

ACC NR: AP6033178

Table 2. Ethyl esters of  $\beta$ -diethylphosphinyl(Ia,Ib) and  $\beta$ -diethylthiophosphinylpropionic acids



Compound No.	X	R	R'	Yield (in %)	bp (p in mm)	d <sub>4</sub> <sup>20</sup>	n <sub>D</sub> <sup>20</sup>	MR		Found %		Formula	Calc'd %	
								Found	Calc'd	P	S		P	S
Ia	O	H	H	48	170°(1.3)	1.1030	1.5108	60.38	60.40	14.40	14.71	C <sub>11</sub> H <sub>19</sub> O <sub>2</sub> PS	13.94	14.41
Ib	O	H	CH <sub>3</sub>	52	159-161(1.3)	1.0750	1.5020	64.98	65.02	13.50	14.00	C <sub>10</sub> H <sub>17</sub> O <sub>2</sub> PS	13.11	13.57
Iia	S	H	H	84	172-173(2)	1.0820	1.5428	69.01	68.73	13.38	17.50	C <sub>11</sub> H <sub>19</sub> OPS <sub>2</sub>	12.99	15.80
Iib	S	H	CH <sub>3</sub>	50	165-166(1)	1.0710	1.5382	73.39	73.24	12.00	24.74	C <sub>10</sub> H <sub>17</sub> OPS <sub>2</sub>	12.28	15.43
Iic	S	CH <sub>3</sub>	H	35	170-172(2)	1.0780	1.5438	73.71	73.34	12.50	25.94	C <sub>10</sub> H <sub>17</sub> OPS <sub>2</sub>	12.28	15.43

SUB CODE: 07/ SUBM DATE: 16Oct65/ ORIG REF: 002

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ADP 1005100

ADP 1005100

Author: Magatullin, V. M.; Ananov, E. M.; Magatullin, V. M.

Card: 1/1

Title: Reaction of diethylchlorophosphine with derivatives of acrylic and methacrylic acids

Source: Chem. Abstr. 1966, v. 16, no. 8, 1966, 1966-1966

Chem. Abstr.: diethylchlorophosphine, acrylic, methacrylic acid / UR-10 spectrometer

ABSTRACT: The reaction of diethylchlorophosphine with derivatives of acrylic and methacrylic acid was studied. The reaction of diethylchlorophosphine with acrylic and methacrylic acids and their chlorides, followed by decomposition of the adducts with alcohols, was found to lead to the corresponding esters of diethylphosphonopropionic acids (beta-diethylphosphonopropionic and alpha-methyl-beta-diethylphosphonopropionic, respectively). The complex formation was found to proceed along the pi-pi conjugated system, rather than at the carboxyl carbon atom. The infrared spectra of the reaction products confirm their structures. The authors thank V. M. Magatullin and E. M. Ananov for carrying out the spectral analyses on the spectrometer UR-10. Orig. art. has: 1 table. [SPRS: 38,970]

SUB CODE: 07 / SUBM DATE: 09Apr65 / ORIG REF: 003

Card 1/1

UDC: 546.181.1 + 547.391.2.3

SHAMIRZAYEV, Sh.Yu.; NURULLAYEV, D.Kh.

Air pollution in Tashkent and ways of reducing it. Med. zhur.  
Uzb. no. 9:20-25 S '60. (MIRA 13:10)  
(TASHKENT---AIR---POLLUTION)

DUBROVINSKIY, S.B.; NURULLAYEV, D.Kh.; GINZBURG, G.M.; MEL'NIK, Ye.Yu.

Epidemiological analysis of the poliomyelitis incidence in the city  
of Tashkent during 1953 to 1958. Trudy TashNIIVS 6:109-124 '61.  
(MIRA 15:11)

(TASHKENT--POLIOMYELITIS)

SUKHOVA, M.N.; ZAIROV, K.S.; GVOZDEVA, I.V.; ANDREYEVA, A.I.; NURULLAYEV, D.Kh.; TALIPOV, M.Z.; MOSUNOV, V.B.; STOROZHEVA, Ye.M.; SAMSONOVA, A.M.; SHAMIRZAYEV, N.Yu.; AKMURZAYEV, T.A.

Fly control and its organization in Uzbekistan. Med.zhur.Uzb.  
no.3:3-14 Mr '62. (MIRA 15:12)

1. Iz Tsentral'nogo nauchno-issledovatel'skogo dezinfektsionnogo instituta Ministerstva zdravookhraneniya SSSR (dir. - prof. V.I.Vashkov) i sanitarno-epidemiologicheskoy organizatsii Uzbekistana (glavnyy gosudarstvennyy sanitarnyy inspektor-kand.med.nauk K.S.Zairov).

(UZBEKISTAN--FLIES--EXTERMINATION)

KHUSANBAYEV, D.I.; NURULLAYEV, Kh.

Ancient weathering surface of the Bukantau. Uzb.geol.zhur. 7 no.5:  
74-76 '63. (MIRA 17:3)

1. Institut geologii im. Kh.M.Abdullayeva AN UzSSR.

MURULLAYEV, S., operator

Our settlement grows and improves. Sov.profsoiuzy 8 no.2:47  
Ja '60. (MIRA 13:2)

1. Novobakinskiy neftepererabatyvayushchiy zavod, Baku.  
(Baku--Petroleum workers)

MAMEDOV, Sh.N.; NURULLAYEV, T.

Efficient parameters of blasting operations in breaking thin  
and very thin dipping veins. Dokl. AN Azerb. SSR 21 no.5:  
35-39 '65. (MIRA 18 9)

1. Institut geologii AN AzerSSR.



NURULLIN, R.A.

First volunteer Saturday work in Turkmenistan (1919-1920).

Izv. AN Uz. SSR no. 9:67-75 '56.

(MIRA 14:5)

(Turkmenistan--Labor service)

NURULLIN, SH. K.; BREZHNEV, A. M.

Bones - Tuberculosis

Bedside table for patients in osteo-articular tuberculosis sanatoria, Probl. tub.,  
No. 6, 1951.

Monthly List of Russian Accessions, Library of Congress, March 1952. UNCLASSIFIED.

NURULLIN, Sh.K.

Apparatus for dosed subcutaneous injection of oxygen. Khirurgia  
no.2:71 F '55. (MIRA 8:5)

1. Klinika neotlozhnoy khirurgii 5-y Gorodskoy klinicheskoy bol'-  
nitsy i kafedra neotlozhnoy i voyenno-polevoy khirurgii Kazanskogo  
gosudarstvennogo instituta usovershenstvovaniya imeni V.I.Lenina  
(dir. V.M.Osipovskiy).

(OXYGEN, administration,  
subcutaneous, appar.)

NURULLIN, Sh.K.

Using exercise therapy in a children's sanatorium for bone and joint tuberculosis. Med.sestra 16 no.4:8-18 4p '57. (MIRA 10:6)

1. Iz kostnotuberkuleznogo sanatoriya Agryz Ministerstva zdравo-okhraneniya Tatarskoy ASSR.

(EXERCISE THERAPY) (BONES--TUBERCULOSIS)

NURULLIN, Sh.N.

Adjustment of floating bearing rollers. put' 1 put. kuz. 9 no.9:  
27 '65. (VLA 18:9)

1. Zamestital' nachal'nika "Miyenovskiy distantniy puti.

NURULLINA, A. N.

"Seasonal Cycle of Propagation and Variation in the Numbers of the Yellow Throated Mouse and the Red Vole in the Forests of Voronezhskaya Oblast."  
Cand Biol Sci, Moscow State Pedagogical Inst, Moscow, 1953. (RZhBiol, No 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR  
Higher Educational Institutions (12)  
SC: Sum. No. 556, 24 Jun 55

NURULLINA, A.N.

Seasonal cycles in the reproduction of yellow-necked field mice and  
bank voles in oak forests of Balashov Province. Trudy Inst. lesa 35:  
122-136 '57. (MLRA 10:8)

(Balashov Province--Field mice)

BAZHANOV, V.S.; NURUMOV, T.H.

New data on Tertiary deer in Kazakhstan. Mat. k ist. fauny i flory  
Kazakh. 1:14-28 '55. (MIRA 11:5)

(Kazakhstan--Deer, Fossil)



GALUZO, I.G., akademik; BAZHANOV, V.S.; NURUMOV, T.N.

Exhibition of the Kazakhstan nature. Priroda 51 no.3:62-68  
Mr '62. (MIRA 15:3)

1. Institut zoologii AN Kazakhskoy SSR, Alma-Ata. 2. AN  
Kazakhskoy SSR (for Galuzo).  
(Alma-Ata--Natural history museums) (Kazakhstan--Paleontology)

NURUMOV, T.N.; SAVINOV, P.F.

Expeditions of the Department of Paleobiology and Natural History  
Museum of the Institute of Zoology of the Academy of Sciences of  
the Kazakh S.S.R. in 1961-1962. Mat. po ist. fauny i flory Kazakh.  
4:260-261 '63. (MIRA 16:9)

(Kazakhstan--Paleobiology)

FASMAN, A.B.; SOKOL'SKIY, D.V., akademik; BYDOV, A.V.; SHCHUROV, K.A.  
NURUSHEV, A.

Potentiometric study of catalytic hydrogenation in dielectric media. Dokl. AN SSSR 142 no.4:874-877 F '62. (MIRA 15:2)

1. Kazakhskiy gosudarstvennyy universitet im. S.M.Kirova.
2. AN KazSSR (for Sokol'skiy).  
(Hydrogenation)  
(Catalysts)  
(Electrochemistry)

1. NURUSHEV, Abay. S.
  2. USSR (600)
  4. KUNABAEV, ABAI, 1845-1904
  7. Completely eradicate bourgeois-nationalistic distortions from the study of the work of Abay S. Nurushev, Vest. AN Kazakh. SSR, no. 4, 1953.
9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

KUMEKIN, Yu.P.; MESHCHERYAKOV, M.G.; NURUSHEV, M.G.; NURUSHEV, S.B.;  
STOLETOV, G.D.

Triple scattering of 660 Mev. Protons. Part 1: Measurement of  
the depolarization parameter  $D(90^\circ)$  [with summary in English].  
Zhur. eksp. i teor. fiz. 35 no.6:1398-1401 D '58.  
(MIRA 12:3)

1.Ob'yedinennyy institut yadernykh issledovaniy. ♣  
(Protons--Scattering)

NURUSHEV, S. B.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1614  
AUTHOR MESČERJAKOV, M.G., NURUSEV, S.B., STOLETOV, G.D.  
TITLE The Polarisation of Protons with the energy of 660 MeV on the  
occasion of Nuclear Scattering.  
PERIODICAL Žurn.eksp. i teor.fiz, 31, fasc.3, 361 - 370 (1956)  
Issued : 12 / 1956

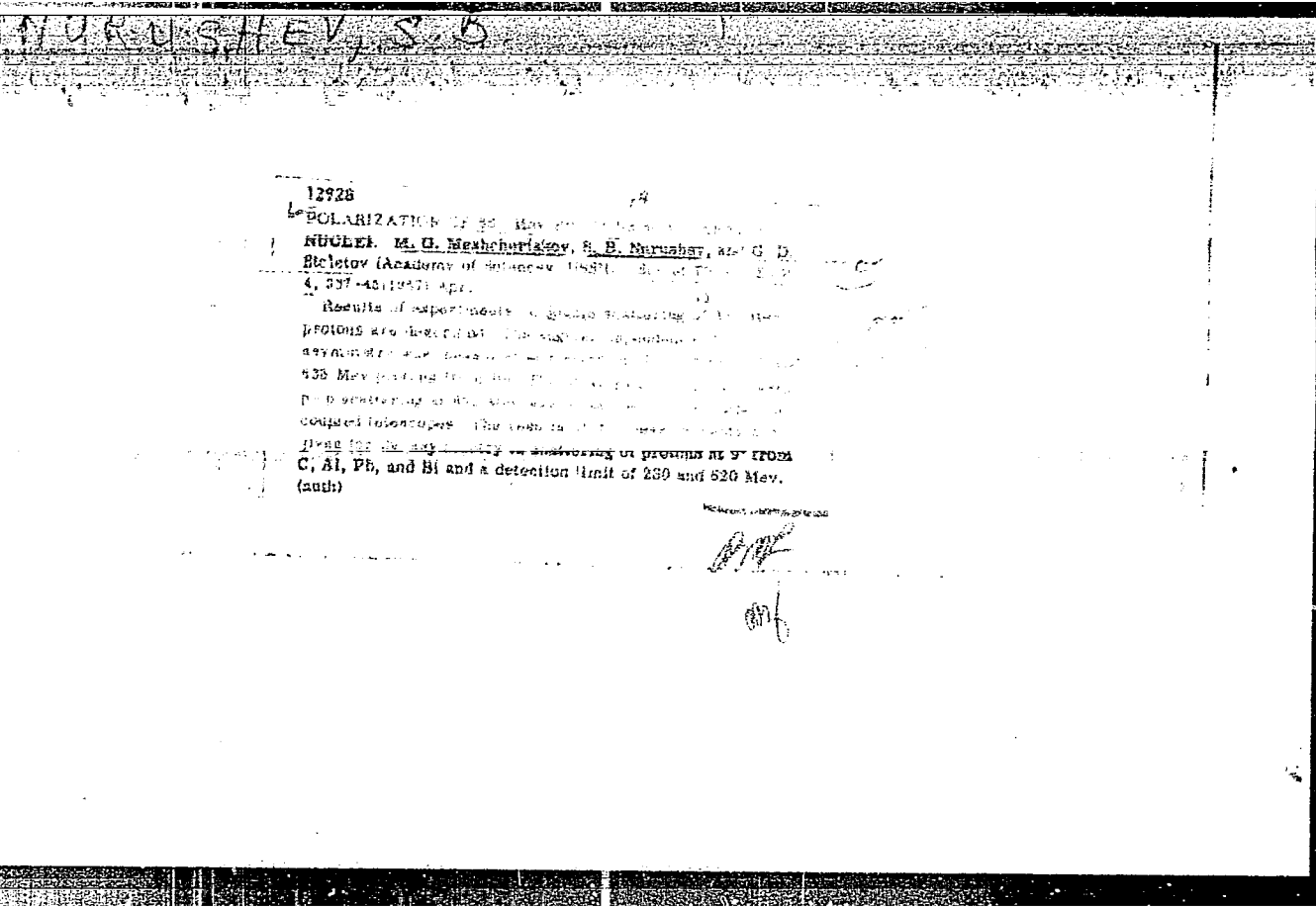
The present work investigates such polarization effects of protons with the initial energy of 660 MeV. At first the production of polarized protons is discussed. The first scattering of protons occurred in the 6 m synchocyclotron on a 4 cm beryllium target (polarizer), which protrudes into the circular orbit of the 660 MeV protons.

Measuring method: The secondarily scattered protons were registered by means of telescopes which consisted of two and three scintillation counters connected for coincidence. The measuring order for secondary scattering consisted of a circular phase angle disk of 800 mm diameter in the center of which a scatterer-analyzer was fitted. Experiments consisted essentially in measuring the angle dependence of asymmetry.

Summary of experimental results: At 660 MeV the polarization of protons occurs on the occasion of diffraction scattering and also on the occasion of quasielastic collisions. In both processes the spin has the same direction as in the case of free (p-p) scattering. The values of asymmetry found at an angle of  $90^{\circ}$  on the occasion of the scattering of polarized protons with  $>620$  MeV on nuclei of Be, V, Al, Pb and Bi were equal to one another within the limits of measuring errors. A comparison of data at present available on the twofold scattering of protons by beryllium gave the following results: a) The maximum value of the polarization of diffractionlike scattered protons does not change noticeably if energy is increased from 300 to 635 MeV,

NURUSHEV, S.B., MESHCHERYAKOV, M.G., STOLETOV, G.D.

"The Polarization of 660 MeV Protons," paper presented at CERN  
Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957





AUTHOR MESHCHERYAKOV, M.G., NURUSHEV, S.B., STOLTOV, G.D., 56-7-6/66  
 TITLE Polarization in (p-p) - Scattering at 635 MeV.  
 (Polarizatsiya v (p-p) - rasseyanii pri 635 MeV - Russian.)  
 PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 33, Nr 7, pp 37-46 (U.S.S.R.)  
 ABSTRACT By means of a simple and a multi-step scintillation telescope the angular distribution of the polarized protons in plastic (p-p)-scattering was measured within the angular range of  $11,6 \leq \theta \leq 90,30^\circ$  (C.M.S.). The primary proton beam had an energy of 635 MeV and a polarization of  $0,58 \pm 0,03$ . With the help of the optical model of (p-p)-scattering the results of the determination of the differential cross section  $\sigma_0(\theta)$  of the elastically scattered but not polarized protons ( $E_p = 657$  MeV) was analyzed. In this way it was possible to determine the character of the interference between the amplitudes of Coulomb- and nuclear scattering. The polarization found can be represented approximately by the function:  $\sigma_0(\theta)P(\theta) = \sin \theta \cos \theta \times [3,20 P_0(\cos \theta) + 3,13 P_2(\cos \theta) + 1,20 P_4(\cos \theta) - 0,12 P_6(\cos \theta)] \cdot 10^{-27} \text{ cm}^2/\text{ster}$ . The presence of the term  $\sin \theta \cos \theta P_4(\cos \theta)$  tends to show that in scattering the tripletlike F-state plays a certain part. It was further found that on the occasion of the quasielastic (p-p)-scattering by Be only ~85% of the protons polarized on the occasion of scattering by H are polarized in this case. (2 tabl., 4 ill., 8 Slavic references)  
 ASSOCIATION United Nuclear Research Institute. (Ob'yedinenny institut yadernykh issledovaniy)  
 SUBMITTED 16.4.1957  
 AVAILABLE Library of Congress.  
 Card 1/1

24(5)

SOV/56-35-6-12/44

AUTHORS: Kumekin, Yu. P., Meshcheryakov, M. G., Nurushev, S. B.,  
Stoletov, G. D.

TITLE: Triple Scattering of Protons at 660 Mev (Troynoye rasseyaniye  
protonov pri 660 Mev) I. Measurement of the Depolarization  
Parameter  $D(90^\circ)$  (I. Izmereniye parametra depolyarizatsii  
 $D(90^\circ)$ )

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 6, pp 1398-1401 (USSR)

ABSTRACT: This paper deals with the contents of a lecture which was  
held at the 4. session of the Scientific Council of the  
Ob'yedinennyy institut yadernykh issledovaniy (United Institute  
for Nuclear Research). The parameter D was introduced by  
Wolfenstein (Vol'fenshteyn) (Ref 1). It holds that

$$\sigma_0(1-D) = \frac{1}{4} |G-N-B|^2 + |H|^2$$
, where  $\sigma_0$  is the scattering cross  
section of the nonpolarized proton beam in hydrogen. The  
amplitudes G, N, B, H are functions of the scattering angle  
and of energy. In the present paper the results obtained by  
D-measurements in pp-scattering below  $90^\circ$  in the center of

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SOV/56-35-6-12/44

Triple Scattering of Protons at 660 Mev. I. Measurement of the Depolarization Parameter  $D(90^\circ)$ 

mass system at 640 Mev are given. Work was carried out on the six-meter synchrocyclotron of the United Institute for Nuclear Research. The first scattering of the 660 Mev protons took place in the external chamber of the synchrocyclotron in the beryllium polarizer target (4 cm thick) and gave a proton beam with  $P_1 = 0.58 \pm 0.03$  and  $E_p = 640 \pm 12$  Mev ( $7 \cdot 10^5$  protons/cm<sup>2</sup>sec). The second scattering occurred in the hydrogen target (liquid H<sub>2</sub> in a glass container, 12 cm diameter). The mean proton energy in the center of the target was 635 Mev. Whereas in the first scattering the angle was  $9^\circ$ , it was found that  $\theta_2 = 41 \pm 2.5^\circ$  (i.e.  $90 \pm 5^\circ$  in the center of mass system). The energy after scattering was  $315 \pm 40$  Mev. The third scattering occurred finally in a carbon analyzer target ( $\theta_3 = 12^\circ$ ). The two variants of the experimental arrangement used by the authors are shown by a figure. It is described and discussed, and the size and arrangement of the 9 counters is given.

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It holds that  $D(90^\circ) = \epsilon_{3n}/\epsilon_3$ ; the two asymmetry values were

SOV/56-35-6-12/44

Triple Scattering of Protons at 660 Mev. I. Measurement of the Depolarization Parameter  $D(90^\circ)$

determined as amounting to  $\epsilon_{3n} = 0.200 \pm 0.032$  and  $\epsilon_3 = 0.216 \pm 0.012$ , respectively, and thus  $D(90^\circ) = 0.93 \pm 0.17$ .

These results agree well with those obtained by other authors (reference 3:  $E_p = 310$  Mev; reference 4:  $E_p = 415$  Mev). The result indicates that pp-scattering at an angle of  $90^\circ$  is mainly due to the  $C(\sigma_1 + \sigma_2)_n$  term in the scattering matrix.

In Born's approximation this term corresponds to pure spin-orbit coupling (Ref 5). The authors finally thank Ya. A. Smorodinskiy and R. M. Ryndin for discussions. There are 1 figure and 5 references, 1 of which is Soviet.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy  
(United Institute for Nuclear Research)

SUBMITTED: July 15, 1958

Card 3/3

24 (5)  
AUTHOR:Nurushev, S. B.

SOV/56-37-1-48/64

TITLE:

Reconstruction of the Matrix of p-p-scattering at an Angle of 90° (Vosstanovleniye matritsy p-p-rasseyaniya pod uglom 90°)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 301 - 302 (USSR)

ABSTRACT:

For the reconstruction of this scattering matrix, 5 experiments are, in general, necessary: Determination of the cross section  $I$  (for this angle), of the coefficient of the spin correlation  $C_{nn}$ , and of the Wolfenstein parameters  $D$ ,  $R$ , and  $A$  (Ref 1). The following holds:  $b^2 = |B|^2/4I = \frac{1}{2} (1 - C_{nn})$ ,  $c^2 = 2|C|^2/I = \frac{1}{4} (1 + C_{nn} + 2D)$ ,  $h^2 = |H|^2/2I = \frac{1}{4} (1 + C_{nn} - 2D)$ ,  $\sin \delta_C = -(R + A)/2bC$ ,  $\cos \delta_H = (A - R)/2bh$ ,  $B = |B|e^{i\varphi_B}$ ,  $C = |C|e^{i(\delta_C - \delta_B)}$ ,  $H = |H|e^{i(\delta_H - \delta_B)}$ . By using the results obtained by Wolfenstein, as well as references 8 and 9, the author evaluated the possible amplitude values for various energies in a polarization-free model, and he published a number of results

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Reconstruction of the Matrix of p-p-scattering at an Angle of  $90^\circ$  SOV/56-37-1-48/64

(partly taken from references 1-6). It follows from these evaluations that the main contribution to the cross section is made by triplet interaction. In the upper interval the triplet term  $c^2$  has spin-orbit character, in the lower one, the triplet term  $h^2$  has tensor character. The following was obtained:

E, Mev	$b^2, \%$	$c^2, \%$	$h^2, \%$	$\delta_C$	$\delta_H$
140	5	13	82	$0^\circ$	$60^\circ$
315	25	62	13	$-90^\circ$	$143^\circ$
400	30	56	14	$\delta_C - \delta_H = 90^\circ$	
635	24	76	12		

With an increase of energy the triplet interaction caused by the terms  $h^2$  and  $c^2$  decreases. Finally, the Wolfenstein parameters and the correlation tensor  $C_{nn}$  are given as functions of  $\theta$ . There

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Reconstruction of the Matrix of p-p-scattering at an Angle of  $90^\circ$  SOV/56-37-1-48/64

are 10 references, 1 of which is Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: March 4, 1959

Card 3/3

83581  
S/056/60/038/005/014/050  
B006/B070

24,6900  
AUTHORS:

Kumekin, Yu. P., Meshcheryakov, M. G., Nurushay, S. B.,  
Stoletov, G. D.

TITLE:

Triple Scattering of 660-Mev Protons. II. The Angular  
Dependence of Depolarization

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 38, No. 5, pp. 1451-1455

TEXT: The authors have shown in an earlier work (Ref. 1) that 640-Mev protons are slightly depolarized when they are scattered through an angle of 90° in the center-of-mass system. This shows that under these conditions the pp-interaction is relatively seldom accompanied by a change in the spin orientation. Further investigations at other scattering angles (54, 72, 108, and 126° in c.m.s.) gave two independent relations between the amplitudes of the pp-scattering matrix, and two relations for the angular dependence of the differential cross sections and the polarization. These investigations are communicated in this paper. The work was done on the six-meter synchrocyclotron of the Ob'yedinennyy institut yadernykh

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Triple Scattering of 660-Mev Protons. II. The  
Angular Dependence of Depolarization

S/056/60/038/005/014/050  
B006/B070

issledovaniy (Joint Institute of Nuclear Research). The experimental arrangement shown in Fig. 1 is the same as that of Ref. 1. The proton beam had an energy of  $(640 \pm 12)$  Mev and a polarization  $P_1 = 0.58 \pm 0.03$ . First, the beam was scattered to the left through  $9^\circ$  by a beryllium polarizer target inside the synchrocyclotron chamber, after which it was scattered in a cylindrical vessel filled with hydrogen, again to the left. The average proton energy at the center of the hydrogen target was 635 Mev, the flux was  $7 \cdot 10^5$  p/sec.cm<sup>2</sup> in the beam 3 cm thick. The depolarization parameter was determined from the scattering angle  $\theta_2$  (second scattering) every  $18^\circ$  in the range of angles investigated. After passing through a three-counter telescope, the beam fell on a carbon analyzer target from which it was scattered on both sides through  $\theta_2 = 12^\circ$  in the laboratory system. The normal component of the polarization vector of the doubly scattered protons was determined from the left-right asymmetry  $\epsilon_{3n}$  of the protons coming from the C-target. This was done by recording the fivefold coincidences of the counters (cf. Fig.). The depolarization parameter was determined from the relation  $D = (\epsilon_{3n}/\epsilon_3)(1 + P_1 P_2) - P_2/P_1$ ; ( $P_2$  is the

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Triple Scattering of 660-Mev Protons. II. The Angular Dependence of Depolarization

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B006/B070

polarization after the first scattering;  $\xi_3$  is the left-right asymmetry of a proton beam with  $P_1$  and having an energy equal to that of the doubly scattered beam  $E_2$ , after scattering by the carbon target). The experimentally determined values of  $\theta_2$ ,  $E_2$ ,  $\xi_3$ ,  $\xi_{3n}$ , and  $D$ , together with corrections, are collected in a table. The values obtained for  $\theta_2 = 90^\circ$  in Ref. 1 are also given. In all cases  $D$  had a positive sign. According to Wolfenstein (Ref. 3),  $D$  may vary between  $-1+2|P_2| \leq D \leq +1$ . The results show that the normal component of polarization is only slightly altered for pp-scattering at 54, 72, and  $90^\circ$ . Referring to Wolfenstein, the authors now show that the sum and difference of the depolarization parameters for scattering angles that are symmetrically situated with respect to  $90^\circ$ , may be interpreted in terms of the amplitude of the pp-scattering matrix. Also, the probability that  $[D(54^\circ) - D(126^\circ)]$  and  $[D(72^\circ) - D(108^\circ)]$  do not vanish may be calculated (80 and 86%). Ya.A.Smorodinskiy, S. N. Sokolov, N. P. Klepikov, and R. M. Ryndin are thanked for discussions. There are 1 figure, 1 table, and 9 references: 2 Soviet, 6 US, and 1 CERN.

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83581

Triple Scattering of 660-Mev Protons. II. The  
Angular Dependence of Depolarization

S/056/60/038/005/014/050  
B006/B070

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint  
Institute of Nuclear Research)

SUBMITTED: December 25, 1959

Card 4/4

X

*NURUSHEV, S.B.*

AZEGIREY, L. A., KUMKIN, Yu. P., MESHCHERYAKOV, M. G., NURUSHEV, S. B., and STOLETOV, S.D.

"Determination of the NN-Scattering Amplitudes Averaged Over Isotopic States at 660 Mev"

report presented at Intl. Conference on High Energy Physics, Geneva,  
4-11 July 1962

Joint Institute for Nuclear Research  
Lab. of Nuclear Problems

*NUKUSHEV, S. B.*

KUMSKIN, Yu. P.; MESHCHENYAKOV, M. G.; NUKUSHEV, S. B.; SOLOVYOV, G. D.

"Tripple Proton Scattering at 660 MeV: Measurement of the Parameter B"  
report presented at the Intl. Conference on High Energy Physics, Cern,  
Geneva, 4-11 July 1962

Joint Institute for Nuclear Research, Laboratory of Nuclear Problems

S/056/62/043/005/017/058  
B102/B104

AUTHORS: Kumekin, Yu. P., Meshcheryakov, M. G., Nurushev, S. B.,  
Stoletov, G. D.

TITLE: Triple scattering of 660-Mev protons. III. Angular  
dependence of parameter R

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,  
no. 5(11), 1962, 1665-1671

TEXT: Further experiments on triple scattering of protons were made  
within the scope of the program of reconstructing the pp-scattering matrix  
for  $E_p = 660$  Mev (cf. I: ZhETF, 35, 1398, 1958; II: ZhETF, 38, 1451,  
1960). The change in primary-beam polarization  $\vec{P}_1$  was measured which  
depends on the polarization tensors  $D_{ip}$  and  $K_{iq}$  of the scattered and  
recoil protons, respectively:

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Triple scattering of 660-Mev protons ... S/056/62/043/005/017/058  
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$$P_{2p} = \frac{P_{2p}^{(0)} + D_{ip} P_{1i}}{1 + P_2^{(0)} P_1}, \quad P_{2q} = \frac{P_{2q}^{(0)} + K_{iq} P_{1i}}{1 + P_2^{(0)} P_1} \cdot \quad \|D_{ip}\| = \begin{matrix} n \\ p \\ K \end{matrix} \begin{matrix} \|D_{nn} & 0 & 0 \\ 0 & X & Z \\ 0 & -Z & Y \end{matrix} \begin{matrix} \| \\ \| \\ \| \end{matrix} ;$$

$$P_2 s_2 = R P_1 [n_2 k_1] + A P_1 k_2, \quad R = Z \sin(\theta/2) + Y \cos(\theta/2), \quad A = Z \cos(\theta/2) - Y \sin(\theta/2);$$

$$P_2 k_2 = R' P_1 [n_2 k_2] + A' P_1 k_1, \quad R' = -Z \cos(\theta/2) + X \sin(\theta/2), \quad A' = Z \sin(\theta/2) + X \cos(\theta/2).$$

The subscripts p and q refer to the measured polarization components of scattered and recoil protons,  $\vec{P}^{(0)}$  is the polarization arising when an unpolarized beam is scattered, the subscript i refers to the initial polarization of the incident beam. The geometry of the experiment may be seen from Fig. 1. The parameter R is related to the asymmetries by  $R = \epsilon_{3s} / (\epsilon_3 \sin \varphi_2)$  where  $\epsilon_3 = P_1 P_3$ ,  $\epsilon_{3s} = R P_1 P_3 \sin \varphi_2 = (N_L - N_R) / (N_L + N_R)$ ; for  $\varphi_2 = 90^\circ$  (which is the case in Fig. 1) these relations are simplest.

The experiments were made with protons of 640±12 Mev and with

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Triple scattering of 660-Mev protons ... S/056/62/043/005/017/058  
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$P_1 = 0.58 \pm 0.03$  from the six-meter synchrocyclotron of the OIYaI. The experimental arrangement of monitor, targets and counter telescopes was such as to satisfy the geometrical demands. The results were used for a phase-shift analysis and for determining the moduli of the scattering matrix  $M_{pp}$ . For  $\theta = 90^\circ$  and  $E_p \approx 640$  Mev:

$$\begin{aligned} |M_{11}| &= (0.24 \pm 0.11) \cdot 10^{-13} \text{ cm}, \\ |M_{01}| &= (0.51 \pm 0.05) \cdot 10^{-13} \text{ cm}, \quad |M_{10}| = (0.40 \pm 0.06) \cdot 10^{-13} \text{ cm} \end{aligned} \quad (13)$$

$\cos \varphi_{01,10} = -0.96 \pm 0.24$  and  $\cos \varphi_{01,00} = 0.84 \pm 0.42$ . There are 5 figures and 1 table.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: June 30, 1962

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Fig. 4. Energy dependence of the moduli of the elements of  $M_{pp}(90^\circ)$

Fig. 5. Energy dependence of the phase angles of the elements of  $M_{pp}(90^\circ)$  assuming  $|M_{01}(640 \text{ Mev}, 90^\circ)| = 180^\circ$ .

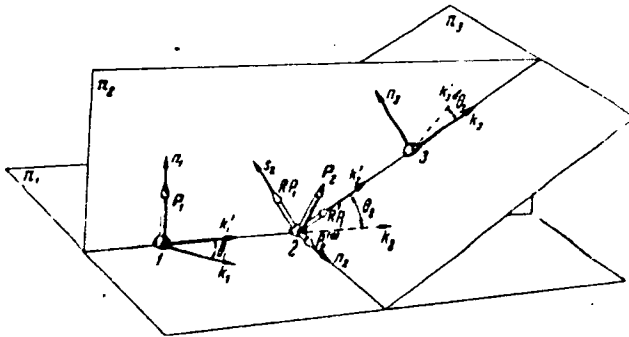


Fig. 1

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Triple scattering of 660-Mev protons ...

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Fig. 4

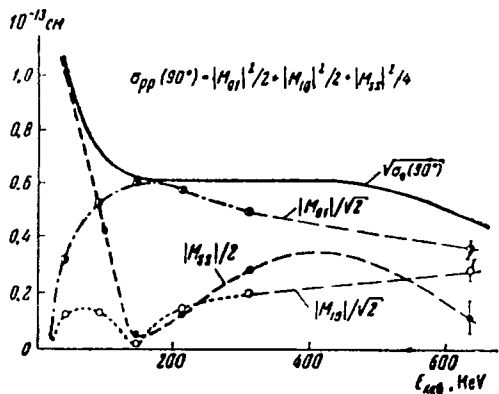
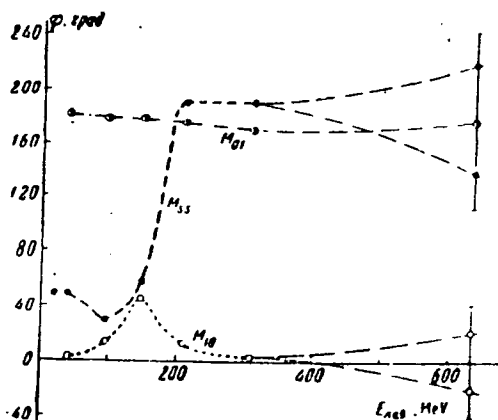


Fig. 5



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Triple scattering of 660-Mev protons ... S/056/62/043/005/017/058  
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$\theta, \text{zrad}$	$\epsilon_{3s} \pm \Delta\epsilon_{3s}$	$\epsilon_1 \pm \Delta\epsilon_1$	$R \pm \Delta R$	$D \pm \Delta D$
54	4,9±0,9	10,9±0,3	0,45±0,08	0,99±0,25
72	6,8±1,0	13,8±0,7	0,49±0,08	0,69±0,20
90	5,5±1,4	21,1±1,3	0,26±0,07	0,93±0,17
108	6,9±1,1	20,5±1,1	0,32±0,06	0,28±0,16
126	4,9±1,3	10,2±0,5	0,49±0,13	0,57±0,20

Table

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B125/B102

**AUTHORS:** Azhgirey, L. S., Kumekin, Yu. P., Meshcheryakov, M. G.,  
Nurushev, S. B., Stoletov, G. D.

**TITLE:** The nucleon-nucleon scattering amplitudes and the complexity  
of the spin-orbit potential of interaction between nucleons  
and nuclei

**PERIODICAL:** Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,  
no. 6(12), 1962, 2194 -2198

**TEXT:** Information as to the nucleon-nucleon scattering at high energies  
can be obtained from experimental data on the scattering of nucleons by  
nuclei. The differential elastic cross sections of protons scattered by  
carbon nuclei through small angles and the polarization of these protons  
were determined by L. S. Azhgirey et al. (ZhETF, 44, 1, 1963) at  
 $E_p = 660$  Mev. The real and imaginary parts of the Born amplitudes were  
obtained from these cross sections  $G(0)$  and  $H(0)$ , and the relations

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The nucleon-nucleon...

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$$G(\tau) = N(k/k_0) \left[ \frac{3}{4} A_1(q) + \frac{1}{4} A_0(q) \right], \quad (3)$$

$$H(q) = -iN(k/k_0)^2 \left[ \frac{3}{4} C_1(q) + \frac{1}{4} C_0(q) \right].$$

between the amplitudes of nucleon-nucleus scattering and the NN-scattering amplitudes following from the superposition model lead to

$$\begin{aligned} \bar{A}^R(0) &= \frac{3}{4} A_1^R(0) + \frac{1}{4} A_0^R(0) = -0.36 \pm 0.03, \\ \bar{A}^I(0) &= \frac{3}{4} A_1^I(0) + \frac{1}{4} A_0^I(0) = 0.72 \pm 0.04, \\ \bar{C}^R(0) &= \frac{3}{4} C_1^R(0) + \frac{1}{4} C_0^R(0) = -0.33 \pm 0.28, \\ \bar{C}^I(0) &= \frac{3}{4} C_1^I(0) + \frac{1}{4} C_0^I(0) = 0.77 \pm 0.20. \end{aligned} \quad (4)$$

for the real and imaginary parts of the amplitudes A and C, averaged over the isotopic states. q is the momentum transferred. The subscripts 1 and zero refer respectively to the isotopic states with T = 1 and  $\tau = 0$  of the two-nucleon system considered. The negative sign of the real part  $\bar{A}^R(0)$

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The nucleon-nucleon...

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of the zero-spin amplitude is due to the effect of the repulsive hard core in nucleon-nucleon interaction. In first Born approximation the spin amplitude  $\bar{C}(0)$  corresponds with the spin-orbit potential of nucleon-nucleus interaction, as is shown by comparing experimentally obtained data on NN-scattering with the phase shift analysis. Between 40 and 660 Mev the energy dependence is described satisfactorily by

$$\begin{aligned} \bar{A}'(0) &= (7,20 \pm 0,20) / E_{u. u.} + (4,68 \pm 0,26) \cdot 10^{-3} E_{u. u.}, \\ \bar{A}^R(0) &= (0,673 \pm 0,03) - (6,88 \pm 0,35) \cdot 10^{-3} E_{u. u.}, \\ \bar{C}'(0) &= (0,188 \pm 0,038) + (3,86 \pm 0,70) \cdot 10^{-3} E_{u. u.}, \\ \bar{C}^R(0) &= (2,45 \pm 0,42) \cdot 10^{-3} E_{u. u.} - (1,97 \pm 0,84) \cdot 10^{-3} E_{u. u.}^2. \end{aligned} \quad (5).$$

The energy  $E_{u. u.}$  in the c.m.s. is given in Mev and the amplitudes in  $10^{-13}$  cm. The amplitude  $\bar{A}^I$  describes mainly the energy dependence of the total cross sections  $\bar{\sigma}$  of nucleon-nucleon interaction (averaged over the isotopic spin). The energy dependence of  $\bar{A}^R(0)$  leads to the relation  $\sigma(0) = (k\sigma_t/4\pi)^2$  for the nucleon-nucleus scattering cross section through Card 3/4

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B125/B102

The nucleon-nucleon...

the angle  $0^\circ$ . It also implies the existence of a pure shadow scattering at  $\sim 400$  Mev in the lab system.  $U^1(0)$  is positive throughout the energy range investigated. Hence up to 660 Mev the real part of the spin-orbit potential  $V_{SR}$  of nucleon-nucleus interaction has the same sign as in the shell model. The parameters of the optical potentials, determined from the nucleon-nucleon scattering, are tabulated. The data obtained on nucleon-nucleon scattering indicate that the real part of  $V_{SR}$  diminishes with increasing energy. According to nucleon-nucleon experiments the imaginary part of  $V_{SR}$  is likely to be non-zero. There are 1 figure and 1 table.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: June 30, 1962

Table

E. MeV	$V_{CR}$ . MeV	$V_{CI}$ . MeV	$V_{SR}$ . MeV	$V_{SI}$ . MeV
40	82±6	89±3	8,6±2,0	-1,14±0,36
90	65±9	57±9	5,0±0,9	-0,85±0,56
147	52±4	46±3	3,8±0,4	-0,65±0,09
210	33±4	46±3	3,1±0,2	-0,58±0,07
310	17±7	43±3	2,2±0,2	-0,56±0,19
660	-33±3	67±4	1,3±0,3	0,55±0,48

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40384

S/020/62/145/006/006/015  
B181/B102

21.2300

AUTHORS: Azhgirey, L. S., Kumekin, Yu. P., Meshcheryakov, M. G.,  
Corresponding Member AS USSR, Nurushev, S. B., Stoletov, G. D.,  
and Huang Tieh-ch'iang

TITLE: Excitation of  $C^{12}$  nuclei by 660-Mev protons

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 6, 1962, 1249-1252

TEXT: A graphite rod, 1 cm thick, was bombarded by protons having  
energies of  $660 \pm 3.0$  Mev and a flux density of about  $3 \cdot 10^9$  p/cm<sup>2</sup> sec.  
The protons scattered through 4.2, 5.2, 7.0, 9.1 and 10.7° were deflected  
magnetically and then conducted through two quadrupole lenses and a  
collimator into an ionization chamber with three scintillation counters.  
The inelastic diffusion scattering cross section for 7° is  $130 \cdot 10^{-27}$  cm<sup>2</sup>/ste-  
rad. The maximum energy distribution of the inelastically scattered  
protons is connected with the energy from the giant photoresonance of the  
 $C^{12}$  nuclei, but is much wider. Interaction between the incident proton and

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Excitation of  $C^{12}$  nuclei...

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the bound nucleons may cause stable collective excitations of the nucleus, i.e. spin, isospin, and spin-isospin waves (ZhETF, 43, no. 8, 1962). Giant photoresonance excitation and excitation of the nucleus by spin waves of the giant resonance energy may set in simultaneously. This is probably what causes the widening of the curve. There are 3 figures.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: May 11, 1962

Card 2/2 2

AZHGIREY, L.S.; KLEPIKOV, N.P.; KUMEKIN, Yu.P.; MESHCHERYAKOV, M.G.;  
NURUSHEV, S.B.; STOLETOV, G.D.; SARANTSEVA, V.R., tekhn.red.

[Phenomenological analysis of pp-interaction at 657 Mev]  
Fenomenologicheskii analiz pp-vzaimodeistviia pri 657 mev.  
Dubna, Ob"edinennyi in-t iadernykh issledovani. Pt.1. 1963. 3 p.  
(MIRA 16:6)

(Protons--Scattering)

S/089/63/014/001/004/013  
B102/B186

AUTHORS:

Meshcheryakov, M. G., Kumenkin, Yu. P., Nurushev, S. B.,  
Stoletov, G. D.

TITLE:

The longitudinally polarized proton beam of the six-meter  
synchrocyclotron

PERIODICAL:

Atomnaya energiya, v. 14, no. 1, 1963, 38-40

TEXT: The program for a full investigation of the pp scattering at the  
Ob'yedinennyi institut yadernykh issledovaniy (Joint Institute of  
Nuclear Research) included also experiments with longitudinally  
polarized proton beams. The experimental arrangement was suggested by  
S. B. Nurushev (Preprint OIYaI P-278, 1959) and is described here in  
detail. On account of the proton spin precession the longitudinally

polarized component is obtained at the angle  $\lambda = \frac{\mu_p - 1}{\sqrt{1 - \beta^2}} \psi$ . The precession  
is due to the anomalous magnetic moment of the proton. The longitudinal  
component of the polarization resulting from this is  $P_{long} = P_1 \sin \lambda$  where

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B102/B186

The longitudinally polarized ...

$P_1$  is the polarization of protons elastically scattered from carbon nuclei,  $\mu_p$  is the proton magnetic moment in terms of nuclear magnetons,  $\beta$  is the proton velocity in c-units, and  $\psi$  is the angle of deflection of the proton beam in the magnetic field. For  $\chi = 90^\circ$  only the longitudinal component exists. By a suitable choice of  $\psi$ , ( $\psi = 30^\circ$  for proton primary energy of 660 Mev) it is possible to have the whole beam longitudinally polarized. A flux of  $2 \cdot 10^6$  p/cm<sup>2</sup> sec could be attained for an energy  $E_{\text{long}} = 612 \pm 9$  Mev. The angle of precession under these conditions is  $\chi = 89 \pm 2.5^\circ$ . The value  $P_1 = 0.43 \pm 0.03$  agrees well with the data published in Zh. eksperim. i teor. fiz., 44, no. 1, 1963. There is 1 figure.

SUBMITTED: October 16, 1962

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24.6600  
AUTHORS:

45369  
S/056/63/044/001/034/067  
B188/B180  
Azhgirey, L. S., Kumekin, Yu. P., Meshcheryakov, M. G.,  
Nurushev, S. R., Stoletov, G. D., Khuan De-tsyun

TITLE:

Elastic small angle scattering of 660-Mev-protons by carbon nuclei

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44,  
no. 1, 1963, 177-191

TEXT: The differential elastic scattering cross section of 660-Mev protons by carbon nuclei was measured in the range ( $1.80 \pm 0 \pm 90$ ) where nuclear and Coulomb scattering interfere. The polarization of the scattered protons was also measured, and the results were used to calculate the scattering amplitudes and the corresponding nuclear potentials of the optical model. Determination of the energy spectra of the scattered protons shows that inelastic competes with elastic scattering at small angles also. Reliable results on elastic scattering cross sections at high proton energies can only be obtained if inelastically scattered protons are carefully separated. Here this is done by deflection in a magnetic field. Fig. 4 gives the differential cross section

Elastic small angle scattering ...

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measured for elastic scattering, and Fig. 5 the polarization of scattered protons as a function of the scattering angle. Hence, the components of scattering amplitudes obtained by the method of least squares are (in

$$10^{-13} \text{ cm}): \quad \epsilon_{NR}(0) = -5.05 \pm 0.45$$

$$\epsilon_{NI}(0) = 15.26 \pm 0.45$$

$$h_{NR}(0) = -10.4 \pm 13.3$$

$$h_{NI}(0) = 37.6 \pm 9.3$$

The corresponding radii of the central and spin-orbital potentials are

$$\sqrt{r_g^2} = (2.48 \pm 0.04) \cdot 10^{-13} \text{ cm},$$

(14 a)

$$\sqrt{r_h^2} = (2.83 \pm 0.16) \cdot 10^{-13} \text{ cm},$$

(14 b).

They are much larger than when determined from electron scattering. The values of the integrated potentials of the optical model according to the Born approximation are:

$$\text{central potential } U = ((-127 \pm 12) + i(257 \pm 14)) \cdot 10^{-39} \text{ MeV} \cdot \text{cm}^3, \quad \left. \begin{array}{l} (22 \text{ a}) \\ (22 \text{ b}) \end{array} \right\}$$

$$\text{spin-orbital potential } W = ((14.8 \pm 3.9) + i(6.3 \pm 5.4)) \cdot 10^{-45} \text{ MeV} \cdot \text{cm}^5.$$

There are 5 figures and 1 table.

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Elastic small angle scattering ...

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ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

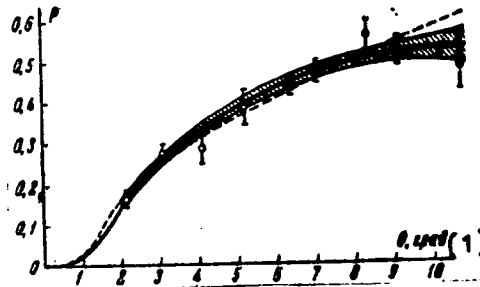
SUBMITTED: June 30, 1962

Fig. 4: Differential scattering cross section for 660 Mev protons by carbon.  $\Theta$  - secondary protons with more than 60 Mev;  $\Theta$  elastically scattered protons. Solid curve: calculated values. Legend: (1)  $d\sigma/d\omega$ ,  $10^{-24} \text{ cm}^2/\text{sterad}$ , (2)  $\Theta$ , degrees.

Fig. 5: Polarization of protons (primary energy 660 Mev) after elastic scattering by carbon nuclei. The P value at  $6.3^\circ$  was taken from ZhETF, 35, 89, 1958; bold, solid curve: calculated values with optimum adaptation; hatched area: range of error. Legend: (1)  $\Theta$ , degrees.

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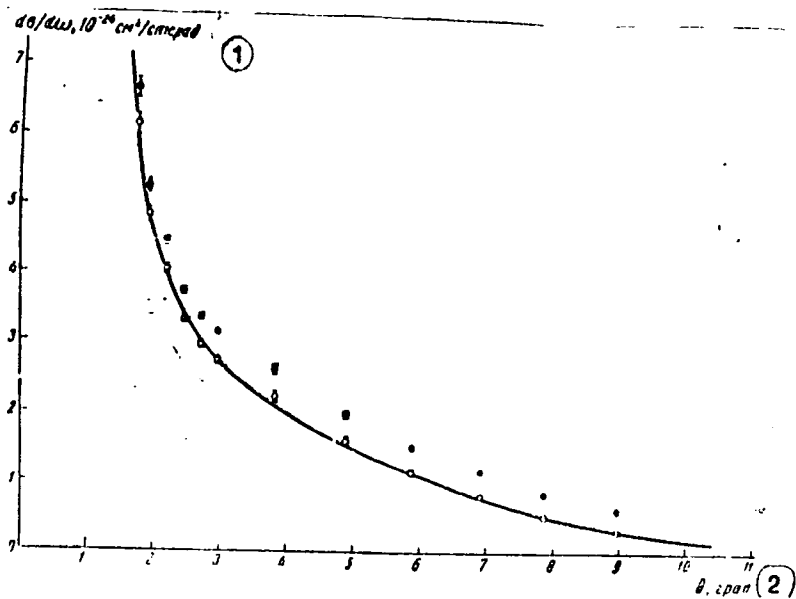
Fig. 5



Elastic small angle scattering ...

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Fig. 4



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S/056/63/044/002/024/065  
B102/B186

AUTHORS: Azhgirey, L. S., Nurushev, S. B.

TITLE: Determination of the parameters of the generalized diffraction model of the nucleus at 660 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 2, 1963, 536-540

TEXT: The generalized diffraction theory of high-energy particle scattering from atomic nuclei developed by K. R. Greider and A. E. Glassgold (Ann. Phys. 10, 100, 1960) is considered. A relation is derived which connects the nuclear scattering amplitudes  $\eta_l = \exp(2i\delta_l)$  (where  $\delta_l$  is the phase shifts) with the parameters of the theory, i.e. the nuclear opacity  $\beta_0$  at small  $l$ , the number  $L$  of the strongly absorbed partial waves, and  $2\Delta$ , the region in which  $\beta(l)$  varies rapidly. The phase  $\psi(l)$  is assumed to be constant for  $\eta(l) < 1$  (inside the nucleus) and  $\psi(l) = 0$  for  $\eta(l) = 1$  (outside the nucleus). These parameters can be determined from the differential cross-section and polarization (cf. ZhETF, Card 1/4

Determination of the parameters ...

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4i, 177, 1963), or, as it is done here, from the relation between nuclear scattering amplitude and phase. When spin-orbital interaction is taken into account,

$$\begin{aligned} \operatorname{Re} \eta_l^+ &= 1 - k \left\{ \frac{1}{\alpha_1} g_{nl}(0) F_l(\alpha_1) - \frac{l}{\alpha_2^2} h_{nr}(0) F_l(\alpha_2) \right\}, \\ \operatorname{Im} \eta_l^+ &= k \left\{ \frac{1}{\alpha_1} g_{nr}(0) F_l(\alpha_1) + \frac{l}{\alpha_2^2} h_{nl}(0) F_l(\alpha_2) \right\}, \\ \operatorname{Re} \eta_l^- &= 1 - k \left\{ \frac{1}{\alpha_1} g_{nl}(0) F_l(\alpha_1) + \frac{l+1}{\alpha_2^2} h_{nr}(0) F_l(\alpha_2) \right\}, \\ \operatorname{Im} \eta_l^- &= k \left\{ \frac{1}{\alpha_1} g_{nr}(0) F_l(\alpha_1) - \frac{l+1}{\alpha_2^2} h_{nl}(0) F_l(\alpha_2) \right\}, \end{aligned} \quad (4)$$

is obtained; without spin-orbital interaction

$$\operatorname{Re} \eta_l = 1 - \frac{k}{\alpha} g_{nl}(0) F_l(\alpha), \quad \operatorname{Im} \eta_l = \frac{k}{\alpha} g_{nr}(0) F_l(\alpha).$$

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Determination of the parameters ...

will hold. The scattering amplitudes for small  $\theta$  are given by

$$g(x) = g(0) e^{\alpha_1(x-1)}, \quad h(x) = h'(x) \sqrt{1-x^2} = h'(0) \sqrt{1-x^2} e^{\alpha_2(x-1)}. \quad (3)$$

where  $g(0)$  and  $h'(0)$  are the amplitudes of forward-scattering,  $x = \cos \theta$ ,  $\alpha_1 = k^2 a_1^2/2$ ,  $\alpha_2 = k^2 a_2^2/2$ ,  $k$  is the wave number of the incident proton (c.m.s.) and  $a_{1,2}$  are the radial formfactors;  $I_{1+1/2}(\alpha)$  is a Bessel function of imaginary argument.

$$\beta_{\pm}(l) = 1 - |\eta_{\pm}^l|^2, \quad \text{tg } \varphi_{\pm}(l) = \text{Im } \eta_{\pm}^l / \text{Re } \eta_{\pm}^l$$

is calculated numerically for the amplitudes

$$g_{nR}(0) = (-4.45 \pm 0.39) \cdot 10^{-13} \text{ cm}, \quad g_{nI}(0) = (13.41 \pm 0.40) \cdot 10^{-13} \text{ cm},$$

$$h_{nR}(0) = (-8 \pm 10) \cdot 10^{-13} \text{ cm}, \quad h_{nI}(0) = (29.1 \pm 7.2) \cdot 10^{-13} \text{ cm}$$

and the radial parameters

$$a_1 = (2.02 \pm 0.03) \cdot 10^{-13} \text{ cm}, \quad a_2 = (2.32 \pm 0.13) \cdot 10^{-13} \text{ cm},$$

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Determination of the parameters ...

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with and without spin-orbital interaction, and the results are compared graphically. It can be seen that spin-orbital interaction leads to a kind of splitting of  $\beta$  into  $\beta^+(1)$  and  $\beta^-(1)$ , referring to different spin orientations of the proton. For  $l \approx 0$  this effect vanishes. There are 2 figures.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: June 20, 1962

Card 4/4

AZHGREY, L.S.; NURUSHEV, S.B.

Real part of the amplitude of elastic proton-proton forward  
scattering. Zhur. eksp. i teor. fiz. 45 no.3:599-603 S '63.  
(MIRA 16:10)

1. Ob'yedinennyy institut yadernykh issledovaniy.  
(Protons—Scattering)

AZHGREY, L.S.; NURUSHEV, S.B.

Determining the parameters of a generalized diffraction  
model of the nucleus at 660 Mev. Zhur. eksp. i teor. fiz.  
44 no.2:536-540 F '63. (MIRA 16:7)

1. Ob'yedinennyy institut yadernykh issledovaniy.

AZHGIREY, L.S.; KLEPIKOV, N.P.; KUMEKIN, Yu.P.; MESHCHERYAKOV, M.G.;  
NURUSHEV, S.B. ; STOLETOV, G.D.

Phenomenological analysis of pp-interaction at 657 Mev. Part 1.  
Zhur. eksp. i teor. fiz. 45 no.4:1174-1182 0 '63. (MIRA 16:11)

ACCESSION NR: AP4018357

S/0120/64/000/001/0025/0030

AUTHOR: Biktimirov, S. Kh.; Kumekin, Yu. P.; Nurushev, S. B.;  
Stoletov, G. D.

TITLE: Outfit for polarization studies with high-energy proton scattering

SOURCE: Pribory\* i tekhnika eksperimenta, no. 1, 1964, 25-30

TOPIC TAGS: proton, proton study, high energy proton, proton scattering,  
polarization study, triple proton scattering

ABSTRACT: An outfit (see Enclosure 1) intended primarily for measuring the triple-scattering parameters in cases where the scattering in hydrogen takes place in a horizontal plane is described. The outfit consists of two rigid trusses 4 and 5 which can rotate around a stationary vertical column 2 being supported by a common base 1. A hydrogen target 3 which serves as a second scatterer is mounted on the column 2. A number of scintillation counters forms two

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ACCESSION NR: AP4018357

telescopes which record the charged particles emitted from the hydrogen target at angles  $\theta_2$  and  $\theta_2'$  in the laboratory coordinate system. The angles can be measured by means of a dial 6. Thus, the outfit can measure the parameters of triple scattering for both above angles. The segments 7 and 8, together with the target analyzers 9 and 10 and with the scintillation counters that record triple-scattered protons, form polarimeters. The segments 7 and 8 can be set either vertically or horizontally. To reduce the random-coincidence background, the protons not scattered by the third targets 9 and 10 are recorded by special scintillation counters П3А and П3А connected for anti-coincidence with other counters. In a typical triple-scattering experiment, the cross-section of a polarized proton beam had a circular shape with a 4-cm diameter. The members 4 and 5 were so adjusted that the protons scattered in the hydrogen to the left and to the right within a  $90^\circ$  angle would be recorded. Target analyzers of 8.5 g/cm were used. With a polarized-beam intensity of  $2 \times 10^7$  protons/sec, the count rate of the triple-scattered protons was about 3 protons/min in each of the four channels. Correlation coincidences were counted at a rate of about 0.1

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**ACCESSION NR: AP4018357**

events/hr. The background in the absence of the third targets was about 16% of the total count rate; the background in the absence of the liquid hydrogen was 1% or less. "In conclusion, we wish to thank M. G. Meshcheryakov for his guidance of the work. We are also thankful to L. V. Budkin, V. L. Nikitin, V. M. Pribor, and G. V. Rykov for their help in building and adjusting the equipment." Orig. art. has: 3 figures and 1 table.

**ASSOCIATION: Ob"yedinenny\*y institut yaderny\*kh issledovaniy (Joint Nuclear Research Institute)**

**SUBMITTED: 23Feb63**

**DATE ACQ: 18Mar64**

**ENCL: 01**

**SUB CODE: PH, NS**

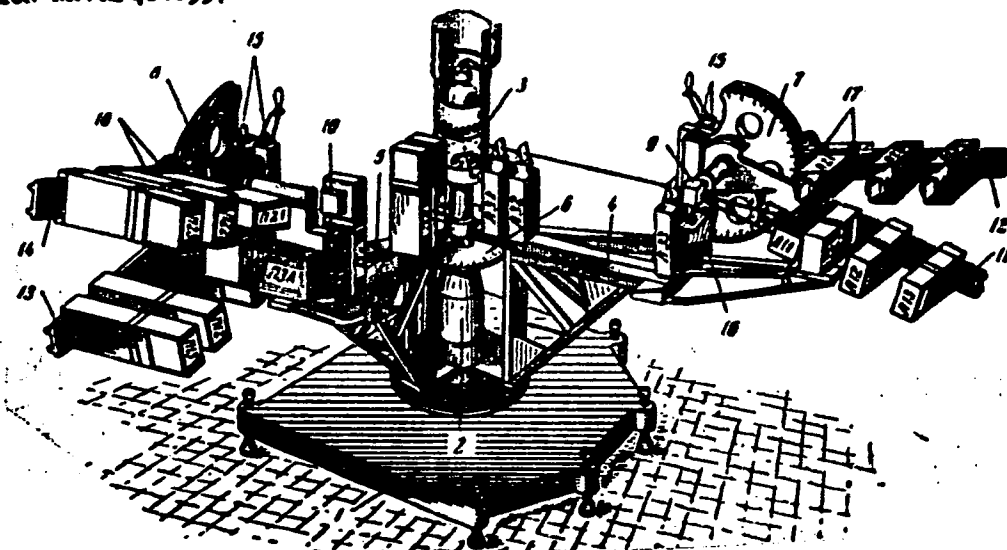
**NO REF SOV: 005**

**OTHER: 002**

Card 3/4

ACCESSION NR: AP4018357

ENCLOSURE: 01



Outfit for polarization studies with high-energy-proton scattering

Card 6/4

ACCESSION NR: AP4012522

S/0056/64/046/001/0050/0058

AUTHORS: Kumekin, Yu. P.; Meshcheryakov, M. G.; Nurushev, S. B.; Stoletov, G. D.

TITLE: Triple scattering of protons at 660 MeV. IV. Angular dependence of the parameter A.

SOURCE: Zhurnal eksper. i teoret. fiz., v. 46, no. 1, 1964, 50-58

TOPIC TAGS: pp interaction, proton triple scattering, triple scattering parameter, angular dependence, phase shift analysis, pp scattering matrix

ABSTRACT: Continuing their investigations of pp interactions near 660 MeV (ZhETF v. 35, 1398, 1958; v. 38, 1451, 1960; v. 43, 1667, 1962), the authors describe the apparatus used in further experiments on proton triple scattering and report the measurements of the triple-scattering parameter A (characterizing the transverse po-

Card 1/1

ACCESSION NR: AP4012522

larization component arising upon scattering of a longitudinally polarized beam) for c.m.s. angles 54, 72, 90, 108, and 126°. The data obtained are used in conjunction with results of other experiments to reconstruct the pp scattering matrix and for comparison with the results of several phase-shift analysis variants. "The authors are grateful to L. S. Azhgirey and S. N. Sokolov for useful discussions." Orig. art. has: 4 figures, 11 formulas, and 3 tables.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy  
(Joint Institute of Nuclear Research)

SUBMITTED: 10Jul63

DATE ACQ: 26Feb64

ENCL: 02

SUB CODE: PH

NO REF SOV: 020

OTHER: 008

Card 2/4

ACCESSION NR: AP4025940

S/0056/64/046/003/1074/1078

AUTHOR: Azhgirey, L. S.; Klepikov, N. P.; Kumekin, Yu. P.; Meshcheryakov, M. G.;  
Nurushev, S. B.; Stoletov, G. D.

TITLE: Further refinement of pp scattering phase shifts at 657 MeV

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 46, no. 3, 1964,  
1074-1078

TOPIC TAGS: pp scattering, scattering phase shift, triple scattering parameter,  
mixing parameter, absorption parameter, phase shift real part, unique phase shift  
set, statistical reliability

ABSTRACT: In view of additional information recently obtained by various investi-  
gators, the results of a phase shift analysis of pp scattering at 657 MeV are re-  
fined by taking into account new data on the angular dependence of the triple-  
scattering parameter A. These experimental data are found to be represented with  
statistical reliability by a set of the real parts of the phase shifts, the mix-  
ing parameters, and the averaged absorption parameters. Arguments are presented  
which indicate that the obtained phase shift set is unique, particularly in view

Card 1/3

ACCESSION NR: AP4025940  
of the smooth transition between the solution and the corresponding curves for  
energies below 345 MeV. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Ob"yedinenny\*y institut yaderny\*kh issledovaniy (Joint Institute  
of Nuclear Research)

SUBMITTED: 30Aug63

DATE ACQ: 16Apr64

ENCL: 01

SUB CODE: PH

NR REF SOV: 006

OTHER: 003

Card 2/3

ACCESSION NR: AP4025940

ENCLOSURE :01

x'	1	2	3	4	5	6
	40,7	35,4	30,5	29,7	28,1	24,4
$\delta (S_0)$	-29,9±3,4	-33,5±4,1	-32,0±5,5	-32,1±6,1	-31,0±6,2	-31,9±11,1
$\delta (P_0)$	-33,5±3,6	-62,8±7,4	-59,7±8,4	-58,3±8,4	-59,9±8,6	-46,0±18,0
$\delta (P_1)$	-38,1±3,4	-30,6±2,7	-34,1±4,3	-35,0±4,4	-34,7±4,3	-35,8±5,7
$\delta (P_2)$	16,6±1,2	16,8±1,4	19,3±3,4	19,0±3,3	19,0±3,3	19,3±3,3
$\delta_1$	-2,3±1,7	-1,2±1,8	-3,6±2,8	-3,8±2,8	-3,9±2,9	-2,8±4,6
$\delta (D_0)$	11,4±2,3	10,0±2,4	8,7±4,4	8,0±6,2	8,5±6,2	7,5±8,0
$\delta (F_0)$	-4,4±1,6	-5,0±1,6	-5,0±1,3	-5,6±1,5	-6,2±1,7	-3,6±2,4
$\delta (F_1)$	0,5±1,3	1,6±1,5	3,0±1,9	2,8±2,6	2,7±2,6	1,6±3,3
$\delta (F_2)$	1,7±0,6	1,4±0,6	1,8±0,7	1,8±0,7	1,8±0,7	2,3±0,9
$\delta_2$	(-2,811)	(-2,811)	-5,4±1,4	-5,6±1,3	-5,4±1,4	-5,7±1,7
$\delta (G_0)$	7,9±0,7	8,2±0,7	6,7±1,4	6,0±2,0	6,3±2,0	5,9±2,1
$\delta (H_0)$	(1,251)	0,1±0,6	0,4±0,7	0,3±0,7	0,6±0,8	0,2±0,9
$\delta (H_1)$	(-2,670)	(-2,670)	(-2,670)	-1,8±1,3	-2,0±1,3	(-2,670)
$\delta (H_2)$	(0,621)	(0,621)	(0,621)	(0,621)	1,0±0,4	(0,621)
$r (P_{0...2})$	0,937±0,022	0,929±0,024	0,936±0,022	0,936±0,022	0,945±0,023	$r (P_0) = 0,79 \pm 0,18$ $r (P_1) = 1,10 \pm 0,31$ $r (P_2) = 0,90 \pm 0,17$
$r (D_0)$	0,672±0,037	0,686±0,036	0,678±0,037	0,675±0,037	0,678±0,038	$r (D_0) = 0,68 \pm 0,06$
$r (F_{0...2})$	0,702±0,022	0,707±0,022	0,705±0,020	0,707±0,021	0,707±0,022	$r (F_0) = 0,69 \pm 0,07$ $r (F_1) = 0,67 \pm 0,11$
$x/\bar{x}$	1,13	1,01	0,90	0,90	0,88	0,80

Real values of barred phase shifts (degrees) and absorption coefficient for different numbers of the varied parameters  
 \*The parentheses indicate the phase shift values calculated in the one-meson approximation

Card 3/3



L 54620-65

EWT(m)/T/EWA(m)-2

ACCESSION NR: AR5007713

S/0367/65/001/001/0122/0129

16  
11  
B

AUTHOR: Azhgirey, L.S.; Kumekln, Yu. P.; Nurushev, S.B.; Solov'yanov, V.L.; Stoletov, G.D.

TITLE: Parameters of triple scattering of protons by carbon nuclei at 660 MeV and a comparison of the results of the analysis of NN and pC-scattering

SOURCE: Yadernaya fizika, v. 1, 1965, 122-129

TOPIC TAGS: triple proton carbon scattering, NN high energy scattering, nucleon nucleus scattering, scattering polarization rotation, NN scattering phase analysis, carbon nucleus, proton scattering

ABSTRACT: Numerous investigators have previously studied (see, e.g., A.K. Kerman, H. McManus, R.M. Thaler, Ann. of Phys., 8, 551, 1959) the quantitative connection between the nucleon-nucleus and nucleon-nucleon scattering and have found, within the framework of the superposition model, a satisfactory agreement up to 310 MeV. In a previous paper (ZhETF, 44, 177, 1963), the authors analyzed the results of measurements of the differential cross section and polarization during elastic scattering through small angles of 660 MeV protons on carbon nuclei and concluded that the spin-orbit potential of

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L 54620-65

ACCESSION NR: AR5007713

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the nucleon-nucleon interaction is complex. Measurements have now been made of the parameters  $A$  and  $R$  describing the rotation of the polarization vector during the elastic scattering of 660 MeV protons by carbon nuclei at  $5^\circ$ . All the available data on pC-scattering at 660 MeV have been used to determine the parameters of the optical potential. Their values at  $5^\circ$  are  $-0.240 \pm 0.091$  and  $0.76 \pm 0.15$ , respectively. The results of the analysis of the data on pC-scattering at 310 MeV and 660 MeV are compared with the results of the phase shift analysis of NN-scattering at the same energies within the framework of the superposition model (Yu. M. Kazarinov, V.S. Kiselev, ZhETF, 46, 797, 1964). Calculations show that none of the phase shift sets for the NN-scattering can be brought into agreement with the scattering on nuclei. In view of the good agreement at 310 MeV, these discrepancies at 660 MeV can hardly be explained by a possible inaccuracy of the theory used during the comparison." The authors thank M. G. Meshcheryakov for his constant interest in the work, Yu. M. Kazarinov and R. M. Ryndin for useful discussions, and A. S. Kuznetsov for help during the tuning of the electronic equipment." Orig. art. has: 6 formulas, 3 figures and 3 tables.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute for Nuclear Studies)

Card 2/3

L 54620-65

ACCESSION NR: AP5007713

SUBMITTED: 01Jul64

ENCL: 00 SUB CODE: NP

NO REF SOV: 011

OTHER: 009

Card 3/3

AZHGIREY, L.S.; KUMKIN, Yu.P.; MESHCHERYAKOV, M.G.; NURUSHEV, S.B.;  
SOLOV'YANOV, V.L.; STOLETOV, G.D.

Measuring the polarization in pp-scattering at 667 Mev.

IAd. fiz. 2 no.5:892-896 N '65.

(MIRA 18:12)

1. Ob"yedinennyy institut yadernykh issledovaniy.

L 26682-66 EWT(m)/T

ACC NR: AP6016898

SOURCE CODE: UR/0367/65/002/005/0892/0896

AUTHOR: Azhgirey, L. S.--Azgirey, L. S.; Kumekin, Yu. P.--Kumekin, Ju. P.;  
Mescher'yakov, M. G.--Mescheryakov, M. G.; Stoletov, G. D.; Murushov, S. G.  
Solov'yanov, V. L.--Solovyvanov, V. L.

21

6

ORG: Joint Institute for Nuclear Research (Ob'yedinenyy institut yadernykh issledovaniy)

TITLE: Measurement of polarization in pp-scattering with 667 mev

SOURCE: Yadernaya fizika, v. 2, no. 5, 1965, 892-896<sup>19</sup>

TOPIC TAGS: proton scattering, proton polarization

ABSTRACT: The polarization in pp-scattering in the interval  $4.4^\circ \leq \theta \leq 48.2^\circ$  is found from an experiment on double scattering of protons by protons; for large angles, by means of renormalization of the measurements with 635 mev. An increase in polarization in pp-scattering appeared with an increase in energy from 602 to 656 mev. Analysis of the angular dependence of the polarization showed that with 667 mev a significant contribution to the polarization is made by the triplet states with angular momentum up to and including  $l = 5$ . The set of phase shifts is described by the values of polarization obtained with other experimental data in the vicinity of 660 mev. Orig. art. has: 2 figures and 1 table. [JPRS]

SUB CODE: 20 / SUBM DATE: 02Jul65 / ORIG REF: 004 / OTH REF: 005  
 SOV REF: 004

Card 1/1 BKG

NURU DINAY, R. A.

5(0)  
AUTHOR:

807/153-2-2-51/51

TITLE:

Khokhlov, V. P., Fomochova, A. M. 807/153-2-2-51/51  
Chemical. All-Union Competition for the Best Student-  
Papers Concerning Chemistry and Chemical Technology for the  
Scientific Year 1957-1958 (Khimika, Vsesoyuznyy konkurs  
na luchshaya studentovskaya rabota po khimii i khimicheskoy  
tehnologii za 1957-1958 uchebnyy god)

PERIODICAL:

Investitsiya v nauku i tekhnologiya. Khimika i khimicheskaya  
tehnologiya, 1959, Vol. 2, No. 2, pp. 303-304 (USSR)  
The Ministry of Higher and Secondary Education of the USSR  
University-education of the USSR (Ministry for  
Education in the title, within the framework of the competition  
studentskiye naukovyye raboty) carried out the competition  
studentskiye naukovyye raboty (Scientific Student  
Works) covering 37 subjects of science, technology,  
arts, and culture. The Lenin State Technical Institute (Leningrad  
Institute of Chemical Technology) was entrusted with the subject 'Chemistry and  
Chemical Technology'. A commission was formed consisting of  
I. P. Prigodnyy, B. A. Alkhalikov, V. P. Fomochova (Chairman),  
Boris P. A. Zolotarev, A. I. Petrov, B. A. Periy-Koshits,  
Boris P. A. Zolotarev, and the following of Chemical Sciences  
Academy of Sciences of the USSR: V. P. Fomochova, V. P. Fomochova,  
A. M. Ginzburg, I. S. Ioffe, E. I. Kryzhanichyov, L. Ya. Kravtsov, A. B. Ginzburg,  
A. S. Mal'kov, I. S. Mal'kov, K. P. Mikhchenko,  
Yu. V. Morozovskiy, with the collaborators, E. M. Kozlov,  
Yu. E. Serednyakov, V. P. Fomochova, A. L. Bolintyn, A. V.  
Maklitskiy, A. V. Stetskiy, and T. A. Yevlakhina with collaborators,  
A. I. Petrov, G. F. Ginzburg, I. A. P'yatkov,  
E. P. Shchegolev, S. F. Mal'kov, Ye. S. Kozlov, P. S. Sokolov,  
E. P. Shchegolev, A. S. Zhurav, A. T. Zumbachskiy, and  
scientific workers.

Card 1/5

Card 2/5

6. A. Mal'chenko, E. E. Zolotarev, G. V. Zhukovskiy, and I. S. Ioffe,  
E. P. Shchegolev, E. P. Shchegolev, and I. S. Ioffe, E. I. Kryzhanichyov,  
and I. S. Ioffe. The paper 'Synthesis and Self-oxidation of the  
Secondary Methyl-benzene' by V. S. Zuykovskiy, Fifth-year  
student of the Voronezhskiy gosudarstvennyy universitet  
(Voronezh State University) was awarded a medal for being  
the best. The second candidate for the medal is the  
Fifth-year student of the Kiyevskiy gosudarstvennyy universitet  
(Kyiv State University) E. P. Lyubov. He submitted  
the paper 'Kinetics of the Ion-stationary Catalytic Deacety-  
lation-process of Hydrogen-peroxide on Platinum'. The third  
medal was awarded to the Fourth-year-student of the  
Chemical-technological institute (Ivanovo  
Chemical-technological Institute): D. V. Babova, A. I.  
Sokolov, E. P. Shchegolev, and E. E. Zolotarev for the  
paper: 'Method of Control of the Synthesis of Zinc-chloride  
From Zinc Oxide of the Electrolysis of Zinc-chloride  
Solutions'. The paper 'Synthesis of Zinc-chloride from  
these three papers, the commission of the Ministry of Higher  
Education and Science, and the Ministry of Chemical Industry  
papers which deserve publication owing to their scientific  
value and originality. The papers are: 'Utilization of Phospho-  
rous Oxides for the Production of Local Construction-  
Building Materials' by the Fourth-year-student of the  
Ivanovo Institute (see above): A. V. Tschilova and A. A.  
Petrov, 'Study of the Influence of the Dispersion of  
Polymers on the Kinetics of the Disintegration of the Molecular  
Weight' by the Third-year-student of the Moskovskiy

Card 3/5

Chemicals. All-Union Competition for the Best Student-Paper Concerning Chemistry and Chemical Technology for the Subsequent Year 1957-1958

technological institute legko promyshlennosti (cosmo technological institute for light industry) V. E. Gorodilov; "Study of the Cathodic Polarization at the Precipitation of Chromium From Sulphide-solutions" by the Fifth-year student of the Uralskiy politekhnicheskiy institut (Ural Polytechnical Institute) V. G. Petrovlevskiy; "Gold Electrodeposition from Aqueous Solutions" by the Fifth-year student of the Moscow Institute of Chemical Technology, Institute of Electrochemistry (Moscow Institute of Chemical Technology) I. I. Kuznetsov; "Some Investigations of the Electrodeposition of Chromium" by the Fourth-year-student of the Leningrad Polytechnical Institute (Voenno-tekhnicheskiy Institut) G. I. Kozlov; "Investigation of the Cathodic and Anodic Processes at Gold-Plating" by the Fifth-year-student of the Leningrad Polytechnical Institute I. A. Kozlov; "Spectral Determination of Polymers and Tungsten in Tri-nitro-polyacids" by the Third-year-student of the Kishinevskiy gosudarstvennyy universitet (Kishinev State University) V. A. Dagev; "Investigation of the Electrodeposition of Chromium from Aqueous Solutions" by the Fourth-year-student of the Leningrad Polytechnical Institute (Moscow Institute of Chemical Technology) L. I. Makina, E. A. Kuridinov, and P. G. Shvartz. The collective, the competition has shown a high standard of the scientific research work in the circles of the students of the Leningrad Polytechnical Institute (Scientific-student associations) of many universities.

Card 4/5

NURUTDINOV, S.

Uzbekistan workers are preparing for the congress. Sov. profsoiuzy  
17 no.16:26-29 Ag '61. (MIRA 14:7)

1. Predsedatel' Uzbekskogo respublikanskogo sovet~~a~~ profsoyuzov.  
(Uzbekistan--Socialist competition) (Uzbekistan--Trade unions)



NURUTDINOV, S.

Let's make all potentialities serve the health of the people.  
Okhr. truda i sots. strakh. 5 no.5:15-16 My '62. (MIRA 15:5)

1. Predsodatel' Uzbekskogo respublikanskogo soveta  
profsoyuzov.

(Uzbekistan--Industrial hygiene)  
(Uzbekistan--Public health)

NURUTDINOV, S.

If everybody fulfills his norm. Sov. profsoiuzy 13 no.17:4-6  
S '62. (MIRA 15:8)

1. Predsedatel' Uzbekskogo soveta professional'nykh soyuzav.  
(Uzbekistan--Efficiency, Industrial) (Uzbekistan--Trade unions)

SEDEL'NIKOV, G.S.; NURYAGDYEV, M.

Formation of mineral deposits in the Kara-Bogaz - Gol.  
Zhur. neorg. khim. 10 no.2:485-488 F '65. (MIRA 18:11)

1. Submitted Apr. 29, 1964.

NURYAGDYEV, S.K., aspirant

Comparative evaluation of the effectiveness of intra-arterial and intravenous blood transfusions in traumatic shock. Zdrav.Turk. 3 no.5:7-12 S-0 '59. (MIRA 13:4)

1. Iz kafedry propedevticheskoy khirurgii (zaveduyushchiy - prof. N.M. Tachmuradov) Turkmenskogo gosudarstvennogo meditsinskogo instituta im. I.V. Stalina.  
(BLOOD--TRANSFUSION) (SHOCK)

NURYAGDYEV, S. K. Cand Med Sci -- "intrasternal Comparative evaluation of the efficacy  
of intravenous blood transfusion in <sup>g</sup> traumatic shock." Ashkhabad, 1961  
(Stalinabad State Med Inst im Abuali Ibn-Sino). (KL, 4-61, 210)

NUR'YAKHMETOVA, A.N.; PSHENNIKOVA, L.F.; YUR'YEVA, V.L.

Sanitary and hygienic evaluation of the water supply of the city of Pechora in Pskov Province. Trudy LSGMI no.68:173-177 '61.

(MIRA 15:11)

1. Kafedra kommunal'noy gigiyeny Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta (zav. kafedroy - prof. A.I.Shtreys).

(PECHORA—WATER SUPPLY)

NURYLYBAYEV, A.N.; PANCHENKO, A.G.; PATRIKEYEV, S.B.

Sodalite-nepheline syenites in the Kubasadyr massif within the  
Dzharkainagach natural boundary (central Kazakhstan). Izv. AN  
Kazakh. SSR. Ser. geol. no.1:28-35 '61. (MIRA 14:6)  
(Akmolinsk Province--Syenite)

NURYEV, O.M., aspirant

Influence of the use of protein hydrolysates on the protein-producing function of the liver. Zdrav. Turk. 4 no.5:17-19 S-0 '60.

(MIRA 13:12)

1. Iz kafedry obshchey khirurgii (zav. - prof. N.M.Tachmuradov)  
Trukmenskogo gosudarstvennogo meditsinskogo instituta imeni I.V.  
Stalina.

(BLOOD PLASMA SUBSTITUTES)

(LIVER)



NURYEV, O.M., aspirant

Change in the amount of blood protein and its fractions following  
the use of protein hydrolysates for surgery patients. Zdrav. Turk.  
4 no.6:326 N-D '60. (MIRA 12:1)

1. Iz kafedry obshchey khirurgii (zav. - prof. N.M.Tachmuradov)  
Turkenskogo gosudarstvennogo meditsinskogo instituta imeni I.V.  
Stalina.

(BLOOD PROTEINS)

(OPERATIONS, SURGICAL)

VZENYAKOVSKAYA, Yu.M.; MURZHANOV, U.S.

Effect of microbial metabolites and gibberellin on some aspects  
of metabolism in corn. Fiziol.rast. 12 no.4:714-720 J1-Ag '65.

(MIRA 18:70)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sel'skokhozyay-  
stvennoy mikrobiologii, Leningrad. Submitted March 2, 1964.

FREINDL, L.; NIEWODNICZANSKI, H.; NURZYNSKI, J.; SLAPA, M.; STRZALKOWSKI, A.

Elastic scattering of 12.8 MeV deuterons on some light nuclei.  
Inst fiz jadr report no.203:1-19 '62.

1. Institut Fizyki Jadrowej, Krakow.

NIEWODNICZANSKI, H.; NURZYNSKI, J.; WILCZYNSKI, J.

Elastic and inelastic scattering of 12.8 MeV deuterons on  $^{27}\text{Al}$  nuclei.  
Inst fiz jadr report no.204:1-6 '62.

1. Instytut Fizyki Jadrowej, Krakow, i Instytut Fizyki, Uniwersytet Jagiellonski, Krakow.

FREINDL, L.; MIEWODNICZANSKI, H.; NURZYNSKI, J.; SLAPA, M.; STRZALKOWSKI, A.

Elastic scattering of 12.8 MeV deuterons on some light nuclei.  
Acta physica Pol 23 no.5:619-628 My '63.

1. Institute of Nuclear Physics, Krakow.

NUS, G.S.

Similarity conditions and modeling of processes of arcless  
electric smelting. Inzh.-fiz.zhur. 5 no.8:71-77 Ag '62.  
(MIRA 15:11)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut tsvetnykh  
metallov, Moskva.  
(Elektrometallurgy)

NUS, G.S.

Investigating temperature and electric fields in ore smelting  
electric furnaces by modeling. Sbor. nauch. trud. Gintsvetmeta  
no.19:504-520 '62. (MIRA 16:7)

(Electric furnaces--Models)  
(Electric fields)  
(Temperature fields)

NUS, G.S.

Conditions of similarity and modeling of processes of arcless  
electric melting. Inzh.-fiz.zhur. 6 no.2:122-126 F '63.  
(MIRA 16:1)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut tsvetnykh  
metallov, Moskva.

(Electrometallurgy)



NUSBAUM, D.G.

Hygienic evaluation of individual components in the schedule  
for pupils. Gig.i san.no.2:38-42 P '54. (MLRA 7:2)

1. Iz Nauchno-issledovatel'skogo sanitarnogo instituta im.  
Krismana. (Education of children) (Fatigue, Mental)

MUSEUM, D. G.

BELOSTOTSKAYA, Ye.M.; NUSBAUM, D.G.

Physiological variations in students during examinations. *Fig. 1*  
san. no.7:31-35 JI '54. (MLBA 7:8)

1. Is Nauchno-issledovatel'skogo sanitarnogo instituta imeni Erismana.  
(SCHOOLS,  
\*physiol. eff. of examination stress on students)

NUSBAUM, D. G.

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