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S/194/61/000/007/042/079  
D201/D305

**AUTHORS:** Tabarovskiy, I.K., Gofman, I.M., Vinogradov, P.M.,  
Pushkarev, A.A. and Pomel'tsov, A.N.

**TITLE:** An electro-kymograph, scintillation model ЭКC -60  
(EKS-60)

**PERIODICAL:** Referativnyy zhurnal. Avtomatika i radioelektronika,  
no. 7, 1961, abstract 7 E15 (Novosti med. tekhn.,  
1960, no. 5, 41-63).

**TEXT:** The graphical recording of pulsating movements of the cardiac vessel cluster as observed using X-rays el. kymography, is used for diagnosing not only cardiac vessels but also pulmonary diseases, e.g. cancer. The model EKS-60 has been approved for series induction. It permits simultaneous registration of the electro-cardiogram and of one of the following processes: The pulsation of heart periphery and of large blood vessels, the capillary pulse of the pulmonary parenchyma, diff. pulmonary ventilation. It is also pos-

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An electro-kymograph...

sible to register simultaneously the diff. pulmonary ventilation of both lungs or of any 2 electrocardiogram connectors. Either a static or scintillation slot diaphragm probe is used. The probe oscillations are applied simultaneously after amplification to a recorder and an oscilloscope. Provision is made for signalling in case the probes and indicators are located separately. The construction is given of the probe together with the diagram of a 2-channel balanced photo amplifier with noise compensation circuits and of a 2-channel oscilloscope and of power supplies. The recording channels from the scintillation and static probes have a frequency band 0.15 to 12 c/s and 0.04 to 8 c/s respectively. The horizontal oscilloscope sweep is regulated from 0.01 to 10.0 sec. The overall equipment power consumption is 1 kVA. Results of clinical experiments are given. 29 references. [Abstracter's note: Complete translation]

Card 2/2

POMEL'TSOV, A.N.; PEKARSKIY, M.D.

Examining the lungs by means of densigraphy. Nov. med. tekhn.  
no. 1:64-69 '60. (MIRA 14:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut meditsinskikh  
instrumentov i oborudovaniya.  
(LUNGS--RADIOGRAPHY)

POMEL'TSOV, A.N.

Effect of muscular activity on the motor function of the digestive tract. Vest.rent. i rad. 33 no.2:78-80 Mr-Apr '58. (MIRA 11:6)

1. Iz laboratorii fiziologii i patologii pishchevareniya (zav. - doktor meditsinskikh nauk S.I.Filippovich) Instituta normal'noy i patologicheskoy fiziologii (dir. - chlen-korrespondent AMN SSSR prof. V.N.Chernigovskiy) Akademii meditsinskikh nauk SSSR.

(GASTROINTESTINAL SYSTEM, physiol.

eff. of musc. activity on motor funct. (Rus))

(WORK, eff.

on motor funct. of Gastrointestinal system (Rus))

POMEL'TSOV, A.N.

Effect of muscular work on motor function of the stomach and duodenum.  
[with summary in English]. Biul. eksp. biol. i med. 43 no.3:28-32 Mr '57.

(MLRA 10:7)

1. Iz laboratorii fiziologii i patologii pishchevareniya (zav. -  
doktor med. nauk S.I. Filipovich) Instituta normal'noy i patologiche-  
skoy fiziologii AMN SSSR (dir. - chlen-korrespondent Akademii nauk  
SSSR prof. V.N. Chernigovskiy). Predstavlena deystvitel'nym chlenom  
Akademii meditsinskikh nauk SSSR V.N. Chernigovskim

(STRESS, eff.

on motor funct. of duodenum & stomach in dogs (Rus))

(DUODENUM, physiol.

motor funct., eff. of stress in dogs (Rus))

(STOMACH, physiol.

same)

POMEL'TSOV, K.V.

Fluorography of the thorax; method of mass roentgenography for the detection of tuberculosis. izd. 2., ispr. i dop. Moskva, Medgiz, 1948. 134 p.

1. Chest-Radiography.
2. Tuberculosis- Prevention.

EGHELITSOV, K. V.

"Condition of the Lungs of Chronic Cases of Lupis Vul-  
garis," Prob. Tuber., No. 2, 1949., Prof., Inst. of  
Skil T. E. -c1949-.

*Form 100-100*

POMEL'TSOV, K.V.; RABINOVA, A.Ya.; STRUKOV, A.I.; KUSEVITSKIY, I.A.

Roentgenographic and anatomical parallels in limited tuberculous affections of the lung. Probl. tuberk., Moskva No. 1:42-46 Jan-Feb 52.

(CJML 21:5)

1. Professor for Pomel'tsov; Candidate Medical Sciences for Rabinova; Corresponding Member of the Academy of Medical Sciences USSR, Professor for Strukov; Professor for Kusevitskiy. 2. Of the Moscow Oblast Scientific-Research Tuberculosis Institute (Director--Prof. F.V. Shebanov) and of the Institute of Morphology of the Academy of Medical Sciences USSR (Director--Academician A.I. Abrikosov).



POBELTSEV, K. V., Prof.; KUCHVITSKIY I. A., Prof.; SIBIRSKY, A. ...

Tuberculosis

Clinico-roentgenologica and anatomic findings in primary complex and in lymph node tuberculosis. Sov. med. 16, no. 2, 1952.

Monthly List of Russian Accessions, Library of Congress , December 1952. Unclassified.

RABINOVA, A.Ya., kandidat meditsinskikh nauk; POMEL'TSOV, K.V., professor, zaveduyushchiy; SHEBANOV, F.V., professor, direktor.

Roentgenological examination of lungs in oblique projections. Vest. rent. i rad. no.3:19-26 My-Je '53. (MLRA 6:8)

1. Rentgenovskoye otdeleniye Moskovskogo oblastnogo nauchno-issledovatel'skogo tuberkuleznogo instituta (for Rabinova and Pomel'tsov). 2. Moskovskiy oblastnoy nauchno-issledovatel'skiy tuberkuleznyy institut (for Shebanov). (Lungs--Diagnosis) (Diagnosis, Radioscopic)

POMEL'TSOV, K.V.

BERLIN, I.I.; POMEL'TSOV, K.V.; FAYNSHTEYN, R.B.; OSTROVSKAYA, M.D.;  
DAVYDOVA, A.A.

Dynamics of minor forms of pulmonary tuberculosis; data of an  
over-all survey in the city Pavlovskiy Posad. Probl. tub. no.3:  
31-38 My-Je '54. (MLRA 7:11)

1. Iz Moskovskogo oblastnogo nauchno-issledovatel'skogo tuberkulez-  
nogo instituta (dir. prof. F.V.Shebanov) i Pavlovskogo-Posadskogo  
tuberkuleznogo dispansera (zav. M.A.Polkanov)  
(TUBERCULOSIS, PULMONARY, statistics,  
analysis of continous survey)

POMEL'TSOV, K.V., professor.

Tuberculoma of the lungs. Vest.rent. i rad. no.4:38-49 J1-Ag  
'55. (MLBA 8:12)

1. Iz rentgenovskogo otdeleniya (zav.-prof. K.V.Pomel'tsov)  
Instituta tuberkuleza Akademii meditsinskikh nauk SSSR (dir.  
Z.A.Lebedeva)

(TUBERCULOMA,  
lungs, diag. x-ray)  
(LUNGS, diseases  
tuberculoma, diag.x-ray)

POMEL'TSOV, K.V., professor

Significance and tasks of roentgenological methods in pulmonary tuberculosis [with summary in French]. Probl.tub. 34 no.6:11-16 N-D '56. (MLRA 10:2)

1. Iz rentgenovskogo otdeleniya (zav. - prof. K.V.Pomel'tsov) Instituta tuberkuleza AMN SSSR (dir. Z.A.Lebedeva) (TUBERCULOSIS, PULMONARY, diagnosis, x-ray (Rus))

EXCERPTA MEDICA Sec.14 Vol.12/5 Radiology May 1958

POMELTsov K.V.

868. ROENTGENOLOGICAL PHASES OF CAVITY HEALING IN TUBERCULOUS PATIENTS (Russian text) - Pomeltsov K. V. - VESTN. RENTGENOL. RADIOL. 1957, 32/2 (21-28) III 16

The author investigated the influence of antibiotics and chemotherapy on 210 patients suffering from pulmonary tb. During 6 months 61 cavities were healed. In the cases of focal and infiltrative forms 50% of the cavities were healed, in the cases of haematogenic-disseminate forms the percentage of healed cavities reached 30 and in cases of chronic fibrous-cavernous tb the treatment had almost no effect. In the process of healing roentgenological investigations show 3 phases. During the first phase the walls of the cavities grow thicker, their external contours become less sharply pronounced and a small fluid level can be observed inside them. During the second phase the lumen of the cavities concentrically decreases, they change their form and shadows appear in the adjacent lung tissue. During the third phase the walls of the cavities lose their contours and changes are observed transforming the cavities into limited indurated areas.

(XIV, 15\*)

POMEL'TSOV, K.V., prof.

Role of roentgenology in the development of phtisiology and in tuberculosis control. Vest.rent.i rad. 32 no.5:13-19 S-O '57.  
(MIRA 11:2)

1. Iz rentgenovskogo otdeleniya (zav. - prof. K.V.Pomel'tsov)  
Instituta tuberkuleza (dir. Z.A.Lebedeva) Akademii meditsinskikh  
nauk SSSR.

(TUBERCULOSIS, prev. & control.  
in Russia, importance of x-ray (Rus))

POMEL'TSOV, K.V.

LAGUNOVA, I.G., dots.; BELETSKIY, G.N., dots.; POMEL'TSOV, K.V., prof.  
PODLYASHUK, L.D., prof.

On the 50th birthday of Professor Il'ia Aleksandrovich Shekhter.  
Vest.rent. i rad. 32 no.6:89 N-D '57. (MIRA 11:3)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut rentgenologii i radiologii (for Lagunova). 2. Moskovskiy meditsinskiy stomatologicheskiiy institut (for Beletskiy). 3. Vserossiyskoye obshchestvo rentgenologov i radiologov (for Pomel'tsev). 4. Moskovskoye obshchestvo rentgenologov i radiologov (for Podlyashuk).

(SHEKHTER, IL'IA ALEKSANDROVICH, 1907-)



POMEL'TSOV, K.V., prof.

X-ray diagnosis of cavities. Sov. med. 24 no. 5:28-36 My '60.  
(MIRA 13:10)

1. Iz Instituta tuberkuleza AMN SSSR (dir. - chlen-korrespondent  
AMN SSSR prof. N.A. Shmelev).  
(TUBERCULOSIS) (LUNGS—RADIOGRAPHY)

POMEL'TSOV, K. V.; YUKELIS, L. I.

Vascular changes simulating pulmonary tuberculosis. Probl. tub.  
40 no.5:29-34 '62. (MIRA 15:7)

1. Iz Tsentral'nogo instituta tuberkuleza (dir. - deystvitel'nyy  
chlen AMN SSSR prof. N. A. Shmelev) Ministerstva zdravookhraneniya  
SSSR.

(TUBERCULOSIS) (LUNGS--BLOOD SUPPLY)

POMEL'TSOV, K.V.

[Fluorography of chest cavity; method of mass X-ray de-  
tection of pulmonary tuberculosis] Fliuorografiia grudnoi  
kletki; metod massovogo rentgenovskogo vyivleniia legoch-  
nogo tuberkuleza. Moskva, Medgiz, 1945. 117 p.

(MIRA 15:9)

(DIAGNOSIS, FLUOROSCOPIC) (TUBERCULOSIS--DIAGNOSIS)

POMEL'TSOV, K.V. (Moskva, Leningradskiy pr., d.75-A, kv.42); OYFEBAKH, M.I.

Present-day clinical and X-ray detection -- a basis for the further lowering of morbidity and mortality from pulmonary tuberculosis. Vest. rent. i rad. 36 no.4:3-10 Ji-Ag '61. (MIRA 15:2)

1. Iz Instituta tuberkuleza AMN SSSR (dir. - chlen-korrespondent AMN SSSR prof. N.A.Shmelev).  
(TUBERCULOSIS...DIAGNOSIS)

POMEL'TSOV, K.V., prof.; TIMASHEVA, Ye.D., kand.med.nauk; DOBYCHINA, A.I.

Four cases of microlithiasis of the pulmonary alveoli. Probl.tub.  
38 no.7:94-98 '60. (MIRA 14:1)

1. Iz Instituta tuberkuleza (dir. - chlen-korrespondent AMN SSSR  
prof. N.A. Shmelev) AMN SSSR.  
(LUNGS--DISEASES)

POMEL'TSOV, K.V., prof.; SORKINA, E.Z., doktor meditsinskikh nauk

Specific allergy and body reactivity in children infected with  
tuberculosis. Trudy Inst. tub. AMN 7:125-132 '58. (MIRA 13:10)  
(TUBERCULIN) (TUBERCULOSIS)

POMEL'TSOV, N.

Confectionery with laminaria. Sov.torg. 35 no.1:35-36 Ja '62.  
(MIRA 15:1)

(Confectionery)

POMEL'TSEV, N.L. (Moskva)

Therapeutic properties of Laminaria. Priroda 51 no.7:111-112  
31 '62. (MIRA 15:9)

(Far East--Kelp)



L 37121-56 EWP(k)/EWP(t)/EWT(m)/ETL LJP(e) JD/GD

ACC NR: AT6010487

SOURCE CODE: UR/0000/65/000/000/0031/0037

AUTHOR: Red'ko, S. G. (Doctor of technical sciences, Professor); Pomel'tsov, N. V.  
(Aspirant)

29

ORG: none

B71

TITLE: Some theoretical problems in wrap-around grinding

SOURCE: Moscow. Vyssheye tekhnicheskoye uchilishche, Obrabotka metallov rezaniyem i davleniyem (Machining and pressure working of metals). Moscow, Izd-vo Mashinostroyeniye, 1965, 31-37

TOPIC TAGS: metalworking, machine grinding, metal finishing

ABSTRACT: The paper deals with a study of certain aspects of the high-speed wrap-around method of grinding. This method, since it is free of the normal limitations imposed by wheel coupling rigidity, permits grinding rates of from 115 to 135 m/sec. Mathematical expressions are derived for productivity ratios in this kind of grinding. Equations are analyzed which make it possible to determine the length of the wheel contact arc as a function of various other factors. In this way the author succeeds in establishing certain general laws with respect to high-speed wrap-around grinding, demonstrating, in particular, that the best results in terms of increased productivity are obtained when grinding pieces which are large in diameter, and that the diameter of the wheel should not exceed the diameter of the worked piece by more than 2.5 times. Orig. art. has: 4 figures and 13 formulas.

SUB CODE: 13 / SUBM DATE: 08Jul65 / ORIG REF: 005

Card 1/1 of

POMLITSOV, S. V., Eng.      Cand. Tech. Sci.

Dissertation: "Investigation of the Construction and Performance of Safety Razors."  
Moscow Automotive Mechanics Inst, 2 May 47.

SO: Vechernyaya Moskva, May, 1947 (Project #17836)



POMENKO, L.A.

"Radio-Frequency magnetic Spectra of Mixed Ferrites." Leningrad

Conference on Physics of Magnetic Phenomena,  
May, 1956, Sverdlovsk, USSR

POMENTUN, Ya.A.

Distillation of niobium and tantalum during their spectrographic determination. Zhur. anal. khim. 20 no.7:789-793 '65.  
(MIRA 18:9)

1. Institut of Chemistry, Tadzhik S.S.R. Academy of Sciences,  
Dushanbe.

GRIBOV, V. N., and POMERANCHUK, A. P.

"Complex Angular Momenta and the Relations between Cross Sections at High Energies."

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

A. F. Ioffe Physics-Theoretical Institute, Leningrad, USSR (Gribov)  
Institute of Theoretical and Experimental Physics, Moscow, USSR (Pomeranchuk)

GRIBOV, V.; OKUN', L.; POMEANCHUK, I.

Processes determined by fermion Regge poles. Zhur. eksp. i teor.  
fiz. 45 no.4:1114-1122 0 '63. (MIRA 16:11)

1. Institut teoreticheskoy i eksperimental'noy fiziki.

1936-1954



POMERANTSOVSK, I.  
POMERANTCHUK I. Ya.

CURRENT TOPICS

MATERIALS INDEX

MATERIALS INDEX

\*On the Properties of Metals at Very Low Temperatures. L. Landau and I. Pomerantschuk (*Physikal. Z. Sowjetunion*, 1936, 10, (6), 649-665).—[In German.] Taking into account inter-electronic forces, an expression is derived for the resistance of metals as a function of the temperature. The resulting formula can be written  $R = \alpha T^2 + \beta T^3$ . The term  $\alpha T^2$  is that attributable to inter-electronic action. This formula agrees well with experimental values of the resistance of platinum at temperatures down to 20° abs. An expression is derived for the thermoelectric power at a junction at low temperatures; the expression satisfies the Thomson-Onsager relations.—J. S. G. T.

Zhur. Fiz.

A S-M-S-L-A METALLURGICAL LITERATURE CLASSIFICATION

E-Z METALLURGICAL

INDEX AND IMP. ORDER      PROPERTIES AND PROPERTIES INDEX

M 1

\*On the Properties of Metals at Very Low Temperatures. I. Landau and I. Pomeranchuk (*Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki (J. Exper. Theoret. Physics)*, 1937, 7, (3), 379-380).—[In Russian.] See abstract from a German source, *Mét. Abs.*, this vol., p. 81—N. A.

Zhurn. Eksp. i Teor. Fiz.,

ASB. S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

LITERATURE INDEX

LITERATURE INDEX	LITERATURE INDEX	LITERATURE INDEX
LITERATURE INDEX	LITERATURE INDEX	LITERATURE INDEX

PROCESSING AND PROPERTIES INDEX

131 AND 130 ORDERS
130 AND 4TH ORDER

Ja

Akhiezer  
 A 53  
 Zhuravil' b b

3998. Coherent Scattering of  $\gamma$ -Rays by Nucl. A. Achleser and I. Pomerantchuk. *Phys. Zits. d. Sowjetunion*, 11, 5, pp. 478-497, 1937. In German.—A theoretical investigation is made of the coherent scattering of  $\gamma$ -rays by nucl. using a vector matrix method. The possibility of this process of scattering follows from the Dirac theory of positrons. An assumption of intermediate energy states for the electrons is used in the development of the argument. Two particular cases are considered: firstly that of large frequencies ( $h\nu \gg mc^2$ ),  $\omega$  being the frequency while the other symbols have their usual meanings. In this case small scattering angles are of primary importance. The differential scattering cross-section is then inversely proportional to the square of the scattering angle. The total cross-section is found to have the form  $\sigma = \sigma_0 Z^2 (c^2/\omega^2) \log(h\nu/mc^2)$ , where  $Z$  is the atomic number,  $\sigma_0$  the fine structure constant and "a" a constant whose evaluation is very difficult. The second case considered is that for small frequencies, i.e.,  $h\nu \ll mc^2$ , where the total cross-section is given by  $\sigma = bZ^2(e^2/mc^2)\omega^2/c^4$  where  $e$  is the charge on the electron and "b" an undetermined numerical coefficient. The integral cross-section has a maximum at  $h\nu \sim mc^2$ . G. O. H.

ASO-SLA METALLURGICAL LITERATURE CLASSIFICATION

E-27777-22722

1 2 3 4 5 6 7 8 9 10 11 12 M 13 N 14 O 15 P 16 Q 17 R 18 S 19 T 20 U 21 V 22 W 23 X 24 Y 25 Z AA BB CC DD EE											
1ST AND 2ND ORDERS											
PROCESSES AND PROPERTIES INDEX											
3											
CA											
Scattering of slow neutrons in the crystalline lattice. I. Ya. Pomeranichuk. <i>Bull. acad. sci. U. R. S. S. R., Classe de math. nat., Sér. phys.</i> 1938, 1890 (in English 189 00); cf. <i>C. A.</i> 32, 4425. - It is pointed out that scattering of slow neutrons by a crystal lattice depends on the presence of isotopes or magnetic moments of nuclei in the lattice. S. L. Madorsky											
Vz. Ak. Nauk SSSR, Ser. Fiz.											
METALLURGICAL LITERATURE CLASSIFICATION											
1ST AND 2ND ORDERS											
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE											
1ST AND 2ND ORDERS											
1 2 3 4 5 6 7 8 9 10 11 12 M 13 N 14 O 15 P 16 Q 17 R 18 S 19 T 20 U 21 V 22 W 23 X 24 Y 25 Z AA BB CC DD EE											

POMERANCHUK, I.

BT-463 POMERANCHUK, I.  
[The scattering of slow neutrons in a  
crystalline lattice] O rasseyanií medlen-  
nykh neutronov v kristallicheskoi rešetke.  
Zhurnal Eksperimental'noi i Teoreticheskoi  
Fiziki, 8(8-9): 894-906, 1954. [19 pages]

Available: Scientific Translations Center L.C.

Source of Reference: Scientific Translations List #4, Jan 1954

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

PROCESSES AND PROPERTIES

Ch

3

Fig.

Scattering of slow neutrons in a crystal lattice. I. Pomeranchuk. *Physik. Z. Sowjetunion* 13, 65 (1958) (in English).—Math. The probability of elastic re. in elastic scattering is detd. and compared with that for capture. At  $K^0 > E > KT$  ( $E$  = energy of the neutron,  $\theta$  = the Debye temp. of the lattice) the capture probability becomes greater than the inelastic scattering and thermal equil. between the neutrons and the crystal lattice cannot be reached. Gregg M. Evans

ASAP-51A METALLURGICAL LITERATURE CLASSIFICATION

GROUPS

LETTERS

1ST AND 2ND ORDERS										PROCESSES AND PROPERTIES INDEX										3RD AND 4TH ORDERS									
1 2 3 4 5 6 7 8 9 10 11 12 M 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 M 33 34 35 36 37 38 39 40 41 42 43 44 45																													
CA										No. 8, No. 11										2									
Common Elements										<p>Effect of a magnetic field on the electrical conductivity of bismuth single crystals at low temperatures. H. Davydov and I. Pomeranchuk. <i>J. Exptl. Theoret. Phys.</i> (U. S. S. R.) 9, 1284-1288 (1959) (in Russian); <i>J. Phys.</i> (U. S. S. R.) 2, 147-60 (1960) (in English).—The effect of the quantization of electrons on the increase in the residual resistance in a transverse magnetic field is considered, assuming the conduction electrons and the pos. holes in Bi to be few and about equal in no. The wave functions are detd. for "tightly bound" Bloch electrons of low energy in a magnetic field, and their analogy to the function for free electrons having anisotropic masses is pointed out. The no. of collisions responsible for the residual resistance is shown to depend only on the energy of the electrons. Based on exptl. evidence and assuming that only quantization in the higher zone is of any importance (due to the small effective mass of the electrons) the authors believe that the oscillations become superimposed on the parabolic growth of the resistance. The degeneracy temp. is found to be about 70°K, and the no. of electrons about <math>10^{-4}</math> per atom. At higher temps. the no. of free electrons was found to vary as <math>T^{3/2}</math>, which would account for Hall's coeff. increasing with decreasing temp. Frank Gonet</p>										Zhur. Eksp. i Teor. Fiz.									
Common Elements										Common Elements										Common Elements									
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION										E-277																			
1ST AND 2ND ORDERS										3RD AND 4TH ORDERS										1ST AND 2ND ORDERS									
1 2 3 4 5 6 7 8 9 10 11 12 M 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 M 33 34 35 36 37 38 39 40 41 42 43 44 45																													

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX 180 AND 4TH ORDERS

BC

No. 1

Zhur. Fiz.

Maximum energy which primary electrons of cosmic rays can have on the earth's surface due to radiation in the earth's magnetic field. I. Pomerantchuk (*J. Physics, U.S.S.R.*, 1946, 2, 66-69).—The radiation of the primary electrons of cosmic rays in the earth's magnetic field is considered. Calculation based on classical electrodynamics indicates that the radiation will play an important rôle beginning with electron energies of  $10^8$  e.v. The electron energy,  $E_e$ , at the earth's surface is due to this radiation, related to its energy at infinity,  $E_0$ , by  $E_e = E_0 E_0 / (E_0 + E_e)$ , where  $E_0$  is  $\sim 10^8$  e.v. and depends on geomagnetic latitude and the angle of incidence of the electron. The spectrum of primary electrons entering the earth's atm. may have energies  $\sim 10^8$  e.v. due to radiation in the magnetic field. W. R. A.

ASME-ISA METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS      PROCESSES AND PROPERTIES INDEX

a-7

BC

No. 7

Date. AN SSSR,

**Tracks of the mesotron were observed in an expansion chamber.**  
**A. Migdal and J. J. Frenkel (USSR) (Comp. rend. Acad. Sci. U.S.S.R., 1948, 17, 448-449).** -- The absence of electron tracks at the ends of mesotron tracks in cloud-chamber photographs may be explained by diffusion of the mesotron over a considerable distance after its energy has decreased too far for it to produce appreciable ionization, and before disintegration occurs. The distance covered in this diffusion region is calc. as  $\sim 1 \cdot 10^6$  cm. for  $E = 10$  kv. in air. I. J. J.

A 18-15A METALLURGICAL LITERATURE CLASSIFICATION

FROM SOURCE  
 FIRST OF ONE

MATERIAL INDEX

GROUP

POMERANCHUK, I.

SA

765 536.212.3  
 Thermal conductivity of dielectrics at temperatures higher than the Debye temperature. POMERANCHUK, I. *J. Phys., U.S.S.R.*, 4, 3, pp. 259-268, 1941.—The thermal conductivity of dielectric crystals at high temperatures depends on the dispersion of sound waves in the crystal. If the dispersion curve does not satisfy certain conditions, the thermal resistance of the crystal is proportional to  $T^{-1/2}$  as against  $T$  in the case considered by Peierls. R. P.

Zhur. Fiz.,

A 52  
J

Also in Zhur. EKSPER. i Teoret. Fiz, 11, Nos. 2-3, 1941

10  
2

POMERANCHUK, I. J.

SA

766

536.212.3

Thermal conductivity of the paramagnetic dielectrics at low temperatures. POMERANCHUK, I. J. *Phys. U.S.S.R.*, 4, 4, pp. 356-374, 1941.—In the temperature range in which the magnetic energy of a paramagnetic crystal gives an important contribution to its heat content, the transport of magnetic energy

also gives an important contribution to the thermal conductivity. The temperature dependence of this effect is very complicated, and observations on this would allow one to draw conclusions about the magnetic forces.

R. P.

Also in Zhur. EKSPER. i Teoret. Fiz., Vol. 11, No. 2-3, 1941

PROCESSED AND PROPERTY INDEX

534.37

SA

A 53  
h

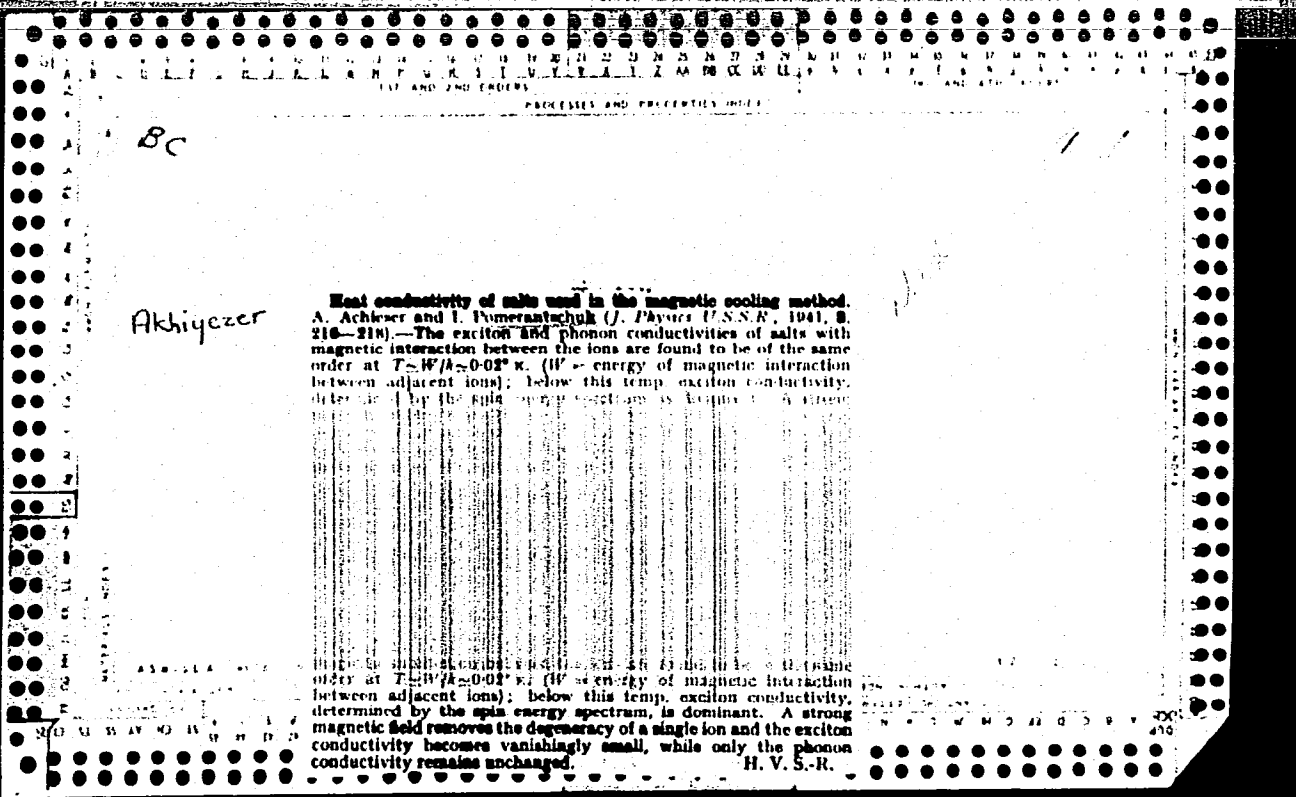
410  
 Small observations. Pomeranchuk, I. J. *Zh. Eksp. i Teoret. Fiz.*, 11, No. 4, 1941. — A  
 An ideal  
 in the  
 analysis is  
 determined by  
 only if a  
 condition  
 caused by  
 dependence  
 as given by Akhiser.

G. E. A.

Also in Zhur. EKSPER. i Teoret. Fiz., 11, No. 4, 1941

METALLURGICAL LITERATURE CLASSIFICATION

ASS-514



POMERANCHUK, I. Ya.

The Physical Review, 1941, Vol 60, pp 820-821, The Thermal Conductivity of Dielectrics (P. N. Lebedev Physical Institute, Academy of Sciences of U.S.S.R., Moscow).

In English; available at Battelle Memorial Institute.

57

1302  
J

536.212.3 1109  
On the thermal conductivity of the dielectrics at  
temperatures lower than the Debye temperature.  
PUMIRANCHIK, I. J. *J. Phys., USSR*, 6, 5, p. 225,  
1942.

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

147080 #2	193000 #2 ONY Del	01111101	1111111 Out ONY 111
147080 #2	193000 #2 ONY Del	01111101	1111111 Out ONY 111

POMERANCHUK, I. J.

SA

536.21 : 548.0 : 537.226

191

Thermal conductivity of dielectrics at temperatures lower than that of Debye. POMERANCHUK, I. *J. Phys., USSR*, 6, 6, pp. 237-250, 1942.—A mathematical discussion is given of the dependence of the thermal conductivity of dielectrics on the temperature and on the impurities conc. at temperatures below the Debye temp. Under impurities are included chemical impurities, lattice defects, isotopes, etc. At the low temperatures considered, dielectrics possess the true thermal conductivity which only depends on the body dimensions within a narrow range of extremely low conc. of impurities. For high impurity conc. the thermal conductivity varies as  $\sqrt{L}$ , where  $L$  is a measure of the linear dimensions of the crystal. A temperature range exists where the thermal conductivity does not depend on temp. and this affords an explanation of the anomalous behaviour of the thermal conductivity of diamond. A. W.

A53  
J

10

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A53



POMERANCHUK, I. Ya.

Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki, 1942, Vol 12, No. 10, pp 419-424

Heat Conductivity of Dielectrics at High Temperatures (Fizicheskii Institut Akademii  
Nauk S.S.S.R.).

1ST AND 2ND ORDERS      3RD AND 6TH ORDERS

PROCESSES AND PROPERTIES INDEX

BC

a-1

*Handwritten:*  $\frac{1}{2} \text{ mol}$

**THE MECHANISM OF DIFFUSION AT HIGH TEMPERATURES. I.**  
**Temperature Dependence of Diffusion Coefficients.**—The  
 temperature dependence of the diffusion coefficients,  $D$ , for  
 the diffusion of  $\text{Na}^+$  and  $\text{K}^+$  ions in  $\text{NaCl}$  and  $\text{KCl}$ ,  
 respectively, is given by the Arrhenius equation,  $D = D_0 \exp(-Q/RT)$ .  
 The activation energy  $Q$  for the diffusion of  $\text{Na}^+$  ions in  
 $\text{NaCl}$  is 1.1 eV, and for the diffusion of  $\text{K}^+$  ions in  
 $\text{KCl}$  is 1.1 eV. The values of  $D_0$  are in agreement with  
 experimental values for  $\text{NaCl}$ ,  $\text{KCl}$ ,  
 and  $\text{AgCl}$ .  
 L. I. I.

450-514 METALLURGICAL LITERATURE CLASSIFICATION

FROM SOURCE

1950-51

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1ST AND 2ND ORDERS      PROCESSES AND PROPERTIES INDEX

**Theory of absorption of infrared rays in crystals possessing a center of symmetry. I. Pomeranchuk. *J. Phys.* (U. S. S. R.) 7, 203-5(1943) (in English).—Theoretical-math. It is shown that in crystals having a center of symmetry the absorption of infrared rays is impossible if the simple anharmonic coupling between the forced vibrations excited by an electromagnetic field and the remaining vibrational degrees of freedom of the crystal is considered. The width of the absorption lines of the infrared rays is detd. not by the cubic anharmonicity as in Pauli's theory but by the anharmonicity of the fourth order; therefore, at high tempo., the width of infrared absorption lines must be proportional to the square of the temp. Also in *J. Exptl. Theoret. Phys.* (U. S. S. R.) 13, 428-31(1943). F. H. R.**

*Also in Zhur. EKSPER. i Teoret. Fiz., 13, No. 11-12, 1943*

ASB-31A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS      PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS  
PROCESSES AND PROPERTIES INDEX

A-1

19c

**Dependence of sound absorption in dielectrics on frequency and temperature.** I. Jumorantachuk (*J. Physics, U.S.S.R.*, 1963, 7, 266-271).—The influence on sound absorption of the collision of four phonons, due to a process of the second order of the perturbation theory, is determined. The dependence of the sound absorption on the frequency and temp. is determined (i) within the range of frequencies for which the sound is a sound field, and (ii) within the range of frequencies for which with respect to certain phonons the sound is a sound field while with respect to other phonons it is a phonon. The presence of sound dispersion is discussed.  
H V. S.-R.

A S 51.4 METALLURGICAL LITERATURE CLASSIFICATION

A S 51.4 METALLURGICAL LITERATURE CLASSIFICATION												A S 51.4 METALLURGICAL LITERATURE CLASSIFICATION											
1ST AND 2ND ORDERS												1ST AND 2ND ORDERS											
A S 51.4 METALLURGICAL LITERATURE CLASSIFICATION												A S 51.4 METALLURGICAL LITERATURE CLASSIFICATION											

1ST AND 2ND ORDERS PROCESSES AND PROPERTIES INDEX

Doc. AN SSSR.  
№ 1

Spectrum of the soft component [of cosmic radiation] in air at high energies. I. Pomeranchuk and A. Kipichev. *Compt. rend. acad. sci. U.R.S.S.*, 41, 408 (1943).  
 --The spectrum of decay electrons arising immediately from mesotron disintegration is used to calculate the spectrum of the soft component. The no. of particles of energy greater than the crit. energy ( $\epsilon$ ) is appreciable, e.g., 12-13% of the total soft charged component due to mesotron decay comprises particles with energy greater than  $4\epsilon$  at sea level. B. C. P. A.

METALLURGICAL LITERATURE CLASSIFICATION

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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

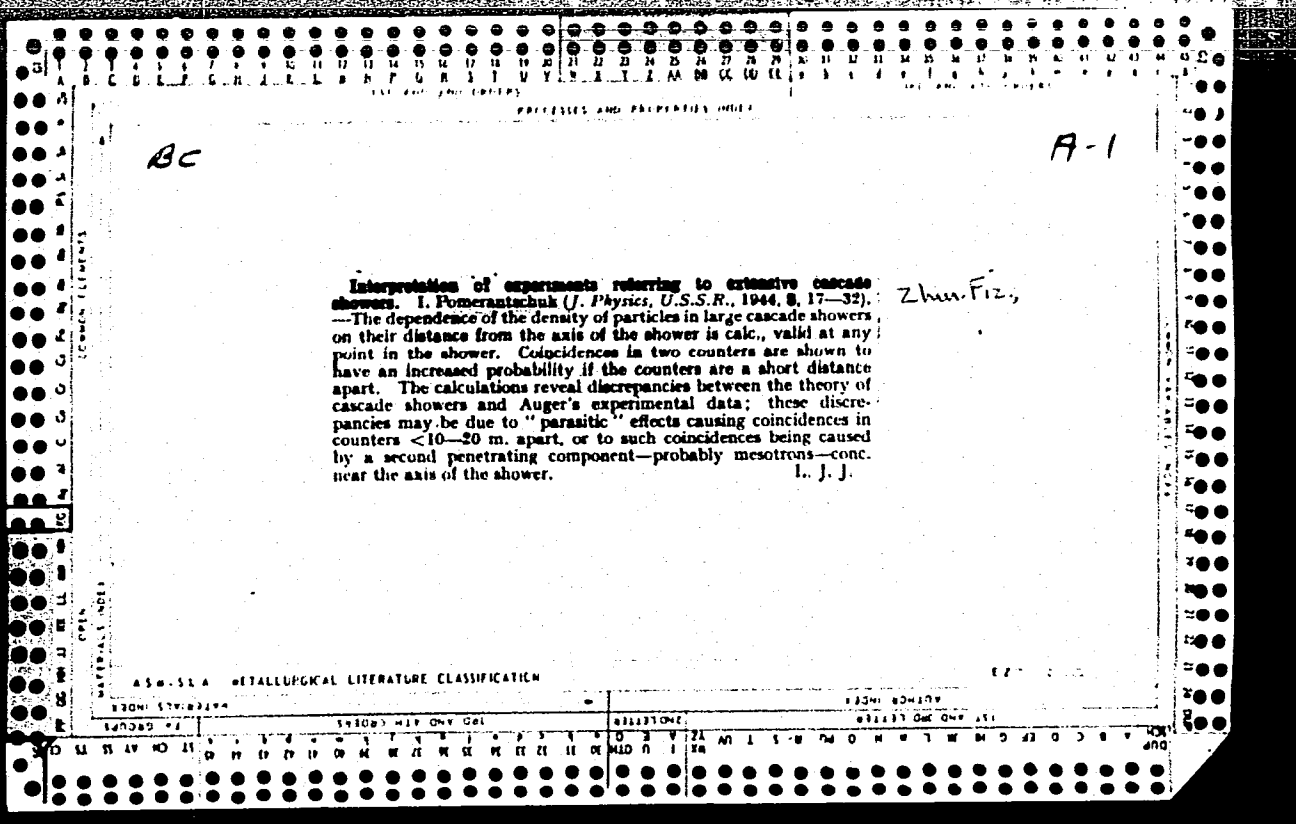
Ca

Coulomb forces and structure of the neutron. I. Ya. Pomeranchuk. *Doklady Akad. Nauk S. S. R.* 41, 102-5 (1943); *Compt. rend. acad. sci. U. R. S. S.* 41, 151-7 (1943) (in English). A math. analysis is given of the meson field surrounding the proton and the neutron. It is shown (1) that the difference between the masses of neutron and a proton can be explained directly with the aid of scalar mesons; (2) that pseudoscalar mesons give an incorrect value for the above-mentioned difference and also for the neutron's anomalous magnetic moment and (3) that this anomalous moment is given correctly only as to order of magnitude by scalar mesons. I. W. Petty

№. 4

ASU.S.S.R. METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS



1ST AND 2ND ORDERS      3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

2

Akhiezer ←

Thermal equilibrium between spins and the crystal lattice. A. Akhiezer and I. Pomeranchuk. *J. Exptl. Theoret. Phys. (U.S.S.R.)* 14, 948-52; *J. Phys. (U.S.S.-Sov. Phys.)* 8, 308-12 (1944). — Magnetic cooling lowers primarily the temp. of the spins which in a secondary process cool the lattice. The rate of this secondary process is calcd. under the assumption that in any given moment there are two thermal equilibria within the crystal, one among the two thermal equilibria within the lattice elements. Then a definite mechanism is postulated for the energy transfer from the lattice to the spins, and it is concluded that the secondary process is completed in approx. 1 sec. J. J. Bierman

E-2 (1954)

METALLURGICAL LITERATURE CLASSIFICATION

MATERIALS INDEX

COMMON VARIABLE INDEX

COMMON ELEMENT

COMMON VARIABLE



PROCESS AND PROPERTIES INDEX

1ST AND 2ND ORDERS

1ST AND 2ND ORDERS

BC A-1

Kirpichev  
 Theory of transition effects in cosmic rays. A. Kirpichev and I. Zhuravitschuk. (Compt. rend. Acad. Sci. U.R.S.S., 1944, 29, 385-385).—The shape of the Rossi curve relating no. of showers to thickness of screen for transition of cosmic rays from one medium to another of different at. no. is considered for screen thicknesses beyond the max. of the curve. The theory gives a ratio 14.4:1 between the max. and the tail of the curve for air and Pb, compared with an experimental val. 7:1. L. I. I.

no. 9 Dokl. AN SSSR,

P. N. Lebedev Physical Inst., Akad. Sci

V. M. MILOTOV YEREVAN STATE UNIV 1943

ASB-3LA METALLURGICAL LITERATURE CLASSIFICATION

E-2

MATERIALS INDEX												PROCESS AND PROPERTIES INDEX											
1ST AND 2ND ORDERS												1ST AND 2ND ORDERS											
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA AB AC AD AE AF AG AH AI AJ AK AL AM AN AO AP AQ AR AS AT AU AV AW AX AY AZ BA BB BC BD BE BF BG BH BI BJ BK BL BM BN BO BP BQ BR BS BT BU BV BW BX BY BZ CA CB CC CD CE CF CG CH CI CJ CK CL CM CN CO CP CQ CR CS CT CU CV CW CX CY CZ DA DB DC DD DE DF DG DH DI DJ DK DL DM DN DO DP DQ DR DS DT DU DV DW DX DY DZ EA EB EC ED EE EF EG EH EI EJ EK EL EM EN EO EP EQ ER ES ET EU EV EW EX EY EZ FA FB FC FD FE FF FG FH FI FJ FK FL FM FN FO FP FQ FR FS FT FU FV FW FX FY FZ GA GB GC GD GE GF GG GH GI GJ GK GL GM GN GO GP GQ GR GS GT GU GV GW GX GY GZ HA HB HC HD HE HF HG HH HI HJ HK HL HM HN HO HP HQ HR HS HT HU HV HW HX HY HZ IA IB IC ID IE IF IG IH II IJ IK IL IM IN IO IP IQ IR IS IT IU IV IW IX IY IZ JA JB JC JD JE JF JG JH JI JJ JK JL JM JN JO JP JQ JR JS JT JU JV JW JX JY JZ KA KB KC KD KE KF KG KH KI KJ KL KM KN KO KP KQ KR KS KT KU KV KW KX KY KZ LA LB LC LD LE LF LG LH LI LJ LK LL LM LN LO LP LQ LR LS LT LU LV LW LX LY LZ MA MB MC MD ME MF MG MH MI MJ MK ML MN MO MP MQ MR MS MT MU MV MW MX MY MZ NA NB NC ND NE NF NG NH NI NJ NK NL NM NO NP NQ NR NS NT NU NV NW NX NY NZ OA OB OC OD OE OF OG OH OI OJ OK OL OM ON OO OP OQ OR OS OT OU OV OW OX OY OZ PA PB PC PD PE PF PG PH PI PJ PK PL PM PN PO PP PQ PR PS PT PU PV PW PX PY PZ QA QB QC QD QE QF QG QH QI QJ QK QL QM QN QO QP QQ QR QS QT QU QV QW QX QY QZ RA RB RC RD RE RF RG RH RI RJ RK RL RM RN RO RP RQ RR RS RT RU RV RW RX RY RZ SA SB SC SD SE SF SG SH SI SJ SK SL SM SN SO SP SQ SR SS ST SU SV SW SX SY SZ TA TB TC TD TE TF TG TH TI TJ TK TL TM TN TO TP TQ TR TS TT TU TV TW TX TY TZ UA UB UC UD UE UF UG UH UI UJ UK UL UM UN UO UP UQ UR US UT UU UV UW UX UY UZ VA VB VC VD VE VF VG VH VI VJ VK VL VM VN VO VP VQ VR VS VT VU VV VW VX VY VZ WA WB WC WD WE WF WG WH WI WJ WK WL WM WN WO WP WQ WR WS WT WU WV WW WX WY WZ XA XB XC XD XE XF XG XH XI XJ XK XL XM XN XO XP XQ XR XS XT XU XV XW XX XY XZ YA YB YC YD YE YF YG YH YI YJ YK YL YM YN YO YP YQ YR YS YT YU YV YW YX YY YZ ZA ZB ZC ZD ZE ZF ZG ZH ZI ZJ ZK ZL ZM ZN ZO ZP ZQ ZR ZS ZT ZU ZV ZW ZX ZY ZZ																							

PROCESSES AND PROPERTIES INDEX

2

Akhiyevzer

Heat conductivity of salts used in the magnetic cooling method. A. Akhiyev and I. Pomeroyanov. *J. Phys. (U.S.S.R.)* 8, 218-18(1944). Theoretical. The heat cond. of salts with magnetic interaction between the ions is found in the temp. range  $T < W/h \sim 0.02^\circ$  not by the lattice oscillations but by the energy spectrum of the spin system. This part of the thermal cond. becomes vanishingly small in sufficiently strong magnetic fields. In this case phonon heat cond. only remains. H. C. Thomas

METALLURGICAL LITERATURE CLASSIFICATION

BC C-4

1918 [REDACTED] D. [REDACTED]

ASSOCIATION OF METALLURGICAL LITERATURE CLASSIFICATION

COMMON VARIABLE INDEX

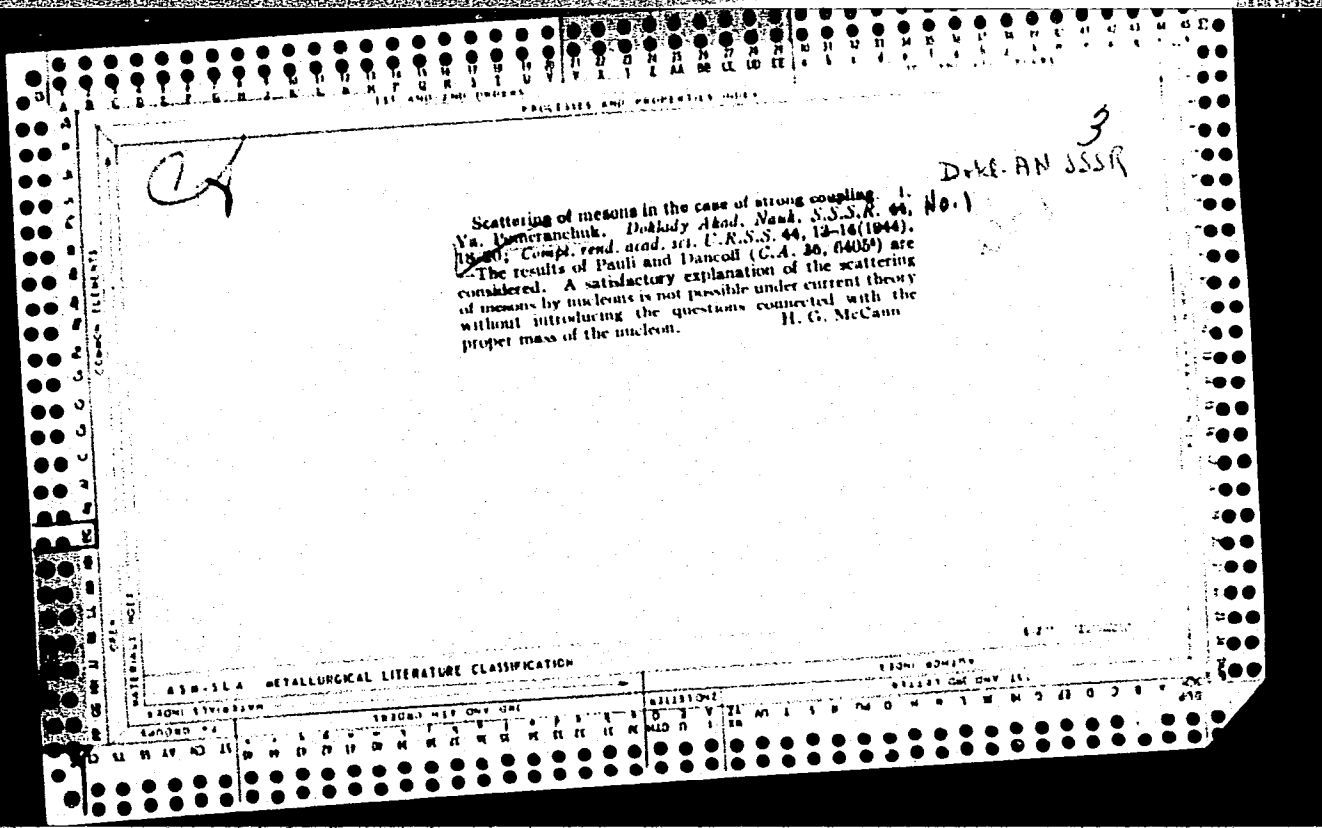
COMMON ELEMENTS

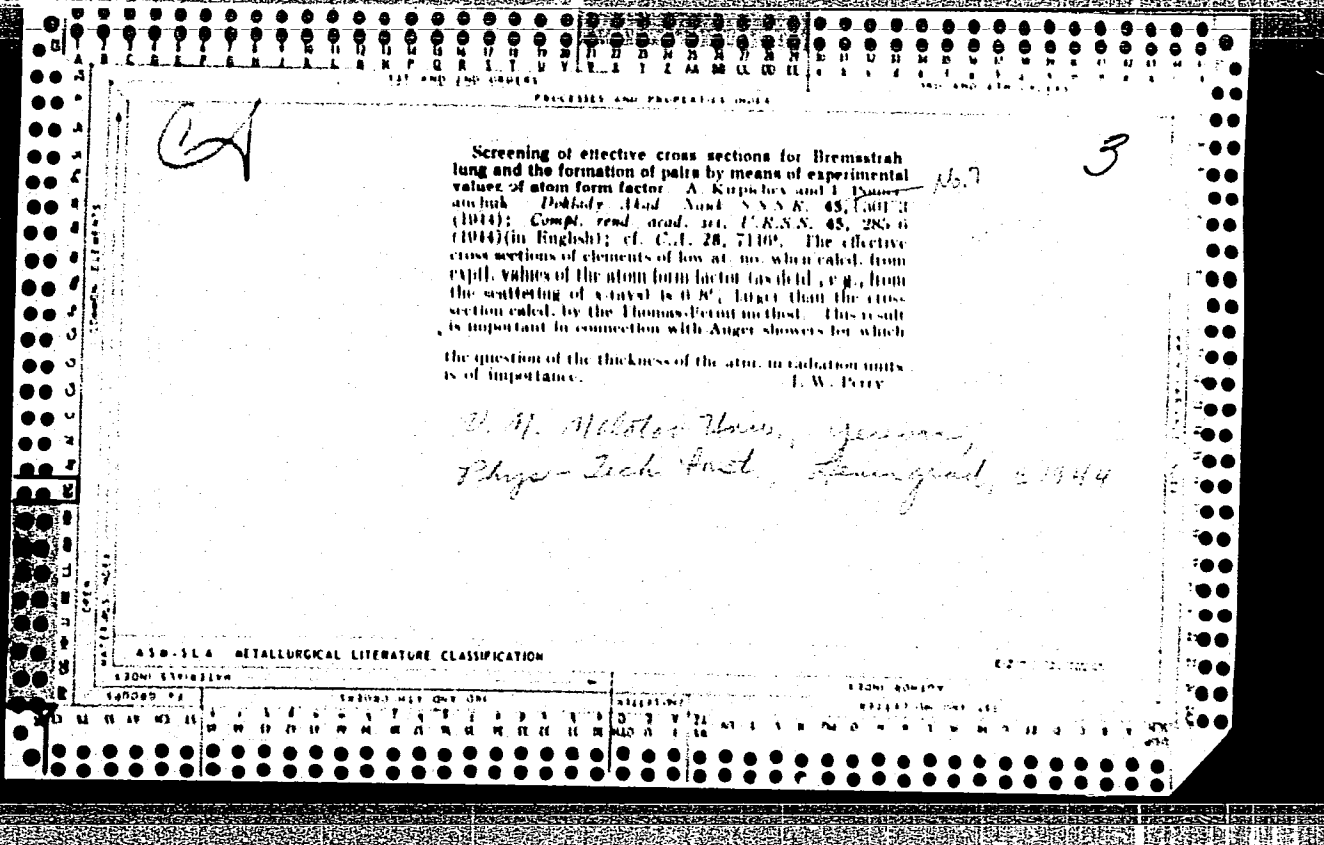
COMMON VARIABLE INDEX

ASSOCIATION OF METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON VARIABLE INDEX





PROCESSES AND PROPERTIES INDEX

AKHUCZEV

Zhur. Fiz. /

*M*

On the Thermal Conductivity of Bismuth. A. Akhiezer and I. Pomeranchuk (*J. Physics (U.S.S.R.)*, 1945, 9, (2), 93-100).—[In English.] A theoretical investigation of the dependence of the thermal conductivity of bismuth on temperature in different temperature regions. The thermal conductivity is regarded as made up from electronic contributions and lattice-vibration contributions. It is deduced that, for temperatures below the Debye characteristic temperature  $\theta$ , but above a critical temperature  $T_c$  which may be calculated, the thermal conductivity of bismuth is determined mainly by the lattice vibrations and not by the electrons, and that the conductivity increases with decreasing temperature. For temperatures below  $T_c$ , the thermal conductivity is determined mainly by the electrons, and decreases with decreasing temperature. These conclusions are discussed in relation to experimental work from other sources, which indicates that the thermal conductivity of bismuth has a maximum in the temperature region 4-14° K.

—G. V. R.

*Also in Zhur. EKSPER. i Teoret. Fiz., 15, No. 10, 1945*

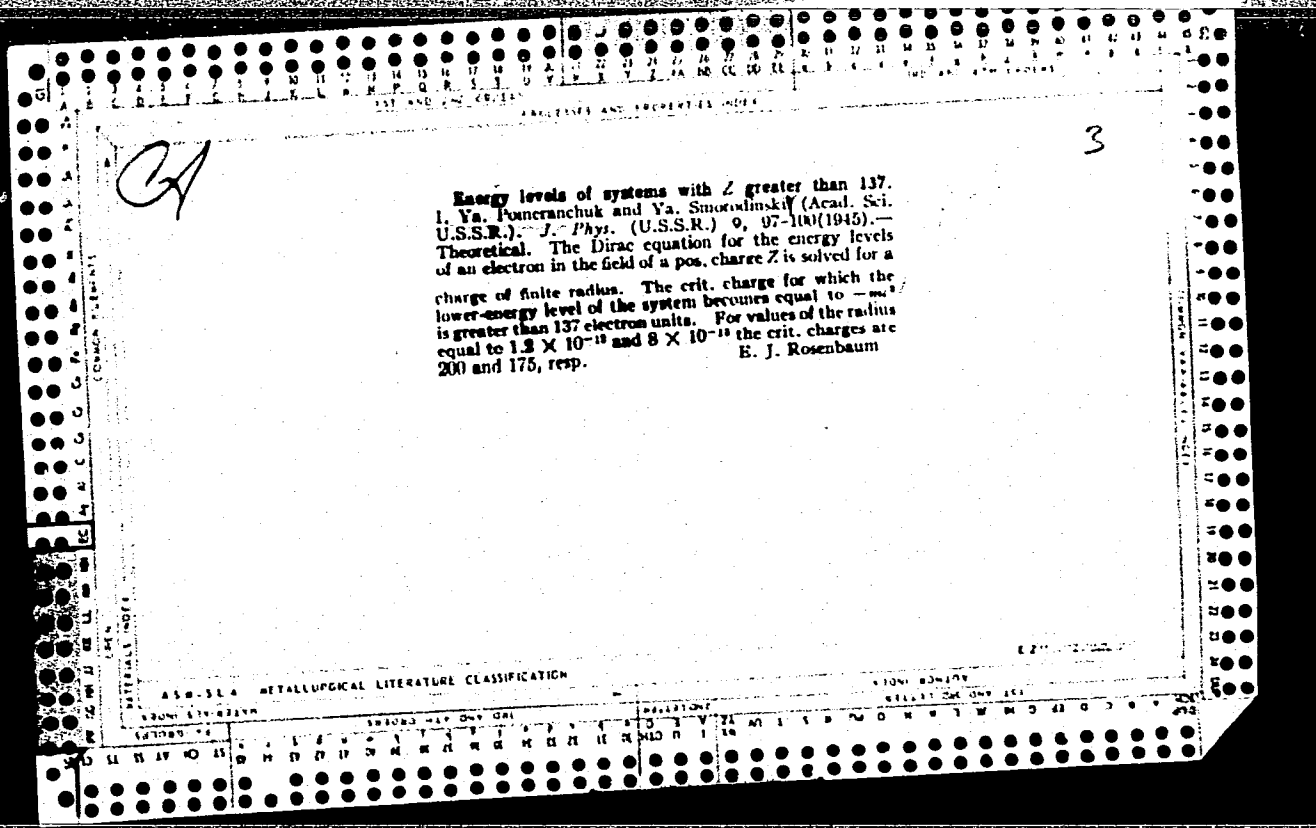
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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WE

General Physics

537.122:538.122  
The Radiation of Fast Electrons in the A. Quatic  
Field. -- L. Arrimovich & I. Pomeranchuk. (J.  
Phys., U.S.S.R., 1945, Vol. 9, No. 4, pp. 267-276.)  
The spectral and angular distribution is investigated.





3

AKHIYZER

Scattering of low-energy neutrons in helium. II. A. Akhiezer and I. Pomeranchuk (Phys. Tech. Inst., Acad. Sci. Ukrainian SSR). *J. Phys. (U.S.S.R.)* 9, 401-4 (1945).—Math. The scattering cross-section of He II for neutrons of energy less than 3.5°K. should be extremely small. A. O. Allen

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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SA

Akhiezer

AS3  
1

On the elastic scattering of fast charged particles by nuclei. Akhiezer, A., Ann. Phys., USSR, 9, 471 (1969). — The scattering of fast particles which can be absorbed by nuclei is considered. The picture of scattering is equivalent to the diffraction of charged waves by an absolutely black sphere. The formulas obtained are a generalization of the diffraction scattering of fast neutrons for the case of charged particles.

ASR-3LA METALLURGICAL LITERATURE CLASSIFICATION

SEARCHED	INDEXED	SERIALIZED	FILED

POMERANCHUK I. J.

Oct. 1975

USSR/Bismuth  
Conductivity, Thermal

"Thermal Conductivity of Bismuth," A. Akhiezer I. J. Pomeranchuk, 6 pp

"Zhur. Eksp<sup>15</sup>'i Teor. Fiz", Vol XV, No 10

Investigation showing that for temperatures satisfying the condition  $T > \hbar s n_e^{1/3} / k$  ( $\theta$  - Debye temperature,  $s$  - sound velocity,  $n_e$  - number of electrons in unit volume) the thermal conductivity of bismuth is determined by lattice vibrations, not by electrons.

PA 10T96

POMERANCHIK, I. J.

PA 11T31

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USSR/Fields, Electromagnetic  
Electrons - Measurements

Mar 1946

"Radiation of Relativistic Electrons in a Magnetic  
Field," I. J. Pomeranchuk, 3 pp

"Izv Ak.Nauk, Ser. Fiz." Vol X, No 3

Discussion of the electromagnetic mass and radius in  
the classical equation relating to energy, with  
relativistic corrections. New inequality relating  
work to electric charge, radius, magnetic field,  
mass, etc.

11T31

POMERANCHUK, I. Ya.

"On the Elastic Scattering of Fast Charged Particles by Nuclei," Zhur. Eksper.  
i Teoret. Fiz., 16, No. 5, 1946

"On the Scattering of Low Energy Neutrons in Helium II," Zhur. Eksper. i Teoret.  
Fiz., 16, No. 5, 1946.

POMERAVCHUK, I.  
POMERAVCHUK, I.

COMMON ELEMENTS  
OPEN  
VALS INDEX

*ArtSimovich*

Radiation of fast electrons in a magnetic field. I. *ArtSimovich* and *Pomeravchuk*. *J. Exptl. Theoret. Phys. (U.S.S.R.)* 16, 370-80 (1948); *J. Phys. (U.S.S.R.)* 9, 267-76 (1945) (in English).—The angular and the spectral distribution of the radiation emitted by fast electrons accelerated in a magnetic field is treated mathematically. Practically all the energy of the radiation is shown to be concentrated in the orbital plane. The frequency spectrum is shown to consist of equidistant lines. The main part of the radiation occurs in the region near the wave length that is equal to the radius of the orbit divided by  $(W/mc)^2$ , where  $W$  = energy of the electron. As long as interaction between electrons can be disregarded and fluctua-

tion follows Poisson's law, interference is absent and the radiation is proportional to the no. of the electrons. A criterion for the negligibility of the interaction is formulated and it is shown that it can be disregarded in the betatron. A formula is derived for the contraction of the orbit owing to radiation damping. Ways of counteracting the effect of the latter in the betatron, particularly with the aid of a supplementary high-frequency elec. field, are indicated. N. Thon

*Zhur. Isp. i Ten. Fiz.*  
*Modern Physics*  
*Tube Technology*

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SA

**ON THE HEAT CONDUCTIVITY OF SALTS USED IN THE MAGNETIC COOLING METHOD.**  
 Akhiezer, A., and Pomeranchuk, I. J. Phys., USSR, 8 (No. 4) 216-18 *Zhur. Fiz.*  
 (Abstr. 317 (1947)). The heat conductivity is due to (1) the oscillations  
 of the lattice and (2) the existence of the energy spectrum of the spin system.  
 The contributions from each of these sources is calculated, and it is shown  
 that in a certain temperature range only the contribution from the energy  
 spectrum is of importance. This assumes no magnetic field. But if such  
 a field is present in sufficient strength and contribution from (2) is ne-  
 gligible and it is necessary to consider the part arising from (1).  
 L.S.G.

ASP. 51A METALLURGICAL LITERATURE CLASSIFICATION

FROM DIVISION

SELECTED

FROM DIVISION

SELECTED

# POMERANCHUK, I

Pomeranchuk, I. Generalization of the  $\lambda$ -limiting process and uniqueness of the elimination of divergencies in the quantum theory of elementary particles. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 17, 661-674 (1947). (Russian)

In the case of a quantized scalar field  $\phi$  the  $\lambda$ -limiting process consists in replacing the commutation rules (for two world points  $\tilde{r}_1, \tilde{r}_2$ )

$$[\phi(\tilde{r}_1), \phi(\tilde{r}_2)] = \Delta_1(\tilde{r}_1 - \tilde{r}_2) \int_{\omega(k)} \frac{\sin(k \cdot \tilde{r}_1 - \tilde{r}_2)}{\omega(k)} dk$$

$$[\phi(\tilde{r}_1), \phi(\tilde{r}_2)] = \frac{1}{2} \{ \Delta_1(\tilde{r}_1 - \tilde{r}_2 + \lambda) + \Delta_1(\tilde{r}_1 - \tilde{r}_2 - \lambda) \}$$

$$= (2\pi)^{-3} \int \cos(k\lambda) \frac{\sin(k \cdot \tilde{r}_1 - \tilde{r}_2)}{\omega(k)} dk$$

by (1)

[For this formulation cf. Dirac, Ann. Inst. H. Poincaré 9, 13-49 (1939); Pauli, Rev. Modern Physics 15, 173-207 (1943); these Rev. 1, 94: 5, 277.] Here  $\omega$  is the scalar product of two four-vectors  $a, b$ ,  $\omega(k) = k^2 + \mu^2$ , where  $\mu$  is the rest mass of the field quanta;  $\lambda$  is a time-like four-vector which, in the computation of the physically relevant quantities is made to converge to zero. Thus integrals of the type  $\int_{\omega(k)} k_i \cos(k\lambda) dk$  are replaced by

$$I_i = \lim_{\lambda \rightarrow 0} \int_0^\infty k_i \cos(k\lambda) dk$$

but  $I_{i=4} = \infty$ , the  $\lambda$  limiting process removes "classical" but not the specifically quantum mechanical divergencies. Dirac's attempt to remove these by introducing

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negative probabilities, and thereby replacing in (2) the limits of integration by  $(-\infty, +\infty)$  [cf. Dirac, Proc. Roy. Soc. London, Ser. A, 189, 1-40 (1942); these Rev. 5, 277; W. Pauli, loc. cit.] gives rise to difficulties in the interpretation of the results of the theory and, moreover, does not lead to the elimination of the logarithmic divergencies which appear in the electron theory.

The author investigates the possibility of using a more general convergence factor without introducing negative probabilities. He replaces in the integral in (1)  $\cos(k\lambda)$  by  $D = \sum A_n(\lambda_n) \cos(k\lambda_n)$ , where  $\lambda_n$  are time-like four-vectors and  $A_n$  certain functions to be determined. Consequently, the commutation rules

$$[\varphi(r), \varphi(r')] = \frac{1}{2} \sum_n A_n(\lambda_n) \{ \Delta_1(r_1 - r'_1 + \lambda_n) + \Delta_1(r_1 - r'_1 - \lambda_n) \}$$

are obtained. The main results of the discussion are the following. (a) The modified integrals  $I_{2n}$  remain zero. (b) By an actual construction the author shows that it is possible to choose the vectors  $\lambda_n$  and the functions  $A_n$  so as to annul the first  $\beta$  integrals  $I_{2n+1}$  ( $0 \leq n \leq \beta - 1$ ), and even to remove the logarithmic divergencies. (c) It is also possible, however, to obtain arbitrary nonvanishing values for the  $I_{2n+1}$ . This constitutes the essential "nonuniqueness" of the proposed procedure. (d) Additional terms depending on space-like vectors  $\beta_n$  may be added to  $D$ . The limits obtained for the integrals  $I_{2n+1}$  depend then on the particular way the  $\beta_n$  tend to zero, which, in the author's opinion, seems to indicate that space-like vectors should not be used.

V. Bargmann (Princeton, N. J.)

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Source: Mathematical Reviews,

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C. A.  
1951

Elastic<sub>3</sub> Phenomena

Scattering of slow neutrons in crystals. A. I. Akhizer and I. Ya. Pomeranchuk (Acad. Sci. Ukr. S.S.R., Kiev). *Zhur. Eksp. Teor. Fiz.* 17, 709 (1947). - Formulas are derived for the cross sections of elastic and inelastic scattering of neutrons, in particular for neutron velocities much smaller than the velocity of sound in the crystal. If the wave length of the neutron is much smaller than the lattice const., the scattering is the same in crystals with identical nuclei or with nuclei differing in at. wt. (isotopes) and magnetic moment. With only one-phonon processes taken into account, the ratio of the cross sections of inelastic and elastic scattering is  $(8 m/7 M) (E/\theta)^2$ , where  $m$  = mass of the neutron,  $E$  = its energy,  $M$  = mass of the nucleus,  $\theta$  = Debye temp. At energies  $E \gg M\theta/m$ , the scattering is the same without regard to the binding of the atoms in the crystals. For low  $E \ll \theta$ , the energy transferred to the lattice is of the order of the total energy of the neutron.

N. Thon

Also in *Zhur. Fiz.*, XI, No. 2

ПОПОВ И ПИКОЧУК I

3  
IRML

V 7894

CERTAIN PROBLEMS ON NUCLEAR THEORY. A.

NU Akhiezer and I. Pomeranchuk. Moscow-Leningrad, Gostekhizdat, 1943. 370p. (In Russian) (Book on display at Geneva Conference)

Results on scientific achievements in the nuclear theory— a summary of publications on this subject. Processes in which neutrons participate; interaction between neutrons and protons, statistic properties of heavy nuclei, resonance phenomena, division of heavy nuclei, interaction of slow neutrons with substance; reaction of fission of fast neutrons in coulomb nuclear fields. (publisher's note)

and (1) PLW

POMERANCHUK, I.

USSR / Nuclear Physics - Neutrons, May 48

Refraction, Nuclear Physics - Neutrons, Velocity

"Neutron Refraction," A. Akhizer, I. Pomeranchuk, 4 pp

"Zhur Eksp 1 Teoret Fiz" Vol VIII, Vol 5

PA 7/49T89

Derives formulas for the index of refraction of slow neutrons for ordinary crystals and magnetized substances (ferromagnetics and paramagnetics). In the latter case the index of refraction and also the angle of total reflection depend on the orientation of the spin of the neutrons with respect to

7/49T89

USSR / Nuclear Physics - Neutrons (Contd) May 48

the vector of magnetic induction. This representation can be employed for obtaining complete polarization of a beam of neutrons.

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PA 9/49T78

USSR/Nuclear Physics - Particles, Elementary  
Nuclear Physics - Dispersion Jul 48

"Theory of the Resonance Dispersion of Particles,"  
A. Akhiezer, I. Pomeranchuk, Phys-Tech Inst, Acad  
Sci Ukrainian SSR, 6 pp

"Zhur Eksp 1 Teoret Fiz" Vol XVIII, No 7

Studied problem of resonance dispersion of slow  
particles. Only two of general laws of dispersion  
of slow particles by nuclei are feasible, namely;  
(1) dispersion, where amplitude is result of ampli-  
tudes of resonance and potential dispersion; and (2)

9/49T78

USSR/Nuclear Physics - Particles, Elementary (Contd) Jul 48

dispersion of slow neutrons by protons. Effective  
terminal radius of nuclear force is presented  
simply without any special assumptions.

9/49T78

POMERANCHUK, I.

PA 9/49107

USSR/Physics  
Trajectory Determination  
Particles, Charged - Trajectories

Aug 48

"Fluctuations in Ionized Trajectories," I.  
Pomeranchuk, Acad Sci USSR, 8 pp

"Zhur Eksper 1 Teoret Fiz" Vol XVIII, No 8

Discusses effect of multiple scattering on ionized trajectory. Expression for extension of average caused by multiple scattering and also for fixed quadratic fluctuation of trajectory length for fixed starting and terminal points. Describes fluctuation during generation of  $\beta$ -particles in thick layers of matter. Establishes distribution of probable

9/49789

Aug 48

USSR/Physics (Cont'd)

Losses of energy in this case and expresses values in Gauss. Discusses limits of accuracy in determining quiescent masses during measurement of filter thickness which absorbs particles with fixed impulse.

POMERANCHUK, I.

9/49789

POMERANCHUK, I.

PA 25/49T88

USSR/Nuclear Physics -- Elementary Particles Dec 48

"An Observation on the Dispersion of Particles With Zero Energy," I. Pomeranchuk, Acad Sci USSR, 1 p

*Jan*  
"Zhur Eksper i Teoret Fiz" Vol XVIII, No 12

Points out several inequalities which must satisfy effective cross sections of dispersion of thermal particles in a strong field of such a nature that connective levels do not exist. Submitted 22 Sep 48.

~~25/49T88~~  
25/49T88

1ST AND 2ND ORDERS      PROCESSES AND PROPERTIES INDEX      3RD AND 4TH ORDERS

1608. On the Movement of Foreign Particles in Helium II, by L. Landau and I. Pomeranchuk. Doklady Akademi Nauk SSSR 59, p. 669-670, February 1, 1948. (In Russian) AN SSSR.

J. Frank (Physical Review 70, p. 561, 1946) has suggested a method of enrichment of the isotope  $He^3$  present in very small quantities in helium, on the theory that  $He^3$  can have no superfluid properties and cannot therefore share in the superfluid movements of helium II. Daunt et al. (Physical Review 72, p. 502, 1947) have confirmed experimentally the possibilities of the method. The present author questions the theoretical explanation given by the previous writers and shows that any atoms, whether superfluid or not, when present in small quantities in  $He^2$ , cannot accompany the latter in its superfluid movement.

ASB-31A METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS      3RD AND 4TH ORDERS



PA 62193

POMERANCHUK, I.

USSR/Nuclear Physics - Electrons - Annihilation Apr 1948  
Nuclear Physics - Positrons - Annihilation

"Principles of Selection in the Annihilation of  
Electrons and Positrons," I. Pomeranchuk, 3 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LX, No 2

Describes studies conducted to confirm the findings  
of Dirac in subject field of science. Submitted by  
Academician L. D. Landau, 5 Feb 1948.

62193

PA 30/49 194

USSR/Physics  
Sound - Speed  
Helium II

Jan 49

"The Effect of Admixtures on the Thermodynamic Properties and Speed of the Second Sound in Helium II," I. Pomeranchuk, Acad Sci USSR, 12 pp

"Zhur Eksper 1 Teor Fiz" Vol XIX, No 1

Admixtures in helium II enter into its normal component. Since the normal component of helium II, due to photons and rotons, falls rapidly as temperature is lowered, and the contribution of admixtures to the normal component does not decrease (or even increase) with fall in temperature, small

30/49194

Jan 49

USSR/Physics (Contd)

amounts of admixtures cause large alterations in thermodynamic properties of helium II, and in the speed of second sound. Determines conditions under which classical statistics can be applied to describe the behavior of admixtures. Calculates contribution of admixtures to normal density, entropy and specific heat. Establishes system of hydrodynamic equations describing weak solutions and taking account of the osmotic pressure of admixtures. Finds expression for speed of secondary sound  $v_2$  in presence of admixtures. Shows that, when  $T \rightarrow 0$ ,  $v_2$  decreases to very small values, in contrast to pure helium II in which  $v_2 \rightarrow 0$ . Determines  $v_2$  in case when the impure gas has completely degenerated (quantum solution). Submitted 9 Jul 48.

30/49194

POMERANCHUK, I

PA32/49177

POMERANCHUK, I.

USSR/Nuclear Physics - Electrons, Feb 49

Positive  
Nuclear Physics - Atomic Disintegration

"The Lifetime of Slow Positrons," I. Pomeranchuk,  
Acad Sci USSR, 1 p

"Zhur Eksper i Teoret Fiz" Vol XIX, No 2

The life of slow positrons  $T$  is sometimes determined from formula  $T = \frac{1}{N Z \sigma v}$ , where  $N$  = number of nuclei,  $Z$  = atomic number,  $\sigma$  = annihilation cross section of positron and electron, and  $v$  = speed of positron. However, this does not take account of the repulsion experienced

32/49177

USSR/Nuclear Physics - Electrons - Positive (Contd) Feb 49

by positron located within the atom. Discusses effect of this phenomenon. Submitted 2 Dec 48.

32/49177

POMERANCHUK, I.

FA 170T86

USSR/Nuclear Physics - Neutrons Jun 49

"Determining the Nonelectromagnetic Interaction  
Between Electrons and Neutrons," A. Akhiezer,  
I. Pomeranchuk, Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol XIX, No 6,  
pp 558-9

Discusses Fermi and Marshall's study of asym-  
metry of cross section of thermal neutrons in  
Xenon ("Phys Rev" 72, 1139, 1947). Agree in  
the order of magnitude of quantities studied.  
Submitted 9 Mar 49.

170T86

POMERANCHUK, I.

PA 51/49T70

USSR/Physics  
Second Sound  
Semiconductors

Jul 49

"Bibliography of Material Available at the Scientific Library of the Physicotechnical Institute, Academy of Sciences USSR" 15 pp

"Zhur Tekh Fiz " Vol XIX, No 7

Includes articles: I. Pomeranchuk's "Influence of Admixtures on the Thermodynamic Properties and Speed of Second Sound in Helium," V. A. Fok's "Movement of Ions in Plasma," and I. N. Dykman's "Theory of Photo- and Secondary Electron Emission from Effective Semiconducting Emitters."

PA 51/49T70

PROCESSES AND PROPERTIES INDEX

1ST AND 2ND ORDERS

100 AND 2TH ORDERS

NO. 8

1521 On the  $\beta$  Decay of the Neutron. V. B. Berestetskii and I. Ya. Pomeranchuk, Zhur. Eksp. i Teoret. Fiz. 19, 756-7(1949) (Letter to the editor, in Russian).

The possibility of a  $\beta$  decay of the neutron is seen from the fact that its mass exceeds that of the proton by 755 keV; and, by comparing this process with such a  $\beta$  decay of a light nucleus in which the maximum energy value of the  $\beta$  spectrum is of the same order of magnitude with the above mass difference, it is concluded that the half-life period of the  $\beta$  disintegration of the neutron must be about 15-30 min. However, comparisons of that kind are based on the assumption of an approximate equality of conditions under which a nucleon undergoes transformations within a nucleus and in the free state. Not in all variants of the  $\beta$  decay theory such an assumption is acceptable. It is shown that in the pseudoscalar variant the probability of a  $\beta$  decay of a neutron is much lower than that of a  $\beta$  disintegration of a nucleus with an equal maximum energy value of the  $\beta$  spectrum; the half-life period of the neutron must be  $10^3$ - $10^4$  times longer than that of such a nucleus. The experimental evidence on the question is still in the rudimentary stage; it is known only that this period must exceed 15 min. (Snell et al, Phys. Rev. 74, 1217(1948)). Future findings will permit the right choice between the many variants of the theory.

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A 30-51A METALLURGICAL LITERATURE CLASSIFICATION

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RECORDS AND INDEX

LITERATURE INDEX

CROSS-REFERENCES

CROSS-REFERENCES

PA 27/49T88

USSR/Nuclear Physics - Protons  
Nuclear Physics - Electrons - Emission

Feb 49

"Emission During Collisions of High-Velocity  
Neutrons With Protons," I. Pomeranchuk, I. Shmush-  
kevich, Leningrad Physicotechn Inst, Acad Sci USSR,  
4 pp

"Dokl Ak Nauk SSSR" Vol LXIV, No 4

Character of angular distribution of diffused neutrons  
during their elastic collisions with protons (for the  
case of high speed of relative motion) is mainly  
dependent on the nature of the forces acting between  
these particles, i.e., whether they are constant

27/49T88

USSR/Nuclear Physics - Protons (Contd)

Feb 49

forces of changing forces. Mathematically analyzes  
this distribution. Submitted 28 Nov 48.

POMERANCHUK, I.

27/49T88

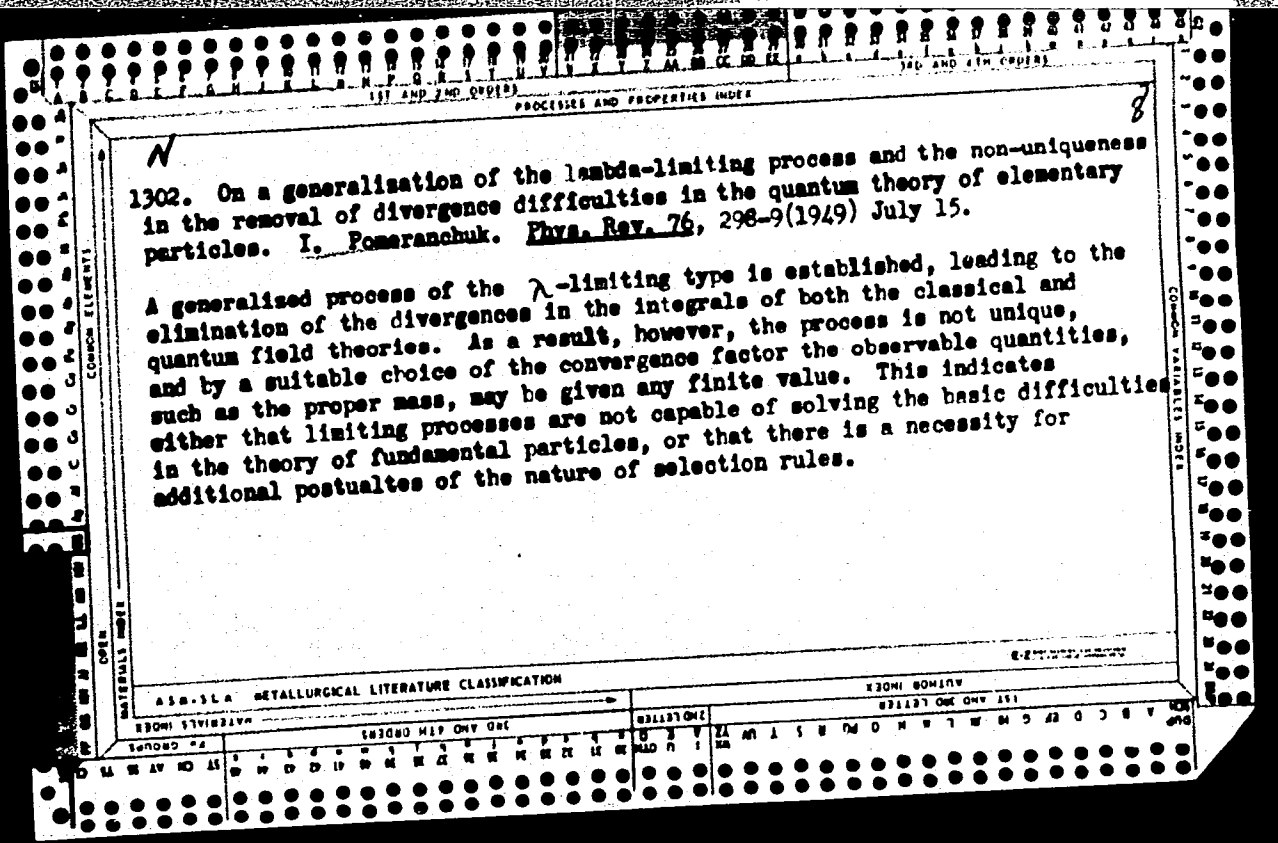
8

2457 Diffraction Scattering of Fast Neutrons and Charged Particles. A. I. Akhizer and I. Ya. Pomeranchuk. Uspekhi Fiz. Nauk 39, 153-200(1949)(in Russian).

The theory of diffraction phenomena, regarded as one of the aspects of the scattering of particles by nuclei, is given, the latter being phenomenologically treated as opaque bodies. The opacity is represented by the phenomenon of formation of excited compound nuclei, and the dependence of the opacity both on the energy of the incident particles (neutrons or charged light nuclides) and on the mass of the absorbing nuclei, is determined by statistical methods, independently of any theory of nuclear forces. After that, an optical diffraction theory of the scattering of fast neutrons is outlined, followed by a quantum-mechanical one, both leading to the same cross-section formula for the diffraction scattering of neutral particles. These considerations are generalized so as to include the diffraction of charged nuclides, viz. fast protons, deuterons, and  $\alpha$  particles.

ASB-5LA METALLURGICAL LITERATURE CLASSIFICATION





POMERANCHUK, I, Ya.

Nekotoryye Voprosy Teorii Yadra (Certain problems on the theory of the nucleus, by)  
A. AKHIEZER i I. POMERANCHUK. Izd. 2 Perer. Moskva, Gostekhlizdat, 1950.

413 p. Diagr.

"Literatura": (412)-(414)

Photostat.

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613.7  
.A3  
1950

155T53

POMERANCHUK, I.

USSR/Nuclear Physics - Radiation, Electromagnetic Jan 50

"Electromagnetic Radiation Under the Action of Exchange Forces," I. Pomeranchuk, I. Shmushkevich, 4 pp

"Doklady Akad. Nauk SSSR" Vol LXX, No 1

Attempts to show that approximation for cross section  $\sigma = \frac{4}{3\pi} \frac{e^2}{hc} \frac{1}{\omega} \frac{\sqrt{V/E}}{h\omega} \frac{E}{Mc^2} \sigma_e$  holds only for collisions between neutrons and protons. In collisions with heavy nuclei, flying particle (neutron or proton) may undergo

155T53

USSR/Nuclear Physics - Radiation, Electromagnetic (Contd) Jan 50

several collisions with individual nucleons before it flies out of nucleus. Submitted by A. F. Ioffe 25 Oct 49.

155T53

POMERANCHUK, I.

USSR/Physics - Helium, He-3

Oct 50

"Theory of Liquid Helium, He-3," I. Pomeranchuk

Zhur. Eksper. i Teoret. Fiz., Vol. XX, No. 10, pp 919-924

Studies temperature dependence of heat capacity, viscosity, heat conductivity of He-3. Discusses influence of exchange effects, due to nuclear spins of He-3 atoms, upon phase transition of liquid He-3 in solid state. Heat of fusion of He-3 at low temperatures must be negative and equal to  $-R \cdot \ln 2$ . Temperatures of the order of  $10^{-6}$  to  $10^{-7}$  °C are possible to obtain by adiabatic freezing of liquid He-3. Calculates certain peculiarities of nuclear magnetic susceptibility.  
Submitted 22 Mar 50.

169T96

POMERANCHUK, I. A.

PA 197T93

USSR/Nuclear Physics - Cross Sections Oct 51

"Exchange Collisions of Nucleons With Deuterons. I," I. A. Pomeranchuk

"Zhur Eksper i Teor Fiz" Vol XXI, No 10, pp 1113-1122

Discusses exptl data of collisions of free nucleons. Shows that effect of binding energy of particles in deuterons and application of Pauli's principle enable one to establish spin dependence of exchange forces in comparison with cross sections of exchange collisions of nucleons with deuterons; and

LC 197T93

USSR/Nuclear Physics - Cross Sections Oct 51  
(Contd)

free nucleons. Author acknowledges helpful discussions of Prof L. Landau, A. Migdal, I. Shmulevich. Submitted 29 Dec 50.

(CA 47 no. 21:11011 '53)

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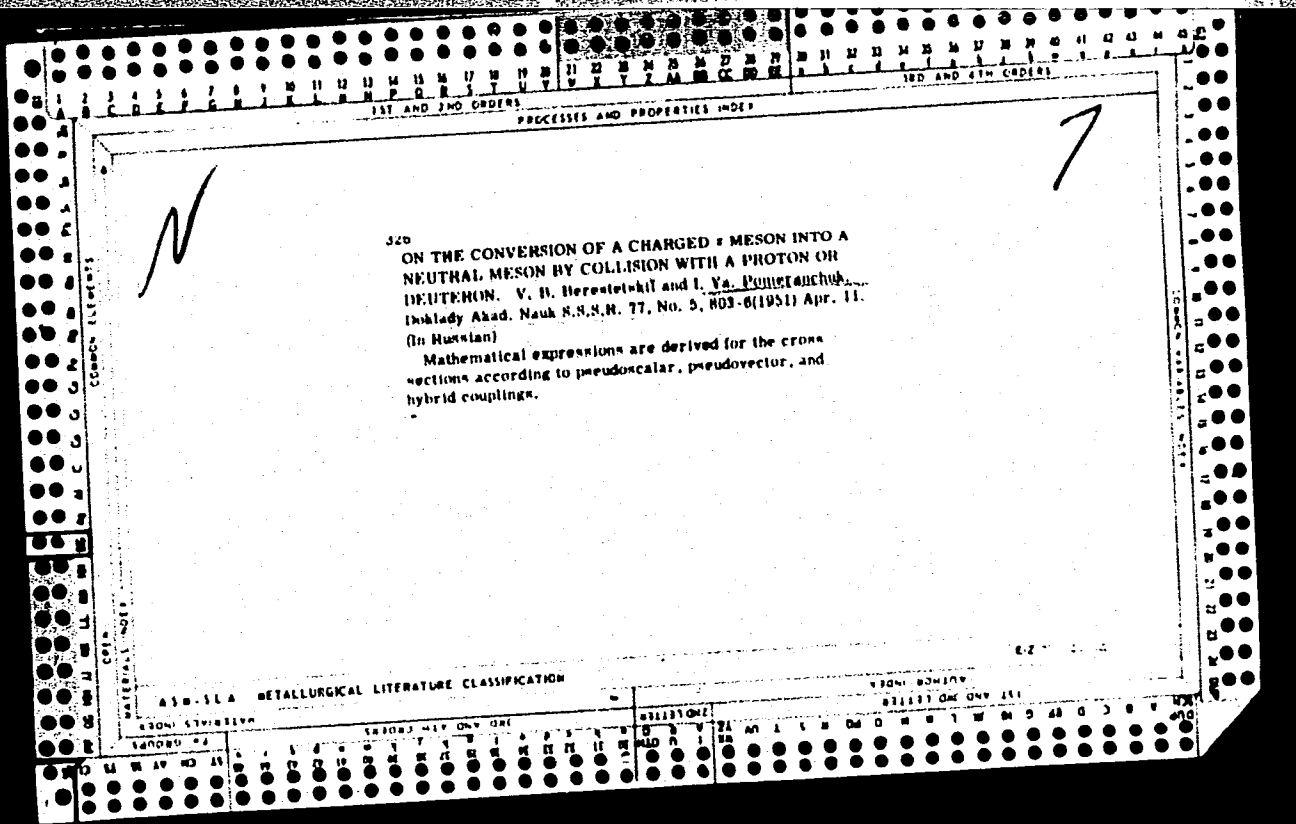
197T93

Pomeranchuk, I. Ya.

*Handwritten initials/signature*

Conversion of a charged  $\pi$  meson into a neutral meson by collision with a proton or a deuteron. V. B. Hrebenchuk and I. Ya. Pomeranchuk. Zhur. Eksp. i Teor. Fiz. 21, 1313-20 (1951); G. C.A., 45, 10078b. The effective cross section for the conversion of a charged  $\pi$  meson to a neutral meson upon collision with  $H_2$  or  $D_2$  has been calcd. The relation between the cross section and the energy is different for different types of interactions between the mesons and the nucleus. J. Rovtar Leach

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POMERANCHUK, I.

USSR/Nuclear Physics - Deuterons,  
Nucleons

11 May 51

"Exchange Collisions of Fast Nucleons With Deuterons,"  
I. Pomeranchuk

<sup>78</sup>  
"Dokl. Akad. Nauk SSSR" Vol LXXVIII, No 2, 249, 250

Considers the reaction  $n + D \rightarrow p + (n + n)$ ,  
 $p + D \rightarrow n + (p + p)$  in the case where the direction of  
the fast nucleon after collision coincides with the  
direction of the fast nucleon before collision. In  
exptl investigations of exchange collisions of fast  
nucleons with deuterons there is a possibility of  
explaining the dependence of exchange forces on spin.  
Submitted by Acad A. I. Alikhanov 2 Feb 51.

222T61



184T97

POMERANCHUK, I.

USSR/Nuclear Physics - Mesons

11 Jun 51

"Theory of Many-Particle Production in a Single Act," I. Pomeranchuk

"Dok Ak Nauk SSSR" Vol LXXVIII, No 5, pp 889-891

Study of nuclear collisions with  $\pi$ -mesons at high-energy producing cascade showers requires methods entirely different from the theory of disturbances (perturbations). Introduces formulas for cross sections and suggests that  $\pi$ -mesons originate from annihilation of nuclear pair. Submitted by Acad A. I. Alikhanov 12 Apr 51.

184T97

POMERANCHUK, I.

USSR/Nuclear Physics - Deuterium

1 Sep 51

"Capture of  $\pi$ -Particles in Deuterium," I. Pomeranchuk

"Dok Ak Nauk SSSR" Vol LXXX, No 1, pp 47, 48

Derives the value for the ratio of probabilities of emission of gamma-quanta in deuterium and hydrogen between 0.4 and 0.8. The main role is played by gamma-quanta with energies close to upper energy boundary of the spectra. Submitted 10 Jul 51 by Acad L. D. Landau.

221T77

NSA

1150774  
(Physics)

3038

ON COLLISION OF  $\pi$  MESONS WITH DEUTERONS. V. B. Berestetskiy and I. Ya. Pomeranchuk. Doklady Akad. Nauk S.S.S.R. 81, 1019-21(1951). (In Russian)

Equations for cross sections of elastic and inelastic scattering of  $\pi$  mesons by deuterons are derived on the assumptions of zero spin and scalar amplitudes.

POMERANCHUK, I. YA.

USSR/Nuclear Physics - Mesons

Feb 52

"Theory of Capture of  $\pi$ -particles in Deuteron,"  
I. Ya. Pomeranchuk

"Zhur Ekspier i Teoret Fiz" Vol XXII No 2, pp 129-135

From American expts (cf Phys Rev, 81, 565, 1951), the author establishes the probability ratios of the processes:  $p+\pi^- \rightarrow n+\pi^0$  and  $d+\pi^- \rightarrow n+\pi^0$  without application of the meson theory. Similarly he finds ratios of radiative capture:  $p+\pi^- \rightarrow n+\gamma$ ,  $d+\pi^- \rightarrow n+\pi^0+\gamma$ . Shows that exact measurement of ratio of amplitudes in p and d may enable one to establish number and spin of  $\pi$  and  $\pi^0$ . Indicates the general connection among

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USSR/Nuclear Physics - Mesons (Contd)

Feb 52

the processes with participation of slow mesons in hydrogen and deuteron. Indebted to B. Ioffe, A. Rudik and I. Shmushkevich. Received 3 May 51.

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