ALTSHUL', A.D., dots., kand.tekhn.nauk; KALITSUN, V.I., aspirant

Stage formula for the distribution of velocities in a pipe. Nauch. dokl.vys.shkoly; stroi. no.3:237-241 '58. (MIRA 12:7)

1. Rekomendovana kafedroy kanalizatsii i gidravliki Moskovskogo instituta inzhenerov gorodskogo stroitel'stva Mosgorispolkoma.
(Hydraulics)

SOV/137-59-7-15105

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 7, pp 131 - 132 (USSR)

AUTHORS: Al'tshul', A.D., and Kalitsun, V.I.

TITLE: Hydraulic Resistance of Welded Butts With Backing Rings

PERIODICAL: Str-vo truboprovodov, 1958, Nr 8, pp 4 - 7

ABSTRACT: Special investigations were carried out on an aerodynamic installation to determine the actual hydraulic resistance, caused by backing rings in pipes. Experimental tests were made with pipes of 99.7; 205 and 302.6 mm in diameter, without butts and with butts and backing rings. The tests proved that hydraulic resistance of pipes with butts increased considerably, whereby hydraulic butts appeared as local resistances. In the tests the reciprocal effect of butts on hydraulic resistance did not occur, already at a distance between the butts of l = 2 m. The effect of butts on the resistance increased with reduced pipe diameter and same l (distance between butts). The experimental dependence between the factor of local resistance of the butt (ζ_{st}) and the ω_1/ω_2 ratio was found, where ω_1/ω_2 is the ratio of the pipe cross sections area in portions contracted by the backing

Card 1/2

to that free of it. The relative increase of resistance, caused by butts with backing rings, was determined by the following formula: $K = 1 + \zeta_{st} \cdot d/\lambda l$ where $\lambda = 0.1 (k/d)^{\frac{1}{4}}$; K = 0.3 mm for pipes in operation; ζ_{st} was found according to the experimental curve $\zeta_{st} = f(\omega_1/\omega_2)$.

M.K.

AUTHOR: Kalitsun, V.I., Engineer SOV/98-59-1-9/14

TITLE: The Formulae for the Coefficient "Chaizy" in the Light of Experimental Data (Formuly dlya koeffitsiyenta Shezi v svete opytnykh dannykh)

PERIODICAL: Gidrotekhnicheskoye stroitel'stvo, 1959, Nr 1, pp 51-53 (USSR)

ABSTRACT: The author sums up the results of a discussion, going on since 1949, on the definition of the coefficient "Chaizy". No unanimous opinion was reached. The author reviews all the proposed formulae. There are four graphs and nine references, eight of which are Soviet and one Italian.

Card 1/1

AL'TSHUL', A.D., kand.tekhn.nauk, dots.; KALITSUN, V.I., inzh.

Investigating the hydraulic resistance of welded joints with lining rings. Izv.vys.ucheb.zav.; energ. 2 no.5:135-142 My '59. (MIRA 12:10)

1. Moskovskiy institut inzhenerov gorodskogo stroitel'stva.
(Pipe--Hydrodynamics)

AL'TSHUL', A.D., kand.tekhn.nauk; KALITSUN, V.I., inzh.; KISLYUK, F.I., doktor tekhn.nauk; KAMERSHTEYN, A.G., kand.tekhn.nauk

Hydraulic resistance of pipeline joints made by resistance butt welding on KTSA-1 equipment. Stroi.truboprov. 4 no.1:7-10 Ja '59. (MIRA 12:1)

(Pipelines--Welding) (Pipelines--Testing)

AL'TSHUL', A.D., KALITSUN, V.I.

Losses of pressure in reduction and diffusion pipe sections with gate valves. Gaz.prom. 5 no.2:35-39 F '60. (MIRA 13:6)
(Pipelines)

AL'TSHUL', A.D., dotsent, kand.tekhn.nauk; KALITSUN, V.I., inzh.

Resistance coefficient of gradually diminishing sections of pipe. Izv. vys. ucheb. zav.; energ. 3 no. 7:116-120 Jl '60. (MIRA 13:8)

1. Moskovskiy institut inzhenerov gorodskogo stroitel'stva Mosgorispolkoma. Predstavlena kafedroy gidravliki i kanalizatsii. (Hydraulics)

AL'TSHUL', A.D.; KALITSUN, V.I.

Investigating the hydraulic resistance of aluminum pipes. Gaz. prom. 5 no.9:36-39 S '60. (MIRA 13:9)
(Pipe, Aluminum) (Hydraulic control)

84925

S/096/60/000/011/014/018
E073/E135

26.2144

AUTHOR: Kalitsun, V.I. (Engineer) 18

TITLE: On the Hydraulic Calculation of Steel Piping

PERIODICAL: Teploenergetika, 1960, No. 11, pp. 86-87

TEXT: For determining the coefficient of hydraulic friction λ in the Darcy—Weisbach equation, the formula originally published by C.F. Colebrook (Journal, Institute of Civil Engineers, 1939, No. 4) is being extensively used. Numerous investigations showed that this formula gives results which are in good agreement with experimental data. A drawback of the formula is that it is transcendental, and therefore A.D. Al'tshul' (Ref. 2) proposed using the following approximate formula which was derived from the Colebrook formula:

$$\lambda = 0.1\left(\frac{k_A}{d} + \frac{100}{Re}\right)^{0.25} \qquad (3)$$

The discrepancy between the two is 2-3% and therefore the latter formula is frequently recommended for pipeline calculations, particularly for calculations of district heating networks.

Card 1/3

S/096/60/000/011/014/018
E073/E135

On the Hydraulic Calculation of Steel Piping

In these recommendations it is erroneously assumed that k_A of the approximate formula has the same value as k_e (equivalent uniform grain roughness) in the Colebrook formula, although in reality $k_A = 1.46\ k_e$. It is shown here that the formula proposed by Al'tshul' (Eq. (3)) can be rewritten thus:

$$\lambda = 0.11 \left(\frac{k_e}{d} + \frac{68}{Re} \right)^{0.25} \qquad (10)$$

For the range of smooth walls the formulae (10) and (3) can be written in a simpler form, yielding the well known Blazius formula

$$\lambda = 0.11\ (k_e/d)^{0.25},$$

which is applicable for the range

$$Re\ \frac{k_e}{d} \geqslant 568.0 \qquad (11)$$

In this case the error (lower loss values) will not exceed 3%. On the basis of this equation the limit speed of flow of the

KALITSUN, V. I., Cand. Tech. Sci. (diss) "Investigation of Some Problems of Hydraulics of Conduits," Moscow, 1961, 16 pp. (Acad. of Communic. Economy) 180 copies (KL Supp 12-61, 267).

YAKOVLEV, Sergey Vasil'yevich, prof.; LASKOV, Yuriy Mikhaylovich, inzh.; KALITSUN, V.I., inzh., nauchnyy red.; NIKEMYAGI, D.K., red. izd-va; ABRAMOVA, V.M., tekhn. red.

[Pumping of sewage sludge and sediments; hydraulic resistances during the flow of sediments in sludge pipes] Perekachka ila i osadkov stochnykh vod; gidravlicheskie soprotivleniia pri dvizhenii osadkov v iloprovodakh. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1961. 105 p. (MIRA 14:6)

(Sewage sludge) (Pipe--Fluid dynamics)

KALITSUN, V.I., inzh.

Hydraulic design of steel pipes. Teploenergetika 7 no.11:86-87 N '60. (MIRA 14:9)

(Pipe, Steel--Design and construction)

KALITSUN, V.I.

New projected designs of the sand traps of sewage purification plants. Izv.vys.ucheb.zav.; stroi. i arkhit. 4 no.6:91-96 '61. (MIRA 15:2)

1. Moskovskiy ordena Trudovogo Krasnogo Znameni inzhenerno-stroitel'nyy institut imeni V.V. Kuybysheva.
(Water—Purification)

KALITSUN, V. I.

Sand traps with constant flow speed. Vod. i san. tekh. no.9:30-32 S '61. (MIRA 14:11)

(Sewage disposal plants)

AL'TSHUL', A.D., kand.tekhn.nauk, dotsent; KALITSUN, V.I., inzh.

Effect of the slope of the bottom on the magnitude of the Chézy coefficient in the presence of a uniform turbulent flow in channels. Izv.vys.ucheb.zav.; energ. 4 no.9:98-103 S '61. (MIRA 14:10)

1. Moskovskiy inzhenerno-stroitel'nyy institut imeni V.V.Kuybysheva. Predstavlena kafedroy kanalizatsii i gidravliki.
(Hydraulic engineering)

YAKOVLEV, S.V., doktor tekhn. nauk; LASKOV, Yu.M., inzh.; KALITSUN, V.I., inzh.

Study of the hydraulic resistances of an experimental bactericidal unit. Vod. i san. tekh. no.12:25-26 D '61. (MIRA 15:6)
(Water--Purification) (Hydraulics)

KALITSUN, V.I.

Design of sand traps with a constant rate of flow. Sbor. trud. MISI no.42:28-32 '62. (MIRA 16:6)

(Sewage--Purification)

YAKOVLEV, S.V.; KALITSUN, V.I.

Determining pressure losses at sewerage screens. Sbor. trud. MISI no.42:33-42 '62. (MIRA 16:6)

(Sewage—Purification)

KALITSUN, V.I.; PUGACHEV, Ye.A.

Experimental study of precast troughs of sewerage structures. Sbor. trud. MISI no.42:53-65 '62. (MIRA 16:6)
(Sewage--Purification) (Precast concrete)

YAKOVLEV, S.V.; KALITSUN, V.I.

Pressure losses in aeration tanks. Sbor. trud. MISI no.42:21-27 '62. (MIRA 16:6)

(Sewage--Purification)

KALITSUN, V.I., inzh.; ZAPORNIKOV, V.P., inzh.

Construction of horizontal sand traps. Vod. i san. tekh. no.9:22-26 S '63. (MIRA 17:2)

AL'TSHUL', A.D.; KALITSUN, V.I.

[Hydraulic resistances in pipelines] Gidravlicheskie soprotivleniia truboprovodov. Moskva, Stroiizdat, 1964. 168 p. (MIRA 18:3)

YAKOVLEV, S.V., doktor tekhn. nauk; KALITSUN, V.I., kand. tekhn. nauk; ITKIN, A.L., inzh.

Sedimentation of waste waters in chambers. Vod. i san. tekh. no.1:12-14 Ja '66. (MIRA 19:1)

~~CHERTANOV~~

KALITSYN, D. S.

Glycogenolytic processes in the liver of rats in narcosis. D. S. Kalitsyn, A. A. Khadzhilolov, and K. I. Dancheva (V. Chervenkov Med. Inst., Sofia, Bulgaria). *Ukrain. Biokhim. Zhur.* 27, 322-29(1955) (in Russian).—After medinal administration (or 5 days, the av. glycogen content of rat liver was 3.29%. Rats receiving medinal just once, 3 hrs. before they were sacrificed, had an av. glycogen content in liver of 0.72%. The av. glycogen content of control rats was 0.56%. The difference between the glycogen content of liver in control rats and in those receiving one narcotic injection was considered insignificant. Phosphorylase activity of liver in narcotized animals was 18% less than that of the controls. The reverse was true with amylase activity (the av. in the narcotized rats being 8 mg. of glucose formed in 7 min., 22 mg. in 15 min., more than in the controls). The blood sugar content in narcotized rats was 60-100 mg. % with an av. of 80 mg. %. It was 58-89 mg. % in controls with an av. of 79 mg. %. B. S. Levina

MD

(2)

KALITSYN, D.S.; KHADZHIOLOV, A.A.; DANCHEVA, K.I.

Modification of certain processes of glycogenolysis in the liver of white rats in drug-induced sleep. Ukr. biokhim. zhur. 27 no.3:324-329 1955. (MLRA 8:12)

1. Kafedra biokhimii imeni A.V.Palladina Meditsinskogo instituta imeni V.Chervenkova v Sofii (Bolgariya)

(GLYCOGEN, metabolism,
liver, eff. of medicinal sleep on glycogenolysis in white rats)
(LIVER, metabolism
glycogenolysis, eff. of medicinal sleep in white rats)
(SLEEP, effects,
on liver, glycogenolysis, medicinal sleep in white rats)

Abstract : An investigation of body temperature, blood pressure, blood sugar and chloride levels, concentration of hemoglobin and formed elements, urinary sugar and intraocular pressure was performed among students during the period examinations. The students were divided into groups according to the times of the examinations (before, during and after the examinations). Among the majority of the students body temperature during the examinations was higher than 37 degrees, the pulse rate increased, blood pressure rose, the concentration of hemoglobin and erythrocytes

Card 1/2

Med Inst, Sofia

USSR/Human and Animal Physiology - Blood. V-3

Abs Jour : Ref Zhur - Biol., No 2, 1958, 8438

increased, as did the blood sugar level. One to two days after the examinations these values were reduced. Among the majority of the students the chloride content was less (by between 7 and 61 mg%) on the day of the examination in comparison with the data obtained the day after the examinations. All of these changes are explained from the position of the doctrine of nervism.

Card 2/2

BULGARIA/Human and Animal Physiology - Metabolism. I

Abs Jour : Ref Zhur - Biol., No 20, 1959, 91[illegible]

Author : Kalitsin; Khadzhiolov; Dancheva

Inst : Institute of Experimental Medicine, AS Bulgaria

Title : Variations in Some Processes of Glycogenolysis in the Liver of White Rats during Drug-Induced Sleep

Orig Pub : Izv. In-ta yeksperim. med. B"lg. AN, 1957, 2, 391-404

Abstract : Drug-induced sleep was elicited in rats with the daily subcutaneous injection for 5 days of 15 mg of sodium veronal per 100 g of body weight. In the liver of the sleeping animals the glycogen content was significantly increased, phosphorylase activity decreased, and amylase activity increased; the blood sugar content was unchanged.

Card 1/1

KALITSYN, D.S.

Dephosphorylation of glucose-1-phosphate by acid phosphomonoesterase in the liver during medinal-induced sleep in rats. Vop. med. khim. 6 no. 6:631-634 N-D '60. (MIRA 14:4)

1. Kafedra biokhimii im. A.V. Palladina Vysshgo meditzinskogo instituta, Sofiya, Bolgoriya.
(LIVER) (PHOSPHATASE) (HEXOSE PHOSPHATES)
(BARBITURATES)

MORGENSHTERN, V.S., kand. tekhn. nauk (Leningrad); KALITSYN, V.I. (Leningrad)

Calculating controlling spillways for the maintenance of constant speed in horizontal sand traps with rectilinear water flow. Vod. i san. tekh. no.2:6-8 F '65. (MIRA 18:4)

KALITURIN, A.

Decisions of the 20th Congress are the program for building socialism. Blok.agit.vod.transp. no.5:24-30 Mr '56. (MLRA 9:8)

1. Agitator Moskovskogo sudostroitel'nogo i sudoremontnogo zavoda.
(Moscow--Shipbuilding)

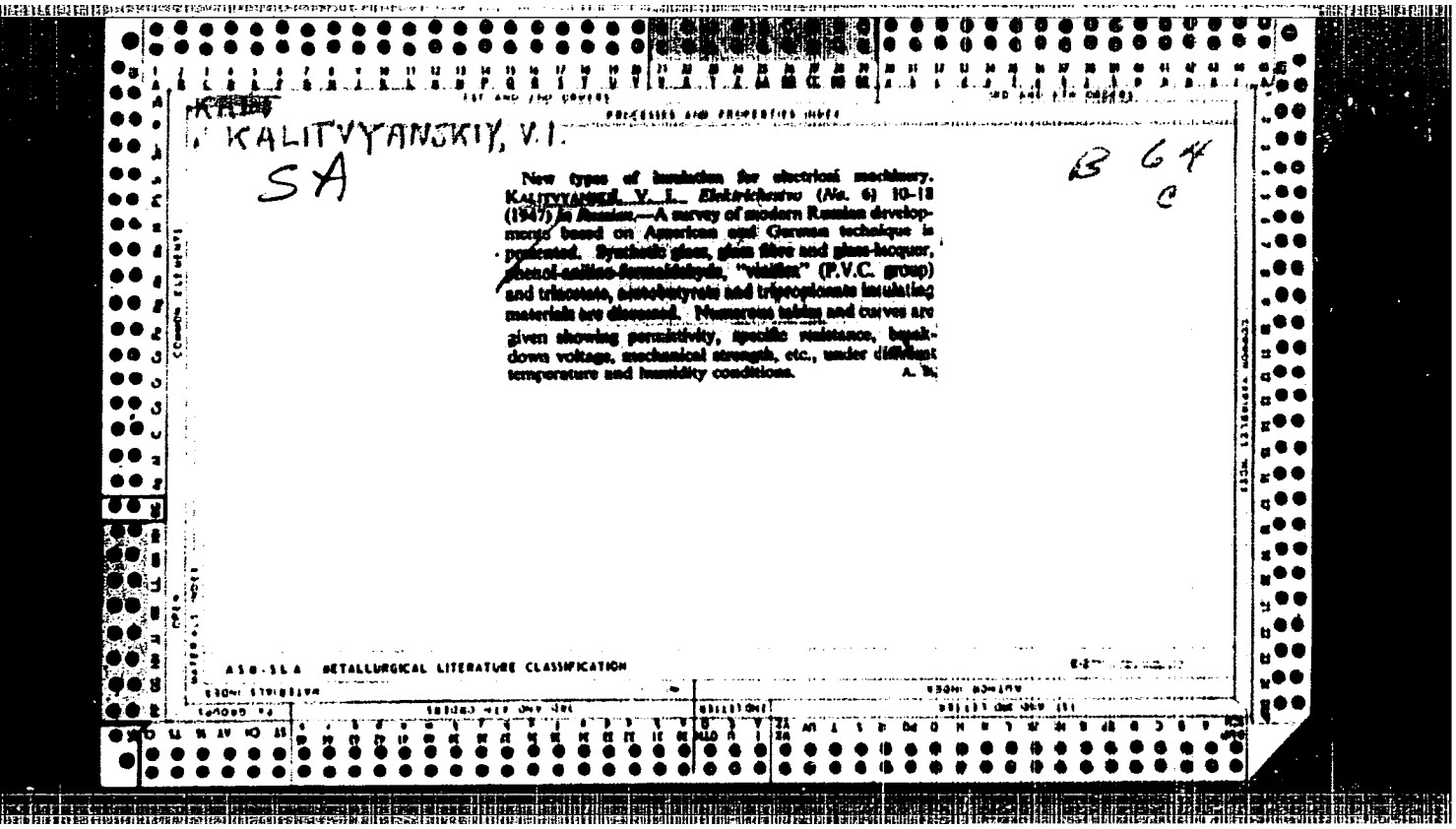
ANISIMOVA, Yo.K., inzh.; ZUSMANOVSKAYA, L.L., inzh.; KALITVYANSKIY, kand. tekhn.nauk

Heat resistant insulation of the traction motor of a mainline electric locomotive. Vest. elektroprom. 32 no.1:14-18 Ja '61. (MIRA 14:3)
(Electric railway motors) (Electric insulators and insulation)

SHAPOVALOV, I.F., starshiy nauchnyy sotrudnik. Prinimali uchastiye: ZHADAN, Ya.M., gornyy inzh.; KALITVYANSKIY, I.T., avtomekhanik. NIKOLAYEV, V.F., otv.red.; VINOGRADOVA, G.V., red.izd-va; IL'INSKAYA, G.M., tekhn.red.

[Manual on the control of mine rescue equipment] Posobie po proverke gornospasatel'nogo oborudovaniia. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1960. 125 p. (MIRA 13:6)

1. Stalinsk. Sovet narodnogo khozyaystva. Nauchno-issledovatel'skaya laboratoriya po gornospasatel'nomu delu. 2. TSentral'naya nauchno-issledovatel'skaya laboratoriya voyenizirovannykh gornospasatel'nykh chastey [TsNIL VGSCh] (for Shapovalov).
(Mine rescue work--Equipment and supplies)



KALITVYANSKIY, V.I.

SA

B 64
C

New types of insulation for electrical machinery. KALITVYANSKII, V. I. *Elektrichestvo* (No. 6) 10–18 (1947) in Russian.—A survey of modern Russian developments based on American and German technique is presented. Synthetic glass, glass fibre and glass-lacquer, phenol-aniline-formaldehyde, "vinilites" (P.V.C. group) and triacetate, acetobutyrate and tripropionate insulating materials are discussed. Numerous tables and curves are given showing permittivity, specific resistance, breakdown voltage, mechanical strength, etc., under different temperature and humidity conditions. A. B.

A 58-5 L A METALLURGICAL LITERATURE CLASSIFICATION

KALITVYANSKIY, V.I., kandidat tekhnicheskikh nauk.

Insulation in the new series of electric machines. Vest.elektroprom. 18 no.1-2:19-23 '47. (MLRA 6:12)

1. Vsesoyuznyy elektrotekhnicheskiy institut.
(Electric machinery) (Electric insulators and insulation)

KALITVYANSKIY, V. I. PA 65T38

USSR/Electricity Mar 1948
Heating, Industrial
Plastics, Heating

"Use of High Frequencies for Preliminary Heating of Plastics During Compression," V. I. Kalitvyanskiy, Candidate Tech Sci; V. M. Degtev, Engr, 5 pp

"Prom Energet" No 3

Authors determined that great technical economies could be achieved by means of rapid heating of plastics to temperatures at which they could be worked. Basically the plastic is heated to 120-140° by means of dielectric heating, after which it is rapidly transferred to the molding tables. Describes the operation and performance of system.

65T38

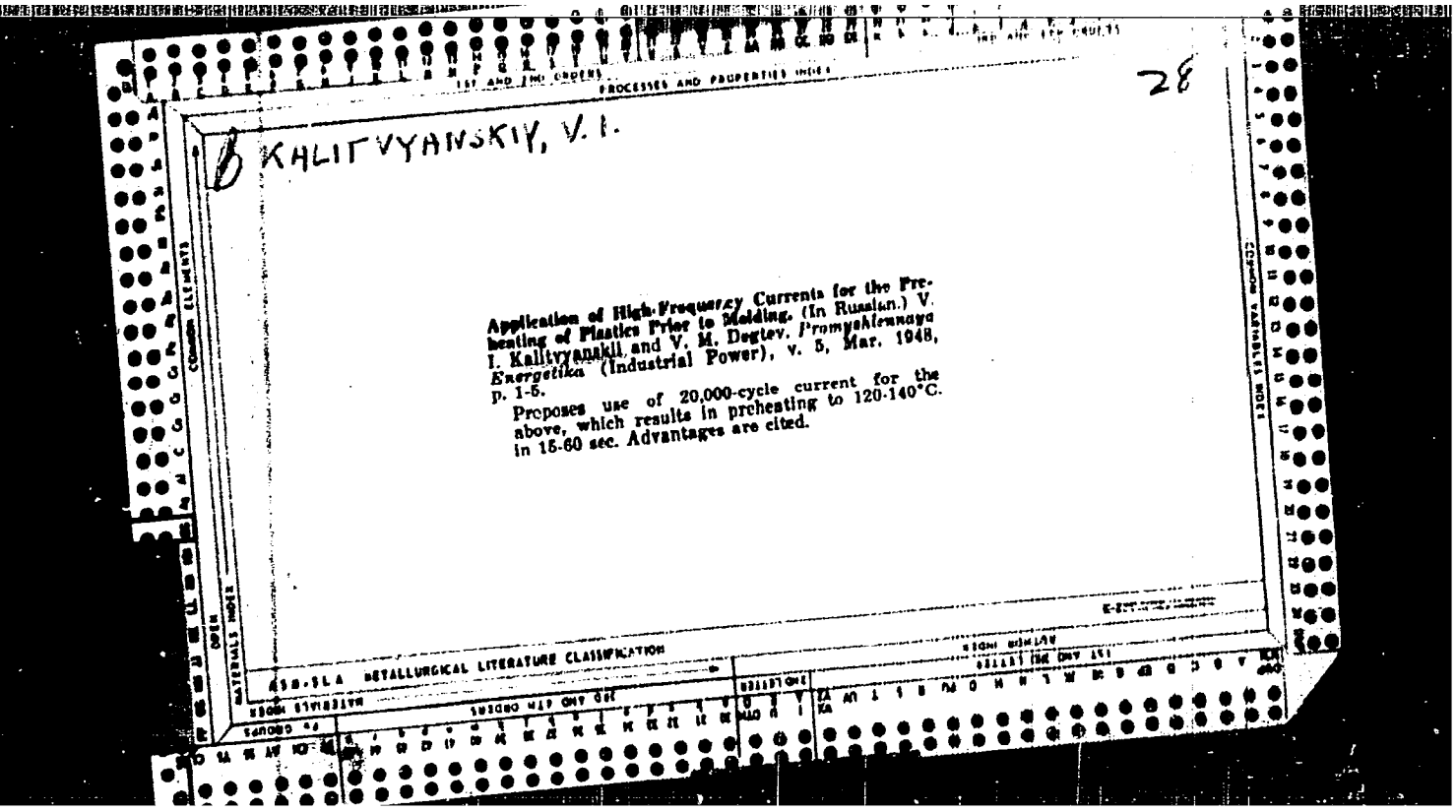
35. Synth Plastics Allied Product

KALITVYANSKIY, V. I.

KALITVYANSKIY

High-frequency heating of plastics. V. V. Kalitvyansky and V. M. Dyakov (Elektrichestvo, 1948, No. 4, April, p. 6-11). The author gives an account of his experiences in high frequency heating as applied to the processing of different plastics. A 5 kw., 20 Mc/s industrial equipment is described for the thermal treatment of plastic specimens. Curves are given showing temperature time relationship, optimum heating conditions and relationship of heating time to specimen thickness. 38579

1948 All-Union Electrotech. Inst. im. Lenin



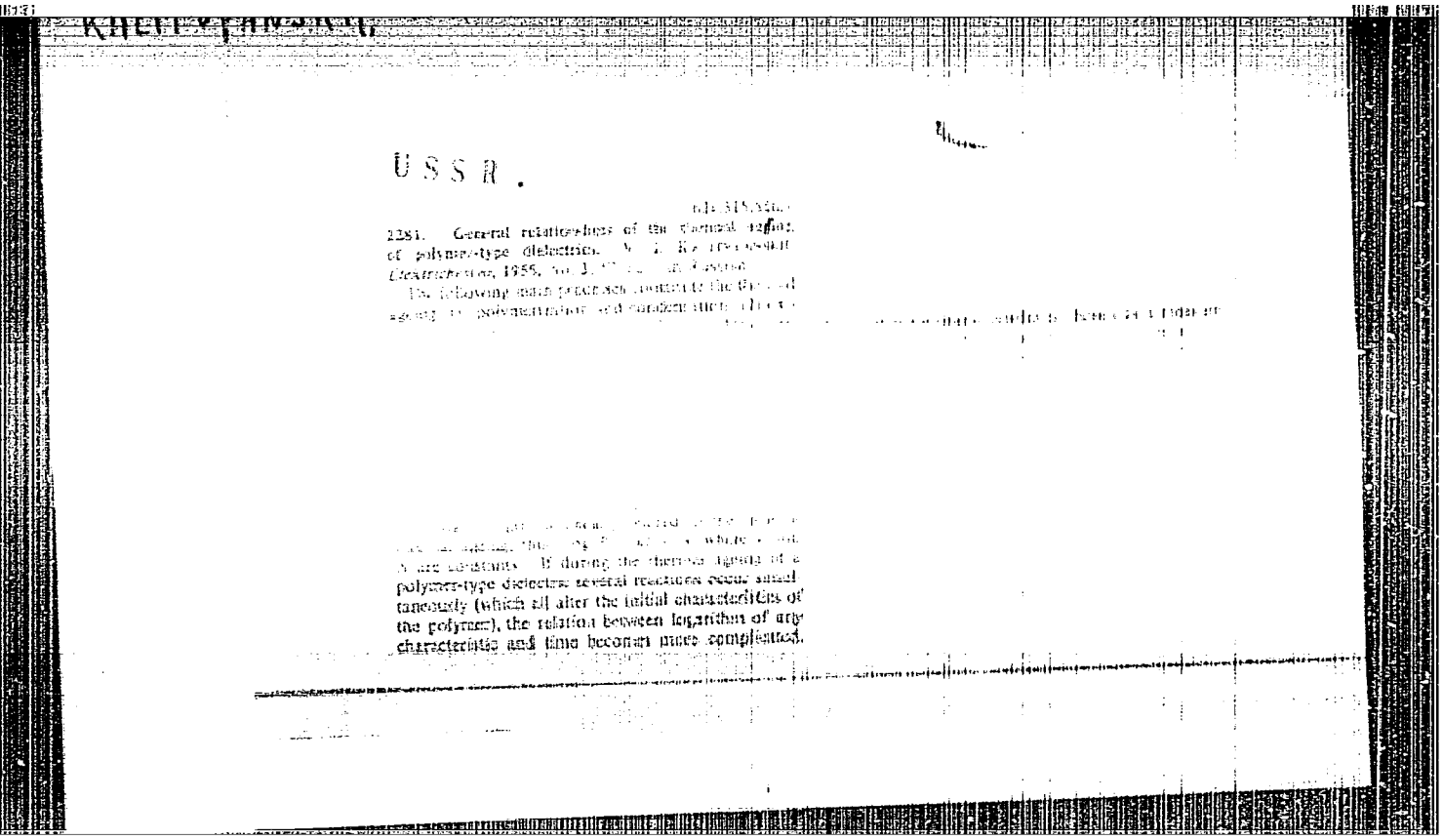
KALITVYANSKIY, V. I., and ANDRIYANOV, K. A.

"Applications of Polymers in the Electrical Industry," by K. A. Andriyanov and V. I. Kalitvyanskiy, Uspekhi Khimii i Tekhnologii Polimerov (Progress of the Chemistry and Technology of High Polymers), Vol 1, 1955, Goskhimizdat, Moscow, pp 3-23

The properties of dielectrics (particularly those used as insulating materials) are reviewed mainly on the basis of USSR publications (out of nine references listed in the bibliography, eight are USSR and 1 US). In the introduction to the article, the principal requirements with which high polymers used as dielectrics must comply are reviewed. The dielectric properties, heat stability, stability to the effects of sparks or of an electric arc discharge, sensitivity to moisture, mechanical properties, stability at low temperatures, heat conductivity, and chemical stability are considered from this standpoint. In connection with the discussion of heat stability, GOST standards pertaining to this characteristic are listed and the statement is made that small electrical machines of light weight and electrical equipment that operates at elevated temperatures require insulating materials which can stand heating to 180-200° and occasionally even up to 250°. As far as stability at low temperatures is concerned, the author points out that insulating materials may be subjected to temperatures reaching minus 60° during the operation of electrical equipment.

Polyethylene, polystyrene, polytetrafluoroethylene (fluoroplast), and aniline-formaldehyde resins are listed as dielectrics suitable for use in high-frequency equipment; their properties are described. The high heat stability (up to 180-200°) of polytetrafluorethylene and its stability at low temperatures (down to minus 73°) are mentioned as particularly advantageous characteristics. As dielectrics suitable for use in low-frequency equipment polyvinylchloride, polyvinylacetals, polyamides (capron), glyptal polyesters, phenol-formaldehyde resins, urea-formaldehyde resins, melamine-formaldehyde resins, and cellulose esters and ethers are listed and discussed. Organosilicon resins are described in great detail from the standpoint of their characteristics as dielectrics. Their superior heat stability is emphasized. The article ends with the following passage:

"The increasing demands put to high polymers by the electrical industry impose continuation of work on the development of new, more effective plastics, as well as on the improvement of already available plastics and the reduction of their cost.



USSR

2281. General relationships of the thermal effect of polymer-type dielectrics. [illegible] Elektrichestvo, 1955, No. 1, [illegible]

[illegible] polymer-type dielectrics several reactions occur simultaneously (which all alter the initial characteristics of the polymer), the relation between logarithm of any characteristic and time becomes more complicated.

KALITVYANSKIY, V. I.

AID P - 2010

Subject : USSR/Electricity

Card 1/2 Pub. 27 - 14/31

Authors : Andrianov, K. A., Corr. member, Academy of Sciences, USSR, Kalitvyanskiy, V. I., Kand. of Tech. Sci., Moscow

Title : The application of Organic silicon compounds in insulating electric machines

Periodical : Elektrichestvo, 4, 62-68, Ap 1955

Abstract : The authors present results of their four years of testing silicone insulation in motors working under difficult operational conditions. They describe the types of motors tested and the details of test procedure. The conclusions reached concern thermal aging and moisture resistance of insulations and also give some data on the dielectric dissipation factor and other dielectric characteristics which remain almost unchanged up to 200°C. Thirteen diagrams, 11 references (1945-1954) (4 Russian).

112-2-2730

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Nr 2, p. 17 (USSR)

AUTHOR: Andriyanov, K.A., Kalitvyanskiy, V.I.

TITLE: New Insulating Materials for Electric Machines and Apparatus (Novyye materialy dlya izolyatsii elektricheskikh mashin i apparatov)

PERIODICAL: Inform.-tekh. sb. M-vo radiotekh. prom-sti SSSR, 1955, Nrs 9-10, pp. 30-46

ABSTRACT: Bibliographic entry.

Card 1/1

KALITVYANSKIY, V.I.

AID P - 3443

Subject : USSR/Electricity

Card 1/2 Pub. 27 - 10/32

Authors : Kalitvyanskiy, V. I., Kand. of Tech. Sci., A. V. Koval'skaya, Kand. of Tech. Sci.

Title : Useful service life of new types of electric machinery insulation

Periodical : Elektrichestvo, 10, 40-44, O 1955

Abstract : The authors describe the results of tests for determining the useful service life of organic silicon and cellulose triacetate (pellicular) insulation of electrical machinery. This insulation was subjected to a complex action of increased heating, high moisture, electric field, and mechanical stresses. The correctness of the method used was confirmed in tests of motors with Class A insulation. A formula expressing the useful service life of these kinds of insulation was found. The extrapolation of

ZABIRINA, K. I. (Cand. Tech. Sci.) and KALITVYANSKIY, V. I. (Cand. Tech. Sci.)

"Silicone Materials for the Insulation of Electrical Machines,"

report presented at a Conference on New Electrical Insulating Materials and Technological Processes, Leningrad, Dec 1957

KALITVYANSKIY, V. I.

KALITVYANSKIY, V.I., kandidat tekhnicheskikh nauk.

Increasing the resistance of insulation and lacquer used for electric traction engines. Elek.i tepl.tiaga no.7:26-27 Jl '57. (MIRA 10:9)

(Electric locomotives) (Electric insulators and insulation)

FOTIN, V.P.; AKOPYAN, A.A.,red.; ANDRIANOV, K.A.,red.; BIRYUKOV, V.G.,glavnyy red.; BUTKEVICH, Yu.V.,zamestitel' glavnogo red.; GRANOVSKIY, V.L., red.; KALITVYANSKIY, V.I.,red.; KLYARFEL'D, B.N.,red.; KRAPIVIN, V.K., red.; TIMOFEYEV, P.V.,red.; FASTOVSKIY, V.G.,red.; TSEYROV, Ye.M., red.; SHEMAYEV, A.M.,red.; DEMKOV, Ye.D.,red.; FRIDKIN, A.M.,tekhn. red.

[Voltage increase on long a.c. lines during nonsymmetric short circuits to ground] Povysheniia napriazhenii v dlinnykh liniiakh peremennogo toka pri nesimmetrichnykh korotkikh zamykaniiakh na zemliu. Moskva, Gos.energ.izd-vo, 1958. 223 p. (Moscow. Vsesoiuznyi elektrotekhnicheskii institut. Trudy, no.64) (MIRA 12:2)
(Electric lines) (Short circuits)

SOV/81-59-13-47766

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 13, p 494 (USSR)

AUTHOR: Kalitvyanskiy, V.I.

TITLE: The Connection Between the Heating Resistance of Dielectrics and Their Chemical Composition and Structure

PERIODICAL: Tr. Vses. elektrotekhn. in-ta, 1958, Nr 62, pp 43 - 87

ABSTRACT: A review. There are 47 references. V.P.

Card 1/1

KALITVYANSKIY, V.I.

Behavior of polymeric dielectrics subjected to heating. Trudy VEI no.62:88-122 '58. (MIRA 11:11)
(Dielectrics)

SOKOLOV, Nikolay Nikolayevich; ANDRIANOV, K.A., red.; AKOPYAN, A.A., red.; BIRYUKOV, V.G., glavnyy red.; BUTKEVICH, G.V., red.; GRANOVSKIY, V.L. red.; GERTSENBERG, G.R., red.; ZABYRINA, K.I., red.; KALITVYANSKIY, V.I., red.; KLYARFEL'D, B.N.; SAKOVICH, A.A.; TIMOFEYEV, P.V.; FASTOVSKIY, V.G.; TSEYROV, Ye.M.; FRIDMAN, A.Ya.; SHEMAYEV, A.M.; TIMOKHINA, V.I., red.

[Methods for the synthesis of organopolysiloxanes] Metody sinteza poliorganosiloksanov. Moskva, Gos.energ. izd-vo. 1959. 198 p. (Moscow. Vsesoiuznyi elektrotekhnicheskii institut. Trudy, no.66) (MIRA 12:5)

(Siloxanes)

ANDRIANOV, Kuz'ma Andrianovich. Prinimali uchastiye: PARKSHEYAN, Kh.R; ROMANOV, R.G.; SEMENKO, P.Ya.; ZABYRINA, K.I., red.; KALITVYANSKIY, V.I., red.; KORITSKIY, Yu.V., red.; KHVAL'KOVSKIY, A.V., red.; EPSHTEYN, L.A., red.

[Macromolecular compounds for electrical insulation] Vysokomolekuliarnye soedineniia dlia elektricheskoi izoliatsii. Moskva, Gos. energ.izd-vo, 1961. 327 p. (Polimery v elektroizoliatsionnoi tekhnike, no.1) (MIRA 15:2)
(Electric insulators and insulation) (Polymers)

VARDENBURG, Arnol'd Kurtovich; ANDRIANOV, K.A., glavnyy red.; ZABYRINA, K.I., red.; KALITVYANSKIY, V.I., red.; KORITSKIY, Yu.V., red.; KHVAL'KOVSKIY, A.V., red.; EPSHTEYN, L.A., red. [deceased]; SHISHKIN, S.V., red.; BORUNOV, N.I., tekhn.red.

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(MIRA 16:8)

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Different equations of compression flow accompanied by condensation. In German. p. 53. Vol 13, No 1/2, 1955. ACTA MICROBIOLOGICA and ACTA TECHNICA. Budapest, Hungary.

So : Eastern European Accession. Vol 5, No 4, April 1956

KALITSIN, G.

Research in the theory of spheric mechanisms. p. 31.
(Izvestiia, Vol. 4, 1956, Bulgaria)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 6, June 1957, Uncl.

KALITSIN, G.

General matrix equations of some classes of mechanics. p. 51.
(Izvestiia, Vol. 4, 1956, Bulgaria)

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, no. 6, June 1957, Uncl.

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Vol. 4, 1956.
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So: East European Accession, Vol. 6, No. 3, March 1957

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Periodical: NAUCHNI TRUDOVE. Vol. 5, 1957.

KALITSIN, G. General matrix equation of mechanisms. p. 261.

Monthly List of East European Accessions (EEAI). LC, Vol. 8, No. 2
February 1959, unclass.

KALITZIN, G. ST.

Distr: 4E3a/4E3d/4E3e 2 cys

On the possibility of raising the thrust of rockets. N. St. Kalitzin and G. St. Kalitzin (Phys. Inst. Bulgaria. Acad. Sci., Sofia). *Astronaut Acta* 6, 75-77(1960).—The use of dissocd. H recombination is considered.

Alfred J. Zaehringer

L 32220-66 EWP(m)/T IJP(c) GW

ACC NR: AP6020835 SOURCE CODE: BU/0011/65/018/006/0505/0508

32
B

AUTHOR: Kalitzin, N.

ORG: Institute of Physics, Bulgarian Academy of Sciences, Sofia

TITLE: Exact solution of Einstein's gravitational equations and its application to groups of galaxies and quasi-stellar radio sources

SOURCE: Bulgarska akademiya na naukite. Doklady, v. 18, no. 6, 1965, 505-508

TOPIC TAGS: space matter, gravitation

ABSTRACT: The author presented earlier the exact solution of Einstein's gravitational equation for the problem of insular spherically symmetric accumulation of matter in empty space (see, e.g., N. S. Kalitzin, Monthly Notices, 122, 1961, 41; Dynamic der relativistischen Raketen und einiger astronomischen Objekte [Dynamics of Relativistic Rockets and of Certain Astronomical Objects], Bulg. Akad. Wissensch. S., 1963, p. 126). Here he studies a model consisting of a spherical region G with a spherically symmetric distribution of matter. The pressure inside G is assumed zero, and the density depends only on time. Outside, the density of matter vanishes, and the field approaches asymptotically the Minkowskian space. The results show that for a quasar radius of $r = 2R_g = 6 \cdot 10^{13}$ cm and mass $M = 10^8 M^\odot$ the peripheral velocity is 211,000 km/sec, i.e., the velocity of an extraordinary cosmic explosion. Such a velocity of matter cannot be the result of nuclear reactions or of gas or light pressure. It is a purely relativistic effect and justifies the above-mentioned hypothesis that the gas and light pressure may be neglected in this problem. Orig. art. has: 7 formulas. [Orig. art. in Eng.] [JPRS]

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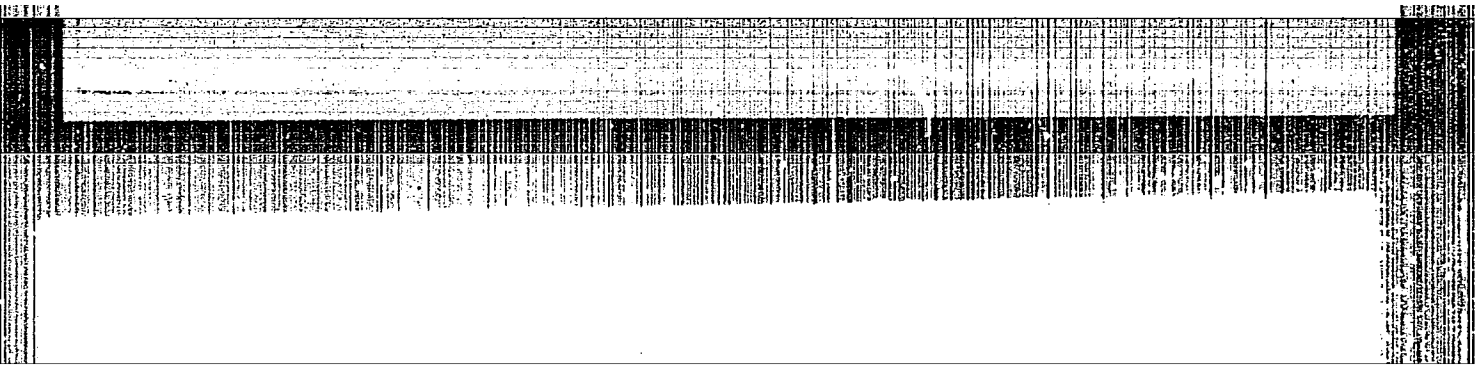

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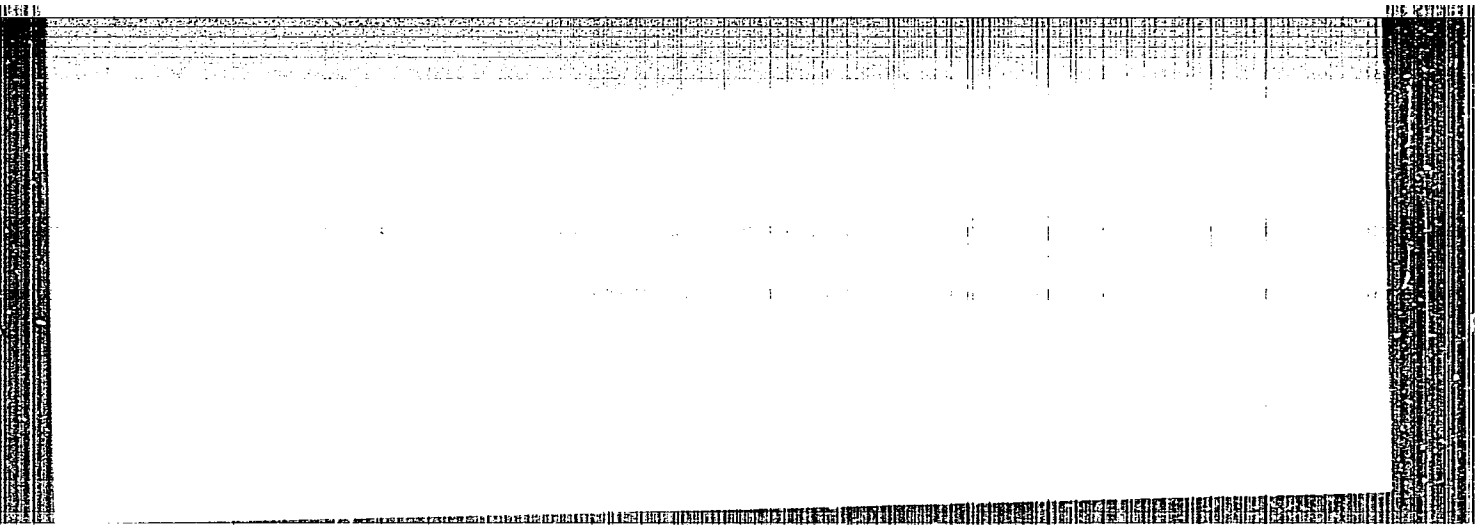

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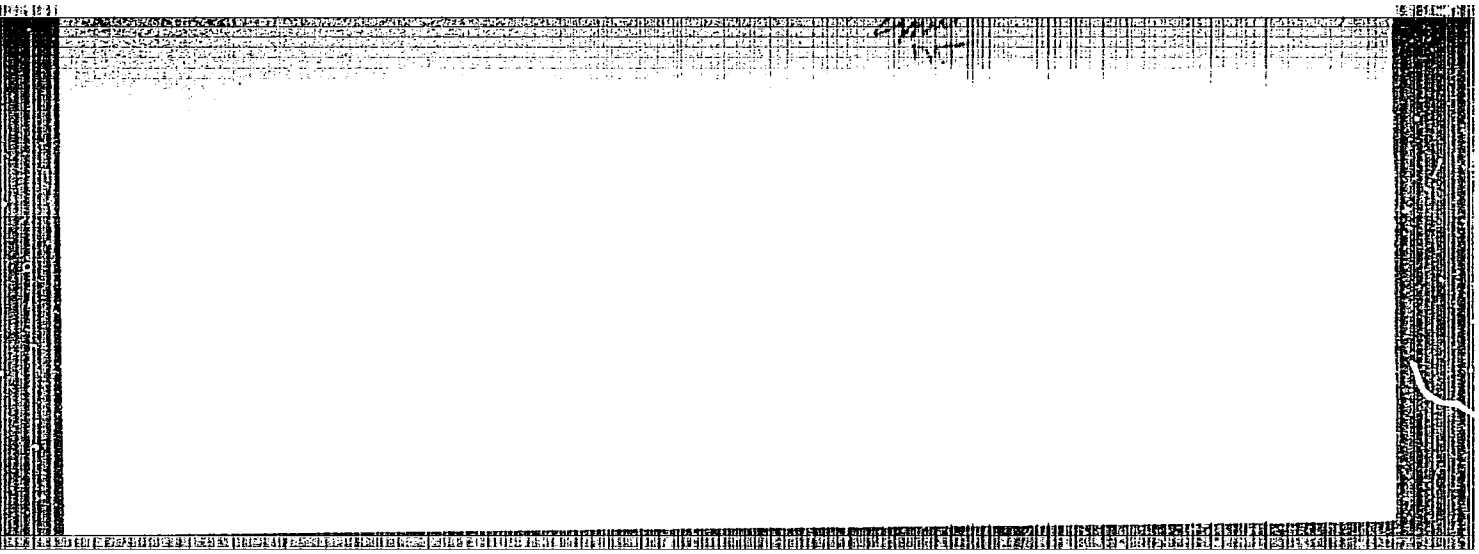

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KALITSIN, NIKOLA ST.

"Vurkhu niakoi-osnovni uravneniia na elektromagnitogravitatsionnoto bipole. Stalin, Nauka i izkustvo, 1952. 16 p. (Some fundamental equations of the meson field and the electromagnetic bipolar field of gravitation)

SO: East European, L. C. Vol. 2 No, 12, Dec., 1953

SO: Monthly List of Russian Accessions, Library of Congress, _____1953, Uncl.

KALITZIN, NIKOLA

Mathematical Reviews
Vol. 15 No. 2
Feb. 1954
Relativity

Kalitzin, Nikola. Elektromagnetismus und Gravitation. Izvestiya Bulgar. Akad. Nauk. Otd. Fiz.-Mat. Tehn. Nauk. Ser. Fiz. 2 (1951), 49–62 (1952). (Bulgarian. Russian and German summaries)

This paper is based on the earlier work of G. Nordström [Phys. Z. 15, 504–506 (1914); cf. also H. C. Corben, Physical Rev. (2) 69, 225–234 (1946); these Rev. 7, 533], in which the Maxwell equations for the electromagnetic field are generalized to five dimensions, the quantities associated with the fifth dimension then serving to describe the gravitational field. It is assumed that there exist two kinds of particles, having opposite charges and represented by world lines in five dimensions with velocity vectors in opposite directions. A neutral particle is assumed to be made up of a pair of such particles.

It should be noted that while such an approach gives, in a suitable approximation, the Newtonian description of gravitation, it fails to give the more accurate description provided by the general theory of relativity. *N. Rosen.*

KALITZIN, Nikola St.

Mathematical Reviews
Vol. 15 No. 4
Apr. 1954
Relativity

Kalitzin, Nikola St., Elektromagnetismus und Gravitation. C. R. Acad. Bulgare Sci. 4 (1951), no. 2-3, 13-16 (1953). (Russian summary)

Essentially a briefer version of what is given in Kalitzin, Izvestiya Bulgar. Akad. Nauk. Otd. Fiz.-Mat. Tehn. Nauk. Ser. Fiz. 2, 49-62 (1952); these Rev. 15, 169. *N. Rosen.*

KALITZIN, Nikola St.

Mathematical Reviews
Vol. 15 No. 4
Apr. 1954
Mathematical Physics

Kalitzin, Nik[illegible] St. Eine Verallgemeinerung der Gleichungen [illegible] Elektrodynamik. C. R. Acad. Bulgare Sci. 4 (1951), [illegible], 17–20 (1953). (Russian summary)

Contains part of the material given in Kalitzin, Izvestiya Bulgar. Akad. Nauk. Otd. Fiz.-Mat. Tehn. Nauk. Ser. Fiz. 2, 63–78 (1952); these Rev. 15, 169. *N. Rosen.*

KALITZIN, Nikola St.

Mathematical Reviews
Vol. 15 No. 4
Apr. 1954
Mathematical Physic

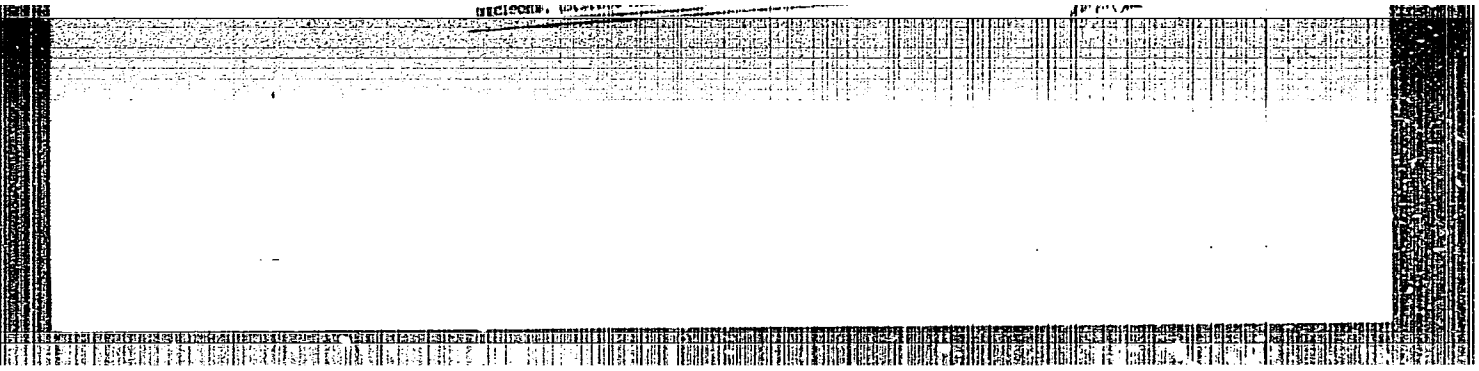
Kalitzin, Nikola St. Über eine neue Kerntheorie. Acta Phys. Acad. Sci. Hungar. 3, 45–53 (1953). (Russian summary)

This paper is a continuation of the work of Kalitzin [Izvestiya Bulgar. Akad. Nauk. Otd. Fiz.-Mat. Tehn. Nauk. Ser. Fiz. 2, 63–78 (1952); these Rev. 15, 169] and of Zaycoff [ibid. 2, 79–98 (1952); these Rev. 15, 170] based on a space of six dimensions and dealing with field equations involving a tensor potential. The author arrives at quantities which he interprets as the spin and two charges of a nucleon. In the static case he obtains an expression for the interaction between two nucleons involving these quantities and finds that the spin-interaction term is free from the usual dipole-potential singularity. *N. Rosen* (Haifa).

Kalitsin, N. S.

6210
A NEW VARIANT OF EQUATIONS OF THE MESON VECTOR
THEORY [illegible] Zhur. Eksper. i Teoret. Fiz. 34,
[illegible] (in Russian)

Equations derived for meson vector field in a five-dimensional space are used for calculating the potential of nuclear forces. Suitable choice of constants, effectively, in the nonrelativistic approximation, the singular dipole po- [illegible] of the 1/r^5 form. The final equation for the potential



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USSR

530.145

2490. On the interaction of an electron with the fluctuations of the electromagnetic field in a vacuum. N. S. KALITKIN. Zh. Eksper. Teor. Fiz., 25, No. 4, 497–9 (1953). In Russian.

In the manner of the papers of Welton [Abstr. (1949)] and Weisskopf [Abstr. 5412 (1949)] the equation of motion of a non-relativistic, classical electron (but with the radiative damping term $(2e^2/3c^3)\ddot{x}$ retained) subject to a periodic force is solved. The resulting root mean square amplitude due to the vacuum fluctuations is essentially the same as in Weisskopf when the same cut-off is used $[(mc^2/h\nu)^2$ for $h\nu > 2mc^2]$, but the mean kinetic energy of the fluctuations is finite $(\sim 3.14 \times 10^{-1})$ ergs].

W. L. SWIFT

KALITSIN, NIKOLA 54

Kalitzin, Nikola St. Untersuchungen über dem magnetischen Moment des Nukleons (relativistische Wellengleichung des Nukleons). [illegible]

spin. The resultant linear equation for the eight-component nucleon wave function is based on a six-dimensional space and involves eight "Dirac" matrices. [illegible]

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KALITSIN, N. S.

2

Kalitzin, Nikola St. Relativistische Mechanik des materiellen Punktes mit veränderlicher Masse. C. R. Acad. Bulgare Sci. 7 (1954), no. 2, 9–12 (1955). (Russian. German summary)

The equations of motion are derived within the framework of the classical special relativity theory for a particle having a variable rest-mass.

N. Rosen (Haifa).

KALITSIN

Category : USSR/Theoretical Physics - Quantum Electrodynamics B-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 2949

Author : Kalitsin Nikola St.
Title : On Certain New Methods of Eliminating Divergencies in Quantum Electrodynamics

Orig Pub : Izv. B"lgar. AN. Otd. fiz.-ma-tem. i tekhn. n., ser. fiz., 1955, 5, 37-66

Abstract : The author proposes a new method for eliminating infinities within the framework of modern quantum field theory. The idea of the method is to dispense with the renormalization method and to assume the nominal charge and mass of the electron to be equal to the experimental values; the divergent terms in the scattering matrix are eliminated by subtraction. The first principle of the new theory is the full symmetry of all the equations with respect to the signs of the energy and of the charge. Since particles with negative energy are not encountered in practice and exist only virtually, the second postulate of the new theory is as follows: particles with negative energies can appear only in closed Feynman diagrams. In this way, the divergent expressions in the scattering matrix are mutually cancelled out in pairs in particles with different signs of E, and the intrinsic energies of the electron and photon turn out to be finite. In order for this not

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Kalitsin

BULGARIA/Theoretical Physics B-6

Abs Jour : Referat Zhur - Fizika, No 5, 1957, No 10908

Author : Kalitsin Nikola, St.

Inst : 0

Title : Interaction Between the Nucleon and the Meson Field.

Orig Pub : Izv. B'lgar. AN. Otd. fiz.-matem. i Ukhn. n., ser. fiz., 1955, 5, 213-229

Abstract : To describe the interaction between the meson and nucleon fields, the following equation is proposed

$$[\beta_\mu (\partial/\partial x_\mu - \tfrac{1}{2} g \beta_\nu \beta_\sigma \varphi_{\mu\nu\sigma}) + m_0] \psi = 0$$

where μ, ν, $\sigma = 0, 1, 2, 3, 4, 5$, $\varphi_{\mu\nu\sigma}$ is the anti-symmetric tensor potential of the meson field, and β_ν

Card 1/2

KALITSIN, N. S.

USSR/Physics - Relativistic mechanics FD-2218

Card 1/1 Pub. 146-23/25

Author : Kalitsin, N. S.

Title : Relativistic mechanics of a material point of variable mass

Periodical : Zhur. eksp. i teor. fiz. 28, 631-632, May 1955

Abstract : The principles of nonrelativistic mechanics of a body of variable mass were established in the works of I. V. Meshcherskiy, whose equations are used to determine the motion of a rocket, weightless bodies of variable mass, etc.; however, his equations being based upon Newtonian mechanics hold only for a region of velocities small in comparison with the velocity of light c. For the important case of radioactive particles moving close to the velocity of light it is necessary to employ relativistic mechanics of a material point of variable mass. In the present note the author utilizes the 4-dimensional space of Minkowsky to investigate such motion. He thanks Professor Kh. Khrsitov. Two references: L. D. Landau and Ye. M. Lifshits, Teoriya polya (Field theory), OGIZ, Moscow-Leningrad, 1948; L. Loytsyanskiy and A. Lur'ye, Kurs teoreticheskoy mekhaniki, II, OGIZ, Moscow-Leningrad, 1948.

Institution : State University, Bulgaria, City of Stalin

Submitted : July 29, 1954

KALITSIN, N.

Nuclear electric-power station in the USSR, first nuclear electric-power station in the world. p.40. TEKHNIKA. (Suiuz na nauchno-tekhnicheskite druzhestva v Bulgariia) Sofila. Vol. 5, no. 1, Jan./Feb. 1956

SOURCE: East European Accessions List, (EEAL), Library of Congress, Vol. 5, no. 12, December 1956

KALITZIN, NIKOLA ST.

Category : HUNGARY/Theoretical Physics - Quantum Field Theory B-6

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 175

Author : Kalitzin, Nikola St.
Inst. : Physics Inst., Bulgarian Acad. of Sciences, Sofia
Title : On the Interaction of Nucleons with a Meson Field

Orig Pub : Acta phys. Acad. sci. hung., 1956, 6, No 1, 1-13

Abstract : The author suggests a reformulation of the wave equations for the nucleon and mesons with introduction of a six-dimensional space. The two additional coordinates introduced by the author are real. The corresponding irreducible representation of the Dirac algebra turns out, as is known, to have eight rows. The authors do not consider actual problems, and the general result reduces to the fact that the entire scheme of the theory is identical to the scheme of quantum electrodynamics in four-dimensional space. This indicates that the proposed theory is renormalizable to the same extent as the existing quantum electrodynamics. It is also noted that in the new mesodynamics all scattering cross sections should be bounded. This eliminates the other substantial difficulty in modern quantum mesodynamics. The physical contents of the proposed generalization is not considered.

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[illegible] leads to a generalized system of Tamm-Dancoff equations. When calculating the free energy, the nucleon interaction, etc., there arise supplementary terms which, possibly, will eliminate some of the difficulties of the known Tamm-Dancoff theory.

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KALITZIN, N. NIKOLA, ST.

BULGARIA/Nuclear Physics - Elementary Particles C-3

Abs Jour : Ref Zhur - Fizika, No 5, 1958, No 10148

Author : Kalitzin Nikola, St.
Inst : Physics Institute, Bulgarian Academy of Sciences.
Title : On the Structure of Nucleons and Hyperons

Orig Pub : Dokl. Bolg. AN, 1957, 10, No 1, 1-4

Abstract : It is proposed that the nucleon consists of two fundamental particles, a "nuclonide" and an "electronide," whose interaction is due to the exchange of mesons with mass approximately 965 m_e. The hyperons are considered as excited states of the nucleon. The nuclear forces from the atomic nucleus are explained by the exchange of the electronides. A result of this assumption are the repulsion forces between the nucleons and hyperons at small distances. Another result is the particular stability of the helium nuclei.

Card : 1/1

Application of the method of W. Ritz in the Quantum Theory of Fields 16

3
1-F\W

Kalitzin, Nikola St. Anwendung der Methode von W. Ritz in der Quantentheorie der Felder. C. R. Acad. Bulgare Sci. 10 (1957), 5–8. (Russian summary)

Potential Theory 16

BULGARIA/Theoretical Physics - Classic Electrodynamics. Classic Field B-3
Theory

Abs Jour : Ref Zhur - Fizika, No 3, 1959, No 4856

Author : Kalitzin Nikola St., Todorov Ivan
Inst : Physics Institute, Bulgarian Academy of Sciences
Title : Investigation of the Possibility of Representation of a Photon with the Aid of an Electromagnetic Model.

Orig Pub : Dokl. Bolg. AN, 1958, 11, No 1, 13-16

Abstract : It is assumed that the photon can be described with the aid of a Maxwell's equations, and the current vector entering into these equations corresponds to electric charges moving with the velocity of light. A regular solution of these equations is found and this solution is investigated. -- G.A. Zaytsev

Card : 1/1

Fundamental Equation of Relativistic Mechanics of a Material Point With Variable Mass

7563:

Kalitzin, Nikola St. Grundgleichungen der relativistischen Mechanik eines materiellen Punktes mit veränderlicher Masse. C. R. Acad. Bulgare Sci. 11 (1958), 185–188. (Russian summary)

The author continues with his study of the equations of motion (within the framework of the special theory of relativity) of a particle of variable rest-mass [same C. R. 7 (1954), no. 2 (1955), 9–12; Soviet Phys. JETP 28(1) (1955), 565–567 (Ž. Eksper. Teoret. Fiz. 631–632); MR 16, 1167; 17, 202]. A particle of rest-mass m, moving with velocity $u_i=dx_i/ds$ $(i=1, \cdots, 4)$, coalesces with a particle of rest-mass dm' and velocity a_i. The resulting momentum p_i of the system is expressed in the form $c(m+dm)(u_i+du_i)$. The equations of motion which had been previously obtained (loc. cit) correspond to the case $dm=dm'$. The present paper is concerned with the case $dp_i=0$, which, according to the author, describes the motion of a rocket in empty space devoid of gravitational fields.

H. Rund (Durban)

2
1-F\W

Fundamental Equations of Relativistic Mechanics for a Material Point of Variable Mass

Kalitzin, N. S. **Grundgleichungen der relativistischen Mechanik eines materiellen Punktes mit veränderlicher Masse.** Nuovo Cimento (10) 8 (1958), 843–849.

Verfasser verallgemeinert die zuerst von W. Meschtcherski angegebene nichtrelativistische Grundgleichung der Mechanik eines materiellen Punktes mit veränderlicher Masse auf den Bereich relativistischer Geschwindigkeiten. Im Bereich klassischer Geschwindigkeiten vom Betrag v hatte sich die aus der Meschtcherskischen Gleichung die klassische Formel $v=q \lg (m_0/m)$ ergeben, auf welcher Grund welcher die Bewegung ein- und mehrstufiger Raketen berechnet wird (dabei entspricht m_0 der Anfangsmasse für $v=v_0$, q ist als Geschwindigkeitsbetrag der weggeschleuderten Teilchen in Bezug auf die Rakete zu deuten). Wenn die zu v und q gehörenden Vektoren linear abhängig sind, gilt

$$\frac{m_0}{m} = \left(\frac{1+\frac{v}{c}}{1-\frac{v}{c}}\right)^{c/2q}$$

wie auch schon von E. Sänger angegeben worden ist. Als Spezialfall wird auch die "reine" Rakete behandelt, die sich in einem von Gravitation, Energie und Materie freien Raum bewegt.

M. Pinl (Köln)

24(5)

AUTHOR: Kalitsin, N. S., (Sofia, Bulgaria) SOV/56-36-5-43/76

TITLE: On the Paper by Ryabushko "On the Equations of Motion of Rotating Masses in the General Relativity Theory" (K rabote Ryabushko "Ob uravneniyakh dvizheniya vrashchayushchikhsya mass v obshchey teorii otnositel'nosti")

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 5, pp 1567-1569 (USSR)

ABSTRACT: The author of the present "Letter to the Editor" criticizes a paper by A. P. Ryabushko (Ref 1), who had endeavored, by means of the Infeld method, i.e. by introducing the Dirac δ-function into the energy-momentum tensor, to derive the equations of motion of a system of rotating bodies. In the present report the author first repeats the premises of the investigations and the fundamental equations which served as a basis to R. In the following he shows that the representation of the energy-momentum tensor used by R. was wrong, and that also the equation of motion derived by R. is wrong. He proves the latter on the basis of mathematical considerations. There are 6 references, 2 of which are Soviet.

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PHASE I BOOK EXPLOITATION BUL/5408

Kalitsin, Nikola Stilyanov, Professor

Teoriyata na otnositelnostta i astronavtikata (Theory of Relativity and Astronautics) Sofia, Dŭrzhavno Izdatelstvo "Nauka i Izkustvo", 1960. (Series: Biblioteka Matematicheski i Fizicheski Znaniya) 118 p. 3,078 copies printed.

Ed.: Z. Petrova, Tech. Ed.: G. Chordinov.

PURPOSE: This popular-science type book is intended for the general reader.

COVERAGE: The author reviews fundamental principles of the theory of relativity closely connected with astronautical problems. Special relativity theory is approached from different points of view. Discussion of absolute space and time, and of mass and energy is included. Conditions for space flights are examined, and chemical and nonchemical fuels are considered. Attention is given to Soviet photographs of the far side of the moon, the corona of the earth, scientific problems to be solved by space rocketry,

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Theory of Relativity (Cont.) BUL/5408

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D220/D301

26.1220

AUTHOR: Kalitsin, N. S., Professor, Engineer

TITLE: Rocket engineering

PERIODICAL: Tekhnika, no. 2, 1960, 25-28

TEXT: The article describes the principles of operation and design of liquid-propellant rocket engines, the propellants used so far and the basic principles of flight control. Stating that a liquid-propellant engine uses a propellant and an oxidizer both of which are injected into the thrust chamber by turbopumps under high pressure, the author lists some of the oxidizers, i.e. liquid oxygen, nitric acid, and some of the propellants such as ethyl alcohol, methyl alcohol, petroleum and gasoline. The pressure of the pumps driving the propellant through the injectors into the combustion chamber exceeds the pressure in the combustion chamber by 10 to 20 atm. depending on the design of the injectors and the resistance of the cooling system. The power of the turbines which

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Rocket engineering

drive the turbopumps varies from 5 to 8 hp/kg of liquid per second. Rockets using nitric acid and petroleum, or liquid oxygen and alcohol, are widely used. The calorific value of the alcohol-oxygen mixture amounts to H = 2,000 kcal/kg, and that of nitric acid and petroleum to 1,500 kcal/kg. The use of the first mixture is not very suitable because of the very low temperature of evaporation, as the boiling point of oxygen lies at - 183°C. At higher temperatures the oxygen begins to evaporate and special outlet valves are required on the fuel tanks to expell the gaseous oxygen. The expelled oxygen represents a loss. The mixture of gasoline or petroleum and liquid oxygen has a calorific value of H = 2,400 kcal/kg. To determine the quality of liquid-propellant rocket engines the specific impulse and specific propellant consumption are used. The specific impulse lies between 200 and 250 kg/sec/kg of propellant. To increase the specific impulse of the engines it is necessary to use, if possible, propellants with a much greater calorific value, i.e. to allow much higher temperatures be developed in the thrust

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Rocket engineering

chamber. According to official data it is not possible to use propellants with a temperature of combustion higher than 3,000°C. Table 1 shows, however, that many of the mixtures listed have much higher temperatures of combustion.

Table 1.

Oxidizer	Propellant	Specific impulse per sec.	Temperature in °C
Liquid fluorine	Liquid hydrogen	400	3600
Liquid ozone	Liquid hydrogen	385	2300
Liquid oxygen	Liquid hydrogen	360	2300
Liquid oxygen	Borium	330	3000
Liquid fluorine	Hydrazine	320	4450
Liquid oxygen	Diborane	310	3600

When such mixtures are used, special refractory materials are required to protect the thrust chamber walls. Although many ceramic materials have a high melting point they crack when exposed to rapid heating. There are, however, materials produced by firing me-

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tal powder mixed with ceramic powder. Certain materials produced this way can resist rapid heating without cracking and, having a higher melting point than many metals, may be used for the thrust chamber lining. Double-wall thrust chambers are built sometimes. In such thrust chambers, the propellant is left to circulate between both walls before being injected into the thrust chamber as shown in Fig. 2. Thus, the coolant absorbs the heat from the walls of the thrust chamber and the propellant is warmed up before injection into the combustion chamber. This improves the thermal effect of the engine. Another system of wall cooling consists of small holes in the walls, through which a liquid under high pressure is injected into the combustion chamber. The liquid introduced in such a way spreads along the inner lining of the chamber under the influence of the high speed of burning gases. Due to the high temperature, the liquid evaporates rapidly and forms a protective layer of steam as shown in Figs. 3 and 4.

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Fig. 2. Double walls of the thrust chamber, between which the propellant circulates.

Legend: 1) - Coolant; 2) - sec. A; 3) - cross-section BB.

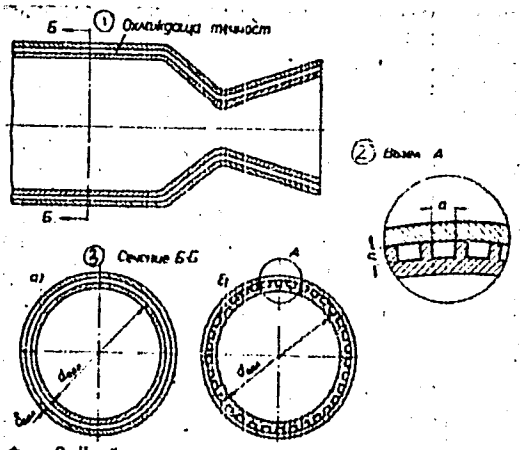

Fig. 2.

Фиг. 2. Двойни стени на камерата на горенето, помежду които тече охлаждаща течност

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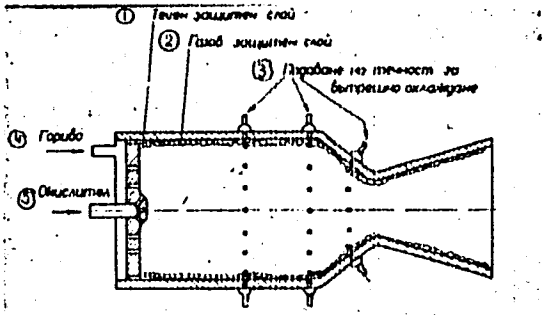
Fig. 3. Inner cooling of the combustion chamber.

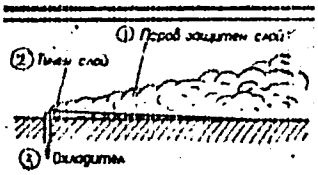
Legend: 1) - Liquid protective layer; 2) - gaseous protective layer; 3) - injection of liquid for inner cooling; 4) - propellant; 5) - oxidizer.



Фиг. 3. Вътрешно охлаждане на камерата на горенето

Fig. 4. Diagram showing the protective activity of the inner cooling.

Legend: 1) - Steam protective layer; 2) - liquid layer; 3) - cooler.



Фиг. 4. Схема на защитното действие на вътрешното охлаждане

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A thrust greater than 400 sec can not be achieved by use of propellants known at present. There is a possibility of using atomized hydrogen in rocket engines. It is known that when the hydrogen atoms in a hydrogen molecule perform a so-called re-combination, large quantities of heat are produced, i.e. about 10 times greater than those when normal propellant mixtures are burning. If such a re-combination of atoms is used, it would be theoretically possible to achieve a specific impulse of up to 1,400 sec. Unfortunately, atomized hydrogen is very unstable but scientific research is underway to make it stable by using extremely low temperatures. It might be possible to obtain metastable molecules of helium with hydrogen or oxygen which may ensure an extremely high specific impulse when disintegrating. The trajectory of a modern space rocket consists of an active and a passive stage. In the first, i.e. the active stage of its trajectory the rocket is accelerated by its engines up to the required speed and takes the required flight direction. Later, i.e. in the passive stage the rocket travels without being driven by its engine behaving in accordance with the

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laws of celestial mechanics, i.e. it travels under the influence of lunar, solar or Earth's gravity. The most difficult stage of the trajectory is the active one. The deviation of the rocket from its estimated trajectory depends on it and, therefore, speed and the flight direction are strictly to be maintained. Rockets designed to land on the Moon must maintain their initial speed with an accuracy up to several meters per second, and the flight direction with an accuracy which is measured by fractions of a degree. The basic systems of flight control are the system of autonomous control, telemetering and the self-directing system. The autonomous system of control does not permit human interference. If the rocket deviates from its trajectory, it is impossible to correct the direction. The telemetering system will be indispensable for rockets designed to land on the Moon and return to the Earth. The self-directing system, i.e. when the rocket follows the curve of pursuit, will be applied when artificial satellites are used as "rocketdromes" for future interplanetary rockets. This system will, most probably, be

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used in rockets designed to convey loads from the Earth to the artificial satellites. There are 1 table and 5 figures.

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KALITZIN, N. ST.

Distr: 4E3a/4E3d/4E3e 2 cys

On the possibility of raising the thrust of rockets. N. St. Kalitzin and G. St. Kalitzin (Phys. Inst. Bulgaria. Acad. Sci., Sofia). *Astronaut Acta* 6, 75–77(1960).—The use of dissocd. H recombination is considered.

Alfred J. Zaehringer

KALITSIN, N. St.
Surname (in caps); Given Names

Country: Bulgaria

Academic Degrees: Professor, Engineer

Affiliation: not indicated

Source: Sofia, Priroda, No 1, Jan/Feb 61, pp 7-12

Data: "New Soviet Astronautic Achievements."

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ACC NR: AP6026273 SOURCE CODE: BU/0011/65/018/007/0627/0629

AUTHOR: Kalitzin, N.

ORG: Institute of Physics, BAN, Sofia

TITLE: CP invariance, the Paritino and the spurion

SOURCE: Bulgarska akademiya na naukite. Doklady, v. 18, no. 7, 1965, 627-629

TOPIC TAGS: parity principle, antiparticle, particle physics, nuclear particle

ABSTRACT: The author proposes a new pseudoscalar zero rest-mass particle—the Paritino--in conjunction with the problem of parity nonconversion in weak interactions. The particle is analogous to the neutrino, is supposed stable, electrically neutral, and has a parity of -1. Paritino is assumed identical with its antiparticle and, therefore, its CP-parity is -1. The new particle is very similar to the spurion introduced by various researchers (G. Wentzel, Proceedings of the Sixth Annual Rochester Conference on High-Energy Nuclear Physics, Interscience Publishers, New York, 1956; M. Gell-Mann, A. H. Rosenfeld, Ann. Rev. Nucl. Sci., 7, 1957, 407; A. Salam, J. C. Ward, Phys. Rev. Letters, 5, 1960, 8, 390). This paper was presented by Academician H. Hristov on 5 April 1965. The author thanks Professor H. Hristov and Pavel Markov for their stimulating discussions. Orig. art. has: 3 formulas. [Orig. art. in Eng.] [JPRS: 33,545]

SUB CODE: 20 / SUBM DATE: none / OTH REF: 010

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KALIVA, V.

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Periodical: BER BUJQESISHE SOCIALISTE.

KALIVA, V. Protection of citrus trees against cold weather.

Vol. 13, no. 2, Feb. 1959

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