MOLCHANOV, Ye.V.; SHVARTS, Z.S.; PETROVA, G.P.; CHEPNAVINA, L.F.; TARASENKO, T.I.

Sixtieth birthday of Professor Aleksandr Prokhorovich Parfenov. Vop. kur., fiziotor. i lech. fiz. kul't. 26 no.6:563-564 N-D '61. (MIRA 15:1)

(PARFENOV, ALEKSANDR PROKHOROVICH, 190?-)

CHERNAVINA, L.S., agronom-entomolog

Observing the shield bug Eurygaster integriceps. Zashch. rast. ot vred. i bol. 4 no.5:42 S-O '59. (MIRA 16:1)

1. Mikhaylovskiy nablyudatel'nyy punkt, Stalingradskaya obl. (Eurygasters—Extermination)

AFANAS'YEV, B.N.; CHERNAVINA, M.S.

Synthesis of dihexylfluorescein. Zhur.ob.khim. 26 no.3:783-784 Mr '56. (MLRA 9:8)

1. Voronezhskiy gosudarstvennyy universitet.
(Fluorescein)

PROSKURYAKOVA, G.F.; SHVEYKINA, R.V.; CHERNAVINA, M.S.

Comparative characteristics of some most sensitive methods for determining iodine in water. Izv.vys.ucheb.zav.;khim.i khim.tekh. 6 no.5:729-734 '63. (MIRA 16:12)

1. Sverdlovskiy sel'skokhozyaystvennyy institut, kafedra khimii.

CHERNAVINA, N. M.

4 1-4E3d

389. Murexide as an indicator in the complexometric determination of copper. E. M. Yakimets and N. M. Chernavina. *Trudy Ural'sk. Politekh. Inst.* 1956, 57, 108–15; *Ref. Zhur., Khim.*, 1957, Abstr. No. 84,653.—Copper forms a complex ion with murexide (I) over a wide range of pH (3 to 12). The sensitivity increases with increase of pH, and in ammoniacal buffer soln. the sensitivity of I to Cu^{2+} depends on the quantity of buffer added. The sensitivity of the reaction decreases with increase in the concn. of NH_3 in the sample. Copper may be titrated with EDTA (disodium salt) in the presence of I at various pH values. The end-point is clear at pH 4 in the range 1 to 600 mg of Cu per ml, and at pH 7·5 in the range 0·1 to 700 mg of Cu per ml. Interference is caused by Zn^{2+}, Ni^{2+}, Ca^{2+}, Mg^{2+}, Pb^{2+}, Cd^{2+} and Fe^{3+} at pH 10, by Fe^{3+}, Cd^{2+}, Pb^{2+}, Ni^{2+}, Zn^{2+} and Mn^{2+} at pH 7·5, and by Fe^{3+}, Cd^{2+} and Pb^{2+} at pH 4. The strongly interfering ions Ni^{2+} and Mn^{2+} do not form complexes with EDTA (disodium salt) at pH 4, nor do Ca^{2+} and Mg^{2+} at pH 4 and 7·5. C. D. KOPKIN

N5 1/1

CHERKAVKIN, N.N.

ANDROS, I.P., inzh.; ASSONOV, V.A., kand. tekhn. nauk.; BERNSHTEYN, S.A., inzh.; BOKIY, B.V., prof.; BROVMAN, Ya.V., inzh. BONDARENKO, A.P., inzh.; BUCHNEV, V.K., kand. tekhn. nauk; VERESKUNOV, G.P., kand. tekhn. nauk; VOLKOV, A.F., inzh.; GELESKUL, M.N., kand. tekhn. nauk; GORODNICHEV, V.M., inzh.; DEMENT'YEV, A.Ya., inzh.; DOKUCHAYEV, M.M., inzh.; DUBNOV, L.V., kand. tekhn. nauk; YEFIFANTSEV, Yu.K., kand. tekhn. nauk.; YERASHKO, I.S., inzh.; ZHEDANOV, S.A., kand. tekhn. nauk; ZIL'BERBROD, A.F., inzh.; ZINCHENKO, E.M., inzh.; ZORI, A.S., inzh.; KAPLAN, L.B., inzh.; KATSAUROV, I.N., doktor; KITAYSKIY, E.V., inzh.; KRAVTSOV, Ye.P., inzh.; KRIVOROG, S.A., inzh.; KRINITSKIY, L.M., kand. tekhn. nauk; LITVIN, A.Z., inzh.; MALEVICH, N.A., kand. tekhn. nauk; MAN'KOVSKIY, G.I., doktor tekhn. nauk; MATKOVSKIY, A.L., inzh.; MINDELI, E.O., kand. tekhn. nauk; NAZAROV, P.P., kand. tekhn. nauk; NASONOV, I.D., kand. tekhn. nauk; NEYYENBURG, V.Ye., kand. tekhn. nauk; POKROVSKIY, G.I., prof., doktor tekhn. nauk; PROYAVKIN, E.T., kand. tekhn. nauk; ROZENBAUM, inzh.; ROSSI, B.D., kand. tekhn. nauk; SEMEVSKIY, V.N., doktor tekhn. nauk; SKIRGELLO, O.B., inzh.; SUKHUT, A.A., inzh.; SUKHANOV, A.F., prof., doktor tekhn. nauk; TARANOV, P.Ya., kand. tekhn. nauk; TOKAROVSKIY, D.I., inzh.; TRUPAK, N.G., prof., doktor tekhn. nauk; FEDOROV, S.A., prof., doktor tekhn. nauk; FEDYUKIN, V.A., inzh.; KHOKHLOVKIN, D.M., inzh.; KHRABROV, N.I., kand. tekhn. nauk; CHEKAREV, V.A., inzh.; CHERKAVKIN, N.N., inzh.; SHREYBER, B.P., kand. tekhn. nauk; EPOV, B.A., kand. tekhn. nauk; YAKUSHIN, N.P., kand. tekhn. nauk; YANCHUR, A.M., inzh.; YAKHONTOV, A.D., inzh.; POKROVSKIY, N.M., otvetstvennyy red.; KAPLUN, Ya.G. [deceased], red.; MONIN, G.I., red.; SAVITSKIY, V.T.,

(Continued on next card)

ANDROS, I.P.---(continued) Card 2.
red.; SANOVICH, P.O., red.; VOLOVICH, M.Z., inzh., red.; GORITSKIY, A.V., inzh., red.; POLUYANOV, V.A., inzh., red.; PALEYEV, M.I., inzh., red.; CHECHKOV, L.V., red. izd-va; PROZOROVSKAYA, V.L., tekhn. red.; NADEINSKAYA, A.A., tekhn. red.

[Mining; an encyclopaedic handbook] Gornoe delo; entsiklopedicheskii spravochnik. Glav. red. A.M. Terpigorev. Moskva, Gos. nauchno-tekhnicheskoe izd-vo lit-ry po ugol'noi promyshl. Vol.4 [Mining and timbering] Provedenie i kreplenie gornykh vyrabotok. Red-kollegiia toma: N.M.Pokrovskii... 1958. 464 p. (MIRA 11:7)

(Mine timbering) (Mining engineering)

KOGAN, A.M., inzh.; CHERNAVKIN, N.N., inzh.; NALIMOV, L.V., inzh.; NURMUKHAMEDOVA, V.F., red.izd-va; KOROVENKOVA, Z.A., tekhn.red.; KOMBRAT'YEVA, M.A., tekhn.red.

[Instructions on conducting inspections, making adjustments and testing mine pumping systems] Rukovodiashchie materialy po provedeniiu revizii, naladok i ispytanii shakhtnykh vodootlivnykh ustanovok. Moskva, Ugletekhizdat, 1959. 157 p. (MIRA 13:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy i proyektno-tekhnologicheskii institut ugol'nogo mashinostroyeniya.
(Mine pumps)

CHERNAVKIN, N.N., inzh.; KOGAN, A.M., inzh.; MAKEYEV, A.V., inzh.; ROMANOV, V.A., otv.red.; VOLKOVA, V.A., red.izd-va; KOROVEN-KOVA, Z.A., tekhn.red.; KONDRAT'YEVA, M.A., tekhn.red.

[Instructions for the inspection, adjustment and testing of mine compressor systems] Rukovodiashchie materialy po provedeniiu revizii, naladok i ispytanii shakhtnykh kompressornykh ustanovok. Moskva, Ugletekhizdat, 1959. 283 p. (MIRA 12:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy i proyektno-tekhnologicheskiy institut ugol'nogo mashinostoyeniya.
(Mining machinery--Handbooks, manuals, etc.)
(Air compressors)

CHERMAKIN, N.N.

2.6

PHASE I BOOK EXPLOITATION SOV/5473

Gornoye delo; entsiklopedicheskiy spravochnik. t. 8: Statsionarnoye elektromekhanicheskoye oborudovaniye. Elektrosnabzheniye shakht (Mining Industry; an Encyclopedic Handbook. v. 8: Stationary Electro-mechanical Equipment. Electric Power Supply to Mines) Moscow, Gosgortekhizdat, 1960. 784 p. Errata slip inserted. 18,500 copies printed.

Chief Ed.: A. M. Terpigorev (Deceased); Members of the Editorial Board: A. I. Baranov, F. A. Barabanov (Deceased), A. A. Boyko, V. K. Buchnev, A. N. Zaytsev; Deputy Chief Eds.: I. K. Kit and N. V. Mel'nikov; I. N. Plaksin, N. M. Pokrovskiy, A. A. Skochinskiy (Deceased), A. O. Spivakovskiy, I. K. Stanchenko, A. P. Sudoplatov, A. V. Topchiyev, S. V. Troyanskiy, A. K. Kharchenko, L. D. Shevyakov and M. A. Shchedrin; Editorial Board for this volume: Resp. Ed.: F. A. Barabanov; Deputy Resp. Ed.: Z. M. Melamed; N. A. Arzamasov, G. M. Yelanchik, V. K. Yefremov, B. I. Zasadych, I. M. Zhumakhov, N. A. Letov, P. P. Nesterov, I. A. Rabinovich, K. I. Skorkin, and V. A. Sumchenko; Authors: G. A.

Card 1/16

SOV/5473

Babak, Candidate of Technical Sciences, V. D. Belyy, Professor, Doctor of Technical Sciences, K. S. Borisenko, Candidate of Technical Sciences, A. G. Borumenskiy, Candidate of Technical Sciences, I. V. Brusilovskiy, Candidate of Technical Sciences, A. R. Bushel', Candidate of Technical Sciences, V. P. Bukhgol'ts, Engineer, M. N. Vasilevskiy, Candidate of Technical Sciences, A. N. Vas'kovskiy, Engineer, B. N. Vlasenko, Engineer, I. Ya. Gershikov, Engineer, V. G. Geyer, Professor, Doctor of Technical Sciences, A. D. Dimashko, Engineer, V. S. Dulin, Candidate of Technical Sciences, I. L. Lokshin, Engineer, B. M. Melamed, Engineer, Yu. A. Mikhayev, Engineer, V. P. Morozov, Engineer, M. I. Mushkatin, Engineer, V. S. Pak, Academician, I. M. Perskaya, Engineer, N. M. Rusanov, Candidate of Technical Sciences, G. P. Savel'yev, Candidate of Technical Sciences, Ya. M. Smorodinskiy, Candidate of Technical Sciences, K. A. Ushakov, Honored Scientist and Technologist, Professor, Doctor of Technical Sciences, B. M. Furmanov, Engineer, and N. N. Chernavkin, Engineer. Eds.: Ya. M. Drozdov, Engineer, B. I. Zasadych,

Card 2/16

Candidate of Technical Sciences, N. S. Karpyshev, Candidate of Technical Sciences, N. A. Letov, Candidate of Technical Sciences, Z. M. Melamed, Candidate of Technical Sciences, Yu. A. Mikheyev, Engineer, V. P. Morozov, Engineer, V. I. Polikovskiy, Professor, Doctor of Technical Sciences, I. A. Rabinovich, Engineer, M. S. Rabinovich, Candidate of Technical Sciences, I. A. Raskin, Engineer, V. S. Tulin, Engineer, S. Ye. Unigovskiy, Engineer, K. A. Ushakov, Honored Scientist and Technologist, Professor, Doctor of Technical Sciences, M. M. Shemakhanov, Candidate of Technical Sciences, P. F. Shishkov, Candidate of Technical Sciences, and V. B. Yablonovskiy, Engineer; Eds. of Publishing House: N. A. Arzamasov and T. I. Rybal'nik; Tech. Ed.: V. L. Prozorovskaya and M. A. Kondrat'yeva.

PURPOSE: This handbook is intended for mining and mechanical engineers as well as for other skilled personnel of the mining industry concerned with the handling and operation of various installations and equipment used in mines.

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308430003-0"

Mining Industry (Cont.) SOV/5473

COVERAGE: Volume VIII of the mining handbook contains detailed information on mine hoisting installations, machines and equipment, mine ventilation units, duct systems, dewatering facilities, various types of pumps, pump meters, pumping stations, and the automatic remote control of these units. The handbook also describes and explains the operation of the air compression units and compressors. Heat-generating and heat-supply equipment of mines is described, as are the electric power supply systems and other electrical equipment such as transformers, power distribution systems, and grounding devices. Telephone communication and signaling systems used in mines are also treated. No personalities are mentioned. Each part of the handbook is accompanied by references, mostly Soviet.

TABLE OF CONTENTS [Abridged]:

CHERNAVSKAYA, A.F.

29304. Tomograficheskiye dannyye v izuchenii patologicheskikh izmeneniy kostno--sustavnoy sistemy. Voprosy onkologii i rentgenologii, No. 1-2, 1948, s. 286-94.

SO: Izvestiya Ak. Nauk Latviyskoy SSR, No. 9, Sept., 1955

[illegible] YA, [illegible]

[illegible], [illegible] -- "Effect of the Intensity of Light and the Nitrogen Supply on Photosynthesis and the Accumulation of Dry Substance in the Early Phases of Plant Growth." [illegible] Dec 52, Inst of Plant Physiology imeni K. A. Timiryazev, Acad Sci USSR. (Dissertation for the Degree of Candidate in Biological Sciences).

So: Vechernaya Moskva January-December 1952

CHERNAVSKAYA, N.M., CHERNAVSKIY, D.S.

Autofluctuations during the process of photosynthesis [with summary in English]. Biofizika 3 no.4:521-523 '58 (MIRA 11:8)

1. Fizicheskiy institut im. P.N. Lebedeva AN SSSR, Moskva.
(PHOTOSYNTHESIS)

17(3)
AUTHORS: Zubkova, S. R., Chernavskaya, N. M.

SOV/20-126-5-57/69

TITLE: Variation of the Choline-esterase Activity in Tissues of Rats at Different Points of Time After Irradiation (Izmeneniye aktivnosti kholinesterazy v tkanyakh krys v raznyye sroki posle oblucheniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 5, pp 1114 - 1117 (USSR)

ABSTRACT: From publication references it can be assumed that in the variation process of permeability of the hematoencephalic and other histohematic barriers an important part is played by the system acetylcholine-cholineesterase (Refs 1-5). As the authors showed (Ref 6), the X-rays cause such variations soon after irradiation. The formation processes of early damages in the irradiated organism are connected with the participation of the nervous mechanisms (Ref 7). The subject mentioned in the title has been insufficiently described in publications. A survey of publications (Refs 8-12) of the most recent papers is given, which shows that the variation mentioned in the title was principally investigated late after irradiation. The object of the present

Card 1/3

paper is the investigation of the said variations in the blood serum, brain and liver, as soon as possible after irradiation. Besides, this should be done at points of time, at which, according to the investigations by the authors (Ref 6), distinct variations in the permeability of the hematoencephalic barrier occurred. White rats were irradiated with a dosis of 1000 r at an intensity of 34 r/min. The results obtained are shown in table 1. An analysis of these data (Fig 1) shows that the choline-esterase acitivity changes at all points of time investigated both in the serum and in the tissues. On the basis of these results, the authors arrive at the following conclusions: 1) In the irradiation of rats with one lethal dosis (1000 r), the said activity falls, after 5 and 45 minutes, in all tissues as compared with normal conditions (by 15.9% in the serum, by 2o.6% in the brain, and by 18.4% in the liver). 2) After 72 hours, the above activity changes in some tissues in a different way: it decreases further in the liver, increases in the brain, without attaining the standard. In the serum, it increases rapidly. There are 1 figure, 1 table, and 2o references, 6 of which are Soviet.

Variation of the Choline-esterase Activity in Tissues of Rats at Different Points of Time After Irradiation

SOV/20-126-5-57/69

ASSOCIATION: Institut biologicheskoy fiziki Akademii nauk SSSR (Institute of Biological Physics of the Academy of Sciences, USSR)

PRESENTED: March 4, 1959, by L. S. Shtern, Academician

SUBMITTED: March 4, 1959

Card 3/3

80267

17 1156 5.4500 (1241, 1018) S/053/60/072/003/004/004
B019/B056

AUTHORS: Chernavskaya, N. M., Chernavskiy, D. S.

TITLE: Periodic Effects in Photosynthesis

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol. 72, No. 3, pp. 627 - 652

TEXT: This is a review of the most important papers on periodicity in photosynthesis. In the first part, experimental and theoretical data are given. The scheme of unknown reactions of photosynthesis, introduced by Calvin, as well as the chemical reactions are discussed. Experimental results concerning the periodic changes of the rate of photosynthesis are then discussed in detail, and finally the hypothesis of the oscillations of photosynthesis is dealt with. Next, the equations for the kinetics of photosynthesis are discussed. An interpretation of experimental results and theoretical considerations shows that the oscillation period of photosynthesis amounts to several hours. The adaptability of a plant consists in the resonance between the inner rhythm and the outer action. The thriving of a short-day plant on long days and vice versa is

Card 1/2

Periodic Effects in Photosynthesis

86267
S/053/60/072/003/004/004
B019/B056

connected herewith. From the actually existing correlation between photosynthesis and the content of triose and hexose phosphates, conclusions are drawn as to a direct relationship between these phenomena. An increase of the hexose or triose content, when there is a maximum concentration of the other component, leads to an increase of the oscillation amplitude of photosynthesis. If the concentration of one component increases at an instant when the other has a minimum, there follows a decrease of the oscillation amplitude of photosynthesis. The theory that the photoperiodicity is of the same nature as the half-day depression of photosynthesis must yet be proved. Ye. Rabinovich, A. A. Nichiporovich, S. P. Kostychev, and Ye. F. Votchal are mentioned. There are 9 figures and 55 references: 30 Soviet, 11 German, 5 US, 1 Dutch, 1 British, and 1 Danish.

Card 2/2

CHERNAVSKAYA, N.M.; CHERNAVSKIY, [illegible]

Periodic phenomena in [illegible] Usp. fiz. nauk 77 no.3: 627-652 N '60. (MIRA 16:8)

[illegible]thesis)

ACCESSION NR: AT3011781

brain extracts is more intensely reduced, but the acetylcholine content increases. Suboccipital administration of chlorpromazine in normal rats produces stronger sympathomimetic action in the brain extracts and increases the acetylcholine content of the brain hemispheres. Suboccipital administration of chlorpromazine before irradiation does not strengthen the sympathomimetic action of the extracts, but does increase the acetylcholine content of the brain, especially on the third day. Acetylcholine increases excitability of the sympathetic centers by acting directly on the vegetative centers of irradiated animals, but whether this action protects the organism from radiation damage requires further study. Orig. art. has: 8 tables.

ASSOCIATION: Laboratoriya fiziologii. Moscow. AN SSSR
(Physiology Laboratory. AN SSSR)

SUBMITTED: 00 DATE ACQ: 07Oct63 ENCL: 00

SUB CODE: AM NO REF SOV: 040 OTHER: 020

Card 2/2

CHERNAVSKAYA, N.M.

Photosynthesis under various conditions of nitrogen nutrition and intensity of light. Fiziol. rast. 10 no.1:3-10 Ja-F '63.
(MIRA 16:5)

1. K.A.Timiriazev Institute of Plant Physiology, U.S.S.R. Academy of Sciences, Moscow.
(Photosynthesis) (Plants, Effect of nitrogen on)

ROSIN, Ya.A., CHERNAVSKAYA, N.M.

Effect of aminazine on the change in adrenaline content in brain. Dokl. AN SSSR 150 no.6:1401-1403 Je '63. (MIRA 16:8)

1. Institut biologicheskoy fiziki AN SSSR. Predstavleno akademikom L.S.Shtern.

(PHENOTHIAZINE) (ADRENALINE)

80078

16.5100 16.5000 S/020/60/131/06/012/071

AUTHOR: Chernavskiy, A. V.

TITLE: Two-fold Continuous Division of a Sphere

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 131, No. 6, pp. 1272-1275

TEXT: The theorem proved by Harrold (Ref.3) for n = 1 and by Roberts (Ref.4) for n = 2 : in every continuous subdivision of the sphere Q^n into pairs of points there exists a division element degenerating into one point, is proved by the author for the case $n \leqq 3$.
The author thanks Professor L.V. Keldysh for the interest in the paper.
There are 4 non-Soviet references: 1 English and 3 American.

ASSOCIATION: Matematicheskiy institut imeni V. A. Steklova AN SSSR (Mathematical Institute imeni V.A. Steklov AS USSR)

PRESENTED: December 25, 1959, by P. S. Aleksandrov, Academician

SUBMITTED: November 24, 1959

Card 1/1

CHERNAVSKIY, A.V.

Arrangement of (n - 1)-dimensional spheres in an n-dimensional sphere. Dokl. AN SSSR 140 no.3:540-542 S '61. (MIRA 14:9)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Predstavleno akademikom P.S.Aleksandrovym.

(Topology)

CHERNAVSKIY, A.V.

Note on a theorem of Schneider concerning the existence of an A-set which is not a B-set in perfectly normal bicompact sets. Vest.Mosk.un.Ser.1:Mat., mekh. 17 no.2:20 Mr-Ap '62. (MIRA 15:6)

1. Kafedra vysshey geometrii i topologii Moskovskogo universiteta. (Topology)

CHERNAVSKIY, A.V.

Impossibility of strict two fold continuous division of a homologous cube. Dokl.AN SSSR 144 no.2:286-289 My '62. (MIRA 15:5)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Predstavleno akademikom P.S.Aleksandrovym.

(Topology)

CHERNAVSKIY, A.V.

Open manifold mappings of finite multiplicity. Dokl. AN SSSR 151 no.1:69-72 Jl '63. (MIRA 16:9)

1. Matematicheskiy institut im. V.A.Steklova AN SSSR. Predstavleno akademikom P.S.Aleksandrovym.

(Algebraic topology)

CHERNAVSKIY, A.V.

Isotopies in Euclidean spaces. Usp. mat. nauk 19 no.6:71-73
N-D '64 (MIRA 18:2)

CHERNAVSKIY, A.V.

Isotopy of elements and spheres in n-dimensional space at $k > 2/3n - 1$. Dokl. AN SSSR 158 no.1:62-65 S-O '64
(MIRA 17:8)

1. Matematicheskiy institut imeni V.A. Steklova AN SSSR.
Predstavleno akademikom P.S. Aleksandrovym.

CHERNAVSKIY, A.V. (Moskva)

Supplement to the article "On open mappings of manifolds of finite multiplicity." Mat. sbor. 66 no.3:471-472 Mr '65.
(MIRA 18:5)

CHERNAVSKIY, A.V. (Moskva)

Homeomorphisms of Euclidean space and the topological insertion of polyhedra in Euclidean spaces. Part 1. Mat.sbor. 68 no.4:581-613 D '65. (MIRA 18:12)

1. Submitted November 18, 1964.

CHERNAVSKIY, D.S.
PETROV, N. A., DOCENT; CHERNAVSKIY, D. S.

Sublimation (Chemistry)

Sublimating solid substances. Nauch. trudy. Mosk. gor. inst. No. 8 1950

9. Monthly List of Russian Accessions, Library of Congress, October 1952 Uncl.

USSR/Nuclear Physics - Generation of Particles 11 Dec 51

"Concerning the Generation of Particles During Collision of Fast Nucleons," Ye. L. Feynberg, D. S. Chernavskiy, Phys Inst imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXXI, No 5, pp 795-798

The interaction of fast nucleons and mesons was considered in a number of works which employed, because of the absence of a theory of elementary particles, various semiquant considerations. Special interest is shown in Fermi's work (Progress

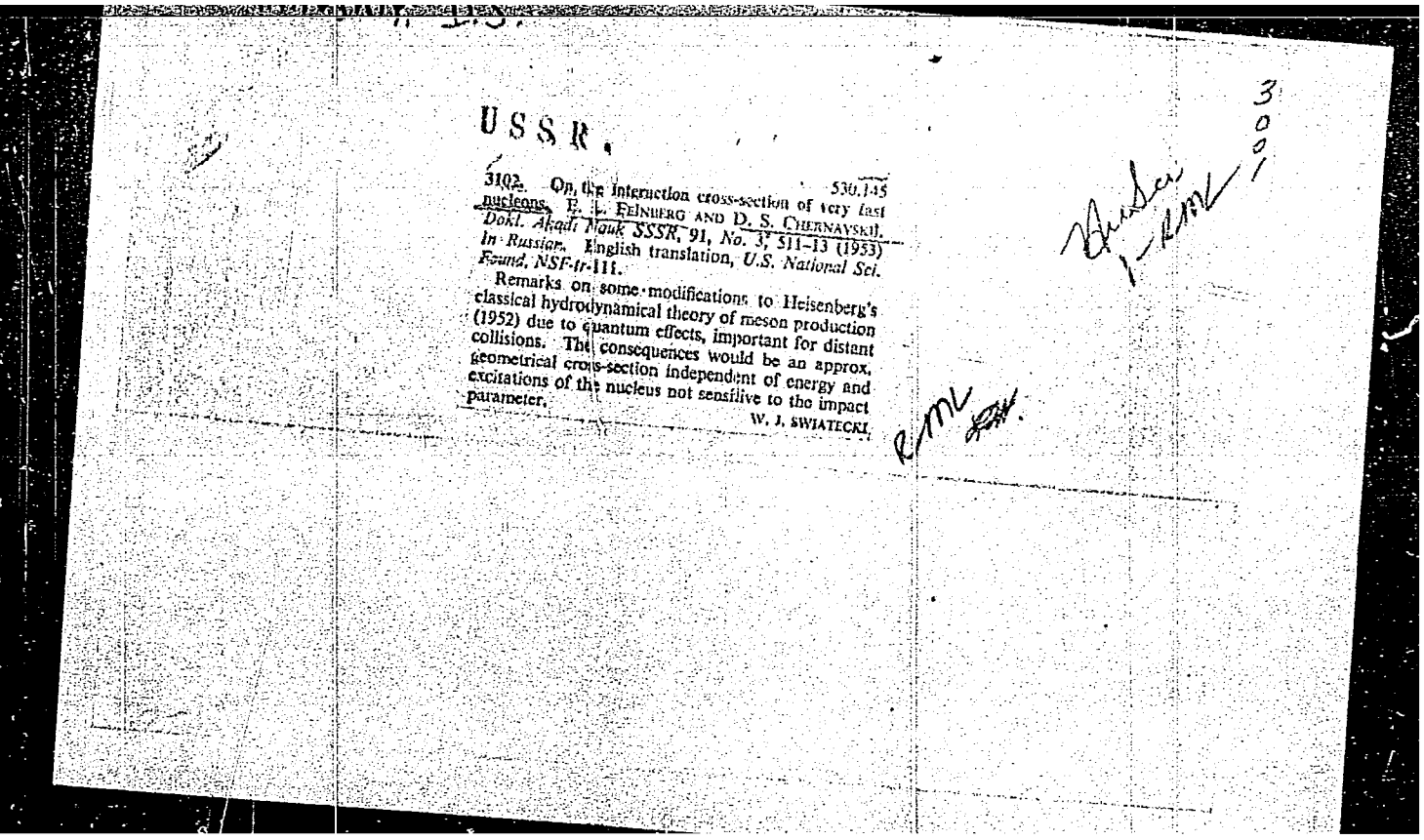
210T78

USSR/Nuclear Physics - Generation of Particles (Contd) 11 Dec 51

of Theoretical Physics, 5, No 4, p 570, 1950), certain points of which however seem to be questionable. The authors attempt to modify Fermi's scheme so that these points may be eliminated. Submitted by Acad D. V. Skobel'tsyn 22 Oct 51.

CHERNAVSKIY, D. S.

210T78



USSR

3102. On the interaction cross-section of very fast nucleons. E. L. FEINBERG AND D. S. CHERNAVSKII. *Dokl. Akad. Nauk SSSR*, 91, No. 3, 511–13 (1953) *In Russian.* English translation, *U.S. National Sci. Found. NSF-tr-111.*

Remarks on some modifications to Heisenberg's classical hydrodynamical theory of meson production (1952) due to quantum effects, important for distant collisions. The consequences would be an approx. geometrical cross-section independent of energy and excitations of the nucleus not sensitive to the impact parameter.

W. J. SWIATECKI.

CHERNAVSKIY, D. S.

USSR/Physics

Card 1/2

Authors : Rozental', I. L.; and Chernavskiy, D. S.

Title : Theoretical and experimental data on the formation of particles at high energies.

Periodical : Usp. Fiz. Nauk, 52, Ed. 2. 185 - 238, 1954

Abstract : Report offers a review of experimental and theoretical data regarding the origination of particles at greater and especially ultra-greater energies ($> 10^{10}$ ev) ($> 10^{12}$ ev and up to 10^{18} ev). The available data indicate the existence of many processes at high energies. The Heisenberg, Oppenheimer and associates and Fukuda theories contradict the experimental data regarding reaction at ultra-high energies. The Fermi and Landau theories show a uniform dependence of the multiplicity upon the energy of the primary particle but their angular and energy distributions of secondary particles are different. The angular distribution of particles, as presented by the Fermi theory, should not be conciliated with the spatial distribution of particles in wide atmospheric showers and the data obtained by means of photo plates.

Usp. Fiz. Nauk, 52, Ed. 2., 185 - 238, 1954 (additional card)

Card 2/2

Abstract : The Landau theory conforms, within the limits of its applicability, with all experimental data available at the present time. Fifty-seven references; 17 USSR since 1940; 40 German and English since 1936. Tables, graphs.

Institution : .....

Submitted : .....

CHERNAVSKIY, D. S.

"Study of the Interaction of a Neutron and Proton at Low Energies by the Variational Method." Cand Phys-Math Sci, Physics Inst imeni P. N. Lebedev, Acad Sci USSR, Moscow, 1955. (KL, No 12, Mar 55)

SO: Sum. No. 670, 29 Sep 55--Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

CHERNAVSKIY, D.S.

Analysis of high-energy "stars". Izv.AN SSSR Ser.fiz.19 no.6: 663 N-D '55. (MLRA 9:4)

1.Fizicheskiy institut imeni P.N.Lebedeva Akademii nauk SSSR.
(Cosmic rays) (Nuclear physics)

PODGORETSKIY, M.I.; ROZENTAL', I.L.; CHERNAVSKIY, D.S.

Fluctuations in high-energy particle interactions. Izv.AN SSSR. Ser.fiz.19 no.6:663 N-D '55. (MLRA 9:4)

1.Fizicheskiy institut imeni P.N.Lebedeva Akademii nauk SSSR.
(Cosmic rays) (Nuclear physics)

CHERNAVSKIY, D. S.

USSR/Nuclear Physics - Fluctuations during collisions FD-2965

Card 1/2 Pub. 146 - 6/28

Author : Podgoretskiy, M. I.; Rozental', I. L.; Chernavskiy, D. S.

Title : Fluctuations during collision of particles of high energy

Periodical : Zhur. eksp. i teor. fiz., 29, September 1955, 296-303

Abstract : On the basis of the representations of the Fermi-Landau theory the authors calculate the fluctuations in the energy and number of particles during collision of nuclear-active particles of high energy. They conclude that the fluctuations in the number of particles are proportional to the square root of the number of particles and are quite considerable in absolute quantity; the coefficient of proportionality differs essentially for Fermi particles (nucleons-antinucleons) and for Bose particles (pi mesons). They show that the energy fluctuations able to be carried by one particle are very large and play a great role in the interpretation of the altitudinal behavior of wide atmospheric showers. The theoretical value of the coefficient of absorption thanks to taking into account fluctuations decreases, which improves the agreement between theory and experience. The authors thank S. Z. Belen'kiy. Four references: e.g. I. L. Rozental',

Card 2/2 Pub. 146 - 6/28

FD-2965

Abstract : Usp. fiz. nauk, 54, 405, 1954; G. T. Zatsepin, L. I. Sarycheva, DAN SSSR, 99, 951, 1954.

Institution : Physical Institute im. P. N. Lebedev, Academy of Sciences USSR

Submitted : May 26, 1954

CHERNAVSKIY, D. S.

USSR/Nuclear Physics - Energy distribution FD-2975

Card 1/1 Pub. 146 - 16/28

Author : Gerasimova, N. M.; Chernavskiy, D. S.

Title : Energy distribution of particles during instantaneous formation

Periodical : Zhur. eksp. i teor. fiz., 29, September 1955, 372-374

Abstract : L. D. Landau (Izv. AN SSSR, Ser. fiz., 17, 1, 1953) developed the hydrodynamic theory of formation of particles during collision of high-energy nucleons; the solution of the given hydrodynamic problem of expansion into vacuum consists of two parts: traveling wave and nontrivial solution (L. D. Landau, Ye. M. Lifshitz, Mekhanika sploshnykh sred [Mechanics of continuous media], GITTL, p. 434, 1953). Here the nontrivial solution plays the main role in the angular distribution of particles in the problems of instantaneous generation, since the principal part of the entropy of the system is located in this solution. In this article the present writer clarifies the problem of to what extent the disregard of the traveling wave is correct in the calculation of the angular and energy distribution of particles, as was done by Landau. The writer thanks S. Z. Belen'kiy. Four references: e.g. S. Z. Belen'kiy, DAN SSSR, 99, 523, 1954 and ZhETF, 82,111, 1955.

Institution : Physical Institute im. P. N. Lebedev, Academy of Sciences USSR

Submitted : May 12, 1955

CHERNAVSKIY, D.S.

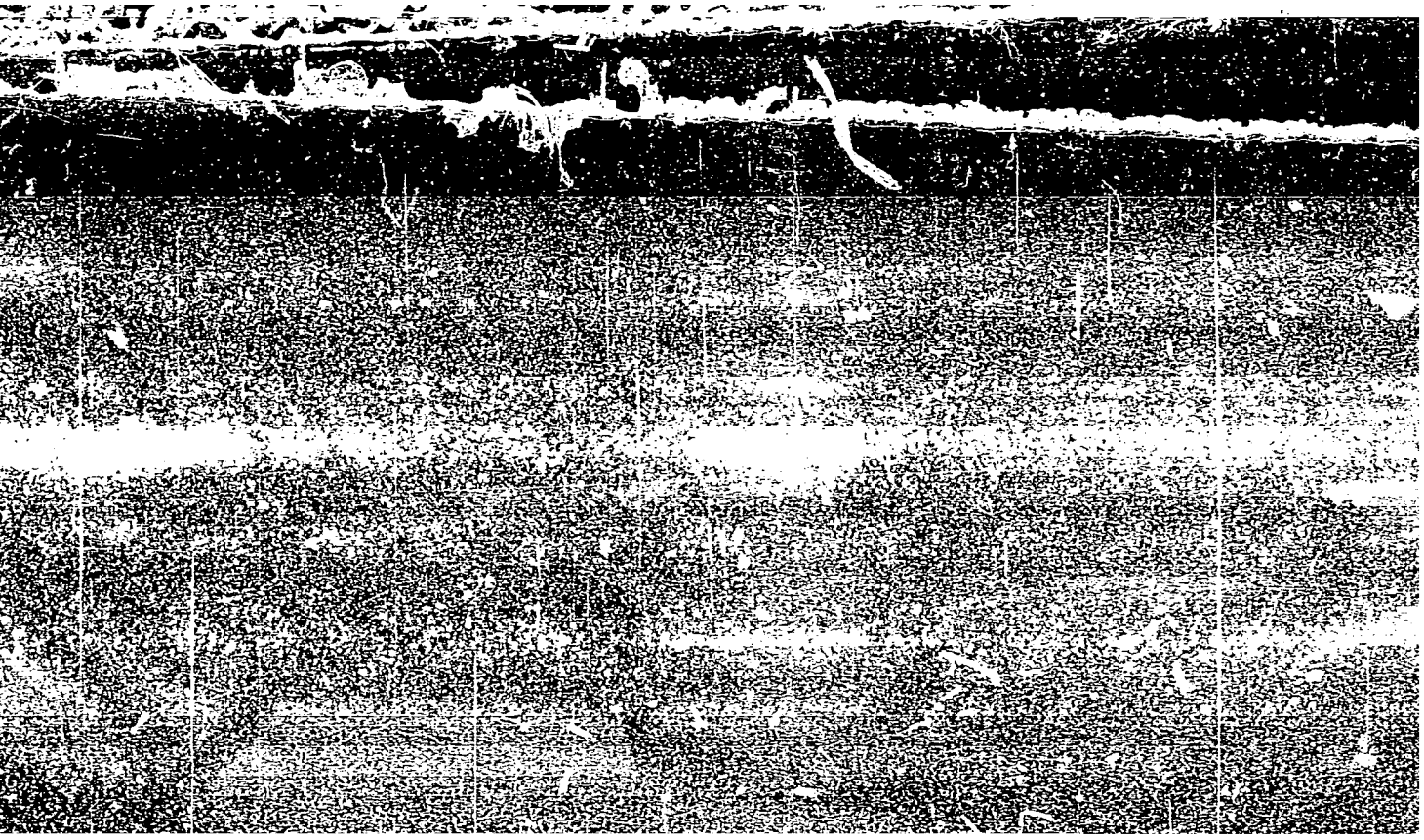
1509 UCRL-Trans-246

A POSSIBLE METHOD OF ELIMINATING THE DIVERGENCES IN THE PROBLEM OF THE INTERACTION OF NON-RELATIVISTIC NUCLEONS. E. L. Feinberg and D. S. Chernavskiy. Translated by Richard B. Mudge from Doklady Akad. Nauk S.S.S.R. 103, 421-4(1955) 8p.

62

Divergencies in the problem of the interaction of non-relativistic nucleons are discussed, and equations, based on a scheme not directly connected with the theory of excitations, are derived for the interaction. Results show that this semi-phenomenological method, which eliminates the natural energy in non-relativistic problems, may be regarded as a consistent method for the self-adjusting field in the meson theory of the interaction of nucleons. (B.J.H.)

(1)



APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308430003-0"

1621 UCRL-Trans-245

THE STABILITY OF THE DEUTERON IN THE MESON THEORY. E. L. Feinberg and D. S. Chernavskiy. Translated by Richard B. Mudge from Doklady Akad. Nauk S.S.S.R. 103, 589-92(1955). 8p. 62

Equations developed in meson theory led to a study of deuterons as non-relativistic by a method that excluded self-action. Qualitative agreement with experiment is obtained.

(1)

Physics Inst. im. Lebedev, AS USSR

CHERNAVSKIY, D. S.

Atomnaya Energiya (Atomic Energy), by D. S. Chernavskiy and V. P. Shabanskiy, Moscow, Goskul'tprosvetizdat, 1956, 72 pp (from a standard library card of the USSR State Library imeni V. I. Lenin, No 530.3 + 6P2.8)

"Discusses the following: structure of the atom, various types of elementary particle accelerators, energy of nuclear reactions and chain reactions, operation of an atomic pile, reactor design, perspectives for use of atomic piles, structure of the atom bomb, and thermonuclear reactions. Material from the Geneva Conference on Peaceful Uses of Atomic Energy is used." Bibliography (11 titles). Intended for lectures and readers. (U)

Sum. IN 1467

MENKOVSKIY, M.A.; PETROV, N.A., [deceased]; LITVIN, K.I.; CHERNAVSKIY, D.S.

Reciprocal solubility of bromine, hydrobromic acid and water. Zhur.neorg.khim. 1 no.7:1658-1664 Jl '56. (MLRA 9:11)

1. Moskovskiy gornyy institut, Kafedra khimii.
(Bromine) (Hydrobromic acid)

CHERNAVSKIY, D. S.

Fluctuations in the collisions of high-energy particles. M. I. Podgoretskii, I. L. Rozental, and D. S. Chernavskii. *Soviet Phys., JETP* 2, 211–16(1956)(Engl. translation).—See *C.A.* 50, 2307c. H. M. R.

CHERNAVSKIY, D. S.

Energy distribution of particle for multiple formation. N. M. Gerasimova and D. S. Chernavskii. *Soviet Phys.*, JETP 2, 344-6(1956)(Engl. translation).—See *C.A.* 50, 2307d. R. M. B.

CHERNAVSKIY D.S.

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

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 5723

Author : Feynberg, Ye.L., Chernavskiy, D.S.
Inst : Physics Institute, Academy of Sciences, USSR.
Title : Higher Approximations in the Self-Consistent Field Method of Meson Theory.

Orig Pub : Dokl. AN SSSR, 1956, 108, No 4, 619-622

Abstract : The role of the two-meson amplitudes is estimated in the method previously proposed by the authors for separating the self-energy in the deuteron problem (Referat Zhur Fizika, 1956, 21850, 21851). The computation of the role of the two-meson amplitudes is of interest because the application of the authors' method to the problem of the electromagnetic interaction of electrons in the single-proton approximation leads to a violation of the Coulomb law. For a pseudoscalar meson field, the role of the higher approximations turn out to be substantially smaller, owing to the fact that the interaction operators H_K do not commute for different quantum momenta K. The

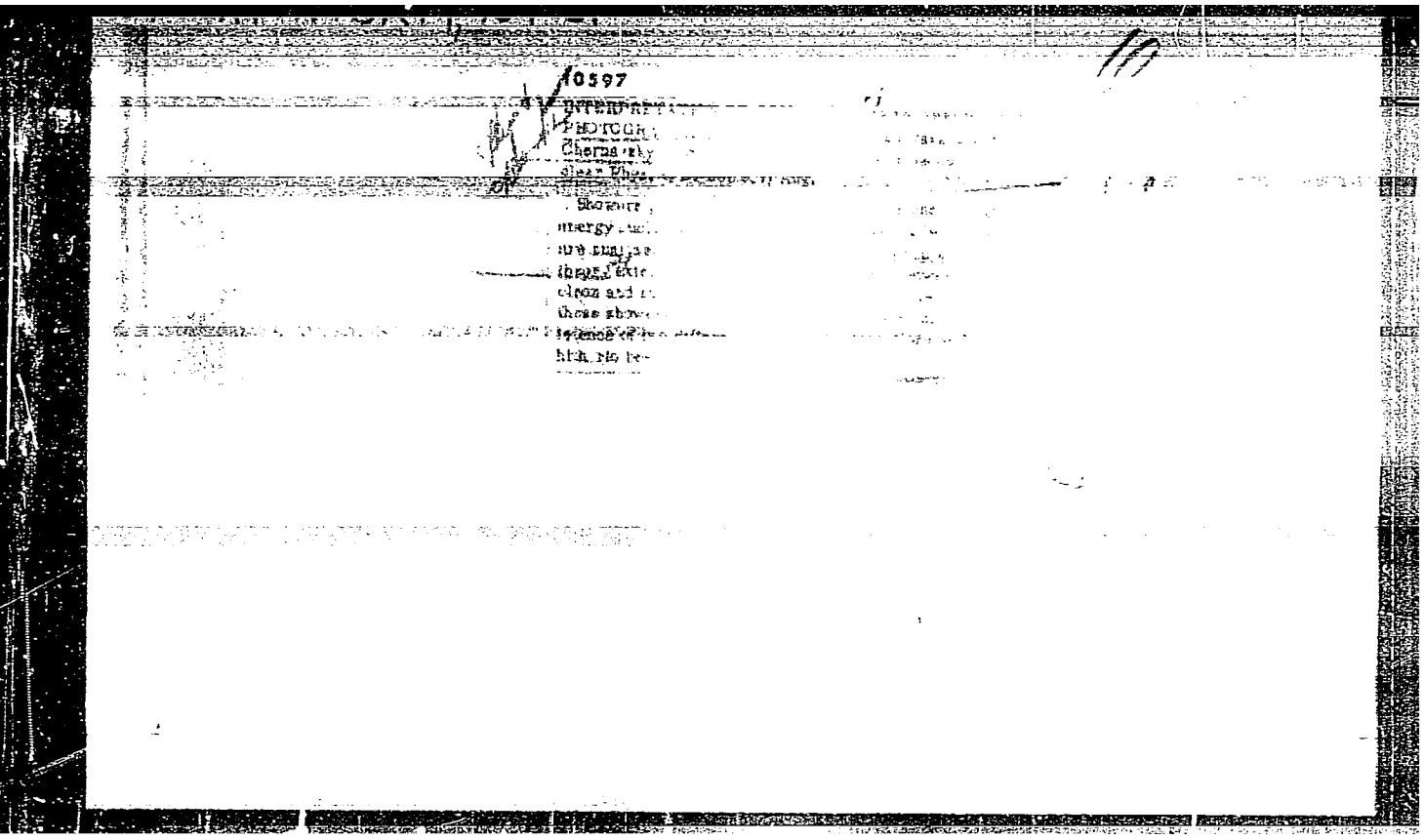
Card : 1/2

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

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 5723

results of the preceding work is considered by the authors to be qualitatively correct, but they note that a quantitative revision is desirable, since the minimum of the energy curve obtained in the preceding work was quite smeared.

Card : 2/2



Chernavskiy, D.S.

56-5-46/46

AUTHOR: Leper, D.P., Chernavskiy, D.S.

TITLE: The Application of the Dispersion Energy as a Criterion for the Accuracy of the Variation Method (Primeneniye dispersii energii v kachestve kriteriya tochnosti variatsionnogo metoda)

PERIODICAL: Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol.33, Nr 5, pp. 1311-1312 (USSR)

ABSTRACT: Hitherto the accuracy of the computation of the energy of the Schroedinger equation solved by means of the variation method has been judged only by a comparison with experimentally obtained values. However, the error limits in energy determination exercise their influence both on the inaccuracy of the "trial function" and on the Hamiltonian. It is shown theoretically that by applying the dispersion of energy to the "trial function" the limit of error can be judged separately. There is 1 Slavic reference.

ASSOCIATION: Physics Institute imeni P.N.Lebedev AN USSR (Fizicheskiy institut im.P.N.Lebedeva AN SSSR)

SUBMITTED: August 10, 1957

AVAILABLE: Library of Congress

Card 1/1

CHERNAVSKAYA, N.M., CHERNAVSKIY, D.S.

Autofluctuations during the process of photosynthesis [with summary in English]. Biofizika 3 no.4:521-523 '58 (MIRA 11:8)

1. Fizicheskiy institut im. P.N. Lebedeva AN SSSR, Moskva.
(PHOTOSYNTHESIS)

Chernavskiy D.S.

56-2-51/51

AUTHORS: Podgoretskiy, M. I., Rozental', I. L., Chernavskiy, D. S.

TITLE: A Correction of the Article "On Fluctuations in the Collision of Particles of High Energy" (Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1955, Vol 29, p 296) (Popravka k stat'ye " O fluktuatsiyakh pri stolknovenii chastits vysokoy energii (ZhETF), 29, 296, 1955)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 2, p 536 (USSR)

ABSTRACT: In the article mentioned in the title an error occurred in the calculation of the quantity $\overline{(n - \bar{n})(E - \bar{E})}$.

The wrong numerical values resulting from this are corrected and replaced by the right values. The authors thank A. I. Nikishov for his valuable information.

AVAILABLE: Library of Congress

Card 1/1 1. Theoretical corrections

CHERNAVSKIY, D. S.

THE ROLE OF VISCOSITY IN THE HYDRODYNAMIC THEORY OF MULTIPLE HIGH ENERGY PARTICLE PRODUCTION

A.A. Yemelyanov, D.S. Chernavskiy

the influence of viscosity upon the separation of the relativistic liquid in the multiple production of particles is considered. It turns out that the influence is particularly strong in the front edge region, firstly, because the velocity gradients in that region are maximal, and secondly, the dissipation of energies and the associated production of additional particles strongly affect the energy distribution of secondary particles. The calculation carried out by the method of successive approximations shows that the number of particles in the front edge region which owe their origin to viscosity increases logarithmically with increase in primary energy..

It follows that at sufficiently high energies one particle cannot carry away a substantial fraction of the energy of the entire system (as is the case at energies of the order of 10^{12} - 10^{13} ev).

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

CHERNAVSKIY, D. S.

THE THEORY OF PERIPHERIAL COLLISIONS AND THE INTERPRETATION OF "JETS"
D.S. Chernavskiy

The peripherial interaction of two high energy nucleons ($E_0 \geq 10^{13} \div 10^{14}$ ev) may be described by means of:

a) the Weizsacker-Williams (W.W.)method an
b) the perturbation theory.

Using very simple examples, these two methods are shown to be adequate and it is seen that the W.W. method is much more straightforward than that of the perturbation theory. Classification of the various possible types of peripherial interactions based on the W.W. method is considered.

The showers observed in photoplates, showing characteristic "two-hump" angular distribution and a small coefficient of inelasticity, are interpreted, in accordance with this classification, as a result of a totally inelastic interact on of the peripherial virtual π -mesons.

On the basis of the experimetal data, the conclusion is drawn that in the collision of two π -mesons the multiple production of secondary particles is described by the Heisenberg theory rather than by the Landau theory.

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

YEMEL'YANOV, A.A.; CHERNAVSKIY, D.S.

Effect of viscosity in multiple production on the energy distribution of secondary particles. Zhur.eksp.i teor.fiz. 37 no.4:1058-1061 O '59. (MIRA 13:5)

1. Fizicheskiy institut imeni P.N.Lebedeva Akademii nauk SSSR.
(Nuclear reactions)

CHERNAVSKIY, D. S.,

"Non-Linear Quantum Spinor Equation"

paper presented at the Intl Conference on High Energy Physics, Rochester, N. Y. and/or Berkly California, 25 Aug - 16 Sep 1960.

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000308430003-0"

21009

S/058/61/000/005/017/050
A001/A101

24.6900

AUTHORS: Slavatinskiy, A.S., Chernavskiy, D.S.

TITLE: Peripheral collisions

PERIODICAL: Referativnyy zhurnal. Fizika, no 5, 1961, 82, abstract 5B282 ("Tr. Mezhdunar. konferentsii po kosmich. lucham, 1959, v 1", Moscow, AN SSSR, 1960, 161 - 167)

TEXT: On the basis of the theory of Weizäcker-Williams the authors analyzed collisions of nucleons with anomalous angular distribution of secondary particles in the center-of-mass system and with low inelasticity coefficient. Penetaining stars are interpreted as a result of peripheral interaction. The following cases are considered: 1) when one of the nucleons suffers a central collisions with the π -meson of another nucleon; recoil and excitation of the other nucleon are neglected, and the process of decay of the excited state into secondary particles can be considered by the statistical theory or by the Fermi-Landau theory; 2) when the meson belonging to one nucleon collides with the meson of another nucleon; the number of secondary particles in this case can not be determined, and moreover, the application of the Fermi-Landau theory is difficult to

Card 1/2

Peripheral collisions

S/058/61/000/005/017/050
A001/A101

substantiate. The result of comparing the theory with experimental data on π-N-interactions shows that it is still too early to speak about agreement or disagreement. As far as $\pi\pi$ collisions are concerned, experiments indicate that the process is developing not according to the statistical theory (energy dissipation in this case is more complete). It is pointed out that for πN-interactions the calculation of peripheral collisions was performed by the perturbation theory in the sense of the work of Ch'u and Ch'u-Lou. The results of calculations agree with the data obtained by the Weizäcker-Williams method, however, the perturbation theory provides for a more complete information.

A. Yemel'yanov

[Abstracter's note: Complete translation.]

DREMIN, I.M.; CHERNAVSKIY, D.S.

Peripheral nucleon interactions at an energy of 9 Bev. Zhur. eksp. i teor. fiz. 38 no.1:229-232 Jan '60. (MIRA 14:9)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR.
(Nuclear reactions)

83720

S/056/60/038/004/013/048
B019/B070

24.6900

AUTHORS: Romanov, Yu. A., Chernavskiy, D. S.

TITLE: Multiple Production of Particles in Jets by Peripheral Collisions

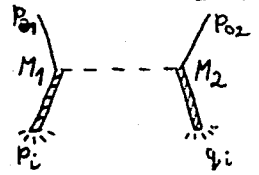
PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 4, pp. 1132-1139

TEXT: The authors study the peripheral collision of nucleons of high energies ($E_{lab} > 10^{12}$ ev). In the first section of the present paper the peripheral collisions are discussed according to Weizsäcker and Williams. As is known, this enables a classification of the peripheral collisions to be made, and the characteristic properties of the different interaction types to be described. The four variants of the peripheral interaction of two nucleons considered here are: the one-meson interaction, the virtual single $\pi\pi$ interaction, the two-meson interaction, and the double interaction of virtual π mesons. The one-meson interaction is discussed in detail according to Weizsäcker-Williams. In the second section of the

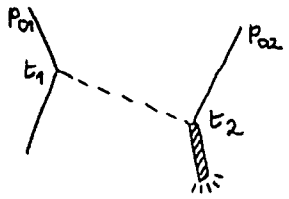
Card 1/3

Multiple Production of Particles in Jets
[illegible] Peripheral Collisions

paper, the perturbation theoretical calculation of one-meson collision is made on the basis of the Feynman graph shown in Fig. 1. Here p_{o1} and p_{o2}



are the momenta of the free nucleons, q_i and p_i the momenta of the secondary particles, and M_1 and M_2 the masses of the excited intermediate states. It turns out that the calculation on the basis of the Feynman graph is not completely equivalent to the method of calculation mentioned in the introduction. The Feynman graph shown in Fig. 2 corresponds better to the Weizsäcker-Williams method. In the following, the remaining three variants of the peripheral interaction shown in Feynman graphs in Figs. 3-5 are discussed. The prediction of the number of secondary particles and their angular distribution is treated, taking into consideration the theory of Fermi-Landau and Heisenberg. Finally, it is briefly discussed as to how the peripheral meson field of a nucleon manifests itself during the collision with a nucleus. This problem has been already



Multiple Production of Particles in Jets by Peripheral Collisions

S/056/60/038/002/013/048
B019/B070

treated by one of the authors (Ref. 5) and here simply the results are quoted. I. I. Gurevich, A. P. Mishakova, B. A. Nikol'skiy, Zh. S.Takibayev, and L. V. Surkova are mentioned (Ref. 13). The authors thank Professor Ye. L. Feynberg and his colleagues for making available their data. There are 7 figures and 13 references: 7 Soviet, 1 Italian, and 4 US.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Institute of Physics imeni P. N. Lebedev of the Academy of Sciences, USSR)

SUBMITTED: May 25, 1959

X

86267

17.1156 5.4500 (1241, 1018)

S/053/60/072/003/004/004
B019/B056

AUTHORS: Chernavskaya, N. M., Chernavskiy, D. S.

TITLE: Periodic Effects in Photosynthesis

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol. 72, No. 3, pp. 627 - 652

TEXT: This is a review of the most important papers on periodicity in photosynthesis. In the first part, experimental and theoretical data are given. The scheme of unknown reactions of photosynthesis, introduced by Calvin, as well as the chemical reactions are discussed. Experimental results concerning the periodic changes of the rate of photosynthesis are then discussed in detail, and finally the hypothesis of the oscillations of photosynthesis is dealt with. Next, the equations for the kinetics of photosynthesis are discussed. An interpretation of experimental results and theoretical considerations shows that the oscillation period of photosynthesis amounts to several hours. The adaptability of a plant consists in the resonance between the inner rhythm and the outer action. The thriving of a short-day plant on long days and vice versa is

Card 1/2

CHERNAVSKAYA, N.M.; CHERNAVSKIY, D.S.

Periodic phenomena in photosynthesis. Usp. fiz. nauk 77 no.3: 627-652 N '60. (MIRA 16:8)

(Photosynthesis)

GRAMENITSKIY, I.M.; DREMIN, I.M.; MAKSIMENKO, V.M.; CHERNAVSKIY, D.S.

Nucleon-nucleon interaction at 9 Bev. Zhur. eksp. i teor. fiz. 40 no.4:1093-1100 Ap '61. (MIRA 14:7)

1. Fizicheskiy institut imeni P.N. Lebedeva AN SSSR.
(Nuclear reactions) (Nucleons)

24707
S/056/61/040/005/007/019
B111/B205

24.6700

AUTHOR: Dremin, I. M., Chernavskiy, D. S.

TITLE: Nucleon-nucleon interaction at an energy of $E \sim 10^{11}$ ev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v.40, no. 5, 1961, 1333-1337

TEXT: In Ref. 1 (ZhETF, 38, 229,1960), the authors suggested to represent inelastic nucleon - nucleon processes at high energies by the graph method in pole approximation. Experiments have shown that, at energies of about 200 Bev, the inelasticity coefficient is in most cases very small. Both types of interaction were detected, i.e., unsymmetric interaction (in the center-of-mass system, secondary π-mesons are emitted preferably in the direction of motion of one of the primary nucleons) and symmetric interaction (in the center-of-mass system, secondary π-mesons are almost isotropically distributed) even though the inelasticity coefficients of both nucleons are small. The total cross section of peripheral single-meson NN collisions at an energy of 200 Bev was calculated using an expression from Ref. 1:

Card 1/4

Nucleon-nucleon interaction...

$$\sigma_{NN}(E_0) = \frac{2}{(2\pi)^3 p_0 E_0^2} \int dz \int dy \int d(\cos\vartheta) \frac{\sqrt{z^2 - m^2\mu^2}\sqrt{y^2 - m^2\mu^2} P_1}{[\mu^2 + \varkappa^2 + 2p_0 P_1 (1 - \cos\vartheta)]^2} \sigma_{\pi N}(z)\sigma_{\pi N}(y),$$

where

$$z = (\mathfrak{M}_1^2 - m^2 - \mu^2)/2, \quad y = (\mathfrak{M}_2^2 - m^2 - \mu^2)/2, \qquad (1)$$

$$\varkappa^2 = 2(E_0 E_1 - p_0 P_1) - \mathfrak{M}_1^2 - m^2, \quad \varkappa^2 + 2p_0 P_1 (1 - \cos\vartheta) = k^2,$$

where $\mathfrak{M}_1$, $\mathfrak{M}_2$ symbolize the nucleon masses, and ϑ is the angle between $\vec{p}_0$ and $\vec{p}_1$ which are the momenta of the primary nucleon and the isobar. Integration of (1) over all values of y and z, which are permitted by theorems of conservation, leads to σ_{NN} = 1400 mb. Here, the effective value of virtuality was $k^2 \sim (50\mu - 100\mu)^2$. A cross section of a value that high is absurd and proves that pole approximation is no longer justified for such values of k^2. The result obtained may be interpreted

Card 2/4

Nucleon-nucleon interaction...

to the effect that the cross section $\sigma_{\pi N}$ (k, k^2) is not constant but depends on k^2 and drops sharply with increasing k^2. A comparison with experimental data makes it necessary to take into account not only the total cross section but also other characteristic processes. Accordingly, the authors calculated $d\sigma/dK = f(K)$ (K - inelasticity coefficient). For the cross section of a single-meson process with NN- and intermediate $\pi\pi$-interaction one obtains

$$\sigma = \frac{32}{(2\pi)^8 E_0^2 I} \int \frac{d^4k_1\, d^4k_2}{(k_1^2+\mu^2)^2 (k_2^2+\mu^2)^2} \omega_1 E' I_1 \sigma_1 \cdot \omega_1 \omega_2 I_3 \sigma_3 \cdot \omega_2 E'' I_2 \sigma_2. \qquad (2)$$

where I_i indicates the current densities of the particles; k_1, k_2 the four-momentum of the virtual mesons; and E', E" the energy of primary nucleons in the coordinate system at rest of excited nucleons. It is finally noted that calculated and experimental data are still unsatisfactory and should be defined more exactly. From the theoretical point of view, the dependence of the πN-interaction cross section on k^2 is of

Card 3/4

Nucleon-nucleon interaction...

particular importance when performing exact computations. Ye.L.Feynberg N. A. Dobrotin and S. A. Slavatinskiy are thanked for their interest in the work. I. Ye. Tamm, Yu. A. Gol'fand, V. Ya. Faynberg, V. A. Belyakov, V. B. Berestetskiy, and I. Ya. Pomeranchuk are mentioned. There are 4 figures and 8 Soviet-bloc references.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva, Akademii nauk SSSR (Institute of Physics imeni P. N. Lebedev, Academy of Sciences USSR)

SUBMITTED: September 21, 1960

24709
S/056/61/040/005/003/019
B111/B205

24.4400

AUTHOR: Chernavskiy, D. S.

TITLE: The problem of the non-linear quantized spinor equation

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 5, 1961, 1360-1365

TEXT: When analyzing spinor equation of the Heisenberg type (W. Heisenberg, Zs. Naturforsch., 9a, 292, 1954), it is of special interest to consider the problems involved without assuming an adiabatic interaction. As the problem cannot be solved without making supplementary assumptions, the population characterizing the functional Φp_μ is considered to be always great. The problem is calculated by the method of the self-consistent field (Hartree-Fok). Now, the problem arises to look for the functionals corresponding to the lowest levels rather than describing the scattering and interaction of "real" particles. The problem of scattering as represented by the author's representation is analogous to the problem of interaction of compound particles. It is stated a priori that the

Card 1/4

The problem of the non-linear...

phenomenological interaction operator of real particles is complicated and not local, and differs greatly from the interaction Lagrangian for quanta of the ψ-field. Method: The Lagrangian density is investigated in natural coordinates ($\hbar = c = 1$):

$$\hat{L}(x) = \bar{\psi}(x)\gamma_\mu \partial_\mu \psi(x) + m\bar{\psi}(x)\psi(x) + \lambda^2(\bar{\psi}(x)\hat{O}\psi(x))(\bar{\psi}(x)\hat{O}\psi(x)) \qquad (2)$$

where λ is the coupling constant, and $\bar{\psi}(x)$ and $\psi(x)$ are the operators of the spinor field. The time and space coordinates in the "coordinate system at rest" used by the author are not equally justified. $H'_E = E'_E$ (5) holds on the assumption that $\psi(x)\psi(\vec{x}') = \psi(\vec{x}-\vec{x}')$. The solution of Eq.(5) is obtained from a variational problem. The expected energy value is given by $E = \Phi^*_E \hat{H} \Phi_E = \int d^3x \, {}_E\langle \bar{\psi}(\vec{x})(m+\gamma_i \partial_i)\psi(\vec{x})\rangle_E + \frac{1}{2}\lambda^2 \int d^3x \, {}_E\langle(\bar{\psi}(\vec{x})\hat{O}\psi(\vec{x}))(\bar{\psi}(\vec{x})\hat{O}\psi(\vec{x}))\rangle_E$ (7), where $\rangle_E \equiv \Phi_E$, ${}_E\langle \equiv \Phi^*_E$. According to the method of the self-consistent field Φ_E may be written as $\Phi_E = \sum_\nu C_\nu \prod_i^{\nu'} a_i^+ \prod_j^{\nu''} b_j^+ \, {}_c$ (8),

Card 2/4

The problem of the non-linear...

where v', v" denote the population, and a_i^+, b_j^+ are given in the natural sequence. Substituting Eq.(8) in Eq. (7) results in

$$E = \sum_{\nu} |C_\nu|^2 \left\{ \int d^3x \sum_{k}^{\nu'} \overline{\Psi}_k^{(+)}(x)\,(m + \gamma_i \partial_i)\,\Psi_k^{(+)}(x) - \right.$$

$$- \int d^3x \sum_{l}^{\nu''} \overline{\Psi}_l^{(-)}(x)(m + \gamma_i \partial_i)\,\Psi_l^{(-)}(x) +$$

$$+ \tfrac{1}{2}\lambda^2 \int d^3x \left[\sum_{k,l}^{\nu'} [(\overline{\Psi}_k^{(+)}\,\hat{O}\,\Psi_k^+)(\overline{\Psi}_l^{(+)}\,\hat{O}\,\Psi_l^+) - (\overline{\Psi}_k^+\,\hat{O}\,\Psi_l^+)(\overline{\Psi}_l^{(+)}\,\hat{O}\,\Psi_k^+)] + \right.$$

$$+ \sum_{k,l}^{\nu''} [(\overline{\Psi}_k^{(-)}\,\hat{O}\,\Psi_k^{(-)})(\overline{\Psi}_l^{(-)}\,\hat{O}\,\Psi_l^{(-)}) - (\overline{\Psi}_l^{(-)}\,\hat{O}\,\Psi_l^{(-)})(\overline{\Psi}_l^{(-)}\,\hat{O}\,\Psi_k^{(-)})] -$$

$$\left. \left. - 2 \sum_{k}^{\nu'} \sum_{l}^{\nu''} [(\overline{\Psi}_k^{(+)}\,\hat{O}\,\Psi_k^{(+)})(\overline{\Psi}_l^{(-)}\,\hat{O}\,\Psi_l^{(-)}) - (\overline{\Psi}_k^{(+)}\,\hat{O}\,\Psi_l^{(-)})(\overline{\Psi}_l^{(-)}\,\hat{O}\,\Psi_k^{(-)})] \right] \right\}. \qquad (9)$$

without taking account of terms having the form $\langle a_k^+, a_l^+ \rangle$, $\langle a_k^+ a_l^+ a_k^+ a_l^+ \rangle$.

Card 3/4

The problem of the non-linear...

Eq. (9) can be varied in two ways: 1) minimizing with respect to the population; 2) minimizing according to the parameters determining $\varphi_n(\vec{x})$.

The determination of the proper mass of a particle results in the problem of the formation of a bound state in a system of many "virtual" particles. Analogous problems have been studied earlier and were found to lead usually to finite expressions for the energy of the system. It is noted that the analogous problem can be fulfilled by the "ordinary" theory which is based on two interacting fields (fermion-boson interaction) which are linearly interrelated. Ye. L. Feynberg, D. A. Kirzhnits, V. Ya. Faynberg and G. A. Milekhin are thanked for advice and discussions. There are 2 figures and 3 references: 1 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva, Akademii nauk SSSR (Institute of Physics imeni P. N. Lebedev of the Academy of Sciences, USSR)

SUBMITTED: November 17, 1960

Card 4/4

GRAMENITSKIY, I.M.; DREMIN, I.M.; CHERNAVSKIY, D.S.

Note on π^-p-interaction at an energy of 7 Bev. Zhur.eksp.i teor.fiz. 41 no.3:856-860 S '61. (MIRA 14:10)

1. Fizicheskiy institut im. P.N.Lebedeva AN SSSR i Ob"yedinennyy institut yadernykh issledovaniy.
(Mesons)

CHERNAVSKIY, D. S., DREMIN, I. M. and ROYZEN, I. I.

"Interaction of High Energy Nucleons according to Diagram Method View Point and Double Dispersion Relations"

Report presented at the International Conference on Cosmic Rays and Earth Storm, 4-15 Sep 61, Kyoto, Japan.

P. N. Lebedev Physical Institute, Academy of Sciences of the USSR, U.S.S.R.

CHERNAVSKIY, D. S., DREMIN, I. M. and MAKSIMENKO, V. M.

"Application of Diagram Method to the Calculation of Characteristics for Nucleon-Nucleon Interaction at the Energy of 300 Bev and Their Comparison with Experimental Data"

Report presented at the International Conference on Cosmic Rays and Earth Storm, 4-15 Sep 61, Kyoto, Japan.

P. N. Lebedev Physical Institute, Academy of Sciences of the USSR

S/056/62/042/002/047/055
B108/B138

AUTHORS: Royzen, I. I., Chernavskiy, D. S.

TITLE: Interference between the amplitudes of inelastic processes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 625 - 629

TEXT: The interference between the single-meson and two-meson amplitudes of high-energy inelastic nucleon collisions is studied. The imaginary part of the scattering amplitude may be represented as an expansion into amplitudes with a definite number of intermediate mesons $\mathrm{Im}\ \varphi_i^T(s,t=0) = \mathrm{Im}\left[\varphi_{i(2)}^T + \varphi_{i(3)}^T + \ldots + \varphi_{i(n)}^T\right]$. T is the isotopic spin of the system. With the aid of the optical theorem it is shown that the single-meson and two-meson interference term is directly related to the three-meson amplitude of elastic scattering. It is further shown that, if elastic scattering has a diffraction character, there is no interference between single-meson and two-meson amplitudes. In such a case, interferences between even and odd-numbered meson amplitudes do not occur at all.

Card 1/2

Interference between the amplitudes of ...

Interference between inelastic single and three-meson (generally (2r + 1)-meson) amplitudes is possible but its contribution is only small. V. B. Berestetskiy, I. Ya. Pomeranchuk, V. Ya. Faynberg, and Ye. L. Feynberg are thanked for discussions. There are 4 figures and 11 references: 6 Soviet and 5 non-Soviet. The references to English-language publications read as follows: F. Salzman, G. Salzman, Phys. Rev. Lett., 5, 377, 1960; P. Matthews, A. Salam, Preprint; M. L. Goldberger et al. Phys. Rev., 120, 1250, 1960.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: September 28, 1961

Card 2/2

S/056/62/043/002/027/053
B104/B108

24.6700

AUTHORS: Dremin, I. M., Chernavskiy, D. S.

TITLE: The interaction cross sections of virtual particles

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 2(8), 1962, 551-556

TEXT: The range of applicability of single-meson approximation for the investigation of the inelastic interaction of high-energy nucleons is studied. Moreover, the problem as to whether the interaction cross section of real particles, calculated in single-meson approximation, is constant for high energies ($\lim_{s\to\infty} \sigma_{NN}(s, p_i^2 = -m^2) = \text{const}$), and the asymptotic dependence on k^2 ($k^2 \gg 1$) of the propagation function of a π-meson, of the vertex parts of $\Gamma_5(k^2)$, and of the cross section $\sigma(s_i; k^2; p_i^2 = -m^2)$ of the interaction of a virtual π-meson with a real nucleon, are investigated. $\sigma(s_i, k^2)$ is a decreasing function of s_i and k^2. $\sigma(s_i, k^2)$ is derived in a

Card 1/2

S/056/62/043/002/027/053
B104/B108

The interaction cross sections of...

form which meets the requirement that σ_{NN} and $\sigma(s_1, k^2 = -\mu^2)$ be constant at high energies, and fulfills the condition of analyticity. The conclusions from this form of $\sigma(s_1, k^2)$, in particular the asymptotic behavior of the nucleon elastic scattering amplitude as a function of the Mandelstam variables s and t, are discussed. The results agree with those obtained by V. N. Gribov (ZhETF, 41, 1962, 1961). There are 3 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: February 21, 1962

Card 2/2

L 13639-63 EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3003120 S/0056/63/044/006/1907/1914

AUTHOR: Royzen, I. I.; Chernavskiy, D. S.

TITLE: On the relation between various methods for describing the interaction of high-energy particle

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 1907-1914

TOPIC TAGS: high-energy interactions, moving pole method, strip approximation, one-meson approximation

ABSTRACT: The correspondence between the three methods used to describe interactions between elementary high-energy particles (the method of moving poles, the strip approximation, and the one-meson approximation) is investigated. It is demonstrated that the moving-pole and strip approximations are very similar in meaning and in the extent of approximation made, although the former method is more attractive in view of the greater orderliness and clarity of the main premises. It is also demonstrated that at high energies the expression derivable from the one-meson approximation for the elastic scattering amplitude coincides asymptotically with the expression that follows from the moving-pole method, so that the terms neglected in both methods are the same. The results of this

Card 1/2

L 13639-63
ACCESSION NR: AP3003120

2

analysis establish a connection between the moving-pole method and inelastic processes and permits determination of the region of application of the above three methods on the basis of an analysis of the experimental inelastic scattering data. The limitation of the analysis is discussed. In conclusion the authors express deep gratitude to Ye. L. Feynberg for very valuable advice and fruitful discussions. Orig. art. has 4 figures and 25 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 04Oct62 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 011 OTHER: 013

Card 2/2

FEYNBERG, Ye.L; CHERNAVSKIY, D.S.

Regge narrowing of the diffraction cone and the role of multiple-meson interactions. Zhur. eksp. i teor. fiz. 45 no.4:1252-1259 O '63. (MIRA 16:11)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR.

CHERNAVSKIY, D.S.

Effect of annihilation on peripheral nucleon - antinucleon interactions. Zhur. eksp. i teor. fiz. 45 no.5:1558-1565 N '63. (MIRA 17:1)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.

DREMIN, I.M.; CHERNAVSKIY, D.S.

Inelastic processes due to various types of moving poles. Zhur. eksp. i teor. fiz. 45 no.6:1943-1950 D '63. (MIRA 17:2)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.

L 14323-65 EWG(j)/EWT(m)/FCC/T AFWL/AEDC(a)/ASD(a)-5/SSD/AFMDC/APETR/
ESD(gs)/ESD(t)/IJP(c) Pb-4
ACCESSION NR: AP4049565 S/0048/64/028/011/1730/1740

AUTHOR: Feynberg, Ye.L.; Chernavskiy, D.S.

TITLE: The theory of strong interactions and cosmic rays (Report, All-Union Conference on the Physics of Cosmic Ra[illegible])

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.11, 1964, 1730-1740

TOPIC TAGS: cosmic ray, cosmic radiation, high energy interaction, strong interaction

ABSTRACT: The paper is a four part review of recent theoretical work in the field of strong interactions with general suggestions on experiments that may serve to advance theory or verify different hypotheses. Part I describes the method of Regge poles and the one meson (one particle [illegible] certain class of Feynman graphs, [illegible] reement with experiment. The Regge pole [illegible] characterized as an attempt at a universal description of all elastic strong interactions. The one particle exchange model and the one meson approximation are, of course, concerned primarily with glancing or peripheral collisions, the opposite extreme from central encounters. In Part

1/2

L 14323-65
ACCESSION NR: AP4049585

2 the authors discuss the relation between elastic and quasielastic collisions in the formalism of the above-mentioned methods. Part 3 is an evaluation of the significance of hydrodynamic theory, particularly, the peripheral-hydrodynamic model, in treating strong interactions. Lastly, Part 4 gives some of the deductions from theory that have been substantiated by experiment and suggests promising lines for further experimentation. It is noted that accelerator-based experiments in the next few decades will necessarily be limited to the energy range below 30-70 GeV, unless there is an unexpected breakthrough in accelerator design; although the maximum available energy already exceeds the threshold for production of most particles this does not, in the opinion of the authors, mean that experimental study of cosmic radiation has become valueless or that it is needless to attempt to develop even higher energy particle accelerators. Some space is devoted to the fire-ball model and the desirability of further investigation in this area, for instance, to determine whether the number or/and size of the fire-ball clusters increase(s) with increasing energy. Orig.art.has: 4 formulas, 2 tables and 4 figures.

ASSOCIATION: Fizicheskiy institut im.P.N.Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 00 ENCL: 00

SUB CODE: AA, NP NR REF SOV: 012 OTHER: 011

2/2

ROYZEN, I.I.; CHERNAVSKIY, D.S.

Intersection of vacuum pole trajectories. Zhur. eksp. i teor. fiz. 46 no.2:628-636 F '64. (MIRA 17:9)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.

ACCESSION NR: AP4014906 S/0053/64/082/001/0003/0081

AUTHORS: Feynberg, Ye. L.; Chernavskiy, D. S.

TITLE: Strong interactions at very high energies

SOURCE: Uspekhi fizicheskikh nauk, v. 82, no. 1, 1964, 3-81

TOPIC TAGS: strong interaction, moving pole method, one pion exchange method, two center model, fire ball model, multiperipheral model, fully peripheral model, Regge pole, peripheral interaction, elastic interaction, inelastic interaction, pion proton scattering, cosmic ray energy, diagram technique, mixed model

ABSTRACT: This review article deals with the two principal methods presently under development in the theory of strong interactions -- the Regge poles or moving pole method (MPM) and the one pion exchange approximation (OPE). The main premises of both methods are treated at some length in view of the lack of a published treatment suitable

Card 1/3

ACCESSION NR: AP4014906

for the non-specialist, particularly on the MPM. An effort is made to reconcile some terminological differences that have crept into the literature and to specify the various theoretical assumptions. Some experimental results obtained at the highest energies afforded by accelerators and at cosmic-ray energies are used to analyze the two methods, with an aim at establishing the connection between them. A tentative conclusion is drawn that the asymptotic properties of elastic scattering, derived from the MPM in its most prevalent modification (allowance for only one pole on the extreme right),, agree with the result of the CPE approximation for inelastic interactions of the same particles. Both experimental and theoretical arguments are advanced in favor of this conclusion, although no rigorous proof is claimed. The table of contents reads: I. Introduction. II. Moving pole method. 1. Introduction. 2. Derivation of main asymptotic formula. 3. Properties of elastic-scattering amplitude at high energies. 4. Extension to other processes. 5. Elastic $\pi^- p$ scattering ard discrepancy between theory and experiment. III. The-

Card 2/3

ACCESSION NR: AP4014906

ory of peripheral interactions. 1. Initial premises and formula for total cross section. 2. Classification of methods. 3. Two center (fireball) model. 4. Fully peripheral (multiperipheral) model. 5. Additional remarks. IV. Experimental data at $E_{lab} \gtrsim 10^{11}$ eV. Comparison with theory. 1. Summary of earlier results. 2. Methods of analysis of experiments. 3. Principal recent experimental results and their significance to the theory. 4. Conclusion. V. Connection between the MPM and the diagram approach in the OPE approximation. 1. Formulation of problem. 2. Diagram interpretation of MPM. 3. Mixed model. 4. Inelastic processes in OPE and MPM. Appendix. Literature. Orig. art. has: 30 figures and 98 formulas.

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 14Feb64 ENCL: 00

SUB CODE: PH NO REF SOV: 0056 OTHER: 0071

Card 3/3

L 47363-65 EWT(1)

ACCESSION NR: AP5008756 S/0056/65/048/003/0952/0964

AUTHOR: Royzen, I. I.; Wayt, R. B. (White, R. B.); Chernavskiy, D. S.

TITLE: The Bethe-Salpeter equation and the role of "central" interactions

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 3, 1965, 952-964

TOPIC TAGS: inelastic amplitude, elastic amplitude, central interaction, peripheral interaction, Regge pole, complex orbital momentum, meson cluster

ABSTRACT: This is the first of a series of articles in which inelastic and elastic amplitudes for various processes are examined from a single point of view, keeping in mind that both central and peripheral processes contribute asymptotically constant terms to the cross section. It is shown in particular that the equation for the imaginary part of the amplitude and the equation for the total cross section follow from the Bethe Salpeter equation. In the total cross section, the integral term corresponds to the peripheral cross section and the free term to the central interaction cross section. A particular case of this equation is the multiperipheral model. The equation for the partial waves in the t-channel makes it possible to use the formalism of the complex orbital momentum to determine those

Card 1/2

L 47363-65

ACCESSION NR: AP5008756 3

-plane singularities to which various assumptions regarding the nature of the inelastic processes correspond. A variant consistent with two-particle unitarity, in which the partial wave possesses a fixed pole, a moving pole, and a moving cut is considered within the framework of the Bethe-Salpeter equation. The variant corresponds to the case of asymptotically constant central and peripheral interaction cross sections. It can also be used to describe the production of many-meson groups (fireballs). "The authors are deeply grateful to Ye. L. Feynberg and D. A. Kirzhnits for interest in the work and valuable discussions." Orig. art. has: 1 figure and 37 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 07Oct64 ENCL: 00 SUB CODE: NP

NR REF SOV: 010 OTHER: 006

Card 2/2 CC