

BRISKIN, Leonid Yakovlevich; FILIMONOV, P.V., nauchnyy red.; CHISLOV,
M.M., red.; BARANOVA, N.N., tekhn. red.; DORODNOVA, L.A.,
tekhn. red.

[Safety measures for electric work in construction]Elektro-
bezopasnost' na stroitel'stve. Moskva, Proftekhizdat, 1962.
115 p. (MIRA 15:8)

(Electric engineering--Safety measures)

FILIMONOV, P.V.

Installation of unshielded 380/220 v. power distribution boards
with exposed current conducting parts. Energetik 10 no.4:34
Ap '62. (MIRA 15:4)
(Electric power distribution--Safety regulations)

FILIMONOV, P.V.

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Electrical wiring in explosion-hazardous systems. Prom.
energ. 18 no.5:62 My '63. (MIRA 16:6)

(Electric wiring—Safety regulations)

SHEVCHENKO, N.F.; FILIMONOV, P.V.

Electronic EMP and EMR automatic d.c. bridges. Prom. energ. 20
no.1:52-53 Ja '65. (MIRA 18:4)

SHEVCHENKO, N.F.; FILIMONOV, P.V.

SLUVZG-1M signal lamp device. Prom. energ. 20 no.2:58 '65.

Standardized UEPK-VZG electric drive. Ibid.:59

(MIRA 18:4)

FILIMNOV, S.A.

The TUK-3 ultrasonic resonance thickness meter. Biul.tekh.-ekon.inform.
Gos.nauch.-issl.inst.nauch.i tekh.inform. 17 no.1:52-54 '64.
(MIRA 17:2)

L. 24822.66 EWT(d)/EWT(h)/EWP(v)/EWP(j)/T/EWP(k)/EWP(h)/EWP(l)/ETC(m)-6

ACC NR: AP6006955 IWP(c) (N) WH/RM SOURCE CODE: UR/0381/65/000/006/0061/0068

AUTHORS: Lange, Yu. V.; Pilimonov, S. A.; Shishkina, N. V.; Pakhomov, V. V.; Veremeyenko, S. V.; Pyrkov, B. Ia.

ORG: none

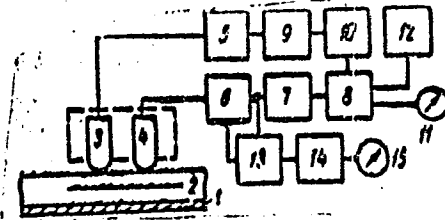
TITLE: UVFD-1 defectoscope for controlling multilayered structures and nonmetallic parts

SOURCE: Defektoskopiya, no. 6, 1965, 61-68

TOPIC TAGS: defectoscope, diagnostic instrument, electric device, electronic circuit /UVFD-1 defectoscope

ABSTRACT: The block diagram and detailed electric circuitry of a UVFD-1 defectoscope are given. Referring to Fig. 1,

Fig. 1. Block diagram of a UVFD-1 defectoscope.



Card 1/2

UDC: 620.179.16

L 24822-66

ACC NR: AP6006955

the defectoscope consists of: 1 - metallic base, 2 - nonmetallic film deposit, 3 - emitting oscillator, 4 - receiving oscillator, 5 - generator to feed power to the vibrator, 6 - amplifier, 7 - shaper, 8 - phase-measuring circuit, 9 - phase regulator, 10 - shaper, 11 - needle indicator, 12 - relay instrument, 13 - detector for automatic regulating of amplification, 14 - amplitude measuring device, and 15 - indicator. The instrument has four types of scanner heads that operate on a frequency range 25-60 keycle. A sketch is included for one such scanner head connected to the instrument by a coaxial cable. The instrument weighs 11 kg and is portable. It is used in conjunction with automatic recorders and is very useful for controlling nonmetallic film deposits on metallic bases and for identifying defects between the joints of multilayer structures. Orig. art. has: 4 figures.

SUB CODE: 14, 09/ SUBM DATE: 16Jun65/ ORIG REF: 005

Card 2/2 97

FILIMONOV, S.I.; IVANOVA, L.N.

Apparatus for simultaneous registration of blood pressure and sounds within the heart. Trudy NIIKHAI no.5:241-244 '61.
(MIRA 15:8)

1. Nauchno-issledovatel'skiy institut eksperimental'noy khirurgi-cheskoy apparatury i instrumentov.
(BLOOD PRESSURE) (HEART—SOUNDS)

FILIMONOV, S.I.

Apparatus for gastric irrigation. Voen.-med. zhur no.5:80-81 My '57.
(IRRIGATION, (MIRA 12:7)
stomach, appar. (Rus))
(STOMACH,
irrigation, appar (Rus))

FILIMONOV, S.I., ROSTOVTSEV, B.N.

Improved apparatus for cardiac examination. Med.prom. 12 no.8:46-47
Ag'58 (MIRA 11:9)

1. Nauchno-issledovatel'skiy institut eksperimental'noy khirurgicheskoy apparatury i instrumentov.
(HEART--EXAMINATION)
(PHYSIOLOGICAL APPARATUS)

FILIMONOV, S. I.

USSR/ Physics - Mass - spectroscopes

Card 1/2 : Pub. 22 - 9/52

Authors : Alekseyevskiy, N. E.; Prudkovskiy, G. P.; Kosourov, G. I. and
Filimonov, S. I.

Title : Use of a non-uniform magnetic field for the purpose of increasing
the resolving power of a mass-spectrometer

Periodical : Dok. AN USSR 100/2, 229-232, Jan 11, 1955

Abstract : Experiments conducted with mass-spectrometers are described. The
purpose of the experiments was to find out the effect of a non-
uniform magnetic field used with the mass spectrometers on the
resolving power of the latter. The results of the experiments
show that a non-uniform magnetic field increases the resolving
power of a mass-spectrometer by a factor of $\frac{1}{1-n}$,

Institution : Acad. of Scs of the USSR, S. I. Vavilov, Institute of Physical
Problems.

Presented by : Academician A. P. Alexandroff, September 30, 1954

Periodical : Dok. AN ESSR 100/2, 229-232, Jan 11, 1954

Card 2/2 Pub. 22 - 9/52

Abstract : Where η is the coefficient of non-uniformity of the field. It can be calculated by the following formula:

$$\eta = -\frac{\partial H}{\partial r} \frac{r}{H} \Big|_{r=r_0} \text{ or } \eta = \frac{r_0}{r_0+a} = 2 \frac{r_0}{r_0} \tan \frac{\theta}{2}, \theta$$

is the angle between generatrices of the magnetic conical tips used for the formation of the non-uniform field. l_0 is the width of the slit on the radius r_0 . Nine references: 1 USSR; 2 German; 6 USA (1941-1952). Diagrams; graphs.

ФИЛИМОНОВ, С. И.

PHASE I BOOK EXPLOITATION NOV/1997

Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po primeneniyu radioaktivnykh i stabil'nykh izotopov i izlucheniya v narodnoe khozyaystve i nauke, Moscow, 1957

Polucheniye izotopov. Koshchnyye gamma-ustanovki. Radiometriya i dosimetriya; trudy konferentsii... (Isotope Production. High-energy Gamma-Radiation Facilities. Radioemetry and Dosimetry; Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and Science) Moscow, Izd-vo AN SSSR, 1958. 293 p. 5,000 copies printed.

Spetsial'naya Agenty: Akademiy nauk SSSR; Olanovye upravleniye po ispol'tovaniyu atomnoy energii SSSR.

Editorial Board: Prolov, Yu.S. (Resp. Ed.), Zhavoronkov, M.M. (Deputy Resp. Ed.), Agintsev, K.K., Alekseyev, B.A., Bocharov, V.V., Lebedinskiy, M.I., Malkov, T.P., Sintayn, V.I., and Popov, G.B. (Secretary); Tech. Ed.: Kovichkov, M.D.

FOREWORD: This collection is published for scientists, technologists, persons engaged in medicine or medical research, and others concerned with the production and/or use of radioactive and stable isotopes and radiation.

CONTENTS: Thirty-eight reports are included in this collection under three main subject divisions: 1) production of isotopes 2) high-energy gamma-radiation facilities, and 3) radiometry and dosimetry.

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Prolov, Yu.S., V.V. Bocharov, and Ye.Ye. Kulish. Development of Isotope Production in the Soviet Union. 5
This report is a general survey of production methods, apparatus, raw materials, applications, investigations, and future prospects for radio isotopes in the Soviet Union.

Card 2/12

Aleksyevskiy, M.Ye., A.V. Dubrovyn, G.I. Kosurov, O.P. Prudkovskiy, S.I. Filimonov, V.I. Chekin, V.M. Smelyapin (deceased), and T.M. Shuvalova. Utilization of Mass Spectrometers With a Monohomogeneous Field for Analyzing Isotopes of Light Elements 73

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Gverdtsitell, I.O., and V.K. Takhakaya. Separation of Isotopes of Light Elements by Diffusion in Vapors 113

Baryshch, G.F., and R.Ya. Kucherov. A Diffusion Column for Separating Isotopes 122

Card 5/12

KAPITSA, P.L., akademik; FILIMONOV, S.I.; KAPITSA, S.P.

Theory of electronic processes in a magnetron generator with
continuous power output. Elektron. bolsh. moshch. no.3:
7-35 '64. (MIRA 17:9)

1. Otvetsvennyy redaktor zhurnala "Elektronika bol'shikh
moshchenostey" (for P.L. Kapitsa).

FILIMONOV, S.I., insh.; GUZUN, M.I., agronom-vinogradar'; SININA, V., red.;
POLEVAYA, Ye., tekhn.red.

[Mechanization of grape nurseries] Mekhanizatsiia rabot v vino-
gradnom pitomnike. Kishinev, Gos.isd-vo "Kartia Moldoveniaska,"
1960. 131 p. (MIRA 14:3)
(Viticulture) (Agricultural machinery)

DIBNER, Ye.E., red.; LISTENGURT, M.A., st. nauchn. sotr., kand. sel'khoz. nauk, red.; MEYSAKHOVICH, Ya.A., kand. sel'khoz. nauk, red.; TARASOVA, A.yu., red.; FILIMONOV, S.I., red.; SHKORUPEYEV, I.S., red.; SHLYAKHOVOY, Ye.M., red.; SININA, V., red.; POLONSKIY, S., tekhn. red.

[Mechanization of work in plant protection] Mekhanizatsia rabot po zashchite rasteniy; sbornik trudov. Kishinev, Izd-vo sel'khoz. lit-ry, 1961. 187 p. (MIRA 16;2)

1. Nauchno-tekhnicheskoye soveshchaniye po voprosam konstruirovaniya mashin dlya zashchity plodovykh kul'tur i vinograda. Kishinev, 1960. 2. Predsedatel' Moldavskogo respublikanskogo pravleniya Nauchno-tekhnicheskogo obshchestva mashinostroitel'noy promyshlennosti, zamestitel' predsedatelya sovmarkhoza Moldavskoy SSR (for Shkorupeyev). 3. Vsesoyuznyy nauchno-issledovatel'skiy institut zashchity rasteniy (for Meysakhovich). 4. Moldavskaya stantsiya zashchity rasteniy (for Listengurt). 5. Zamestitel' nachal'nika Gosudarstvennogo spetsial'nogo konstruktorskogo byuro po mashinam dlya mekhanizatsii rabot v sadakh i na vinogradnikakh (for Dibner). 6. Nachal'nik laboratorii ispytaniy mashin Gosudarstvennogo spetsial'nogo konstruktorskogo byuro po mashinam dlya mekhanizatsii rabot v sadakh i na vinogradnikakh (for Shlyakhovoy). Nachal'nik issledovatel'skogo otdela Gosudarstvennogo spetsial'nogo konstruktorskogo byuro po mashinam dlya mekhanizatsii rabot v sadakh i na vinogradnikakh (for Filimonov).

(Spraying and dusting equipment)

DIBNER, Ye. E., inzh.; FILIMONOV, S. I., inzh.

Mechanization of the fumigation of soils in vineyards. Zashch.
rast. ot vred. 1 bol. 5 no.10:15-17 0 '60.
(MIRA 16:1)

1. Gosudarstvennoye spetsial'noye konstruktorskoye byuro
Moldavskogo soveta narodnogo khozyaystva, g. Kishinev.

(Phylloxera—Extermination) (Fumigation)

E 11146-65 EWT(d)/EWT(L)/ERC(t)-2/EMA(h) Pn-L/Pi-L/Pj-L/Pac-L/Feb ESD(t)

S/3055/64/000/003/0007/0035

A404727

Academician, Filimov, S. I. Kap...

theory of electronic processes in a c.w. magnetron...

SOURCE: AN SSSR. Fizicheskaya laboratoriya. Elektronika bol'shikh moshchnostey, no. 3, 1964, 7-35

TOPIC TAGS: oscillator theory, continuous wave oscillator, magnetron oscillator, nigonron

ABSTRACT: The paper presents the theory and description of high-power continuous-wave oscillators, one-row and two-row nigonrons, operating at decl... about 15 and 20 cm. This is a continuation of the theory of... magnetron-type, the... have a periodic structure... equivalent systems which, in nigonrons...

2 11/14/65

ACCESSION NR: AT4047273

0

π -type oscillation which takes place in a magnetron. During operation of a niqo-
oscillator mode is excited in the cathode. A series of several
oscillations were fabricated; they were the first to be made. At
the same time, the efficiency of the oscillator was increased
by a factor of 10. Further development is required to make the
oscillator more reliable and to improve its performance. The
oscillator has been operating for several years and has been reliable
and efficient. The oscillator has been used in a number of
applications and has been found to be a very reliable and
efficient oscillator.

date

PERMITTED: 00

ENCL: 00

SLR CODE: EC

no

OTHER: 000

Filimonov, S.L.

USSR/Human and Animal Physiology - Digestion.

V-7

Abs Jour : Ref Zhur - Biol., No 1, 1958, 4064

Author : C.L. Filimonov

Inst : -

Title : An Apparatus for the Irrigation of the Stomach.

Orig Pub : Voen.-med. zh., 1957, No 5, 80-81

Abstract : A description is given of a simple apparatus for the irrigation and lavage of the stomach under field and ambulatory conditions. The fluid gets into the stomach through one of the canals of the probe with the help of a manual vacuum pump, and is evenly expelled through another canal under the effect of the same pump.

Card 1/1

FILIMONOV, S.L. (Daugavpils)

Olive-tip made out of AKR-7 plastic for gastric bougies. Klin.med.
35 no.4:124 Ap '57. (MLRA 10:7)
(BOUGIES)

FILIMONOV, S.S.

Laboratory investigations conducted on control of road sections
located in channels. Sbor. nauch. trud. po lesospl. no.2:95-110
'57. (MIRA 11:7)
(Lumber--Transportation) (Hydraulic models)

GAVRILOV, Ye.N., inzh.; GONIK, A.A., kand. tekhn. nauk; DONSKOY, I.P., kand. tekhn. nauk; ZHUKOV, G.A., inzh.[deceased]; LAZAREV, M.P., inzh.; NEFEDOV, S.I., inzh.; PETROV, Ya.P., kand. tekhn. nauk; SAVEL'YEV, V.V., kand. tekhn. nauk; FILIMONOV, S.S., inzh.; SHUL'TS, G.F., kand. tekhn. nauk; ZOTOV, N.V., inzh., retsenzent; ORLOV, N.N., inzh., otv. red.; KOZLOV, A.D., red.izd-va; AKOPOVA, V.M., tekhn. red.

[Water transportation of lumber] Vodnyi transport lesa; spravochnik. Moskva, Goslesbumizdat, 1963. 560 p.
(MIRA 16:11)

(Lumber---Transportation)

FILIMONOV, S. S.

Mining Engineering

Dissertation: "Investigation of Heat Exchange by Convection in High-Pressure Boiler Furnaces." Cand Tech Sci, Power Engineering Inst imeni G. M. Krzhizhanovskiy, Acad Sci USSR, 5 Apr 54. (Vechernyaya Moskva Moscow, 24 Mar 54)

SO: SUM 213, 20 Sep 1954

FILIMONOV
FILIMONOV, S.S., kandidat tekhnicheskikh nauk; **KHRUSTALEV, B.A.**, kandidat tekhnicheskikh nauk; **KOLCHENOGOVA, I.P.**, kandidat tekhnicheskikh nauk

Experimental investigation of heat exchange in furnaces. Teplo-energetika 2 no.7:30-33 J1'55. (MLRA 8:10)

1. Energeticheskiy institut Akademii nauk SSSR (Furnaces)

KONAKOV, P.K., doktor tekhnicheskikh nauk; FILINONOV, S.S., kandidat tekhnicheskikh nauk; NIKOLAEV, B.S., kandidat tekhnicheskikh nauk.

Calculation of heat exchange in boiler furnaces [with summary in English]. *Teplotengetika* 4 no.8:49-53 Ag '57. (MLRA 10:9)

1. Energeticheskiy institut Akademii nauk SSSR.
(Boilers) (Heat--Transmission)

FILIMONOV, S.S.

AUTHOR: KONAKOV, P.K., FILIMONOV, S.S., KHRUSTALEV, B.A. PA - 3562

TITLE: On the Calculation of Radiative Heat Exchange in a Cooled Combustion Chamber. (K raschetu luchistogo teploobmena v okhlazhdayemykh kamerakh gorennya, Russian)

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 5, pp 1066 - 1075 (U.S.S.R.)

ABSTRACT: A scheme for the heat exchange process in combustion chambers is suggested, which makes it possible to determine the required radiation temperature T_s and to calculate the radiation heat exchange. It is assumed that near the heat absorbing surfaces there is a layer of the medium which is in equilibrium with radiation, the molecular temperature of the medium and the radiation temperature being equal to each other. It is assumed that on the way from the balanced layer to the wall radiation is not in interaction with the medium, i.e. there is a transfer of radiation energy by effusion. It is therefore assumed that the temperature of this layer is equal to the T_s on the heat-absorbing surface. The temperature of the balanced layer adjusts itself in accordance with an interaction between the medium and the radiation in the core of the flow. The molecular-kinetic temperature of the balanced layer is determined by means of a field analysis of the molecular temperatures of the ignition chamber. Thus, the balanced layer divides the ignition chamber into two zones: one that is close against the

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PA - 3562

On the Calculation of Radiative Heat Exchange in a Cooled Combustion Chamber.

wall and comprises the domain from the heat absorbing surface to the balanced layer. The second zone, the medium core, comprises the rest of the space. The existence of a radiation equilibrium near the heat absorbing surfaces is proved theoretically and experimentally. The thickness of the balanced layer is measured in millimeters. On the basis of what has been said it is possible to determine the radiation temperature on the heat-absorbing surface and to calculate the radiative heat exchange in the combustion chamber. (With 10 illustrations and 7 Slavic references)

ASSOCIATION: Institute for Energetics "G.M.KRZHIZHANOVSKIY", Moscow

PRESENTED BY:

SUBMITTED: 17.7.1956

AVAILABLE: Library of Congress

Card 2/2

KHRUSTALEV, B.A.; FILIMONOV, S.S.

Temperature field in combustion chambers. Teploenergetika [Energ. inst.]
no.1:62-70 '59. (MIRA 13:2)
(Thermodynamics) (Furnaces)

24(6)

Академија наук СССР. Energeticheskiy Institut Imeni
G. N. Krzhizhanovskiy
Teplotnergetika VVP. 1 (Heat Power Engineering, Nr. 1) Moscow, copies
Izd-vo AN SSSR, 1959. 143 p. Errata slip inserted. No. of copies
printed not given.

Ed. of Publishing House: V. A. Kotovi Tech. Ed.: Yu. V. Rylymskiy
Editorial Board: V. A. Baum, Doctor of Technical Sciences,
Professor (Resp. Ed.); G. Ye. Kholodovskiy, Doctor of Technical
Sciences; M. I. Yushchenkova, Candidate of Technical Sciences;
Z. L. Mitropol'skiy, Candidate of Technical Sciences (Secretary);
and S. G. Poyarkov, Candidate of Technical Sciences.

PURPOSE: This work is intended for scientists and engineers working
in the field of steam boilers.

COVERS: This is a collection of 9 articles on the circulation of
water and water-vapor mixture in boilers, bubbling processes,
radiation heat transfer, temperature fields in and the solution of
radiation heat transfer between gray bodies. There is also an
article describing mathematical physics. There is also an
article describing processes occurring in the steam boiler of a
nuclear heat energy station. References appear at the end of
each article.

Work conducted at thermoelectric laboratories in cooperation
with Heat and Electric Power Plant (Izra) No. 9.

Bartolomay, G. O., Ye. G. Vinokur, V. A. Kolokolnikov, and
V. I. Panchukov. Experimental Investigation of Vapor and Gas
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It was found that the distribution of volume vapor content
and air content along the elevation of the bubbling vessel at
at insignificant reduced velocities of vapor or air, and at
low boiler water salt content, remains qualitatively the
same over various pressures and characteristics of perforated
plates. An increase in the weight level of steam. An increase in
pressure results in a decrease of vapor content. An increase in
the reduced velocity of steam when the water is of low salt
content increases the volume vapor content.

Semenov, M. I. Pulsations of Pressure in the Flow of Gas-Liquid
Mixtures in Pipes 46

The article describes experiments in pressure pulsation in
four 1/8" long pipes of different diameters, 25.8, 27.8, 74.7,
and 95.8 mm. The flow velocity changed from 0.2 to 5m/sec.
The gas content changed from 0.05 to 0.95. Graphical representa-
tion of experimental results are given.

Mirpoevskiy, Z. L., and B. I. Smayzerova. Investigation of a
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mining the average values of steam volume contents ϕ_{av} in
pipes and in conduits of rectangular cross section. The
methods obtained are also valid for conduits of
arbitrary geometrical shapes. Diagrams and graphs are given.

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independence of dimensionless temperature fields from the
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type of combustion processes.

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Surinov, Yu. A. Investigation of Radiation Heat Transfer in
Systems of Gray Bodies 79

The author develops a theory of radiation and radiation heat
transfer. The equations appearing in the article permit a
theoretical-probability solution of a mixed problem in radi-
ation heat transfer in a system of gray bodies in a diathermal
space, and 2) Solution of a mixed problem of radiation heat

Filimonov, S.S.

PLASMA BOIL EXPIRATION 201/2570

Akademiya nauk SSSR. Energeticheskii Institut

Konspirologiya i Inzheneriya Teploobmen (Convection and Radiation Heat Transfer) Moscow, Izdatel' M SSSR, 1960. 224 p. Series slip inserted. 3,000 copies printed.

Ed. M.A. Milobogov, Akademicheskii M. of Publishing House G.S. Gornoburov: Tech. M.: V.Y. Braugol'

PREFACE: The book is intended for scientists and engineers working in various branches of science and industry concerned with thermodynamics and heat transfer problems.

CONTENT: The book consists of 19 original articles on various problems in thermodynamics. The following subjects are discussed: mechanism of heat transfer processes; lateralization of heat exchange; determination of flow of gas, and properties of operating valves; heat transfer in pipes; experimental techniques; combustion chambers and nuclear reactors; physical and chemical processes; tables of the experimental data obtained are given. The data may be used for calculations of heat transfer and heat exchangers. Always taking account of

Milobogov, M.A., Filimonov, S.S., and S.A. Gornoburov. Investigation of heat transfer in boiling of water in tubes. Izvestiya Akad. Nauk SSSR, 1959, 1, 1-10. Priblizh. I.M. Heat Transfer in Vertical Pipes in Natural Convection

Milobogov, M.A., and I.D. Polozov. Critical Thermal Currents in Boiling Underheated Water in Channels of Complex Form (100 atm pressure) 65

Milobogov, M.A., and V.G. Malozemov. Experimental Data on Heat Transfer in Bubbling Boiling of Underheated Water in Pipes 79

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AVIARMS. Library of Congress

KONAKOV, Petr Kuz'mich, prof., doktor tekhn.nauk; FILIMONOV, Sergey
Sergeyevich, kand.tekhn.nauk; KHRUSTALEV, Boris Aleksandrovich,
kand.tekhn.nauk; ARNOL'D, L.V., prof., renszent; LAKHANIN,
V.V., prof., doktor tekhn.nauk, nauchnyy red.; SHELENNIKOVA,
Z.V., red.izd-va; BODROVA, V.A., tekhn.red.

[Heat exchange in the combustion chambers of steam boilers]
Teplobmen v kamerakh sgoraniia parovykh kotlov. Moskva, Izd-vo
"Rechnoi transport," 1960. 269 p. (MIRA 13:5)
(Boilers) (Furnaces)

32381

S/124/61/000/012/025/038

D237/D304

26.5200

AUTHORS:

Filimonov, S. S., and Khrustalev, B. A.

TITLE:

On calculating heat transfer and hydraulic drag in the laminar flow of fluid in tubes

PERIODICAL:

Referativnyy zhurnal, Mekhanika, no. 12, 1961, 95, abstract 12B655 (V sb. Konvektivn. i luchisty teploobmen. M., AN SSSR, 1960, 221-232)

TEXT:

The method of processing experimental data is given, allowing the calculations of local and mean characteristics of heat transfer and hydraulic resistance in laminar flow of fluids in tubes heated in a constant flow of heat under the condition of simultaneous development of thermal and hydrodynamic boundary layers. It is shown that the dependence of the Nusselt No. on Gretz criterion, ✓

Card 1/4

32381

S/124/61/000/012/025/038

D237/D304

On calculating heat...

$$N_{fx} = f (Gz')$$

$$\left(N = \frac{qd}{(t_{wx} - t_{fx}) h_{fx}} , \quad Gz' = \frac{x/d}{P'_f} \right) , \quad (1)$$

does not fully reflect the influence of all parameters on the mode of development, as the spread over the layer of experimental points depends on the magnitude of thermal flow q on the temperature of the fluid on entering the experimental region. The author succeeded in representing the experimental data by

$$N_{fx} \left(\frac{P_{wx}}{P_{fx}} \right)^{1/3} = 4.36 + 0.36 X^{-1/2} \times 10^{-18X} , \quad (2)$$

Card 2/4

32381
 S/124/61/000/012/025/038
 D237/D304

On calculating heat...

which enables the calculation of the wall temperature at any point of the tube under the condition of constant thermal flow with simultaneous formation of thermal and hydrodynamic boundary layers. Graphs of $N_{fx} (P_{wx} / P_{fx})^{1/3}$ v. X are given for the experimental data of various authors. A formula is proposed for the determination of the region of thermal stability, and a graph is given of the mean Nusselt No. N v. mean value of the criterium X. Experimental data on hydraulic resistance for the front part of the tube $((x/d) R_f^{-1} \approx 0.065)$ are satisfactorily described by

$$\frac{\xi_x R_f^1}{(P_{wx}/P_{fx})^{1/3}} = 64 + 3.2 \left(\frac{x/d}{R_f^1} \right)^{-0.56} 10^{-14.6} \frac{x/d}{R_f^1} \quad (3)$$

Card 3/4

On calculating; heat...

32381
S/124/61/000/012/025/038
D237/D304

Graphs are given of the change of local and mean coefficients of hydraulic resistance v. the criterium x/dR_f' , and a formula is given for determining the initial hydrodynamic region. [Ab-stracter's note: Complete translation.] ✓

Card 4/4

S/057/60/030/06/15/023
B012/B064

81594

24.5500

AUTHORS: Filimonov, S. S., Khrustalev, B. A., Adrianov, V. N.

TITLE: On the Theoretical Principles of the Method of the Two Radiometers /9

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 6, pp. 690-698

TEXT: V. S. Kocho (Ref. 1) introduced a method for the separate measurement of the radiation flow and the convective flow (method of two radiometers). This was used in the investigation of the heat exchange in the Siemens-Martin furnaces (Ref. 1) and in the combustion chambers (Refs. 2, 3). In the present paper this method is analyzed. The heat absorption at the relevant place of heating is measured simultaneously by means of two radiometers with different degrees of blackening A_1, A_2 , of the heat-absorbing elements. The formulas (1) and (2) are written down for the calculation of the heating flow. It is assumed that the density $E_{incident}$ of the incident radiation is equal for both radiometers. Furthermore, it is assumed that

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On the Theoretical Principles of the Method
of the Two Radiometers

S/057/60/030/06/15/023 81594
B012/B064

the convective flows for both radiometers are equal and $= q_k$. Formula (5) is derived for $E_{incident}$ and (6) for q_k which are commonly used in calculations. The constancy of $E_{incident}$ is maintained if the measuring surface of the radiometer is considerably smaller than the over-all surface of the heat exchanger. In order to prove the accuracy of the assumption of the mutual independence of the convective and the radiation current the experimental investigation described herein was carried out. This was done by means of 3 radiometers. This proof was based on the idea that, if the assumption was right, any pair of radiometers would yield the same results as the other two pairs. The investigation showed that the hypothesis of the mutual independence of the radiation flow and the convective flow in the medium boundary layer in the combustion chambers is in practice maintained with sufficient accuracy. The experiments have shown that by the method of two radiometers and by fulfilling the conditions

$$\frac{A_2}{A_1} \ll 0.2 \quad \text{and} \quad \frac{F_{radiometer}}{F_{heating-}} \ll 1 \quad \text{satisfactory results were obtained.}$$

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On the Theoretical Principles of the Method of the Two Radiometers S/057/60/030/06/15/023 81594
B012/B064

This should also be considered in the production of the radiometers. In the present paper also a mathematical analysis of the accuracy of formulas (5) and (6) was carried out on the basis of the error theory. The two methods applicable in this case are given. On the basis of this analysis formulas (10), (11), (12), and (13) were derived. With these formulas all the extreme relative errors in the required quantities can be calculated in dependence of all the factors influencing such quantities. The analysis showed that the errors $\delta_{E_{\text{incident}}}$ and δ_{q_k} diminish with decreasing ratio

$\frac{A_2}{A_1}$. This was confirmed by the results obtained from the experimental investigation. There are 8 figures and 4 Soviet references. WT

SUBMITTED: November 18, 1957

Card 3/3

FILIMONOV, S. S., and KHRUSTALEV, B. A.

"Evaluation of Local Heat Transfer and Hydraulic Resistance
at Turbulent Flow of Water in Tubes with Different Inlets."

Report submitted for the Conference on Heat and Mass Transfer,
Minsk, BSSR, June 1961.

ACCESSION NR: AP4004156

S/0294/63/001/002/0318/0320

AUTHOR: Fillimonov, S. S.; Kryukova, M. G.; Teplov, S. V.; Aycistov, A. A.

TITLE: Test stand for studying heat transfer in the flow of liquid aluminum in a pipe

SOURCE: Teplofizika vy*sokikh temperatur, v. 1, no. 2, 1963, 318-320

TOPIC TAGS: heat transfer, liquid aluminum heat exchanger, liquid metal, liquid aluminum, aluminum heat transfer, heat exchanger, liquid metal coolant, coolant, fluid flow

ABSTRACT: A test stand has been designed for heat-transfer studies with liquid aluminum. The use of liquid aluminum as a heat-transfer agent in heat exchangers operating at temperatures exceeding 1200C is being investigated since difficulties are encountered with alkali metals at such temperatures. Fig. 1 of the Enclosure shows the test assembly. An induction-type electromagnetic pump with a traveling magnetic field (capacity 3 m³/hr) was specially

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ACCESSION NR: AP4004156

developed for the assembly. Two types of heating can be used: an electric nichrome heater, which will heat the pipe uniformly at a heat flux of 5×10^6 kcal/m².hr, or an electron bombardment heater, which will give higher heat fluxes. Thermal expansion of the graphite parts is compensated by means of slyphon expansion joints. All parts of the assembly in contact with the aluminum are made from pyrolytic graphite. Preliminary testing for 200 hr with individual test runs of up to 12-hr duration showed the design to be satisfactory and the assembly suitable for heat transfer studies. Orig. art. has: 1 figure.

ASSOCIATION: Energeticheskiy institut im. G. M. Krzhizhanovskogo
(Power Engineering Institute)

SUBMITTED: 15Apr63

DATE ACQ: 26Dec63

ENCL: 01

SUB CODE: PR

NO REF SOV: 000

OTHER: 000

Card 2/3

1 16398-65 EPP(c)/EPP(n)-2/EPR/EPA(s)-2/ENI(l)/ENI(m)/EPA(bb)-2/ENP(b)/r/
 Pr-4/Ps-4/Pt-10/Pu-4 IJP(c)/BDD/AS/m)-2/ASD/a)/SDP/ASD/AS-2/
 ACCESSION NR AP5001154 ASD(p)-3 JD/WH/JG S/0294/64/002/006/0901/0909

AUTHOR: Filimonov, S. S.; Kryukova, M. G.; Teplov, S. V.

TITLE: Investigating heat transfer in pipe flow of liquid aluminum ^B

SOURCE: Teplofizika vysokikh temperatur, v. 2, no. 6, 1964, 901-909 ²⁷

TOPIC TAGS: heat transfer agent, liquid metal, heat transfer, aluminum

ABSTRACT: The Krzhizhanovskiy Power Institute investigated experimentally the heat transfer in a pipe flow of liquid aluminum with a view to using liquid aluminum as a high-temperature (above 1300°C) coolant. The experiments were conducted with a high-purity 4.99999% aluminum in a specially designed openable loop, in which the test section consisted of an electrically heated vertical graphite pipe. Flow rate and temperature of aluminum at the inlet and outlet of the test section and the wall temperatures were measured under steady-state conditions with turbulent flow and uniform heat supply to the test section. The heat transfer coefficient was determined from plots of the inside-surface temperature of the pipe versus the mean calorimetric temperature of aluminum at a given cross section.

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ACCESSION NR: AP5001154

The experimental data in terms of Nu and Pe numbers are presented in Fig. 1 of the Enclosure along with the results of other investigators for heat transfer in turbulent flow of alkali metals. The curves obtained are well described by the equation $Nu = 5 + 0.025 Pe^{0.8}$ derived by several authors on the basis of experimental data for heat transfer in turbulent flow of alkali metals and mercury. Orig. art. has: 7 formulas, 1 table, and 3 figures.

ASSOCIATION: Energeticheskiy Institut im. G. M. Krzhizhanovskogo
(Power Institute)

SUBMITTED: 20Jun64

ENCL: 01

SUB CODE: MM, TD

NO REF SOV: 007

OTHER: 002

ATD PRESS: 3154

Card 2/3

L 18398-65

ACCESSION NUMBER AP5001154

ENCLOSURE: 01

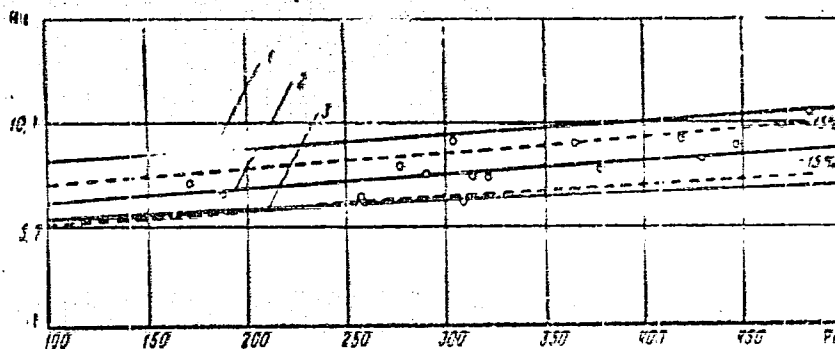


Fig. 1. Curves of $Nu = f(Pe)$

o - Present experimental data;
[1-3] - other data.

Card 3/3

ПЛАН РАБ. С.С.

Reducing wood losses during lumber floating. Bul. tekhn.-ekon.
Inform. Gos. nauch.-issl. nauch. i tekhn. inform. 17 no.9:55-58
S '64 (MIRA 18:1)

FILIMONOV, Sergey Sergoyevich; POTAPOV, Fedor Andreyevich

[Felling and floating birch timber] Zagotovka i spla.
drevesiny berezy. Moskva, Lesnaia promyshlennost',
1965. 72 p. (MIRA 19:1)

ACC NR: AP6026505 (A) SOURCE CODE: UR/0118/66/000/005/0016/0018

AUTHOR: Verte, L. A. (Candidate of technical sciences); Filimonov, S. S.
(Candidate of technical sciences)

ORG: none

TITLE: Induction pump for liquid aluminum

SOURCE: Mekhanizatsiya i avtomatizatsiya proizvodstva, no. 5, 1966, 16-18

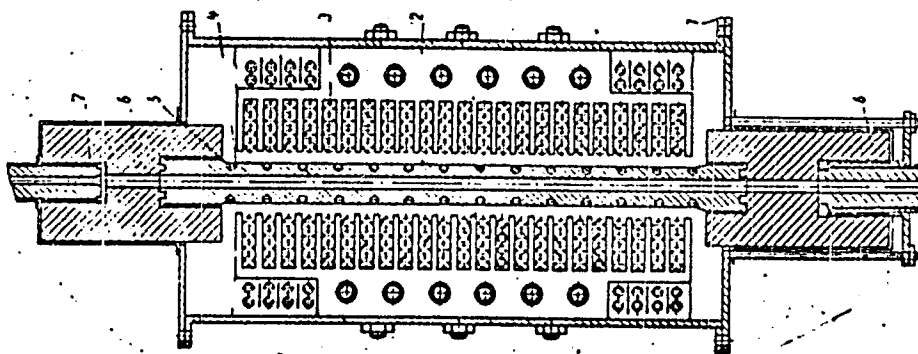
TOPIC TAGS: liquid metal pump, electromagnetic pump

ABSTRACT: In 1961, a new induction pump was developed for the purpose of circu-
lating liquid aluminum through an experimental heat-exchange circuit at the Power-
Engineering Institute im.Krzhizhanovskiy. The pump's essential parts (see figure)
are: 1 - housing, 2 - magnets, 3 - three-phase windings made from cooling-water-
carrying copper tubing, 4 - aluminum-carrying graphite channel, 5 - starting heaters,
6 - graphite connection nipples. The pump has a capacity of $0.195 \times 10^{-3} \text{ m}^3/\text{sec}$ and
develops a pressure of 1 kg/cm^2 ; phase voltage, about 45 v. The pump has had over
30 operations; overall working time, 150 hrs. Orig. art. has: 2 figures and 1 table.

Card 1/2

UDC: 621.65 / 68:656.546.621

ACC NR: AP6026505



SUB CODE: 13, 09 / SUBM DATE: none

Card 2/2

L 42943-56 EWT(m)/EWP(t)/ETI IJP(c) JH/JD/NW/GD/JG

ACC NR: AT60:29312

SOURCE CODE: UR/0000/66/000/000/0068/0083

AUTHOR: Filimonov, S. S.; Kryukova, M. G.; Teplov, S. V.

71
8+1

ORG: Power Engineering Institute im. G. M. Krzhizhanovskiy (Enegeticheskiy institut)

TITLE: Aluminum as a high temperature coolant

SOURCE: Moscow. Energeticheskiy institut. Teploobmen v elementakh energeticheskikh ustanovok (Heat exchange in power installation units). Moscow, Izd-vo Nauka, 1966, 68-83

TOPIC TAGS: ^{thermal} high-temperature reactor, reactor-cooling, nuclear reactor, reactor ^{nuclear} coolant, ~~liquid-metal~~ cooling, aluminum, ~~coolant~~, liquid-aluminum, liquid ^{metal} aluminum coolant

ABSTRACT: Since 1959, the Power Engineering Institute im. G. M. Krzhizhanovskiy has been engaged in a study dealing with the use of liquid aluminum as a coolant for high temperature nuclear reactors. The experimental equipment and some of the results of this study are described. From the study, it was concluded that the difficulties encountered in the practical use of aluminum as a coolant can be successfully overcome, and that the heat transfer during the flow of liquid aluminum through pipes can be calculated with the equations used for calculating the heat transfer of other liquid metal coolants. Orig. art. has: 4 figures and 5 tables. [AV]

SUB CODE: 13/ SUBM DATE: 05Apr66/ ORIG REF: 016/ OTH REF: 008/ ATD PRESS:5069
Card 1/1 MLE

VECHTOMOV, M.I., inzh.; KUDRYAVTSEV, V.A., inzh.; MALKES, D.A., inzh.;
OSTROVSKIY, G.I.; POVERENNIY, L.D.; SUSHKOV, P.M., inzh.;
TYULENEV, N.Z., inzh. Primalni uchastiye: GALYANOVA, N.S., inzh.;
PUTEYEVA, N.P.; IZRAYLOVICH, Ye.A., inzh.; MARCHENKO, G.A., inzh.;
MALYGINA, Z.S.; SOKOLOVA, Ye.A.; SOKOV, V.N., inzh.; TARASOVA,
S.N.; TASHAYEV, A.L., inzh.; FILIMONOV, S.V.; DRALICH, K.F., inzh.,
nauch. red.; NOVITCHENKO, K.M., inzh., nauchnyy red.; SIMAKOV,
S.N., inzh., nauchnyy red.; FAKTOROVICH, Yu.A., kand. tekhn. nauk,
nauchnyy red.; STUPIN, Ye.N., otv. red.; LUTOV, N.S., red.;
IVANOV, V.S., red.; BAGUZOV, N.P., glav. red.; VOLCHEGORSKIY, M.S.,
zam. glav. red.; DOBRYNIN, S.N., red.; NAZAROV, I.A., red.;
KOLESNIKOV, S.I., red.; MEL'NIKOV, N.P., red.; SUSNIKOV, A.A., red.;
STAROVEROV, I.G., red.; LYTKINA, L.S., red. izd-va; GORDEYEV, P.A.,
red. izd-va; OSENKO, L.M., tekhn. red.

[Handbook for the designer of industrial, residential, and public
buildings and structures; organization of construction and execu-
tion of building and assembly operations. Industrial construc-
tion] Spravochnik proektirovshchika promyshlennykh, zhilykh i
obshchestvennykh zdaniy i sooruzheniy; organizatsiya stroitel'-
stva i proizvodstvo stroitel'no-montazhnykh rabot. Promyshlen-
noe stroitel'stvo. Pod red. P.M.Sushkova. Moskva, Gos.izd-vo
lit-ry po stroit., arkhitekt. i stroit. materialam, 1961. 372 p.
(MIRA 15:2)

(Industrial buildings)

BUKSHTEYN, D.I.; AFANAS'YEVA, A.A.; MIKHAYLOV, V.G.; SUSHKOV, P.M.;
FILIMONOV, S.V.; ROZHDESTVENSKIY, I.I.; GERASIMOVA, G.S.,
red.izd-va; RUDAKOVA, M.I., tekhn.red.

[Methods and norms for determining rated costs of and labor required in making precast reinforced concrete construction elements.] Metodika i normativy dlia opredeleniia raschetnoi stoimosti i trudookosti sbornykh zhelezobetonnykh konstruksii na stadii ikh proektirovaniia. Moskva, Gos.izd-vo lit-ry po stroit., arkhit. i stroit.materialam, 1960. 62 p.

(MIRA 13:6)

1. Moscow. Gosudarstvennyy institut tipovogo proyektirovaniya i tekhnicheskikh issledovaniy. 2. Institut ekonomiki stroitel'stva (for Bukshteyn, Afanas'yeva). 3. Institut betona i zhelezobetona (for Mikhaylov). 4. Gosudarstvennyy institut tipovogo proektirovaniya i tekhnicheskikh issledovaniy (Giprotis) (for Sushkov, Filimonov, Rozhdestvenskiy).

(Construction industry--Costs)

FILIMONOV, S.Ye.

New order for estimating in railroad construction. Transp.stroi. 6
no.3:23-24 Mr '56. (MLRA 9:7)

1.Glavnyy spetsialist otdela Giproprromtransstroya.
(Railroads--Cost of construction)

FILIMONOV, S.Ye., inzhener, otvetstvennyy red.; PEVZNER, A.S., red.izdatel'stva;
GUSEVA, S.S., tekhn.red.

[Collection of supplements, elucidations, and amendments pertaining to the uniform district prices] Sbornik dopolnenii, raz'iasnenii i popravok k edinyam raionnym edinichnym rastsenkam. Moskva, Gos. izd-vo lit-ry po stroit.i arkhiz., 1957. 94 p. (MIRA 10:12)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.

(Building materials--Cost)

FILIMONOV, S. Ye., inzh., red.; PEVZNER, A.S., red.izd-va; SOLNTSEVA,
L.M., tekhn.red.

[Collection of additions, explanations, and corrections to
standard district rates] Sbornik dopolnenii, raz"iasnenii
i popravok k edinyam raionnym edinichnym rastsenkam. Moskva,
Gos.izd-vo lit-ry po stroit., arkhit. i stroit.materialam.
No.2. 1958. 37 p. (MIRA 12:9)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam
stroitel'stva.

(Building--Estimates)

CHERNYSHEV, Petr Georgiyevich; FILIMONOV, Semen Yevgen'yevich; RUSANOV, Nikolay Vasil'yovich [deceased]; BABKIN, Aleksandr Rodionovich; KHISHTAL', L.I., red.; BOBROVA, Ye.N., tekhn.red.

[Estimates, bookkeeping, and technical records in construction and track management] Smety, uchët i tekhnicheskaya otchetnost' v stroitel'stve i putevom khoziaistve. Pod obshchei red. P.G. Chernysheva. Moskva, Gos.transp.zhel-dor.izd-vo, 1959. 235 p.
(MIRA 12:9)

(Railroads--Accounts, bookkeeping, etc.)

FILIMONOV, S.Ye., inzh., otv.red.; RUDAKOVA, N.I., tekhn.red.

[Additions, explanations, and/corrections to standard district rates for building work] Sbornik dopolnenii, raz"iasnenii i popravok k edinyim raionnym edinichnym rastsenkam na stroitel'nye raboty. Moskva, Gos.izd-vo lit-ry po stroit., arkhit. i stroit. materialam. No.3. 1960. 465 p. (MIRA 13:7)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva.

(Building--Estimates)

MALYUGIN, V.I.; YEFRE'OV, S.A., kand. tekhn. nauk; REYNIN, S.N.;
BUKSHTEYN, D.I.; DUNAYEV, Ye.S.; KIL', A.Kh.; KRAKOVICH,
A.A.; FILIMONOV, S.Ye.; PETROV, I.A., prof., doktor
tekhn. nauk, nauchn. red.; GIROVSKIY, V.F., prof., doktor
ekon. nauk, nauchn. red.; GERASIMOVA, G.S., red. izd-va;
GOL'BERG, T.M., tekhn. red.

[Manual for estimated costs in construction] Spravochnik
po smetnomu delu v stroitel'stve. Moskva, Gosstroizdat,
Pt.2. 1963. 462 p. (MIRA 16:12)

1. Akademiya stroitel'stva i arkhitektury SSSR. Nauchno-
issledovatel'skiy institut ekonomiki stroitel'stva.
(Construction industry--Costs)

DESYATNIK, E.M., inzh., red.; YELISEYEVA, Ye.Ye., inzh., red.;
MURASHOV, A.G., inzh., red.; GUSEV, V.I., inzh., red.;
MALAKHOV, A.Ye., inzh., red.; PETROV, G.P., inzh., red.;
FILIMONOV, S.Ye., inzh., red.; ROKKO, M.A., inzh., red.;
ANDREYEV, L.N., inzh., red.; TURIANSKIY, M.A., inzh., red.;
ZERENKOV, A.D., inzh., red.

[Collections Nos. 10, 20, 31, and 42 of standard district
uniform estimates for construction work] Sborniki No.10,
20, 31 i 42 edinykh raiornykh edinichnykh rastsenok na
stroitel'nye raboty. Moskva, Stroizdat, 1965.

(MIRA 18:10)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po de-
lam stroitel'stva. 2. Gosstroy SSSR (for Desyatnik, Gusev,
Filimonov). 3. Nauchno-issledovatel'skiy institut ekonomiki
stroitel'stva Gosstroya SSSR (for Yeliseyeva, Murashov,
Rokko, Andreyev, Malakhov, Turianskiy). 4. Gosudarstvennyy soyuz-
nyy institut po proyektirovaniyu spetsial'nykh sooruzheniy, zdaniy,
sanitarno-tekhnicheskikh i energeticheskikh ustroystv i dva predpri-
yatiy khimicheskoy promyshlennosti (for Petrov). 5. ~~Sentral'nyy~~ Sentral'nyy
nauchno-issledovatel'skiy i proyektno-eksperimental'nyy institut
promyshlennykh zdaniy i sooruzheniy (for Zerenkov).

SOV/84-58-10-5/54

AUTHOR: Filimonov, V.

TITLE: Labor Duty (Trudovaya vakhta)

PERIODICAL: Grazhdanskaya aviatsiya, 1958, Nr 10, p 5 (USSR)

ABSTRACT: The author tells of the pledge to fulfill the annual plan by 18 December [1959], i.e., ahead of schedule, made by the crews in his unit in honor of the XXI KPSS Congress. The Red Banner challenge prize had, in the past 8 months, been awarded twice to the personnel of the unit for superior performance by the Main Administration of the Air Fleet (GUGVP) and the Central Committee of the Union of Aviation Workers (Soyuz aviarabotnikov).

Card 1/1

FILIMONOV, V.

Work program of meteorological posts. Meteor. i gidrol. no.10:
47 0 '61. (MIRA 14:9)
(Tuva Autonomous Province--Meteorology--Observations)

FILIHONCV, V.A. (g. Khar'kov).

Using indicators. *Fiz. v shkole* 17 no.3:67-69 My-Je '57.
(Measuring instruments) (MLBA 10:6)

KNORRE, V.E., inzh.; LIKHACHEV, A.S., inzh.; LUNKEVICH, M.V., inzh.;
MURAV'YEV, I.N., inzh.; FILIMONOV, V.A., inzh.

Public utilities and communications in a satellite city
near Moscow. Gor.khoz.Mosk. 34 no.4:10-13 Ap '60.
(MIRA 13:8)

(Kryukovo—City planning)
(Kryukovo—Sewerage)

ZELENEVSKIY, V.A., inzh.; FILIMONOV, V.A., inzh.

Ways of improving the planning of engineering communications in
Moscow. Gor.khoz.Mosk. 36 no.6:19-22 Ju '62. (MLRA 15:8)
(Moscow--Municipal engineering)

F. Khodov, U.A.

USSR

1109. Statistical calculation of the distribution of density and the shell structure of the nucleus. L. P. RABOROT and V. A. FUDOMOV. *Zh. Eksp. teor. Fiz.* 27, No. 2 (89) 1954 (1954) in Russian.

The energy of the nucleus is calculated using an exponential-type potential between nucleons with different exchange characters for $n-p$ and $p-p$ interactions. Coulomb forces are neglected. The density is then taken as $\rho = \rho_0$ for $r < R_0$ and $\rho = \rho_0 e^{-\alpha(r-R_0)}$ for $r > R_0$, and the energy is minimized with respect to the two independent constants occurring here. With the resulting charge density, density of particles with a given angular momentum l can be defined and the number of particles n_l is calculated as a function of number of nucleons. G. L. KHODOV *ML*

FD-2360

USSR/Nuclear Physics - Nuclear shells

FILIMONOV, V. A.
Card 1/1 Pib. 146 - 25/34

Author : Filimonov, V. A.

Title : ~~Deviations from Mayer's scheme in the filling of the shells of a nucleus and in the interaction of the levels~~
Deviations from Mayer's scheme in the filling of the shells of a nucleus and in the interaction of the levels

Periodical : Zhur. eksp. i teor. fiz. 28, 753, Jun 1955

Abstract : M. I. Korsunskiy (Uspekhi fiz. nauk, 52, 1954) pointed out that in the Mayer scheme of filling of nuclear shells there are nuclei that do not build up their levels according to this scheme. The present author explains this departure on the example of $^{23}\text{Na}_{11}$ and $^{55}\text{Mn}_{25}$.

Institution : Mariinskiy Posad Forestry Engineering Technicum*

Submitted : June 26, 1954

* Mariinskoposal'skiy lesotekhnicheskiy tekhnikum

LYAMIN, A.A., inzh.; ZAKHARENKO, S.Ye., inzh.; SHAL'NOV, A.P., kand.
tekhn.nauk; YUSHKIN, A.R., inzh.; FILIMONOV, V.A.; inzh.
OSTAL'TSEV, P.P.

The technical and economic expediency of the simultaneous
installation of underground equipment by engineering teams.
Gos.khoz.Mosk. 31 no.11:30-35 N '57. (MIRA 10:12)

1.Mosenergoprojekt (for Lyamin). 2.Mosteploset'stroy (for Zakhar-
chanko). 3.Mospodzemprojekt (for Shal'nov, Yushkin, Filimonov,
Ostal'tsev)

(Municipal engineering)

21(1), 21(7), 24(7)

AUTHOR: Filimonov, V.A.

SOV/155-58-2-38/47

TITLE: Λ -Nucleon Forces and the Binding Energy of the Λ -Particle in Light Hypernuclei (Λ -nuklonnyye sily i energiya svyazi Λ -chastitsy v legkikh giperyadrakh)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 2, pp 174-180 (USSR)

ABSTRACT: The author starts from the Lagrangian of the reciprocation of barions with \bar{K} and K-meson fields according to Espagnat and Prentki [Ref 6] and calculates the forces between a Λ -particle and a nucleon combined with the exchange of one K-, two K-mesons, two π - and K- and π -mesons. The obtained forces are used in order to calculate the energies of the hyperkernels ${}_{\Delta}H^3$, ${}_{\Delta}H^4$, ${}_{\Delta}He^4$ and ${}_{\Delta}He^5$. These theoretical results show a good agreement with the experimental results. The author thanks Professor D.Ivanenko for his assistance. There are 9 references, 2 of which are Soviet, 4 American, 2 Italian, and 1 English.

Card 1/2

Λ -Nucleon Forces and the Binding Energy of the
 Λ -Particle in Light Hypernuclei

SOV/155-58-2-38/47

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

SUBMITTED: January 5, 1958

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AUTHOR: Filimonov, V. A. SOV/48-22-8-20/20

TITLE: ~~Λ~~-Nucleon Forces and the ~~Λ~~-Particle Binding Energies in Hypernuclei (~~Λ~~-nuklonnyye sily i energiya svyazi ~~Λ~~-chastitsy v giperyadrakh)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958, Vol. 22, Nr 8, pp. 1009 - 1012 (USSR)

ABSTRACT: The ~~Λ~~-nucleon forces were computed by the author in a similar manner as the nucleon-nucleon forces in the paper given by reference 2. The matrices Λ and Λ^{-1} transform the ~~Λ~~-particle into a nucleon and vice versa. The author formally considers the ~~Λ~~-particle and the nucleon as to represent two different states of the baryon. They are described by a one-column matrix:

$$N = \begin{vmatrix} 1 \\ 0 \end{vmatrix}; \quad \Lambda = \begin{vmatrix} 0 \\ 1 \end{vmatrix}$$

In order to compute the ~~Λ~~-particle binding energy in the hypernucleus the interaction potential energy between the nucleon in the core of the nucleus and the ~~Λ~~-particle in the triplet (E_{tr}) and in the singlet (E_s) state is wanted. The part

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of the forces independent of the spin contributes to the potential

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energy of the triplet and of the singlet state, which have equal values, yet opposite signs. The potential energy of different states differs considerably. It is negative for the singlet and positive for the triplet state. In both cases it has approximately the same absolute value. Hence it can be concluded that the state preferred by the Λ -nucleon pair is the singlet state. Therefore in light hypernuclei, states with the greatest variety of singlet pairs will have the smallest energy. That is to say the ground state of light hypernuclei will be that with the smallest spin. In this case the Λ -particle potential energy in the hypernucleus is given by:

$$\begin{aligned} \Lambda\text{H}^3 & E_p = \frac{3}{2} E_s + \frac{1}{2} E_{tr}; \\ \Lambda\text{H}^4, \quad \Lambda\text{He}^4 & E_p = \frac{3}{2} E_s + \frac{3}{2} E_{tr}; \\ \Lambda\text{He}^5 & E_p = E_s + 3E_{tr}. \end{aligned}$$

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The kinetic energy is given by the equation:

$$E_k = \frac{3}{8} m^2 \frac{m_\pi}{M_\lambda \mu^2} m_\pi c^2$$

The computation of the function of the energy versus η by numerical integration of the formulae (17) - (19) proves to be very easy. The smallest value of the Λ -particle binding energy $B_\Lambda = -E_{\min}$ can also easily be determined. Results of such a computation are given in a table. They show good agreement with experimental data. For g^2 , however, a smaller value must be taken as proceeds from the data on the nucleon-nucleon forces. There are 1 table and 3 references, 0 of which is Soviet.

ASSOCIATION: Kafedra statisticheskoy fiziki i mekhaniki fizicheskogo fakul'teta Moskovskogo gos. universiteta im. M. V. Lomonosova
(Chair of Statistical Physics and Mechanics at the Physics Department of the Moscow State University imeni M. V. Lomonosov)

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Λ -Nucleon Forces and the Λ -Particle Binding Energies in Hypernuclei

SOV/48-22-8-20/20

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USCOMM-DC-60483

AUTHOR: Filimonov, V. A.

SOV/56-34-5-61/61

TITLE: The Δ -Nucleon Potential According to the Meson Theory and the Energy of the Δ -Particle in Light Hyper-Nuclei
(Δ -muklonnyy potentsial' iz mezonnoy teorii i energiya Δ -chastitsy v legkikh giper-yadrakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958
Vol. 34, Nr 5, pp. 1355 - 1356 (USSR)

ABSTRACT: The interaction of the Δ -particle with the nucleons in the nucleus is connected with the low energy range. It may therefore be expected that the Δ -nucleon potential derived from the theory with cutting off (with respect to the momenta) of the virtual mesons will give reasonable results. The author calculated the Δ -nucleon potential, using an interaction Hamiltonian, which is given explicitly in this paper. This Hamiltonian can be derived from the interaction of baryons with pion fields and K-meson fields using a Dyson transformation. Moreover it is assumed that all constant bindings are identical. Using the above-mentioned Hamiltonian, the author calculated the forces between Δ and nucleons coupled by interaction with one K-, two π and also with two K-mesons.

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SOV/56-34-5-61/61

The Σ -Nucleon Potential According to the Meson Theory and the Energy
of the Σ -Particle in Light Hyper-Nuclei

The calculated forces were used to find the binding energy of the light hyper-nuclei H^3 , H^4 , H^5 . The potential energy of the Σ -particle (which is bound with 2 π - and 2 K- meson forces) in a hyper-nucleus hardly depends on the spin of the hyper-nucleus. The potential energy due to the 1 K- meson forces amounts to 1/10 of the whole potential energy; it is positive and approximately the same for all light hyper-nuclei. The low value of the 1 K- meson forces is due to the non-monotonous potential of these forces. The energy due to the 1 K- meson forces depends very much on the spin of the hyper-nucleus. The lowest potential energy corresponds to the smallest spin values of the hyper-nuclei. Some numerical values are then given. The theory discussed in this paper gives binding energies which lie too closely together. Although there is no quantitative agreement the discussed theory correctly states that the forces between Σ and nucleons are not pure Wigner (Wigner) forces. The author thanks Professor D. D. Ivanenko for his help in

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The Δ -Nucleon Potential According to the Meson Theory and the Energy
of the Δ -Particle in Light Hyper-Nuclei

carrying out of the discussed investigations. There are
5 references.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State
University)

SUBMITTED: January 15, 1958

1. Nuclei--Energy
2. Particles--Energy
3. Mesons--Theory
4. Nuclear spins
5. Mathematics--Applications

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24(5)

AUTHORS:

Lyall, V. A., Pliginskoy, V. A.

SOV/JAN-1970

TITLE:

The Binding Energy of Light Hypernuclei According to the Meson Theory (Energiya svyazi legkikh gipernukley po mezonnuyu teorii)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1970, Vol 20, Nr 4, p. 1626 - 1630 (USSR)

ABSTRACT:

In recent years, the properties of hypernuclei were **discussed in** several papers, as e.g. the linear growth of binding energy with increasing atomic number (Ref 1), the binding energy on the basis of the field theory (Refs 2-4) etc. The results obtained by these investigations are discussed in short. In the present paper the authors investigate the binding energy of particles in light hypernuclei by means of the meson theory, proceeding from the scalar form of the interaction between \bar{K} -mesons and baryons without basing on any assumption as to the equality of the constants g_{Λ} and g_{Σ} . The method

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The Binding Energy of Light Hypernuclei According to
the Meson Theory

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used when dealing with this subject corresponds to that developed by Filimonov in a previous paper (Ref 4). Investigations are based upon the interaction Hamiltonian. Basing on the assumption that the interaction constants for baryon-ion-interaction corresponding to the symmetry of strong interaction (Ref 7) are equal, the Hamiltonian is further transformed and the elements for the 3-row matrices $T_i^{(k)}$ $T_i^{(k)}$ are written down in-so-far as they are different from zero. Furthermore, formulae for the interaction potential and the potential energy of Λ -singlets and -triplets for these potentials are derived. With the aid of the results of reference 4, the binding energy of the Λ -particles are calculated for the hypernuclei H_{Λ}^3 , H_{Λ}^4 , He_{Λ}^4 , and He_{Λ}^5 , with the spins 1/2, 0, 0, 1/2 (perturbation theory in 2. and 4. order). With a kinetic energy of Λ -particles of

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$$E_{\text{kin}} = \frac{3}{8} \hbar^2 (m_{\pi}/M_{\Lambda}^1 \gamma^2) n_{\pi} c^2 \text{ one obtains:}$$

The Binding Energy of Light Hypernuclei According to
the Meson Theory

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$$H_{\Lambda}^3 : E = E_{\text{kin}} + 2E_c^{2\pi} + E_c^{1K} + \frac{5}{3} E_c^{K\pi} + 2E_c^{2K}$$

$$H_{\Lambda}^4, He_{\Lambda}^4 : E = E_{\text{kin}} + 3E_c^{2\pi} + 2E_c^{K\pi} + 3E_c^{2K}$$

$$He_{\Lambda}^5 : E = E_{\text{kin}} + 4E_c^{2\pi} - 2E_c^{1K} + 2E_c^{K\pi} + 4E_c^{2K}$$

Calculation results obtained by using the γ^2 -values
of reference 4 are shown in a table. Theoretical
results are found to be in good agreement with ex-
perimental ones. In conclusion the authors thank
D.D.Ivanenko for his assistance in carrying out this work.
There are 1 table and 13 references, 2 of which are
Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State
University)

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Y. L. Ivanov, V. A.

21(1.6) 24(5) PHASE I BOOK EXPLOITATION SOV/1369
 Vsesoyuznaya mekhanicheskaya konferentsiya po kvantovoy teorii polya
 i teorii elementarnykh chastits. Uzhgorod, 1958
 Problemy sovremennoy teorii elementarnykh chastits. No. 2: Trudy
 konferentsii... (Problems in the Quantum Theory of Elementary
 Particles. No. 2: Abstracts of the All-Union Inter-Vus
 Conference on the Quantum Field Theory and the Theory of
 Elementary Particles) Uzhgorod, Zakarpatskoye oblastnoye isk-vo,
 1959. 214 p. 5,000 copies printed.

Ed.: Yu. Lomax, Docent; Tech. Ed.: M. Belous.
 PURPOSE: This book is intended for physicists, particularly those
 concerned with problems in the field of elementary particles and
 the quantum theory.

COVERAGE: This book contains articles on elementary particles
 originally read at the All-Union Inter-Vus Conference held at
 Uzhgorod State University on October 26, 1958. Among the topics
 discussed are: the spinor field theory, the fusion theory,
 Lorentz contractions, parities, studies nucleon-nucleon scattering,
 etc. English abstracts accompany each article. References
 follow each article.

Dolgicov, A.Z. Polarization of Quanta Emitted by μ Mesons 138
 Karashenkov, V.S. Optical Analysis of the Interaction Between
 Fast Nucleons and Pions Particles With Nucleons and Nuclei 142

Sharkov, G.F. The Semi-Phenomenological Theory of Nuclear
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Fisher, Ya. and S. Ghilli. Partial Wave Analysis of the
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 on the Processes of Bremsstrahlung and Generation of Pairs
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Shil'manov, M.I. On the Interaction Between Δ -Particles and
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Kozakova, Yu.M. The δ -Summation of the Perturbation
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E032/E114

24.6510

AUTHOR: Filimonov, V.A.

TITLE: On the Depth of the Potential Well for a Λ -Particle in Heavy Hypernuclei ¹⁹

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 6, pp 61-70 (USSR)

ABSTRACT: The interaction of a Λ -particle with real nuclei is looked upon as an interaction with a limited portion of nuclear matter. The nuclear matter is looked upon as a degenerate Fermi gas and the fact that the interaction radius for Λ -nucleon systems is small is taken into account. Moreover, the interaction of a Λ -particle with nuclear matter in the case of exchange forces is described with the aid of an effective potential which depends only on the coordinates of the Λ -particle. The depth of this potential well is estimated in the second and fourth order perturbation theory. It is found that the depth of the potential well is 20-30 MeV. The final formula for the depth of the potential well U_0 is given by Eq (39) where B_Λ is the binding energy of the Λ -particle, R is the radius of the residual nucleus, and the Λ -particle is assumed to be in the

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Hypernuclei

is state.

There are 1 table and 13 references, of which 7 are
English, 2 Italian and 4 Soviet.

ASSOCIATION: NII pri Tomskom politekhnicheskome institute
imeni S.M. Kirova

Card 2/2 (Scientific Research Institute at Tomsk Polytechnical
Institute imeni S.M. Kirov)

SUBMITTED: January 19, 1959

24(5),21(1)

AUTHOR:

Filimonov, V. A.

SOV/56-36-5-44/76

TITLE:

On the Depth of the Potential Well for Λ -Particles in Heavy Hypernuclei (O glubine potentsial'noy yamy dlya Λ -chastitsy v tyazhelykh giper'yadrakh)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 5, pp 1569-1571 (USSR)

ABSTRACT:

In heavy hypernuclei the motion of Λ -particles may be considered to be a motion in a square potential well the depth of which depends on the interaction between Λ -particles and nucleons. In previous papers the author, in collaboration with V. A. Lyul'ka (Refs 3,4), already investigated the Λ -nucleon potential by means of the meson theory; the singularities at short distances were eliminated by means of the cutoff method. These potentials resulted in a regular dependence of the binding energy on the number of particles in light hypernuclei and led to stronger interaction of the Λ -nucleon pair in the singlet state. In the present "Letter to the Editor" the author endeavors to evaluate the potential interaction energy of the Λ -particles in nuclear matter on the basis of the potential values calculated in the earlier papers. For the purpose of evaluating potential energy

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Heavy Hypernuclei

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the nucleons of nuclear matter were considered to be an incompressible degenerated Fermi gas. Calculations were carried out for two different values of nuclear density (radii: $R = 1.2 \cdot A^{1/3} \cdot 10^{-13}$ and $R = 1.4 \cdot A^{1/3} \cdot 10^{-13}$) and are given in a table. Calculations were carried out for two kinds of K-meson-baryon bonds: scalar and pseudoscalar. The bond between baryons and pions is assumed to be pseudovectorial (coupling constant $f^2 = 0.08$). Rectangular cutoff with $k_m = 6\mu_\pi$ is used. The data were calculated with application of the "zero radius of action" approximation method. For $10 < A < 20$ a well depth of 20 - 30 Mev and for $A < 10$ one of 20 Mev is obtained; other authors (Ref 6) obtained 29 - 38 Mev for heavy hypernuclei. The author thanks Professor D. D. Ivanenko for assisting him in this investigation. There are 1 table and 6 references, 3 of which are Soviet.

ASSOCIATION: Tomskiy politekhnicheskiy institut (Tomsk Polytechnic Institute)
SUBMITTED: November 15, 1958
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24 (5), 21 (7)

AUTHOR: Filimonov, V. A.

SOV/56-36-6-54/66

TITLE: On Saturation in the Hyperon System (O nasyshchenii v sisteme giperonov)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1941 - 1942 (USSR)

ABSTRACT: One of the characteristic features of a nucleon system is the phenomenon of saturation, which is connected with the nature of nucleon-nucleon forces (repulsion at small distances, exchange character). The forces are first briefly discussed from the point of view of the meson theory, and the differences in the forces acting among hyperons are pointed out; though these forces are of the same magnitude as those acting among nucleons, their mechanism is different. Thus, between two Λ -particles, forces of second order (exchange of a π - or a K-meson) are forbidden on account of the demand for isotopic invariance in the case of strong interaction. In this case, forces of the fourth order (exchange of two π - or K-mesons) occur. The difference in character of the forces active between hyperons influences the behavior of systems of a large number of hyperons. This applies especially to the stability condition. For example,

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in the case of systems consisting of Λ -particles and nucleons, the stability condition (stability with respect to transitions into the nucleon state) (1) is: $L(m_{\Lambda} - m_N) + B(A + L) + T_N + T_{\Lambda} + U < 0$. A and L denote the number of nucleons and Λ -particles respectively, the m denote the masses, T - the kinetic energy of these particles, B - the absolute value of the binding energy per nucleon of nuclear matter, U - the potential interaction energy of the particles. For the purpose of investigating the conditions necessary for satisfying this inequality, the binding energy of such a system was calculated on the basis of certain assumptions with respect to the forces acting between the particles. For this purpose short-range forces of the Wigner type are assumed between two Λ -hyperons and between Λ and N forces, which lead to zero binding energy between the systems $\Lambda\Lambda$ and ΛN . Repulsion between nucleons is taken into account only at distances $r_0 = 0.4 f$ (nucleons and hyperons are considered to be degenerated Fermi gas). By basing on these assumptions it was found that in the case of a constant distribution density of Λ -particles within the sphere with $R = r_0 L^{1/3}$,

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(1) is satisfied if $r_0 \approx 0.9 f$. The particle ratio is found to amount to $A/L \approx 1.6$. If (1) is satisfied, the proton-neutron state becomes metastable with respect to a transition into the hyperon-nucleon state. There is 1 reference.

ASSOCIATION: Institut yadernoy fiziki, elektroniki i avtomatiki Tomskogo politekhnicheskogo instituta (Institute for Nuclear Physics, Electronics, and Automation of Tomsk Polytechnic Institute)

SUBMITTED: March 5, 1959

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Philimonov, V. A.

BINDING ENERGIES OF HYPER-NUCLEI AND INTERACTIONS OF TYPE ΛN AND $\Lambda\Lambda$
 D.D.Ivanenko, N.N. Kolesnikov, V.A.Lyul'ka, V.A.Philimonov

Hypernuclei systems containing Λ or Σ hyperons in addition to protons and neutrons, are of great interest both for the understanding of cosmic ray processes and for research into ordinary nuclear forces. By making use of the binding constants known from scattering theory, and having carried out the "out off" as in the Chou-Hartenhaus method in the theory of ordinary nuclei, we obtained values for hyper-nuclei binding energies in satisfactory agreement with experimental results.

An evaluation made on the basis of field theory revealed the existence of weak forces of $\Lambda\Lambda$ attraction in addition to the stronger ΛN interaction, which, in turn, is noticeably weaker than the $N-N$ forces. In this connection, the binding energies of the normal and the excited states of a series of light nuclei containing one or two Λ particles were calculated using the approximation of a short range of action and a phenomenological potential depending on the spin, whose parameters were selected so as to insure the necessary binding energy of the Λ particle in ${}^A_{\Lambda}Z$ and ${}^A_{\Lambda}Z^*$.

The data on forces proceeding from hyper-nuclei were employed to calculate the cross section of scattering and capture of slow Λ particles by nuclei.

Report presented at the International Cosmic Ray Conference, Moscow, 6-11 July 1959

21(1),21(7)

AUTHORS:

Ivanenko, D. D., Lyul'ka, V. A., Filimonov, V. A. SOV/53-68-1-1/12

TITLE:

The Theory of Hyper-nuclei (Teoriya gipernyader)

PERIODICAL:

Uspekhi fizicheskikh nauk, 1959, Vol 68, Nr 4, pp 602-603 (USSR)

ABSTRACT:

The authors give a survey of the present stage of the theory of hyper-nuclei, nuclear systems consisting of nucleons and hyperons. An investigation of these hyper-nuclei makes it possible to obtain data on elementary particles (Λ , Σ , K , etc.) such as spin, parity, and the interaction between particles. The large amount of experimental material available in this respect makes it possible to deal in theory with hyper-nuclei both from the phenomenological point of view, and by means of the quantum field theory. The authors enumerate the most essential experimental factors and the most important theoretical investigations concerning hyperons. The experimental part of the paper begins with the discovery of hypernuclei in 1953 by the Polish physicists Danysz and Pniewsky (Ref 1) in nuclear emulsions (Fig 1); in the following, the authors discuss the identification of hyper-nuclei; a table shows a number of hypernucleus observations. It was found that whereas in the

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case of accelerator- and cosmic radiation experiments, the relative frequency with which hyper-nuclei are recorded is about $1 \cdot 10^{-3}$ (cosmic rays only $0.2 \cdot 10^{-3}$), it was found to be between 24 and $57 \cdot 10^{-3}$ for the case of K-captures. In the following the question of the life time of hyper-nuclei is briefly discussed; their value is near the order of magnitude of 10^{-10} sec. Further, the frequency of hyper-nuclei as a function of the nuclear charge is discussed. Figures 3 and 4 show the Z-dependence of mesonic and non-mesonic decay. Finally, the binding energy of the Λ -particles in the hyper-nuclei is discussed according to the relation $B_{\Lambda} = M_{\Lambda} + M_A - \sum_i m_i - Q$ (Figure 5 shows $B_{\Lambda}(A)$ - a straight line; A denotes the number of nucleons in the hypernucleus, m_i the masses of the reaction products, and Q - the sum of their kinetic energies), and also some anomalous cases observed. In the second part of the paper - the theoretical treatment of the hypernucleus problem - the most important properties of the hyperons and K-mesons are discussed (classification of interaction into strong, electromagnetic and weak interaction, the

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theory of the former, special cases, some Σ - and Ξ -processes), after which the decay possibilities of hyper-nuclei (mesonic and nonmesonic decay), as well as the problem of the spin of the Λ -particles. In the following, the authors first mention some general questions of a phenomenological treatment of the hyper-nuclei with $A \leq 5$, followed by the special cases of the hyper-nuclei He_{Λ}^5 , H_{Λ}^4 , He_{Λ}^4 and H_{Λ}^3 . Finally, the treatment of light hyper-nuclei on the basis of the field theory and several questions related to the spins of the hyper-nuclei are discussed. The material (particularly that of the theoretical part) was mainly taken from Western papers. There are 5 figures, 5 tables, and 136 references, 12 of which are Soviet.

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AUTHOR: Filimonov, V.A. 19

TITLE: On the Binding Energy of a System of Nucleons and Hyperons

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, Nr 1, pp 60-63 (USSR)

ABSTRACT: Recent work has shown that the hyperon-nucleon force is attractive and is of the same order of magnitude as the nucleon-nucleon force. One of the characteristic properties of nucleon-nucleon forces is the so-called saturation phenomenon. Various suggestions and models have been put forward to explain this property. For example, the saturation of nucleon-nucleon forces has been ascribed to a repulsive hard core (Ref 5), to many-body forces (Ref 4) and to the exchange character of the forces. The general view at the present time is that the saturation is a consequence of the presence of a repulsive hard core and the exchange part in the nucleon-nucleon potential (Ref 6). The basic features of nucleon-nucleon forces can be obtained from the meson theory in which the repulsion at small distances is

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associated with the existence of the function $\delta(\underline{r})$ in the second order potential of the pseudoscalar meson theory. This point of view is confirmed by the interaction of nucleons with antinucleons. If this view is accepted then in many hyperon-hyperon and hyperon-nucleon interactions one would expect to find forces without a repulsive core. This would occur in the absence of an interaction associated with single meson exchange, the meson interacting pseudoscalarly with baryons. An example of such an interaction is the interaction between two Λ particles in which second order forces are forbidden by the isotopic invariance of strong interactions. The absence of repulsion at small distances will lead to a considerable difference between a bound system of a large number of Λ particles and a nucleon system. In particular, one would expect a large mass defect in the former case. This would ensure the stability of the system against a transition into a nucleon state. It is shown in the present paper that the condition for the stability of

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hyperon systems against transition to a nucleon state may be satisfied for densities comparable with the densities of nuclear matter. This means that one can use methods employed in studying the properties of nuclear matter in the discussion of systems containing hyperons. The mass of a system of interacting particles is given by Eq(1) where m_N and m_Λ are the masses of nucleons and Λ particles respectively, and A and L are their numbers; T_N and T_Λ are the corresponding kinetic energies and U_N and U_Λ and $U_{\Lambda N}$ are the potential energies. If the nucleons are looked upon as Fermi gas, distributed with a constant density in a sphere having a radius $R_A = r_A A^{1/3}$, and the Λ particles in a sphere of radius $R_L = r_\Lambda L^{1/3}$, then the kinetic energies are given by Eq (2) and (3) where r_π and m_π are the Compton wavelength and the mass of π mesons. In order to calculate the potential energies, it is assumed that the hyperon-hyperon and hyperon-nucleon forces are Wiegner forces of the Yukawa

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type, having a radius of action equal to one half of the Compton wavelength of a meson (cf Eq (4)). The quantity g^2 is chosen to be of the order of 0.5. The potential energies are then found to be given by Eq (6) and (7) (Pauli principle being neglected). If one assumes that the radius of the hard core for nucleon-nucleon interactions is of the order of 0.4 f, then U_N is given by Eq (8). The binding energy of the system is defined as that necessary to transform the system under consideration into an aggregate of non-interacting nucleons. The binding energy per particle is then given by Eq (9). The condition for the stability of the system of nucleons and Λ particles against a transition to a nucleon state is $E > 0$, provided one neglects the binding energy of nucleons in nuclear matter. The ratio of number of nucleons to the number of Λ particles which correspond to a maximum binding energy can then be found from the condition given by Eq (11). Table 1 gives the binding energy for

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two values of g^2 , namely 0.5 and 0.25. As can be seen from this table, the stability condition is satisfied for $g^2 = 0.5$ if $r_{\Lambda} \leq 0.92 f$. If $g^2 = 0.25$ the condition is satisfied if $r_{\Lambda} \leq 0.64 f$. These quantities are to be compared with $r_N = 1.2 f$ which characterizes the density of nucleons in nuclear matter. There are 1 table and 8 references, 3 of which are Soviet (1 translation from English), 4 English and 1 Italian.

ASSOCIATION: NII pri Tomskom politekhnicheskome institute imeni S.M.Kirova (Scientific Research Institute of the Tomsk Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: March 28, 1959

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S/139/60/000/004/027/033
E032/E514

24.6900

AUTHOR: Filimonov, V.A.

TITLE: The Role of Three-Particle Forces in the Interaction of a Λ -Particle with Nucleons

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No.4, pp. 222-228

TEXT: Meson theory is used to obtain 3-particle Λ -nucleon potential. The 3-particle forces are due to the meson exchange between three heavy particles. The simplest 3-particle forces correspond to the two-meson exchange. In order to calculate the 3-particle potential, use is made of the nonrelativistic Hamiltonian for the interaction between fixed baryons and π - and K-meson fields. (these are given by Eqs.1-3). An expression is derived for the potential energy of the Λ -particle in nuclear matter. The energy turns out to be negligible compared with energy due to pair forces. There are 1 figure and 11 references: 5 Soviet and 6 English. ✓

ASSOCIATION: NII pri Tomskom politekhnicheskom institute imeni S. M. Kirova (Scientific Research Institute of the Tomsk Polytechnical Institute imeni S. M. Kirov)

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FILIMONOV, V. A., Cand Phys-Math Sci -- "Hypernuclei and
the interaction ^{between} ~~of~~ λ -hyperons ^{and} ~~with~~ nucleons." Mos, 1961.
(Min of Ed RSFSR. Mos Oblast Ped Inst im N. K. Krupskaya)
(KL, 8-61, 229)

$\lambda = \text{baryon}$

FILIMONOV, V.A.; RAKOVSKIY, V.Ye.

Exothermal and endothermal reactions in the decomposition of peat
[with summary in English]. Inzh.-fiz. zhur. 4 no.3:18-25 Mr '61.
(MIRA 14:8)

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i Kalininskiy torfyanyy institut, g. Moskva.
(Chemical reaction, Heat of) (Peat)