BAYER, V.N.; KHOZE, V.A.

Photon emission in the electromagnetic annihilation of heavy particles. IAd. fiz. 2 no.2:287-293 Ag '65. (MIRA 18:8)

1. Novosibirskiy gosudarstvennyy universitet.

BAYYER, V.N.; FADIN, V.S.

Polarization effects accompanying the production of particles in experiments with opposing beams. Dokl. AN SSSR 161 no.1:74-77 Mr '65. (MIRA 18:3)

1. Novosibirskiy gosudarstvennyy universitet. Submitted October 8, 1964.

BAYYER, V.N.; GALITSKIY, V.M.

Two-photon emission in electron collisions. Zhur. eksp. i teor. fiz. 49 no.2:661-671 Ag '65. (MIRA 18:9)

1. Novosibirskiy gosudarstvennyy universitet.

L 10177-66 EWT(m) DIAAP

ACC NR: AP5026402 SOURCE CODE: UR/0386/65/002/006/0259/0262

AUTHOR: Bayer, V. N.; Galitskiy, V. M.

ORG: Novosibirsk State University (Novosibirskiy gosudarstvennyy universitet)

TITLE: Double bremsstrahlung in electron collisions

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 6, 1965, 259-262

TOPIC TAGS: bremsstrahlung, electron collision, collision cross section, photon emission

ABSTRACT: The authors present the results of a calculation of the cross section for the emission of two photons with arbitrary energy in electron-electron and electron-positron collisions. This question is of great interest in connection with colliding-beam experiments. The emission of two soft photons was treated by them earlier (Phys. Lett. v. 13, 355, 1964), as was the emission of one soft photon and one photon of arbitrary energy (ZhETF v. 49, 661, 1965). Most of the calculations are based on the results of the latter paper. Formulas are derived for the double-bremsstrahlung cross section and for the ratio of the double-bremsstrahlung cross section in the region of hard photons to the cross section for two-quantum annihilation of an electron-positron pair. It is shown that if the photon detectors have a reasonable energy resolution, these cross sections become equal at energies on the order of 1 Bev. Orig. art. has: 6 formulas.

SUB CODE: 20/ SUBM DATE: 12Jul65/ ORIG REF: 001/ OTH REF: 001

Card 1/1

BAYYER, V.N.

Possible testing of the nonconservation of time parity in experiments on opposing beams. Pis'. v red. Zhur. eksper. i teoret. fiz. 2 no. 7:330-333 O '65. (MIRA 18:12)

1. Novosibirskiy gosudarstvennyy universitet. Submitted Aug. 2, 1965.

[illegible], Yu.F.

Quantum depolarization of electrons in a magnetic field. Dokl. AN SSSR 165 no.4:783-785 D '65. (MIRA 18:12)

1. Novosibirskiy gosudarstvennyy universitet. Submitted April 7, 1965.

BAYER, Ye. Ya.

see BAYER, Ye. Ya.

BAYYEROVA, G. [Bayerova, G.]; BAYYER, A. [Bayer, A.]; MALINSKIY, I. [Malinsky, J.]; ZAPLETAL, B.

Functional significance of the epiphysial pigment (electron-optical study). Arkh. anat., gist. i embr. 48 no.1:18-21 Ja '65. (MIRA 18:11)

1. Kafedra gistologii (zav.- dotsent M. Obruchnik), kafedra patologicheskoy anatomii (zav.- dotsent V.Valakh), neyrokhirurgicheskoye otdeleniye fakul'tetskoy bol'nitsy Universiteta imeni Palatskogo (zav.- B.Zapletal), gorod Olomouts, Chekhoslovakiya.

PEFTI, I.D.; KOKKOZOV, O.A.; BAYZAKOV, U.B.

Reduction of endemic goiter in the eastern regions of the Chu Valley of the Kirghiz S.S.R. during a 12-year peroid. Izv. AN Kir. SSR. Ser. Biol. nauk 2 no.6:5-16 '60. (MIRA 14:6)
(CHU VALLEY--GOITER)

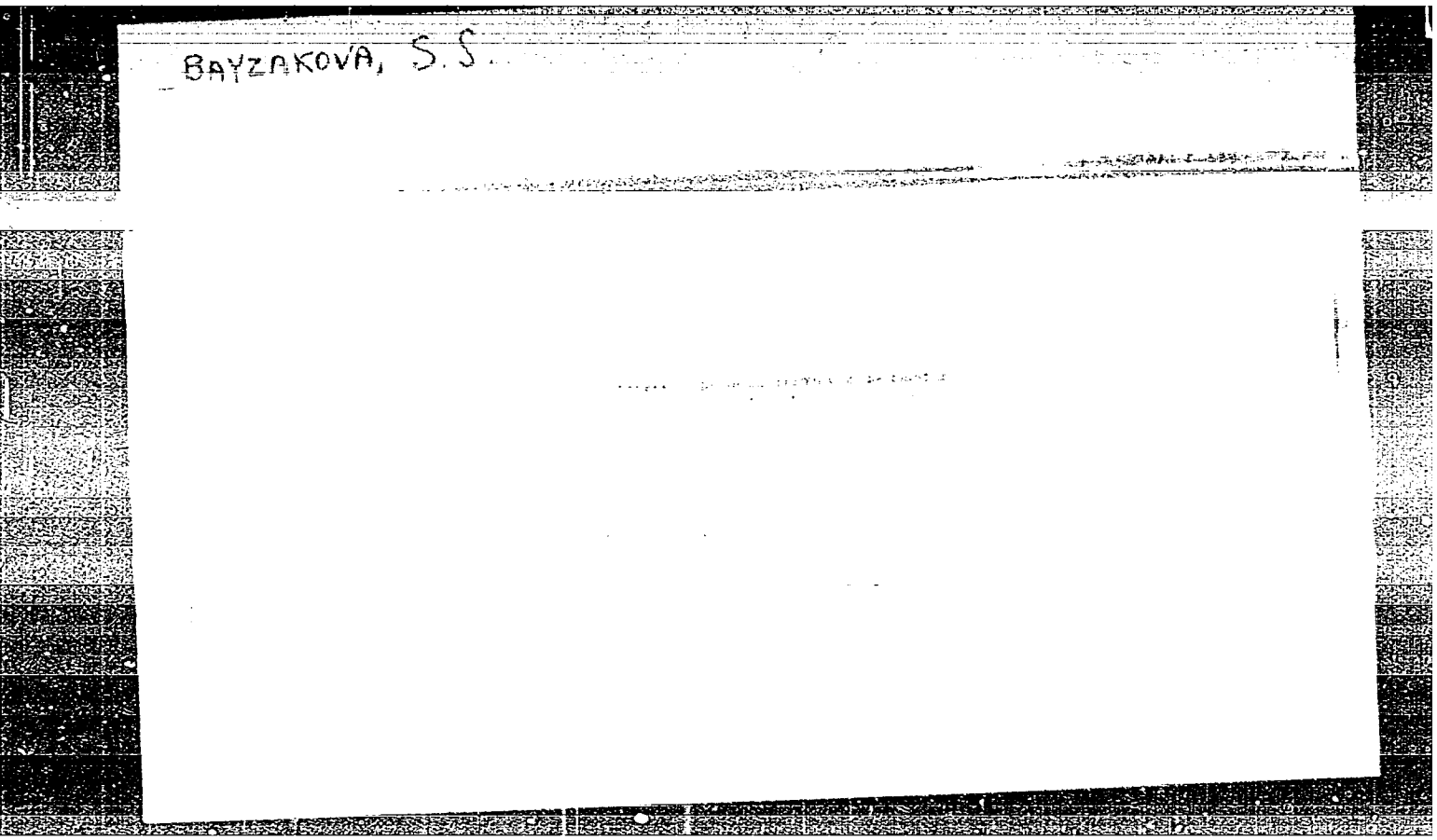
BAYZAKOV, U.B.

Amount of iodine in local food products, water sources, and soils of the Chu Valley in connection with the study of the etiology of endemic goiter. Izv. AN Kir. SSR. Ser. biol. nauk 2 no.6:23-26 '60. (MIRA 14:6)

(CHU VALLEY—GOITER) (IODINE)

BAYZAKOV, U.B.

Etiology of endemic goiter in the Chu Valley. Izv. AN Kir. SSR. Ser. biol. nauk 5 no.3:27-31 '63. (MIRA 17:1)



BAYZAKOVA, S. S.: Master Med Sci (diss) -- "Some qualitative changes in the serum proteins of the blood in patients with silicosis, silicotuberculosis, and tuberculosis". Frunze, 1958. 16 pp (Kirgiz State Med Inst), 200 copies

(KL, No 5, 1959, 155)

BAYZAKOVA, S.S.; ISTAMBEKOVA, D.N.

Effectiveness of treating hypertension with preparation "F-1". Sov. zdrav. Kir. no.3:18-21 My-Je '62. (MIRA 15:5)

1. Iz kafedry propedevticheskoy (zav. - dotsent M.M.Mirrakhimov) i fakul'tetskoy terapii (zav. - dotsent R.I.Ibragimova) Kirgizskogo gosudarstvennogo meditsinskogo instituta.
(HYPERTENSION) (MEADOW RUE)

[redacted], M.N.; [redacted], Ye.K.

Saving 457,000 kilowatt hours. Mashinostroitel' no. 2:24 F '61. (MIRA 14:2)

(Electric welding--Technological innovations)

BAYZHANOV, S.D.

BAYZHANOV, S.D., inzhener (Arys'); LYSENKO, V.A., inzhener (Arys')

Efficient utilization of diesel locomotives. Zel.dor.transp. 39 no.4:67-69 Ap '57. (MLRA 10:5)
(Diesel locomotives)

FD-1492

USSR/Nuclear Physics - Proton Interaction

BAZ, A. I.

Card 1/1 : Pub. 146-15/20

Author : Baz, A. I., and Smorodinskiy, Ya. A.

Title : Interaction of protons with H^3 and excited states of the alpha-particle (Letter to the editor)

Periodical : Zhur. eksp. i teor. fiz., 27, 382-384, Sep 1954

Abstract : Analysis of the H^3 (p, n) He^3 reactions is carried out; in particular, the analysis of the results obtained by H. B. Willard et al. (Phys. Rev. 90, 865 (1953). The improbability of the existence of a stable H^4, is indicated. One aforementioned reference.

Institution :

Submitted : April 27, 1954

BAZ', A.I.

Structure of the second excited level of He^5 and Li^5. Izv.AN SSSR. Ser.fiz.19 no.3:360-362 My-Je '55. (MLRA 9:1)
(Moscow--Spectrum analysis--Congresses)

535.1[illegible]

1462 ISOTOPE [illegible] AND THE [illegible] OF LIGHT NU[illegible]

CI.21. A Baz'[illegible] [illegible] Uspekhi Fiz. Nauk, Vol. 55, No. 2, 215-64 (1955) In Russian [illegible] of the theory of the subject the paper [illegible]

BAZ, A. L.

[A. I.]

"Polarisation of Neutrons, Elastically Scattered by Pb." a paper presented at the International Conference on Nuclear Reactions, Amsterdam, 2-7 July 1956.

D551274

BAZ', A. I.

C-5

USSR/Nuclear Physics

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11218

Author : Baz', A.I.

Inst : Not given

Title : Polarization of Neutrons Scattered by Lead.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 31, No 1, 159-161

Abstract : The Hamiltonian of the interaction of the magnetic moment of a neutron with the electric field of the nucleus

$$H = -\mu_n (e\hbar/2Mc) \cdot \sigma [E, p] \equiv \ldots (\sigma I)$$

($\mu_n = -1.91$, M, σ, and p are the mass, spin operator, and momentum operator of the neutron respectively, and E is the electric field of the nucleus) leads to a

Card 1/3

USSR/Nuclear Physics C-5

Abs Jour : Ref Zhur - Fizika, No 5, 1957, 11218

θ = 1, 2, 3°. At θ = 1°, the polarization reaches a values of 0.8 in the energy interval from three to five Mev. The calculations of this work show that the polarization diminishes with increasing angle more rapidly than follows from Schwinger results (Schwinger, J., Phys. Rev., 1948, 73, 407).

Card 3/3

Zurn.eksp.i teor.fis,31,fasc.5,831-836 (1956) CARD 2 / 2 PA - 1873

the S-state will, with increasing nucleon number n grow more rapidly than the number n(n-1)/2 of the bindings between the nucleons. Therefore groupings of four correlated nucleons must be energetically the most favorable.
The existence of such groupings in nuclei is also indicated with some certainty by experimental data. Thus, there is a sharp difference between the spectra of nuclei with A = 4n and A = 4n + 2. Besides, the general shape of the spectrum on the occasion of transition from nucleus to nucleus changes only little among nuclei of the same type (A = 4n or A = 4n + 2), and all spectra are with respect to the isotopic spin T periodic with the period $\Delta T = 2$. The curve of the dependence of binding energy of a nucleon on the mass number is saw-like in nuclei with a minimum surplus of neutrons (with respect to A), with maxima at A = 4n and minima at A = 4n + 1.
The wave functions of the shell model contain a considerable part of states which correspond to the existence of one or several groups of nucleons. These nucleons are reciprocally in the S-state. In conclusion the connection between the classification of states given here with the classification according to the quantum number "seniority" is pointed out in short.

INSTITUTION:

BAZ, A. I. and SMORODINSKIY, Ya. A. (Acad. Sci. USSR)

"Polarization Effects in the Light Nuclei Reactions,"

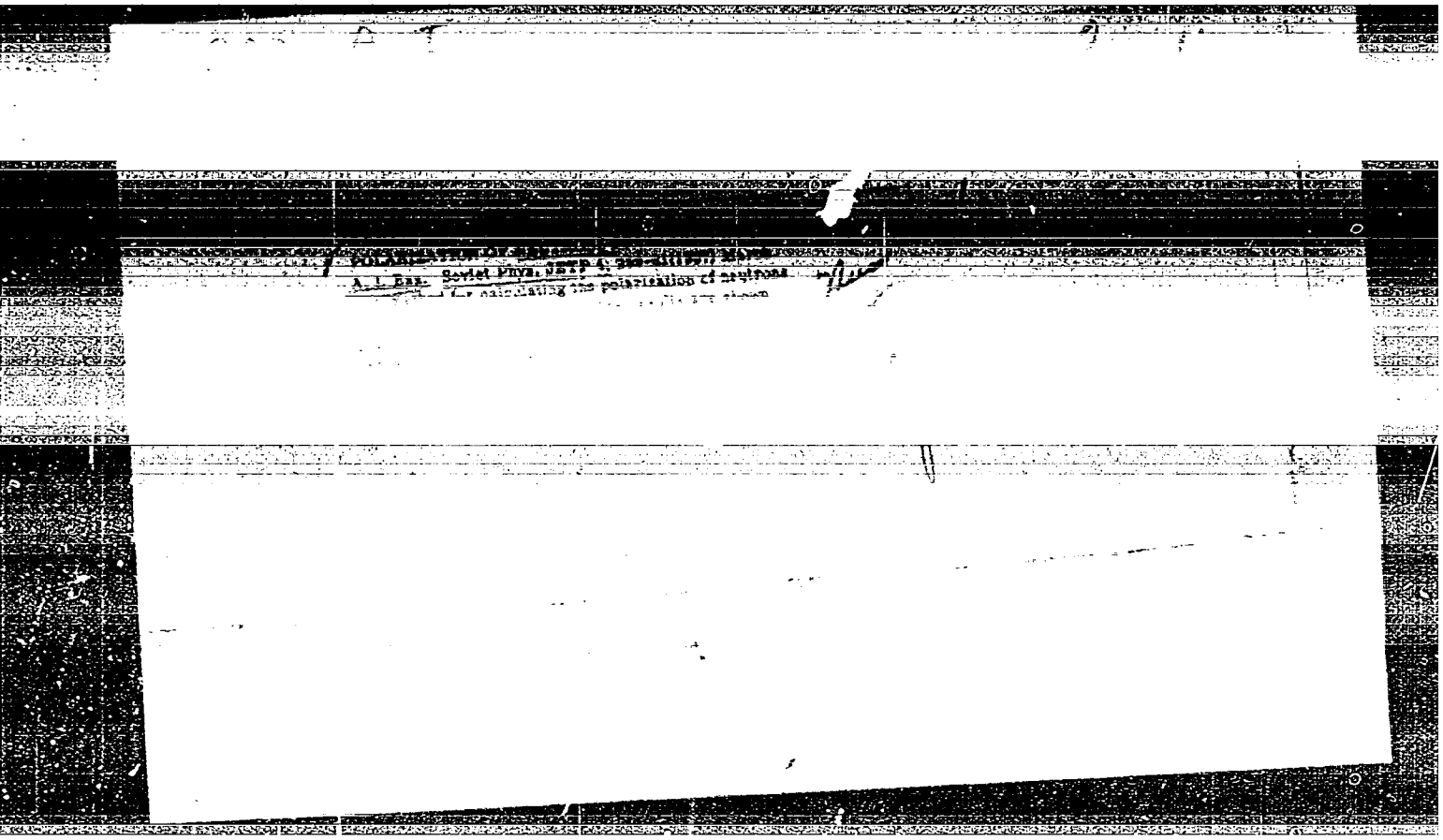
paper submitted at the All-Union Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov. 1957

BAZ, A. I. (Acad. Sci. USSR)

"(p, p) /or (α α)/ Scattering Near the Threshold of the (p,n)/(or(α, n)/ Reactions,"

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 1957

BAZ', A. I., Cand Phys-Math Sci -- (diss) "Reaction Matrix for Particles with Half Spin." [Mos], 1957. 11 pp (Acad Sci USSR), 110 copies (KL, 49-57, 110)



nucleus. The wave ... number of ... compared from this point of view and a ... of ... models of the nucleus properties of the shell and α-particle ... are shown. Several regularities in the binding energies of light nuclei are discussed. (auth)

PA - 2959

AUTHOR BAZ', A.I.,

TITLE Charge Invariance in Nuclear Reactions.
(Zarydovaya invariantnost' v yadernykh reaktsiyakh - Russian)

PERIODICAL Zhurnal Eksperim.Teoret. Fiziki, 1957, Vol32, Nr 3, pp 478-490,
(U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT The present paper investigates the reciprocal connection between the cross section of some nuclear reaction resulting from the assumption of the charge invariance of nuclear reactions. The author here carries out the entire examination of reactions which are possible in the case of small energies in systems with 4 nucleons((2p,2n),(3p,n),(p,3n)), T(pp)T, He^3(pp)He^3, T(nn)T, He^3(nn)He^3, T(pn)He^3, He^3(np)T. The method developed by the author is generally applicable and is suited for the reaction on all light nuclei. The paper is divided into the following chapters. Introduction, boundary conditions, the matrix of the reaction for the states with a determined T. The reactions T(pp)T, T(pn)He^3, He^3(nn)He^3, and He^3(np)T, the reactions He^3(pp)He^3 and T(nn)T. the behavior of the matrix elements of the reaction at threshold energies. Some conclusions. The results of this work may be summarized as follows. The author was able, to express the matrix elements of the reactions, which correspond to all reactions possible at low energies within a system of four nucleons (these reactions are enumerated above) by the same parameters $\delta^J_{ls}(T)$ and $\varepsilon^J_{ll}(T)$. These parameters have the simple physical significance of scattering phases in the state with the isotopic spin T.

Card 1/2

PA-2999

AUTHOR BAZ A.I.

TITLE Polarization in the case of inverse Reactions.
(Polyarizatsiya v obratnykh reaktsiyakh.- Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 3, pp 628 - 630 (USSR).

Received: 6/1957 Reviewed: 7/1957

ABSTRACT This report deals with the connection between the polarizations of particles created in the case of direct and inverse reaction. The author here investigates any reaction of the type a+X -> b+ Y, where a,b,X,Y are any particles with spin 1/2. The product of the internal parities of the particles is assumed to be equal before and after the reaction. The spin state of the initial and end systems is here described by the column of the coefficients ζ_{sm}, where s denotes the total spin and m its projection. The amplitude of the created particles then has the following shape:

CARD 1/ 4

Polarization in the case of inverse Reactions.

$\sigma_i^{(b)} = \langle \sigma_i^{(b)} \rangle / (d\sigma/do)$; $\sigma_i^{(Y)} = \langle \sigma_i^{(Y)} \rangle / d\sigma/do$

$\langle \sigma_i^{(b,Y)} \rangle = (k_1/k) Sp(M\varrho M^+ \sigma_i^{(b,Y)})$; $d\sigma/do = (k_1/k) Sp(M\varrho M^+)$

These formulae are given also in the coordinate system which is connected with the center of mass.
There cross section $(d\sigma/do)'$ of the inverse reaction $b+Y \rightarrow a+X$ and the mean values of the spins of the particles a and X can be computed in exactly the same manner as in the case of the reaction $a+X \rightarrow b+Y$. On this occasion the places of a and Y must be exchanged for those of b and Y respectivelly, and the direction of the coordinate axes must be changed accordingly.
Several formulae are given which express the cross sections and polarizations of the direct reactions by the respective inverse reactions. One of these formulae connects the asymmetry of the angular distribution of the direct reaction with the polarizations in the case of inverse reaction.
(No illustrations.)

CARD 3/4

PA - 2999

Polarisation in the case of inverse Reactions.

ASSOCIATION: not given.
PRESENTED BY:-
SUBMITTED: 27. 12. 1956.
AVAILABLE: Library of Congress.

CARD 4/4

BAZ', A.I.

56-4-15/54

AUTHOR: Baz', A.I.

TITLE: The Energy Dependence of the Scattering Cross Section Near the Reaction Threshold (Energeticheskaya zavisimost' secheniya rasseyaniya vblizi poroga reaktsii)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 4, pp. 923 - 928 (USSR)

ABSTRACT: It was experimentally found that an anomaly occurred in the curve of the scattering cross section of the reaction $Li^7(p,p)Li^7$ in the place corresponding to the threshold value of the reaction $Li^7(p,n)Be^7$. It is theoretically attempted to determine this anomaly for the general case X(a,a) X - X(a,b)Y (b is a neutron). This anomaly near the threshold value permits to determine the parity and the spin of the produced nucleus Y. The phase analysis of the elastic scattering is facilitated. The following problems are theoretically treated in more detail: 1.) The scattering cross section of α -particles on nuclei with the spin 0 near the threshold value of the reaction (α ,n). 2.) The scattering cross section of α -particles on nuclei with the spin 1/2 (or scattering cross section of protons on nuclei

Card 1/2

BAZ, A. I. and SMORODINSKIY, I. A.

"Sur la Possiblite de Detection du Dineutron,"

report presented at the International Congress for Nuclear Interactions (Low Energy) and Nulear Structure, Paris, 7-12 July 1958.

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 nucleons move.
2) The optical model is usually applied for the quantitative description of the neutron-proton-dispersion on the nuclei.

Card 1/3

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. Sliva: 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.

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

BAZ', A. I.

89-3-22/30

AUTHORS: Baz', A. I., Samoylov, L. N.

TITLE: All-Union Conference on Nuclear Reactions of Small and Medium Energies (Vsesoyuznaya konferentsiya po yadernym reaktsiyam pri malykh i srednikh energiyakh)

PERIODICAL: Atomnaya Energiya, 1958, Vol. 4, Nr 3, pp. 306 - 311 (USSR)

ABSTRACT: From November 17 - 27, 1957, in Moscow the conference mentioned in the title took place. 500 participants from the USSR and 37 foreigners (from 17 nations) came to the conference.
It only briefly and partially can be reported on the results.
Nuclear reactions at light nuclei.
$T(p,n)\,He^3$ and $He^4(p,p')$-reactions confirm the presence of an about 22 MeV-state in He^4 with J = 2 -, T = 0. A second excited state at 24 - 25 MeV might be present (T = 1). By the reaction $Li^6(p,n)\,Be^6$ for the first time it could definitely be shown that the nucleus Be^6 is existing. It is instable to α and double proton decay.

Card 1/4

All Union Conference on Nuclear Reactions of Small and Medium Energies

11 levels were found in the nucleus Li^6. The neutron scattering cross sections of slow neutrons (E_n = 0,0047 eV) for the scattering on tritium are the following:

σ(ortho-tritium) = 4,5 ± 1,0 b
σ(para-tritium) = 1,0 ± 1,5 b

Polarization effects in nuclear reactions.

A number of works were discussed in which the polarization of the particles takes place in the simple reactions T(d,n); D(d,n); D(d,p); C^{12}(p,p). It was reported in detail on the γ-polarization of the reaction $Si^{30}(p,\gamma)P^{31}$.

Neutron-reactions.

First the particularities concerning the apparatus of the neutron-spectrometers were discussed. The spectrometer of Shapira has to be mentioned especially, the resolving power of which is 15 % at E_n < 1 KeV and 35 % at E_n = 10 KeV. A lecture on the electromagnetic interaction between neutron and nuclei was especially discussed. It is believed that there are experimental indications that the neutron is deformed in the electric nuclear field and thereby obtains an electrical dipole moment.

Card 2/4 Deuteron-reactions.

All Union Conference on Nuclear Reactions of Small and Medium Energies

The experimental data of the reactions $Ca^{46}(d,p)Ca^{41}$, $P^{31}(d,p)P^{32}$ are compared with the data theoretically calculated beforehand and a satisfactory conformity is found.
A number of excited levels from the reactions $Li^7(d,d')$ and $Al^{27}(d,d')$ were found in Li^7 and Al^{27}.

Coulomb's excitation and Proton-reactions.

A review lecture dealt with the present picture and the experimental understanding of these reactions.
The excitation funotions and the angular distribution of the γ-quanta for Coulomb's excitation reactions with 1,8-3,4 MeV-protons of the nuclei Cr, Mn, Ni, Ge, Fe, Cu and Zn were measured.
It is reported on the measuring of the differential effective cross section of the reactions $Co^{59}(p,p')$, $Pb^{207}(p,p')$, $Pb^{208}(p,p')$, $Bi^{209}(p,p')$ and $U^{238}(p,p')$ with E_p = 19,8 MeV.

Photonuclear reactions.

The problem of the "giant"-resonances was especially discussed and it was ascertained that there are still discrepancies between the observed resonances and the theoretically predicted fission of the resonances.

Card 3/4

89-3-22/30

All Union Conference on Nuclear Reactions of Small and Medium Energies

A number of reports dealt with (α,p'), $(\gamma,3\alpha)$, $(\gamma,4\alpha)$ $(\gamma,p\alpha)$ -processes.

Reactions caused by multifariously charged ions.

Here it was reported on the reactions: Au(N, 4n), Au(N, 5n), Au(N, 6n), U^{235}(N,f), U^{238}(N,f), Al(N,f), Re(N,f) etc.

Nuclear models.

Here the pro and con of the single nuclear models, as they are used by the theorists nowadays, was discussed. There is 1 figure.

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1. Nuclear reactions-Polarization effects 2. Neutron reactions-Photonuclear reactions

Card 4/4

SOV/56-35-3-29/61

24(5)
AUTHORS: Baz', A. I., Okun', L. B.

TITLE: The Production Cross Sections of Λ-Hyperons Near the Production Threshold of Σ-Hyperons (O sechenii rozhdeniya Λ-giperona vblizi poroga rozhdeniya Σ-giperona)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 3, pp 757-761 (USSR)

ABSTRACT: In several papers (e.g. Refs 1,2), the energy- and angle-dependence of the elastic scattering of particles near the threshold of any unelastic process has already been investigated. It was shown that measurements of this dependence may supply information concerning the phases of elastic scattering as well as spin and parity of particles, which occur in unelastic processes. The same applies to investigations of the energy- and angle-dependence of an unelastic process near the threshold of another unelastic process. In the present paper this is shown by the example of the production of strange particles in pion-proton collisions, with a pion energy of approximately E_o = 890 MeV : $\pi^- + p \longrightarrow K^0 + \Sigma^0$. The following

Card 1/4

SOV/56-35-3-29/61

The Production Cross Sections of Λ-Hyperons Near the Production Threshold of Σ-Hyperons

is connected with this reaction (1): a) elastic scattering of of pions, b) production of 2, 3, 4, and 5 pions, c) production of Λ-hyperons in the reaction (2) $\pi^- + p \longrightarrow K^o + \Lambda^o$, the threshold of which is about 760 MeV. The present paper investigates the reaction cross sections of (2) near the threshold of (1). It is assumed that the K-mesons have spin 0 and the Λ- and Σ-hyperons have the spin 1/2 and determine the two possible values of relative parity (Ref 2). Calculations lead to the following results if $j = 1/2$ is assumed: The $\Sigma^o + K^o$-production in (1) takes place in the S-state; the orbital moment is 0 or 1 according to the relative parity of Λ- and Σ-hyperons; (2) leads to a state with the isotopic spin $T = 1/2$:
a) The parity of Σ-hyperons coincides with that of Λ-hyperons, $l = 0$; for the amplitudes g and h it holds that $g(\theta,E) = g(\Theta) + \alpha k/2ik_1$; $h(\theta,E) = h(\Theta)$, with $\varphi(\Theta) \equiv \varphi(\Theta, E-E_o)$, where φ is a random quantity; $\alpha = m_1 m_2/2$.

For the cross section of (2) it holds that

Card 2/4

The Production Cross Sections of Λ-Hyperons Near the Production Threshold of Σ-Hyperons

$$\sigma(\theta,E) = \sigma(\theta) + \frac{|k|}{k_1}\begin{cases} -\operatorname{Im} g(\theta)\alpha^* & E>E_0 \\ \operatorname{Re} g(\theta)\alpha^* & E<E_0. \end{cases}$$

For the polarization of Λ-particles it holds that

$$P(\theta,E) = P(\theta) + \frac{|k|}{k_1}\begin{cases} \operatorname{Re} f(\theta)\alpha^* & E>E_0 \\ \operatorname{Im} f(\theta)\alpha^* & E<E_0, \end{cases}$$

where $f(\theta) = h(\theta) - iP(\theta)g(\theta)/\sigma(\theta)$.

b) The parity of Σ-hyperons is inverse to that of Λ-hyperons, $(l = 1)$: $g(\theta,E) = g(\theta) + \frac{\alpha\cos\theta}{2ik_1}k$; $h(\theta,E) = h(\theta) + \frac{\alpha\sin\theta}{2ik_1}k$;

$$\sigma(\theta,E) = \sigma(\theta) + \frac{|k|}{k_1}\begin{cases} -\operatorname{Im} l(\theta)\alpha^* & E>E_0 \\ \operatorname{Re} l(\theta)\alpha^* & E<E_0 \end{cases}$$

$$P(\theta,E) = P(\theta) + \frac{|k|}{k_1}\begin{cases} \operatorname{Re} f_1(\theta)\alpha^* & E>E_0 \\ \operatorname{Im} f_1(\theta)\alpha^* & E<E_0 \end{cases}$$

The Production Cross Sections of Λ-Hyperons Near the Production Threshold of Σ-Hyperons

These results are discussed. Finally, the authors point out that a similar investigation of the reaction $\bar{K} + p \rightarrow \Lambda(\Sigma) + \pi$ near the threshold of $\bar{K} + p \rightarrow \Xi + K$ would be of interest. There are 5 references, 2 of which are Soviet.

SUBMITTED: April 17, 1958

BAZ', A.I.

INOPIN, Ye.V.

SOV/53-65-4-7/13

AUTHOR: Varshalovich, D.

TITLE: The VIII Annual Congress of Nuclear Spectroscopy (VIII yezhegodnoye soveshchaniye po yadernoy spektroskopii). I

PERIODICAL: Uspekhi fizicheskikh nauk, 1958, Vol 65, Nr 4, pp. 721 - 722 (USSR)

ABSTRACT: The 8th Congress of Nuclear Spectroscopy took place in Leningrad from January 27 to February 3, 1958. It was attended by 500 scientists from the USSR, further by scientists from China, France, Poland, Czechoslovakia, Hungary, Eastern Germany, Yugoslavia, and the Mongol Democratic Republic. 4 main lectures and about 90 reports were heard. The main lectures dealt with problems concerning nuclear models, the α- and β-decay, γ-radiation, internal conversion, and nuclear isomerism. B.S.Dzhelepov, Corresponding Member, Academy of Sciences, USSR, opened the conference. Lectures were held by: V.Yu. Gonchar, Ye. V. Inopin, S.P.Tsytko (FTI,AS UkrSSR) on light nuclei and generalized nuclei models;L.K. Peker (BAN SSSR-Library AS USSR), Yu.M.Shirokov (MGU-Moscow State University), L.A.Sliv (LFTI-Leningrad Physical-Technical Institute) et al. on levels in Mg^{24},Mg^{25} and Al^{25}; D.G.

Alkhasov, A.F.Grinberg, G.M.Gusinskiy, K.I.Yerokhina and I.Kh.Lemberg (LFTI) on having found no rotational levels at E<1 MeV in Cr, In, and Mn nuclei. The same research workers also reported on the discovery of vibrational γ-levels in W^{182}, W^{184}, W^{186}- nuclei by means of the method of the Coulomb (Kulon) excitation at $E_{exc} \sim 1$ MeV. L.K.Peker (BAN SSSR) gave a survey report: "Concerning Some Particulars in Vibrational Levels of Deformed Nuclei". Lectures were held also by: D.P.Zaretskiy (AN SSSR - AS USSR) on radiation transitions in deformed nuclei with the spin = 1/2; V.S. Shpinel' 2 NIFI MGU (2nd Scientific Research Institute of Physics, Moscow State University) on the level displacement and the probability of corresponding β - and γ - transitions in odd nuclei; D.F.Zaretskiy (AN SSSR - AS USSR) on the influence of the spin-orbital coupling upon the magnetic moments of the nuclei. A.I.Baz' (AN SSSR -AS USSR) on the existence of light nuclei with high neutron or proton excess; V.A.Kravtsov (LPI-Leningrad Polytechnic Institute) on the formation of nucleon pairs in nuclei; L.L. Gol'din, A. D. Piliye, G.N.Novikova, K.A.Ter-Martirosyan (TTL AN SSSR)

on alpha decay on rotational levels of odd nuclei; V.G. Nosov (AN SSSR - AS USSR) on alpha decay of nonspherical nuclei (survey); A.I.Alikhanov, G.P.Yeliseyev, V.A.Lyubimov, V.V.Mrahler (TTL AN SSSR) on polarization measurements at electrons emitted in the β-decay of Tm^{170}, Lu^{177}, Ag^{198}, Sm^{153}, Re^{186} (ΔI= 0,1,Δ n= -1) as well as in that of Sr^{90} and Y^{90} (ΔI= 2,Δ n= -1);V.P.Rudakov (AN SSSR - AS USSR) on measurements of the (β-γ) angular correlations in Ba^{139}-decay; N.A.Burgov and Yu.V.Terekhov (TTL AN SSSR) on investigations of the electron-neutron correlations and the resonance scattering of γ-radiation; B.K.Kerimov and I.M.Nadzhafov (MGU-Moscow State University) on the bremsstrahlung of longitudinally polarized electrons; A.I.Mukhtarov and Yu.S. Perov (MGU) on the effective cross section of the scattering of polarized electrons and positrons at polarized electrons; Ya.K.Chudars and I.Ya.Taurs (Riga) on the determination of the intensity of the components of the complex β-spectrum according to the Fermi diagram; I.M.Band, L.N.Zyryanova, and Yu.P.Suslov, LGU (Leningrad State University) on the computation of the probability of the permitted and of the forbidden capture of electrons by a nucleus.

BAZ', A. I.

21(8)

AUTHOR: Baz', A. I. SOV/89-6-5-15/33

TITLE: On the Existence of Light Nuclei With a Large Surplus of Neutrons or Protons (O sushchestvovanii legkikh yader s bol'shim izbytkom neytronov ili protonov)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 5, pp 571 - 573 (USSR)

ABSTRACT: One of the consequences of charge invariance is the existence of similar levels in isobaric nuclei. The energy difference between two similar levels may be expressed by the Coulomb energy of the two nuclei as well as by the neutron- and proton mass, viz:

$$\Delta E(Z_1,Z_2) = [E_{Coulomb}(Z_1) - E_{Coulomb}(Z_2)+(Z_2-Z_1).0.78] \text{ Mev} \quad (1)$$

By means of this equation the energy of the ground states of the light nuclei having a surplus of protons or neutrons is calculated and it is found that within the range $A \leq 40$ there ought to be a number of hitherto not detected β-active nuclei. For these nuclei the maximum positron decay energies and the half-lives are predicted. Within the range Z-N=2 there ought to be between Ne^{18} and Ca^{38} still 5, in the range Z-N=3

Card 1/2

On the Existence of Light Nuclei With a Large Surplus of Neutrons or Protons

between Ne^{17} and Sc^{39} still 10, and in the range N-Z=4, N-Z=6 O^{20}, F^{22}, Na^{26}, Al^{30} energy levels. The predicted energies are probably accurate up to $\pm$ 1.5 Mev. In the case of the half-lives, an error of up to one order of magnitude, may, however, occur. The isotopes with a surplus of protons may probably be produced by means of (p,n)- or (He^3,n)-reactions. For the production of isotopes with a surplus of neutrons the (t,p)-reaction appears to be the best suited. By means of (p,3p)-, (p,2n)-, and (α,2p)-reactions and by using high-energy protons or α-particles it should also be possible to produce the nuclei mentioned. There are 1 figure, 3 tables, and 3 references, 1 of which is Soviet.

SUBMITTED: January 6, 1959

Card 2/2

BAZ, A. I.

RUMANIA/Nuclear Physics - General Problems. C

Abs Jour : Ref Zhur Fizika, No 1, 1960, 227

Author : Baz. A.I., Sambilov, L.N.
Inst : -
Title : All-Union Conference on Nuclear Reactions at Small and Medium Energies, Held in Moscow on 19 - 27 November 1957.

Orig Pub : An. Rom.-Sov. Ser. mat.-fiz., 1959, 13, No 1, 136-144

Abstract : Translated from the journal Atomnaya Energiya /Atomic Energy/ 1958, 4, No 2, See Referat Zhur Fizika, 1958, No 10, 22147.

Card 1/1

24(5),21(7)

AUTHOR: Bez', A. I.

SOV/56-36-6-21/66

TITLE: Resonance Effects in Particle Scattering Near the Threshold of the Reaction (Rezonansnyye effekty pri rasseyanii chastits vblizi poroga reaktsii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1762-1770 (USSR)

ABSTRACT: In an earlier paper (Ref 1) the author already investigated the energy dependence of the scattering cross section of the reaction X(aa)Y near the threshold of the reaction X(ab)X. He had shown that, if there is no Coulomb reaction between b and Y (X, a, b, and Y are arbitrary particles), the scattering cross section has a characteristic singularity in the threshold. In the present paper the author investigates the question as to the behavior of the cross section energy dependence in the case long-range attractive forces (e.g. Coulomb forces) being active between b and Y. Therefore, the reaction X(aa)X near the threshold E_{th} of the reaction X(ab)Y is again investigated. As the only restriction it is assumed that, besides the reaction X(ab)Y, no inelastic processes

Card 1/3

occur in the energy interval under investigation. If the forces acting between b and Y are capable of producing a bound state of particles b + Y with the binding energy Δ, resonances should be observed in the scattering cross sections, viz at a bound state production energy $E = E_{th} - \Delta$. Breit (Ref 2) was the first to point out this possibility. These resonances occur only if the range of action of the long-range potential $\gg r_0$ (r_0 is the radius beyond which the specific nuclear forces are to be neglected). It is assumed that this condition is satisfied in the following. In chapter 1 the general theory of the phenomenon is briefly discussed, and it is shown that the resonances are located below the threshold of the reaction X(ab)Y. In the second chapter a detailed investigation is carried out of the case in which attractive Coulomb forces act between b and Y. The number of resonances in this case is found to be infinite, and their density tends to infinity when the threshold is approached from below. Finally, the case is investigated in which the particle denoted by Y is unstable and has a finite life-time. The formula

Resonance Effects in Particle Scattering Near the Threshold of the Reaction

SOV/56-36-6-21/66

obtained for S_1 corresponds to the Breit-Wigner formula. The author finally thanks Ya. A. Smorodinskiy for his constant interest and L. A. Maksimov for editing the manuscript. There are 4 figures and 7 references, 3 of which are Soviet.

SUBMITTED: December 10, 1958

Card 3/3

S/030/60/000/010/012/018
B021/B058

AUTHORS: Baz', A. I. and Chuyev, V. I.

TITLE: Nuclear Reactions at Low and Medium Energies

PERIODICAL: Vestnik Akademii nauk SSSR, 1960, No 10, pp. 106 - 108

TEXT: The Second All-Union Conference on these reactions was held in Moscow from July 21 to 28, 1960. It was attended by 600 Soviet and 50 foreign scientists. The Conference program included practically all essential parts of nuclear physics, except α- and β-radioactivity and fission. N. A. Vlasov gave a survey of experimental studies dealing with the investigation of low nucleonic systems. Ya. B. Zel'dovich, V. I. Gol'danskiy, and Ya. A. Smorodinskiy took part in the discussion on the problem of the possible existence of superheavy isotopes of the lightest nuclei and the ways for their discovery. A. I. Baz' reported on the surface structure of light nuclei. The following lectures were held next: I. S. Shapiro, on the possibility of obtaining extensive information about the structure of light nuclei

Card 1/3

Nuclear Reactions at Low and Medium Energies

S/030/60/000/010/012/018
B021/B058

on the basis of investigations of the μ-meson capture by nuclei; A. A. Ogloblin gave a survey of experimental studies and V. G. Neudachin of theoretical problems concerning direct nuclear reactions; A. P. Klyucharev reported on studies concerning the elastic proton scattering on nuclei conducted in laboratories of the Ukraine; V. I. Strizhak, on the results of the experimental study of elastic neutron scattering on nuclei; P. E. Nemirovskiy, on the present state of the optical model; I. Kh. Lemberg (USSR) gave a survey of papers on the Coulomb excitation; A. S. Kompaneyets reported on theoretical problems connected with the conditions of diatomic molecules; F. L. Shapiro, on the classical theory of the Mössbauer effect and experimental studies conducted in this direction in the USSR. L. Ye. Lazareva underlined the fact that at present the study of the energy dependence of the absorption cross section of photons by nuclei is emphasized. Interesting results in this field were achieved by a group of scientists of the Fizicheskiy institut im. P. N. Lebedeva (Institute of Physics imeni P. N. Lebedev) and the Institut teoreticheskoy i eksperimental'noy fiziki Akademii nauk SSSR (Institute of Theoretical and Experimental Physics of the Academy of

Card 2/3

Sciences USSR). A. M. Baldin reported on theoretical problems of the interaction of photons with the nuclei; L. V. Groshev, on general regularities of γ-ray spectra, accompanying the thermal neutron capture by the nuclei; S. L. Tsytko, on the study of the radiative capture of the protons; V. V. Balashov and A. S. Davydov discussed various models of nuclei; Yu. T. Grin' gave a survey on Soviet studies in this direction. The results of nuclear physics during the last years, summarized by the Conference, facilitate the planning of further research.

S/053/60/072/002/002/005
B006/B067

AUTHORS: Baz', A. I., Gol'danskiy, V. I., and Zel'dovich, Ya.B.

TITLE: Some Isotopes of Light Nuclei

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol. 72, No. 2, pp. 211 - 234

TEXT: At present about 300 isotopes of light nuclei ($Z \leq 36$) are known of which abundant experimental material has already been collected. The present paper gives a survey of these data. After a short introduction the neutron-deficient isotopes ($Z > N$) are dealt with in chapter 2. Their properties can be predicted by the fact - which follows from charge invariance - that the properties of two isotopically conjugate nuclei (nucleus A, Z_1N_1 is the isotopically conjugate nucleus of nucleus A_1, Z_2N_2 if $Z_1 = N_2$ and $N_1 = Z_2$) exactly coincide up to the Coulomb corrections and the corrections for the neutron-proton mass difference. Since these corrections are relatively easy to consider, the main properties of the isotopes can

Card 1/3

be determined with Z > N from the known properties of the isotopes with N > Z. Fig. 1 gives a scheme of the difference of the binding energy of the Z-th neutrons in the nucleus (A, A-Z) and the binding energy of the Z-th proton in the nucleus (A, Z). In a similar scheme Fig. 3 illustrates the region of the stable nuclei. The most promising method of producing neutron-deficient isotopes of light nuclei are the reactions (p,xn) and (He^3,xn), as well as reactions induced by multiply-charged ion bombardment. New physical phenomena are assumed to be observable in neutron-deficient nuclei, proton and two-proton radioactivity; these phenomena are dealt with in part 3 of the paper in which among others the region where such phenomena may occur, is briefly outlined, and the main properties of two-proton radioactivity are described. The reaction $Ne^{16} \rightarrow O^{14} + 2p$ is discussed more thoroughly. $Mg^{17}(18?)$, $Si^{21}(22?)$, $S^{25}(24?)$, $Al^{29}(28?)$, $Ca^{33}(34?)$, Ti^{48}, Cr^{42}, $Fe^{44}(43?)$, $Ni^{46}(47?)$, $Zn^{53}(54?)$, $Ge^{59}(58?)$, $Se^{63}(62?)$, $Kr^{67}(66?)$, are also counted among the 2p-active nuclei. In part 4 the nuclei

Some Isotopes of Light Nuclei

S/053/60/072/002/002/005
B006/B067

with high neutron excess are dealt with. In this case above all problems of neutron binding energy in the nucleus are discussed (Fig. 6 shows E_n as a function of Z for a large number of N-values). Also experimental results are presented and discussed. The possibilities of an experimental determination of the bineutron (reaction (n^2,α) e.g. $N^{14} + n^2 \rightarrow B^{12} + \alpha + 3.2$ Mev, $n^2 \rightarrow 2n$ decay on passage of n^2 through matter and measurement of the neutron directional correlation, Fig.7) are discussed. Furthermore experiments for determining H^5 and He^8 are discussed. In part 5 considerations are made on the stability limits and a five-page table containing a survey of various properties $(N, A, (M-A), E_p, E_n, E_\beta, T_{1/2\beta})$ of isotopes with neutron excess as well as of neutron- deficient electrons for the region $2 \leq Z \leq 40$ is given which is highly valuable for practical work in this field. P. E. Nemirovskiy and A. T. Varfolomeyev are mentioned. There are 8 figures, 1 table, and 25 references: 14 Soviet, 10 US, and 1 Canadian.

Card 3/3

BAZ', A.I.; GOL'DANSKIY, V.I.; ZEL'DOVICH, Ya.B.

Undiscovered isotopes of light nuclei. Usp. fiz. nauk 77 no.2:211-234 O '60. (MIRA 16:8)
(Isotopes)

S/026/61/000/008/003/004
D051/D113

AUTHORS: Baz', A.I. and Puzikov, L.D. (Moscow)

TITLE: Study of the nucleus

PERIODICAL: Priroda, no. 8, 1961, 59-62

TEXT: A general introduction into basic problems and recent advances in nuclear physics is given. It is based on material presented at the All-Union Conference on Nuclear Reactions at Low and Mean Energies, held in Moscow from July 21-28, 1960 and the International Conference on the Structure of Nuclei held in Canada, from August 29 - September 3,1960. In order to simplify problems of nuclear research, scientists have been using models which represent the nucleus or the mechanism of nuclear reactions. Many properties are explained by the shell model, according to which the nucleons move independently along orbits in a self-consistent field. This model is based on the assumption that each nucleon has a definite amount of energy which is not subject to exchange within the nucleus. In many cases it helped to determine the spins and parities in basic and weakly excited nuclear states, magnetic and quadrupole moments etc. At the conferences the suitability of this model was confirmed by reports of two new achievements.
Card 1/4

S/026/61/000/008/003/004
D051/D113

Study of the nucleus

After calculating the energy required for the emission of a proton from a bombarded nucleus, it was found that the result was consistent with that obtained using a shell model. The shell model also helped to explain the huge resonance in photonuclear reactions, which occur during bombardment of the nucleus by gamma quanta. The use of the shell model, however, is limited to the study of static nuclear properties, and cannot be used for the study of the so-called residual interaction of nucleons in a self-consistent field or for considering nuclear surface phenomena. Towards the nuclear surface, the density of the nucleons and the intensity of the self-consistent field rapidly decrease. This involves increased nucleon interaction and the subsequent reformation of nucleon groups, a phenomenon which was confirmed by recent research. Proper consideration of surface effects, evidently, will considerably expand the field of application of the shell model. In contrast to previous assumptions that all nuclei have a spherical form, more recent experimental research has established that many nuclei have the shape of a rotating ellipsoid. This second hypothesis has permitted many phenomena such as the sequence of and difference between weakly excited nuclear levels to be explained. However, it was frequently shown that many experimental data were inconsistent with this assumption also. The Soviet scientists Davydov and Filippov, therefore, proposed a model shaped like a triaxial ellipsoid.

Card 2/ 4

S/026/61/000/008/003/004
D051/D113

Study of the nucleus

This model helped calculate a number of magnitudes observed under experiment. The variety of nuclear shapes has been further increased by modern research. For example, in 1960 it was revealed that two specific excited states, which can be represented as two C^{12} nuclei, exist in the Mg^{24} nucleus. These nuclei rotate in relation to one another (dumbbell composed of two C^{12} nuclei).

The existence of a "dumbbell" state for Mg^{24} was detected thanks to a new experimental technique consisting in using accelerated beams of heavy ions as bombarding particles. The results obtained with the so-called optical nuclear model coincide with experimentally obtained values for the characteristics of 1-20 Mev proton and neutron collisions with nuclei. It is evident, however, that this model is inadequate because it cannot explain, for instance, the results of experiments in which the polarization of mean energy nucleons scattered on various nuclei was measured. The present trend is to improve the model within the approved limits. In connection with the "direct" type of nuclear reaction, the conferences paid special attention to the "method of deformed waves". This method does not only consider the interaction at the moment of direct particle-nucleus contact, which leads to the reaction, but also the nuclear interaction with incident and scattering particles. A general trend observed at the conferences was the attempt to

Card 3/4

Study of the nucleus

synthesize the different models and to combine opinions on the intermediate nucleus, direct processes, and optical interaction. There are 4 figures and 2 Soviet references.

Card 4/4

BAZ', A.I.; STRUTINSKIY, V.M.

From the materials of the Kingston conference on nuclear structure. Atom.energ. 10 no.4:408-409 Ap '61. (MIRA 14:4)
(Kingston, Canada—Nuclear physics—Congresses)

S/056/61/040/002/027/047
B102/B201

24.6600 (1138, 1160, 1098)

AUTHORS: Badalyan, A. M., Baz', A. I.

TITLE: Mechanism of photonuclear reactions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, 549-552

TEXT: The present paper offers a discussion of the applicability of the statistical theory of nuclear reactions to photonuclear reactions, and, in this connection, a comparison of the main results of experiments and theory in this field. It may be concluded from the results of this study as to whether a great number of levels of the compound nucleus participates in the reaction (the statistical theory is based upon this assumption), or only few wide levels - perhaps single-particle levels with a width near the one assumed by Weisskopf. In the former case the statistical theory is expected to be well suited to describe the experimental results, whereas in the latter it is not. Experimental results concerning interaction of gamma quanta with nuclei in the energy range of 5-15 Mev have been published sporadically; the following facts

Card 1/5

IV

S/056/61/040/002/027/047
B102/B201

Mechanism of photonuclear reactions

may be inferred from published results: 1) Of almost all elements, the $\sigma_{\gamma\gamma}$ and $\sigma_{\gamma\gamma'}$ exhibit, near the threshold of the reaction (γ,n) or (γ,p) a distinct peak, some millibarns high and with a half-width Γ of 1-3 Mev; medium-heavy nuclei mostly exhibit resonance with respect to the cross section in connection with the (γ,p) threshold, whereas heavy ones do so with the (γ,n) threshold. 2) Height and width of these peaks vary irregularly from one element to another. 3) Resonance is observable in the course of the cross section. Data concerning the nuclear absorption below the (γ,n) threshold are available only for P, S, and Ca. The predictions of the statistical theory of nuclear reactions, which are compared with experimental data, may be formulated as follows: 1) The cross section should be a smooth function of the atomic weight. Fuller and Hayward (Phys. Rev. 101, 692, 1956) have shown that in the scattering of γ-quanta the nuclei have very individual behaviors, and the statistical theory is not applicable. 2) The elastic scattering cross section should have the course shown in the figure. At excitation energies $\gtrsim 5$ Mev $\Gamma_\gamma/\Gamma = (\hbar\omega)^3/6\pi^4\rho(\hbar\omega) \sim 1\%$ $(\rho(\hbar\omega) = \rho_0 e^{\hbar\omega/\tau}$ gives

Card 2/5

Mechanism of photonuclear reactions

the level density, and $\tau \approx 0.9$ Mev). In the energy range > 5 Mev the elastic scattering cross section changes like $(\hbar\omega)^4 e^{-\hbar\omega/\tau}$ (on the assumption of dipole absorption, $\sigma_{capt} \sim \hbar\omega$) with a maximum at ~ 4 Mev. The maximum of $\sigma_{\gamma\gamma}$ near the nucleon threshold is not explicable by the statistical theory. The sharp drop of the cross section at energies corresponding to the photoneutron production threshold is explained by the fact that neutron emission is much more probable than gamma emission.

3) The total inelastic scattering cross section $\sigma_{\gamma\gamma'} = \sigma_{capt} \Gamma^{-1} \sum \Gamma_{\gamma'}$ at large excitation energies (below the nucleon threshold) should practically coincide with the capture cross section, since $\sum \Gamma_\gamma \approx \Gamma$ and increases with energy. According to the statistical model, the maximum of the inelastic scattering cross section should be practically at the neutron threshold, or somewhat above the proton threshold, but not below. Actually, however, it has been found in individual cases that $E_{max} < E_{thresh}$ (e.g., at Y^{89}, where $E_{max} \approx 10.5$ Mev, $E_{thresh} = 11.8$ Mev).

Card 3/5

Mechanism of photonuclear reactions

4) According to the statistical model, $\sigma_{abs} \approx 100\ \sigma_{\gamma\gamma}$ should hold at $E \gtrsim 5$ Mev; experimentally, the proportionality factor was not at 100, but at 2-10. It is thus found that the statistical theory cannot describe the experimental data in the range of excitation energies from 5 to 10 Mev. The discrepancy between theory and experiments is reduced when it is assumed for the photoreactions to take place only via some wide levels. The intense lines observed near the (γ,n) and (γ,p) thresholds correspond to "threshold states" exhibiting single-particle structure and having a large irradiation width. A paper in this connection has been published by Baz' in Adv.Phys. 8, 349, 1959. This assumption allows to explain a number of facts, such as the appearance of peaks of $\sigma_{\gamma\gamma}$, $\sigma_{\gamma\gamma'}$, and σ_{abs} near the (γ,n) and (γ,p) thresholds, the irregular change of σ_{max} and Γ with the atomic weight, the ratio $\Gamma_{\gamma}/\Sigma\Gamma_{\gamma'}$, and the absolute value of $\sigma_{\gamma\gamma}$. The fact that few but intense levels of the compound nucleus play the main part in the threshold regions can be well explained, as is proved in a detailed discussion, by the assumption of

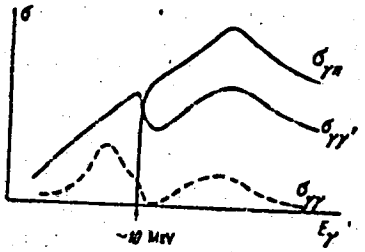
Card 4/5

Mechanism of photonuclear reactions

S/056/61/040/002/027/047
B102/B201

"threshold states" which are "condensed" near the threshold. In light nuclei, such levels should be observable in the following regions: Li^7: 6.5-7.5 Mev; B^{11}: 11-11.5 Mev; C^{12}: 18.3-18.9 Mev; O^{16}: 15-16 Mev; O^{18}: 6-6.4 and 8-8.4 Mev; Ne^{20}: 5-5.6 Mev. O. V. Bogdankevich, L. Ye. Lazareva, and B. N. Kalinkin are mentioned. There are 1 figure, 1 table, and 12 references: 6 Soviet-bloc and 6 non-Soviet-bloc.

SUBMITTED: July 18, 1960



Card 5/5

BAZ', A.I.

Energy dependence of scattering cross sections near the "threshold" of the generation of an unstable particle. Zhur. eksp. i teor. fiz. 40 no.5:1511-1515 My '61. (MIRA 14:7)

(Nuclear reactions)

BAZ, A. I.

"The Solution of the 3-Body Problem in a Special Case."

Paper presented at the International Symposium on Direct Interactions and Nuclear Reaction Mechanisms, Padua, 3-8 Sep 62

S/903/62/000/000/001/044
B102/B234

AUTHOR: Baz', A. I.

TITLE: Some problems of the theory of light nuclei

SOURCE: Yadernyye reaktsii primalykh i srednikh energiyakh; trudy Vtoroy Vsesoyuznoy konferentsii, iyul' 1960, g. Ed. by A. S. Davydov and others. Moscow, Izd-vo AN SSSR, 1962, 13-32

TEXT: Those problems of light nuclei ($A < 12$) that are of main interest, such as the deviations from the shell model, the nuclear surface and the nuclear substructure are dealt with in great detail. Special attention is paid to experimental data on the nuclear energy level structure indicating the presence of nucleon groups. Also the problem of nonconservation of isotopic spin is discussed. These considerations lead to the following conclusions: (1) The shell model is inapplicable for studying the nuclear surface since in this region residual interaction of the nucleons predominates and the conception of the selfconsistent potential no longer applies. (2) Nucleon groups will form on the nuclear surface and the wave function describing the relative motion of the nucleon groups beyond the surface will be tailed. (3) Extension and amplitude of the tails, and so also the

Card 1/3

Some problems of the theory...

structure and the width of the nuclear surface, vary strongly from level to level and from nucleus to nucleus. When the level (E_i) is positioned near to one of the threshold levels ($E=E_{th}$) then the range of the tail will be $(\hbar^2/2m|E_{th}-E_i|)^{1/2}$. (4) When between the particles of the i-th channel, b+Y, an attractive interaction potential U_i is acting at $r>r_i$, r_i being the radius of the channel, then the amplitude of the i-th tail will be considerably higher than in the case $U_i=0$. Hence in the region $r>r_i$ the main part of the total wave function will be concentrated; this indicates that the nucleus will spend most of the time in the form of pairs of b+Y particles moving relatively to each other in the range $r>r_i$. (5) Such a surface structure leads to the following consequences: a relatively great number of levels with anomalous large widths are observed especially near the thresholds of the two-particle disintegration of the nucleus; the large widths of the i-th channel are to be found near the i-th threshold. The energy dependences of the threshold reactions become changed. "Threshold states" of the nucleus arise which are identical with single-particle states of large radii. The isotopic spin becomes considerably disturbed and especially the

Some problems of the theory... S/903/62/000/000/001/044
B102/B234

"threshold states" have no definite value of the isotopic spin. There are 16 figures.

Card 3/3

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37873
S/056/62/042/005/017/050
B102/B104

AUTHORS: Baz', A. I., Puzikov, L. D., Smorodinskiy, Ya. A.

TITLE: Reconstruction of the scattering matrix near the threshold conditions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 5, 1962, 1249-1251

TEXT: As a development of work previously reported (A. I. Baz'. ZhETF, 33, 923, 1957) the authors present an analysis of the scattering data for spinless particles close to the reaction threshold in terms of a "complete experiment". The amplitude and cross-section of scattering near the threshold can be represented by the first few terms in a series expansion of the threshold quantities. The data required for the scattering matrix can be derived from measurements of the dependence of the polarisation quantities on the energy, in respect of elastic scattering near the threshold. For e.g. scattering of a 1/2-spin particle from a zero-spin particle, the elastic-scattering matrix near the reaction threshold is given by

Card 1/2

S/056/62/043/001/025/056
B104/B102

AUTHORS: Baz', A. I., Vaks, V. G., Larkin, A. I.

TITLE: K-meson - hyperon resonances

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 166 - 174

TEXT: Experimental data on the cross sections of the reactions $\pi^- + p \longrightarrow \Sigma + K$ and $\pi^- + p \longrightarrow \Lambda + K$ near the $\Sigma + K$ threshold are phenomenologically analyzed. A level in the system $\Sigma + K$ with $T = 1/2$ with a binding energy of about 30 Mev is assumed to exist. In the cross section of the reaction $\pi + N \longrightarrow \Lambda + K$; this level leads to a resonance below the $\Sigma + K$ threshold. Possible levels in the systems $\Lambda + K$, $N + Q$, $N + \omega$, and $N + K^*$ are discussed. To clarify the interaction between Σ and K in states with $T = 1/2$, the cross sections of the reaction $\pi + N \longrightarrow \Lambda + K$ must be studied in the energy range $T_\pi = 810 - 900$ Mev, and of the reaction $\pi^- + p \longrightarrow \Sigma + K$, near the threshold. The analysis is conducted by methods of R. Dalitz and S. Tuan (Ann. Phys., 8, 100, 1959; 10, 307, 1960;

Card 1/2

S/056/62/043/001/025/056
B104/B102

K-meson - hyperon resonances

Phys. Rev. Lett., 2, 425, 1959; Rev. Mod. Phys., 33, 471, 1961; Talk at Aix-en-Provence Int. Conf., September, 1961, preprint); unitarity, time reversal, and analycity of the scattering matrix are used for analyzing the $\overline{K}N$ interaction at small energies. There are 3 figures.

SUBMITTED: January 24, 1962

Card 2/2

L 11061-65 EWT(m)/T/EWA(m)-2 AFWL/SSD/ESD(gs)/ESD(t)

ACCESSION NR: AP4046423 S/0056/64/047/003/1041/1042

AUTHORS: Baz', A. I.; Zommer, V. P.

TITLE: Effect of threshold levels on the shape of the photoneutron spectrum

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 3, 1964, 1041-1042

TOPIC TAGS: photoneutron, gamma neutron reaction, neutron spectrum, photoneutron spectrum, threshold state

ABSTRACT: The presence of threshold states of the compound nucleus Z^A, which
produced in the (γ, n) reaction on an arbitrary nucleus (A. I. Baz, Adv.
was theoretically predicted by one of the authors
and established reliably for light nuclei
Phys. v. 8, 349, 1959) [illegible] is demon-
by [illegible] A. Zhmailo (ZhETF v. 44, 332, 1963),
strated [illegible] basis of data on the spectra of neutrons from [illegible]

Card 1/2

L 11061-65

ACCESSION NR: AP4046423

the (γ, n) reaction, especially the spectra of photoneutrons from the reaction $Bi^{209}(\gamma, n)Bi^{208}$. These spectra were calculated under certain reasonable assumptions and the results of the calculation were compared with the experimental data of M. V. Savin et al (ZhETF, in press). The irregularities in the experimental spectra seem to [illegible] magic or near-magic nuclei. Orig. art. has: 1 figure.

ASSOCIATION: None

SUBMITTED: 01Apr64 ENCL: 00

SUB CODE: NP NR REF SOV: 003 OTHER: 002

Card 2/2

L 16503-65 EWT(m)/T/EWA(m)-2 ESD(t)/APWL/ASD(a)-5
ACCESSION NR: AP5000346 S/0056/64/047/005/1874/1876

AUTHOR: Baz', A. I.

TITLE: Energy dependence of the lifetime of quasistationary states

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 5, 1964, 1874-1876

TOPIC TAGS: particle scattering, resonance scattering, line shape, half life, potential scattering

ABSTRACT: It is shown that to determine the lifetime of the quasi-stationary state of some particle whose scattering by some system exhibits a resonance of known width located at a known energy can be determined as a function of the energy of the scattered particle by two approaches, one based on the work of E. Wigner (Phys. Rev. v. 98, 145, 1955), yielding a lifetime plot with a Lorentz shape, and the other based on a model consisting of a potential with a

Card 1/2

L 16503-65
ACCESSION NR: AP5000346

barrier, inside which a magnetic field is produced. The same result is obtained in both approaches. "I thank Ya. B. Zel'dovich for numerous discussions." Orig. art. has: 13 formulas.

ASSOCIATION: None

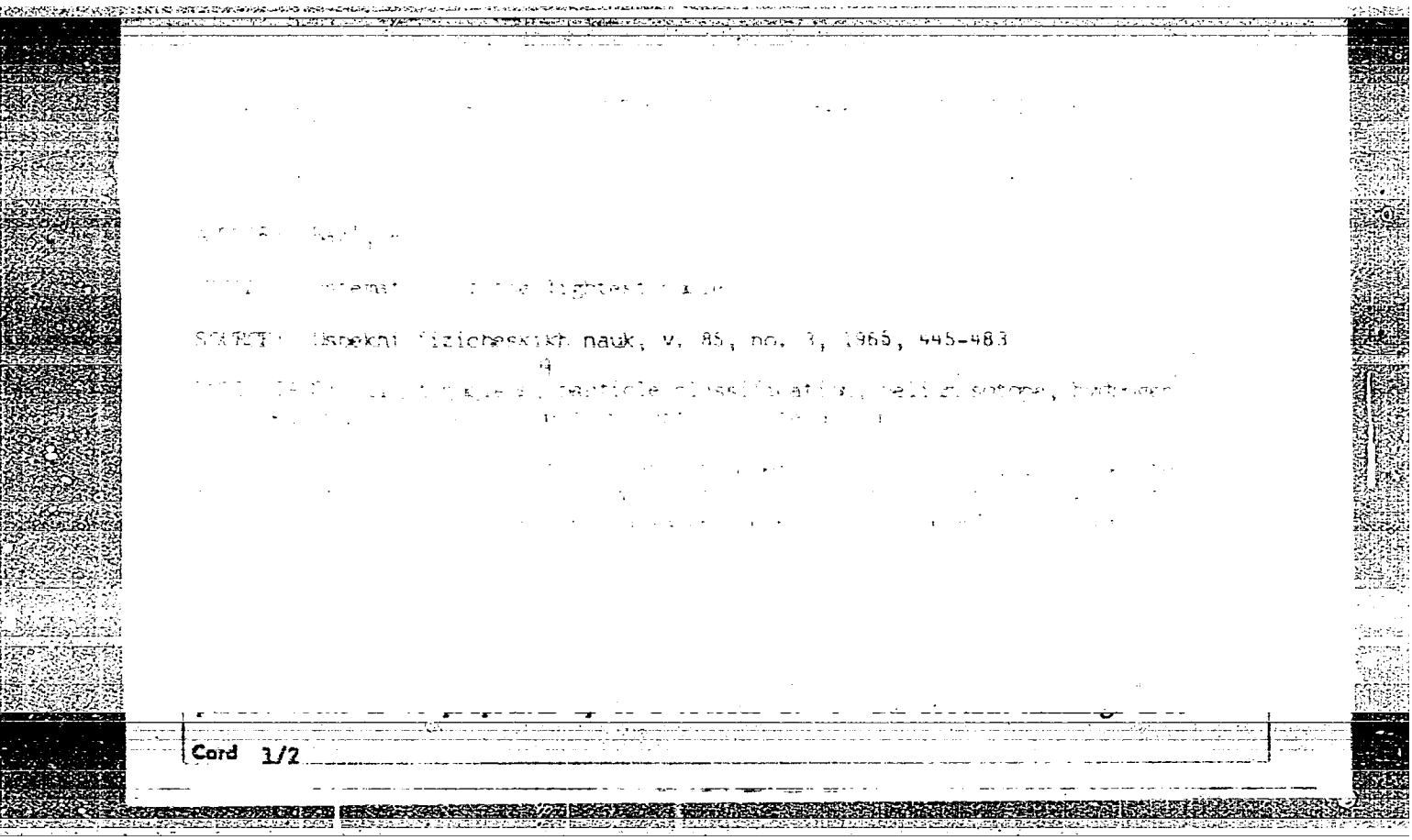
SUBMITTED: 14May64 ENCL: 00

SUB CODE: NP NR REF SOV: 000 OTHER: 001

Card 2/2

BAZ', A.I.; ZOMMER, V.P.

Effect of threshold levels on the shape of a photoneutron spectrum. Zhur. eksp. i teor. fiz. 47 no.3:1041-1042 S '64. (MIRA 17:11)



Uspekhi fizicheskikh nauk, v. 85, no. 3, 1965, 445-483

Card 1/2

L 48603-65

ACCESSION NR: AP5009068

1. Introductory remarks. 2. The dineutron. 3. The diproton. 4. The "tri-neutron" and the position of the level T = 3/2 for A = 5. The levels of the alpha particle. 6. Cases in which the concept of isotopic spin cannot be applied. 7. The problem of H^5. 8. The tetraneutron. 9. The isotope H^6. 10. The isotope He^5. ... heavier isotopes. Orig. art. has: 16 figures and 10 formulas.

ASSOCIATION: None

SUBMITTED: 00	ENCL: 00	SUB CODE: NP
NR REF SOV: 028	OTHER: 084	

Card 2/2

ACC NR: AP7011836 SOURCE CODE: UR/0367/66/004/006/1131/1133

AUTHOR: Baz', A.I. -- Baz, A. I.; Demin, V. F.; Kuz'min, I. I.

ORG: none

TITLE: Exact calculation of deuteron elastic scattering and the stripping reaction as a specific case of the three-body problem

SOURCE: Yadernaya fizika, v. 4, no. 6, 1966, 1131-1133

TOPIC TAGS: three body problem, elastic scattering, deuteron scattering

SUB CODE: 20

ABSTRACT: The elastic scattering of a deuteron and the stripping reaction in a rectangular field with one bound state (the 1s-level) have been calculated using the exact solution for a specific case of the three-body problem. The deuteron kinetic energy was chosen equal to 2.2 MeV. The obtained results are compared with those of approximation methods. The authors thank Yu. P. Orevkov for his continuous interest in carrying out the numerical computations. Orig. art. has: 2 figures, 1 formula and 2 tables. [Based on authors' Eng. Abst.] [JPRS: 40,423]

Card 1/1

BAZ', B., inzh.

Tables for making calculations for centrally compressed elements and flexible elements. Bud.mat.i konstr. 4 no.6:40-43 N-D '62. (MIRA 15:12)

(Precast concrete)

BAZ', Boris Dmitriyevich; VOLOSHCHENKO, Z.N., red.; KALISHEVSKAYA, I.K., red.

[Normative pressure on a natural foundation; calculation tables] Normativnoe davlenie na estestvennoe osnovanie; tabulitsy dlia rascheta. Kiev, Budivel'nyk, 1965. 188 p. (MIRA 18:7)

ACC NR: AM6018987 Monograph UR

Milenin, Vladimir Girgor'yevich; Baz', Grigoriy Averkovich; Bulybenko, Viktor YUr'yevich; Muromtsev, Gennadiy Petrovich; Osipov, Vladimir Pavlovich; Rainkin, Aleksandr Nikolayevich; Tregub, Iosif Konstantinovich

Principles of pulse techniques (Osnovy impul'snoy tekhniki) Moscow, Voyenizdat M-va obor. SSSR, 1966. 389 p. illus., biblio. 45,000 copies printed.

TOPIC TAGS: pulse coding, pulse counter, pulse generator, pulse shaper, logic circuit, tunnel diode

PURPOSE AND COVERAGE: This is a textbook on pulse technology for students attending military schools of higher education. Circuits and methods employed in numerous fields of radio electronics are described and analyzed. In addition to the usual problems of pulse technology, comparatively novel problems related to computer technology and the use of semiconductor devices are covered. Emphasis is placed on the physical aspect of the phenomena.

TABLES OF CONTENTS:

Card 1/6 UDC: 621.374

ACC NR: AM6018987

Section I. Pulse Shaping

Section II. Pulse Generation

Card 2/6

ACC NR: AM6018987

Card 3/6

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000204110003-0"

ACC NR: AM6018987

Card 5/6

ACC NR: AM6018987

SUB CODE: 09/ SUBM DATE: 21Jan66/ ORIG REF: 042/ OTH REF: 002/

Card 6/6

BAZ', Grigoriy Averkovich; MUROMTSEV, Gennadiy Petrovich; RAINKIN, Aleksandr Nikolayevich; TREGUB, Iosif Konstantinovich; TSIKUNOV, Kirill Andreyevich. Prinimal uchastiye BULYBENKO, V.Yu.. MILENIN, V.G., dotsent, kand.tekhn.nauk, red.; PODGUZOV, M.I., red.; MEDNIKOVA, A.N., tekhn.red.

[Calculation of pulse systems] Raschet impul'snykh skhem. Pod red. V.G.Milenina. Moskva, Voen.izd-vo M-va obor.SSSR, 1960. 237 p. (MIRA 13:5)

(Pulse techniques (Electronics))

BAZ', Grigoriy Averkovich; MUROMTSEV, Gennadiy Petrovich; RAINKIN, Aleksandr Nikolayevich; TREGUB, Iosif Konstantinovich; TSIKUNOV, Kirill Andreyevich; Prinimal uchastiye BULYBENKO, V.Yu.; MILENIN, V.G., dots., kand. tekhn. nauk, red.; PODGUZOV, M.I., red.; MEDNIKOVA, A.N., tekhn. red.

[Design of pulse networks] Raschet impul'snykh skhem. [By] G.A.Ba' i dr. Izd.2., dop. i perer. Moskva, Voen. izd-vo M-va obor. SSSR, 1962. 267 p. (MIRA 15:3)
(Pulse circuits)

BAZ', I.S.

BAZ', I.S. Istochniki voennogo mogushchestva Sovetskogo Soiuza. Moskva, Voen. izd-vo. 1947. 115 p.

DLC: D742.R8B3

SO: LC, Soviet Geography, Part I, 1951, Uncl.

BAR', I.S., polkovnik

Soviet military science on the nature of modern warfare. Voen. vest. 38 no. 6:19-29 Je '58. (MIRA 11:7)

(War)
(Military art and science)

SMIRNOV, Mikhail Vasil'yevich; BAZ', I.S.; ZUBKOV, I.I., nauchnyy red.

[On Soviet military science] O sovetskoi voennoi nauke. Moskva, Voen.izd-vo, 1960. 333 p. (MIRA 13:11)
(Military art and science)

AM4037183 BOOK EXPLOITATION S/

Kozlov, Svyatoslav Nikolayevich; Smirnov, Mikhail Vasil'yevich; Baz', Ivan Stepanovich; Sidorov, Petr Aleksandrovich

Soviet military science (O sovetskoy voyennoy nauke), 2d rev. and enl. ed. Moscow, Voyenizdat M-vo obor. SSSR, 1964. 403 p. biblio. 15,000 copies printed.

TOPIC TAGS: Soviet military science, Soviet military theory, nuclear weapons, modern warfare

PURPOSE AND COVERAGE: The book is intended for officers of the Soviet Army and Navy, and for civilian readers interested in military service. The development of military theory and the principles of modern warfare are presented and the decisive importance of rockets and nuclear weapons is explained. The effect of the decisions of the 22nd Party Congress and the Party Program on the Soviet theory of war is also discussed. No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

Card 1/2

BAZ', L.G.

Biology and morphology of representatives of the genus Microtendipes, inhabiting the water-supply canal of Ucha Reservoir. Trudy Gidrobiol. ob-va 9:74-84 '59. (MIRA 12:9)

1. Kafedra zoologii bespozvonochnykh Moskovskogo gosudarstvennogo universiteta.
(Ucha Reservoir--Chironomidae)