude analysers and time selectors. No experimental results are reported.

Card 1/1

5/120/62/000/006/019/029 E140/E435

AUTHORS:

Levin, G.L., Markov, A.A., Plakhov, A.G., Smolkin, G.Y

Sofiyev, G.N., Stepanov, G.N., Shapkin, V.V.

TITLE:

Line and frame scanning generator for electron-optical

image intensifiers

PERIODICAL: Pribory i tekhnika eksperimenta, no.6, 1962, 100-106

The authors discuss the use of image-intensifier tubes for the spectroscopic and space-geometric study of pulsed gas discharges in plasma studies (controlled thermonuclear synthesis). The system permits spectral analysis of dynamic processes with time resolution in the range 5×10^{-8} to 1.25 x 10^{-5} sec. A five-stage intensifier is used. Free-running and triggered versions are used, the latter to reduce background noise where necessary. There are 6 figures.

ASSOCIATION: Institut atomnoy energii AN SS\$R

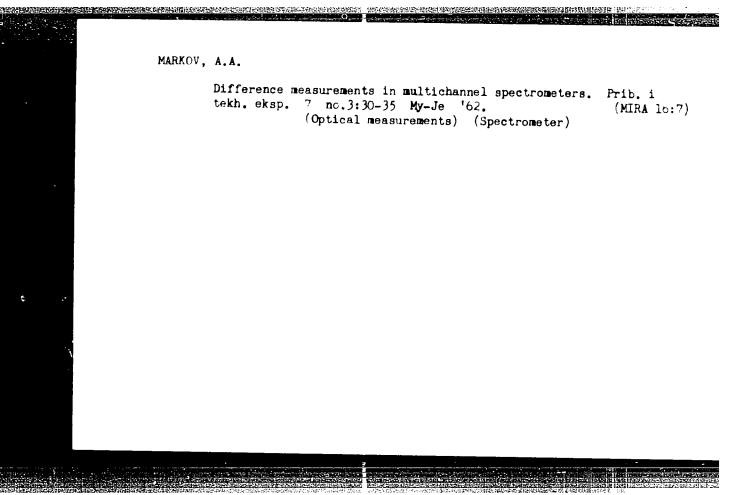
(Institute of Atomic Energy AS USSR)

SUBMITTED:

January 25, 1962

Card 1/1

CIA-RDP86-00513R001032420014-4" **APPROVED FOR RELEASE: 09/19/2001**



L 35349-66 EWT(m)
ACC NR: AR6017791

SOURCE CODE: UR/0058/66/000/001/A044/A04

AUTHOR: Markov, A. A.

TITLE: Coincidences of arbitrary multiplicity

SOURCE: Ref. zh. Fizika, Abs. 1A397

REF SOURCE: Tr. 6-y Nauchno-tekhn. konferentsii po yadern. radioelektron. T. 2. M., Atomizdat, 1965, 42-51

TOPIC TAGS: coincidence circuit, nuclear radiation, radiation measurement

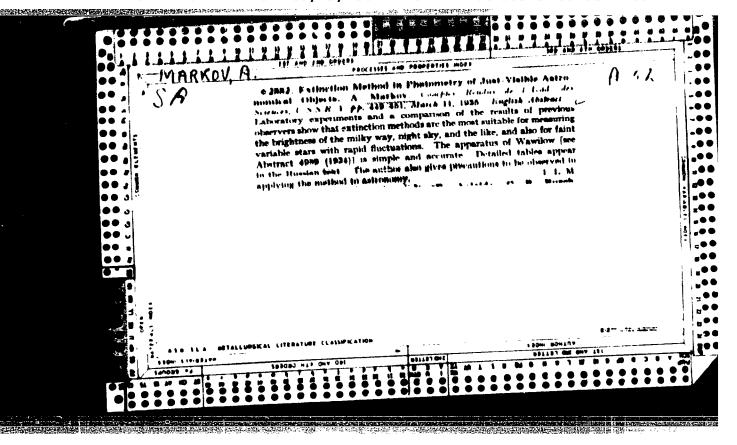
ABSTRACT: The author considers one case that is frequently encountered in the practice of measurement of nuclear radiation, when it is necessary to register coinciden of arbitrary multiplicity from several (m) pickups. In this case all the signals entering the m inputs must be divided into two groups: a) noncoinciding and b) coin ciding, for at least two arbitrary inputs. Depending on the purpose of the system, it is necessary to ensure in it measurement of either only such signals when arbitra coincidence took place, or, to the contrary, signals which do not coincide. Several practical examples of measurement of nuclear radiation are presented, in which it is necessary to have such a coincidence registration system. Different methods of construction of such systems are analyzed. A method of constructing a system of this type, which appears to be the simplest, is described. M. L. [Translation of abstra

SUB CODE: 18, 09

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L 34797-66 EWT(d)/EWP(1) IJF(c)		10050 Kr 1000 1010 1407h 1407h
ACC NR: AR6017202	SOURCE CODE:	UR/0058/65/000/012/A034/A034
AUTHOR: Markov, A. A.		62
TITLE: Calibration and stabilization of istic	slope and shift	t of an amplitude character-
SOURCE: Ref. zh. Fizika, Abs. 12A323		
REF SOURCE: Tr. 6-y Nauchno-tekhn. konf Avemizdat, 1964, 81-89	erentsii po yad	ern. radioelektron. T. 1. M.,
TOPIC TAGS: coding, pulse amplitude, pu matic stabilization equipment	lse amplifier,	pulse height analyzer, auto-
ABSTRACT: Methods are considered for ca of the amplitude characteristic of conve	librating and serters of an inv	tabilizing the slope and shift ut quantity into a unitary
code. Will is noted that the gain calibra	tion error of a	proportional amplifier can
be decreased by determining the gain fro input and output quantities. To stabili	om the measured	ratio of increments of the
auxiliary control input of the amplifier	an error-signa	l voltage equal to the differ-
ence between the actual pulse amplitude	and a standard	signal converted from a pulse
into a slowly varying voltage. In the	ase of a linear	pulse-height discriminator
with a characteristic shifted relative t also be attained by means of a circuit t	o zero, the sta hat compares th	e mitmit voltage milse with
a reference voltage. The slope of the c	characteristic c	an be stabilized with a cir-
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cuit that formulas	compares the are presented.	difference of G. K. [Tran	two output sign	als. Corresponding ract]	g calculation
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Card 2/2	, J.				



(andrey andreyerich) MARKOV. A. A.

Nevozmozhnost' nekotorykh algorifmov v teorii assotsiativnykh siste. DA., 155 (1947), 587-590. Nevozmozhnostinekotorykh algorifmov v teorii assotsiativnykh sistem., II DAN, 58(1047), 353-256. O rredstavlenii rekursivnykh formul.
DAN, 58(1947), 1891-1892. On the representation of relatively definite
functions. Matem. SB. 4(46), (1°38). On the determination of the number of roots of an algebraic equation situated in a given domain. Mate. SE., 7:49, (1940), 3-6. O svobodnykh topologicheskikh grup-akh. DAN, 31(1941), 290-702.

SO: Mathematics in the USSh., 1917-1947 edited by Kurosh, A. G. Markushe vich, A. I. Rashevskiy, P. K. Mosco w-Leningrad, 1948

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MARKOV, A.A. Continued

O sushchestvovanii periodicheskikh svyaznykh topologicheskikh grupe. Ian, see. matem, 8 (1944), 225-232 0 bezuslovno zamknutykh mnozhestvakh. Dan, 44 (1044), 10 -107. Nekotoryye teoremy ob abelevykh mnozhestvakh. Dan, 1 (1036), 200-302. O sushchestvovanii integral'nogo ivarianta. Dan, 17 (1937), 455-458. On mean values and exterior densities. Matem sb., 4 (46), (1938), 165-191. O svobodnykh topologicheskikh gruppakh. IAN, ser. natem., 9 (1954), 3-64. Arifmeticheskaya kharakterizatsiya trigonometri heskikh rolino ov. L., Trudy Vtorogo Vsesoyuzn. matem. S"ezda, T. 2 (1936), 202-204. Sur les mouvements presque periodiques. C.R. Acad. Sei. 189 (1928), 732-735. Sur une propriete generale des ensembles mini aux de Birkhoff. C.R. Acad. Sei., 103 (1031) 823-825. Stabilitat im Liapounoffschen Sinne und Frat periodizient. Mach. 2., 36 (1933), 708-738. Pochti periodich ost' i Garmonizuemost'. L., Trudy vtorogo Vesesoyuzn. Matem, Salada, T. 2 (1936), 227-231. O sushchestvovanii integral'nogo invarianta Dan, 17 (1937), 455-458. Uber eine Minimumeigenschaft de Schrodingerschen Wellengruppen. L. f. Phys., 42 (1927), 637-640. Ob odnoy zadache na ekstremu... Novocherkassk, Izv. Sev.-Kavk. industr. in-ta, 1 (15), (1935), 59-62. Chto takoye gladkaya powerkhnost! L., Ucher - zap. un-t:, ser. matem 10 (1040), 27-30.

MARKOV, A. A.

Mbr., Mathematics Inst. im. V. A. Steklov, Dept. Physico-Math. Sci., A.S.

"On Unconditionally Closed Sets." Dok. AN, 44, No. 5, 1944

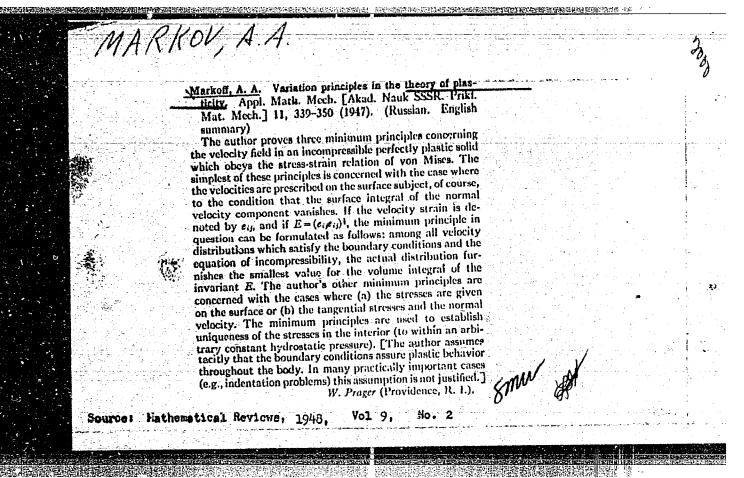
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"Representation of Recursive Functions," Iz. Ak. Nauk SSSR, Ser. Matemat, 13, No. 5, 1949

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[Principles of the algebraic theory of braids] Osnovy algebraicheskoi teorii kos. Akademiia nauk SSSR, Moscow-Leningrad, 1945. 53 p. (Geometry, Differential--Projective) (MLRA 7:8)

以外的企业以上的1970年的特殊的是特别的**发展的支持,在1970年的**的特殊的。



Systems with a finite set of generators and relations are stated; and roved in outline. Theorem I asserts the unsolvability; the word (identity) problem and is identical with a theo cm of E. L. Post [see the preceding review]. The method of proof is essentially similar, making use of an earlier result of Post [Amer. J. Math. 65, 197-215 (1943); these Rev. 4, 209] and Rosser's combinatorial logic [Ann. of Math. (2) 36, 127-150 (1935)]. Theorem 2 states that an associative system can be constructed in which the word problem is solvable but the division problem is unsolvable, i.e., the question whether XQ+R has a solution in the system for any given Q and R. Let A be a finite alphabet and G _i , G' (i=1, 2,, m) words in it such that the word problem is unsolvable under the one-way substitution laws "G _i P->PG' for any word P" [Post, op. cit. (1943)]. Then a system for theorem 2 is obtained by adding the new letters d, f, e _i to the alphabet and taking as relations e _i f + fe _i , è _i G _i a + ae _i G _i , e _i G _i d + G' _i d (atA, i=1,, m). M. H. A. Newman (Manchester).			On the impossibility of certain algorithms in of associative systems. C. R. (Doklady) URSS (N.S.) 55, 583-586 (1947).	
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Markov, A. On certain insoluble problems concerning matrices. Doklady Akad. Nauk SSSR (N.S.) 57, 539-542 (1947). (Russian)

Let a square matrix with integers as elements and determinant 1 be called "admissible." If $\{X_1, X_2, \dots, X_p\}$ a finite set of admissible n-matrices, the semi-group of all matrices expressible as products of X't is denoted by $S(X_1, X_2, \dots, X_p)$. Theorem 1. If $n \ge 4$ there is no algorithm (in the sense of Church-Kleene-Turing) for deciding whether, given two finite sets, X_1, X_2, \dots, X_p and Y_1, Y_2, \dots, Y_p of admissible n-matrices, the sets $S(X_1, X_3, \dots, X_p)$ and $S(Y_1, Y_2, \dots, Y_q)$ have a common member. Moreover (corollary) all the Y's, and all X's but one, can be chosen and fixed, so that the question remains undecidable when the remaining X varies; the number q can here be 2, and p can also be chosen independent of n.

Proof. By a theorem of E. L. Post [Bull. Amer. Math. Soc. 52, 264-268 (1946); these Rev. 7, 405] there is no algorithm for deciding whether, given ρ pairs, G_i , G_i of words in two letters, a and b, there exists an identity $G_1G_1\cdots G_{i_m}=G_{i_1}G_1\cdots G_{i_m}$; and Post's proof shows that all the G's and all but one of the G's can be chosen so that the question is still undecidable when the remaining G' varies. The two matrices

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 $A = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} \quad B = \begin{pmatrix} 1 & 0 \\ 1 & 0 \end{pmatrix}$

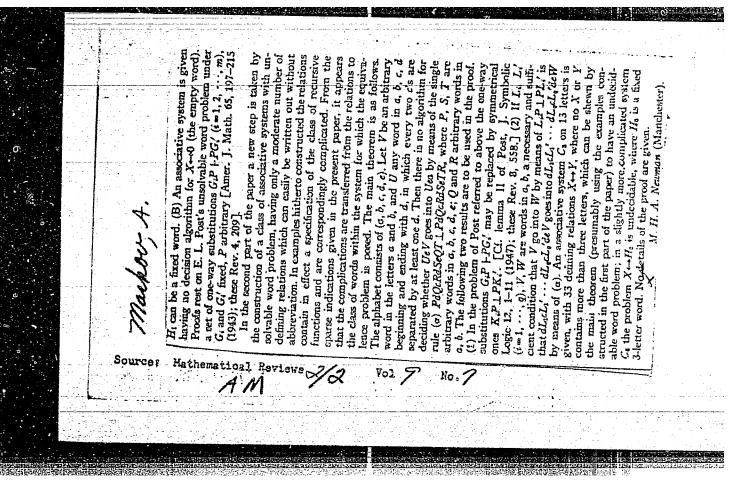
generate a free semi-group S(A, B) []. Nielsen, Danske Vid. Selsk. Math.-Fys. Medd. 5, no. 12 (1924)]. Hence the question whether, given p pairs of matrices Z_1 , Z_1' , each equal to A or B, there exists a relation $\prod_i Z_i = \prod_i Z_i'$, is undecidable; or, what is the same, the question whether some $\prod_i (Z_i, +Z_i)$ is in S(A+A, B+B), where + denotes the direct sum (4-matrix). This proves the case n=4, and the extension to n>4 is trivial.

Theorem 2. If $n \ge 4$ there is no algorithm for deciding whether, given admissible n-indiffices X_1, X_1, \cdots, X_p and Y_1, Y_2, \cdots, Y_q , the set $S(X_1, X_2, \cdots, X_p)$ and like additive group $L(Y_1, Y_2, \cdots, Y_q)$ generated by the Y's, have a compon member. All the Y's, and all the X's but one, can be fixed [corollary 1]; or all the X's can be fixed [corollary 2]; and the question is still undecidable when the ramadning X_1 or the Y's, vary. (Here q can be 5, and p independent of R.) This is proved similarly, by taking Y_1, Y_2, Y_1, Y_2 to be the four 4-matrices $F_1 = E_1 + E_2$, where E_1 , has 1 in position (r, 3) and 0 eleewhere. Then $L(Y_1, Y_2, Y_1, Y_2)$ constats of all matrices Z + Z(Z admissible).

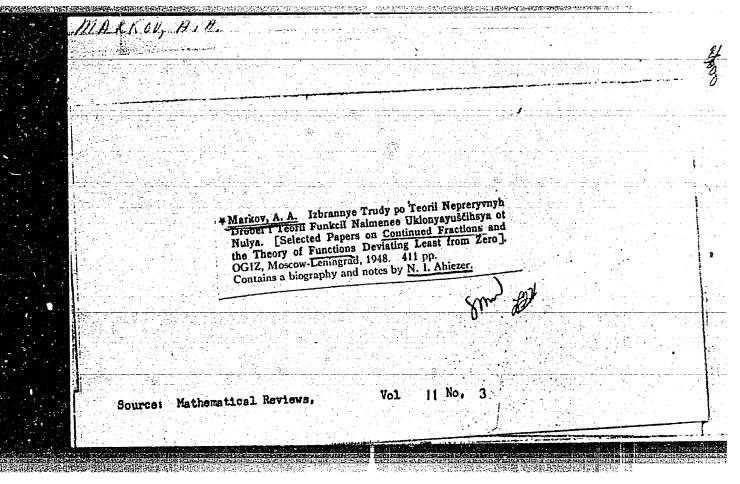
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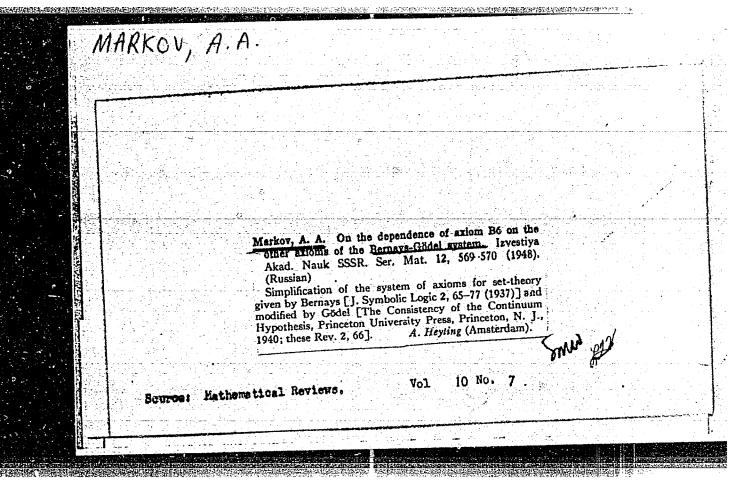
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Markov, A. The impossibility of certain algorithms in the theory of associative systems. II. Doklady Akad. Nauk SSSR (N.S.) 58, 353-356 (1947). (Russian) The first part of the paper is concerned with sharpening the author's theorems 1 and 2 [same Doklady (N.S.) 55, 583-586 (1947); these Rev. 8, 558] on the unsolvability of the word problem in associative systems [demi-groups, Thue systems], and on the unsolvability of the division problem ("has XQ+R a solution for given Q and R?"), respectively. (Notations: X + Y means that word X may be replaced by word Y, X \(\text{L}\) Y means X + Y and Y + X, X \((\text{L}\) Y means that PXQ\(\text{L}\) PYQ for any P and Q.) (3) A system may have a	
solvable word problem and solvable left-division problem, but unsolvable right-division problem, $XH_1 \rightarrow R$; and here	i,
but unsolvable right-division problem, XH ₁ →R; and here Source: Mathematical Reviews, Vol 7 No. / 5	



	Markov, A. On the representation of recursive functions. Doktary Akad. Nauk SSSR N.S.) 58, 1891-1892 (1947). (Russian) S. C. Kleene has proved (A) that every general recursive
o o	function of n variables can be represented in the form (1) $P(ny \cdot Q(x_1, \dots, x_n, y) = 0)$, where P and Q are primitive recursive, and $py \cdot X$ is the least natural number p such that X holds, or 0 if there is none [Math. Ann. 12, 72?—742 (1936)]; and (B) that a fixed "universal" primitive recursive function P can be found, such that all general recursive functions are obtained by suitable choice of primitive recursive Q in (1) [Trans. Amer. Math. Soc. 53, 41–73 (1943); these Rev. 4, 126]. In the present note the theorem is announced [without proof] that a necessary and sufficient condition for a primitive recursive function $P(x)$ to be universal, in the above sense, is that it takes every natural number as value an infinity of times. M , H , A , Neuman (Manchester).
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	Markov, A. A. On the Cons. Tayestiya Ak 424 (1949). (Russia This paper gives a sufficient condition that be such that every represented, for suitab $F[uy \cdot \mathcal{O}(x_1, \dots, x_n, y)]$ number as value infinannounced earlier [Dol 1891–1892 (1947); these is constructive in terms in the above-mentioned constructive, but has a	rad. Nauk SSR. an) detailed proof the taprimitive recurvative function of le primitive recurvation of list hat P(x) itely many times clady Akad. Naud e Rev. 9, 403]. To of certain resulta review]; the necevveakened constru	Ser. Mat. 13, The state of the surficiency partial was a sive Q, in the form take every nature. This result was SSSR (N.S.) 5 the sufficiency partial of Kleene's [cite sufficiency proof is not citive counterpartial proof is not citive citive citive citive citive citive citive citive citive citiv	nnd (x) be yrm yral as ss, rt	
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	Markov, A. A. Three papers on the custome of periodic conn II. On free topological groups. closed sets. Amer. Math. Soc pp. (1950). Translated from Izvestiya Akad 8, 225-232 (1944); 9, 3-64 (19418(60), 3-28 (1946); these Rev. 7,	ected topological groups. III. On unconditionally Translation no. 30, 120 I. Nauk SSSR. Ser. Mat. S): Mat. Shornik (N.S.)	
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MARKOV, A. A.

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USSR/Mathematics - Approximations

Jul/Aug 51

"Ideas of P. L. Chebyshev and A. A. Markov in the Theory of Limit Magnitudes of Integrals and Their Further Development," M. G. Kreyn, P. G. Rekhtman

"Uspekh Matemat Nauk" Vol VI, No 4 (44), pp 3-120

Discusses fundamental theorem concerning positive sequences, max mass, main properties of Chebyshev's system of functions, canonical representations of a positive sequence, existence of the main representations, motion of the masses of canonical representations, mech quadratures and soln of an extremal problem, Chebyshev-Markov inequalities, case of infinite integral, the phi-psi problem of Markov, and a min problem.

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MUTKOVALA

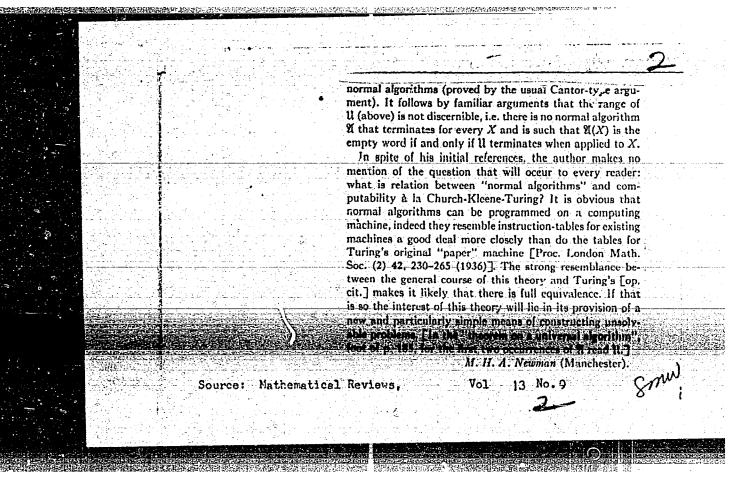
The author considers that the Church-Kleene-Turing theory of computability touches the idea of "algorithm" so indirectly as to make an independent development desirable. After somewhat lengthy preliminaries (e.g. definition of an "occurrence" of one word in another) an "algorithm & in normal form" is defined as follows It is (or is determined by) a list of instructions in one of the forms

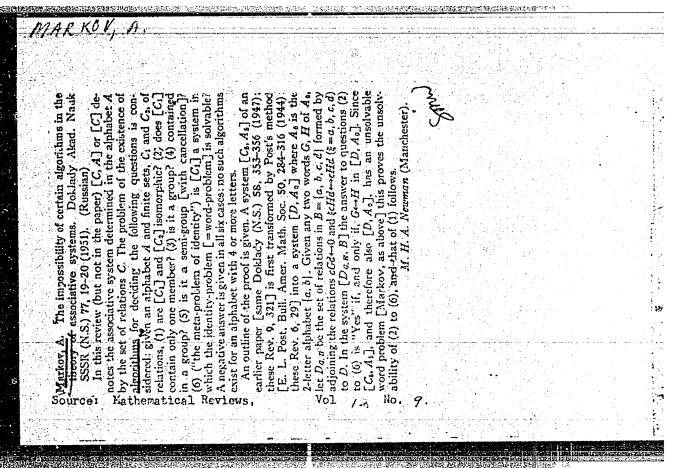
$$P \rightarrow Q$$
 or $P \rightarrow \cdot Q$,

where P and Q are words in some alphabet; either or both of P or Q may be the empty word (i.e. absent). Thus $ab \rightarrow ba$ and $a \rightarrow *$ and \rightarrow are possible instructions. The order of the instructions in the list must be specified. To apply the algorithm to a given word X, take the first instruction in the list whose left-hand side occurs in X (the empty word occurs before and after every letter), and replace the first occurrence of P by Q. If there is a dot after the arrow this ends the process; if not, apply $\mathfrak A$ in the same way to the resulting word; and so on. If the process terminates the final result is $\mathfrak A(X)$.

Source: Mathematical Reviews,

In support of the claim that this gives a satisfactory meaning of "algorithm" it is asserted that (1) every algorithm I in the rather vague sense of ordinary mathematics, is equivalent to some normal algorithm II, i.e. applied to any given word X, N terminates if and only if A does, and then $\mathfrak{N}(X) = \mathfrak{U}(X)$; (2) various specified combinations of normal algorithms (iteration, juxtaposition of results, etc.) are equivalent to normal algorithms; (3) a "universal normal algorithm" Il exists such that, if the instructions specifying-If are combined in an obvious way (with spacing symbols) into a single word A*, 11(A*P) = A(P) (if either exists, A*P denoting mere juxtaposition). No indications of the proofs are given. The word N*, translated into a 2-letter alphabet, is the "signature" of the algorithm II. A normal algorithm is "self-applicable" if its application to its own signature terminates. There is no normal algorithm which terminates for just those words that are signatures of non-self-applicable





K-system S, having an unsolvable word-problem, and a K-system S, not included in any having property P. (Here the "direct product" of [R, A] and [R', A'] is [RUR', AUA'], provided that $A \cap A' = \phi$.) The system [R, B,] is a K-system [R, B,] there is no algorithm for deciding if a given K-system is finite. corollary of the theorem is that if P is a hereditary property, i.e., holds for all subsystems, of K-systems that have the deduction from the main theorem not included in MI is that tem having property P, such that Br B, = 4. An immediate cm is unsolvable for alphabets of 4 or more letters. A property, and if there exist K-systems that have, and K-systems that have not the property, then the recognition probincludes (in the above sense) the "direct product" of a is invariant if it is preserved under isomorphisms. As in the cited review, we denote by [R,A] the K-system defined by the relations D and alphabet $B = \{a, b, c, d\}$ of that paper being replaced by RaUR, and BUB, respectively, where R_1 , R_1 and B_2 are as follows. $[R_1, \{a, b\}]$ is a K-system that K-system, Si is said to be included in another, T. if S is isomorphic to a subsystem of T. A property P of K-systems erty, then there exists an alphabet for which the recognition The method of proof is a generalisation of that used in M1, larkov, A. The impossibility of algorithms for the recog-infilm of sertain properties of associative systems. Dok-lady Akad. Nauk SSSR (N.S.) 77, 953-956 (1951). A general theorem is announced, with an outline proof. from which the results of a previous paper [same voli, 19-20 (1951); these Rev. 12, 661; called M1 in this review follow as special cases. Let "K-system", mean "associative system with a finite set of generating relations". A the relations R in the alphabet A. The "recognition probfinding an algorithm for deciding, for any finite set of rela-Theorem 1. Let P be an invariant property of K-systems. If there exist both a K-system having the property, and a K-system not included in any K-system having the propmobilem for P is unsolvable. If a K-system with the property P is definable with n letters, the recognition problem for P lem" for a property P and an alphabet A is the problem of tions R in A, whether or not [R, A] has the property P. is upsolvable for alphabets of $\ge m+4$ letters. (Russian) Source: Nathematical Reviews,

Marler A
사용하는 경험 등에 들어 있다. 그 전에 보고 있다고 있다고 있는 것이 되었는데 그 사용하는데 되었다. 그는 것이 되었다. 그는 것이 되었다. 1985년 - 1985년 - 1985년 1985년 - 1985년
Markov. A. On an unsolvable problem consterning matrices. Doklady Akad. Nauk SSSR (N.S.) 78, 1089-1092 (1951). (Russian) The following-theorem is proved. If n≥6, a set of 102 n-rowed square matrices U, with rational integral elements can be found, such that the problem of deciding whether any given integral matrix U of the same size is expressible as a finite product ∏U, is unsolvable (in the usual sense, that no algorithm or machine routine exists). The proof, which is given in full, depends on an earlier unsolvability theorem of the author on matrices [same Doklady 57, 539-542 (1947); these Rev. 2, 221]. The transformation of the one problem into the other depends on ingenious but elementary algebra. The author believes that the number 102 can probably be lowered. M. H. A. Neuman (Manchester).
Source: Mathematical Reviews, Vol 13 No2

MARKOV, A. A.

"Impossibility of Certain Algerisms in the Theory of Associative Systems,

Dok. AN, Vol. 78, No. 1, 1951

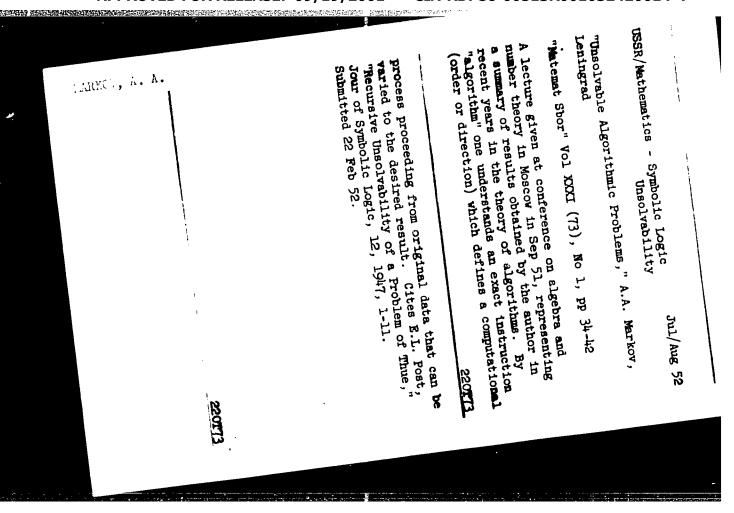
Discusses following problems which arise in study of associative systems is first by finite systems of relations in given algebra A: isomorphy, unity, uniqueness, recognition of groups, inclusiveness in group, recognition of subgroup, and metaproblem of identity. Finds for each letter A containing more than 3 letters each of the above problems in unsolvable: The sought-for algorithm in this problem is impossible. Submitted 4 Jan 51 by Acad I. M. Vinogradov

179T47

DELONE, B.N.; KURCSH, A. 3.; KOLMOGOROV, A. M.; MARKOV, A. A.; GELFOND, A. C.; Algebra

Development of algebra. Usp. mat. nauk 7 No. >, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1953, Uncl.



MARKOV, A. A.

200T75

USSR/Mathematics - Algorithm Theory

21 May 53

"Strengthening the Theorem of Reduction (Adduction) in the Theory of Algorithms," N. M. Nagornyy

DAN SSSR, Vol 90, No 3, pp 341-342

Strengthens the theorem given by A. A. Markov (Trudy Matemat In-ta imeni Steklova, 38 (1951)) as a consequence of the theorem on algorithm reduction. This theorem states that each normal algorithm over algorithm A is equivalent relative to A to a certain normal algorithm in the alphabet A cup (a,b), where a and b are letters not belonging in A. The

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theorem permits one to reduce any normal algorithm over alphabet A to an equivalent, relative to A, normal algorithm in a 2-letter expansion of alphabet A. Acknowledges attention of Prof A. A. Markov. Presented by Acad V. I. Smirnov 18 Mar 53.

在美国西部的海绵主席中的自己主义教会会议是在安徽共享,发展的大大型主义教育的主义是否是不是不是不同的

260T70

MARKOV, A. A.

work/Mathematics - inequalities

رر سن 11

"Generalization of Inequalities of S. N. Bernshtey and A. A. Markov," N. K. Bari

DAN SSSR, Vol 90, No 5, pp 701-702 . (45)

Subject inequalities and those of A. Zygmund are widely used in studying the best approximations of a function by means of trigonometric polynomials and also in investigating convergence and summability of Fourier series and their conjoints; however, in order to utilize these inequalities one must know what properties are possessed by the considered function on an interval of length 2w, which means that, if the

function's behavior is investigated on an interval \sqrt{a} , b/of length less than 2π , the corresponding theorems lose some force. Generalize 3 theorems apropos of this case. Presented by Acad A. N. Kolmogorov.

MARKOV, A.A.; PETROVSKIY, I.G., akademik, redaktor; NIKOL'SKIY, S.M., pro-TEBEOT; SAZONOV, L.S., redaktor; ARONS, R.A., tekhnicheskiy redaktor.

Theory of algorithms. Trudy Mat.inst. 42:3-374 '54. (MIRA 8:5) (Algorism)

MARKOV, A. A.

"Work of Soviet Mathematicians in the Domain of Constructive Analysis,

"On the Principle of Constructive Selection,"

paper either presented or distributed at the Intl. Colloquium on the Different Notions of Constructivity in "athematics, 26-31 Aug 57, Amsterdam,

B-3,095,946, 20 Jan 1958

AUTHOR:

Markov, A.A., Corresponding Member of the AN USSR

30-8-3/37

author TITLE: Mathematical Logic and Determination Mathematics (Matematicheskaya logika i vychislitel'naya matematika)

PERIODICAL:

Vestnik Akademii Nauk SSSR, 1957, Vol.27, Nr 8, pp.21-25 (USSR)

ABSTRACT:

The author at first gives explanatory specifications on the reciprocal connection between the two fields of science mentioned above. One of the basic methods of mathematical logic is the construction of proof. Formulating of the axioms and theorems is, by making use of a special system of symatolics, represented by the usual formulae. After concrete specifications on the "method of determination" the author gives an example for one of these possibilities (in form of an equation proof, see page 22). In conclusion the author deals with algorithms and underlines their great importance in mathematical logic. An important task is imposed upon mathematical logics with respect to the programmatical working through of the further development of electron computation machines. It may be expected that the attitude towards

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是一个人,我们就是一个人的人,我们就是一个人的人,我们就是一个人的人,我们就是一个人的人,我们就是一个人的人,我们就会是这个人的人,我们就是一个人的人的人,也是

30-8-3/37

Mathematical Logic and Determination Mathematics

these problems will have a stimulating effect on one of the most important fields of mathematical logic, the algorithm theory.

AVAILABLE:

Library of Congress

Card 2/2

Marken MARKOV, A.A. Corresponding Member Acad. Sc. USSR 11-7-5, 42 AUTHOR: On the Inversion Complexity of Function Syntons to be reversion-TITLE: noy slozhnosti sistem funktsiy) 1057, Vol. 116, Fr 6, 17. 417-519 (USSR) PERIODICAL: Doklady Akad. Nauk, SSSR, Generalizing E.N. 'ilbort's investigations Ref. 2 cone raing ABSTRACT: the inversion complexity of a Boolean function the author considers the inversion complexity Inv (f_1, \dots, f_m) of a system f_1, \dots, f_n of a Boolean functions of a arguments. Let the maximum Inv $(f_1,...f_m)$ of the 2^{m2^n} different systems f_1, \dots, f_m be I(n,n). Then it is: 1. I(n,1) = pd(n,n+1) and 2. I(n,m) = D(n) for m > 1. Here D(r) is the smallest natural number y for which it holds $r < 2^{y}$, and $(d^{2}r)$ is the integer of least distance to r which is not greater than r . If particularly it is m = 1 , then it is Inv(f) = pd (D(Alt(f))), whereby it is $0 \le Alt(f) \le n+1$ and the symbol Alt(f) is defined by certain alternating chains. There are 2 references, Card 1/2

On the Inversion Complexity of Function Systems 72-6-5742

ASSOCIATION; Mathematics Institute imeni V. A. Steklov, Acad. Sc. USSR

(Matematicheskiy institut im. V. A. Steklova Akademii nauk SSSR)

SUBMITTED: May, 17, 1957

AVAILABLE: Library of Congress

Card 2/2

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Matematicheskly institut 16(1)

Problemy konstruktivnogo napravleniya v matematike; sbornik rabot, months of the construction mond in Matha Vyp. 1 (Problems Connected With the Construction Trader of Articles Nr 1) Maggow Today of Articles Nr 1) Maggow Today of Articles Nr 1) vyp. 1 (rroplems connected with the construction Trend in Mathematics; Collection of Articles, Nr 1) Moscow, Izd-vo AN SSSR, matics; Collection of Articles, Nr 1) Moscow, 2,500 copies printed. 1958. 348 p. (Series: Its: Trudy, t. 52). Akademiya nauk SSSR.

.: N.A. Shanin; Resp. Ed.: I.G. Petrovskiy, Academician; Deputy Resp. Ed.: S.M. Nikol'skiy, Professor; Tech. Ed.: R.A. Arons. Ed.: N.A. Shanin; Resp.

This book is intended for mathematicians.

COVERAGE: The book is a collection of works presented at the seminar DRAGE: THE DOOK IS a COLLECTION OF WORKS PRESENTED AT THE SEMILIAL ON MATERIAL AND INSTITUTE AND A STAKLOVA (Mathematical Institute Ameni institut imeni V.A. Steklova (Mathematical Institute imeni V.A. Steklov) of the Academy of Sciences, USSR. The articles deal V.A. Steklov, of the Academy of Sciences, USBA. The artifices and primarily with problems connected with the constructive trend in mothematical Adetailed study is made of the theory of sloomithm mathematics. A detailed study is made of the theory of algorithms and constructive mathematical logic. mathematical and constructive mathematical logic. The book is divided into

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Problems Connected With the Construction (Cont.) SOV/1707

three main parts: I. The General Theory of Algorithms and Its Application to the Theory of Associative Calculations. II. Constructive Mathematical Logic. III. Constructive Mathematical Analysis.

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SOV/1707

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SOV/1707

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Markov, A.A. On Constructive Functions

315

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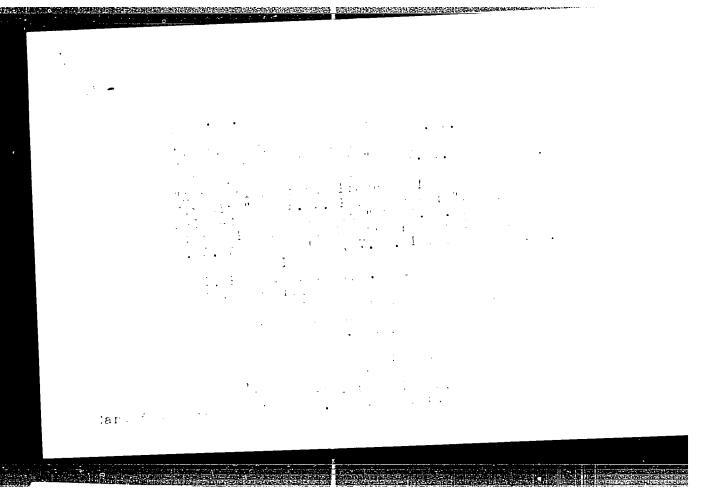
LK/ad 6-15-59

かりおどらへ オリナ . AUTHOR: None Girag. All-Union Conference on the Treery of a conf TITLE: (Vsesoyuznoje soveshchaniye po teorii .. : derstviya). PERIODICAL: Izvestiya Arademii Nauk SSSR, Otdeleri e lahalirili a Nauk, 1958, No.2, pp. 167-168 (USSR). ABSTRACT: The Institute of Automation and Telemech and of the Ac. Sc. USSR (Institut Avtomotiki i Telemekushini As is ii Nauk SCSR) convened in October, 1957 an All Usi a Conference on the theory of relay systems. I wash or the conference was to evaluate the present of to profile... of the theory of relay operation, percention evaluation of the problems of synthesis, and in the transformation of the structure of relax equipment, ptimum construction and assembly of sach struct a ... automation of the processes of synthesis and automation of the processes of the p entablishment, works' lateratoria. tions from numerous centres of the UBOR at 1973 scientists from Roumania, Hungary and Checke los rin participated in the conference. Card 1/5 In his opening aldress M. A. Gavrilov reported at the

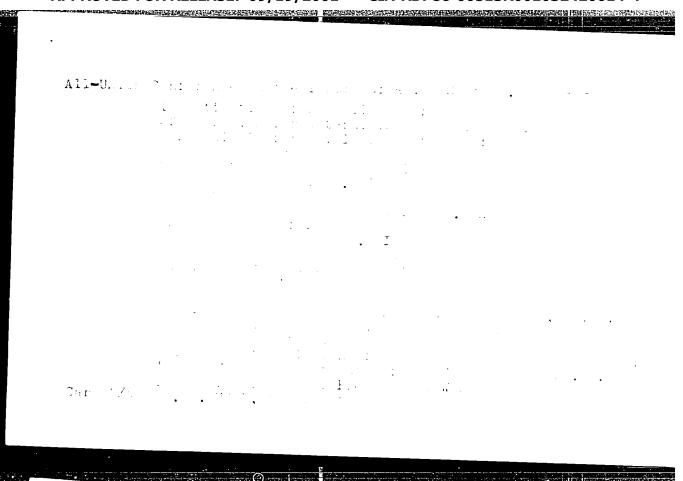
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for the synthesis of structure.

a coordinate sound the advise line of relay system for each line.

Federation relating to this problem.

(Note: Principle of the problem.

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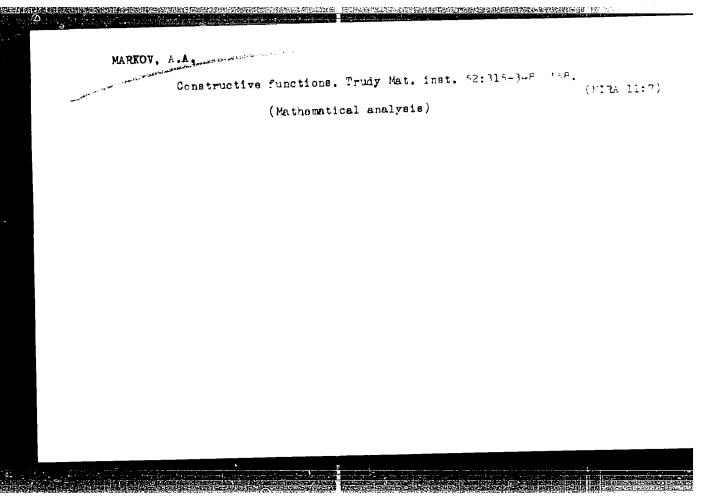
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MARKOV, A.

"Mathematical logic and computational methematics. Tr. from the Russian" Fiziko-Matematichesko Spisanie. Sofiia, Bulgaria. Vol. 1, no. 3/4, 1958

Monthly list of East European Accessions (EEAI), IC, Vol. 8, No. 6, Jun 59, Unclas



APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R001032420014-4"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R001032420014-4

Markov, A. (Corresponding Lember of the Academy of AUTHOR: SC7/20-121-2-6/5 Sciences of the USSR)

中的大型工作。1915年11月1日的中国工作中国工作的大型工作的工作。1915年11月1日日 1915年11日 1915年11日

TITLE: The Unsolubility of the Problem of Homeomorphy (Nerazreshimost problemy gomeomorfii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 2, pp 218-220 (USSR)

The determination of an algorithm with the aid of which it can be ABSTRACT: investigated whether two arbitrary given polyhedra (manifolds) are homeomorphic or not, is denoted by the author as the problem of homeomorphy. A natural restriction consists in the establishment of one of the compared polyhedra; then it has to be investigated whether the other polyhedra are homeomorphic to the given one.

Principal theorem: Let n > 3. The manifold is understood in the sense of Poincaré [Ref 4] and Veblen [Ref 5]. For every n there exists an n-dimensional manifold Mn such that the problem of homeomorphy of the manifolds to Mn is unsolvable.

In an analogous manner the problem of the homotopic equivalence is given; in this case the correspondingly changed above principal

theorem is valid too. There are 5 references, 2 of which are Soviet, 2 American, and

1 Italian.

THE REPORT OF THE PROPERTY OF

Card 1/2

CIA-RDP86-00513R001032420014-4"

APPROVED FOR RELEASE: 09/19/2001

The Unsolvability of the Problem of Homeomorphy SOV/20-121-2-6/53

SUBMITTED: March 21, 1958

Card 2/2

16(1) AUTHOR:

Markov, A. (Corresponding Member of the AS USSR) SOV/20-123-6-6/50

TITLE:

On the Unsolvability of Some Topological Problems (O nerazreshimost

nekotorykh problem topologii)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 6, pp 978-980 (USSR)

ABSTRACT:

The present paper improves and precises the earlier results of the author [Ref 3].

Let the complex K be related to the complex L if: K and L are connected and their fundamental groups are isomorphic, or if at least one of these complexes is not connected.

Let Rand The binary relations between complexes. Ris called stronger than T, if K always has a relation T to L, if K has a relation R to L. Let the binary relation ? lie between R and Y if

Qis stronger than Aand Ais stronger than T.

Principal results: To every natural n > 3 there exists a connected closed n-dimensional manifold Mn so that for every binary relation R lying between the combinatoric equivalence and the relationship

the problem of distinction of the relation Octo M' among the n-dimensional manifolds is unsolvable.

Herefrom there follows that the general problem of distinction of

Card 1/2

On the Unsolvability of Some Topological Problems SOV/20-123-6-6.50

the combinatoric equivalence is unsolvable. There are 5 references, 2 of which are Soviet, 2 American, and

1 Dutch.

ASSOCIATION: Matematicheskiy institut imeni V.A.Steklova Akad.n.SSSR (Mathematical Institute imeni V.A.Steklov of the AS USSR)

SUBMITTED: October 21, 1958

Card 2/2

16,4000 (1831,1344,1132)

26083

P/021/61/000,002/001,001 A107/A126

AUTHOR:

Markov, A.A., Professor, Doctor, Chairman, Corresponding Member

TITLE:

Development of cybernetics in the Soviet Union

PERIODICAL: Przegląd Elektrotechniczny, no. 2, 1961, 53 - 55

The basic element of cybernetics is the information based on associations given by the nature's order, evoking the situation A as a consequence of the previous situation B. The Soviet Mathematician A.N. Tikhonov proved that the division of the temperature of an earth stratum depends on its depth and contains information on temperature changes of the earth surface in the past. This example demonstrates the process of information arising when the temperature of the earth surface is expressed as the situation A and the temperature in the past computed according to established rules, as the situation B. If the situations A and B are divided by time or space the forwarding of information takes place. The author describes the Shannon theory and the established coding of information. Soviet scientist A.N. Kolmogcrov, A.Ya. Khinchin, A.M. Yaglom and I.M. Gelfand. investigated this problem, whereas A.Ya. Khinchin and V.R. Varshamov investigated the problem of coding. The synthesis of steering systems, based on contact ele-

Card 1/4

26083

P/021/61/000/002/001/001

Development of cybernetics in the Soviet Union

ments, was successfully investigated by Soviet scientists. A partial answer to the problem of the Bool function in relation to n arguments was given by Shannon The Soviet mathematician, 0.B. Lupanov, found this solution by changing n + 2 into n. This achievement is based on a new interpretation of the Bool's function and on new methods of contact synthesis expressed by

 $\frac{2^n}{n} \, (1-\xi) \, < \, L \, (n) \, < \, \frac{2^n}{n} \, (1+\xi),$ at which the condition is a sufficient high n-value. Lupanov obtained results for various additional systems based on functional elements, especially for programming computers. An example of a functional element is the alternator in which electronic valves and semi-conducting diodes are used. Similar is the system of two entries, called conjunctor. The negator is a function element registrating negations. By assembling conjunctors, alternators and negators it is possible to build up unlimited Bool functions or systems related to those functions. Our nervous system can be regarded as a system of neurone functions. Evaluating the composition of such systems it is advisable to replace the number of function elements by a "weight" for each element, expressed by plus values. According to Lupanov it is possible to relate free established weights to given function elements. Analogue to the Shannon system, tolerable figures of matching weight can be used for contact systems. The author describes results of investi-

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26083

P/021/61/000/002/001/001 A107/A126

Development of cybernetics in the Soviet Union

gations performed by the Soviet biologist Vaynovayg (Weinzweig) in the field of power engineering systems composed of functional elements. Vaynovayg assumed that energy is delivered only in case of an exit signal of an element; in this case an energy evaluation of a system is performed. The function ê in case of unlimited increase of the argument was different from Shannon's function. He demonstrated that for some systems of functional elements the expression $\varepsilon(n)$ ∠ Cn is valid, where C is a constant plus value. This assumption enables the realization of Bool function of a high number of arguments of rather complicated systems. It is probable that such a process takes place in the human brain. The author describes the practical use of cybernetics in investigation of the structure of languages and creation of artificial languages, i.e., conventional logical mathematical languages, chemical-formula lagnuages, etc. Recently, an international algorythmical language, called "algol", for formulation of problems for computers was introduced. A.A. Iuranov worked out an operational language for programming of such problems. The mathematical linguistic which is a part of cybernetics was recently investigated by the Soviet scientists Kulagin and Dobrushin. Investigations on mechanical translations were performed in the USSR by Kulagin and Moloshny. Automatic programming based on Soviet results was developed by L.B. Kantorovich, A.P. Jershov and others. The Soviet scientist Mielchuk

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26083

Development of cybernetics in the Soviet Union

P/021/61/000/002/001/001 A107/A126

developed methods for translation of various languages into Russian. A team of scientists in Leningrad works on algorythms for translation into Indonesian, Burman, Vietnam and Suahely languages and vice versa. For this purpose an intermediate language was worked out. Similar investigations were performed in Kiyev, Tbilisi and Yerevan. The Soviet scientist L.V. Kantorovich works since 1930 on the development of mathematical methods for the solution of economical problems based on cybernetics. Based on this method, Leontiyev developed in the USA a method of linear programming for planning in economy. The Soviet scientist A.M. Giman developed a practical method for designing metal shaping machines by use of programming computers. The Soviet scientists Breyelo, Gurfinkel, Kobrinskiy, Sysin, Getlin and Jakobson investigated the problem of muscle currents, which permits the production of protheses steered by current and moved by outside motors enabling the invalid to express only the wish of a particular move, whereby the necessary energy is rendered and conducted by the proper muscles. The Soviet mathematician M.M. Gelfand investigated recently the activity of the heart based on cybernetics. There is I figure.

ASSOCIATION: Department of Logical Mathematics, Moscow University im. Lomonosev;

Card 4/4

MARKOV, Andrey A.

"On Computable invariants"
To be presented at the IMU International Congress of Mathematicians 1962 - Stockholm, Sweden, 15-22 Aug 62

Corresponding Member, Acad. of Sci. USSR; Mathematics Insta.imeni V. A. Steklov, Acad. of Sci. USSR (1961 position)

ARZUMANYAN, A.A., akademik; BERG, A.I., akademik; ZHUKOV, Ye.M., akademik; SEMENOV, N.N., akademik; VINOGRADOV, V.V., akademik; FRANTSEV, Yu.P.; SHCHERBAKOV, D.I., akademik; ANISIMOV. I.I.; GATOVSKIY, L.M.; IOVCHUK, M.T.; FEDOSEYEV, P.N., akademik; ROMASHKIN, P.S.; KONSTANTINOV, F.V.; MITIN, M.B., akademik; YELYUTIN, V.P.; PLOTNIKOV, K.N.; PRUDENSKIY, G.A.; YUDIN, P.F., akademik; RYBAKOV, B.A., akademik; KONSTANTINOV, B.P., akademik; KHVOSTOV, V.M.; KEDROV, B.M.; MARKOV, A.A.; BAISHEV, S.B., akademik; ALEKSEYEV, M.N., prof.; SKAZKIN, S.D., akademik; ALEKSANDROV, A.D.; POSPELOV, P.N., akademik

Discussion of L.F. Il'ichev's rreport. Vest. AN SSSR 32 no.12:19-50 D'62. (MIRA 15:12)

1. Chleny-korrespondenty AN SSSR (for Aleksandrov, Frantsev, Anisimov, Gatovskiy, Iovchuk, Romashkin, Konstantinov, Yelyutin, Plotnikov, Prudenskiy, Khvostov, Kedrov, Markov). 2. AN Kazakhskoy SSR (for Baishev).

(Research)

S/582/62/000/008/004/013 D405/D301

AUTHOR: Markov, A. A. (Moscow)

TITLE: On minimal contact-rectifier two-terminal networks for mo-

notonic symmetrical functions

SOURCE: Problemy kibernetiki. no. 8. Moscow, 1962, 117-121

TEXT: The problem of constructing a minimal positive two-terminal network is solved for monotonic symmetrical functions, the solution being feasible in practice for a sufficiently large number of tion being feasible in practice for a sufficiently large number of arguments. The two-terminal network which realizes the given monoarguments. The two-terminal network which realizes the function tonic symmetrical function $s_n^k(x_1,\ldots,x_n)$ is equal to unity if and only if not less than k of its arguments assume the value 1. Theorem: Any positive two-terminal network which realizes the function of a k contains not less than k(n-k+1) contacts $(1 \le k \le n)$. This has a contains not less than k(n-k+1) contacts of "length" and "width" theorem is proved by utilizing the concepts of "length" and "width" of a two-terminal network, introduced by Moore and Shannon (see reference). The proof is based on 3 lemmas. Lemma 3: The number of Card 1/2

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On minimal contact- ...

contacts in a positive two-terminal network is not less than the product of its length by its width. This lemma was proved by Moore and Shannon for a network without rectifiers; the author shows that the presence of rectifiers does not affect the validity of the lemma. By setting $k = \left\lceil \frac{n+1}{2} \right\rceil$, it is found that the minimal positive two-terminal network for the function $s_n = \frac{n+1}{2}$ contains $\frac{n+1}{2}$ (n+1) contacts. Thus, for even n the minimal positive network for the function $s_n = \frac{n+1}{2}$ contacts. Thus, for even n the minimal positive network for the function $s_n = \frac{n+1}{2}$ contacts (for the function $s_n = \frac{n+1}{2}$). There is 1 figure.

SUBMITTED: October 18, 1961

Card 2/2

MARKOV, A.A.

Constructive mathematics. Trudy Mat.inst. 67:8-14 '62. (MIRA 16:2) (Mathematical analysis)

MARKOV, A.A.

On computable invariants. Dokl. AN Sook 146 no.5:1017-1020 0 '62. (MIRA 15:10)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Chlen-korrespondent AN SSSR. (Invariants)

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R001032420014-4

MARKOV, Andrey Andreyevich, prof.

Constructive mathematics. Fiz mat spisanie BAN 6 no. 2: 129-136-163.

1. Moskovski durzhaven universitet, rukovoditel na katedrata po matematicheska logika.

16.7000

S/038/63/027/001/003/004 B112/B186

APPRORE

Markov, A. A.

TIPDE:

cortain algorithms connected with systems of words

PERIOD PCAL:

Akademiya nauk SSSR. Izvestiya. Seriya matematicheskaya, v. 27, mo. 1, 1963, 101-160

TRAT: Systems of words in a given alphabet A may be regarded as words in an alphabet obtained from A by adding a new letter which acts as a separation mark (see A.A. Markov. Teoriya algorifmov (Theory of algorithms). Trudy Mat. in-ta im. V. A. Steklova At. hauk SSSR. 42, 1954). In the present paper certain concepts and normal algorithms are considered which are connected with systems of words capable of the above interpretation. The paper has the character of an auxiliary work for feather investigations.

SUBBITTED:

May 22, 1962

Cord 1/1

B