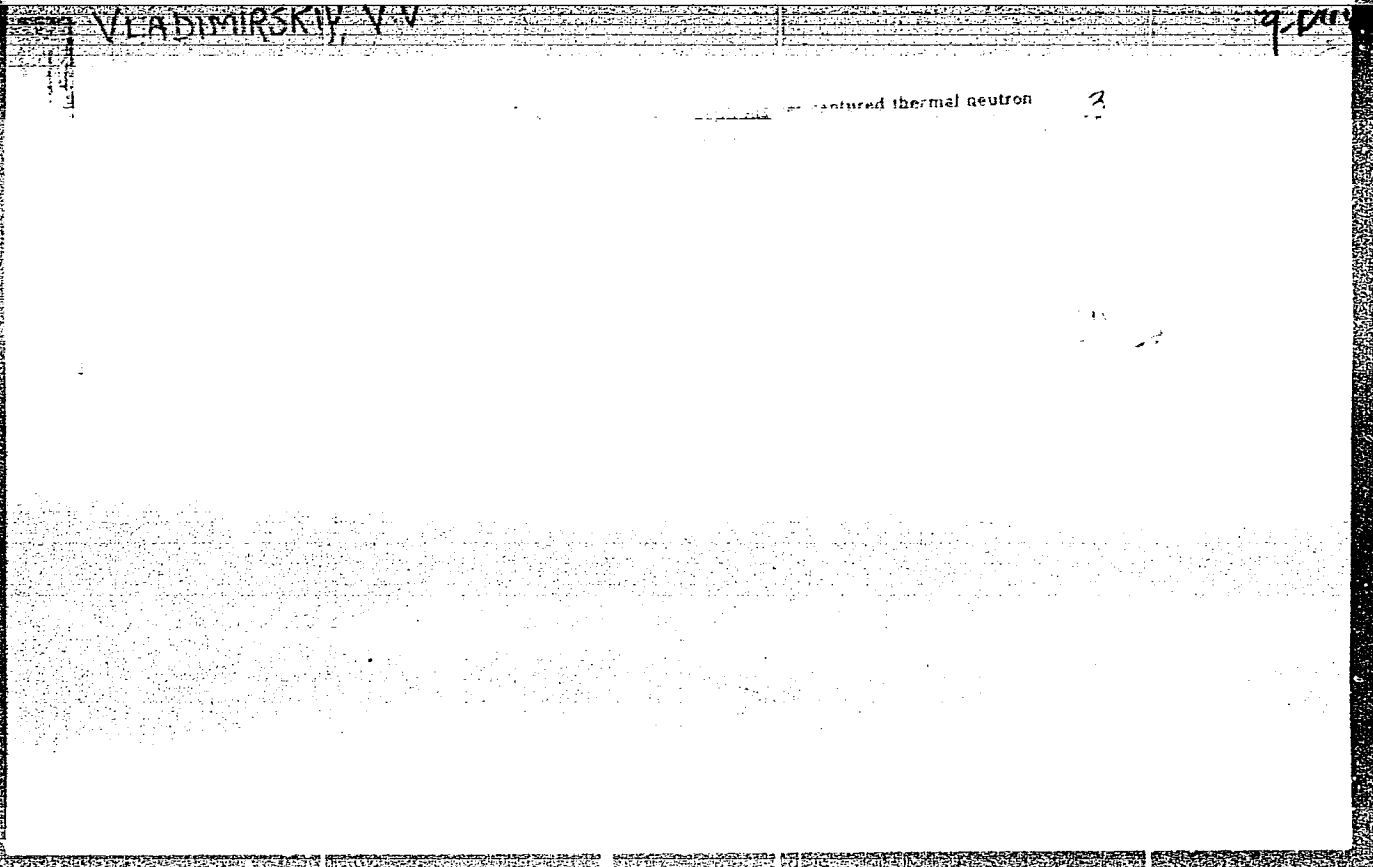VLADIMIRSKIY, V.V.; KOMAR, Ye.G.; MINTS, A.L.; GOL'DIN, L.L.; KOSHKAREV,
    D.G.; MONOSZON, N.A.; NIKITIN, S.Ya.; RUBCHINSKIY, S.M.; SKACH-
    KOV, S.V.; STREL'TSOV, N.S.; TARASOV, Ye.K.

Basic characteristics of the projected 50-60 Bev proton accelera-
tor with alternating-gradient focusing. Atom.energ. no.4:31-33
'56.   (MLRA 9:12)
    (Particle accelerators)   (Protons)

VLADIMIRSKIY, V.V.

captured thermal neutron   2

VLADIMIRSKIY, V. V.   (Acad. Sci. , Moscow.)=

"Interaction of Slow Neutrons with Spherical and Elongated Nuclei,"

paper presented Intl. Conference on the Neutron Interactions with the Nucleus, 9-13 Sept. 1957, Columbia Univ, New York.

The paper reports on the results of the work on calculation of slow neutron interaction with elongated nuclei, according to the cloudy crystal model of the nucleus, by V. V. Vladimirskiy and K. L. Il'in and interaction of slow neutrons with nuclei (review) by V. V. Vladimirskiy, Radkovich, I. A., Sokolovskiy, V. V. and Panov, A. A. The solution of the problem of the motion of a neutron on a complex potential well for an elongated nucleus has shown that the position and the shape of the giant neutron absorption resonances with respect of atomic number changes appreciable in the transition from spherical to elongated nuclei. This enables one to explain qualitatively the washed out character of the giant resonance near A = 150 without recourse to an increase of the imaginary part of the complex potential. A quantitative comparison between theory and experimental data is unsuccessful.

VLADIMIRSKIY, V. V., KOMAR, E. G., MINTS, A. L.

"Project of a Proton Ring Accelerator for 7 GeV "
paper presented t CERN Symposium, 1956, appearing in Nuclear'
Instruments, No. 1. pp. 21-30, 1957

VLADIMIRSKIY, V. V., GOLDIN, L. L., DANILTSEV, E. N., KOSHKAREV, D. G.
MEYMAN, N. N.

"Deflection of the Beam of a 7 GeV Strong Focusing Proton
Accelerator," paper presented at CERN Symposium, 1956, appearing
in Nuclear Instruments, No. 1, pp. 21-30, 1957

VLADIMIRSKIY, V. V., KOMAR, E. G., MINTS, A. L.

        "Main Characteristics of a Projected strong-focusing 50-60
GeV Proton Accelerator," paper presented at CERN Symposium, 1956,
appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

THE FUNDAMENTAL CHARACTERISTIC OF THE
PLANNED 55 TO 60 Bev PROTON ACCELERATOR WITH
FIXED FOCUS V. V. Vladimirski, Atomnaya Energie

AUTHOR: SOKOLOVSKIY,V.V., VLADIMIRSKIY,V.V.,   PA - 2256
            RADKEVICH,I.A., PANOV,A.A.

TITLE: The Measuring of the total Cross-Sections of U^{233}, U^{235}, Pu^{239},
            and of the Fission Cross-Sections of U^{235} for resonance Neutrons.
            (Izmereniye polnykh effektivnykh secheniy U^{233}, U^{235}, Pu^{239},
            a takzhe secheniya de leniya U^{235} dlya rezonansnykh neytronov,
            Russian)

PERIODICAL Atomnaia Energiia, 1957, Vol 2, Nr 2, pp 129 - 139, (U.S.S.R.)
            Received: 3 / 1957   Reviewed: 5 / 1957

ABSTRACT: Measuring was carried out by means of a neutron-spectrometer with
            a resolving power of ~0,1 - 0,2 microsec/m and 3 - 5 ~500 eV.
            The parameters of the resonances were computed up to energies of
            from 30 - 50 (with which the levels can still be regarded as re-
            solvable). For these resonances the neutron widths Γ_n were de-
            termined. The total widths Γ are sufficiently determined for those
            strong levels for which errors committed in determining width
            was not more than ~50%. The authors try the statistical treatment
            of the data obtained in order to compare them with the theory.

            Next the method of dealing with results is discussed. The total
            cross-sections were determined by measuring the transparence of
            samples of different thicknesses. The fission cross-section of
Card 1/3 U^{235} was measured by means of a fission chamber which contains

The Measuring of the total Cross-Sections of U^{233}, U^{235}, Pu^{239}, and of the Fission Cross-Sections of U^{235} for resonance Neutrons.

PA - 2256

$\sim$ 280 mg U^{235}

Result:

The total cross-section of U^{233}: Three samples of U^{233}-oxide were investigated, i.e. the samples Nr 2 and 3 at neutron-energies of from 6 to 22 eV, the samples Nr 1, 2, and 3 at energies of from 18 to 450 eV. At energies of more than 20 eV noticeable errors occur on the occasion of the determination of the number of levels. The here computed resonance parameters are shown in a table.

The total cross-section of U^{235}: Three samples of U^{235}-oxide were examined, i.e. 2 samples at neutron energies of from 3,3 to 7 eV, and all samples within the energy range of from 3,3 to 7 eV. At energies of more than 20 eV a considerable number of levels is lost. The authors found for both spin states of the composed nucleus $I_1 = 4$ and $I_2 = 3$ the average density $W = 1,65 \pm 0,05$ eV^{-1}. The parameters of the resonances of U^{235} are shown in a table. Reports on the fission cross-section of U^{235} and on the total cross-section of Pu^{239} are analogous.

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PA - 2256

The Measuring of the total Cross-Sections of U^{233}, U^{235}, Pu^{239}, and of the Fission Cross-Sections of U^{235} for resonance Neutrons.

Some Conclusions: The values of the reduced neutron width show considerable variations for one and the same nucleus. The distribution of the neutron widths cannot be described by a simple exponential law. The distribution of levels in all cases can be explained by accidental causes. An exception is perhaps formed by Pu^{239} where, with n = 4, the grouping probability of the levels is 90 %   (15 illustrations).

ASSOCIATION: Not given.
PRESENTED BY:
SUBMITTED: 4.5.1956
AVAILABLE: Library of Congress

Card3/3

VLADIMIRSKIJ, V.V.; KOMAR, Je.G.; MINC, A.L.; GOL'DIN, L.L.; KOSKAREV, D.C.;
        MONOSZON, N.A.; NIKITIN, S.Ja.; RUBCINSKIJ, S.M.; SKACKOV, S.V.;
        STREL'COV, N.S.; TRASOV, Je.K.; MEDONOS, S., inz. [translator]

Main characteristics of the planned proton accelerator for 50-60
BeV energy with sharp focusing. Jaderna energie 3 no.2:56-57 F '57.

VLADIMIRSKIJ, V.V. [Vladimirskiy, V.V.]; PANOV, A.A.; RADKEVIC, I.A. [Radkevich,
     I.A.]; SOKOLOVSKIJ, V.V. [Skolovskiy, V.V.]

Interaction of slow neutrons with nuclei. Jaderna energie 3 no.11:370-
384 N '57.

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AUTHORS: Vladimirskiy, V.V., Panov, A.A., Radkevich, I.A., 89-11-7/9
Sokolovskiy, V.V.

TITLE: The Interaction of Slow Neutrons with Nuclei.Review.(Vzaimodeyst-
viye meddlennykh neytronov s yadrami.Obzor)

ABSTRACT: Everything known from more than 1oo Russian and foreign original
works on the interaction between slow neutrons and nuclei is short-
ly discussed here. The following items are discussed in particular:
Different velocity selectors.
Multichannel impulse analyzers.
Neutron spectrometers.
Comparison between the experimentally found and theoretically cal-
culated widths of the neutron resonance levels. Determination and
comparison of the level widths of the fission resonances.
The following data are given on large neutron meters at present in
operation in the USSR:

Site	$\triangle t$ μ_B	L M	$\triangle t / L$ μ_B / M	Note
a) crystal spectrometer				
Pyrometric Laboratory		1		curved quartz crystal with the planes(134o) and (1o1o)
b) neutron selectors on accelerators				

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·· The Interaction of Slow Neutrons with Nuclei.Review.   89-11-7/9

Pyrometric
Laboratory   2   16   o,12   cyclotron

                    c) mechanical interrupter

Institute for
Atomic Energy 5   6,3   o,8   transverse rotor

    "   3,2   26,5   o,12   longitudinal rotor

Pyrometric
Institute   1,3   19   o,o7   transverse rotor.

There are 16 figures, 2 tables and 1o9 references, 3o of which are
Slavic.

AVAILABLE: Library of Congress.

Card 2/2

AUTHOR   VLADIMIRSKIY, V.V.   56-4-23/52
TITLE   On aMechanism of the Fission of Heavy Nuclei.
(O mekhanizme deleniya tyazhelykh yader –Russian)

ABSTRACT   The present paper investigates the influence exercised by the individual
nucleons upon the shape of the nucleus before fission.The quantitative com-
parison of the computations of the droplet model with experimental data
meets with some difficulties,examples are given.Further difficulties al-
so arise when explaining the observed asymmetry in the distribution of the
masses of the fragments.Many peculiarities of the fission process may be
explained more easily,if stability is lost with respect to the asymmetric
deformations on the occasion of the expansion of the nucleus already be-
fore transition through the maximum of the energy of the symmetric form.
Instead of one saddle point,two saddle points with an asymmetric configu-
ration of the nucleus are actually obtained.Hereby the inequality of the
mass of the fragments can be explained in a natural manner.The delibera-
tions mentioned above make an ivestigation of the possible conditions for
the occurrence of asymmetric saddle points seem advisable,thoutn this fact
does not fit into the classical notions of the droplet model.The explana-
tion of this effect discussed in the following is based upon the investi-
gation of the states of the individual nucleons within the deformed nucleus
in the sense of the collective model and this explanation is of a qualita-
tive character.The author here investigates only such states of deformation

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On a Mechanism of the Fission of Heavy Nuclei.   56-4-23/52

of the surface of the nucleus,in whicn the nucleus is axially symmetric
with respect to the axis OZ.In the case of an assumed expansion of the
nucleus these states are energetically tne most favorable and are likely
to be the most easy way of attaining expansion energetically.For such asy-
mmetry of the nucleus the wave functions of the free nucleons may be clas-
sified by the quantum number $\Omega = l_z + s_z$ (i.e.by tne projection of tne total
angular momentum of the nucleon onto the axis of symmetry of the nucleus).
With increasing expansion of the nucleus there follows a reconstruction of
the filling-up of the level of the nucleons with respect to Ω.The presen-
ce surplus nucleons witn high values of Ω in a greatly expanded nucleon
most considerably diminish its stability with respect to asymmetric de-
formations.For symmetric deformations,however,the stability of the nucleus
is somewhat increased.
(No illustrations)

ASSOCIATION
PRESENTED BY
SUBMITTED   16.3.1956
AVAILABLE   Library of Congress
Card 2/2

VLADIMIRSKIY, V. V. and SOKOLOVSKIY, V. V.

,   "Review of Pulsed Neutron Sources and Neutron Monochromators."

paper to be presented at 2nd UN Intl. Conf. on the peaceful uses of Atomic
Energy, Geneva, 1 - 13 Sep 58.

VLADIMIRSKIY, V. V. and SUKHORUCHKIN, S. I.

"A Review of Some New Data on of Neutron Effective Cross-Section and Fission Process Investigations."

paper to be presented at the 2nd UN Intl. Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sep 58.

VLADIMIRSKIY, V.V

30-58-4-20/44

AUTHORS: Baz', A. I., Candidate of Physical and Mathematical Science
            Samoilov, L.N.

TITLE: The Physics of Nuclear Reactions With Small and Medium Energies
            (Fizika yadernykh reaktsiy pri malykh i srednikh energiyakh)
            Conference in Moscow (Konferentsiya v Moskve)

PERIODICAL: Vestnik Akademii Nauk SSSR,1958,   .   Nr 4,pp.97-102 (USSR)

ABSTRACT: This All Union conference took place in Moscow in November
            1957. The program included all fundamental problems of
            nuclear physics. A short survey on the transactions makes it
            possible to understand the problems facing nuclear physics
            at present. One of the most interesting and most important
            problems is that of nuclear models, i.e. which is the best
            way of model representation of nuclear properties. At present
            these models develop into three main directions:
            1) According to the shell model the nucleus can be represented
            as a self-coordinating potential in the field of which nu-
            cleons move.
            2) The optical model is usually applied for the quantitative
Card 1/3   description of the neutron-proton-dispersion on the nuclei.

30-58-4-20/44

The Physics of Nuclear Reactions With Small and Medium Energies . Conference in Moscow

3) A great number of phenomena connected with the non-spheroidal form of equilibrium of the nuclei can be understood from the viewpoint of the collective model.

The following reports were delivered:

1) P. E. Nemirovskiy: On results of the theoretical analysis of the interaction of neutrons of small and medium energies with nuclei.

2) V. V. Vladimirskiy, Ye. V. Inopin, S. I. Drozdov: On problems of the optical model.

3) V. M. Agranovich, A. S. Davydov: On theoretical foundations of the nuclear models.

4) B. L. Birbrair, L. A. Sliv: On the form of equilibrium of the nucleus.

5) N. A. Vlasov: On excited states of the α-particle.

6) F. L. Shapiro: On the problem of the state 0^+.

7) I. I. Levintov: On the radius determination of the α-particle.

Card 2/3   8) Ye. K. Zavoyskiy: On the construction of accelerators.

30-58-4-20/44

The Physics of Nuclear Reactions With Small and Medium Energies. Conference in Moscow

9) G. Barshall(USA): On the investigation of polarization phenomena.

10) Yu. A. Aleksandrov: On the electromagnetic interaction of fast neutrons and nuclei.

11) G. N. Flerov: On works of his group concerning nuclear reactions.

12) A. I. Alikhanov: On measurements of the polarization of electrons forming during β-decay.

1. Nuclear physics—USSR

Card 3/3

SOV/89-5-1-8/28

AUTHORS: Vladimirskiy, V. V., Panov, A. A.,
Radkevich, I. A., Sokolovskiy, V. V.

TITLE: Measurement of the Fission Cross Section of U^{233} and of the Total Cross Section of Arsenic, Vanadium, Tantalum, and Bismuth (Izmereniye secheniya deleniya U-233 i polnykh effektivnykh secheniy mysh'yaka, vanadiya, tantala i vismuta)

PERIODICAL: Atomnaya energiya, 1958, Vol. 5, Nr 1, pp. 69-70 (USSR)

ABSTRACT: Cross sections were measured by means of a neutron spectrometer with mechanical selector (as described by reference 1):

1.) Resonance parameter of U^{233}.

E_0, eV	1,47	1,78	2,23	3,6	4,5	6,8	10,4	12,7	15,4	+)
$\sigma_0 \Gamma_f$ in b.eV	60±15	195±15	58±4	13±6	4,0±1,5	73±8	135±12	103±8	41±4	++)

Card 1/3

Measurement of the Fission Cross Section of U^{233} and of the Total Cross Section of Arsenic, Vanadium, Tantalum, and Bismuth

Γ_f in mV									+++)
	–	–	–	–	–	57±30	260±130	330±200	–

+)	16,4	19,0
++)	96±15	90±9
+++)	75±50	105±40

2.) No resonance was found in vanadium between 10 and 100 eV.

3.) The resonance in tantalum at 35 and 39 eV is not a doublet but only 1 level at 35 eV.

4.) In bismuth resonances were found at 800, 2300, and possibly also at 3100 eV. The following parameters were calculated for the 800 eV resonance: $\Gamma = 10 \pm 3$ eV, $\Gamma_\gamma = 7 \pm 5$ eV, $\Gamma_n = 3 \pm 2$ eV. There are 2 tables and 10 references, 5 of which are Soviet.

SUBMITTED: July 25, 1957

Card 2/3

Measurement of the Fission Cross Section of U^{233} and of   SOV/89-5-1-8/28
the Total Cross Section of Arsenic, Vanadium, Tantalum,
and Bismuth

1. Uranium--Fission   2. Arsenic--Properties   3. Vanadium--Properties
4. Tantalum--Properties   5. Bismuth--Properties   6. Neutron cross section
--Measurement

Card 3/3

VLADIMIRSKIY, V.V.; KOSHKAREV, D.G.

Achromatic magnetic turning system. Prib. i tekh. eksp. no.6:46
N-D '58.   (MIRA 12:1)
(Particle accelerators)

VLADIMIRSKIY, V.V.

VLADIMIRSKIY, V.V. and IL'INA, I.L.
    USSR Academy of Sciences, Moscow

"Optical Model Calculations of the Interaction of Slow Neutrons with Prolate Nuclei," Nuclear Physics, Vol. 6, No. 2, pp. 295-304, 1958.
(North Holland Publishing Co., Amsterdam)

Abst: The cross sections for absorption and scattering of slow neutrons by non-spherical ellipsoidal nuclei are calculated on the basis of the optical model. Diffuseness of the nuclear boundary and rotation of the nucleus are neglected. The results obtained allow us to explain the great width of the giant resonance in the region A 150. It is shown that in the case of prolate nuclei the main resonances are accompanied by additional maxima.

7(5), 7(6)   SOV/56-35-2-59/60

AUTHOR: Vladimirskiy, V. V.

TITLE: On the Optical Methods for the Observation of Ionization in
               the Tracks of Fast Particles (Ob opticheskikh metodakh
               nablyudeniya ionizatsii v sledakh bystrykh chastits)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
               Vol 35, Nr 2(8), pp 556-557 (USSR)

ABSTRACT: It is possible to prove the following facts: If the atoms and
               ions in the tracks of the ionizing particles are exposed to
               resonance light, the number of the scattered quanta is by
               far higher than the number of the quanta which is found by
               the immediate recording of the scintillations in a gas. This
               permits the observation of the particle tracks without the
               condensation of vapors on ions. It is theoretically possible
               optically to record ions and also neutral atoms in the tracks
               of the particles. But in the recording of neutral atoms there
               arise difficulties which are caused by the extinction of the
               resonance fluorescence by the molecules of the initial gas.

Card 1/3   Therefore the use of ions is more advantageous. The author

SOV/56 35 2-59/60

On the Optical Methods for the Observation of Ionization in the Tracks of Fast Particles

first estimates the intensity of the light scattered by an ion. An expression is given for the cross section of the scattering for a dipole transition in the maximum of the resonance line. The greater part of the suitable transitions belongs to the doublets $^2S_{1/2} \to {}^2P_{1/2}$, $^2S_{1/2} \to {}^2P_{3/2}$.

Expressions are given for the maximum flux of the light quanta of both polarizations from the light source into a unit of the solid angle and for the general number of the scattered quanta. The observation time is limited by the diffusion of the ions and may be chosen within the interval 0.01 - 0.1 sec. According to the above-mentioned formula, a single scattered ion gives $\sim 2 \cdot 10^5$ quanta. Such a light quantity may be recorded by means of an electron-optical converter. An immediate photographic recording is possible, probably, for the tracks of the strongly ionizing particles. The singly charged ions of Mg, Ca, Sr, Ba, Cd, Zn, Pb have suitable resonance lines in the visible and in the near ultraviolet part of the spectrum. A combination of one of the above-mentioned metals with an inert gas seems to be very advantageous. The ions of Ca

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SOV/56-35-2-59/60

On the Optical Methods for the Observation of Ionization in the Tracks of
' Fast Particles

Sr, Ba have metastable states and may be used for the obtain-
ing of a resonance combination scattering. Hitherto has not
been possible to decide whether the above discussed method
is more advantageous than the hitherto known methods or not.
The author thanks I. S. Abramson for useful advice. There
are 5 references, 4 of which are Soviet.

SUBMITTED: June 9, 1958

Card 3/3

VLADIMIRSKIY, V. V.

VLADIMIRSKIy, U.U.

SOV/89-...-18/25

21 (7), 21 (8)
AUTHOR: Rudakov, V. P.

TITLE: IX All-Union Conference on Nuclear Spectroscopy
             (IX Vsesoyuznoye soveshchaniye po yadernoy spektroskopii)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr..., pp 76-79 (USSR)

ABSTRACT: The IX All-Union Conference was held from January 26 to
             February 2, 1959 at Kharkov. More than 300 participants heard
             100 lectures, the most important of which dealt with the
             following fields. Nuclear Theory. General problems of β-decay.
             A. S. Davydov (MGU): Theoretical classification of low-energy
             excited nuclear states. L. K. Peker: Deformed nuclei ...
             Birbrair, L. K. Peker, L. A. Sliv (LFTI): Quadrupole
             oscillations of deformed nuclei ...

Card 1/5

Card 3/5

SOV/56-36-4-56/70

21(7)
AUTHORS:

Trebukhovskiy, Yu. V., Vladimirskiy, V. V., Grigor'yev, V. K.,
Yergakov, V. A.

TITLE:

The e-ν-Angular Correlation in the β-Decay of the Free Neutron
(Uglovaya korrelyatsiya e-ν pri β-raspade svobodnogo neytrona)

PERIODICAL:

ABSTRACT:

In the present "Letter to the Editor" the authors report about a
method of determining the electron-neutrino angular correlation
in the β-decay of the free neutron; this method is carried out
by spectrum analysis of the decay electrons with fixed momentum
of the recoil protons. The experimental arrangement is schemat-
ically represented by figure 1. The collimated neutron beam
(diameter 35 mm) used for this investigation was obtained from
the heavy water reactor of the AS USSR. The neutron beam incides
direct on to a lead- and boron-carbide-shielded monitor by which
flux is controlled. The electrons are conveyed via magnetic
lenses to a Geiger-Müller counter, and eventually reach a photo-
multiplier; the recoil protons encounter an electronic multi-
plier. Work was carried out with double coincidence connection

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SOV/56-36-4-56/70

The e-ν-Angular Correlation in the β-Decay of the Free Neutron

(for the purpose of eliminating such electrons as had penetrated both detectors) and with triple coincidence connection (between the proton- and electron detectors). The former had a time resolution of 0.2 μsec and the latter of 0.7 μsec. During measurements, the results of which are shown by a diagram in figure 2, the effectivity of the electronic multiplier was checked by calibration with an α-source and that of the Geiger-Müller counter and the photomultiplier by means of an Sr^{90}-source. Figure 2 shows the calculated curves for 5 λ-values between -1 and -1. The measured values (which are also plotted) have a standard error. Dealing with the results according to the method of the smallest squares gave λ = -0.06 ± 0.13, by which only the statistical error is taken into account. The value deviates somewhat from that obtained by Robson (Ref 3) (λ = +0.07 ± 0.12). Proceeding from the assumption that in β-decay the main contribution is made by the axially-vectorial and the vectorial variant (cf Refs 4-7), it holds, in accordance with the λ-value of the authors, that $R = g_A^2/g_V^2 = 1.3^{+1.5}_{-0.53}$. The authors finally thank Academician A. I. Alikhanov for his advice, Ye. K. Tarasov

Card 2/3

SOV/56-36-4-56/70

The e-ν-Angular Correlation in the β-Decay of the Free Neutron

SUBMITTED: December 25, 1958

Card 3/3

VLADIMIRSKIY, V.V.; NIKITIN, S.Ya.

International conference on high-energy accelerators and
devices. Prib.i tekh.eksp. no.1:147-150 Ja-F '60.
(MIRA 13:6)

(Particle accelerators) (Cloud chambers)

84414

S/056/60/039/004/032/048
B006/B063

26.2240
21.1100

AUTHOR: Vladimirskiy, V. V.

TITLE: Magnetic Mirrors, Channels, and Bottles for Cold Neutrons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
            Vol. 39, No. 4(10), pp. 1062 - 1070

TEXT: The fact that neutrons whose spins are orientated in the magnetic
field direction are reflected by regions of high field strengths is used
to focus polarized neutron beams by means of magnetic mirrors and
channels. In the present paper, the author discusses several problems
related to neutron storage. The cold neutrons can be confined by
restricting the vacuum cavity by magnetic mirrors. First, the author
studies the adiabaticity conditions that are necessary for maintaining
the spin orientation relative to the field. Section 3 deals with possible
magnetic field configurations: a plane magnetic mirror (Fig. 1), a
cylindrical, focusing channel (Fig. 2), arrangement of poles on equi-
distant circles (Fig. 3), and an arrangement of poles on a helical line
(Fig. 4). The advantages and disadvantages of the various configurations

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S/056/60/039/004/032/048
B006/B063

Magnetic Mirrors, Channels, and Bottles for
Cold Neutrons

are discussed. Section 4 gives an estimate of the intensities of polarized neutron beams. By using magnetic channels, it is possible to form beams of cold, polarized neutrons having energies from 10^{-4} to 10^{-3} ev. Section 5 deals with neutron storage and neutron densities in magnetic bottles. The neutron densities may be estimated from the formula $n = (2n_\theta/3\sqrt{\pi})(\mu H/\theta)^{3/2}$, where n_θ is the thermal neutron density on the reactor boundary, and θ the neutron temperature. The cold neutrons on the surface of the reactor are assumed to have an ordinary thermal spectrum. In fact, however, the number of cold neutrons is somewhat smaller on account of absorption. The correction factor is approximately equal to $\sigma_0/(\sigma_0+\sigma_a)$, where σ_a denotes the absorption cross section, and σ_0 the cross section for the energy exchange between neutron and moderator. For a reactor with a thermal neutron density of $10^8/cm^3$, it is found that the neutron density in a magnetic bottle is $n \sim 10^4/m^3$. When using the cryogen technique inside the reactor it is not possible to increase n by more than one order of magnitude. Finally, the author discusses the possibility

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84414

Magnetic Mirrors, Channels, and Bottles
for Cold Neutrons

S/056/60/039/004/032/048
B006/B063

of placing a magnetic bottle over the reactor and of using a vertical
hole as a neutron source. Problems concerning the potential barrier and
neutron heating as dependent on the selection of the bottle walls are
also discussed. V. K. Grigor'yev is mentioned. There are 6 figures and
5 references: 2 Soviet, 2 US, and 1 Swiss.

SUBMITTED: May 13, 1960

Card 3/3

VLADIMIRSKIY, V.V.; GRIGOR'YEV, V.K.; YERGAKOV, V.A.; ZHARKOV, D.P.;
TREBUKHOVSKIY, Yu.V.

Electron-neutrino angular correlation in free neutron decay.
Izv. AN SSSR. Ser. fiz. 25 no.9:1121-1123 '61.(MIRA 14:8)
            (Neutrons—Decay)
            (Neutrinos)
            (Electrons)

30036
S/030/61/000/011/003/007
B105/B147

24.6730

AUTHORS: Vladimirskiy, V. V., Doctor of Physics and Mathematics,
          Gol'din, L. L., Doctor of Physics and Mathematics

TITLE: A new powerful proton synchrotron

PERIODICAL: Akademiya nauk SSSR. Vestnik, no. 11, 1961, 34-39

TEXT: A new large $7 \cdot 10^9$ ev proton synchrotron was put into operation at
the Institut teoreticheskoy i eksperimental'noy fiziki Akademii nauk SSSR
(Institute of Theoretical and Experimental Physics of the Academy of
Sciences USSR). The principle of strong focusing makes it possible to
build lighter, cheaper machines of higher efficiency with equal maximum
acceleration. Fig. 1 shows the cross section of the vacuum chamber and
the poles of the electromagnet; the chamber is much smaller than that of
the accelerator at Dubna. The magnetic field of the required shape is
obtained between two hyperbolic poles and the neutral pole. The poles of
the electromagnet correspond to $xy = 50.5$ cm^2 and are machined to an
accuracy of 0.05 mm. The magnetic ring, 80 m in diameter, consists of
112 magnetic blocks weighing 35 tons each; they are arranged with an

Card 1/4 2

S/030/61/000/011/003/007
B105/B147

A new powerful proton synchrotron

accuracy of 0.1 mm. The field in the center of the chamber amounts to ~ 8500 oe. Fig. 3 shows the plan of the accelerator building. A proton beam electrostatically accelerated up to about 4 Mev is injected into the ring, accelerated to $7 \cdot 10^9$ ev, and finally conducted through the exit channels into the experimenting rooms, the largest of which is 100 m long and 42 m wide. They are separated from the magnet room by 10 or 6 m thick detachable concrete walls. According to its energy, this accelerator is the fourth largest in the world and the second largest in the USSR, after that at the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) at Dubna (10^{10} ev). The experience gained during the construction of this accelerator is to be utilized for the construction of a 60-70 billion ev accelerator. The energy of accelerated protons reached $7.3 \cdot 10^9$ ev in October 1961, and thus surpassed the energy planned. The intensity of the beam is to be further increased. There are 4 figures.

Card 2/3

39146

S/120/62/000/003/005/048

E039/E135

21.6000

AUTHORS: Kalebin, S.M., and Vladimirskiy, V.V.

TITLE: A mechanical neutron chopper suspended in a magnetic field

PERIODICAL: Pribory i tekhnika eksperimenta, no.3, 1962, 36-43

TEXT: The apparatus is described in detail. The rotor, which weighs 25 kg, is suspended in a magnetic field and rotates about a vertical axis. All aspects of the stability of the system are discussed and it is shown that damping in the horizontal plane is required. The rotor is maintained in space with no mechanical contact to an accuracy ~0.01 mm in rotational stability and is driven by an asynchronous motor on the same axis. No vertical oscillation is observed with a microscope (50X). A detailed description of the vertical and horizontal stabilizing circuits is also given. In the rotor are two slit systems, 13 in each, symmetrically placed with respect to a diameter of the rotor. At the exit the slit width is 0.4 mm, at the centre 0.6 mm, and the height is 15 mm. The camber of the slit at one wall is 0.2 mm and the other 0.4 mm. With this arrangement two neutron pulses

Card 1/2

A mechanical neutron chopper ...   S/120/62/000/003/005/048
                                      E039/E135

per revolution are obtained. At 15 x 10^3 rev/min the transmission
spectrum passes through a maximum at ~20 ev. Using thick
samples of Co, W, and Ta, it is shown that the background is ~15%
for a flight base of 50 m. Theoretical analysis shows that the
form of the transmitted neutron pulse approximates closely to a
triangle, the half width of which defines the limiting resolution
of the chopper. A CHM-5 (SNM-5) boron counter is used at a
pressure of 600 mm. Experimental and theoretical curves are
compared for Ta^{181} (38.8 ev) at 15 x 10^3 rev/min and good agree-
ment is obtained. It is concluded that, with the aid of this
chopper, it is possible to obtain neutron pulses having a half
width ~0.5 µsec.   There are 12 figures.

ASSOCIATION: Institut eksperimental'noy i teoreticheskoy fiziki
             AN SSSR (Institute of Experimental and Theoretical
             Physics, AS USSR)

SUBMITTED: November 25, 1961 ·

Card 2/2

40744

S/120/62/000/004/010/047
E032/E514

24.6730

AUTHORS: Vladimirskiy, V.V., Kobozev, A.S., Marfenko, S.V.,
             Pevnev, A.K., Porubay, N.I. and Tarasov, Ye.K.

TITLE: Effect of the deformation of the foundations on the
             orbit of protons in a synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 66-69

TEXT: Unavoidable displacements of the ground in the
vertical and horizontal directions due to seasonal variations in
the temperature, humidity and so on, may give rise to relative
displacements in the position of magnet sections, which in turn
may produce forced oscillations of the proton beam. In the
7 GeV proton synchrotron of the GKAE the magnet is supported by
a continuous solid ring which is in principle similar to that
employed at CERN. The reinforced-concrete ring which supports
the magnet lies directly on the ground which consists of soft
morainic deposits. The relatively small dimensions of the ring
(R = 40 m) ensured that it could be made sufficiently rigid and
thereby minimise the effect of nonuniform settling of the ground
on the orbit. The ring was placed at a depth of 5 m. A theoretical

Card 1/3

Effect of the deformation of the ... S/120/62/000/004/010/047
E032/E514

analysis is now given of the strength of the ring foundation by
developing the displacement of the axis of the accelerator chamber
due to deformation of the foundations into a Fourier series.
Owing to the rigidity of the magnet sections and the small
distance between neighbouring sections, the position of all the
sections can be specified with sufficient accuracy by the
coordinates of 112 points. The Fourier series, therefore,
contain a finite number of terms. For each harmonic of the
deformation one can then calculate the amplitude of the correspond-
ing periodic orbits. Numerical calculations showed that the
13th, 43rd and neighbouring harmonics were the most dangerous.
The mathematical analysis is facilitated by the fact that a
mathematical solution is available for the problem of mechanical
vibrations of an elastic ring (Love, Mathematical Theory of
Elasticity). In their final form the foundations were in the
shape of a continuous reinforced-concrete belt of square cross-
section having a length of 250 m, height 5 m and width 5 m with a
nett load of about 16 tons per running metre. The belt contains
two circular cable tunnels (1.25 x 1.95 m^2). The analytical

Card 2/3

Effect of the deformation of the ...   S/120/62/000/004/010/047
                                       E032/E514

calculations and the design data were then tested experimentally
by observations of the position of 28 markers attached to the
foundations. Vertical and radial variations for the period
1959/62 are reported in the form of graphs, from which it is
concluded that the maximum departure of the orbit from the axis   .
of the chamber, due to the deformation of the foundations, did
not exceed 1.5 mm.   The amplitude of the deformations of the
foundations was of the same order of magnitude (about 1 mm).
There are 2 figures and 2 tables.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy
               fiziki GKAE
               (Institute of Theoretical and Experimental Physics
               GKAE)

SUBMITTED: March 31, 1962

Card 3/3

VLADIMIRSKIY, V.V.; GOL'DIN, L.L.; PLIGIN, Yu.S.; VESELOV, M.A.;
TALYZIN, A.N.; TARASOV, Ye.K.; KOSHKAREV, D.G.; LAPITSKIY,
Yu.Ya.; BARABASH, L.Z.; KLEOPOV, I.F.; LEBEDEV, P.I.;
KUZ'MIN, A.A.; BATALIN, V.A.; ONOSOVSKIY, K.K.; UVAROV, V.A.;
VODOP'YANOV, F.A.

Adjustment of acceleration in the 7 bev. proton synchrotron.
Prib. i tekh. eksp. 7 no. 4:248-255 Jl-Ag '62. (MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosu-
darstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.

40745

S/120/62/000/004/011/047
E140/E420

AUTHORS: Vladimirskiy, V.V., Koshkarev, D.G., Onosovskiy, K.K., Smolyankina, T.G., Smirnitskiy, V.A., Danil'tsev, Ye.N., Lazarev, N.V., Lapitskiy, Yu.Ya., Pligin, Yu.S., Batalin, V.A.

TITLE: The ion guide and beam-introduction system of the proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 70-75

TEXT: From experimental work on the 4 Mev electrostatic generator used for beam injection, it was found that the diameter of the matched beam in the accelerator chamber would be not less than about 25 mm. The injection system was therefore designed to use plane condensers instead of slot condensers. As the phase volume of the beam was four times greater than expected, the focusing was strengthened by the use of quadrupole lenses. The beam introduction system is shown in Fig.2, where $C_{1,2,3}$ are condensers. C_1 is constructed from stainless steel plates, $\ell = 600$ mm, $h = 35$ mm, bent to a radius of 4000 mm, $V = 80$ kV, $\omega = 171$ mr, $\Delta V/V = 1.5 \times 10^{-3}$.

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S/120/62/000/004/011/047
E140/E420

The ion guide and beam-introduction ...

C_2 has $\ell = 220$ mm, $h = 20$ mm, $\ell = 220$ mm, $h = 80$ mm, $V = 62$ kV, $\omega = 85$ mr and $\Delta V/V = 2.2 \times 10^{-3}$. C_3 has $\ell = 220$ mm, $h = 80$ mm, $V = 56$ kV, $\omega = 9.6$ mr, $\Delta V/V = 1 \times 10^{-2}$, where ℓ is length of the plates, h is the distance between them, ω is the angle through which the beam is bent and $\Delta V/V$ is the required stability. Calculation on the design of the system and its adjustment are given, in particular design details are presented on the first condenser C_1, the electrostatic quadrupole lenses, the ion guide and the magnetic quadrupole lenses. The electrostatic quadrupole lens consists essentially of four stainless steel plates with a hyperbolic profile and the magnetic quadrupole lens is calculated for a gradient of 350 Oe/cm and a length of 15 cm with a magnetic aperture of 60 mm. There are 12 figures.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKAE (Institute of Theoretical and Experimental Physics GKAE)

SUBMITTED: March 31, 1962
Card 2/3

The ion guide and beam-introduction ... S/120/62/000/004/011/047
E140/E420
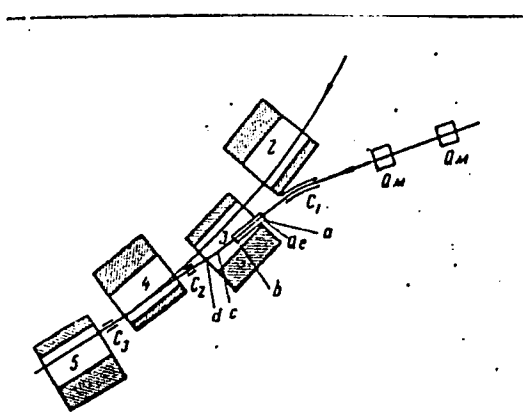
Fig.2.

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$\text{ho}755$

S/120/62/000/004/029/047
E039/E420

AUTHORS: Vladimirskiy, V.V., Borisov, V.S., Smolyankina, T.G.,
Gorbik, V.K., Kurdyukova, Z.A., Moskovtsev, V.A.,
Smirnov, V.S.

TITLE: Calculation and construction of pole piece correction
coils in the proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 153-158

TEXT: Preliminary tests with model magnets showed that the field
configuration required correction at the beginning and end of the
acceleration cycle. Deviations which are constant in time can be
corrected by a small geometrical displacement of the magnet blocks
but transient deviations have to be corrected by coils on the pole
faces. In the present article calculations are made on the form
of these coils. As the radius of curvature of the magnet is
large by comparison with the chamber dimensions the problem can
be solved for the plane case. In a region limited by two
hyperbolas $xy = \pm p$ and a straight line $x = 0$ the surface
distribution of the currents is determined for the general case.
Suitable positions for the conductors are then selected and the

Card 1/2

Calculation and construction of ...

S/120/62/000/004/029/047
E039/E420

sum of the magnetic fields produced by these conductors is calculated on a computer. The construction of the coils is described in detail. A completely rigid construction is obtained by embedding the conductors in epoxy-resin. The average gradient produced by the gradient coils in the region $\pm$ 3 cm relative to the equilibrium orbit is -8.01 Oe/cm and the nonlinear coils on the edge produce a field H = -316 Oe with a mean square deviation of 10.8 Oe. The calculated and experimental values of the fields produced by gradient and nonlinear coils are compared and show reasonable agreement. There are 5 figures.

ASSOCIATIONS: Institut teoreticheskoy i eksperimental'noy fiziki GKAE (Institute of Theoretical and Experimental Physics GKAE): Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury GKAE (Scientific Research Institute of Electrophysical Apparatus GKAE)

SUBMITTED: March 29, 1962

Card 2/2

40765
S/120/62/000/004/046/047
E039/E420

24,6730

AUTHORS: Vladimirskiy, V.V., Barabash, L.Z., Pligin, Yu.S.,
Veselov, M.A., Talyzin, A.N., Tarasov, Ye.K.,
Kuz'min, A.A.

TITLE: Measurement of the frequency of transverse
oscillation of the beam of the 7 Gev proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 245-247

TEXT: Periodic oscillations of the centre of gravity of separate
bunches in the proton beam are observed with the aid of the signal
electrodes used for determining the beam position.   The signals
are amplified with a wide band amplifier and observed on a double
beam oscillograph using photographic recording.   At 0.5 m sec after
injection transverse oscillations connected with small initial
oscillations of the beam at the moment of injection are observed.   The
These transverse oscillations decay rapidly in 2 to 3 msec.
basic measurements were therefore made by artificially exciting
oscillations by applying a transverse electric field
ε = 1 to 1.5 KV/cm over a length of ≃ 20 cm for a time of 4 to
10 μ sec.   The amplitude of oscillation of the beam in one
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Measurement of the frequency ...

S/120/62/000/004/046/047
E039/E420

revolution is then A = 400 e$\varepsilon\ell$/pv cm where p is the pulse and .
v is the proton velocity.   Immediately after injection the
amplitude is about 1 cm and after 100 msec about 0.5 mm.   To
facilitate analysis the time of injection was limited to about
5 μ sec for a duration of revolution of 9 μ sec and in addition a
sinusoidal signal with a frequency of 7/8 the frequency of
revolution of the beam is presented on the second trace of the
oscillograph.   Results are presented showing the frequencies of
vertical and radial oscillations which are very near to resonance
values: $Q_{z\ max}$ = 12.94 and $Q_{r\ min}$ $\simeq$ 12.55 .
There are 2 figures and 2 tables.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki
             GKAE (Institute of Theoretical and Experimental
             Physics GKAE)

SUBMITTED: May 18, 1962

Card 2/2

40756

S/120/62/000/004/047/047
E039/E420

24.6500.

AUTHORS: Vladimirskiy, V.V., Gol'din, L.L., Pligin, Yu.S.,
Veselov, M.A., Talyzin, A.N., Tarasov, Ye.K.,
Koshkarev, D.G., Lapitskiy, Yu.Ya., Barabash, L.Z.,
Kleopov, I.F., Lebedev, P.I., Kuz'min, A.A.,
Batalin, V.A., Onosovskiy, K.K., Uvarov, V.A.,
Vodop'yanov, F.A.

TITLE: Adjustment of the acceleration regime of the 7 Gev
proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 248-255

TEXT: In order to establish the optimum parameters for
programming the control frequency the intensity, position,
and frequency and amplitude of transverse oscillation of the beam
is measured in three stages: (1) during the first revolution,
(2) with a circulating beam and (3) with acceleration.
For measurements on the first revolution long afterglow
scintillation screens are used which are either observed visually
or by means of a television camera. The screens are placed in
the sections between magnet blocks; 15 in the initial part and
10 in the final part of the chamber. It is shown that the orbit does not

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Adjustment of the acceleration ...

S/120/62/000/004/047/047
E039/E420

deviate by more than 1.5 cm from the axis during the first
revolution.   Circulating beams without acceleration are obtained
which continue for 20 to 30 revs.   The circulating current is
determined by means of a flight tube and the transverse
oscillation frequency with an electrostatic probe with double
vertical and horizontal plates.   Scintillation screens in the
form of a grid with 85% transmission are used to show the beam
position and diameter for 5 to 10 revs.   The beam diameter is
shown to be about 4 cm under normal conditions.   Investigations
are carried out on the optimum form of the frequency – time
relation for holding the beam in orbit.   The width of the trapping
region is $\pm$ 3 Kc/s for an initial frequency of 750 Kc/s which
agrees well with theoretical estimates.   Preliminary adjustment
permitted the attainment of 6.2 Gev protons and after adjustment
7.2 Gev protons were obtained on October 25, 1961.   The usual
intensity on a normal cycle lies in the range 3 to 5 x 10^9.
There are 7 figures and 1 table.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki
             GKAE (Institute of Theoretical and Experimental
                                           Physics GKAE)
SUBMITTED: April 11, 1962
Card 2/2

24.6730

AUTHOR: Vladimirskiy, V.V., Doctor of Physics and Mathematics

TITLE: Strong focussing

PERIODICAL: Priroda, no. 5, 1962, 34-40

TEXT: A 7 BeV proton synchrotron, the first Soviet strong-focussing particle accelerator, is described. It recently started operations at the Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR (Institute of Theoretical and Experimental Physics, AS USSR) in Moscow. The device has an injection energy of 4 MeV, a mean radius of 40 m, an 8x11 cm chamber aperture, a magnetic system weighing 3800 t and having 112 magnetic segments, a peak supply output of 27 mw, a 1.5 sec acceleration time, 10 c/min, and a rated intensity of 10^9-10^{10} in a pulse. The magnetic and supply systems, vacuum chamber and electrostatic generator were designed at the Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury (Scientific Research Institute of Electrophysical Equipment), and the precision radioelectronic equipment by the Radiotekhnicheskiy institut AN SSSR (Radio Engineer-

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30

Strong focussing

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ing Institute, AS USSR). The device is intended for studying fast π meson, K meson, proton and antiproton beams. Secondary particle beams have already been successfully obtained. Equipment for producing fast π meson, K meson and antiproton beams will be installed later. The layout will provide for 10 independent experimental units, some of which will be able to operate simultaneously. There are 7 figures.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR
(Institute of Theoretical and Experimental Physics, AS USSR),
Moscow

Card 2/2

24 6730

AUTHORS: Vladimirskiy, V. V., Komar, Ye. G., Mints, A. L.,
Gol'din, L. L., Monoszon, N. A., Rubchinskiy, S. M.,
Tarasov, Ye. K., Vasil'yev, A. A., Vodop'yanov, F. A.,
Koshkarev, D. G., Kuryshev, V. S., Malyshev, I. F., Stolov,
A. M., Strel'tsov, N. S., Yakovlev, B. M.

TITLE: The design of the 7-Bev proton synchrotron

PERIODICAL: Atomnaya energiya, v. 12, no. 6, 1962, 472-474

TEXT: The history of the first Soviet cyclic accelerator with rigid
focusing is briefly described, and the most important data on its planning
and operation are presented. Planning was started in 1953. The parameters
of this proton accelerator, the energy of which exceeds the antinucleon
production threshold, were so chosen that the dependence of the orbital
circumference on the particle momenta was completely compensated. This was
achieved by employing 14 quadrupole magnets with orbits of negative
curvature. Technical data: output current, 10^{10} protons/pulse; maximum
field strength, 8475 oe; length of equilibrium orbit, 251.2 m; radius of

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end, $5 \cdot 10^{-5}$. accelerating

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VLADIMIRSKIY, V.V.; KOBOZEV, A.S.; MARGENKO, S.V.; PEVNEV, A.K.;
PORUBAY, N.I.; TARASOV, Ye.K.

Effect of deformations in the foundation on the proton orbits
in a synchrotron. Prib. i tekh. eksp. 7 no.4:66-69 Jl-Ag '62.
(MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosu-
darstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.
(Synchrotron)

VLADIMIRSKIY, V.V.; BORISOV, V.S.; SMOLYANKINA, T.G.; GORBIK, V.K.; KURDYUKOVA, Z.A.; MOSKOVTSEV, V.A.; SMIRNOV, V.S.

Design and construction of correcting pole windings for a proton synchrotron. Prib. i tekh. eksp. 7 no.4:153-158 Jl-Ag '62.   (MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR i Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.
                   (Synchrotron)   (Electric coils)

VLADIMIRSKIY, V.V.; KOMAR, Ye.G.; MINTS, A.I.; GOD'DIN, L.L.; MOMOSZON, N.A.;
RUBCHINSKIY, S.M.; TARASOV, Ye.K.; VASIL'YEV, A.A.; VODOP'YANOV, F.A.;
KOSHKAREV, D.G.; KURYSHEV, V.S.; MALYSHEV, L.F.; STOLOV, A.M.;
STREL'TSOV, N.S.; YAKOVLEV, B.M.

Designing a 7 Bev. synchrotron. Atom. energ. 12 no.6:472-474 Je
'62.   (MIRA 15:6)
                        (Synchrotron)

VLADIMIRSKIY, V.V.; BARABASH, L.Z.; PLIGIN, Yu.S.; VESELOV, M.A.;
     TALYZIN, A.N.; TARASOV, Ye.K.; KUZ'MIN, A.A.

Measurements of the frequencies of transverse oscillations of
the beam in the 7 bev. proton synchrotron. Prib. i tekh. eksp. 7
no.4:245-247   Jl-Ag '62.   (MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosu-
darstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.
          (Electronic measurements)   (Synchrotron)

VLADIMIRSKIY, V.V., doktor fiziko-matem.nauk

   Strong focusing; a new Soviet synchrotron. Priroda 51   no.5:34-40
   My '62.   (MIRA 15:5)

   1. Institut teoreticheskoy i eksperimental'noy fiziki AN SSSR,
   Moskva.
                           (Synchrotron)

L 43085-65   EWT(m)/EPA(w)-2/EWA(m)-2   Pab-1C/Pt-I   IJP(c)   GS

ACCESSION NR: AP5007915   S/0000/64/000/000/0086/0089

AUTHOR: Vladimirskiy, V. V.; Koshkarev, D. G.; Tarasov, Ye. K.

TITLE: 500-Gev proton accelerator

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963.
Trudy. Moscow, Atomizdat, 1964, 86-89

TOPIC TAGS: high energy accelerator, injector, synchrotron

ABSTRACT: The present report discusses a third alternative of an injector ring,
whose advantage would be the fact that such an accelerator-injector has already
been built at Serpukhov; namely, the 70-Gev accelerator of the Institute of
Theoretical and Experimental Physics, which has a ring just seven times smaller in
length than that of the main accelerator. The 70-Gev accelerator can operate both
as an independent device producing a proton beam with an energy of 70 Gev and also
as an injector with an energy of 15 Gev per cycle. Provision would be made for the
use of multi-turn injection on the Serpukhov accelerator to increase the intensity.
(The first alternative was an auxiliary proton synchrotron with an energy of 15
Gev, proposed in 1959 by Sandsom. The second alternative was a long injector which

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ACCESSION NR: AP5007915

6

has a ring equal in length to the main accelerator and is placed in the same ring chamber.) The report presents the main parameters of the 500-Gev accelerator and the arrangement of its magnets and the correcting elements. Serpukhov possesses, it is noted, enough space for an accelerator even larger than the 70-Gev, which would become its injector. The comparatively long acceleration time of 6 seconds in the parameter list is one of the properties of the injector, in which the energy distribution of the accelerated particles is rather large. Acceleration time would decrease at higher radio-frequencies. "The authors take this opportunity to express their thanks to F. A. Vodop'yanov (RAI AN SSSR) for his very valuable ideas in the field of high-frequency accelerating systems, to L. L. Gol'din for his ac-

computations." Orig. has 2 figures.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKAE SSSR (Institute of Theoretical and Experimental Physics, GKAE SSSR)

Card 2/3

SUBMITTED: 26 MAY 64

L 43088-65   EWT(m)/ EPA(w)-2/EWA(m)-2   Pab-10/Pt-1   IJP(c)   JT/GS

ACCESSION NR: AT5007918   S/0000/64/000/000/0197/0201

AUTHOR: Vladimirskiy, V. V.; Gol'din, L. L.; Koshkarev, D. G.; Tarasov, Ye. K.;
Yakovlev, B. M.; Gustov, G. K.; Komar, Ye. G.; Kulikov, V. V.; Malyshev, I. F.;
Monoszon, N. A.; Popkovich, A. V.; Stolov, A. M.; Strel'tsov, N. S.; Titov, V. A.;
Vodop'yanov, F. A ; Kuz'min, A. A.; Kuz'min, V. F.; Mints, A. L.; Rubchinskiy,
S. M.; Uvarov, V. A.; Zhadanov, V. M.; Filaretov, S. G.; Shiryayev, E. Z.

TITLE: 60-70 Gev Proton Synchrotron

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy.
Moscow, Atomizdat, 1964, 197-201

TOPIC TAGS: high energy accelerator, synchrotron

ABSTRACT: A 60-70 Gev proton synchrotron with strong focusing is being constructed
not far from Serpukhov, as has been reported earlier (e.g. "Research Institute for
Electro-Physical Equipment, Leningrad," in Proceedings of the International Confer-
ence on High Energy Accelerators and Instrumentation, CERN, 1959), p. 373
. . . .
. . . .
1963. The parameters of the magnet are presented in a table. . . . .
the original plans permitted an increase in the length of a part of the free
Card 1/4

L 43038-65

ACCESSION NR: AT5007918

sections, some of which are utilized for input and exit of beams. The super-period design is described. The lengthened sections were obtained as a consequence of shortening the focusing and defocusing blocks by 112 cm. The focusing properties of the magnetic channel were diminished consequently, but very little; and the limiting energy was lowered by 2-3 Gev. The construction of the magnet is described. Each of the magnetic blocks is divided lengthwise into 5 sub-blocks which are enveloped by the common winding. These sub-blocks consist of laminar two-millimeter silicon steel. These steel sheets were stamped out without subsequent mechanical working, and were subjected to sorting and intermixing in order to smooth out their magnetic characteristics. The sub-blocks are constricted by lateral welded plates without adhesion. Provision was made for windings on the poles in order to correct for pole nonlinearity and for variations in the drop reading. These windings make it possible to introduce artificial quadratic (square) nonlinearity that changes the dependence of the frequency of transverse oscillations during a pulse. In order to correct for straying of the residual field, provision has been made for windings on the yoke in series with the main winding. The sub-blocks must undergo calibration on a magnet stand in order to make correcting systems more precise and to determine the most convenient disposition of the sub-blocks along the ring. The winding of the electromagnet is made of aluminum busbars with hollow cores for cooling water. The length of the busbar is so selected that there would be no

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L 43038-65
ACCESSION NR: AT5007918

welded joints inside the coils. The winding consists of 4 sections, two of which are disposed on the upper pole and two on the lower. The most important character-istics of the electromagnet and power supply system are described in a table. Also described are the vacuum chamber and accelerating field (obtained by 53 paired resonators with ferrite rings, which operate at the 30-th harmonic of revolution and give accelerating potential of 350 kilovolts) The ring tunnel and the general arrangement of the accelerator are shown in figures and described. The building for the injector and portions of the ring tunnel from the injector to the experi-mental room have been completed in the main and are ready for installation of equipment. This room, in the form of a single-aisle building without internal supports, permits one to work on beams brought into the inner and outer sides. A 90-meter arch covers this room, whose overall length is 150 meters. Provisions have been made for a second experimental room at the southwest part of the ring. Orig. has 4 figures, 2 tables.

ASSOCIATION: Institute teoreticheskoy i eksperimental'noy fiziki GKAE SSSR (Institute of Theoretical and Experimental Physics, GKAE SSSR). (2) Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury imeni D. V. Yefremova GKAE SSSR (Scientific Research Institute of Electrophysical Apparatus, GKAE SSSR).

Card 3/4

L 43088-65

ACCESSION NR: AT5007918

(3) Radiotekhnicheskiy institute AN SSSR (Radio Engineering Institute, Academy of
Sciences SSSR). (4) Gosudarstvennyy proyektnyy institut GKAE SSSR (State Planning
Institute, GKAE SSSR).

SUBMITTED: 26May64   ENCL: 00   SUB CODE: EC, NP

NO REF SOV: 002   OTHER: 001

Card 4/4

GRIGOR'YEV, V.K.; GRISIN, A.[...] VLADIMIRSKIY, V.V.; PROCHIN, [...] TEOFILYEV,
I.A.; TIKHOMIROV, G.[...].

Study of the reaction $\pi^- + p \to p + \pi^- + \pi^- + \pi$ at an energy of 2.8 Bev.
Zhur. eksp. i teor. fiz. 47 no.23:00-[...] Ag '[...].
                                                            (MIRA [...])

1. Institut teoreticheskoy i eksperimentalnoy fiziki Gosudarstvennogo
komiteta po ispol'zovaniyu atomnoj energii.

VLADIMIRSKIY, V.V.; KOMAR, Ye.O.; MINTS, A.L.; GOL'DIN, L.L.;
MONOSZON, N.A.; RUBCHINSKIY, S.M.; TARASOV, Ye.K.; VASIL'YEV, A.A.;
VODOP'YANOV, F.A.; KOMAREV, D.G.; KURYSHEV, V.S.; MALYSHEV, I.F.;
STOLOV, A.M.; STREL'TSOV, N.S.; YAKOVLEV, B.M.

The 7 bev. proton synchrotron. Prib. i tekh. eksp. 7 no. 4:5-9
Jl-Ag '62.   (MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosu-
darstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR,
Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury
Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii
SSSR i Radiotekhnicheskiy institut Gosudarstvennogo komiteta
po ispol'zovaniyu atomnoy energii SSSR.
                         (Synchrotron)

KOTOV, V.I., kand.fiz.-matem.nauk (Dubna); VEKSLER, V.I., akademik; VLADIMIRSKIY,
V.V.; SETVAK, M., doktor (Chekhoslovakiya); MINTS, A.L., akademik; DZHE-
LEPOV, V.P., prof.; VAL'TER, A.K., prof.; KOLOMENSKIY, A.A., prof.

Accelerators of the future; articles and speeches of the participants
in the international conference in Dubno. Priroda 53 no.1:44-56 '64.
(MIRA 17:2)

1. Chlen-korrespondent AN SSSR (for Vladimirskiy).

ACCESSION NR: AP4043608

S/0056/64/047/002/0400/0403

AUTHORS: Grigor'yev, V. K.; Grishin, A. P.; Vladimirskiy, V. V.;
Trostina, K. A.; Yerofeyev, I. A.; Tikhomirov, G. D.

TITLE: Investigation of the reaction $\pi^{+} + p \rightarrow p + \pi^{-} + \pi^{+} + \pi^{-}$ at
2.8 BeV energy

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 400-403

TOPIC TAGS: pi meson product, negative pi meson, positive pi meson,
pion scattering, scattering cross section, resonance scattering

ABSTRACT: The experimental material used by Yu. V. Trebukhovskiy
et al. (Phys. Lett., v. 6, 190, 1963) to investigate the reaction
$\pi^{-} + p \rightarrow p + \pi^{-} + \pi^{0} + \pi^{0}$ (1) at a primary pion momentum 2.8 BeV/c,
was used by the authors to analyze the analogous reaction with charged
pions in the final state, namely $\pi^{-} + p \rightarrow p + \pi^{-} + \pi^{+} + \pi^{-}$ (2).
About 70% of the photographs (total 30,000) obtained in the earlier

Card   1/5

ACCESSION NR: AP4043608

investigation were used, and 550 events were selected to check the
distribution of the latter reaction relative to the three pion
mass.   The selection criteria are briefly described.   The value
obtained for the ratio of the cross sections of reaction (2) to
that of (1) (0.8 ± 0.4) offers evidence that these reactions are
more likely to proceed via three-pion resonance than via formation
of ρ and Δ resonances (ρ meson and Δ isobar).   The irregularity in
the three-pion-mass distribution in the vicinity 0.9--1.0 BeV/c^2
indicates that three-pion resonance can exist with T = 1 or T = 2
(T -- isotopic spin).   "The authors are grateful to V. A. Shebanov,
Yu. S. Krestnikov, and V. V. Barmin for supplying the material, to
Yu. V. Trebukhovskiy for participating in the work during its
earlier stage and for useful discussion, Ye. M. Lapidus, V. M.
Polyakova, and V. N. Lyakhovitskiy for guidance of the mathematical
reduction of the measurement data, to the accelerator crew, and to
the computer crew for collaboration.   Orig. art. has: 4 figures and
8 formulas.

Card 2/5

ACCESSION NR: AP4043608

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki
(Institute of Theoretical and Experimental Physics)

SUBMITTED: 29Jan64   ENCL: 02

SUB CODE: NP   NR REF SOV: 001   OTHER: 002
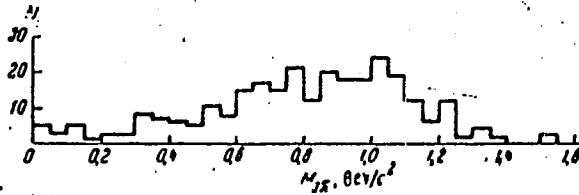
Card 3/5

Distribution of events relative to the three-pion
mass for the interval between 2.75 and 2.90 BeV.
The triangles denote events satisfying the
hypothesis $\pi^- + p \to \Delta^0 + p^0 \to p + \pi^- + \pi^+ + \pi^-$

Card 4/5

ACCESSION NR: AP4043608

ENCLOSURE: 02

Three-pion mass distribution for total energy
larger than 2.90 BeV

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L 8312-65   EWI(m)   DIAAP/AEDC(a)/SSD/AEDC(b)

ACCESSION NR: AP4044669   S/0120/64/000/004/0054/0055

AUTHOR: Radkevich, I. A.; Vladimirskiy, V. V.; Sokolovskiy, V. V.;
Blagorodov, A. M.

TITLE: Magnetic track spectrometer with spark chambers

SOURCE: Pribory* i tekhnika eksperimenta, no. 4, 1964, 54-55

TOPIC TAGS: spark discharge chamber, spectrometer, magnetic track
spectrometer

ABSTRACT: The blueprint of a new track spectrometer is briefly discribed. The
spark-discharge chambers are located inside the magnet which permits identifi-
cation of 3 or more charged particles, provides sufficient solid angle, and
ensures the recording of even weak particles. Designed for operation with a
7-Gev accelerator, the magnet will have an inside 90 x 50 x 300 cm cavity for the
spark chambers; magnetic induction, 16 kgauss; 5 groups of 50 x 90-cm spark

Card 1/3

L 8512-65

ACCESSION NR: AP4044669   C

chambers with 10 gaps in each, with 7-micron aluminum electrodes; slot width,
10 cm; distance between slots, 65 cm; magnet weight, 140 tons. The optical
system is so arranged that the optical paths between the chambers and cameras
are equal. Some details are given in Enclosure 1. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 24Aug63   DATE: ENCL: 01

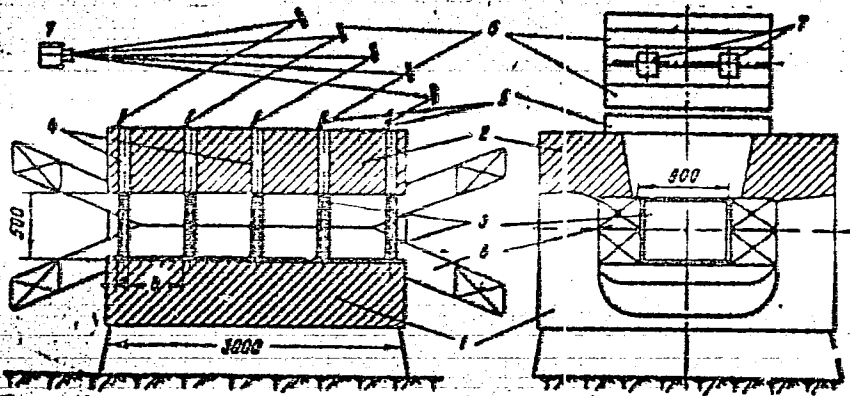SUB CODE: NP   NO REF SOV: 000   OTHER: 003

Card 2/3

L 8512-65

ACCESSION NR: AP4044669

ENCLOSURE: 1

Design features of the planned magnetic spectrometer

1 - magnet yoke; 2 - upper detachable beam;
3 - flat spark chambers; 4 - slots for photographing;
5 - 6 - mirrors; 7 - cameras; 8 - magnet winding

Card 3/3

L 2757-66   EWT(m)/T/EWA(m)-2
ACCESSION NR: AP5024340

AUTHOR: Vladimirskiy, V. V.; Terent'yev, M. V.

TITLE: Regeneration effects and a complete experiment in a K^0-meson beam

SOURCE: Yadernaya fizika, v. 2, no. 2, 1965, 265-271

TOPIC TAGS: parity principle, nuclear physics, K meson

ABSTRACT: The authors suggest a set of experiments (each of which has, as a rule, been previously proposed in the literature for verifying various models explaining CP-parity nonconservation) which would theoretically be sufficient for determining all the parameters pertaining to nonconservation of CP- and CPT-parity in neutral K-meson decay. Since interference phenomena in regeneration processes give several possibilities for studying the nature of CP-parity violation, the authors analyze the regeneration of short-lived components in a medium without any suppositions about the symmetric properties of the mass operator. "In conclusion, the authors are sincerely grateful to L. Okun', who initiated this work, to M. Balata for consultation, and to workers in the mathematics department of the ITEF for doing the computation. The authors express their deep gratitude to V. Lyuboshits, E. Okonov,

Card 1/2

L 2757-66

ACCESSION NR: AP5024340

M. Podgoretskiy and U Tzun Fan' for discussing their work before publication."
Orig. art. has: 4 figures, 14 formulas.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKIAE (Institute
of Theoretical and Experimental Physics, GKIAE)

SUBMITTED: 15Mar65   ENCL: 00   SUB CODE: NP

NO REF SOV: 005   OTHER: 006

Card 2/2

L 1866-66   EWT(m)   DIAAP
ACCESSION NR: AT5022283

UR/3138/65/000/353/0001/0017

AUTHOR: Vladimirskiy, V. V.

TITLE: Degenerate SU sub 4 symmetry of strong interactions

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii.
Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 353, 1965.
Vyrozhdennaya SU_4-simmetriya sil'nykh vzaimodeystviy, 1-17

TOPIC TAGS: strong nuclear interaction, quantum theory, group theory, meson

ABSTRACT: The assumption of degeneration of strong interactions relative to one
of the quantum numbers of the SU_4 group results in a substantial reduction of the
number of states with various masses. Degenerate SU_4 multiplets resemble SU_3
supermultiplets: in the regular 15-dimension representation there is only one
excess mass as compared to the octet; in the 20-dimensional representation analo-
gous to the baryon octet, there are two excess masses (Ξ 1395, Ω 1560); in the
20-dimensional representation analogous to the decuplet, there are no excess
masses. Doubling of the number of states of K-mesons makes it possible to
obtain a phenomenological description of CP-parity violation in $K_2^0 \rightarrow 2\pi$ decay.
"The author thanks I. Yu. Kobzarev for an interesting discussion of the possible
methods of checking the proposed model." Orig. art. has: 23 formulas.
Card 1/2

L 1866-66
ACCESSION NR: AT5022283

ASSOCIATION: none

SUBMITTED: 10May65   ENCL: 00   SUB CODE: NP

NO REF SOV: 002   OTHER: 018

Card 2/2

L 3828-66   EWT(m)/T/EWA(m)-2
ACCESSION NR: AT5022124

AUTHORS: Vladimirskiy, V. V.; Terent'yev, M. V.   UR/3138/65/000/323/0001/015

TITLE: Regeneration phenomena and a complete experiment in a K_0 meson beam

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 323, 1965. Yavleniya re-generatsii i polnyy opyt v puchke K_0 mezonov, 1-15

TOPIC TAGS: meson beam, K meson

ABSTRACT: Regeneration phenomena in a neutral K meson beam are studied, and formulas are derived for determining parameters characterizing regeneration and the nature of parity nonconservation. The aim of the work is to find a set of experiments that would, in principle, be sufficient for determining a number of parameters characterizing CP (and perhaps CPT) parity nonconservation in the decay of neutral K mesons. The value ϵ can be determined in experiments in the dependence of $K \to 2\pi$ decay upon time. The parameter $(1 + x)\beta$ can be determined in experiments in regeneration with a thick plate of a heavy material placed in a K beam. The differ-ences between the masses of the short-lived and long-lived mesons must be estab-lished from experiments in regeneration with two thick plates in conjunction with

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L 3828-66
ACCESSION NR: AT5022124

O

tests to determine the admixture of $\bar{K}$ mesons in the beam. The value x can be
determined by determining the admixture of K mesons as a function of time. The
formulas

$$A_{2\pi}'(t) = \langle 2\pi | K_s \rangle K_e(0) \exp(-\bar{\lambda}_e t_o) \left[(1+x)\beta \exp(-\lambda_s t) + \epsilon \exp(-\lambda_e t) \right]$$

$$\beta = R(\bar{\lambda}_s - \bar{\lambda}_e) t_o = \frac{c \pi N}{m\gamma} (A - \bar{A}) t_o$$

$$A_{2\pi}'(t_o) = \langle 2\pi | K_s \rangle K_e(0) \exp(-\bar{\lambda}_e t_o) \left[(1+x)R + \epsilon \right]$$

$$A_{2\pi}(t) = \langle 2\pi | K_s \rangle K_e(0) \times$$

$$\times \left[\beta(1+x) e^{-\lambda_s t} \left(e^{-\lambda_e T} + e^{-\lambda_s T} \right) + \epsilon e^{-\lambda_e t - \lambda_e T} \right]$$

$$W(\ell) = f(\Delta, \bar{L}) e^{-\ell} + a^2 +$$

$$+ 2af(\Delta, \bar{\ell}) e^{-\ell/2} \left[\cos(\Delta \ell - \varphi) - e^{-L/2} \cos(\Delta(\ell - L) - \varphi) \right]$$

$$\frac{n_{\pi a_2}}{n_{H.K}} = \gamma_\pi N \ell \frac{1}{p^2/\delta \theta)^2} \left(1 + \frac{\epsilon}{\beta(1+x)} \right)^2$$

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L 3828-66
ACCESSION NR: AT5022124

allow determination of $R(\beta)$ when ϵ, x, and the mass difference of K_s and K_1 are known, and determination of ϵ when R, X, and Δ are known. The formulas are also easily used to determine the mass difference when ϵ, β, and x are known. The authors thank L. Okun', M. Balats, V. Lyuboshits, E. Okonov, M. Podgoretskiy, and Tsung Fang. Orig. art. has: 17 formulas, 2 diagrams, and 2 graphs.

ASSOCIATION·   none

SUBMITTED: 20Feb65   ENCL: 00   SUB CODE: NP

NO REF SOV: 006   OTHER: 006

Card 3/3

L 2135-66   EWT(m)/T/EWA(m)-2

ACCESSION NR: AT5022129

UR/3138/64/000/290/0001/0064

AUTHOR: Vladimirskiy, V. V.

TITLE: Strong interaction symmetry and the SU_4 group

SOURCE: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. Doklady, no. 290, 1964. Simmetriya sil'nykh vzaimodeystviy i gruppa SU_4, 1-64

TOPIC TAGS: elementary particle, meson, group theory, baryon, resonant state

ABSTRACT: SU_4 group representations are considered, and the possibility of constructing a compound model of strongly interacting particles using four baryons as a basis is investigated. The SU_4 group is represented by the three operators

$$I_3 = \frac{1}{2}(a_1' - a_2^2)$$

$$K_3 = \frac{1}{2}(a_3^3 - a_4^4)$$

$$X = \frac{1}{2}(a_1' + a_2^2 - a_3^3 - a_4^4)$$

Card 1/5

L 2135-66

ACCESSION NR: AT5022129

and 12 nondiagonal operators a_k^i. It is shown to have two independent, three-dimensional, rotational subgroups. Of these, only the D_{123} and D_{124} representations are considered. For example, the matrix of the generating operators D(1,1) is given by

$$\left(a_k^i\right)_{m\,n'}^{m'n} = \delta_{Km}^{m'i} - \delta_{n'k}^{in}\;.$$

The particle electric charge is closely associated with the quantum number I_3, K_3, and X according to the following definitions

$$Q_a = I_3 + \tfrac{1}{2}X + const$$

$$Q_6 = I_3 - K_3 + const.$$

This leads to the following representation for D(1,1)

$$\left(b_k^i\right)_{m\,n'}^{m'n} = \delta_k^i + 2\delta_{n'k}^{in} + 2\delta_{Km}^{m'i} - \delta_{K\,n'm}^{m'in} - \delta_{n'm\,k}^{m'in}$$

Card 2/5

L 2135-66

ACCESSION NR: AT5022129

The SU_4 representation is then classified according to its "square"-ness $\mathcal{G} =$ r + 2s + 3t = -B, (mod 4) and associated with four baryons as a basis. A systematic representation is obtained for the baryons in the form

$$D\ (0;\ 1), D\ (8;\ I^4), D\ (2, I; I^4),\ D\ (I^4; 5),$$

$$D\ (I^4;\ 4, I),\ D\ (I^4; 8, 2),\ D\ (I^4; 8, I^2),\ D\ (7; 2^4)....$$

$$D(p, p'', 4n-I-p'-p''; n^4)....\ D(n^4; q', q'', 4n+I-q'-q'')...,$$

and the main representations are given in tabular form. It is shown that known unitary supermultiplets (8, 10-dimensional) can be considered as part of the SU_4 representation, with resonances satisfying the higher symmetry of SU_4. Symmetry violations and mass formulae for the various representations are investigated. For the allowable excitations K_3, X, a_4^3, a_4^4 the equidistant mass distribution is given by

$$m = m_0 + m_3 K_3 + m_x X$$

which can be destroyed only by the operator $2X^2 - 21/10$ (or more complex operators).

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L 2135-66
ACCESSION NR: AT5022129   / ⌒⌐

Both 20-dimensional baryon representations $D(3,I^4)$ and $D(2,I,I^4)$ are discussed in
some detail, where it is shown that the latter of the two representations is by
far the more complex. The regular 15-dimensional SU_4 representation is then used
to describe meson and meson resonance representations with charge models -000 and
+000. These regular $D(I;I)$ representations are shown to decay in SU_3 subgroups
according to $3 + (8 + I)+\bar{3}$ with the unitary octets $\pi, \eta, K, \bar{K}$; $\rho, \omega, (\varphi), K^{*}$.

From the existence of such decays the validity of the model could be verified.
Determining the spin and parity of the known resonances $K\pi$ and $K\pi\pi$ can help one
to classify the meson states along SU_4 and SU_3 representations. The loss of sym-
metry in SU_4 is shown to be still open for further investigations. "The author
thanks I. Yu. Kobzarav for his valuable advice on the type of interactions and
symmetry loss, and acknowledges A. M. Baldin, B. L. Ioffe, A. A. Komar, V. B.
Mandel'tsveyg, M. A. Markov, L. B. Okun', I. Ya. Pomeranchuk, Ya. A. Smorodinskiy,
K. A. Ter-martirosyan, I. S. Shapiro, and V. M. Shekhter for their interesting
evaluation of the mathematical and physical problems of the above analysis."
Orig. art. has: 44 formulas, 6 tables, and 5 figures.
ASSOCIATION: none

Card 4/5

L 2135-66
ACCESSION NR: AT5022129

SUBMITTED: 21oct64   ENCL: 00   SUB CODE: NP, MA

NO REF SOV: 007   OTHER: 004

Card 5/5

L 14141-66   EWT(1)/EWT(m)/EWP(t)/EWP(b)   IJP(c)   JD/JW/LHB

ACC NR: AP6000863   SOURCE CODE: UR/0181/65/007/012/3612/3616

AUTHORS: Vladimirskiy, Yu. B.; Nikitinskaya, T. I.

ORG: Leningrad Polytechnic Institute im. M. I. Kalinin (Leningradskiy politekhnicheskiy institut)

TITLE: Electric conductivity of x-irradiated fluorite crystals

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3612-3616

TOPIC TAGS: electric conductivity, x ray irradiation, fluorite, activation energy, crystal impurity

ABSTRACT: The purpose of the investigation was to determine the affect of x-rays on the conductivity of synthetic fluorite, and also to investigate the kinetics of the recovery of conductivity. To this end the conductivity of irradiated and non-irradiated crystals were measured at high temperatures. The conductivity was measured with a dc electrometer with sensitivity 3.3×10^{-14} amp/div in an argon atmosphere. The temperature range was 80--450C. The samples were ap-

Card   1/2

2

L 14141-66
ACC NR: AP6000863

proximately 1.5 cm^2 in area and 3 -- 4 mm thick.   The field intensity
was approximately 400 V/cm.   The dose intensity at the crystal loca-
tion was approximately 10^4 r/sec.   Two measurement series were made.
In one, the conductivity was measured as a function of the temperature
at constant heating rate (300 deg/hr), and in the other the conduc-
tivity was measured as a function of the sign at constant temperature
(isothermal annealing).   The results show that the conductivity of
pure fluorite after irradiation remains the same, and the conductiv-
ity of impurity-containing fluorite decreases by a factor 100--1000
(depending on the dose).   The electric conductivity is completely re-
covered after heating to 300C.   It is concluded from the results that
there exist two processes (fast and slow) of conductivity recovery.
The activation energy of the fast process is estimated to increase
by 11,000 cal/mole.   The fact that the change in conductivity after
irradiation depends primarily on the contamination of the crystal was
confirmed also with reactor experiments elsewhere.   Orig. art. has:
2 figures.

SUB CODE: 20/   SUBM DATE: 29Jan65/   ORIG REF: 001/ OTH REF: 009

Card   2/2

VLADIMIRTSEV, A.P.

       Progressive experience on typical project. Put' i put. khoz.
9 no.3:39 '65.   (MIRA 18:4)

       1. Nachal'nik mostoispytatel'noy stantsii, L'vov.

10

Preparation of enanthylideneacetone. V. I. Esalov,
I. F. Vladimirtsev, M. S. Kassikhina, Z. S. Lisina, Z. S.
Pronina and I. I. Raikher. *J. Gen. Chem.* (U.S.S.R.) 13,
814-17(1943)(English summary).—It was shown that the
product obtained by Rupe and Hinterlach (*C. A. 2,*
800) from condensation of Me$_2$CO with enanthole in the
cold in the presence of 1% NaOH is not enanthylidene-
acetone but *decen-4-ol-3-one.* Authentic *enanthylidene-
acetone* was prepd. as follows: 5 g. piperidine and 6 g. gla-
cial AcOH, in 50 g. dry Me$_2$CO, were treated dropwise with
30 g. enanthole while refluxing the mixt. on a steam bath;
after the addn., which requires 4 hrs., the mixt. was
heated for 8 hrs., cooled, the aq. layer sepd. while the org.
layer was freed of Me$_2$CO, dild. with Et$_2$O, dried over
Na$_2$SO$_4$ and distd. to yield enanthylideneacetone, b$_0$ 100-
10°, n$_D^{20}$ 1.4480, d$_4^{20}$ 0.8473; yield, 15-17 g. The product
yields the normal positive iodoform reaction. The product
obtained by R. and H. yields enanthylideneacetone after
dehydration over KHSO$_4$-Na$_2$SO$_4$ by repeated distn. at 22
mm.   O. M. Kowalnoff

Ca

10

Synthesis of new hydrocarbons with a conjugated system of double bonds. IV. V. I. Esafov, I. F. Vladimirtsev, M. S. Kassikhina and I. I. Itsfkher. J. Gen. Chem. (U. S. S. R.) 13, 818-22(1943)(English summary); cf. C. A. 39, 476° and following abstr.—MeMgI (from 14.5 g. MeI) was added dropwise over 5 hrs. to 15.4 g. enanthylideneacetone in Et₂O at —15°; after standing overnight and decompn. by ice and NH₄Cl, there was obtained 16% 2-methyl-1,3-decadiene, b₁₀ 88°, n_D²⁰ 1.4492, d₄²⁰ 0.7718. The product, heated for 20 hrs. in a steam bath in a sealed tube with maleic anhydride in toluene, yielded an adduct, apparently of the trimer, which could not be reduced to the cryst. state. Similar reaction using EtMgBr gave a mixt. of 3-methyl-3,4-hendecadiene and 2-ethyl-1,3-decadiene, b₁₀ 96-104°, n_D²⁰ 1.4510, d₄²⁰ 0.7906; heating with maleic anhydride gives a mixt. of adducts of the monomer and the dimer of the hydrocarbons, in the form of a heavy oil. A similar prepn. using iso-AmMgBr gave a mixt. of 2-isoamyl-1,3-decadiene and 3,5-dimethyl-4,6-tridecadiene, b₁₀ 126-34°, n_D²⁰ 1.4484, d₄²⁰ 0.7906. G. M. Kosolapoff

PROCESSES AND PROPERTIES INDEX

METALLURGICAL LITERATURE CLASSIFICATION

Polarographic study of some hydroxyazo compounds.
I. P. Vladimirtsev and I. Ya. Postovskii (S. M. Kirov
Polytech. Inst., Sverdlovsk). Doklady Akad. Nauk
S.S.S.R. 83, 855–8(1952).—Polarographic study was made
of several azo compds. in an acetate buffer in 75% EtOH
(0.1 N both in AcOH and NaOAc) and at a concn. of 1 ×
10^{-4} moles/l. The half-wave potentials for azobenzenes
are: unsubstituted −331 mv., p-HO −383, p-MeO
−358, p-AcO −322; for 1-naphthylazobenzenes: unsub-
stituted −305, 4-HO (in naphthyl radical) −365, 4-MeO
−345, 4-AcO −300. The differences caused by group in-
troduction are very close for either Ph or $C_{10}H_7$ nuclei. The
results support the idea that the hydroxynaphthyl deriv.
exists mainly in the azoid form, i.e. with true HO group.
The quinonehydrazone structure is improbable since the
polarography of N-methyl-N-phenylhydrazone of 1,4-
naphthoquinone would be expected to be similar to it and
the measurement made on the Me deriv. gave a half-wave

potential of but −217 mv. for the unsubstituted compd. HO
and MeO groups in p-position to the N:N structure increase
the resistance of azo group to reduction; the AcO group
operates in the opposite sense, as expected. In 4-hydroxy-
naphthylazobenzene, introduction of p-MeO group gives a half-
wave potential of −410 mv., while the p-SO₃H group gives
−345; in 4-hydroxynaphthylazobenzene (half-wave potential
−465 mv.) p-MeO gives −500, while p-SO₃H gives −445
mv.; m-MeO gives −455, and m-SO₃H gives −455 mv.
The results are again expected from the electronic considera-
tions of the groups.   G. M. Kosolapoff